Factual Report – Attachment 17

National Weather Service Instructions (Directives)

METEOROLOGY

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NTSB, AS-30

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Operations and Services

Public Weather Services, NWSPD 10-5

WFO SEVERE WEATHER PRODUCTS SPECIFICATION

NOTICE: This publication is available at: http://www.nws.noaa.gov/directives/.

OPR: W/AFS21 (G. Schoor) **Certified by:** W/AFS21 (M. Hawkins)
Type of Issuance: Emergency

SUMMARY OF REVISIONS: This directive supersedes NWSI 10-511, dated August 20, 2018. The following changes were made to this instruction:

1) Reverted language about the "LAT…LON" section (4.3.5) parameters in the Severe Weather Statement (SVS) to previous version.

2) Additional guidance in Section 2.2.2 for Severe Thunderstorm Warning (SVR) issuance in situations where there are convective storms with little or no lightning.

3) Added "Broadcast Media" to the default list included in the IBW "Source" bullet for SVR (Section 2.3.5), TOR (3.3.5), and SVS (4.3.5).

4) Additional guidance on the inclusion of qualifying severe reports into warning product messages for SVR (Section 2.3.5), TOR (3.3.5), and SVS (4.3.5) and an example in the Appendix (4c).

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04/15/2020

Andrew D. Stern
Director, Analyze, Forecast, and Support Office

Date

WFO Severe Weather Products Specification

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1. **Introduction.** This procedural instruction describes the severe weather products issued by Weather Forecast Offices (WFOs), provides guidelines associated with these products, specifies detailed content as needed, and outlines the format for each product type.

2. Severe Thunderstorm Warning (product category SVR).

2.1 Mission Connection. Severe Thunderstorm Warnings (SVR) are issued to protect lives and property. WFO forecasters issue SVRs to provide the public, media, and emergency managers with advance notice of the combination of damaging wind gusts, large hail, and possible tornado development.

2.2 Issuance Guidelines.

2.2.1 Creation Software. WFOs will use WarnGen to issue SVRs.

2.2.2 Issuance Criteria. WFOs should issue SVRs when there is radar or satellite indication and/or reliable reports of wind gusts equal to or in excess of 50 knots (58 miles per hour (mph)) and/or hail size of one inch (U.S. quarter-size) diameter or larger. WFOs should issue SVRs for a convective cell or squall with little or no lightning that otherwise meet or exceed hail and/or wind warning criterion. A SVR should also be issued for potential tornado/landspout development in thunderstorms that also are forecasted to meet or exceed the minimum damaging wind gust and/or large hail criterion.

2.2.3 Issuance Time. SVRs are non-scheduled, event-driven products.

2.2.4 Valid Time. Valid times should be within 30 to 60 minutes of issuance. For thunderstorms that are expected to remain severe beyond the valid time of the original warning, WFOs should issue a new warning.

2.2.5 Product Expiration Time. The product expiration time is the end of warning valid time.

2.3 Technical Description. SVRs will follow the Impact-Based Warning (IBW) format and content described in this section.

2.3.1 Universal Geographic Code (UGC) Type. County (Zone for Alaska and parts of Pacific Region).

2.3.2 Mass News Disseminator (MND) Broadcast Line. For states that require Emergency Alert System (EAS) activation, SVRs should include the broadcast line: “BULLETIN - EAS ACTIVATION REQUESTED.” If a state does not require EAS activation for SVRs, the broadcast line will read: “BULLETIN – IMMEDIATE BROADCAST REQUESTED.” The term “BULLETIN” is used when information is sufficiently urgent to warrant breaking into a normal broadcast.

2.3.3 MND Header. The SVR MND header is “Severe Thunderstorm Warning”.

2.3.4 Content. The following guidelines apply to the issuance of SVRs by WFOs:

a. Writing Style:
   1) SVRs will be in Letter Case with the exception of section headers and coded tag lines designed to be in Uppercase.
   2) SVRs will follow a standard bullet style format, with the third bullet providing sub-category information that distinguishes the hazard, source of information, and potential impacts.
   3) Locations used to identify the threatened areas should be larger towns and other familiar landmarks.
   4) Names of states and counties (or parts of counties) should be spelled out.
   5) Concise call-to-action (CTA) statements should be included.
   6) The WFO designated on-duty shift leader/supervisor may discontinue call-to-action statements in warnings during widespread severe weather outbreaks.
   7) Mileage markers may be used as reference points when a storm is occurring or forecast to move over a major highway but limited to five references points or less.
   8) Named stadiums, arenas, or venues can be included in the locations section, as long the residing city name is included as a separate location entry.

b. Inclusion of Reports of Severe Events or Damage:
   1) Recent credible reports of severe hail, winds gusts, and/or damage due to hail or high winds should be included.

c. Pathcasts:
   1) In general, warnings may contain 'pathcasts' (specific forecasts of location and arrival time) provided the forecaster has very high confidence in the movement (direction and speed) of the hazardous weather.
   2) Any 'pathcast' issued should use terms of uncertainty appropriate to the state of the science (e.g. 'the severe thunderstorm will be near [location] around [time]').
   3) Warnings that contain 'pathcast' information should be followed by frequent (approximately every 15 minutes) Severe Weather Statements (SVS). This ensures that users receive the most recent information concerning the location and movement of the hazardous weather.

d. Number and Divisions of Counties/Parishes:
   1) WFOs should limit the number of counties/parishes in a SVR to 12 or less.
   2) If separating a county/parish into divisions, WFOs should use no more than a nine part division (i.e. northeast, east central, etc.) in coordination with state and local emergency managers and other partners.

e. Severe Thunderstorm Moves Over Water:
   1) If a severe thunderstorm moves over coastal waters, a Special Marine Warning (SMW) will be issued (see NWSI 10-313 for details on SMWs and issuance

criteria).

f. Combining Warnings:
   1) WFOs should keep Severe Thunderstorm and Flash Flood Warnings separate.

g. Tornado Watch Information:
   1) When a Tornado Watch is in effect for the warned area, WFOs should add this selection in the "PRECAUTIONARY/PREPAREDNESS ACTIONS" section, along with the additional pertinent CTA statements.
   2) The format for this information may either read as a generic statement (e.g. "A tornado watch remains in effect for the warned area."), or the more explicit statement (e.g. "A tornado watch remains in effect until 10 pm EDT for Southeastern Alabama.").
   3) This consideration is only valid for SVRs and their updates, through the SVS.

2.3.5 Format. The SVR format will contain this information in the following order, through the Impact-Based Warning (IBW) format (see Figure 1):

First Bullet – Type of warning; and warning location(s);

Second Bullet – Expiration time of warning;

Third Bullet – Time; notation of "severe thunderstorm(s)" and the physical distance (in miles) from the closest location; storm motion. If edits of more than 10 mph or more than 45 degrees are required for the storm motion, the forecaster should adjust the track in WarnGen, rather than manually edit the text, in order to keep in agreement with TIME…MOT…LOC line.

HAZARD (IBW Sub-Section 1)…Basis for warning (including recent credible reports if available); forecast or observed thunderstorm wind gusts and maximum hail sizes.

SOURCE (IBW Sub-Section 2)…Select one of these accepted source types (radar, trained weather spotters, law enforcement, emergency management, broadcast media, or public). If a qualifying report of severe weather occurs from the warned storm within the time span of the valid area and time warning, it should be added in a separate sentence in this section, after the source type (e.g. "At 4:55pm CDT, tennis ball size hail was reported 3 miles northeast of Emporia.").

IMPACT (IBW Sub-Section 3)…This section contains predetermined statements that are based on the selected wind speed and/or hail size attribute. Default and designated alternative impact statements are as follows in Table 1:

Table 1: Impact Statements for Severe Thunderstorm Warnings

Severe Thunderstorm	**Impact Statement(s)** [1) Sentence 1. 2) Sentence 2. … n) Sentence n. n = last sentence]

Attribute	Use all numbered statements in the order they appear.
Wind – 60 mph	1) Expect damage to roofs, siding, and trees.
	* 1) Tree and power line damage is likely. * 2) Expect damage to some roofs, siding, carports, and fences. (this alternative option should include both statements)
Wind – 70 mph	1) Expect considerable tree damage. 2) Damage is likely to mobile homes, roofs, and outbuildings.
	* 1) Expect considerable tree and power line damage. * 2) Damage is likely to mobile homes, roofs, screen enclosures, carports, and outbuildings.
Wind – 80 mph	1) Flying debris will be dangerous to those caught without shelter. 2) Mobile homes will be heavily damaged. 3) Expect considerable damage to roofs, windows, and vehicles. 4) Extensive tree damage and power outages are likely.
	* 1) Flying debris will be dangerous to those caught without shelter. * 2) Mobile homes will likely be heavily damaged. * 3) Considerable damage to roofs, windows, and vehicles is likely. * 4) Expect considerable tree and power line damage.
Wind – 90 mph	1) You are in a life threatening situation. 2) Flying debris may be deadly to those caught without shelter. 3) Mobile homes will be heavily damaged or destroyed. 4) Homes and businesses will have substantial roof and window damage. 5) Expect extensive tree damage and power outages.
	* 1) You are in a life threatening situation. * 2) Flying debris may be deadly to those caught without shelter. * 3) Mobile homes will be heavily damaged or destroyed. * 4) Homes and businesses will likely have substantial roof and window damage. * 5) Expect extensive tree damage and power line damage with widespread power outages.
Wind – 100 mph	1) You are in a life threatening situation. 2) Flying debris may be deadly to those caught without shelter. 3) Mobile homes will be destroyed. 4) Expect considerable damage to homes and businesses. 5) Expect extensive tree damage and power outages.
	* 1) You are in a life threatening situation. * 2) Flying debris may be deadly to those caught without shelter. * 3) Mobile homes will be heavily damaged or destroyed. * 4) Homes and businesses will likely have substantial roof and window damage.

	* 5) Expect extensive tree damage and power line damage with widespread power outages.
Hail – Up to Half Dollar/Walnut Size (1.25")	1) Damage to vehicles is expected.
	* 1) Damage to vehicles is likely.
Hail – Ping Pong Ball Size (1.50") to Tennis Ball Size (2.50")	1) People and animals outdoors will be injured. 2) Expect damage to roofs, siding, windows, and vehicles.
	* 1) People and animals outdoors will likely be injured. * 2) Expect damage to roofs, siding, screen enclosures, windows, and vehicles.
Hail – Baseball Size (2.75 Inches)	1) People and animals outdoors will be severely injured. 2) Expect shattered windows, extensive damage to roofs, siding, and vehicles.
	* 1) Severe injuries are likely with hail this size. * 2) Expect shattered windows, extensive damage to roofs, siding, screen enclosures, and vehicles.

* Note: Alternative impact statements may be utilized per Regional discretion.

Fourth Bullet – Locations to be impacted during the warning (see Figure 1);

PRECAUTIONARY/PREPAREDNESS ACTIONS – One or two short, concise, action-oriented CTA statements should be included. If CTAs are included under the PRECAUTIONARY/PREPAREDNESS ACTIONS, then two ampersands (&&) are required as a dissemination marker after the last CTA (see NWSI 10-1701, Section 5.5 for details on CTAs and markers). Credible reports of hail size and wind gusts should go in the basis statement (first IBW sub-section "HAZARD", under the third bullet) instead of the precautionary/preparedness actions. If a Tornado Watch is in effect for the warned area, the SVR will have a notation for this in this section.

LAT…LON – The warning area polygon as described by a series of latitude/longitude coordinates in decimal degrees with precision to hundredths (2 decimal places). The polygon will contain as few as three and as many as twenty vertices.

TIME…MOT…LOC – The tracking information gives the location and movement of the event being tracked. Examples of such events could include the leading edge of a gust front or the leading edge of a hail core. The format (see Figure 1) includes the time of the observed event in Coordinated Universal Time (UTC), followed by a three digit direction of movement in degrees (direction the event is moving from), followed by speed of movement in knots, and finally the location of the event as a single latitude/longitude coordinate, or in the case of a line, two or more latitude/longitude coordinates.

IBW Coded Tag Lines – This section details the required and optional IBW coded tag lines according to each hazard type. These outputs are linked to options made within the WarnGen product generation application and are not editable in the warning text. All tag lines and information wording will be in Uppercase. The specifications for IBW coded

tag choices are as follows:

`TORNADO...POSSIBLE`
(Optional; only one choice for this tag `[POSSIBLE]`. Select only if the severe thunderstorm is suspected to have the potential to produce a tornado/landspout but forecaster confidence does not warrant a Tornado Warning at the issuance time of the SVR). If this option is chosen, there must also be at least one of the other SVR criterion (wind and/or hail) selected.
`HAIL...X.XXIN`
(Required; X.XXIN = value of maximum expected/reported hail size, in inches, from above in the "HAZARD" warning basis section; can be `0.00IN` if no hail is expected or a lower value of hail size than the minimum SVR criteria, e.g. `<.75IN`, if the minimum SVR wind criterion is met).
`WIND...XXMPH`
(Required; XXMPH = value of maximum wind speed, in miles per hour (mph), from above in the "HAZARD" warning basis section, to the nearest 10mph; can be 00MPH if no thunderstorm wind gusts are expected or it can be a lower value than the minimum SVR thunderstorm wind gust criteria, e.g. `<50MPH`, if the minimum SVR hail size criterion is met).

IBW Tag Order – If chosen, "`TORNADO...POSSIBLE`" will be first in all cases. Otherwise, hail will be first, then wind. This section also pertains to the updates to a SVR, under the Severe Weather Statement (SVS).

```
WUaa5i cccc ddhhmm
SVRccc
STC001-002-ddhhmm-
/k.aaa.cccc.pp.s.####.yymmddThhnnZB-yymmddThhnnZE/

BULLETIN - EAS ACTIVATION (or IMMEDIATE BROADCAST) REQUESTED
Severe Thunderstorm Warning (...CORRECTED as required)
National Weather Service City State
time am/pm time_zone day mon dd yyyy

The National Weather Service in City has issued a

* Severe Thunderstorm Warning for...
  Portion County one in section State...(List warned counties)
  Portion County two in section State...(Number of counties will
  match number of counties in UGC Line)

* Until hhmm AM/PM time_zone (Expiration time of warning)

* At hhmm am/pm time_zone, warning basis, forward speed and
  direction.

  HAZARD...Warning basis elements (wind speed and/or hail size).
```

```
  SOURCE...(Choose one) Radar indicated, Trained weather spotters,
  Law enforcement, Emergency management, Broadcast media, or Public.

  IMPACT...Statements will populate based on the selected severe
  hazards in Table 1.

* Locations impacted include...
  Location #1, Location #2, Location #n. (n = variable number of
  locations).

PRECAUTIONARY/PREPAREDNESS ACTIONS...

(Call-to-Action statements).

(Tornado watch information, if valid for the warned area).

&&

LAT...LON (Required list of latitude/longitude coordinate pairs
      outlining the forecaster-drawn warning area)
TIME...MOT...LOC hhnnZ xxxDEG xxKT xxxx xxxx (lat/lon couplet(s))

TORNADO...POSSIBLE (will only appear if selected)
HAIL...X.XXIN (X.XX = value of maximum expected hail size, in
diameter, from the "HAZARD" warning basis section)
WIND...XXMPH (XX = value of maximum expected wind speed from the
"HAZARD" warning basis section to the nearest 10mph)

$$
FORECASTER NAME/NUMBER (OPTIONAL)
```

Figure 1. Severe Thunderstorm Warning Format

2.4 Updates, Amendments and Corrections. Updates and amendments are not applicable. WFOs will correct SVRs for significant grammatical errors, format or dissemination code errors. Corrected warnings will have the same time in the MND Header and the same Event Tracking Number (ETN) in the Valid Time Event Code (VTEC) line as the original warning. WFOs should issue Severe Weather Statements (SVS) to inform users of erroneous counties removed from original warnings (either in the Federal Information Processing Standards (FIPS)/Zone UGC code or in the body of the warning).

3. Tornado Warning (product category TOR).

3.1 Mission Connection. Tornado Warnings (TOR) are issued to protect lives and property. WFO forecasters issue TORs to provide the public, media, and emergency managers with advance notice of tornadoes.

3.2 Issuance Guidelines.

3.2.1 Creation Software. WFOs will use WarnGen to issue TORs.

3.2.2 Issuance Criteria. WFOs should issue TORs when there is radar indication and/or reliable reports of a tornado or developing tornado.

3.2.3 Issuance Time. TORs are non-scheduled, event-driven products.

3.2.4 Valid Time. Valid times should be 15 to 45 minutes from issuance. For a tornado expected to continue beyond the valid time of the original warning, WFOs should issue a new warning.

3.2.5 Product Expiration Time. The product expiration time is the end of warning valid time.

3.3 Technical Description. TORs will follow the Impact-Based Warning (IBW) format and content described in this section.

3.3.1 UGC Type. County (Zone for Alaska Region and parts of Pacific Region).

3.3.2 MND Broadcast Line. TORs will include the broadcast line "BULLETIN - EAS ACTIVATION REQUESTED." The term "BULLETIN" is used when information is sufficiently urgent to warrant breaking into a normal broadcast.

3.3.3 MND Header. The TOR MND header is "Tornado Warning".

3.3.4 Content. The following guidelines apply to the issuance of TORs by WFOs:

a. Writing Style:
    1) TORs will be in Letter Case with the exception of section headers and coded tag lines designed to be in Uppercase.
    2) TORs will follow a standard bullet style format, with the third bullet providing sub-category information that distinguishes the hazard, source of information, and potential impacts.
    3) Locations used to identify the threatened areas should be larger towns and other familiar landmarks.
    4) Names of states and counties (or parts of counties) should be spelled out.
    5) Concise call-to-action (CTA) statements should be included.
    6) The WFO designated on-duty shift leader/supervisor may discontinue CTA statements in warnings during widespread severe weather outbreaks.

7) Mileage markers may be used as reference points when a storm is occurring or forecast to move over a major highway but limited to five references points or less.
8) Named stadiums, arenas, or venues can be included in the locations section, as long the residing city name is included as a separate location entry.

b. Inclusion of Tornado or Tornado Damage Reports (3rd bullet):
   1) Recent credible reports of a tornado, possible tornado, and/or recent credible reports of damage from a tornado or possible tornado should be included.

c. Pathcasts:
   1) In general, warnings may contain 'pathcasts' (specific forecasts of location and arrival time) provided the forecaster has very high confidence in the movement (direction and speed) of the hazardous weather.
   2) Any 'pathcast' issued should use terms of uncertainty appropriate to the state of the science (e.g., 'the severe thunderstorm will be near [location] around [time]').
   3) Warnings that contain 'pathcast' information should be followed by frequent (approximately every 15 minutes) Severe Weather Statements (SVS). This ensures that users receive the most recent information concerning the location and movement of the hazardous weather.

d. Number and Divisions of Counties/Parishes:
   1) WFOs should limit the number of counties/parishes in a TOR to 12 or less.
   2) If separating a county/parish into divisions, WFOs should use no more than a nine part division (i.e. northeast, east central, etc.) in coordination with state and local emergency managers and other partners.

e. Tornado Moves Over Water
   1) If a tornado moves over coastal waters, a Special Marine Warning (SMW) will be issued (see NWSI 10-313 for details on SMWs and issuance criteria).

f. Combining Warnings
   1) WFOs should keep Tornado and Flash Flood Warnings separate.

3.3.4.1 Tornado Emergency. In exceedingly rare situations, when a severe threat to human life and catastrophic damage from a tornado is imminent or ongoing, WFOs have the option to insert the headline in a Tornado Warning (TOR) "…TORNADO EMERGENCY FOR [IMPACTED LOCATIONS]…" with concurrence of the designated on-duty shift leader/supervisor. The headline will be on a separate line directly following the date/time line in the MND Header and before the first line that begins "THE NATIONAL WEATHER SERVICE IN XXX HAS ISSUED A", where "XXX" is the WFO location. The headline will be preceded and followed by a three dot ellipsis. "TORNADO EMERGENCY FOR [IMPACTED LOCATIONS]" is duplicated without ellipses in the last line of the third bullet, e.g., the basis statement of the warning. The "IMPACTED LOCATIONS" should be cities, towns or well-known landmarks, and may include "AND SURROUNDING AREAS". The TORNADO EMERGENCY will also

contain an IBW coded tag line of "TORNADO DAMAGE THREAT...CATASTROPHIC" (see Section 3.3.5, Table 2).

Use of "TORNADO EMERGENCY" terminology is appropriate for the tornadic situation if all of the following criteria are met:

a. Severe threat to human life is imminent or ongoing
b. Catastrophic damage is imminent or ongoing
c. Visual (1) or Radar (2)
    (1) Reliable sources visually confirm tornado
    (2) Radar imagery (e.g., debris ball signature) strongly suggests the existence of a damaging tornado.

3.3.5 Format. The TOR format will contain this information in the following order, through the Impact-Based Warning (IBW) format (see Figure 2):

First Bullet - Type of warning; warning location(s);

Second Bullet - Expiration time of warning;

Third Bullet - Time, basis for warning, storm motion. If edits of more than 10 mph or more than 45 degrees are required, the forecaster should adjust the track in WarnGen, rather than manually edit the text, in order to keep in agreement with TIME…MOT…LOC line.

HAZARD (IBW Sub-Section 1)…Basis for warning (including recent credible reports, if available). Tornado will be mentioned first, then the forecast or observed thunderstorm wind gusts and/or maximum hail size, if the tornado is radar indicated. If the tornado is observed and maximum expected hail size is below criteria (e.g. 0.75 inches), then hail does not need to be included in this section but will appear in the IBW coded tag line. If the tornado is observed and hail meets or exceeds criteria, then it will be included in this section and the IBW coded tag line.

SOURCE (IBW Sub-Section 2)…Select one of these accepted source types (radar, trained weather spotters, law enforcement, emergency management, broadcast media, or public). If a qualifying report of severe weather occurs from the warned storm within the time span of the valid area and time warning, it should be added in a separate sentence in this section, after the source type (e.g. "At 3:18pm EDT, a tornado was reported 6 miles southwest of Meridian.").

IMPACT (IBW Sub-Section 3)…This section contains predetermined statements that are based on the selected attribute. Default and designated alternative impact statements are as follows in Table 2:

Table 2: Impact Statements for Tornado Warnings

Tornado Impact	Impact Statement(s)

Attribute	[1) Sentence 1. 2) Sentence 2. … n) Sentence n. n = last sentence] Use all numbered statements in the order they appear.
Landspout / Weak Tornado	1) Expect damage to mobile homes, roofs, and vehicles.
	* 1) Expect damage to mobile homes, roofs, screen enclosures, carports, vehicles and trees along the path of the tornado.
"Base" (default)	1). Flying debris will be dangerous to those caught without shelter. 2) Mobile homes will be damaged or destroyed. 3) Damage to roofs, windows and vehicles will occur. 4) Tree damage is likely.
CONSIDERABLE	1) You are in a life-threatening situation. 2) Flying debris may be deadly to those caught without shelter. 3) Mobile homes will be destroyed. 4) Considerable damage to homes, businesses, and vehicles is likely and complete destruction is possible.
CATASTROPHIC	1) You are in a life-threatening situation. 2) Flying debris may be deadly to those caught without shelter. 3) Mobile homes will be destroyed. 4) Considerable damage to homes, businesses, and vehicles is likely and complete destruction is possible.

* Note: Alternative impact statements may be utilized per Regional discretion for Landspout / Weak Tornado only. The other statements are standard nationwide.

Fourth Bullet – Locations to be impacted during the warning (see Figure 2);

PRECAUTIONARY/PREPAREDNESS ACTIONS – One or two short, concise, action-oriented CTA statements should be included, starting with this Uppercase text phrase, "TAKE COVER NOW!" If CTAs are included under the PRECAUTIONARY/ PREPAREDNESS ACTIONS, then two ampersands (&&) are required as a dissemination marker after the last CTA (see NWSI 10-1701, Section 5.5 for details on CTAs and markers). Credible reports of tornadoes and associated damage should go in the basis statement (first IBW sub-section "HAZARD", under the third bullet) instead of the precautionary/preparedness actions.

LAT…LON – The warning area polygon as described by a series of latitude/longitude coordinates in decimal degrees with precision to hundredths (2 decimal places). The polygon will contain as few as three and as many as twenty vertices.

TIME…MOT…LOC – The tracking information gives the location and movement of the event being tracked. Examples of such events could include the low-level mesocyclone, or a report of the tornado location. The format includes the time of the observed event in UTC, followed by a three digit direction of movement in degrees (direction the event is moving from), followed by speed of movement in knots, and finally the location of the event as a single latitude/longitude coordinate.

IBW Coded Tag Lines – This section details the required and optional IBW coded tag lines according to each hazard type. These outputs are linked to choices made within the WarnGen product generation application and are not editable in the warning text. All tag lines and information wording will be in Uppercase.

`TORNADO...[RADAR INDICATED; OBSERVED]`
Required first line, based on selection from the "HAZARD" IBW sub-section.
`TORNADO DAMAGE THREAT...[CONSIDERABLE; CATASTROPHIC]`
Will only appear for the selection of either of these two options (`CONSIDERABLE; CATASTROPHIC`). The selection of `CONSIDERABLE` can associated with either `RADAR INDICATED` or `OBSERVED` in the above tag and "`Damaging tornado`" will be placed in the HAZARD section, as the warning basis. The selection of `CATASTROPHIC` will assign `OBSERVED` in the above tag and "`Deadly tornado`" will be placed in the HAZARD section, as the warning basis. With either the tags, `CONSIDERABLE` or `CATASTROPHIC`, the phrase "This is a PARTICULARLY DANGEROUS SITUATION. TAKE COVER NOW!" will also be placed in the third bullet, above the "HAZARD" section.
`HAIL...X.XXIN`
(Required; X.XXIN = value of maximum expected/reported hail size, in inches, from above in the "HAZARD" warning basis section; can be `0.00IN` if no hail is expected or a lower value of hail size than the minimum SVR criteria, e.g. `<.75IN`).
`WIND...XXMPH`
(Optional; XXMPH = value of maximum wind speed, in miles per hour (mph), from above in the "HAZARD" warning basis section, to the nearest 10mph; can be 00MPH if no thunderstorm wind gusts are expected or it can be a lower value than the minimum SVR thunderstorm wind gust criteria, e.g. `<50MPH`).

```
WFaa5i cccc ddhhmm
TORccc
STC001-002-ddhhmm-
/k.aaa.cccc.pp.s.####.yymmddThhnnZB-yymmddThhnnZE/

BULLETIN - EAS ACTIVATION REQUESTED
Tornado Warning (... CORRECTED as required)
National Weather Service City State
time am/pm time_zone day mon dd yyyy

...TORNADO EMERGENCY FOR (CITY, CITIES, PORTION OF
COUNTY/COUNTIES)... (if applicable; IBW tornado damage threat tag
"Catastrophic" must be invoked/selected)

The National Weather Service in City has issued a

* Tornado Warning for...
  Portion County one in section State...(List warned counties)
  Portion County two in section State...(Number of Counties will
match number of counties in UGC Line)
```

```
* Until hhmm AM/PM time_zone (Expiration time of warning)

* At hhmm am/pm time_zone, warning basis, forward speed and
  direction.

TORNADO EMERGENCY for (same location/s as first headline). This is a
PARTICULARLY DANGEROUS SITUATION. TAKE COVER NOW! (for the
“Catastrophic” tornado damage threat IBW tag only)

This is a PARTICULARLY DANGEROUS SITUATION. TAKE COVER NOW! (for the
“Considerable” tornado damage threat IBW tag only)

  HAZARD...Warning basis statement (Tornado and; Damaging Tornado
  and; largest expected hail size – if chosen).

  SOURCE...(Choose one) Radar indicated, Trained weather spotters,
  Law enforcement, Emergency management, Broadcast media, or Public.

  IMPACT...Statements will populate based on the selected severe
  hazards in Table 2.

* Locations impacted include...
  Location #1, Location #2, Location #n. (n = variable number of
  locations).

PRECAUTIONARY/PREPAREDNESS ACTIONS...

(Call-to-Action statements).

&&

LAT...LON (Required list of latitude/longitude coordinate pairs
      outlining the forecaster-drawn warning area)
TIME...MOT...LOC hhnnZ xxxDEG xxKT xxxx xxxx (lat/lon couplet(s))

TORNADO...RADAR INDICATED; OBSERVED
TORNADO DAMAGE THREAT...CONSIDERABLE; CATASTROPHIC
HAIL...X.XXIN (X.XX = value of maximum expected hail size, in
diameter, from the “HAZARD” warning basis section)
WIND...XXMPH (XX = value of maximum expected wind speed from the
“HAZARD” warning basis section to the nearest 10mph)

$$
FORECASTER NAME/NUMBER (OPTIONAL)
```

Figure 2. Tornado Warning Format

3.4 Updates, Amendments and Corrections. Updates and amendments are not applicable. WFOs will correct TORs for significant grammatical errors, format or dissemination code errors.

Corrected warnings will have the same time in the MND Header and the same ETN in the VTEC line as the original warning. WFOs should issue Severe Weather Statements (SVS) to inform users of erroneous counties removed from original warnings (either in the FIPS/Zone UGC code or in the body of the warning).

4. Severe Weather Statement (product category SVS).

4.1 Mission Connection. Severe Weather Statements (SVS) provide the public and emergency managers with updated information for specific Severe Thunderstorm (SVR) and Tornado (TOR) Warnings. Updated information includes reports of observed severe weather. They also inform the public, media, and emergency managers when all or portions of a warning have been canceled or have expired.

4.2 Issuance Guidelines.

4.2.1 Creation Software. WFOs will use WarnGen to issue SVSs.

4.2.2 Issuance Criteria. The following guidelines apply to the issuance of SVSs by WFOs:

a. Cancellations – WFOs should issue a SVS to provide notice a SVR or TOR has been cancelled for all or portions of the warning polygon.

b. Updates – WFOs should issue SVSs at least once during the valid time of a SVR or TOR. During significant severe thunderstorm and tornado events WFOs should issue more frequent SVS updates to keep the public informed of the progression of dangerous storms. This includes substantive changes to storm intensity and/or potential impacts (e.g. increase in hail size from quarter-sized to golf ball sized; decrease in estimated wind gusts from 80 mph to 60 mph, radar-indicated tornado to a tornado confirmed by a visual report from a credible source), if the reports/observations are received within the valid time of the warning.

c. Corrections – WFOs should issue a SVS to notify users of erroneous counties included in the original SVR or TOR (either in the FIPS/Zone UGC code or in the body of the warning) have been removed.

d. Expirations – WFOs may issue a SVS to provide notice that a SVR or TOR has expired.

4.2.3 Issuance Time. SVSs are non-scheduled, event-driven products.

4.2.4 Valid Time. The valid time will be from the time of issuance to the warning expiration or cancellation time.

4.2.5 Product Expiration Time. The product expiration time is no more than 15 minutes after the warning expiration or cancellation time.

4.3 Technical Description. SVSs will follow the Impact-Based Warning (IBW) format and content described in this section.

4.3.1 UGC Type. County (Zone for Alaska Region and parts of Pacific Region).

4.3.2 MND Broadcast Line. None.

4.3.3 MND Header. The SVS MND header is "Severe Weather Statement".

4.3.4 Content. The following Guidelines apply to the issuance of SVSs by WFOs.

a. Purpose:
   1) WFOs should issue SVSs to address the status of severe weather warnings.
   2) WFOs will not use SVSs to expand in area or extend the valid time of TORs and SVRs.
   3) If the threat of severe weather clears a significant portion of the SVR or TOR during the warning period, forecasters should update the latitude and longitude pairs of the polygon within the warned county or counties.

b. Writing Style:
   1) SVSs will be in Letter Case with the exception of section headers and coded tag lines designed to be in Uppercase.
   2) The SVS will be in the IBW format for the section following the storm characteristics information (e.g. impact(s), timing, location, movement).
   3) Locations used to identify the threatened areas should be larger towns and other familiar landmarks.
   4) Names of states and counties (or parts of counties) should be spelled out.
   5) Concise call-to-action (CTA) statements should be included.
   6) The WFO designated on-duty shift leader/supervisor may discontinue call-to-action statements in warnings during widespread severe weather outbreaks.
   7) Mileage markers may be used as reference points when a storm is occurring or forecast to move over a major highway but limited to five references points or less.
   8) Named stadiums, arenas, or venues can be included in the locations section, as long the residing city name is included as a separate location entry.

c. Reports of Severe Events or Damage:
   1) Recent credible reports of a tornado, severe hail, or damaging wind should be included.
   2) Recent credible reports of damage from tornadoes, severe hail, or high wind should be included.

d. Pathcasts:
   1) In general, the SVS may contain 'pathcasts' (specific forecasts of location and arrival time) provided the forecaster has very high confidence in the direction and speed of the movement of the hazardous weather.
   2) Any 'pathcast' issued should use terms of uncertainty appropriate to the state of the science (e.g., 'the tornadic storm will be near [location] around [time]').
   3) In addition, SVSs with 'pathcast' information should be frequently updated (approximately every 15 minutes). This ensures that users receive the most recent

information concerning the location and movement of the hazardous weather.

4.3.4.1 Tornado Emergency. In exceedingly rare situations, when a severe threat to human life and catastrophic damage from a tornado is imminent or ongoing, WFOs have the option to insert this headline "…TORNADO EMERGENCY FOR [IMPACTED LOCATIONS]…" in an update to a Tornado Warning, through the SVS, per the guidelines in Section 3.3.4.1. Additionally, a TORNADO EMERGENCY will also contain an IBW coded tag line of "TORNADO DAMAGE THREAT...CATASTROPHIC" (see Section 3.3.5, Table 2).

4.3.5 Format. (See Figure 3).

```
WWUS5i cccc ddhhmm
SVSccc

Severe Weather Statement
National Weather Service City State
time am/pm time_zone day mon dd yyyy

STC001-ddhhmm-
/k.CAN.cccc.pp.s.####.yymmddThhnnZB-yymmddThhnnZE/
County A -
time am/pm time_zone day mon dd yyyy

...SEVERE THUNDERSTORM or TORNADO WARNING HAS BEEN CANCELLED FOR
PORTION COUNTY A...

LAT...LON (Required list of latitude/longitude points outlining the
      warning area – modified to remove those areas no longer
      threatened)
TIME...MOT...LOC hhnnZ xxxDEG xxKT xxxx xxxx (lat/lon coordinate(s))

$$

STC003-ddhhmm-
/k.CON.cccc.pp.s.####.yymmddThhnnZB-yymmddThhnnZE/
County B -
time am/pm time_zone day mon dd yyyy

...TORNADO EMERGENCY FOR (CITY/CITIES, PORTION/S OF COUNTY B)... (if
applicable; IBW tornado damage threat tag "Catastrophic" must be
invoked/selected)

...SEVERE THUNDERSTORM or TORNADO WARNING REMAINS IN EFFECT UNTIL
hhmm am/pm time_zone FOR COUNTY B...

At hhmm am/pm time_zone, warning basis, forward speed and direction.

TORNADO EMERGENCY for (same location/s as first headline). This is a
PARTICULARLY DANGEROUS SITUATION. TAKE COVER NOW! (for the
"Catastrophic" tornado damage threat IBW tag only)
```

```
This is a PARTICULARLY DANGEROUS SITUATION. TAKE COVER NOW! (for the
“Considerable” tornado damage threat IBW tag only)

HAZARD...Severe thunderstorm-based hazard(s) (hail and/or wind) or
         tornado.

SOURCE...(Choose one) Radar indicated, Trained weather spotters,
         Law enforcement, Emergency management, Broadcast media, or
         Public.

IMPACT...Statements will populate based on the selected severe
         hazards in Table 1.

Locations impacted include...
Location #1, Location #2, Location #n. (n = variable number of
locations).

PRECAUTIONARY/PREPAREDNESS ACTIONS...

(Call-to-Action statements).

(Tornado watch information for Severe Thunderstorm Warnings only, if
valid for the warned area).

&&

LAT...LON (Required list of latitude/longitude points outlining the
      warning area – modified to remove those areas no longer
      threatened)
TIME...MOT...LOC hhnnZ xxxDEG xxKT xxxx xxxx (lat/lon couplet(s))

(for a Tornado Warning)
TORNADO...RADAR INDICATED; OBSERVED
TORNADO DAMAGE THREAT...CONSIDERABLE; CATASTROPHIC
HAIL...X.XXIN (X.XX = value of maximum expected hail size, in
diameter, from the “HAZARD” warning basis section)
WIND...XXMPH (XX = value of maximum expected wind speed from the
“HAZARD” warning basis section to the nearest 10mph)

(for a Severe Thunderstorm Warning)
TORNADO...POSSIBLE (will only appear if selected)
HAIL...X.XXIN (X.XX = value of maximum expected hail size, in
diameter, from the “HAZARD” warning basis section)
WIND...XXMPH (XX = value of maximum expected wind speed from the
“HAZARD” warning basis section to the nearest 10mph)

$$

FORECASTER NAME/NUMBER (OPTIONAL)
```

Figure 3. Severe Weather Statement (SVS) Format

4.3.5.1 Event Tracking Number (ETN). The VTEC ETN (####) in the SVS will match the corresponding active SVR or TOR for updates and cancellations (See Figure 3).

4.4 Updates, Amendments and Corrections. Updates and amendments to the corresponding warning polygon should be provided as necessary through subsequent SVSs. WFOs will correct statements for format and grammatical errors as required.

5. Watch County Notification Message (product category WCN).

5.1 Mission Connection. WFOs will issue Watch County Notification Messages (WCN) to provide NOAA/NWS' Storm Prediction Center (SPC), emergency managers, the media, and the public with a list of counties, parishes, independent cities, and marine zones in a convective watch area within their geographic area of responsibility.

5.2 Issuance Guidelines.

5.2.1 Creation Software. WFOs should use the Graphical Hazards Generation Editor (GHG) software to create WCNs.

5.2.2 Issuance Criteria. Affected contiguous United States (CONUS) WFOs will issue initial WCNs after SPC issues the initial Watch Outline Update Message (WOU). WFOs in tropical areas outside the CONUS (OCONUS) will issue WCNs without a WOU from SPC and based on the potential of damaging winds, severe hail, and/or tornadoes. WFOs will issue updated WCNs to cancel, extend the valid time, or extend in area portions of one or more convective watches in their geographic area of responsibility.

5.2.3 Issuance Time. WCNs are non-scheduled, event-driven products.

5.2.4 Valid Time. WCNs are valid until the watch expiration time.

5.2.5 Product Expiration Time. The expiration time is the same as the convective watch end time found in the initial WOU. WFOs may extend the convective watch expiration time in a WCN update after collaboration with SPC and the other WFOs in the watch area. Timely collaboration on a watch extended in time is particularly important so other WFOs in the watch area have the opportunity to cancel the watch from their counties.

5.3 Technical Description. WCNs will follow the format and content described in this section.

5.3.1 UGC Type. County.

5.3.2 MND Header. The WCN MND header is "WATCH COUNTY NOTIFICATION FOR WATCH nnnn", where "nnnn" is the watch number. The watch number will be for the watch with the earliest issuance time if more than one watch is in effect for a WFO's geographical area of responsibility.

5.3.3 Content. WFOs and SPC are partners in the convective watch process. In the spirit of partnership, WFOs and SPC work toward a consensus convective watch area and duration before, during, and at the end of convective watches. This partnership is defined as collaboration. OCONUS WFOs are not required to collaborate with SPC.

The list of counties, parishes, independent cities and marine zones in the initial WCN within

CONUS will match the list of counties, parishes, independent cities, and marine zones in the initial WOU issued by SPC for their geographic area of responsibility. The marine zones refer to adjacent coastal waters out to 20 nautical miles (nm) for the Atlantic and Pacific Oceans, and Gulf of Mexico. All marine zones are included in convective watches for the Great Lakes.

a. Active Watches – WFOs will issue updated WCNs to continue, cancel or extend in time or area portions of one or more active convective watches in their geographic area of responsibility.
b. New Watches – WFOs will also issue updated WCNs to include new watches issued within their geographic area of responsibility while existing watches remain in effect.
c. Watch Extensions – CONUS WFOs will collaborate with SPC and affected WFOs on counties, parishes, independent cities or marine zones added to the initial watch area, or extensions to the expiration time of the initial convective watch area.
d. Watch Replacements – CONUS WFOs will collaborate with SPC and adjacent WFOs when counties, parishes, independent cities or marine zones are transferred from an existing convective watch to a new convective watch (e.g. watch replacement).
e. Watch Editing Consistency – WFOs should ensure modifications to the convective watch area are consistent with modifications made by adjacent WFOs.
f. WCN Issuance Times – WCNs should be issued by H+55 so that changes will be reflected in the WOU issued by SPC after the top of the hour.
g. Watch Cancellation/Expiration – The final WCN for a particular convective watch will cancel or allow expiration of all remaining counties, parishes, independent cities and/or marine zones in the watch for their geographic area of responsibility.

5.3.4 Format. (See Figure 4)

```
WWUS6i cccc ddhhmm
WCNccc

WATCH COUNTY NOTIFICATION FOR WATCH nnnn (or nnnn/nnnn if more than
one watch is in effect)
NATIONAL WEATHER SERVICE CITY STATE
time am/pm time_zone day mon dd yyyy

STC001-003-ddhhmm-
/k.aaa.cccc.pp.s.####.yymmddThhnnZB-yymmddThhnnZE/
THE NATIONAL WEATHER SERVICE HAS CANCELLED SEVERE THUNDERSTORM (OR
TORNADO WATCH) nnnn FOR THE FOLLOWING AREAS  (If Cancellation
Segment)

THE NATIONAL WEATHER SERVICE HAS ISSUED SEVERE THUNDERSTORM (OR
TORNADO) WATCH nnnn UNTIL time am/pm time_zone WHICH REPLACES A
PORTION OF SEVERE THUNDERSTORM (OR TORNADO) WATCH nnnn.  THE NEW
WATCH IS VALID FOR THE FOLLOWING AREAS  (If Replacement Segment)

THE NATIONAL WEATHER SERVICE HAS ISSUED SEVERE THUNDERSTORM (OR
TORNADO) WATCH nnnn UNTIL time am/pm time_zone.  SEVERE THUNDERSTORM
(OR TORNADO) WATCH nnnn WILL BE ALLOWED TO EXPIRE (OR HAS EXPIRED).
THE NEW WATCH IS VALID FOR THE FOLLOWING AREAS  (If Replacement for
Expired Segment)

THE NATIONAL WEATHER SERVICE HAS ISSUED SEVERE THUNDERSTORM (OR
TORNADO) WATCH nnnn IN EFFECT UNTIL time am/pm time_zone FOR THE
FOLLOWING AREAS (If New Segment)

THE NATIONAL WEATHER SERVICE HAS EXTENDED SEVERE THUNDERSTORM (OR
TORNADO) WATCH nnnn TO INCLUDE THE FOLLOWING AREAS UNTIL time am/pm
time_zone  (If Extension in Area Segment)

SEVERE THUNDERSTORM (OR TORNADO) WATCH NUMBER nnnn...PREVIOUSLY IN
EFFECT UNTIL  time am/pm time_zone...IS NOW IN EFFECT UNTIL time
am/pm time_zone FOR THE FOLLOWING AREAS(If Extension in Time Segment)

SEVERE THUNDERSTORM (OR TORNADO) WATCH nnnn REMAINS VALID UNTIL time
am/pm time_zone FOR THE FOLLOWING AREAS (If Continuation Segment)

THE NATIONAL WEATHER SERVICE WILL ALLOW SEVERE THUNDERSTORM (OR
TORNADO) WATCH nnnn TO EXPIRE AT time am/pm time_zone FOR THE
FOLLOWING AREAS(If Expiration Segment - issued prior to watch end
time)

THE NATIONAL WEATHER SERVICE HAS ALLOWED SEVERE THUNDERSTORM (OR
TORNADO) WATCH nnnn TO EXPIRE FOR THE FOLLOWING AREAS. (If Expiration
```

```
***Segment - issued after the watch end time)***

SEVERE THUNDERSTORM (OR TORNADO) WATCH nnnn WILL BE ALLOWED TO EXPIRE
(OR HAS EXPIRED).  THE NEW WATCH IS VALID FOR THE FOLLOWING AREAS
***(If Replacement for Expired Segment)***

IN STATE 1 THIS WATCH INCLUDES (or CANCELS or ALLOWS TO EXPIRE) n
COUNTIES

LIST OF COUNTIES IN STATE 1 (OR PORTION OF STATE 1)

IN STATE 1 THIS WATCH INCLUDES (or CANCELS or ALLOWS TO EXPIRE) n
INDEPENDENT CITIES

LIST OF INDEPENDENT CITIES IN STATE 1

THIS WATCH INCLUDES (or THIS CANCELS or ALLOWS TO EXPIRE) THE
FOLLOWING ADJACENT COASTAL WATERS

LIST OF MARINE ZONES

OTHER CITIES IN STATES 1 (OPTIONAL)

$$ (END OF SEGMENT)
```

Figure 4. Watch County Notification (WCN) Message Format

5.3.4.1 Event Tracking Number. The VTEC ETN (####) will match the SPC watch number designated in the WOU, except for WCNs issued by WFOs in Pacific Region and Puerto Rico.

5.4 Updates, Amendments and Corrections. WFOs will update WCNs when counties, parishes, independent cities, or marine zones are canceled or added from the watch or the watch valid time is extended. WFOs will correct WCNs for format and grammatical errors.

APPENDIX A - Examples

Table of Contents: Page

1. Introduction. This appendix provides the public with examples for each of the IBW categories for each of the WFO products.

2. Severe Thunderstorm Warning (SVR).

a. IBW Tag: "Base" (example SPC Tornado Watch information included)

```
WUUS53 KLSX 070333
SVRLSX
MOC103-111-127-137-173-205-070430-
/O.NEW.KLSX.SV.W.0029.170307T0333Z-170307T0430Z/

BULLETIN - IMMEDIATE BROADCAST REQUESTED
Severe Thunderstorm  Warning
National Weather Service St Louis MO
933 PM CST MON MAR 6 2017

The National Weather Service in St Louis has issued a

* Severe Thunderstorm Warning for...
  Knox County in northeastern Missouri...
  Ralls County in northeastern Missouri...
  Marion County in northeastern Missouri...
  Shelby County in northeastern Missouri...
  Lewis County in northeastern Missouri...
  Monroe County in northeastern Missouri...

* Until 1030 PM CST.

* At 932 PM CST, severe thunderstorms were located along a line
  extending from near Memphis to 9 miles northwest of Huntsville,
  moving east at 55 mph.

  HAZARD...60 mph wind gusts and quarter size hail.

  SOURCE...Radar indicated.

  IMPACT...Hail damage to vehicles is expected. Expect wind damage
           to roofs, siding, and trees.

* Locations impacted include...
  Hannibal, Palmyra, Monroe City, Canton, Shelbina, Paris, Edina,
  Santa Fe, Warren, New London, La Grange, Clarence, Perry, La Belle,
  Madison, Shelbyville, Lewistown, Center, Ewing and Rensselaer.

This also includes Wakonda State Park, Union Covered Bridge Historic
Site, and Mark Twain Lake Recreational Area.

PRECAUTIONARY/PREPAREDNESS ACTIONS...
```

```
For your protection move to an interior room on the lowest floor of a
building.

A tornado watch remains in effect until 400 AM CST for west central
Illinois and northeastern Missouri.

&&

LAT...LON 4030 9195 4026 9193 4025 9150 4003 9150
      3993 9142 3988 9145 3984 9144 3980 9137
      3973 9137 3969 9133 3960 9118 3945 9146
      3932 9144 3935 9231 3995 9229 3996 9234
      4030 9235
TIME...MOT...LOC 0332Z 266DEG 48KT 4047 9227 3956 9264

HAIL.  1.00IN
WIND.  60MPH

$$
```

Wind threshold (only)

```
WUUS53 KJKL 060128
SVRJKL
KYC065-109-129-197-237-060200-
/O.NEW.KJKL.SV.W.0030.170406T0128Z-170406T0200Z/

BULLETIN - IMMEDIATE BROADCAST REQUESTED
Severe Thunderstorm Warning
National Weather Service JACKSON KY
928 PM EDT WED APR 5 2017

The National Weather Service in Jackson KY has issued a

* Severe Thunderstorm Warning for...
  Southeastern Powell County in east central Kentucky...
  Estill County in east central Kentucky...
  North central Jackson County in southeastern Kentucky...
  Northern Lee County in southeastern Kentucky...
  Southwestern Wolfe County in southeastern Kentucky...

* Until 1000 PM EDT

* At 928 PM EDT, a severe thunderstorm was located over Station Camp,
  or near Irvine, moving northeast at 45 mph.

  HAZARD...70 mph wind gusts and penny size hail.
```

```
  SOURCE...Radar indicated.

  IMPACT...Expect considerable tree damage. Damage is likely to
           mobile homes, roofs, and outbuildings.

* Locations impacted include...
  Irvine, Fincastle, Ravenna, Pilot, Torrent, Leeco, Rice Station,
  Kings Station, Pinnacle, Pine Ridge, Calloway Crossing, Patsey,
  Wisemantown, Weedon, Drip Rock, Natural Bridge S.P., Blanton Flats,
  Knowlton, Haystack and Alumbaugh.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

For your protection move to an interior room on the lowest floor of a
building.

A tornado watch remains in effect until 1000 PM EDT for southeastern
and east central Kentucky.

&&

LAT...LON 3785 8367 3784 8367 3783 8364 3763 8354
      3753 8411 3756 8412 3757 8409 3765 8413
      3767 8409 3768 8410 3769 8409 3786 8368
TIME...MOT...LOC 0128Z 241DEG 40KT 3764 8400

HAIL.  0.75IN
WIND.  70MPH

$$
```

Hail threshold (only)

```
WUUS53 KMKX 232224
SVRMKX
WIC049-232330-
/O.NEW.KMKX.SV.W.0017.170323T2224Z-170323T2330Z/

BULLETIN - IMMEDIATE BROADCAST REQUESTED
Severe Thunderstorm Warning
National Weather Service Milwaukee/Sullivan WI
524 PM CDT THU MAR 23 2017

The National Weather Service in Milwaukee/Sullivan has issued a

* Severe Thunderstorm Warning for...
  Iowa County in south central Wisconsin...
```

```
* Until 630 PM CDT

* At 524 PM CDT, a severe thunderstorm was located near Lancaster,
  moving east at 50 mph.

  HAZARD...Ping pong ball size hail.

  SOURCE...Radar indicated.

  IMPACT...People and animals outdoors will be injured. Expect
           damage to roofs, siding, windows, and vehicles.

* Locations impacted include...
  Dodgeville, Mineral Point, Blanchardville, Barneveld, Highland,
  Ridgeway, Linden, Cobb, Rewey, Hollandale, Governor Dodge St Park,
  Edmund, Blue Mound St Park, Blackhawk Lake Rec Area and London.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

For your protection move to an interior room on the lowest floor of a
building.

This storm is producing large hail. SEEK SHELTER NOW inside a sturdy
structure and stay away from windows!

&&

LAT...LON 4309 9043 4316 8984 4281 8984 4281 9043
TIME...MOT...LOC 2224Z 268DEG 42KT 4289 9067

HAIL.  1.50IN
WIND.  <50MPH

$$
```

b. IBW Tag: "Tornado…Possible"

```
WUUS54 KOUN 212341
SVROUN
OKC015-031-051-220030-
/O.NEW.KOUN.SV.W.0903.171021T2341Z-171022T0030Z/

BULLETIN - IMMEDIATE BROADCAST REQUESTED
Severe Thunderstorm Warning
National Weather Service Norman OK
641 PM CDT SAT OCT 21 2017

The National Weather Service in Norman has issued a
```

```
* Severe Thunderstorm Warning for...
  North central Comanche County in southwestern Oklahoma...
  West central Grady County in central Oklahoma...
  Southern Caddo County in southwestern Oklahoma...

* Until 730 PM CDT

* At 641 PM CDT, a severe thunderstorm was located near Boone, moving
  northeast at 35 mph.

  This is a very dangerous storm.

  HAZARD...Baseball size hail and 70 mph wind gusts.

  SOURCE...Radar indicated.

  IMPACT...People and animals outdoors will be severely injured.
           Expect shattered windows, extensive damage to roofs,
           siding, and vehicles.

* Locations impacted include...
  Anadarko, Elgin, Apache, Fletcher, Cyril, Verden, Cement, Medicine
  Park, Meers, Lake Lawtonka, Boone, Lake Ellsworth, Ninnekah,
  Stecker, Laverty and eastern Wichita Mountains Wildlife Refuge.

This includes Interstate 44 between mile markers 54 and 74.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

Remain alert for a possible tornado! Tornadoes can develop quickly
from severe thunderstorms.

This is a dangerous storm. Prepare immediately for large destructive
hail capable of producing significant damage. People outside should
move to shelter inside a strong building, and stay away from windows.

&&

LAT...LON 3471 9849 3479 9861 3492 9860 3518 9828
      3509 9808 3491 9796
TIME...MOT...LOC 2341Z 232DEG 29KT 3484 9846

TORNADO...POSSIBLE
HAIL.  2.75IN
WIND.  70MPH

$$
```

“Tornado…Possible” with Wind threshold (only)

```
WUUS54 KHUN 100627
SVRHUN
ALC049-071-100730-
/O.NEW.KHUN.SV.W.0029.170310T0627Z-170310T0730Z/

BULLETIN - IMMEDIATE BROADCAST REQUESTED
Severe Thunderstorm Warning
National Weather Service Huntsville AL
1227 AM CST FRI MAR 10 2017

The National Weather Service in Huntsville Alabama has issued a

* Severe Thunderstorm Warning for...
  Jackson County in northeastern Alabama...
  Northern DeKalb County in northeastern Alabama...

* Until 130 AM CST

* At 1227 AM CST, severe thunderstorms were located along a line
  extending from near Sewanee to Triana, moving southeast at 40 mph.

  HAZARD...60 mph wind gusts and penny size hail.

  SOURCE...Radar indicated.

  IMPACT...Expect considerable tree damage. Damage is likely to
           mobile homes, roofs, and outbuildings.

* Locations impacted include...
  Scottsboro, Fort Payne, Rainsville, Bridgeport, Little River Canyon
  National Preserve, Henagar, Stevenson, Sylvania, Fyffe and
  Hollywood.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

For your protection move to an interior room on the lowest floor of a
building.

&&

LAT...LON 3448 8558 3444 8558 3437 8563 3435 8568
      3451 8610 3453 8611 3454 8615 3460 8616
      3460 8632 3499 8586 3498 8561 3453 8551
TIME...MOT...LOC 0627Z 292DEG 46KT 3514 8585 3461 8674

TORNADO...POSSIBLE
HAIL...<.75IN
```

```
WIND...60MPH

$$
```

3. Tornado Warning (TOR)

a. IBW Tag: "Base"

Radar indicated; no visual confirmation

```
WFUS54 KLIX 071714
TORLIX
LAC071-071745-
/O.NEW.KLIX.TO.W.0039.170207T1714Z-170207T1745Z/

BULLETIN - EAS ACTIVATION REQUESTED
Tornado Warning
National Weather Service New Orleans LA
1114 AM CST TUE FEB 7 2017

The National Weather Service in New Orleans has issued a

* Tornado Warning for...
  Orleans Parish in southeastern Louisiana...

* Until 1145 AM CST

* At 1113 AM CST, a severe thunderstorm capable of producing a
  tornado was located near Arabi, or near Chalmette, moving east at
  20 mph.

  HAZARD...Tornado and half dollar size hail.

  SOURCE...Radar indicated rotation.

  IMPACT...Flying debris will be dangerous to those caught without
           shelter. Mobile homes will be damaged or destroyed.
           Damage to roofs, windows, and vehicles will occur.  Tree
           damage is likely.

* Locations impacted include...
  New Orleans, East New Orleans and Lakefront Airport.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

TAKE COVER NOW! Move to a basement or an interior room on the lowest
floor of a sturdy building. Avoid windows. If you are outdoors or in
a vehicle, move to the closest substantial shelter and protect
yourself from flying debris.

To report severe weather contact your nearest law enforcement agency.
They will send your report to the National Weather Service office in
New Orleans.
```

```
&&

LAT...LON 2996 9005 3004 9008 3016 8985 3013 8982
      3019 8976 3001 8970 3000 8970 3001 8980
      2997 8985 3000 8986 2999 8986 2999 8988
      3000 8989 3000 8991 2998 8994 2999 8997
      2999 8999 2996 9001
TIME...MOT...LOC 1713Z 254DEG 19KT 3002 9000

TORNADO...RADAR INDICATED
HAIL.  1.25IN

$$
```

Visual confirmation

```
WFUS53 KMPX 132359
TORMPX
MNC041-121-149-140045-
/O.NEW.KMPX.TO.W.0019.170613T2359Z-170614T0045Z/

BULLETIN - EAS ACTIVATION REQUESTED
Tornado Warning
National Weather Service Twin Cities/Chanhassen MN
659 PM CDT TUE JUN 13 2017

The National Weather Service in The Twin Cities has issued a

* Tornado Warning for...
  Southwestern Douglas County in west central Minnesota...
  Northwestern Pope County in west central Minnesota...
  Northeastern Stevens County in west central Minnesota...

* Until 745 PM CDT

* At 659 PM CDT, a confirmed tornado was located near Cyrus, or near
  Morris, moving north at 35 mph.

  HAZARD...Damaging tornado and hail up to two inches in diameter.

  SOURCE...Weather spotters confirmed tornado.

  IMPACT...Flying debris will be dangerous to those caught without
           shelter. Mobile homes will be damaged or destroyed.
           Damage to roofs, windows, and vehicles will occur.  Tree
           damage is likely.
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* The tornado will be near...
  Kensington around 725 PM CDT.

Other locations impacted by this tornadic thunderstorm include
Farwell and Holmes City.

This includes the following highways...
 Interstate 94 in Minnesota near mile marker 97.
 U.S. Highway 59 between mile markers 165 and 177.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

To repeat, a tornado is on the ground. TAKE COVER NOW! Move to a
basement or an interior room on the lowest floor of a sturdy
building. Avoid windows. If you are outdoors, in a mobile home, or in
a vehicle, move to the closest substantial shelter and protect
yourself from flying debris.

&&

LAT...LON 4576 9588 4576 9576 4591 9576 4588 9548
      4553 9572 4557 9590
TIME...MOT...LOC 2359Z 197DEG 31KT 4560 9581

TORNADO...OBSERVED
HAIL.  2.00IN

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b. IBW Tag: "Considerable"

Radar indicated; no visual confirmation

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WFUS54 KSHV 022102
TORSHV
LAC021-059-022145-
/O.NEW.KSHV.TO.W.0048.170402T2102Z-170402T2145Z/

BULLETIN - EAS ACTIVATION REQUESTED
Tornado Warning
National Weather Service Shreveport LA
402 PM CDT SUN APR 2 2017

The National Weather Service in Shreveport has issued a

* Tornado Warning for...
  Southern Caldwell Parish in north central Louisiana...
  Northeastern La Salle Parish in north central Louisiana...
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* Until 445 PM CDT

* At 401 PM CDT, a large and extremely dangerous tornado was located
  near Midway, or 22 miles northeast of Pineville, moving northeast
  at 40 mph.

  This is a PARTICULARLY DANGEROUS SITUATION. TAKE COVER NOW!

  HAZARD...Damaging tornado.

  SOURCE...Radar indicated rotation.

  IMPACT...You are in a life-threatening situation. Flying debris
           may be deadly to those caught without shelter. Mobile
           homes will be destroyed. Considerable damage to homes,
           businesses, and vehicles is likely and complete
           destruction is possible.

* The tornado will be near...
  Jena around 410 PM CDT.
  Midway around 415 PM CDT.

Other locations impacted by this tornadic thunderstorm include Nebo.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

To repeat, a large, extremely dangerous and potentially deadly
tornado is developing. To protect your life, TAKE COVER NOW! Move to
a basement or an interior room on the lowest floor of a sturdy
building. Avoid windows. If you are outdoors, in a mobile home, or in
a vehicle, move to the closest substantial shelter and protect
yourself from flying debris.

&&

LAT...LON 3172 9201 3166 9204 3155 9215 3160 9228
      3193 9212 3192 9201
TIME...MOT...LOC 2101Z 209DEG 35KT 3160 9219

TORNADO...RADAR INDICATED
TORNADO DAMAGE THREAT...CONSIDERABLE
HAIL.  1.75IN

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Visual confirmation

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WFUS53 KTOP 282311
TORTOP
KSC045-290000-
/O.NEW.KTOP.TO.W.0024.190528T2311Z-190529T0000Z/

BULLETIN - EAS ACTIVATION REQUESTED
Tornado Warning
National Weather Service Topeka KS
611 PM CDT Tue May 28 2019

The National Weather Service in Topeka has issued a

* Tornado Warning for...
  Central Douglas County in east central Kansas...

* Until 700 PM CDT.

* At 610 PM CDT, a confirmed tornado was located near Lone Star,
  moving northeast at 40 mph.

  This is a PARTICULARLY DANGEROUS SITUATION. TAKE COVER NOW!

  HAZARD...Damaging tornado.

  SOURCE...Emergency Management confirmed tornado.

  IMPACT...You are in a life-threatening situation. Flying debris
           may be deadly to those caught without shelter. Mobile
           homes will be destroyed. Considerable damage to homes,
           businesses, and vehicles is likely and complete
           destruction is possible.

* The tornado will be near...
  Lawrence and Vinland around 620 PM CDT.
  Eudora around 630 PM CDT.

This includes Kansas Turnpike between mile markers 202 and 205.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

To repeat, a large, extremely dangerous and potentially deadly
tornado is on the ground. To protect your life, TAKE COVER NOW! Move
to a basement or an interior room on the lowest floor of a sturdy
building. Avoid windows. If you are outdoors, in a mobile home, or in
a vehicle, move to the closest substantial shelter and protect
yourself from flying debris.

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LAT...LON 3879 9534 3893 9539 3903 9519 3896 9518
      3896 9517 3898 9516 3897 9513 3897 9511
      3895 9509 3896 9508 3898 9508 3899 9506
      3886 9506
TIME...MOT...LOC 2310Z 241DEG 33KT 3887 9531

TORNADO...OBSERVED
TORNADO DAMAGE THREAT...CONSIDERABLE
HAIL...<.75IN

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c. IBW Tag: "Catastrophic" (Tornado Emergency)

Radar indicated; no visual confirmation

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WFUS52 KFFC 051654
TORFFC
GAC261-051745-
/O.NEW.KFFC.TO.W.0041.170405T1654Z-170405T1745Z/

BULLETIN - EAS ACTIVATION REQUESTED
Tornado Warning
National Weather Service PEACHTREE CITY GA
1254 PM EDT WED APR 5 2017

...TORNADO EMERGENCY FOR SUMTER...

The National Weather Service in PEACHTREE CITY has issued a

* Tornado Warning for...
  Sumter County in west central Georgia...

* Until 145 PM EDT

* At 1252 PM EDT, a confirmed large and destructive tornado was
  observed over Weston, or 7 miles southwest of Preston, moving east
  at 30 mph.

  TORNADO EMERGENCY for SUMTER COUNTY. This is a PARTICULARLY
  DANGEROUS SITUATION. TAKE COVER NOW!

  HAZARD...Deadly tornado.

  SOURCE...Emergency management confirmed tornado and a history of
           producing damage from a half mile to one mile wide.

  IMPACT...You are in a life-threatening situation. Flying debris
```

may be deadly to those caught without shelter. Mobile homes will be destroyed. Considerable damage to homes, businesses, and vehicles is likely and complete destruction is possible.

* Locations impacted include...
  Americus, Plains, New Era and Maddox.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

To repeat, a large, extremely dangerous and potentially deadly tornado is on the ground. To protect your life, TAKE COVER NOW! Move to an interior room on the lowest floor of a sturdy building. Avoid windows. If in a mobile home, a vehicle or outdoors, move to the closest substantial shelter and protect yourself from flying debris.

A large and extremely dangerous tornado is on the ground. Take immediate tornado precautions. This is an emergency situation.

&&

LAT...LON 3196 8444 3204 8444 3204 8443 3213 8443
      3217 8431 3217 8429 3216 8428 3216 8418
      3217 8418 3217 8414 3202 8413 3194 8441
TIME...MOT...LOC 1652Z 252DEG 25KT 3197 8460

TORNADO...OBSERVED
TORNADO DAMAGE THREAT...CATASTROPHIC
HAIL. 1.50IN

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4. Severe Weather Statement (SVS).

a. IBW Tag: "Base" SVR

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WWUS53 KOAX 170036
SVSOAX

Severe Weather Statement
National Weather Service Omaha/Valley Nebraska
736 PM CDT FRI JUN 16 2017

IAC085-129-155-NEC025-055-153-155-177-170100-
/O.CON.KOAX.SV.W.0155.000000T0000Z-170617T0100Z/
Mills IA-Pottawattamie IA-Harrison IA-Sarpy NE-Washington NE-
Douglas NE-Saunders NE-Cass NE-
736 PM CDT FRI JUN 16 2017

...A SEVERE THUNDERSTORM WARNING REMAINS IN EFFECT UNTIL 800 PM CDT
FOR NORTHWESTERN MILLS...WESTERN POTTAWATTAMIE...SOUTHWESTERN
HARRISON...SARPY...SOUTHEASTERN WASHINGTON...DOUGLAS...SOUTHERN
SAUNDERS AND NORTHERN CASS COUNTIES...

At 736 PM CDT, severe thunderstorms were located along a line
extending from 4 miles southwest of Missouri Valley to 8 miles
southwest of Fort Calhoun to 3 miles south of Waterloo to near Wahoo,
moving southeast at 40 mph.

These are very dangerous storms.

HAZARD...80 mph wind gusts and quarter size hail.

SOURCE...Radar indicated.

IMPACT...Flying debris will be dangerous to those caught without
         shelter. Mobile homes will be heavily damaged. Expect
         considerable damage to roofs, windows, and vehicles.
         Extensive tree damage and power outages are likely.

Locations impacted include...
Omaha, Council Bluffs, Bellevue, Papillion, La Vista, Blair, Ralston,
Wahoo, Gretna, Missouri Valley, Ashland, Valley, Springfield, Yutan,
Underwood, Fort Calhoun, Waterloo, Mead, Cedar Creek and Kennard.

This includes the following highways...
 Highway 275 in Nebraska near mile marker 167.
 Highway 30 in Iowa between mile markers 1 and 5.
 Interstate 29 between mile markers 39 and 79.
 Interstate 80 in Iowa between mile markers 1 and 23.
 Interstate 80 in Nebraska between mile markers 428 and 454.
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PRECAUTIONARY/PREPAREDNESS ACTIONS...

For your protection move to an interior room on the lowest floor of a
building.

&&

LAT...LON 4140 9543 4115 9573 4103 9590 4101 9640
      4129 9683 4132 9643 4143 9626 4163 9602
TIME...MOT...LOC 0036Z 305DEG 34KT 4151 9595 4136 9612 4124 9629 4123
9660

HAIL.  1.00IN
WIND.  80MPH

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b. IBW Tag: "Base" SVR with partial cancellation

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WWUS55 KBYZ 182259
SVSBYZ

Severe Weather Statement
National Weather Service Billings MT
459 PM MDT TUE JUL 18 2017

MTC075-182308-
/O.CAN.KBYZ.SV.W.0022.000000T0000Z-170718T2330Z/
Powder River MT-
459 PM MDT TUE JUL 18 2017

...THE SEVERE THUNDERSTORM WARNING FOR EASTERN POWDER RIVER COUNTY IS
CANCELLED...

The severe thunderstorm which prompted the warning has moved out of
the warned area. Therefore, the warning has been cancelled.

LAT...LON 4512 10454 4551 10499 4569 10498 4580 10482
      4566 10404 4556 10404
TIME...MOT...LOC 2258Z 305DEG 46KT 4559 10469

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MTC011-182330-
/O.CON.KBYZ.SV.W.0022.000000T0000Z-170718T2330Z/
Carter MT-
459 PM MDT TUE JUL 18 2017
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...A SEVERE THUNDERSTORM WARNING REMAINS IN EFFECT UNTIL 530 PM MDT
FOR CENTRAL CARTER COUNTY...

At 458 PM MDT, a severe thunderstorm was located 11 miles northwest
of Ridgeway, or 21 miles south of Ekalaka, moving southeast at 35
mph.

HAZARD...60 mph wind gusts and half dollar size hail.

SOURCE...Radar indicated.

IMPACT...Hail damage to vehicles is expected. Expect wind damage to
         roofs, siding, and trees.

Locations impacted include...
Ridgeway and Belltower.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

For your protection move to an interior room on the lowest floor of a
building.

&&

LAT...LON 4512 10454 4551 10499 4569 10498 4580 10482
      4566 10404 4556 10404
TIME...MOT...LOC 2258Z 305DEG 46KT 4559 10469

HAIL.  1.25IN
WIND.  60MPH

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c. <u>IBW Tag: "Base" SVR with inclusion of qualifying severe weather report</u>

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636
WWUS53 KARX 200051
SVSARX

Severe Weather Statement
National Weather Service La Crosse WI
751 PM CDT Fri Jul 19 2019

WIC019-119-200100-
/O.CON.KARX.SV.W.0053.000000T0000Z-190720T0100Z/
Clark WI-Taylor WI-
751 PM CDT Fri Jul 19 2019
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...A SEVERE THUNDERSTORM WARNING REMAINS IN EFFECT UNTIL 800 PM CDT FOR NORTHERN CLARK AND EASTERN TAYLOR COUNTIES...

At 750 PM CDT, severe thunderstorms were located along a line extending from 8 miles southwest of New Wood Wildlife Area to 7 miles northeast of Spencer to 6 miles north of Neillsville, moving southeast at 45 mph.

These are very dangerous storms.

HAZARD...80 mph wind gusts and quarter size hail.

SOURCE...Public. At 737 PM, numerous downed tree limbs were reported in Owen.

IMPACT...Flying debris will be dangerous to those caught without shelter. Mobile homes will be heavily damaged. Expect considerable damage to roofs, windows, and vehicles. Extensive tree damage and power outages are likely.

These severe thunderstorms will remain over mainly rural areas of northern Clark and eastern Taylor Counties, including the following locations... Mead Lake, Wood Lake, Highway 13 And County Road M, Stetsonville, County Roads A And E, Highway M And Joe Martin Road and Esadore Lake.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

Remain alert for a possible tornado! Tornadoes can develop quickly from severe thunderstorms. If you spot a tornado go at once into the basement or small central room in a sturdy structure.

This is an EXTREMELY DANGEROUS SITUATION with tornado like wind speeds expected. Mobile homes and high profile vehicles are especially susceptible to winds of this magnitude and may be overturned. For your protection move to an interior room on the lowest floor of a building. These storms have the potential to cause serious injury and significant property damage.

Torrential rainfall is occurring with these storms, and may lead to flash flooding. Do not drive your vehicle through flooded roadways.

&&

LAT...LON 4538 9005 4512 9004 4512 9020 4503 9020
4503 9031 4495 9032 4471 9092 4496 9092
4538 9030
TIME...MOT...LOC 0050Z 293DEG 38KT 4519 9003 4484 9017 4466 9060

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TORNADO...POSSIBLE
HAIL.  1.00IN
WIND.  80MPH

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d. IBW Tag: "Base" TOR

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WWUS54 KAMA 282301
SVSAMA

Severe Weather Statement
National Weather Service Amarillo TX
601 PM CDT TUE MAR 28 2017

TXC087-483-282330-
/O.CON.KAMA.TO.W.0002.000000T0000Z-170328T2330Z/
Wheeler TX-Collingsworth TX-
601 PM CDT TUE MAR 28 2017

...A TORNADO WARNING REMAINS IN EFFECT UNTIL 630 PM CDT FOR SOUTH
CENTRAL WHEELER AND CENTRAL COLLINGSWORTH COUNTIES...

At 601 PM CDT, a confirmed tornado was located 6 miles northwest of
Wellington, moving northeast at 35 mph.

HAZARD...Damaging tornado and golf ball size hail.

SOURCE...Weather spotters confirmed tornado.

IMPACT...Flying debris will be dangerous to those caught without
         shelter. Mobile homes will be damaged or destroyed. Damage
         to roofs, windows, and vehicles will occur.  Tree damage is
         likely.

Locations impacted include...
Wellington, Shamrock, Lutie, Quail and Samnorwood.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

To repeat, a tornado is on the ground. TAKE COVER NOW! Move to a
basement or an interior room on the lowest floor of a sturdy
building. Avoid windows. If you are outdoors, in a mobile home, or in
a vehicle, move to the closest substantial shelter and protect
yourself from flying debris.

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LAT...LON 3477 10024 3489 10047 3526 10022 3515 10000
      3504 10000
TIME...MOT...LOC 2301Z 210DEG 31KT 3493 10027

TORNADO...OBSERVED
HAIL.  1.75IN

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e. IBW Tag: "Base" TOR with partial cancellation

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WWUS54 KFWD 300012
SVSFWD

Severe Weather Statement
National Weather Service Fort Worth TX
712 PM CDT SAT APR 29 2017

TXC467-300021-
/O.CAN.KFWD.TO.W.0029.000000T0000Z-170430T0030Z/
Van Zandt TX-
712 PM CDT SAT APR 29 2017

...THE TORNADO WARNING FOR NORTH CENTRAL VAN ZANDT COUNTY IS
CANCELLED...

The tornadic thunderstorm which prompted the warning has moved out
of the warned area. Therefore, the warning has been cancelled.

A tornado watch remains in effect until 1000 PM CDT for north central
Texas.

LAT...LON 3284 9583 3298 9584 3298 9567 3288 9565
      3282 9573
TIME...MOT...LOC 0011Z 193DEG 24KT 3290 9573

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TXC379-300030-
/O.CON.KFWD.TO.W.0029.000000T0000Z-170430T0030Z/
Rains TX-
712 PM CDT SAT APR 29 2017

...A TORNADO WARNING REMAINS IN EFFECT UNTIL 730 PM CDT FOR
NORTHEASTERN RAINS COUNTY...

At 711 PM CDT, a confirmed tornado was located near Emory, or 18
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miles southwest of Sulphur Springs, moving north at 30 mph.

HAZARD...Damaging tornado and ping pong ball size hail.

SOURCE...Weather spotters confirmed tornado.

IMPACT...Flying debris will be dangerous to those caught without
         shelter. Mobile homes will be damaged or destroyed. Damage
         to roofs, windows, and vehicles will occur.  Tree damage is
         likely.

Locations impacted include...
Emory.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

To repeat, a tornado is on the ground. TAKE COVER NOW! If you are
outdoors, in a mobile home, or in a vehicle, move to the closest
substantial shelter now!  Get to an interior room on the lowest floor
of a sturdy building and avoid windows.

&&

LAT...LON 3284 9583 3298 9584 3298 9567 3288 9565
      3282 9573
TIME...MOT...LOC 0011Z 193DEG 24KT 3290 9573

TORNADO...OBSERVED
HAIL.  1.50IN

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f. IBW Tag: “Considerable” TOR

Radar indicated; no visual confirmation

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WWUS54 KFWD 292243
SVSFWD

Severe Weather Statement
National Weather Service Fort Worth TX
543 PM CDT SAT APR 29 2017

TXC213-467-292300-
/O.CON.KFWD.TO.W.0023.000000T0000Z-170429T2300Z/
Van Zandt TX-Henderson TX-
543 PM CDT SAT APR 29 2017
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...A TORNADO WARNING REMAINS IN EFFECT UNTIL 600 PM CDT FOR
SOUTHWESTERN VAN ZANDT AND NORTH CENTRAL HENDERSON COUNTIES...

At 542 PM CDT, a confirmed large and extremely dangerous tornado was
located over Purtis Creek State Park, or 11 miles east of Gun Barrel
City, moving northeast at 35 mph. Another possible tornado was
located near Log Cabin moving northeast at 35 mph.

This is a PARTICULARLY DANGEROUS SITUATION. TAKE COVER NOW!

HAZARD...Damaging tornado.

SOURCE...Radar confirmed tornado.

IMPACT...You are in a life-threatening situation. Flying debris may
         be deadly to those caught without shelter. Mobile homes
         will be destroyed. Considerable damage to homes,
         businesses, and vehicles is likely and complete destruction
         is possible.

Locations impacted include...
Gun Barrel City, Mabank, Malakoff, Eustace, Enchanted Oaks, Caney
City, Purtis Creek State Park, Payne Springs, Log Cabin and Star
Harbor.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

To repeat, a large, extremely dangerous and potentially deadly
tornado is on the ground. To protect your life, TAKE COVER NOW! If
you are outdoors, in a mobile home, or in a vehicle, move to the
closest substantial shelter now!  Get to an interior room on the
lowest floor of a sturdy building and avoid windows.

If a tornado or other severe weather is spotted, report it to the
National Weather Service or your local nearest law enforcement agency
who will send your report. This act may save lives of others in the
path of dangerous weather.

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LAT...LON 3242 9576 3217 9598 3221 9614 3236 9612
      3236 9608 3247 9607
TIME...MOT...LOC 2242Z 202DEG 30KT 3237 9595

TORNADO...OBSERVED
TORNADO DAMAGE THREAT...CONSIDERABLE
HAIL...<.75IN

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Visual confirmation

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WWUS54 KSHV 022122
SVSSHV

Severe Weather Statement
National Weather Service Shreveport LA
422 PM CDT SUN APR 2 2017

LAC021-059-022145-
/O.CON.KSHV.TO.W.0048.000000T0000Z-170402T2145Z/
Caldwell LA-La Salle LA-
422 PM CDT SUN APR 2 2017

...A TORNADO WARNING REMAINS IN EFFECT UNTIL 445 PM CDT FOR SOUTHERN
CALDWELL AND NORTHEASTERN LA SALLE PARISHES...

At 422 PM CDT, a confirmed large and extremely dangerous tornado was
located near Jena, or 23 miles south of Columbia, moving north at 35
mph.

This is a PARTICULARLY DANGEROUS SITUATION. TAKE COVER NOW!

HAZARD...Damaging tornado.

SOURCE...Weather spotters confirmed tornado.

IMPACT...You are in a life-threatening situation. Flying debris may
         be deadly to those caught without shelter. Mobile homes
         will be destroyed. Considerable damage to homes,
         businesses, and vehicles is likely and complete destruction
         is possible.

This tornadic thunderstorm will remain over mainly rural areas of
southern Caldwell and northeastern La Salle Parishes.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

To repeat, a large, extremely dangerous and potentially deadly
tornado is on the ground. To protect your life, TAKE COVER NOW! Move
to a basement or an interior room on the lowest floor of a sturdy
building. Avoid windows. If you are outdoors, in a mobile home, or in
a vehicle, move to the closest substantial shelter and protect
yourself from flying debris.

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LAT...LON 3173 9207 3175 9220 3193 9212 3192 9201
TIME...MOT...LOC 2122Z 197DEG 30KT 3177 9214

TORNADO...OBSERVED
TORNADO DAMAGE THREAT...CONSIDERABLE
HAIL.  1.25IN

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g. IBW Tag: "Catastrophic" (Tornado Emergency)

Radar indicated; no visual confirmation

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WWUS54 KLCH 021912
SVSLCH

Severe Weather Statement
National Weather Service Lake Charles LA
212 PM CDT SUN APR 2 2017

LAC079-021945-
/O.CON.KLCH.TO.W.0030.000000T0000Z-170402T1945Z/
Rapides LA-
212 PM CDT SUN APR 2 2017

...TORNADO EMERGENCY FOR ALEXANDRIA...

...A TORNADO WARNING REMAINS IN EFFECT UNTIL 245 PM CDT FOR NORTH
CENTRAL RAPIDES PARISH...

At 211 PM CDT, a confirmed large and destructive tornado was located
over Alexandria, moving north at 30 mph.

TORNADO EMERGENCY for Alexandria. This is a PARTICULARLY DANGEROUS
SITUATION. TAKE COVER NOW!

HAZARD...Deadly tornado.

SOURCE...Radar confirmed tornado.

IMPACT...You are in a life-threatening situation. Flying debris may
         be deadly to those caught without shelter. Mobile homes
         will be destroyed. Considerable damage to homes,
         businesses, and vehicles is likely and complete destruction
         is possible.

The tornado will be near...
  Alexandria around 215 PM CDT.
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  Pineville around 225 PM CDT.
  Tioga, Paradise, Kingsville, Timber Trails and Libuse around 230
  PM CDT.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

To repeat, a large, extremely dangerous, and potentially deadly
tornado is on the ground. To protect your life, TAKE COVER NOW! Move
to an interior room on the lowest floor of a sturdy building. Avoid
windows. If in a mobile home, a vehicle or outdoors, move to the
closest substantial shelter and protect yourself from flying debris.

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LAT...LON 3119 9245 3124 9255 3141 9252 3142 9248
      3134 9229
TIME...MOT...LOC 1911Z 198DEG 24KT 3127 9248

TORNADO...OBSERVED
TORNADO DAMAGE THREAT...CATASTROPHIC
HAIL.  1.00IN

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Visual confirmation

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WWUS54 KSHV 022107
SVSSHV

Severe Weather Statement
National Weather Service Shreveport LA
407 PM CDT SUN APR 2 2017

LAC021-059-022145-
/O.CON.KSHV.TO.W.0048.000000T0000Z-170402T2145Z/
Caldwell LA-La Salle LA-
407 PM CDT SUN APR 2 2017

...TORNADO EMERGENCY FOR THE CITIES OF MIDWAY AND JENA...

...A TORNADO WARNING REMAINS IN EFFECT UNTIL 445 PM CDT FOR SOUTHERN
CALDWELL AND NORTHEASTERN LA SALLE PARISHES...

At 406 PM CDT, a confirmed large and destructive tornado was located
near Midway, or 24 miles northwest of Larto, moving northeast at 35
mph.

TORNADO EMERGENCY for the cities of Midway and Jena. This is a
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PARTICULARLY DANGEROUS SITUATION. TAKE COVER NOW!

HAZARD...Deadly tornado.

SOURCE...Weather spotters confirmed tornado.

IMPACT...You are in a life-threatening situation. Flying debris may
         be deadly to those caught without shelter. Mobile homes
         will be destroyed. Considerable damage to homes, businesses
         and vehicles is likely and complete destruction is possible.

The tornado will be near...
  Jena and Midway around 415 PM CDT.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

To repeat, a large, extremely dangerous, and potentially deadly
tornado is on the ground. To protect your life, TAKE COVER NOW! Move
to an interior room on the lowest floor of a sturdy building. Avoid
windows. If in a mobile home, a vehicle or outdoors, move to the
closest substantial shelter and protect yourself from flying debris.

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LAT...LON 3172 9201 3166 9204 3159 9211 3163 9226
      3193 9212 3192 9201
TIME...MOT...LOC 2106Z 205DEG 31KT 3163 9218

TORNADO...OBSERVED
TORNADO DAMAGE THREAT...CATASTROPHIC
HAIL.  1.75IN

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5. Watch County Notification Message (WCN).

Initial Issuance

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WWUS63 KFSD 052232
WCNFSD

WATCH COUNTY NOTIFICATION FOR WATCH 251
NATIONAL WEATHER SERVICE SIOUX FALLS SD
532 PM CDT SAT MAY 5 2012

IAC149-167-193-NEC043-051-SDC009-027-127-135-060400-
/O.NEW.KFSD.TO.A.0251.120505T2232Z-120506T0400Z/

THE NATIONAL WEATHER SERVICE HAS ISSUED TORNADO WATCH 251 IN
EFFECT UNTIL 11 PM CDT THIS EVENING FOR THE FOLLOWING AREAS

IN IOWA THIS WATCH INCLUDES 3 COUNTIES

IN NORTHWEST IOWA

PLYMOUTH              SIOUX                 WOODBURY

IN NEBRASKA THIS WATCH INCLUDES 2 COUNTIES

IN NORTHEAST NEBRASKA

DAKOTA                DIXON

IN SOUTH DAKOTA THIS WATCH INCLUDES 4 COUNTIES

IN SOUTHEAST SOUTH DAKOTA

BON HOMME             CLAY                  UNION
YANKTON

THIS INCLUDES THE CITIES OF...ALCESTER...ALLEN...AVON...
BERESFORD...ELK POINT...JEFFERSON...LE MARS...NORTH SIOUX CITY...
ORANGE CITY...PONCA...SCOTLAND...SIOUX CENTER...SIOUX CITY...
SOUTH SIOUX CITY...SPRINGFIELD...TABOR...TYNDALL...VERMILLION...
WAKEFIELD AND YANKTON.

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Clearing Counties - One Watch in Effect

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WWUS64 KSJT 050133
WCNSJT

WATCH COUNTY NOTIFICATION FOR WATCH 240
NATIONAL WEATHER SERVICE SAN ANGELO TX
833 PM CDT FRI MAY 4 2012

TXC059-081-083-095-105-151-207-235-253-267-307-319-327-353-399-
411-413-417-431-435-441-447-451-050245-
/O.CAN.KSJT.SV.A.0240.000000T0000Z-120505T0400Z/

THE NATIONAL WEATHER SERVICE HAS CANCELLED SEVERE THUNDERSTORM
WATCH 240 FOR THE FOLLOWING AREAS

IN TEXAS THIS CANCELS 23 COUNTIES

IN WEST CENTRAL TEXAS

CALLAHAN              COKE                  COLEMAN
CONCHO                CROCKETT              FISHER
HASKELL               IRION                 JONES
KIMBLE                MASON                 MCCULLOCH
MENARD                NOLAN                 RUNNELS
SAN SABA              SCHLEICHER            SHACKELFORD
STERLING              SUTTON                TAYLOR
THROCKMORTON          TOM GREEN

THIS INCLUDES THE CITIES OF...ABILENE...ALBANY...ANSON...BAIRD...
BALLINGER...BRADY...BRONTE...COLEMAN...CROSS PLAINS...EDEN...
ELDORADO...HAMLIN...HASKELL...JUNCTION...MASON...MENARD...
MERTZON...OZONA...PAINT ROCK...ROBERT LEE...ROBY...ROTAN...
SAN ANGELO...SAN SABA...SONORA...STAMFORD...STERLING CITY...
SWEETWATER...THROCKMORTON...WINTERS AND WOODSON.

$$

TXC049-050400-
/O.CON.KSJT.SV.A.0240.000000T0000Z-120505T0400Z/

SEVERE THUNDERSTORM WATCH 240 REMAINS VALID UNTIL 11 PM CDT THIS
EVENING FOR THE FOLLOWING AREAS

IN TEXAS THIS WATCH INCLUDES 1 COUNTY

IN WEST CENTRAL TEXAS

BROWN
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THIS INCLUDES THE CITIES OF...BROWNWOOD.

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Watch Cancellation

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WWUS61 KILN 010302
WCNILN

WATCH COUNTY NOTIFICATION FOR WATCH 211
NATIONAL WEATHER SERVICE WILMINGTON OH
1102 PM EDT MON APR 30 2012

KYC023-081-135-161-187-191-201-OHC001-015-071-073-131-141-145-
010415-
/O.CAN.KILN.SV.A.0211.000000T0000Z-120501T0500Z/

THE NATIONAL WEATHER SERVICE HAS CANCELLED SEVERE THUNDERSTORM
WATCH 211 FOR THE FOLLOWING AREAS

IN KENTUCKY THIS CANCELS 7 COUNTIES

IN NORTHEAST KENTUCKY

LEWIS                 MASON

IN NORTHERN KENTUCKY

BRACKEN               GRANT                 OWEN
PENDLETON             ROBERTSON

IN OHIO THIS CANCELS 7 COUNTIES

IN CENTRAL OHIO

HOCKING               ROSS

IN SOUTH CENTRAL OHIO

ADAMS                 BROWN                 HIGHLAND
PIKE                  SCIOTO

THIS INCLUDES THE CITIES OF...BROOKSVILLE...CHILLICOTHE...
FALMOUTH...GEORGETOWN...HILLSBORO...LOGAN...MAYSVILLE...
MOUNT OLIVET...OWENTON...PIKETON...PORTSMOUTH...VANCEBURG...
WEST UNION AND WILLIAMSTOWN.

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Second Watch Issued While First Watch Remains in Effect

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WWUS63 KEAX 062049
WCNEAX

WATCH COUNTY NOTIFICATION FOR WATCHES 258/259
NATIONAL WEATHER SERVICE KANSAS CITY/PLEASANT HILL MO
349 PM CDT SUN MAY 6 2012

KSC005-043-091-103-107-121-209-MOC003-013-021-037-047-049-063-095-
165-070400-
/O.NEW.KEAX.SV.A.0259.120506T2049Z-120507T0400Z/

THE NATIONAL WEATHER SERVICE HAS ISSUED SEVERE THUNDERSTORM WATCH
259 IN EFFECT UNTIL 11 PM CDT THIS EVENING FOR THE FOLLOWING
AREAS

IN KANSAS THIS WATCH INCLUDES 7 COUNTIES

IN EAST CENTRAL KANSAS

JOHNSON KS            LINN KS               MIAMI

IN NORTHEAST KANSAS

ATCHISON KS           DONIPHAN              LEAVENWORTH
WYANDOTTE

IN MISSOURI THIS WATCH INCLUDES 9 COUNTIES

IN NORTHWEST MISSOURI

ANDREW                BUCHANAN              CLINTON
DEKALB

IN WEST CENTRAL MISSOURI

BATES                 CASS                  CLAY
JACKSON               PLATTE

THIS INCLUDES THE CITIES OF...ATCHISON...BUTLER...CAMERON...
EXCELSIOR SPRINGS...HARRISONVILLE...INDEPENDENCE...KANSAS CITY...
KANSAS CITY...LEAVENWORTH...LIBERTY...MOUND CITY...OLATHE...
OVERLAND PARK...PAOLA...PARKVILLE...PLATTE CITY...PLATTSBURG...
SAVANNAH...ST. JOSEPH AND TROY.

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MOC001-025-033-041-053-061-079-083-089-101-107-115-117-121-159-
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175-177-195-211-070200-
/O.CON.KEAX.SV.A.0258.000000T0000Z-120507T0200Z/

SEVERE THUNDERSTORM WATCH 258 REMAINS VALID UNTIL 9 PM CDT THIS
EVENING FOR THE FOLLOWING AREAS

IN MISSOURI THIS WATCH INCLUDES 19 COUNTIES

IN CENTRAL MISSOURI

COOPER                HOWARD                PETTIS
SALINE

IN NORTH CENTRAL MISSOURI

CALDWELL              CARROLL               CHARITON
DAVIESS               GRUNDY                LINN MO
LIVINGSTON            MACON                 RANDOLPH
SULLIVAN

IN NORTHEAST MISSOURI

ADAIR

IN WEST CENTRAL MISSOURI

HENRY                 JOHNSON MO            LAFAYETTE
RAY

THIS INCLUDES THE CITIES OF...BOONVILLE...BROOKFIELD...
CARROLLTON...CHILLICOTHE...CLINTON...CONCORDIA...FAYETTE...
GALLATIN...KEYTESVILLE...KINGSTON...KIRKSVILLE...LA PLATA...
LEXINGTON...MACON...MARSHALL...MILAN...MOBERLY...NEW FRANKLIN...
RICHMOND...SEDALIA...TRENTON...WARRENSBURG AND WINDSOR.

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New Watch Issued Which Replaces an Old Watch and Partial Cancellation of a Second Old Watch

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WWUS63 KDVN 040557
WCNDVN

WATCH COUNTY NOTIFICATION FOR WATCHES 234/235/236
NATIONAL WEATHER SERVICE QUAD CITIES IA IL
1257 AM CDT FRI MAY 4 2012

IAC057-087-101-111-177-MOC045-199-041000-
```

/O.CAN.KDVN.TO.A.0234.000000T0000Z-120504T0600Z/
/O.NEW.KDVN.SV.A.0236.120504T0557Z-120504T1000Z/

THE NATIONAL WEATHER SERVICE HAS ISSUED SEVERE THUNDERSTORM WATCH 236 UNTIL 5 AM CDT EARLY THIS MORNING WHICH REPLACES A PORTION OF TORNADO WATCH 234. THE NEW WATCH IS VALID FOR THE FOLLOWING AREAS

IN IOWA THE NEW WATCH INCLUDES 5 COUNTIES

IN SOUTHEAST IOWA

DES MOINES HENRY IA JEFFERSON
LEE VAN BUREN

IN MISSOURI THE NEW WATCH INCLUDES 2 COUNTIES

IN NORTHEAST MISSOURI

CLARK SCOTLAND

THIS INCLUDES THE CITIES OF...BURLINGTON...FAIRFIELD...
FORT MADISON...KAHOKA...KEOSAUQUA...MEMPHIS AND MOUNT PLEASANT.

$$

ILC011-073-155-040700-
/O.CAN.KDVN.SV.A.0235.000000T0000Z-120504T1000Z/

THE NATIONAL WEATHER SERVICE HAS CANCELLED SEVERE THUNDERSTORM WATCH 235 FOR THE FOLLOWING AREAS

IN ILLINOIS THIS CANCELS 3 COUNTIES

IN NORTH CENTRAL ILLINOIS

BUREAU PUTNAM

IN NORTHWEST ILLINOIS

HENRY IL

THIS INCLUDES THE CITIES OF...HENNEPIN...KEWANEE AND PRINCETON.

$$

IAC107-115-183-040700-
/O.EXP.KDVN.TO.A.0234.000000T0000Z-120504T0600Z/

THE NATIONAL WEATHER SERVICE WILL ALLOW TORNADO WATCH 234 TO

EXPIRE AT 1 AM CDT EARLY THIS MORNING FOR THE FOLLOWING AREAS

IN IOWA THIS ALLOWS TO EXPIRE 3 COUNTIES

IN SOUTHEAST IOWA

KEOKUK LOUISA WASHINGTON

THIS INCLUDES THE CITIES OF...SIGOURNEY...WAPELLO AND WASHINGTON.

$$

ILC067-071-109-187-041000-
/O.CON.KDVN.SV.A.0235.000000T0000Z-120504T1000Z/

SEVERE THUNDERSTORM WATCH 235 REMAINS VALID UNTIL 5 AM CDT EARLY THIS MORNING FOR THE FOLLOWING AREAS

IN ILLINOIS THIS WATCH INCLUDES 4 COUNTIES

IN WEST CENTRAL ILLINOIS

HANCOCK HENDERSON MCDONOUGH
WARREN

THIS INCLUDES THE CITIES OF...CARTHAGE...MACOMB...
MONMOUTH AND OQUAWKA.

$$

Extending a Watch's Expiration Time for Selected Counties

WWUS63 KABR 051443
WCNABR

WATCH COUNTY NOTIFICATION FOR WATCH 246
NATIONAL WEATHER SERVICE ABERDEEN SD
943 AM CDT SAT MAY 5 2012

SDC041-065-075-107-117-119-051545-
/O.CAN.KABR.SV.A.0246.000000T0000Z-120505T1500Z/

THE NATIONAL WEATHER SERVICE HAS CANCELLED SEVERE THUNDERSTORM WATCH 246 FOR THE FOLLOWING AREAS

IN SOUTH DAKOTA THIS CANCELS 6 COUNTIES

IN CENTRAL SOUTH DAKOTA

HUGHES JONES STANLEY
SULLY

IN NORTH CENTRAL SOUTH DAKOTA

DEWEY POTTER

THIS INCLUDES THE CITIES OF...FORT PIERRE...GETTYSBURG...MURDO...
ONIDA...PIERRE AND TIMBER LAKE.

$$

SDC017-059-069-085-051700-
/O.EXT.KABR.SV.A.0246.000000T0000Z-120505T1700Z/

SEVERE THUNDERSTORM WATCH 246...PREVIOUSLY IN EFFECT UNTIL 10 AM
CDT THIS MORNING...IS NOW IN EFFECT UNTIL NOON CDT TODAY FOR THE
FOLLOWING AREAS

IN SOUTH DAKOTA THIS WATCH INCLUDES 4 COUNTIES

IN CENTRAL SOUTH DAKOTA

BUFFALO HAND HYDE
LYMAN

THIS INCLUDES THE CITIES OF...FORT THOMPSON...HIGHMORE...
MILLER AND PRESHO.

$$

Extension in Area - Adding Counties

WWUS62 KRAH 012229
WCNRAH

WATCH COUNTY NOTIFICATION FOR WATCH 219
NATIONAL WEATHER SERVICE RALEIGH NC
629 PM EDT TUE MAY 1 2012

NCC065-101-191-195-020100-
/O.EXA.KRAH.SV.A.0219.000000T0000Z-120502T0100Z/

THE NATIONAL WEATHER SERVICE HAS EXTENDED SEVERE THUNDERSTORM
WATCH 219 TO INCLUDE THE FOLLOWING AREAS UNTIL 9 PM EDT THIS
EVENING

IN NORTH CAROLINA THIS WATCH INCLUDES 4 COUNTIES

IN CENTRAL NORTH CAROLINA

EDGECOMBE JOHNSTON WAYNE
WILSON

THIS INCLUDES THE CITIES OF...GOLDSBORO...ROCKY MOUNT...
SMITHFIELD AND WILSON.

$$

NCC001-037-057-063-067-069-077-081-083-127-135-145-151-181-183-
185-020100-
/O.CON.KRAH.SV.A.0219.000000T0000Z-120502T0100Z/

SEVERE THUNDERSTORM WATCH 219 REMAINS VALID UNTIL 9 PM EDT THIS
EVENING FOR THE FOLLOWING AREAS

IN NORTH CAROLINA THIS WATCH INCLUDES 16 COUNTIES

IN CENTRAL NORTH CAROLINA

ALAMANCE	CHATHAM	DAVIDSON
DURHAM	FORSYTH	FRANKLIN
GRANVILLE	GUILFORD	HALIFAX
NASH	ORANGE	PERSON
RANDOLPH	VANCE	WAKE
WARREN		

THIS INCLUDES THE CITIES OF...ASHEBORO...BURLINGTON...
CHAPEL HILL...DURHAM...GREENSBORO...HENDERSON...HIGH POINT...
LEXINGTON...LOUISBURG...NASHVILLE...OXFORD...PITTSBORO...
RALEIGH...ROANOKE RAPIDS...ROXBORO...WARRENTON AND WINSTON-SALEM.

$$

Partial Cancellation, Extension in Expiration Time and Expansion in Area

WWUS64 KBRO 110751
WCNBRO

WATCH COUNTY NOTIFICATION FOR WATCH 273
NATIONAL WEATHER SERVICE BROWNSVILLE TX
251 AM CDT FRI MAY 11 2012

TXC047-247-427-505-110900-
/O.CAN.KBRO.TO.A.0273.000000T0000Z-120511T0800Z/

```
THE NATIONAL WEATHER SERVICE HAS CANCELLED TORNADO WATCH 273 FOR
THE FOLLOWING AREAS

IN TEXAS THIS CANCELS 4 COUNTIES

IN DEEP SOUTH TEXAS

BROOKS                JIM HOGG              STARR
ZAPATA

THIS INCLUDES THE CITIES OF...FALFURRIAS...HEBBRONVILLE...
RIO GRANDE CITY...ROMA AND ZAPATA.

$$

GMZ150-155-111000-
/O.EXB.KBRO.TO.A.0273.000000T0000Z-120511T1000Z/

THE NATIONAL WEATHER SERVICE HAS EXTENDED TORNADO WATCH 273 TO
INCLUDE THE FOLLOWING AREAS UNTIL 5 AM CDT EARLY THIS MORNING

THIS WATCH INCLUDES THE FOLLOWING ADJACENT COASTAL WATERS

COASTAL WATERS FROM PORT MANSFIELD TO THE RIO GRANDE OUT 20 NM
COASTAL WATERS FROM BAFFIN BAY TO PORT MANSFIELD OUT 20 NM

$$

TXC061-215-261-489-111000-
/O.EXT.KBRO.TO.A.0273.000000T0000Z-120511T1000Z/

TORNADO WATCH 273...PREVIOUSLY IN EFFECT UNTIL 3 AM CDT EARLY
THIS MORNING...IS NOW IN EFFECT UNTIL 5 AM CDT EARLY THIS MORNING
FOR THE FOLLOWING AREAS

IN TEXAS THIS WATCH INCLUDES 4 COUNTIES

IN DEEP SOUTH TEXAS

CAMERON               HIDALGO               KENEDY
WILLACY

THIS INCLUDES THE CITIES OF...BROWNSVILLE...EDINBURG...
HARLINGEN...MCALLEN...MISSION...PHARR...RAYMONDVILLE...
SARITA AND WESLACO.

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GMZ130-132-135-111000-
/O.EXT.KBRO.TO.A.0273.000000T0000Z-120511T1000Z/

TORNADO WATCH 273...PREVIOUSLY IN EFFECT UNTIL 3 AM CDT EARLY
THIS MORNING...IS NOW IN EFFECT UNTIL 5 AM CDT EARLY THIS MORNING
FOR THE FOLLOWING AREAS

THIS WATCH INCLUDES THE FOLLOWING ADJACENT COASTAL WATERS

LAGUNA MADRE FROM THE PORT OF BROWNSVILLE TO THE ARROYO COLORADO
LAGUNA MADRE FROM THE ARROYO COLORADO TO 5 NM NORTH OF PORT
MANSFIELD TX
LAGUNA MADRE FROM 5 NM NORTH OF PORT MANSFIELD TO BAFFIN BAY TX

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Department of Commerce •National Oceanic & Atmospheric Administration •National Weather Service

NATIONAL WEATHER SERVICE INSTRUCTION 10-313
AUGUST 28, 2019

Operations and Services
Marine, Tropical, and Tsunami Services Branch, NWSPD 10-3
SPECIAL MARINE WARNINGS

NOTICE: This publication is available at: http://www.nws.noaa.gov/directives/.

OPR: W/AFS26 (D. Wright) **Certified by:** W/AFS26 (A. Allen)
Type of Issuance: Routine

SUMMARY OF REVISIONS: This directive supersedes NWSI 10-313, "*Special Marine Warnings,*" dated February 16, 2017. This directive includes the following changes:

1. Changed OPR.
2. Updated Figure 1 for mixed case.
3. Updated examples in Appendix A for mixed case.

Signed 8/14/2019

Andrew D. Stern Date
Director,
Analyze, Forecast and Support Office

SPECIAL MARINE WARNINGS
Table of Contents

1 Introduction. This procedural instruction provides detailed information on a product Weather Forecast Offices (WFOs) and Weather Service Office (WSO) Pago Pago issue concerning ongoing or imminent marine weather hazards. The Special Marine Warning (SMW) product provides the marine community with vital information to protect life and property.

2 Special Marine Warning (product category SMW; Valid Time Event Code (VTEC) Significance / Phenomena MA.W)

2.1 Mission Connection. The SMW product is used to provide specific details that aid in the protection of life and property. WFO forecasters and WSO Pago Pago forecasters issue polygon-based special marine warnings within their marine areas of responsibility for their coastal marine zones or Great Lakes marine zones to provide advanced notice to mariners of potentially hazardous weather conditions. SMWs are not issued for Offshore or High Seas areas, except in designated areas along the East Coast.

2.2 Issuance Guidelines

2.2.1 Creation Software. WFOs use the Advanced Weather Interactive Processing System (AWIPS) WarnGen Application to issue the SMW product. WSO Pago Pago issues the SMW with regionally approved software.

2.2.2 Issuance Criteria. WFOs and WSO Pago Pago should issue the SMW product for short-duration (2 hours or less) sustained marine thunderstorm winds or associated frequent gusts of 34 knots (KT) or greater; and / or hail 3/4 inch or more in diameter; and / or waterspouts. Forecasters should also issue the SMW for sustained non-convective short duration winds or associated frequent gusts of 34 KT or greater (gale force or stronger).

a. Where VTEC is not used in the Alaska and Pacific Regions, issue the SMW for Ashfall warnings.

2.2.3 Issuance Time. The SMW product is non-scheduled and event-driven.

2.2.4 Valid Time. The SMW product is valid from the time of issuance until the expiration time.

2.2.5 Universal Geographic Code (UGC). The SMW product will contain marine-based zone UGC codes.

2.2.6 Product Expiration Time. The product expiration time should not exceed 2 hours beyond issuance time. A new SMW should be issued if the event is expected to continue past two hours beyond issuance time.

a. Where SMW is used for Ashfall Warnings, the product expiration time should not exceed 6 hours beyond issuance time. A new SMW should be issued if the event is expected to continue past six hours beyond issuance time.

2.3 Technical Description. The SMW product will follow the format and content described in this section.

2.3.1 Mass News Disseminator (MND) Broadcast Line. The SMW product should include the broadcast line "BULLETIN - EAS ACTIVATION REQUESTED". If a state does not require Emergency Alert System (EAS) activation for the SMW product, the broadcast line will read "BULLETIN - IMMEDIATE BROADCAST REQUESTED". The term "BULLETIN" is used when information is sufficiently urgent to warrant breaking into a normal broadcast.

2.3.2 MND Header. The SMW MND Header is "Special Marine Warning".

2.3.3 Content. The SMW product will be issued in standard bullet format, as outlined in NWS Instruction (NWSI) 10-1701, *Text Product Formats and Codes.*

Storm motion and wind speed should be expressed in knots (KT).

SMWs may be issued while a Small Craft Advisory, Gale, Storm or Hurricane Force Wind Warning (not associated with a tropical cyclone warning) is in effect. When a tropical cyclone warning is in effect, SMWs should only be issued for waterspouts.

For events impacting both land and water, separate warnings will be issued. SMWs will not include any portion of adjacent land areas.

2.3.4 Precautionary/Preparedness Actions. If a Tornado Watch is in effect for the area, the Tornado Watch number may be included in this section of the SMW product. Where SMWs are issued for Ashfall Warnings, mariners are encouraged to report ashfall and other volcanic impact encounters.

2.3.5 Format. The format of the SMW can be seen in Figure 1. The SMW is a non-segmented product. Please reference NWSI 10-1702, *Universal Geographic Code (UGC)*, for additional information on product segmentation. For detailed VTEC information, please reference NWSI 10-1703, *Valid Time Event Code (VTEC)*. For more detailed product format information consult NWSI 10-1701, *Text Product Formats and Codes*.

This product is available in industry standard encoding and languages, and may include, but not be limited to, American Standard Code for Information Interchange (ASCII), Extensible Markup Language (XML), Wireless Markup Language (WML) and HyperText Markup Language (HTML).

(WMO HEADER) (UTC ISSUANCE DATE TIME)
(AWIPS ID)
(AREAL UGC CODE[S])-(EXPIRATION TIME)-
(VTEC STRING)

BULLETIN - IMMEDIATE BROADCAST REQUESTED
Special Marine Warning
National Weather Service (City)(State)
Time AM/PM TIME_ZONE Day_of_week Mon DD YYYY
The National Weather Service in (WFO Location) has issued a

*Special Marine Warning for...(marine forecast area affected) (when multiple zones are covered, may list only the location points at the far end of the combined zones, and eliminate the intermediate points) (should list the zones in the numerical order of the UGC codes)

*Until (ending effective time)

*At (time)...(description of storm event, movement)

HAZARD…

SOURCE…

IMPACT…

*Locations, may reference marine and coastal land points, etc.)

PRECAUTIONARY/PREPAREDNESS ACTIONS…

&&

LAT...LON
TIME…MOT…LOC
[Mandatory list of latitude / longitude points outlining the forecaster drawn polygon in WarnGen and time, location, and movement of event being tracked. Special Marine Warnings may include special tags after the && to provide better definition, similar to other short term warnings.]
$$

Figure 1. **Special Marine Warning (SMW) Format**

2.4 Updates, Amendments and Corrections. Updates and amendments are not applicable. WFOs and WSO Pago Pago will reissue a SMW for significant grammatical errors, or format errors in marine zones already covered by a warning. WFOs and WSOs will issue a Marine Weather Statement, as described in NWSI 10-314, to provide the public with follow-up information or to cancel all or part of an SMW.

APPENDIX A – Examples of Special Marine Warnings

```
WHUS51 KLWX 231800
SMWLWX
ANZ532-533-540-541-231900-
/O.NEW.KLWX.MA.W.0001.180123T1800Z-180123T1900Z/

BULLETIN - IMMEDIATE BROADCAST REQUESTED
Special Marine Warning
National Weather Service Baltimore MD/Washington DC
100 PM EST Tue Jan 23 2018

The National Weather Service in Sterling Virginia has issued a

* Special Marine Warning for...
  Chesapeake Bay from North Beach to Drum Point MD...
  Chesapeake Bay from Sandy Point to North Beach MD...
  Choptank River to Cambridge MD and the Little Choptank River...
  Eastern Bay...

* Until 200 PM EST

* At 1259 PM EST, showers capable of producing waterspouts and hail were
  located along a line extending from near Knapps Narrows Bridge to 6
  nm southeast of Chesapeake Beach to 8 nm west of Broomes Island,
  moving east at 30 knots.

  HAZARD...Waterspouts and large hail.

  SOURCE...Radar indicated.

  IMPACT...Waterspouts can create locally hazardous seas. Boaters in
           small craft could be thrown overboard by suddenly higher
           winds and waves capsizing their vessel. Large hail can result in
           structural damage.

* Locations impacted include...
  Choptank River...
  Miles River...
  Blackwalnut Point...
  Dares Beach...
  James Island...
  Poplar Island...
  Calvert Cliffs...
  Tilghman Island...
  and Taylors Island.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

Move to safe harbor immediately as gusty winds and high waves are
expected.

Seek safe shelter, mariners can expect gusty winds and increasing
waves.

Waterspouts can easily overturn boats and create locally hazardous
```

```
seas. Seek safe harbor immediately.

&&

LAT...LON 3863 7629 3857 7631 3851 7621 3843 7645
      3861 7654 3879 7647 3886 7620 3879 7619
      3882 7630 3868 7635 3867 7634 3875 7632
      3878 7629 3871 7627 3877 7624 3875 7624
      3867 7620 3860 7605
TIME...MOT...LOC 1759Z 250DEG 29KT 3872 7638 3858 7648 3847 7672

WATERSPOUT...POSSIBLE
HAIL...0.75in
WIND...<34KT

$$

WHUS52 KMFL 102214
SMWMFL
AMZ630-651-671-102315-
/O.NEW.KMFL.MA.W.0018.180410T2214Z-180410T2315Z/

BULLETIN - IMMEDIATE BROADCAST REQUESTED
Special Marine Warning
National Weather Service Miami FL
614 PM EDT Tue Apr 10 2018

The National Weather Service in Miami has issued a

* Special Marine Warning for...
  Biscayne Bay...
  Coastal waters from Deerfield Beach to Ocean Reef FL out 20 NM...
  Waters from Deerfield Beach to Ocean Reef FL from 20 to 60 NM
  excluding the territorial waters of Bahamas...

* Until 715 PM EDT.

* At 614 PM EDT, severe thunderstorms capable of producing
  waterspouts were located along a line extending from 13 nm east of
  Surfside to 8 nm southeast of Miami Beach, moving east at 15 knots.

  HAZARD...Waterspouts and wind gusts 34 knots or greater.

  SOURCE...Radar.

  IMPACT...Waterspouts can easily overturn boats and create locally
           hazardous seas. Small craft could be damaged in briefly
           higher winds and suddenly higher waves.

* Locations impacted include...
  Virginia Key, Key Biscayne, Miami Beach and Cape Florida.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

Thunderstorms can produce sudden waterspouts. Waterspouts can easily
overturn boats and create locally hazardous seas. Seek safe harbor
```

immediately.

Report severe weather to the Coast Guard or the National Weather Service. You can also share your report with NWS Miami on Facebook and Twitter.

&&

Note: Where MWW is issued Ashfall Warnings are carried in the MWW (see NWSI 10-315)

WHAK58 PAFC 301440
SMWAFC
PKZ176-302040-

BULLETIN - IMMEDIATE BROADCAST REQUESTED
Special Marine Warning
National Weather Service Anchorage, AK
640 AM ADT Fri Mar 30 2007

… The National Weather Service in Anchorage has issued an ashfall warning for volcanic ash and other hazards in the western Aleutians …

A submarine eruption of Semisopochnoi volcano is in progress.

The Alaska volcano observatory reports strong seismicity indicative of an explosive eruption at Semisopochnoi Island in the western Aleutians. Satellite analysis indicates a vent just offshore of sugarloaf head on the south point of the island. Ashfall is occurring south and southeast of the island. Vessels should avoid the immediate area and be alert for floating pumice.

An ashfall warning means that the volcano is undergoing a major eruption. It is very likely that mariners will be affected by volcanic hazards in the warning areas such as significant debris…ashfall 1/4 inch or greater…lava…or lahar and debris flows.

Additional information is available at / use lower case letters / www.avo.alaska.edu..

Ash is an eye and respiratory irritant and is abrasive. Those with respiratory sensitivities should take extra precautions to minimize exposure. Protect electronics and cover air intakes if ashfall is expected or confirmed. Remove ash from surfaces with water if possible to prevent excessive accumulation.

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Department of Commerce · National Oceanic & Atmospheric Administration · National Weather Service

NATIONAL WEATHER SERVICE INSTRUCTION 10-517
October 9, 2017

Operations and Services
Public Weather Services, NWSPD 10-5

MULTI-PURPOSE WEATHER PRODUCTS SPECIFICATION

NOTICE: This publication is available at: http://www.nws.noaa.gov/directives/

OPR: W/AFS21 (G. Schoor) **Certified by:** W/AFS21 (M. Hawkins)
Type of Issuance: Routine

SUMMARY OF REVISIONS: This directive supersedes NWSI 10-517, "*Multi-Purpose Weather Products Specification*", dated September 28, 2012. Changes made to reflect the NWS Headquarters reorganization effective April 1, 2015. No content changes were made.

Signed 9/25/2017
Andrew D. Stern Date
Director
Analyze, Forecast, and Support Office

Multi-Purpose Weather Products Specification

Table of Contents: Page

1. Introduction. This procedural directive provides detailed information on routine short-term forecast products issued by National Weather Service (NWS) Weather Forecast Offices (WFO) and multi-purpose products issued for severe, fire, marine, tropical, winter and/or non-precipitation weather and flooding hazards issued by WFOs and the NWS' Storm Prediction Center (SPC).

2. Short Term Forecast (product category NOW).

2.1 Mission Connection. Short Term Forecasts provide the public with detailed weather information occurring within 6 hours of product issuance.

2.2 Issuance Guidelines.

2.2.1 Creation Software. WFOs should use Graphical Hazards Generation Editor (GHG) or WarnGen software to issue Short Term Forecasts.

2.2.2 Issuance Criteria. WFOs may issue Short Term Forecasts to discuss the evolution of convective and stratiform precipitation, winter weather, sea breezes, marine weather, fog, winds, and temperatures within their geographic area of responsibility. The NOW will not duplicate or contradict information contained in the SPS or other watch, warning, or advisory text products. At regional discretion, offices may issue graphical short term forecasts via WFO Internet pages that compliment or replace the NOW. If an office issues both a NOW and a graphical short term forecast, the forecasts will be consistent.

2.2.3 Issuance Time. Short Term Forecasts are non-scheduled, event-driven products.

2.2.4 Valid Time. Short Term Forecasts are valid from the time of issuance until the expiration time.

2.2.5 Product Expiration Time. The product expiration time is not more than 6 hours after the time of issuance.

2.3 Technical Description. Short Term Forecasts will follow the format and content described in this section.

2.3.1 UGC Type. NOWs will use the Zone (Z) code of the UGC.

2.3.2 Mass News Disseminator Header. The Short Term Forecast MND header is "SHORT TERM FORECAST."

2.3.3 Content. WFOs will write Short Term Forecasts in non-technical terms. WFOs should write Short Term Forecasts in future tense, focusing on precipitation location, movement, intensity, amounts and duration. Short Term Forecasts should be concise. WFOs should segment Short Term Forecast into separate zone groupings based on common weather conditions. WFOs may include additional information as time permits.

2.3.4 Format.

```
FPaaii cccc ddhhmm
NOWccc

SHORT TERM FORECAST
NATIONAL WEATHER SERVICE CITY STATE
time am/pm time_zone day mon dd yyyy

STZ001-002-003-ddhhmm-
ZONE 1-ZONE 2-ZONE 3-
INCLUDING THE CITIES OF...TOWN A...TOWN B...TOWN C
time am/pm time_zone day mon dd yyyy

.NOW...
...OPTIONAL HEADLINE...

THIS SECTION CONTAINS A CONCISE NON-TECHNICAL FREE TEXT PARAGRAPH
DESCRIBING NON-HAZARDOUS WEATHER TIMING...DURATION...AND FORECAST
CONDITIONS.

$$


STZ004-005-006-ddhhmm-
ZONE 4-ZONE 5-ZONE 6-
INCLUDING THE CITIES OF...TOWN D...TOWN E...TOWN F
time am/pm time_zone day mon dd yyyy

OPTIONAL ADDITIONAL SEGMENT WITH SAME FORMAT AS THE FIRST SEGMENT.

$$


FORECASTER NAME/NUMBER (OPTIONAL)
```

Figure 1. Short Term Forecast Format

2.4 Updates, Amendments and Corrections. Short Term Forecasts are not updated or amended. WFOs will correct Short Term Forecasts for format and grammatical errors.

3. **Special Weather Statement (product category SPS)**.

3.1 Mission Connection. Special Weather Statements (SPS) provide the public with information concerning ongoing or imminent weather hazards, which require a heightened level of awareness or action. Although typically used for hazards within 6 hours of product issuance, the SPS may also be used to heighten the awareness of a major event forecast to occur beyond 6 hours.

3.2 Issuance Guidelines.

3.2.1 Creation Software. WFOs should use GHG or WarnGen to issue SPSs.

3.2.2 Issuance Criteria. The criteria are dependent on the situation for which the SPS is issued. Issuance criteria guidelines by weather hazard are as follows:

a. Developing Hazardous Convective Weather. WFOs may issue SPSs to heighten public awareness about ongoing or imminent hazardous convective weather expected to continue/dissipate, or expand/decrease in geographical coverage within the next hour or two.

b. Sub-Severe Thunderstorms. WFOs should issue an SPS for strong thunderstorms that approach, or are expected to approach, severe convective criteria. General criteria for a strong thunderstorm is considered to be one or a combination of the following events:
   (1) Sustained winds or gusts of 40 to 57 mph (lower values may be used at forecaster's discretion)
   (2) hail less than 1 inch in diameter
   (3) frequent to continuous lightning
   (4) funnel clouds not expected to become a tornado threat

c. Other Short-term Hazards. WFOs may issue SPSs for high-impact events to supplement information contained in other hazardous weather products, providing high-resolution details when possible. Examples include but are not limited to:
   (1) "black ice"
   (2) short-duration heavy snow bands
   (3) lake-effect snow bands that briefly reduce visibility
   (4) heavy rainfall that is not expected to cause flooding
   (5) heat indices or wind chill near "advisory" level for an hour or two
   (6) local areas of blowing dust where wind is below advisory criteria

d. Major Events Forecast to Occur Beyond 6 Hours. WFOs may issue SPSs to heighten awareness of major events forecast to occur beyond 6 hours. Priority should be given to ongoing or imminent events such as those listed above.

3.2.3 Issuance Time. SPSs are non-scheduled, event-driven products.

3.2.4 Valid Time. SPSs are valid from time of issuance until the expiration or update time.

3.2.5 Product Expiration Time. The product expiration time is not more than 6 hours after the time of issuance, except for an SPS covering an event forecast to occur beyond 12 hours, for which the product expiration time is not more than 12 hours after the time of issuance.

3.3 Technical Description. SPSs will follow the format and content described in this section.

3.3.1 UGC Type. SPSs will use the Zone (Z) code of the UGC.

3.3.2 Mass News Disseminator Header. The SPS MND header is "SPECIAL WEATHER STATEMENT."

3.3.3 Content. The SPS will be consistent with other hazardous weather products. WFOs should describe weather hazards in concise, non-technical terms.

3.3.4 Format. WFOs may use the term "SIGNIFICANT WEATHER ADVISORY" in the text and/or headline(s) of the SPS with Regional concurrence.

Latitude/longitude polygon delineation of the threat area may be included for those hazardous events where observational and model data support sub-County Warning Area (CWA) scale specificity (e.g., bands of heavy snow, strong thunderstorms, etc.). SPS for events with more indefinite areal bounds, or CWA-wide events (e.g., general change to unseasonably cold weather, or "heads up" to a long-term winter storm threat), do not need to include a polygon segment.

```
WWaa8i cccc ddhhmm
SPSccc

SPECIAL WEATHER STATEMENT
NATIONAL WEATHER SERVICE CITY STATE
time am/pm time_zone day mon dd yyyy

STZ001-002-003-ddhhmm-
ZONE 1-ZONE 2-ZONE 3-
INCLUDING THE CITIES OF TOWN A...TOWN B...TOWN C
time am/pm time_zone day mon dd yyyy

...OPTIONAL HEADLINE...

CONCISE FORECAST OF HAZARDOUS WEATHER CONDITIONS.

LAT...LON AAaa BBbb AAaa BBBbb AAaa BBBbb ... (Optional list of at
least three latitude/longitude coordinates outlining the forecaster-
drawn threat area.)

$$

STZ004-005-006-ddhhmm-
ZONE 4-ZONE 5-ZONE 6-
INCLUDING THE CITIES OF TOWN D...TOWN E...TOWN F
time am/pm time_zone day mon dd yyyy

...OPTIONAL HEADLINE...

OPTIONAL SECOND SEGMENT WITH THE SAME FORMAT AS THE FIRST SEGMENT.

LAT...LON AAaa BBbb AAaa BBBbb AAaa BBBbb ...

$$


FORECASTER NAME/NUMBER (OPTIONAL)
```

Figure 2. Special Weather Statement Format, where AAaa indicated latitude in decimal degrees north to two decimal places (without the decimal point), and BBBbb indicated longitude in decimal degrees west to two decimal places (without the decimal point and with no leading zero).

3.4 Updates, Amendments and Corrections. SPSs should be updated as needed. WFOs will correct SPSs for format and grammatical errors.

4. **Hazardous Weather Outlook (product category HWO)**.

4.1 Mission Connection. WFOs issue Hazardous Weather Outlooks (HWO) to provide the public, media, and emergency managers with a single source of information regarding expected hazardous weather through the seven-day forecast period. The HWO is a brief description of the potential for hazardous weather. The HWO provides (but is not limited to) outlooks of

hazardous winter weather, fire weather, non-precipitation, convective weather, tropical, marine and/or flood hazards (see Section 4.3.3.d for content guidelines by weather hazard).

4.2 Issuance Guidelines.

4.2.1 Creation Software. WFOs should use GHG to issue HWOs.

4.2.2 Issuance Criteria. The issuance criteria for the HWO varies by WFO and region. The HWO may be issued 1) as a daily routine product, 2) on an event-driven basis, or 3) not at all. The decision on which one of these three criteria WFOs use should be made in coordination with primary users and their regional office to best meet the local needs. If a WFO uses the product either on a daily routine basis or an event-driven basis, it should be updated whenever necessary to always depict the latest expected weather hazards for the seven day forecast period.

4.2.3 Issuance Time. WFOs should issue HWOs between 5 am and 7 am local time, except where local users request a different issuance time.

4.2.4 Valid Time. An outlook is valid from the time of issuance until the next scheduled issuance or update, unless the HWO is issued on an event-driven basis.

4.2.5 Product Expiration Time. The product expiration time is 24 hours from the routine issuance time, including updated or corrected HWOs, unless issued on an event-driven basis.

4.3 Technical Description. HWOs will follow the format and content described in this section.

4.3.1 UGC Type. HWOs will use the Zone (Z) code of the UGC.

4.3.2 Mass News Disseminator Header. The HWO MND header is "HAZARDOUS WEATHER OUTLOOK."

4.3.3 Content. HWOs will describe in concise non-technical terms the specific weather hazards of concern for the first and second forecast period. HWOs should also briefly discuss in non-technical terms any weather hazards in the Day Two through Seven time period. A weather hazard is considered to be any weather phenomenon that may require the issuance of a watch, warning, or advisory. WFOs should include a general time and location for the hazardous weather event, possible impact, and degree of uncertainty. The HWO will not be updated to address specific short-fuse warning and advisory products (Tornado Warning, Severe Thunderstorm Warning, Flash Flood Warning, Special Marine Warning, etc.). The HWO may reference readers to other long-fuse WFO watch, warning, or advisory products rather than duplicating the information therein.

a. Headlines. WFOs may include headlines for watches, warnings, advisories and significant weather hazards. (Note: Headlines are mandatory for tropical cyclone watches and warnings – see Section 4.3.3.d(7)). If the HWO includes headlines, the WFO should issue an update to the HWO any time those headlines change.

b. Geographic Locations. The HWO should include a short description of the geographical area covered. HWOs may be written to include the entirety of any WFO's geographic area of responsibility in one or more segments to cover specific weather hazards and/or geographic areas. If the HWO contains more than one segment, these segments should add up to cover all of a WFO's geographic area of responsibility each time the outlook is issued.

c. Days of Week. WFOs may include actual days of the week such as "TODAY" after ".DAY ONE..." and "SATURDAY THROUGH THURSDAY" after ".DAYS TWO THROUGH SEVEN..."

d. Content Guidelines By Weather Hazard.

(1) Convective Weather. WFOs will discuss convective weather hazards such as large hail, damaging winds, and tornadoes for all or portions of their geographic area of responsibility. WFOs should include Storm Prediction Center Categorical Convective Outlook information for Day 1, Day 2, and Day 3 Risks (Slight, Moderate and High) of organized severe convective weather. WFOs may include information on strong (less than severe) convection.

(2) Winter Weather. WFOs will discuss winter weather hazards such as wind chill, freezing fog, significant snow, freezing rain, sleet, or a mixture of these weather phenomena for all or portions of their geographic area of responsibility. WFOs should mention winter weather hazards in the Day 3 through Day 7 time period when there is a 30 percent or greater chance of these types of weather events meeting or exceeding local warning or advisory criteria. WFOs should mention active winter weather watches, warnings, and advisories for Days 1 and 2 in the HWO.

(3) Non Precipitation. WFOs will discuss non-precipitation weather hazards such as strong winds, excessive heat, extreme cold, blowing dust/sand, freezing temperatures during the growing season, and dense fog for all or portions of their geographic area of responsibility. WFOs should mention active non-precipitation watches, warnings, and advisories for Days 1 and 2 in the HWO. WFOs should mention non-precipitation weather hazards in the Day 3 through Day 7 time period when there is a 30 percent or greater chance of these types of weather events meeting or exceeding local warning or advisory criteria.

(4) Fire Weather. WFOs will discuss fire weather hazards such as extremely dry conditions, strong gusty winds, and dry thunderstorms for all or portions of their geographic area of responsibility. WFOs should mention active Fire Weather Watches and Red Flag Warnings for Days 1 and 2 in the HWO. WFOs may include SPC Fire Weather Outlook (Day 1 and Day 2) information in the HWO.

(5) Flooding. WFOs will discuss flood hazards for all or portions of their geographic area of responsibility. This includes inland flooding associated with a tropical cyclone. WFOs may include information on small stream flood situations and life threatening flood prone areas such as narrow canyons.

(6) Marine. WFOs will discuss the following marine hazards: high winds, high seas, high surf, coastal flooding, and waterspouts for all or portions of their area of responsibility. Rip currents may be discussed following the rip current guidance in NWSI 10-310, Section 3.6. WFOs routinely providing rip current information will include this information in the Day 1 portion of the HWO when forecasting a high risk of rip currents. Marine hazards that do not directly affect the coastline or lakeshore, such as those associated with Small Craft Advisories and Gale Warnings, may be omitted from the HWO based on local user needs.

(7) Tropical. WFOs will headline the Day 1 Tropical Cyclone Watches and Warnings issued by the National Hurricane Center (NHC), Central Pacific Hurricane Center (CPHC), or Joint Typhoon Warning Center (JTWC). The HWO should urge users to consult Hurricane Local Statements issued by the WFO to obtain detailed information concerning potential hazards such as strong winds, storm surge, and excessive rainfall. WFOs should be consistent with official guidance and products issued by the NHC/HPC in the Days 2 through 7 time period of the HWO. If a WFO forecasts a potential impact to all or portions of its geographic area of responsibility in Days 2 through 5, WFOs may use the following statement in the HWO: "CONSULT THE LATEST GUIDANCE AND INFORMATION FROM THE NATIONAL HURRICANE CENTER CONCERNING THE POSSIBLE EFFECTS OF (HURRICANE OR TROPICAL STORM) xxxx" where (xxxx is the name of the storm). WFOs will not reference tropical cyclone activity beyond the time period addressed by official tropical cyclone products (currently 5 days).

e. "Nil" Statement. If the HWO is a routine product and no weather hazards are expected, WFOs will include one of the following statements in the Day One and/or Days Two through Seven sections:

"NO HAZARDOUS WEATHER IS EXPECTED AT THIS TIME" or
"THE PROBABILITY FOR WIDESPREAD HAZARDOUS WEATHER IS LOW"

The HWO should not contain "nil" statements for specific types of weather hazards.

f. Spotter Instructions. HWOs should include instructions to spotters and emergency managers for any time during the seven day forecast period.

g. Grids and Graphics. WFOs may produce information supplemental to the text HWO in the form of grids or graphics with Regional concurrence. Any supplemental grids or graphics will be consistent with the text HWO.

4.3.4 Format.

```
FLaa4i cccc ddhhmm
HWOccc

HAZARDOUS WEATHER OUTLOOK
NATIONAL WEATHER SERVICE city state
time am/pm time_zone day mon dd yyyy

STZ001-002-003-ddhhmm-
ZONE 1-ZONE 2-ZONE 3-
time am/pm time_zone day mon dd yyyy

...HEADLINE FOR ACTIVE TROPICAL CYCLONE WATCHES AND WARNINGS...
(MANDATORY)

...HEADLINE FOR ALL OTHER ACTIVE WATCHES, WARNINGS, ADVISORIES OR
SIGNIFICANT WEATHER HAZARDS...  (OPTIONAL)

THIS HAZARDOUS WEATHER OUTLOOK IS FOR PORTION OF STATE(S).

.DAY ONE...ACTUAL DAY OF THE WEEK (Optional - SUCH AS TODAY OR THIS
AFTERNOON)

WFOS WILL DISCUSS IN CONCISE NON-TECHNICAL TERMS EACH HAZARD'S IMPACT
IN A FREE TEXT FORMAT FOR THE FIRST AND SECOND FORECAST PERIODS.
WFOS MAY REFERENCE SUPPORTING WARNINGS, WATCHES, ADVISORIES, AND
STATEMENTS.

.DAYS TWO THROUGH SEVEN...ACTUAL DAYS OF THE WEEK (Optional - SUCH AS
MONDAY THROUGH SATURDAY)

WFOS SHOULD DISCUSS IN CONCISE NON-TECHNICAL TERMS EACH HAZARD'S
IMPACT IN A FREE TEXT FORMAT FOR DAYS TWO THROUGH SEVEN.  WFOS MAY
REFERENCE SUPPORTING WARNINGS, WATCHES, ADVISORIES, AND STATEMENTS.
THIS SECTION IS A "HEADS UP" FOR PLANNING PURPOSES.

.SPOTTER INFORMATION STATEMENT...

INSTRUCTIONS TO SPOTTERS OR EMERGENCY MANAGERS.  WFOS MAY OMIT THIS
SECTION IF NO HAZARDOUS WEATHER IS EXPECTED IN BOTH THE DAY ONE AND
DAYS TWO THROUGH SEVEN TIME PERIODS.

$$

STZ004-005-006-ddhhmm-
ZONE 4-ZONE 5-ZONE 6-
time am/pm time_zone day mon dd yyyy

OPTIONAL SECOND SEGMENT WITH THE SAME FORMAT AS THE FIRST SEGMENT.

$$

FORECASTER NAME/NUMBER (OPTIONAL)
```

Figure 3. Hazardous Weather Outlook Format

4.4 Updates, Amendments and Corrections. WFOs should update the HWO if the forecast for hazardous weather changes. WFOs will place higher priority on updating the relevant watch, warning, and advisory products. WFOs will correct outlooks for format and grammatical errors.

5. **Preliminary Local Storm Report (product category LSR).**

5.1 Mission Connection. Preliminary Local Storm Reports (LSR) provide the Storm Prediction Center (SPC), River Forecast Centers (RFCs), adjacent WFOs, the public, media and emergency managers with reported observations of hazardous weather events. Preliminary Local Storm Reports also serve as the primary basis for the official monthly publication *Storm Data*.

5.2 Issuance Guidelines.

5.2.1 Creation Software. WFOs should use the AWIPS LSR generation software for reports. Other LSR generation software may be used with Regional concurrence.

5.2.2 Issuance Criteria. WFOs will issue LSRs for severe weather events such as tornadoes, waterspouts, large hail, thunderstorm/marine wind gusts and flash floods. WFOs should issue LSRs for other events listed in Appendix B. LSRs should be issued for events that meet or exceed applicable warning criteria. WFOs should issue LSRs for hail reports equal to or larger than 0.75 inches in diameter. WFOs may issue LSRs for other hazardous weather events that do not exceed applicable warning criteria. LSRs should be issued as close to real time as possible. WFOs should issue LSRs to "summarize" a list of reports during and/or at the end of an event (e.g. severe weather outbreak, winter storm). Events reported more than seven days after occurrence will be included in monthly *Storm Data* reports instead of LSRs.

5.2.3 Issuance Time. LSRs are non-scheduled, event-driven products.

5.2.4 Valid Time. LSRs are valid upon issuance.

5.2.5 Product Expiration Time. Not applicable.

5.3 Technical Description. LSRs will follow the format and content described in this section.

5.3.1 UGC Type. Not applicable.

5.3.2 Mass News Disseminator Header. The LSR MND header is "PRELIMINARY LOCAL STORM REPORT."

5.3.3 Content. LSRs will follow a national standard format. WFOs should denote whether the magnitude of a report was measured, estimated or of unknown origin for thunderstorm or non-thunderstorm wind gusts, marine thunderstorm wind gusts, downburst winds, high sustained winds, ice accumulation associated with freezing rain, sleet accumulation, snow accumulation, hail size, and visibility restrictions due to fog or dense fog. Many users decode the LSR and the SPC decodes the report to produce national hourly and daily reports. All fields of data will begin at the prescribed column of the page. The report should include type of phenomenon, date/time of occurrence, location of event (including state, county, direction, distance from a well-known site and Latitude/Longitude points), source of the report, damage, deaths, and/or injuries and

remarks to convey other noteworthy information about the event. The remarks section of the LSR should use plain English and be written in full sentences. After all weather events listed in the LSR, WFOs may use a delimiter "&&" to provide a narrative summary of weather events in plain English sentences.

LSRs are preliminary in nature. The final report of verified weather events will be listed in monthly *Storm Data* reports in accordance with NWSI 10-1605. Please refer to the NDS procedural directives or associated regional supplements for warning threshold criteria for the following weather phenomena:

Marine Weather	NWSI 10-313 (Special Marine Warnings)
Severe Weather	NWSI 10-511 (WFO Severe Weather Products Specification)
Winter Weather	NWSI 10-513 (WFO Winter Weather Products Specification)
Non Precipitation	NWSI 10-515 (WFO Non-Precipitation Weather Products Specification)
Tropical Weather	NWSI 10-601 (Tropical Cyclone Products)
Flooding	NWSI 10-922 (WFO Hydrologic Products Specification)

Please refer to Appendix B for a list of event sources and weather event types.

5.3.4 Format.

```
NWaa5i Kccc DDHHMM
LSRccc

PRELIMINARY LOCAL STORM REPORT
NATIONAL WEATHER SERVICE CITY STATE
time am/pm time_zone day mon dd yyyy

..TIME...   ...EVENT...      ...CITY LOCATION...     ...LAT.LON...
..DATE...   ....MAG....      ..COUNTY LOCATION..ST.. ...SOURCE....
            ..REMARKS..

hhmm qM|xxx|EVENT           |DIST DIR CITY          |LL.LLd LLL.LLd|x|
MM/DD/YYYY||EMAG UNIT    |xx|COUNTY            |ST|x|SOURCE          |
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
xxxxxxxxxx|*** # FATAL, # INJ *** OR REMARKS                          |
xxxxxxxxxx|REMARKS CONTINUED FOR UP TO 500 CHARACTERS TOTAL          |
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

&&

OPTIONAL FREE TEXT SUMMARY.

$$

FORECASTER NAME/NUMBER (OPTIONAL)
```

Figure 4. Local Storm Report Format. The "x" and "|" symbols indicate blank spaces. See Table 1 for explanation of fields within individual reports.

Item	Description	Example(s)	Line:Chars	Length
hhmm qM	time: hour and minute with am/pm qualifier, and preceding zero if necessary	0109 PM	1:1-7	7
EVENT	event type from the list in Appendix B	TORNADO TSTM WIND GST	1:13-28	16
DIST	distance from city	10	1:30-52	23
DIR	direction from city	NW		
CITY	City name (obtained from list)	NECHE		
LL.LLd	latitude to 2 decimal places and direction	38.31N	1:54-67	14
LLL.LLd	longitude to 2 decimal places and direction, no negative sign, no leading zero	104.92W		
MM/DD/YYYY	date: month / day / 4-digit year, no leading zero on month	8/22/2009	2:1-10	10
EMAG	event magnitude value, led by determination method designator (E/M/U) for those event types listed with an asterisk in Appendix B	E2.5 M59 U6.50 EF4	2:13-25	13
UNIT	units of the magnitude value	INCHES MPH		
COUNTY	county name	PEMBINA	2:30-47	18
ST	state 2-letter postal abbreviation	ND	2:49-50	2
SOURCE	source of the report from list in Appendix B	TRAINED SPOTTER	2:54-69	16
FATAL INJ	numbers of fatalities and injuries, surrounded by 3 asterisks, separated by a comma, with spaces in between, at the beginning of the remarks section	*** 1 FATAL, 2 INJ *** *** 4 INJ ***	4+:13-69	57 to 500

Table 1. Explanation of fields within individual reports in the LSR format described in Figure 4.

5.4 Updates, Amendments and Corrections. Updates and amendments are not applicable. WFOs will issue a new LSR if the office receives new reports of weather events which meet or exceed warning criteria or updated information on previously reported weather events. WFOs will correct statements for format and grammatical errors.

6. **Mesoscale Discussion (product category MD)**.

6.1 Mission Connection. SPC issues Mesoscale Discussions (MD) to convey to CONUS WFOs, the public, media, emergency managers, and other specialized users, the location and current meteorological reasoning for short term hazardous weather concerns.

6.2 Issuance Guidelines.

6.2.1 Creation Software. SPC will use the N-AWIPS graphics creation tool in NMAP and SPC web-based product generation software to create and issue MDs.

6.2.2 Issuance Criteria. MD issuance criteria depend on the type of weather hazard. Refer to Section 6.3.3 for details.

6.2.3 Issuance Time. MDs are non-scheduled, event-driven products.

6.2.4 Valid Time. The valid time is from the time of issuance until the next update time.

6.3 Technical Description. MDs will follow the format and content described in this section.

6.3.1 UGC Type. MDs will use the Zone (Z) code of the UGC.

6.3.2 Mass News Disseminator Header. The MD MND header is "MESOSCALE DISCUSSION nnnn", where nnnn is a four-digit number reset to 0001 on 1 January at 0000 UTC.

6.3.3 Content. SPC uses the Mesoscale Discussion (MD) to alert WFOs and various users to different types of short term weather hazards. Types of MD by weather hazard are as follows:

a. Severe Potential. SPC should issue a MD to discuss convective trends and severe thunderstorm potential as follows:

(1) Watch likely. This type of MD should be issued in an area where organized severe convection is expected, and should precede Severe Thunderstorm or Tornado Watch issuance by about 1 to 2 hours, allowing time for collaboration with the affected WFOs.

(2) Watch possible. This type of MD may be issued in an area where organized severe convection is possible, but it is unclear whether a Severe Thunderstorm or Tornado Watch will be needed in the next 1 to 2 hours.

(3) Watch unlikely. This type of MD may be issued in an area where isolated strong to severe convection is ongoing or expected, but is not expected to reach the severity or coverage criteria for a Severe Thunderstorm or Tornado Watch in the next 1 to 2 hours. SPC should also issue an MD for severe potential when it is monitoring an area for a potential convective watch or when thunderstorm development is potentially severe, but will not have enough areal coverage or duration that is expected to last long enough for a convective watch issuance.

(4) Watch needed soon. This type of MD may be issued in an area where organized severe convection may develop very rapidly and a Severe Thunderstorm or Tornado Watch will be issued within the next 15-30 minutes.

(5) Probability of watch issuance. This qualifies the likelihood of watch issuance contained in the Severe Potential line, using the following probability values: 5 and 20 percent (watch unlikely); 40 and 60 percent (watch possible); 80 and 95% (watch likely). A probability of 95 percent is also used for "watch needed soon" situations.

b. Watch Update. SPC should issue a MD at least once every 2 to 3 hours for each convective watch that is in effect and focus on mesoscale and storm scale features affecting the severe weather within the watch area. A MD should also be issued within the last 1-2 hours before convective watch expiration detailing expected SPC actions for possible new watch issuance. The text of the MD should begin "THE SEVERE WEATHER THREAT FOR (SEVERE THUNDERSTORM/TORNADO) WATCH nnnn CONTINUES."

c. Heavy Rainfall. SPC should issue a MD for:

- Localized areas of convective rainfall where rates equal to or greater than 3 inches per hour
- Two or more inches are expected at any one location in one hour, **or**
- Rainfall rates of 1.5 inches per hour are expected to occur for 3 hours or greater.

SPC may issue a Convective Heavy Rain MD to forecast the end of a heavy rain event.

d. Heavy Snow. SPC should issue a MD for snowfall accumulation rates of 1 inch per hour or greater for a period of 2 hours or greater at elevations below 4000 feet MSL (mean sea level) and accumulation rates of 2 inches per hour or greater for a period of 2 hours or greater at elevations above 4000 feet MSL. Discussions may also address precipitation trends (increasing or decreasing rates), and climatologically rare events.

e. Freezing Rain. SPC should issue a MD for freezing rain accumulations greater than .05 inch per hour for a period of 3 hours or greater. Discussions may also address where a precipitation type is forecast to change from liquid to freezing or from freezing to liquid.

f. Blizzard. SPC should issue a MD for mesoscale blizzard conditions forecast to persist 3 hours or greater.

g. Convective Outlook Upgrade. SPC should issue a MD when upgrading a Day 1 convective outlook risk category to "moderate" or "high" risk. SPC will issue this type of MD prior to the 1300, 1630, 2000, or 0100 UTC convective outlook issuance times, and briefly describe the area to be upgraded. This MD will refer to the ensuing outlook discussion.

6.3.4 Format for Severe Potential Mesoscale Discussion.

```
ACUS11 KWNS ddhhmm
SWOMCD
SPC MCD ddhhmm
STZ000-STZ000-ddhhmm-

MESOSCALE DISCUSSION nnnn
NWS STORM PREDICTION CENTER NORMAN OK
time am/pm time zone day mon dd yyyy

AREAS AFFECTED...(PORTION OF STATES OR GEOGRAPHICAL AREAS)...

CONCERNING...(TYPE OF MD)

VALID DDHHMMZ - DDHHMMZ

PROBABILITY OF WATCH ISSUANCE...[increments of 20 percent from 20-80
percent, including 5 and 95 percent]

SUMMARY...[A concise statement regarding the forecast
   (timing, coverage, intensity, and mode) severe threat.]

DISCUSSION...[The description of significant mesoscale features and
   atmospheric processes which will likely result in the expected
   event.]

..FORECASTER NAME.. mm/dd/yyyy

...PLEASE SEE WWW.SPC.NOAA.GOV FOR GRAPHICAL PRODUCT...

ATTN...WFO A...WFO B... (affected WFOs)

LAT...LON AAaaBBbb AAaaBBbb AAaaBBbb AAaaBBbb AAaaBBbb AAaaBBbb
          AAaaBBbb AAaaBBbb (list of latitude/longitude coordinates
          outlining the for MD graphic area)
```

Figure 5. Severe Potential Mesoscale Discussion format, where AAaa=Latitude north in degrees to two decimal places (without decimal point), BBbb=Longitude west in degrees to two decimal places (without decimal point and without leading 1 west of 100 degrees west).

6.3.5 Format for all other Mesoscale Discussions (Watch Update, Winter, Heavy Rain, and Outlook Upgrade MDs)

```
ACUS11 KWNS ddhhmm
SWOMCD
SPC MCD ddhhmm
STZ000-STZ000-ddhhmm-

MESOSCALE DISCUSSION nnnn
NWS STORM PREDICTION CENTER NORMAN OK
time am/pm time zone day mon dd yyyy

AREAS AFFECTED...(PORTION OF STATES OR GEOGRAPHICAL AREAS)...

CONCERNING...(TYPE OF MD)

VALID DDHHMMZ - DDHHMMZ

SUMMARY...[A concise statement regarding the forecast
   (timing, coverage, intensity, and mode) severe threat.]

DISCUSSION...[The description of significant mesoscale features and
   atmospheric processes which will likely result in the expected
   event.]

..FORECASTER NAME.. mm/dd/yyyy

...PLEASE SEE WWW.SPC.NOAA.GOV FOR GRAPHICAL PRODUCT...

ATTN...WFO A...WFO B... (affected WFOs)

LAT...LON AAaaBBbb AAaaBBbb AAaaBBbb AAaaBBbb AAaaBBbb AAaaBBbb
          AAaaBBbb AAaaBBbb (corner points for MD graphic)
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Figure 6. Mesoscale Discussion format (other than Severe Potential Discussions), where AAaa=Latitude north in degrees to two decimal places (without decimal point), BBbb=Longitude west in degrees to two decimal places (without decimal point and without leading 1 west of 100 degrees west).

6.4 Updates, Amendments and Corrections. SPC will issue MDs as needed and there are no updates. SPC will correct messages for format and grammatical errors.

APPENDIX A - Product Examples

Table of Contents: Page

1. Introduction. This appendix provides product examples for the WFOs, SPC and the public.

2. Short Term Forecast.

(Non-segmented version)

```
FPUS74 KSHV 070258
NOWSHV

SHORT TERM FORECAST
NATIONAL WEATHER SERVICE SHREVEPORT LA
958 PM CDT WED JUN 6 2012

ARZ070-OKZ077-TXZ096-097-108>112-124>126-136>138-149>153-165>167-
070500-
MILLER-MCCURTAIN-RED RIVER-BOWIE-FRANKLIN-TITUS-CAMP-MORRIS-CASS-
WOOD-UPSHUR-MARION-SMITH-GREGG-HARRISON-CHEROKEE-RUSK-PANOLA-
NACOGDOCHES-SHELBY-ANGELINA-SAN AUGUSTINE-SABINE TX-
INCLUDING THE CITIES OF...TEXARKANA...IDABEL...CLARKSVILLE...
MT VERNON...MT PLEASANT...PITTSBURG...DAINGERFIELD...ATLANTA...
QUITMAN...GILMER...JEFFERSON...TYLER...LONGVIEW...MARSHALL...
RUSK...HENDERSON...CARTHAGE...NACOGDOCHES...CENTER...LUFKIN...
SAN AUGUSTINE...HEMPHILL
958 PM CDT WED JUN 6 2012

.NOW...
SHOWERS AND THUNDERSTORMS...ALONG WITH A LARGE AREA OF LIGHT TO
MODERATE RAIN OVER EAST TEXAS...WILL CONTINUE TO MOVE SLOWLY TO THE
EAST THROUGH MIDNIGHT. A FEW OF THE STRONGER STORMS MAY PRODUCE GUSTY
WIND...BRIEF HEAVY RAINFALL...AND DANGEROUS CLOUD TO GROUND LIGHTNING.
RAINFALL AMOUNTS OF A QUARTER TO A HALF INCH CAN BE EXPECTED WEST OF A
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DAINGERFIELD...LONGVIEW...MOUNT ENTERPRISE LINE...WITH AMOUNTS OF OVER
AN INCH POSSIBLE FROM A FEW STORMS.

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(Segmented version)

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FPUS75 KCYS 070512
NOWCYS

SHORT TERM FORECAST
NATIONAL WEATHER SERVICE CHEYENNE WY
1112 PM MDT WED JUN 6 2012

WYZ106>108-117>119-070700-
CENTRAL LARAMIE RANGE AND SOUTHWEST PLATTE COUNTY-
EAST PLATTE COUNTY-GOSHEN COUNTY-SOUTH LARAMIE RANGE FOOTHILLS-
CENTRAL LARAMIE COUNTY-EAST LARAMIE COUNTY-
INCLUDING THE CITIES OF...BORDEAUX...GLENDO...WHEATLAND...
CHUGWATER...GUERNSEY...TORRINGTON...HORSE CREEK...HARRIMAN...
WHITAKER...CHEYENNE...BURNS...CARPENTER...ALBIN...PINE BLUFFS
1112 PM MDT WED JUN 6 2012

.NOW...

NUMEROUS SHOWERS AND THUNDERSTORMS WILL CONTINUE OVER SOUTHEAST
WYOMING TO THE EAST OF THE LARAMIE RANGE THROUGH 100 AM. THE STRONGEST
THUNDERSTORM IS CURRENTLY JUST TO THE EAST OF CHEYENNE AND MOVING
TO THE EAST AT AROUND 20 MPH. HEAVY RAIN AND SOME PEA SIZED HAIL CAN
BE EXPECTED FROM THIS STORM.

$$

NEZ002-003-019>021-054-055-095-096-070700-
DAWES-BOX BUTTE-SCOTTS BLUFF-BANNER-MORRILL-KIMBALL-CHEYENNE-
NORTH SIOUX-SOUTH SIOUX-
INCLUDING THE CITIES OF...CHADRON...ALLIANCE...SCOTTSBLUFF...
GERING...HARRISBURG...BRIDGEPORT...BAYARD...KIMBALL...SIDNEY...
HARRISON...AGATE
1112 PM MDT WED JUN 6 2012

.NOW...

SCATTERED LIGHT RAIN SHOWERS WILL CONTINUE OVER PORTIONS OF THE
NEBRASKA PANHANDLE THROUGH 100 AM. RAINFALL AMOUNTS WILL GENERALLY
BE LESS THAN A FEW TENTHS OF AN INCH.

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(Segmented version broken down by time periods)

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FPUS74 KTSA 122156
NOWTSA

SHORT TERM FORECAST
NATIONAL WEATHER SERVICE TULSA OK
356 PM CST SAT DEC 12 2009

OKZ060-130400-
TULSA-
INCLUDING THE CITIES OF...TULSA...
356 PM CST SAT DEC 12 2009

THROUGH 6 PM...INCREASING CLOUDS. WINDY. TEMPERATURES 65 TO 68.
SOUTHEAST WINDS 15 TO 25 MPH WITH GUSTS TO 40 MPH.

6 PM TO 8 PM...CLOUDY WITH A FEW SHOWERS DEVELOPING. TEMPERATURES 64
TO 66. SOUTH WINDS SHIFTING TO WEST 10 TO 20 MPH.

8 PM TO 10 PM...CLOUDY AND WINDY. RAIN...HEAVY AT TIMES. TEMPERATURES
FALLING TO AROUND 50. WINDS BECOMING NORTHWEST AT 25 TO 30 MPH.

$$

ARZ019-029-130400-
CRAWFORD-SEBASTIAN-
INCLUDING THE CITIES OF...FORT SMITH...VAN BUREN...
356 PM CST SAT DEC 12 2009

THROUGH 6 PM...CLEAR. TEMPERATURES 55 TO 60. EAST WINDS 10 TO 15 MPH.

6 PM TO 8 PM...INCREASING CLOUDS. TEMPERATURES 53 TO 58. SOUTHEAST 15
TO 20 MPH.

8 PM TO 10 PM...CLOUDY WITH SHOWERS AND THUNDERSTORMS INCREASING.
TEMPERATURES 52 TO 57. SOUTHEAST WINDS 15 TO 25 MPH.

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3. Special Weather Statement.

(Sub-severe thunderstorm with optional headline)

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WWUS84 KSJT 140313
SPSSJT

SPECIAL WEATHER STATEMENT
NATIONAL WEATHER SERVICE SAN ANGELO TX
1013 PM CDT WED JUN 13 2012

TXZ049-140400-
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FISHER TX-
1013 PM CDT WED JUN 13 2012

...SIGNIFICANT WEATHER ADVISORY IN EFFECT FOR FISHER COUNTY UNTIL 1100
PM CDT...

AT 1007 PM CDT...A STRONG THUNDERSTORM WAS INDICATED BY NATIONAL
WEATHER SERVICE DOPPLER RADAR OVER HOBBS...OR ABOUT 19 MILES EAST OF
SNYDER...MOVING NORTHEAST AT 20 MPH.

* THE STRONG THUNDERSTORM WILL BE NEAR...
  ROTAN BY 1035 PM CDT
  HITSON BY 1100 PM CDT

DIME SIZE HAIL AND WIND GUSTS TO 50 MPH ARE LIKELY WITH THIS STORM.
HEAVY RAINFALL WILL CAUSE PONDING OF WATER ON AREA ROADWAYS...
ESPECIALLY THOSE IN POOR DRAINAGE AREAS. RESIDENTS ARE ENCOURAGED TO
MONITOR THE SITUATION CLOSELY AND BE PREPARED TO TAKE THE PROPER
ACTIONS SHOULD A WARNING BE ISSUED.

LAT...LON 3296 10023 3278 10014 3267 10014 3260 10063
      3269 10067 3289 10066 3297 10055
TIME...MOT...LOC 0313Z 241DEG 18KT 3281 10058

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(Severe thunderstorms approaching the area)

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WWUS83 KLOT 142103
SPSLOT

SPECIAL WEATHER STATEMENT
NATIONAL WEATHER SERVICE CHICAGO IL
403 PM CDT THU MAY 14 2009

ILZ006-013-014-022-142200-
COOK-DUPAGE-LAKE IL-WILL-
INCLUDING THE CITIES OF...CHICAGO...JOLIET...WAUKEGAN...WHEATON...
403 PM CDT THU MAY 14 2009

A LINE OF SEVERE THUNDERSTORMS WITH A HISTORY OF PRODUCING WIND
DAMAGE IS MOVING EAST AT 50 MPH TOWARD THE AREA. THESE STORMS WILL
REACH THE WESTERN SUBURBS OF CHICAGO AROUND 530 PM AND THE LAKEFRONT
AROUND 600 PM. PEOPLE IN CHICAGOLAND SHOULD BE PREPARED FOR SEVERE
WEATHER INCLUDING STRONG WINDS...FREQUENT LIGHTNING...AND VERY HEAVY
RAIN DURING THE EVENING RUSH HOUR.

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(Local dense fog)

```
SPECIAL WEATHER STATEMENT
NATIONAL WEATHER SERVICE TAUNTON MA
1024 PM EDT MON MAY 21 2012

MAZ015>024-RIZ002-004>008-221100-
SUFFOLK MA-EASTERN NORFOLK MA-NORTHERN BRISTOL MA-
WESTERN PLYMOUTH MA-EASTERN PLYMOUTH MA-SOUTHERN BRISTOL MA-
SOUTHERN PLYMOUTH MA-BARNSTABLE MA-DUKES MA-NANTUCKET MA-
SOUTHEAST PROVIDENCE RI-EASTERN KENT RI-BRISTOL RI-WASHINGTON RI-
NEWPORT RI-BLOCK ISLAND RI-
INCLUDING THE CITIES OF...BOSTON...QUINCY...TAUNTON...BROCKTON...
PLYMOUTH...FALL RIVER...NEW BEDFORD...MATTAPOISETT...CHATHAM...
FALMOUTH...PROVINCETOWN...VINEYARD HAVEN...NANTUCKET...
PROVIDENCE...WARWICK...BRISTOL...NARRAGANSETT...WESTERLY...
NEWPORT...BLOCK ISLAND
1024 PM EDT MON MAY 21 2012

...AREAS OF DENSE FOG WILL CONTINUE OVERNIGHT ACROSS PORTIONS OF
SOUTHERN RHODE ISLAND AND EASTERN MASSACHUSETTS...

AREAS OF DENSE FOG WILL REDUCE VISIBILITY TO ONE QUARTER MILE OR
LESS AT TIMES. MOTORISTS SHOULD USE EXTRA CAUTION OVERNIGHT.
VISIBILITIES WILL IMPROVE BY MID MORNING TUESDAY.

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(Snow squall with optional headline)

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WWUS81 KCTP 171037
SPSCTP

SPECIAL WEATHER STATEMENT
NATIONAL WEATHER SERVICE STATE COLLEGE PA
537 AM EST THU DEC 17 2009

PAZ037-171115-
TIOGA PA-
537 AM EST THU DEC 17 2009

...HEAVY SNOW SQUALL AFFECTING TIOGA COUNTY...

A HEAVY SNOW SQUALL WILL MOVE SOUTHEAST AT 10 MPH ACROSS THE TIOGA
AND WELLSBORO AREAS BY 6 AM. VISIBILITY IN THE SQUALL WILL RAPIDLY
DROP TO LESS THAN A MILE WITH A QUICK COATING OF SNOW...CAUSING SUDDEN
HAZARDOUS DRIVING CONDITIONS.  THE SQUALL WILL MOVE INTO THE MANSFIELD
AND BLOSSBURG AREAS SHORTLY AFTER 6 AM.

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(Long-range hazardous weather)

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WWUS86 KEKA 132200
SPSEKA

SPECIAL WEATHER STATEMENT
NATIONAL WEATHER SERVICE EUREKA CA
200 PM PST SUN DEC 13 2009

CAZ001>004-076-140400-
REDWOOD COAST-MENDOCINO COAST-NORTH COAST INTERIOR-
UPPER TRINITY RIVER-MENDOCINO INTERIOR-
200 PM PST SUN DEC 13 2009

...PERIODS OF MODERATE TO HEAVY RAIN EXPECTED MONDAY NIGHT THROUGH
WEDNESDAY...

A STRONG PACIFIC STORM WILL BRING PERIODS OF MODERATE TO HEAVY RAIN
STARTING MONDAY EVENING AND CONTINUING THROUGH WEDNESDAY MORNING.
TOTAL RAINFALL AMOUNTS OF 2 TO 3 INCHES WILL BE POSSIBLE OVER A
WIDESPREAD AREA. THE KING RANGE AND SOUTH FORK WILL LIKELY RECEIVE
GREATER AMOUNTS.

LOCALIZED MINOR FLOODING WILL BE POSSIBLE...ESPECIALLY IN LOW LYING
AREAS. WATER WILL POND ON THE ROADWAYS AND VISIBILITY WILL BE
REDUCED...CAUSING HAZARDOUS DRIVING CONDITIONS.

SNOW OR A MIX OF RAIN AND SNOW IS EXPECTED MONDAY NIGHT THROUGH
WEDNESDAY MORNING ABOVE 5000 FEET. SEVERAL INCHES OF SNOW
ACCUMULATION AND GUSTY WINDS ARE EXPECTED ABOVE 6000 FEET.

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4. Hazardous Weather Outlook.

(Severe Convective Weather and other hazards, with optional headline)

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HAZARDOUS WEATHER OUTLOOK
NATIONAL WEATHER SERVICE ALBANY NY
358 AM EDT WED MAY 16 2012

NYZ032-033-038-042-058-063-082-VTZ013-014-171100-
NORTHERN HERKIMER-HAMILTON-SOUTHERN HERKIMER-NORTHERN WARREN-
WESTERN GREENE-WESTERN ULSTER-NORTHERN FULTON-BENNINGTON-
WESTERN WINDHAM-
358 AM EDT WED MAY 16 2012

THIS HAZARDOUS WEATHER OUTLOOK IS FOR THE SOUTHERN
ADIRONDACKS...WESTERN MOHAWK VALLEY AND CENTRAL AND SOUTHEAST
CATSKILLS OF EAST CENTRAL NEW YORK AND THE SOUTHERN GREEN
MOUNTAINS OF VERMONT.
```

.DAY ONE...TODAY AND TONIGHT

THERE IS A SLIGHT RISK OF SEVERE THUNDERSTORMS THIS AFTERNOON INTO EARLY THIS EVENING AHEAD OF A STRONG COLD FRONT. THE POTENTIAL SEVERE THUNDERSTORMS MAY PRODUCE HAIL STONES ONE INCH IN DIAMETER AND LARGER...AND DAMAGING WINDS 58 MPH AND GREATER. THE STORMS MAY FORM INTO ONE OR MORE LINES WHICH WILL MOVE FROM WEST TO EAST AS INDIVIDUAL STORMS TRACK FROM SOUTHWEST TO NORTHEAST AT 35 TO 45 MPH.

.DAYS TWO THROUGH SEVEN...THURSDAY THROUGH TUESDAY

FROST IS POSSIBLE LATE THURSDAY NIGHT INTO EARLY FRIDAY MORNING AS TEMPERATURES ARE EXPECTED TO DROP INTO THE LOW TO MID 30S WITH SOME UPPER 20S POSSIBLE ACROSS THE WESTERN ADIRONDACKS.

.SPOTTER INFORMATION STATEMENT...

SKYWARN ACTIVATION MAY BE REQUESTED THIS AFTERNOON INTO EARLY THIS EVENING. ANY COUNTIES WHERE ACTIVATION IS REQUESTED WILL BE LISTED INDIVIDUALLY IN THIS STATEMENT.

$$

(Flooding and high winds)

FLUS45 KTWC 181400
HWOTWC

HAZARDOUS WEATHER OUTLOOK
NATIONAL WEATHER SERVICE TUCSON AZ
700 AM MST FRI SEP 18 2009

AZZ019-029>035-191400-
NORTHERN GREENLEE COUNTY-SOUTHEAST PINAL COUNTY-UPPER GILA RIVER VALLEY-WESTERN PIMA COUNTY-TOHONO-OODHAM NATION-TUCSON METRO/MARANA/GREEN VALLEY-SANTA CRUZ COUNTY-COCHISE COUNTY-
700 AM MST FRI SEP 18 2009

THIS HAZARDOUS WEATHER OUTLOOK IS FOR SOUTHEAST ARIZONA

.DAY ONE...TODAY...

THE REMNANTS OF HURRICANE ERIK WILL BRING HEAVY RAIN AND GUSTY WINDS ACROSS THE AREA THIS AFTERNOON AND TONIGHT. NORMALLY DRY WASHES WILL FLOOD QUICKLY AFTER THE HEAVY RAIN BEGINS. URBAN FLOODING IS ALSO LIKELY. DAMAGING WIND GUSTS ARE POSSIBLE AT ELEVATIONS ABOVE 5000 FEET BETWEEN 3 PM AND 9 PM.

.DAYS TWO THROUGH SEVEN...SATURDAY THROUGH THURSDAY

ISOLATED STRONG THUNDERSTORMS ARE POSSIBLE MONDAY AFTERNOON AND

```
EVENING AS A STORM SYSTEM MOVES ACROSS THE AREA. OTHERWISE...NO
ADDITIONAL HAZARDOUS WEATHER IS EXPECTED THROUGH THE PERIOD.

.SPOTTER INFORMATION STATEMENT...

SKYWARN SPOTTER ACTIVATION WILL BE NEEDED THIS AFTERNOON AND EVENING.

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(Fire Weather)

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HAZARDOUS WEATHER OUTLOOK
NATIONAL WEATHER SERVICE FLAGSTAFF AZ
328 AM MST WED MAY 16 2012

AZZ004>018-037>040-170715-
KAIBAB PLATEAU-MARBLE AND GLEN CANYONS-GRAND CANYON COUNTRY-
COCONINO PLATEAU-YAVAPAI COUNTY MOUNTAINS-
NORTHEAST PLATEAUS AND MESAS HWY 264 NORTHWARD-CHINLE VALLEY-
CHUSKA MOUNTAINS AND DEFIANCE PLATEAU-
LITTLE COLORADO RIVER VALLEY IN COCONINO COUNTY-
LITTLE COLORADO RIVER VALLEY IN NAVAJO COUNTY-
LITTLE COLORADO RIVER VALLEY IN APACHE COUNTY-
WESTERN MOGOLLON RIM-EASTERN MOGOLLON RIM-WHITE MOUNTAINS-
NORTHERN GILA COUNTY-YAVAPAI COUNTY VALLEYS AND BASINS-
OAK CREEK AND SYCAMORE CANYONS-BLACK MESA AREA-
NORTHEAST PLATEAUS AND MESAS SOUTH OF HWY 264-
328 AM MST WED MAY 16 2012

THIS HAZARDOUS WEATHER OUTLOOK IS FOR PORTIONS OF EAST CENTRAL
ARIZONA...NORTH CENTRAL ARIZONA...NORTHEAST ARIZONA AND WEST
CENTRAL ARIZONA.

.DAY ONE...TODAY AND TONIGHT

EXPECT AREAS OF GUSTY SOUTHWESTERLY WINDS WITH SOME LOCATIONS IN
THE NORTHEAST CORNER OF ARIZONA APPROACHING CRITICAL FIRE WEATHER
CONDITIONS. ONGOING FIRES IN CENTRAL ARIZONA WILL LIKELY PRODUCE
AREAS OF DENSE SMOKE IN OR NEAR CROWN KING /GLADIATOR FIRE/ AND
RYE /SUNFLOWER FIRE/ TONIGHT.

.DAYS TWO THROUGH SEVEN...THURSDAY THROUGH TUESDAY

DRY CONDITIONS AND GUSTY SOUTHWEST WINDS ARE EXPECTED EACH
AFTERNOON THROUGH FRIDAY ACROSS NORTHERN ARIZONA. NEAR CRITICAL
FIRE CONDITIONS ARE EXPECTED ON THURSDAY. A FIRE WEATHER WATCH IS
IN EFFECT FOR FRIDAY AS DRY CONDITIONS AND SOUTHWEST WINDS OF 20
TO 35 MPH WITH GUSTS INTO THE 40 MPH RANGE ARE ANTICIPATED.

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(Marine)

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HAZARDOUS WEATHER OUTLOOK
NATIONAL WEATHER SERVICE CORPUS CHRISTI TX
541 AM CDT WED MAY 16 2012

GMZ230-235-250-255-270-275-TXZ229>234-239>247-171045-
BAYS AND WATERWAYS FROM BAFFIN BAY TO PORT ARANSAS-
BAYS AND WATERWAYS FROM PORT ARANSAS TO PORT O`CONNOR-
COASTAL WATERS FROM BAFFIN BAY TO PORT ARANSAS OUT 20 NM-
COASTAL WATERS FROM PORT ARANSAS TO MATAGORDA SHIP CHANNEL OUT
20 NM-WATERS FROM BAFFIN BAY TO PORT ARANSAS FROM 20 TO 60 NM-
WATERS FROM PORT ARANSAS TO MATAGORDA SHIP CHANNEL FROM 20 TO
60 NM-LA SALLE-MCMULLEN-LIVE OAK-BEE-GOLIAD-VICTORIA-WEBB-DUVAL-
JIM WELLS-KLEBERG-NUECES-SAN PATRICIO-ARANSAS-REFUGIO-CALHOUN-
541 AM CDT WED MAY 16 2012

THIS HAZARDOUS WEATHER OUTLOOK IS FOR SOUTH TEXAS AND THE MIDDLE
TEXAS COASTAL WATERS.

.DAY ONE...TODAY AND TONIGHT

ISOLATED THUNDERSTORMS EXPECTED TODAY OVER THE COASTAL WATERS.

.DAYS TWO THROUGH SEVEN...THURSDAY THROUGH TUESDAY

NO HAZARDOUS WEATHER IS EXPECTED AT THIS TIME.

.SPOTTER INFORMATION STATEMENT...

SPOTTER ACTIVATION IS NOT ANTICIPATED.

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(Long Range Hazardous Weather)

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HAZARDOUS WEATHER OUTLOOK
NATIONAL WEATHER SERVICE MOUNT HOLLY NJ
352 PM EDT TUE JUL 31 2012

MDZ008-012-015-019-020-NJZ001-007>010-012-016-PAZ054-055-060>062-
012000-
CECIL-KENT MD-QUEEN ANNES-TALBOT-CAROLINE-SUSSEX-WARREN-MORRIS-
HUNTERDON-SOMERSET-MIDDLESEX-SALEM-CARBON-MONROE-BERKS-LEHIGH-
NORTHAMPTON-
352 PM EDT TUE JUL 31 2012

THIS HAZARDOUS WEATHER OUTLOOK IS FOR NORTHEAST MARYLAND...NORTHERN
NEW JERSEY...NORTHWEST NEW JERSEY...SOUTHERN NEW JERSEY...EAST
CENTRAL PENNSYLVANIA AND NORTHEAST PENNSYLVANIA.

.DAY ONE...THIS AFTERNOON AND TONIGHT.
```

HAZARDOUS WEATHER IS NOT EXPECTED AT THIS TIME.

.DAYS TWO THROUGH SEVEN...WEDNESDAY THROUGH MONDAY.

CLUSTERS OF THUNDERSTORMS MAY BE STRONG WEDNESDAY AFTERNOON AND EVENING AND AGAIN ON SUNDAY OR MONDAY. THEY COULD PRODUCE GUSTY WINDS AND HEAVY DOWNPOURS. EASTERN PENNSYLVANIA...NORTHEAST MARYLAND AND INTERIOR NEW JERSEY APPEAR TO BE THE MOST FAVORED REGION FOR STRONG THUNDERSTORMS ON WEDNESDAY.

.SPOTTER INFORMATION STATEMENT...

SPOTTER ACTIVATION IS NOT EXPECTED AT THIS TIME.

$$

DEZ001-NJZ015-017>019-PAZ067>071-012000-
NEW CASTLE-MERCER-GLOUCESTER-CAMDEN-NORTHWESTERN BURLINGTON-CHESTER-
MONTGOMERY-BUCKS-DELAWARE-PHILADELPHIA-
352 PM EDT TUE JUL 31 2012

THIS HAZARDOUS WEATHER OUTLOOK IS FOR NORTHERN DELAWARE...CENTRAL NEW JERSEY...SOUTHERN NEW JERSEY AND SOUTHEAST PENNSYLVANIA.

.DAY ONE...THIS AFTERNOON AND TONIGHT.

HAZARDOUS WEATHER IS NOT EXPECTED AT THIS TIME.

.DAYS TWO THROUGH SEVEN...WEDNESDAY THROUGH MONDAY.

CLUSTERS OF THUNDERSTORMS MAY BE STRONG WEDNESDAY AFTERNOON AND EVENING AND AGAIN ON SUNDAY OR MONDAY. THEY COULD PRODUCE GUSTY WINDS AND HEAVY DOWNPOURS.

HEAT INDEX VALUES PARTICULARLY IN URBAN AREAS SHOULD APPROACH OR EXCEED 100 DEGREES FRIDAY THROUGH MONDAY WITH THE GREATEST CHANCES ON THE WEEKEND.

.SPOTTER INFORMATION STATEMENT...

SPOTTER ACTIVATION IS NOT EXPECTED AT THIS TIME.

$$

(Marine/heavy snow threats, discussion of uncertainty, segmented example)

FLUS41 KBOX 171100
HWOBOX

HAZARDOUS WEATHER OUTLOOK
NATIONAL WEATHER SERVICE TAUNTON MA
600 AM EST THU DEC 17 2009

CTZ002>004-MAZ002>024-026-NHZ011-012-015-RIZ001>008-181100-
HARTFORD CT-TOLLAND CT-WINDHAM CT-WESTERN FRANKLIN MA-

EASTERN FRANKLIN MA-NORTHERN WORCESTER MA-CENTRAL MIDDLESEX MA-
WESTERN ESSEX MA-EASTERN ESSEX MA-WESTERN HAMPSHIRE MA-
WESTERN HAMPDEN MA-EASTERN HAMPSHIRE MA-EASTERN HAMPDEN MA-
SOUTHERN WORCESTER MA-WESTERN NORFOLK MA-SOUTHEAST MIDDLESEX MA-
SUFFOLK MA-EASTERN NORFOLK MA-NORTHERN BRISTOL MA-
WESTERN PLYMOUTH MA-EASTERN PLYMOUTH MA-SOUTHERN BRISTOL MA-
SOUTHERN PLYMOUTH MA-BARNSTABLE MA-DUKES MA-NANTUCKET MA-
NORTHERN MIDDLESEX MA-CHESHIRE NH-EASTERN HILLSBOROUGH NH-
WESTERN AND CENTRAL HILLSBOROUGH NH-NORTHWEST PROVIDENCE RI-
SOUTHEAST PROVIDENCE RI-WESTERN KENT RI-EASTERN KENT RI-BRISTOL RI-
WASHINGTON RI-NEWPORT RI-BLOCK ISLAND RI-
600 AM EST THU DEC 17 2009

THIS HAZARDOUS WEATHER OUTLOOK IS FOR NORTHERN
CONNECTICUT...CENTRAL MASSACHUSETTS...EASTERN
MASSACHUSETTS...NORTHEASTERN MASSACHUSETTS...SOUTHEASTERN
MASSACHUSETTS...WESTERN MASSACHUSETTS...SOUTHERN NEW
HAMPSHIRE...NORTHERN RHODE ISLAND AND SOUTHERN RHODE ISLAND.

.DAY ONE...THIS AFTERNOON AND TONIGHT

NO HAZARDOUS WEATHER IS EXPECTED AT THIS TIME.

.DAYS TWO THROUGH SEVEN...FRIDAY THROUGH WEDNESDAY

A COASTAL STORM MAY BRING ACCUMULATING SNOW TO MUCH OF SOUTHERN NEW
ENGLAND LATE SATURDAY INTO SUNDAY. THE MOST LIKELY SCENARIO WOULD
BRING MODERATE SNOWFALL OF 2 TO 6 INCHES TO NORTHEAST
CONNECTICUT...RHODE ISLAND AND EASTERN MASSACHUSETTS...FROM BOSTON TO
CAPE COD AND THE ISLANDS. STRONG NORTHEAST WINDS ARE POSSIBLE ALONG
THE COAST.

THERE IS UNCERTAINTY AS TO THE TRACK OF THIS STORM. IF IT PASSES
CLOSER TO NANTUCKET...IT WOULD BRING HIGHER ACCUMULATIONS AND AFFECT
MORE OF SOUTHERN NEW ENGLAND. IF IT PASSES FARTHER OUT TO SEA...LESSER
IMPACTS CAN BE EXPECTED ON LAND.

.SPOTTER INFORMATION STATEMENT...

SPOTTER ACTIVATION IS NOT EXPECTED AT THIS TIME.

$$

ANZ230>237-250-251-254>256-181100-
BOSTON HARBOR-CAPE COD BAY-NANTUCKET SOUND-VINEYARD SOUND-
BUZZARDS BAY-RHODE ISLAND SOUND-NARRAGANSETT BAY-BLOCK ISLAND SOUND-
COASTAL WATERS EAST OF IPSWICH BAY AND THE STELLWAGEN BANK NATIONAL
MARINE SANCTUARY-MASSACHUSETTS BAY AND IPSWICH BAY-COASTAL WATERS
FROM PROVINCETOWN MA TO CHATHAM MA TO NANTUCKET MA OUT 20 NM-COASTAL
WATERS EXTENDING OUT TO 25 NM SOUTH OF MARTHAS VINEYARD AND NANTUCKET-
COASTAL WATERS FROM MONTAUK NY TO MARTHAS VINEYARD EXTENDING OUT TO 20
NM SOUTH OF BLOCK ISLAND-
600 AM EST THU DEC 17 2009

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THIS HAZARDOUS WEATHER OUTLOOK IS FOR MASSACHUSETTS COASTAL WATERS AND
RHODE ISLAND COASTAL WATERS.

.DAY ONE...THIS AFTERNOON AND TONIGHT

NO HAZARDOUS WEATHER IS EXPECTED AT THIS TIME.

.DAYS TWO THROUGH SEVEN...FRIDAY THROUGH WEDNESDAY

HEAVY SNOW AND GALE FORCE NORTH TO NORTHEAST WINDS ARE POSSIBLE
SATURDAY NIGHT INTO SUNDAY AS A COASTAL STORM TRACKS SOUTHEAST OF
NANTUCKET.

.SPOTTER INFORMATION STATEMENT...

SPOTTER ACTIVATION IS NOT EXPECTED AT THIS TIME.

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(No Hazardous Weather)

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HAZARDOUS WEATHER OUTLOOK
NATIONAL WEATHER SERVICE TAUNTON MA
1136 PM EDT SAT JUN 2 2012

CTZ002>004-MAZ002>006-008>014-017-018-020-021-023-024-026-NHZ011-012-
015-RIZ001>008-040345-
HARTFORD CT-TOLLAND CT-WINDHAM CT-WESTERN FRANKLIN MA-
EASTERN FRANKLIN MA-NORTHERN WORCESTER MA-CENTRAL MIDDLESEX MA-
WESTERN ESSEX MA-WESTERN HAMPSHIRE MA-WESTERN HAMPDEN MA-
EASTERN HAMPSHIRE MA-EASTERN HAMPDEN MA-SOUTHERN WORCESTER MA-
WESTERN NORFOLK MA-SOUTHEAST MIDDLESEX MA-NORTHERN BRISTOL MA-
WESTERN PLYMOUTH MA-SOUTHERN BRISTOL MA-SOUTHERN PLYMOUTH MA-
DUKES MA-NANTUCKET MA-NORTHERN MIDDLESEX MA-CHESHIRE NH-
EASTERN HILLSBOROUGH NH-WESTERN AND CENTRAL HILLSBOROUGH NH-
NORTHWEST PROVIDENCE RI-SOUTHEAST PROVIDENCE RI-WESTERN KENT RI-
EASTERN KENT RI-BRISTOL RI-WASHINGTON RI-NEWPORT RI-BLOCK ISLAND RI-
1136 PM EDT SAT JUN 2 2012

THIS HAZARDOUS WEATHER OUTLOOK IS FOR NORTHERN
CONNECTICUT...CENTRAL MASSACHUSETTS...EASTERN
MASSACHUSETTS...NORTHEASTERN MASSACHUSETTS...SOUTHEASTERN
MASSACHUSETTS...WESTERN MASSACHUSETTS...SOUTHERN NEW
HAMPSHIRE...NORTHERN RHODE ISLAND AND SOUTHERN RHODE ISLAND.

.DAY ONE...TONIGHT.

NO HAZARDOUS WEATHER IS EXPECTED AT THIS TIME.

.DAYS TWO THROUGH SEVEN...SUNDAY THROUGH FRIDAY.
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NO HAZARDOUS WEATHER IS EXPECTED AT THIS TIME.

.SPOTTER INFORMATION STATEMENT...

SPOTTER ACTIVATION IS NOT REQUESTED AT THIS TIME.

$$
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5. Preliminary Local Storm Report.

(Winter storm with optional free-text remarks)

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NWUS55 KPIH 161810
LSRPIH

PRELIMINARY LOCAL STORM REPORT...SUMMARY
NATIONAL WEATHER SERVICE POCATELLO ID
1110 AM MST WED DEC 16 2009

..TIME...   ...EVENT...      ...CITY LOCATION...     ...LAT.LON...
..DATE...   ....MAG....      ..COUNTY LOCATION..ST.. ...SOURCE....
            ..REMARKS..

0800 AM     SNOW             KETCHUM                 43.69N 114.38W
12/16/2009  M3.5 INCH        BLAINE             ID   CO-OP OBSERVER

            TOTAL IN THE LAST 24 HOURS WITH 5 INCHES ON THE GROUND.

0800 AM     SNOW             HAILEY                  43.51N 114.30W
12/16/2009  M4.5 INCH        BLAINE             ID   CO-OP OBSERVER

            TOTAL IN THE LAST 24 HOURS WITH 6 INCHES ON THE GROUND.

0958 AM     HEAVY SNOW       5 WSW GANNETT           43.33N 114.27W
12/16/2009  M8.0 INCH        BLAINE             ID   TRAINED SPOTTER

            REPORT INCLUDES ENTIRE STORM ACCUMULATION.

0958 AM     HEAVY SNOW       3 WNW GALENA            43.87N 114.66W
12/16/2009  E10.0 INCH       BLAINE             ID   TRAINED SPOTTER

            REPORT INCLUDES ENTIRE STORM TOTAL ACCUMULATION.

1100 AM     HEAVY SNOW       17 WSW OAKLEY           42.15N 114.19W
12/16/2009  U10.0 INCH       CASSIA             ID   PARK/FOREST SRVC

            REPORTED AT BOSTETTER RANGER STATION AT 7500 FEET.
1100 AM     BLIZZARD         9 ENE BASIN             42.30N 113.62W
12/16/2009  E18.0 INCH       CASSIA             ID   LAW ENFORCEMENT

            NEAR ZERO VISIBILITY ALONG OAKLEY ELBA ROAD ALL
            MORNING WITH DRIFTS TO 4 FEET AND TEMPERATURE NEAR 15.
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```
1100 AM     HEAVY SNOW       16 WSW KETCHUM          43.60N 114.67W
12/16/2009  E7.5 INCH        CAMAS              ID   MESONET

            REPORTED AT DOLLARHIDE SUMMIT AT 8420 FEET.

1100 AM     HEAVY SNOW       3 W GALENA              43.87N 114.71W
12/16/2009  E7.5 INCH        BLAINE             ID   MESONET

            REPORTED AT GALENA SUMMIT AT 8780 FEET.

&&

OUR THANKS TO NWS SKYWARN STORM SPOTTERS AND COOPERATIVE OBSERVERS
FOR THEIR TIMELY REPORTS DURING THIS WINTER STORM.

$$
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(Tornado with injury)

```
NWUS53 KICT 270002
LSRICT

PRELIMINARY LOCAL STORM REPORT...CORRECTED
NATIONAL WEATHER SERVICE WICHITA KS
702 PM CDT SAT MAY 26 2012

..TIME...   ...EVENT...      ...CITY LOCATION...     ...LAT.LON...
..DATE...   ....MAG....      ..COUNTY LOCATION..ST.. ...SOURCE....
            ..REMARKS..

0945 PM     TORNADO          RUSSELL                 42.07N 95.91W
05/25/2012                   RUSSELL            KS   EMERGENCY MNGR

            *** 1 INJ *** TRAINED SPOTTER REPORTED DAMAGE FROM THE
            ROPE TORNADO WHICH DESTROYED ONE MODULAR HOME ON THE
            SOUTH SIDE OF RUSSELL. THE OCCUPANT HAD A FEW CUTS AND WAS
            LATER TRANSPORTED TO THE HOSPITAL FOR A BROKEN COLLAR
            BONE. HOUSES ON EITHER SIDE OF THE HOME RECEIVED MINOR
            DAMAGE.

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(Various events)

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NWUS53 KOAX 281401
LSROAX

PRELIMINARY LOCAL STORM REPORT...SUMMARY
NATIONAL WEATHER SERVICE OMAHA/VALLEY NE
901 AM CDT MON MAY 28 2012

..TIME...   ...EVENT...      ...CITY LOCATION...     ...LAT.LON...
..DATE...   ....MAG....      ..COUNTY LOCATION..ST.. ...SOURCE....
```

..REMARKS..

0457 PM	HAIL	5 S WINSIDE		42.11N 97.17W
05/27/2012	E1.75 INCH	WAYNE	NE	CO-OP OBSERVER

0500 PM	HAIL	1 S ELGIN		41.97N 98.08W
05/27/2012	E1.00 INCH	ANTELOPE	NE	TRAINED SPOTTER

A FUNNEL CLOUD WAS REPORTED WITH THIS STORM.

0505 PM	HAIL	ELGIN		41.98N 98.08W
05/27/2012	E1.00 INCH	ANTELOPE	NE	CO-OP OBSERVER

0506 PM	TORNADO	8 SE ELGIN		41.90N 97.97W
05/27/2012		BOONE	NE	LAW ENFORCEMENT

THE TORNADO WAS 6 MILES EAST AND 5 MILES SOUTH OF ELGIN

0512 PM	HAIL	ELGIN		41.98N 98.08W
05/27/2012	E2.50 INCH	ANTELOPE	NE	CO-OP OBSERVER

WINDOWS WERE BROKEN OUT OF CARS AND BUILDINGS. A LARGE TREE WAS DOWN ON ROAD 4 MILES SE OF ELGIN.

0525 PM	HAIL	OAKDALE		42.07N 97.97W
05/27/2012	E2.50 INCH	ANTELOPE	NE	EMERGENCY MNGR

MOST OF THE HAIL WAS GOLF BALL SIZE...BUT SOME WAS TENNIS BALL SIZE. SIDING WAS STRIPPED OFF HOMES. GLASS WAS BROKEN OUT OF CARS AND BUILDINGS.

0537 PM	HAIL	PIERCE		42.20N 97.53W
05/27/2012	M1.75 INCH	PIERCE	NE	CO-OP OBSERVER

0542 PM	FLOOD	1 E ELGIN		41.98N 98.06W
05/27/2012		ANTELOPE	NE	EMERGENCY MNGR

WATER WAS OVER A RURAL ROAD...WASHING OVER A BRIDGE.

0548 PM	HAIL	PRIMROSE		41.62N 98.24W
05/27/2012	E1.50 INCH	BOONE	NE	LAW ENFORCEMENT

THE TIME WAS ESTIMATED

0557 PM	HAIL	5 W RANDOLPH		42.38N 97.46W
05/27/2012	E2.75 INCH	PIERCE	NE	LAW ENFORCEMENT

0605 PM	TORNADO	7 NW NEWMAN GROVE		41.82N 97.87W
05/27/2012		BOONE	NE	PUBLIC

0617 PM	HAIL	6 S UTICA		40.81N 97.35W
05/27/2012	E1.75 INCH	SEWARD	NE	LAW ENFORCEMENT

THE HAIL OCCURRED NEAR MILE MARKER 366 SOUTH OF UTICA.

0630 PM	TORNADO	2 SW BATTLE CREEK		41.98N 97.63W
05/27/2012		MADISON	NE	FIRE DEPT/RESCUE
0635 PM	HAIL	1 S ALBION		41.67N 98.00W
05/27/2012	E1.00 INCH	BOONE	NE	TRAINED SPOTTER
0639 PM	HAIL	ALBION		41.69N 98.00W
05/27/2012	E0.75 INCH	BOONE	NE	LAW ENFORCEMENT
0652 PM	HAIL	DAVID CITY		41.25N 97.13W
05/27/2012	E1.75 INCH	BUTLER	NE	EMERGENCY MNGR

HAIL WAS UP TO GOLFBALL SIZE BUT MOSTLY PING PONG BALL SIZE AND SMALLER.

0725 PM	HAIL	2 ESE SEWARD		40.90N 97.06W
05/27/2012	E1.25 INCH	SEWARD	NE	TRAINED SPOTTER
0735 PM	TSTM WND GST	1 NE WAHOO		41.23N 96.61W
05/27/2012	M58.00 MPH	SAUNDERS	NE	AWOS
0820 PM	HAIL	3 S HUMPHREY		41.64N 97.49W
05/27/2012	E1.00 INCH	PLATTE	NE	TRAINED SPOTTER
0857 PM	FLASH FLOOD	4 NW WAYNE		42.28N 97.07W
05/27/2012		WAYNE	NE	TRAINED SPOTTER

WATER FROM FLOODED CORN FIELDS FLOWED OVER ROADS.

0922 PM	FLASH FLOOD	STANTON		41.95N 97.22W
05/27/2012		STANTON	NE	LAW ENFORCEMENT

STREET FLOODING OCCURRED IN STANTON.

0922 PM	FLASH FLOOD	PILGER		42.01N 97.05W
05/27/2012		STANTON	NE	LAW ENFORCEMENT

STREET FLOODING OCCURRED IN PILGER.

0946 PM	FLASH FLOOD	COLUMBUS		41.43N 97.36W
05/27/2012		PLATTE	NE	TRAINED SPOTTER

WATER WAS OVER ROAD NEAR CARRIAGE HOUSE ESTATES. WATER WAS 4 TO 18 INCHES DEEP.

1001 PM	FLASH FLOOD	1 N COLUMBUS		41.45N 97.36W
05/27/2012		PLATTE	NE	TRAINED SPOTTER

WATER WAS 2 TO 3 FEET DEEP IN PARTS OF NORTH COLUMBUS. THREE CARS STALLED.

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(Marine Event)

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NWUS51 KAKQ 301301
LSRAKQ

PRELIMINARY LOCAL STORM REPORT...SUMMARY
NATIONAL WEATHER SERVICE WAKEFIELD VA
901 AM EDT MON JUL 30 2012

..TIME...   ...EVENT...      ...CITY LOCATION...     ...LAT.LON...
..DATE...   ....MAG....      ..COUNTY LOCATION..ST.. ...SOURCE....
            ..REMARKS..

0800 AM     WATER SPOUT      2 ESE FLEETON           37.81N 76.25W
07/30/2012                   ANZ630             VA   911 CALL CENTER

WATERSPOUT WAS REPORTED BY WATERMAN.

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6. <u>Mesoscale Discussion</u>.

(Winter Weather Discussion)

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NWS STORM PREDICTION CENTER NORMAN OK
1128 PM CST TUE FEB 28 2012

AREAS AFFECTED...NRN LOWER MI

CONCERNING...WINTER MIXED PRECIPITATION

VALID 290528Z - 291130Z

SUMMARY...HEAVY SNOW WILL DEVELOP ACROSS NORTHERN PORTIONS LOWER
MICHIGAN OVER THE NEXT COUPLE OF HOURS AND PERSIST THROUGH EARLY
MORNING. SNOWFALL RATES WILL MAINLY RANGE FROM .5 TO 1 IN/HR. FURTHER
SOUTH ACROSS THE DISCUSSION AREA...MIXED PRECIPITATION TYPES OF
FREEZING RAIN AND SLEET ARE EXPECTED TO PREVAIL.

DISCUSSION...A SFC LOW CURRENTLY LOCATED OVER NORTHEAST NEBRASKA WILL
CONTINUE TO TRACK NORTHEAST THROUGH THE EARLY MORNING HOURS AS WILL
THE ASSOCIATED UPPER LEVEL TROUGH...NOW SITUATED FROM CENTRAL KANSAS
NORTHWESTWARD TOWARD THE WESTERN DAKOTAS. AS THIS SYSTEM LIFTS
NORTHEAST...A BAND OF FRONTOGENESIS AROUND THE 850-700 MB LAYER WILL
PIVOT EASTWARD FROM MINNESOTA AND WISCONSIN INTO NORTHERN MICHIGAN.
AIDED BY DEEP LAYER ASCENT THROUGH A DEEP SATURATED ENVIRONMENT AND
NEARLY 50 MB DEEP DENDRITIC ZONE...PERIODS OF HEAVY SNOW ARE
EXPECTED. POINT FORECAST SOUNDING INDICATE THAT THE VERTICAL THERMAL
PROFILE WILL REMAIN SUB-FREEZING THROUGHOUT AND THE PRECIPITATION
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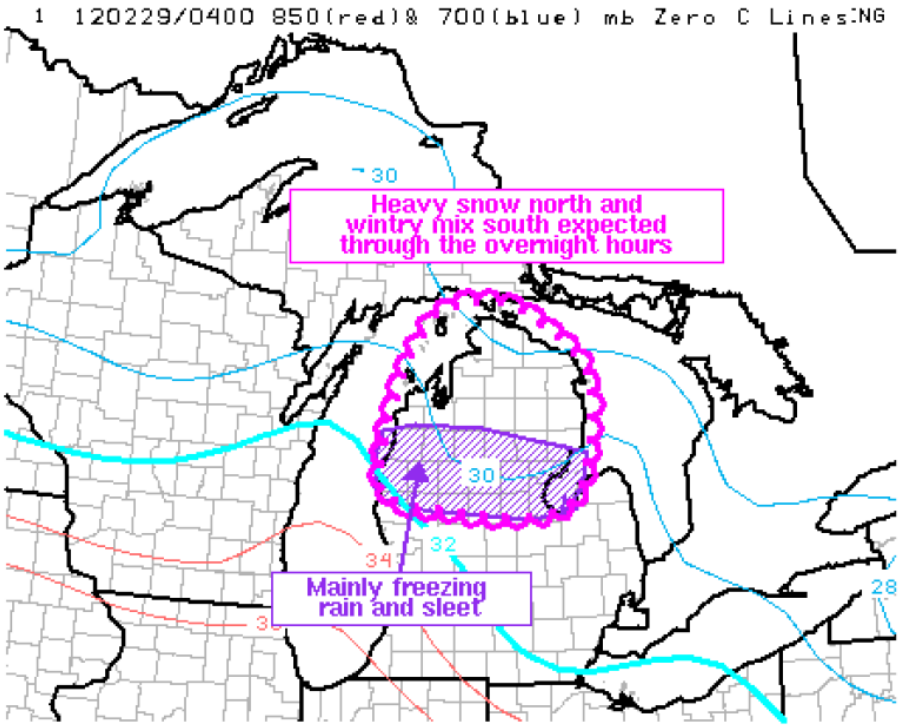
TYPE WILL REMAIN ALL SNOW THROUGH THE EARLY MORNING HOURS.

FURTHER SOUTH ACROSS THE DISCUSSION AREA...WARMER MIDLEVEL TEMPERATURES ON THE ORDER OF 1 TO 3 DEG C WILL LEAD TO MAINLY SLEET AND FREEZING RAIN AT THE SFC. SOME AREAS MAY EVEN TRANSITION TO RAIN BY 12Z ACROSS FAR SOUTHERN PARTS OF THE MCD AREA.

..LEITMAN.. 02/29/2012

ATTN...WFO...DTX...APX...GRR...
LAT...LON 44618635 45248609 45848561 45948504 45938455 45888430
45468355 45398345 45018315 44378321 43878335 43608366
43548436 43648580 43768644 44098645 44618635

(Winter Weather Graphic)



SPC MCD #0174

(Heavy Rainfall Discussion)

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MESOSCALE DISCUSSION 0112
NWS STORM PREDICTION CENTER NORMAN OK
0342 AM CST SAT FEB 04 2012

AREAS AFFECTED...PORTIONS S-CENTRAL/SE TX.

CONCERNING...HEAVY RAINFALL

VALID 040942Z - 041245Z

INITIALLY WIDELY SCATTERED AREAS OF 1-3 INCH/HOUR RAIN RATES MAY
BECOME MORE WIDESPREAD AS BAND OF TSTMS OVER S-CENTRAL THROUGH
E-CENTRAL TX BECOMES BETTER-DEFINED BY FRONTAL INTRUSION/ASCENT.
PEAK OF HEAVY RAIN THREAT...INCLUDING SUSTAINED RAINFALL WITH
SLOW-MOVING/MERGING/TRAINING CELLS...WILL BE THROUGH 12Z.

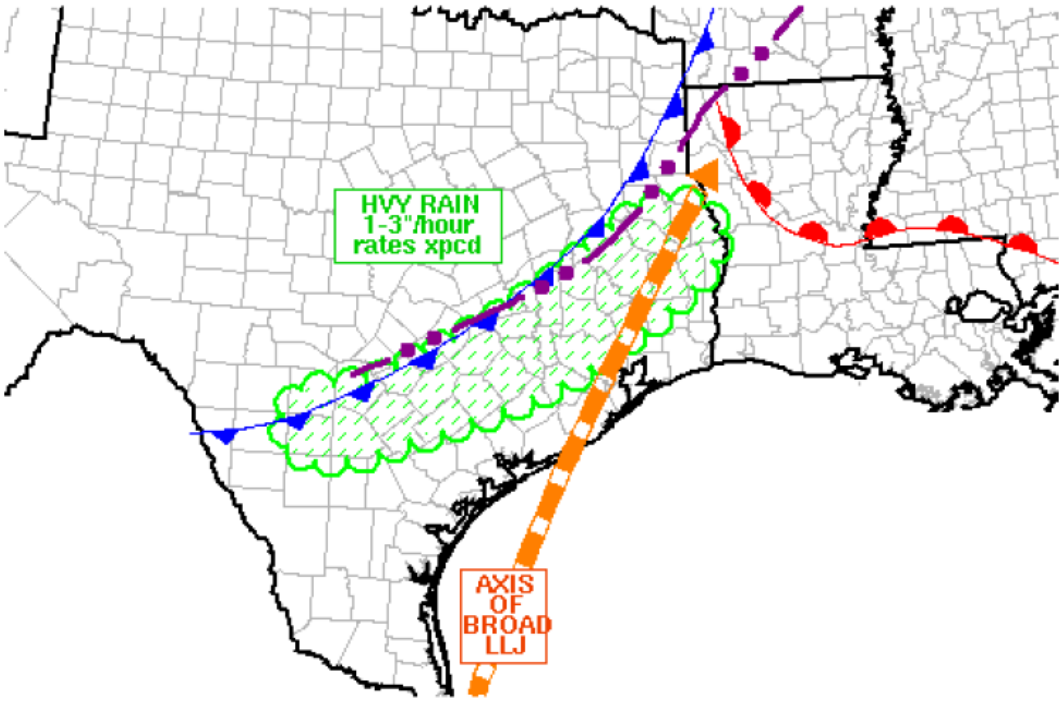
09Z SFC MESOANALYSIS SHOWED COLD FRONT...EXTENDING SWWD FROM WEAK
LOW OVER WRN AR TO JUST SE OF TXK-GGG-HDO LINE. FRONT HAS CAUGHT UP
TO PRE-EXISTING CONVECTIVE BAND FROM ABOUT I-45 SWWD...AND SHOULD DO
SO OVER REMAINDER E TX SEGMENT DURING NEXT 2 HOURS. COLD FRONT HAS
UNDERCUT TSTM LINE OVER SAT AREA...THOUGH CONVECTION IS PERSISTING
AND MAY EVEN BACKBUILD AS FRONTAL ASCENT ACTS ON FAVORABLE
MOISTURE/BUOYANCY IN ELEVATED LOW-LEVEL AIR MASS. ENHANCED LIFT
FROM FRONTAL FORCING ALL ALONG THIS BAND...AND STORM-RELATIVE INFLOW
AIDED BY BROAD/20-30 KT LLJ...WILL ACT TO CONCENTRATE/ENHANCE PRECIP
FIELDS. INFLOW SECTOR WILL REMAIN CHARACTERIZED BY UPPER 60S TO LOW
70S SFC DEW POINTS...LAYER RH AOA 90%...AND PW REACHING 1.5-1.75
INCH RANGE. PRECIP LOADING ALSO MAY CONTRIBUTE TO THREAT FOR
ISOLATED/LOCALIZED DAMAGING GUSTS...HOWEVER SVR HAZARD APPEARS TOO
DISORGANIZED FOR WW AND IS SECONDARY TO THREAT FROM HEAVY RAIN. AS
FRONT CONTINUES TO CROSS S AND SE TX...ESPECIALLY AFTER ABOUT
12Z...NET SEWD MOTION OF TSTM BAND SHOULD ACCELERATE...REDUCING
AMOUNT OF TIME THAT HEAVIEST RAIN RATES ARE LIKELY TO REMAIN OVER
MOST SPOTS.

..EDWARDS.. 02/04/2012


ATTN...WFO...LCH...SHV...HGX...CRP...EWX...

LAT...LON   29369925 29569821 30569620 31559472 31589382 30919374
            29709549 28909760 28559894 28829946 29369925
```

(Heavy Rainfall Graphic)



SPC MCD #0112

(Watch Update Discussion)

```
MESOSCALE DISCUSSION 1147
NWS STORM PREDICTION CENTER NORMAN OK
0738 PM CDT TUE JUN 12 2012

AREAS AFFECTED...ERN NM...WEST TX

CONCERNING...SEVERE THUNDERSTORM WATCH 383...

VALID 130038Z - 130145Z

THE SEVERE WEATHER THREAT FOR SEVERE THUNDERSTORM WATCH 383 CONTINUES.

SUMMARY...SEVERE THREAT PERSISTS ACROSS THE SRN HIGH PLAINS THIS
EVENING...ESPECIALLY ACROSS SERN NM INTO THE PERMIAN BASIN OF WEST TX.

DISCUSSION...SEVERAL STORM CLUSTERS...WITH ISOLATED SUPERCELLS...HAVE
EVOLVED ACROSS THE SRN HIGH PLAINS FROM SERN NM TO NEAR MAF. THIS
ACTIVITY INITIATED WITHIN UPSLOPE REGIONS WHERE STRONG HEATING
CONTRIBUTED TO AIRMASS DESTABILIZATION. 00Z SOUNDING FROM MAF APPEARED
TO SAMPLE ENVIRONMENT JUST WEST OF OUTFLOW PER STEEP LOW LEVEL LAPSE
RATES AND MID 50S DEW POINTS. THIS SOUNDING SUPPORTS SUPERCELL
STRUCTURES THAT WILL LIKELY PROPAGATE SLOWLY EWD... ESPECIALLY GIVEN
THAT A SEGMENT OF THE LLJ SHOULD INCREASE ACROSS THE PERMIAN BASIN
INTO SERN NM OVER THE NEXT NEW HOURS. WITH INCREASING SHEAR ALONG WWD
MOVING OUTFLOW BOUNDARY IT WOULD SEEM THESE STORMS WILL EXPERIENCE
```

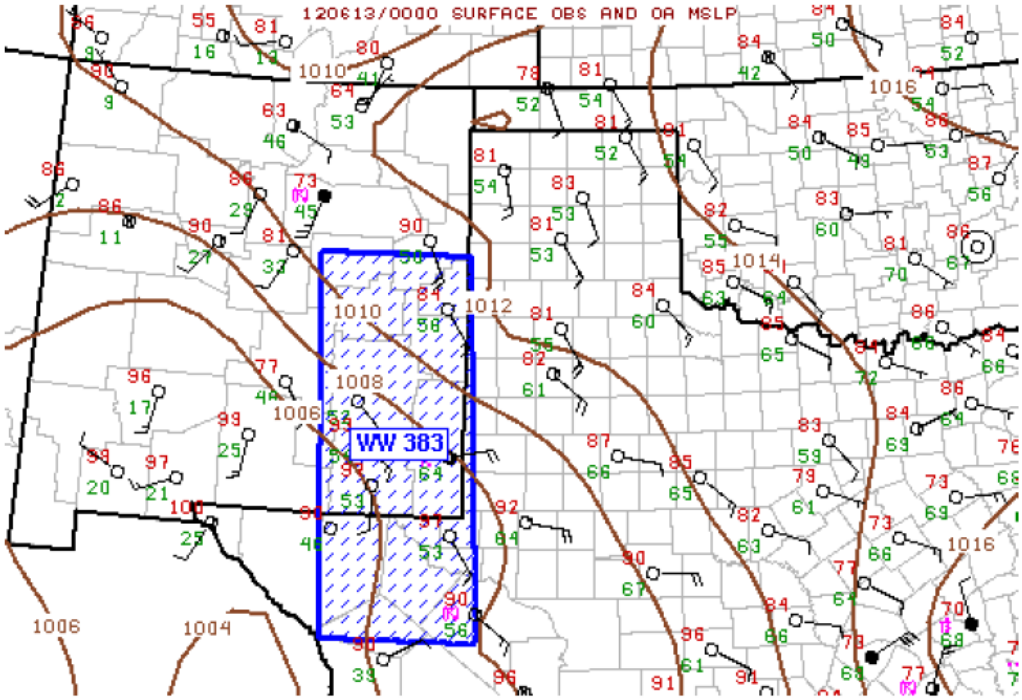
SOME LONGEVITY AND PERSIST WELL AFTER DARK. LARGE HAIL REMAINS THE PRIMARY SEVERE THREAT.

..DARROW.. 06/13/2012

ATTN...WFO...LUB...AMA...MAF...ABQ...EPZ...

LAT...LON 30570486 34990512 34980300 30580283 30570486

(Watch Update Graphic)



SPC MCD #1147

(Severe Potential Mesoscale Discussion)

MESOSCALE DISCUSSION 1289
NWS STORM PREDICTION CENTER NORMAN OK
0202 PM CDT TUE JUN 26 2012

AREAS AFFECTED...S-CNTRL/SERN TX

CONCERNING...SEVERE POTENTIAL...WATCH POSSIBLE

VALID 261902Z - 262100Z

PROBABILITY OF WATCH ISSUANCE...60 PERCENT

SUMMARY...AT LEAST ISOLATED HIGH-BASED TSTMS SHOULD FORM WITHIN A

HOT THERMODYNAMIC ENVIRONMENT BY LATE AFTERNOON. WITH MODERATE MID-LEVEL NELYS...UPDRAFTS COULD COALESCE INTO AN ORGANIZED CLUSTER WITH THREATS OF ISOLATED SEVERE WIND AND HAIL.

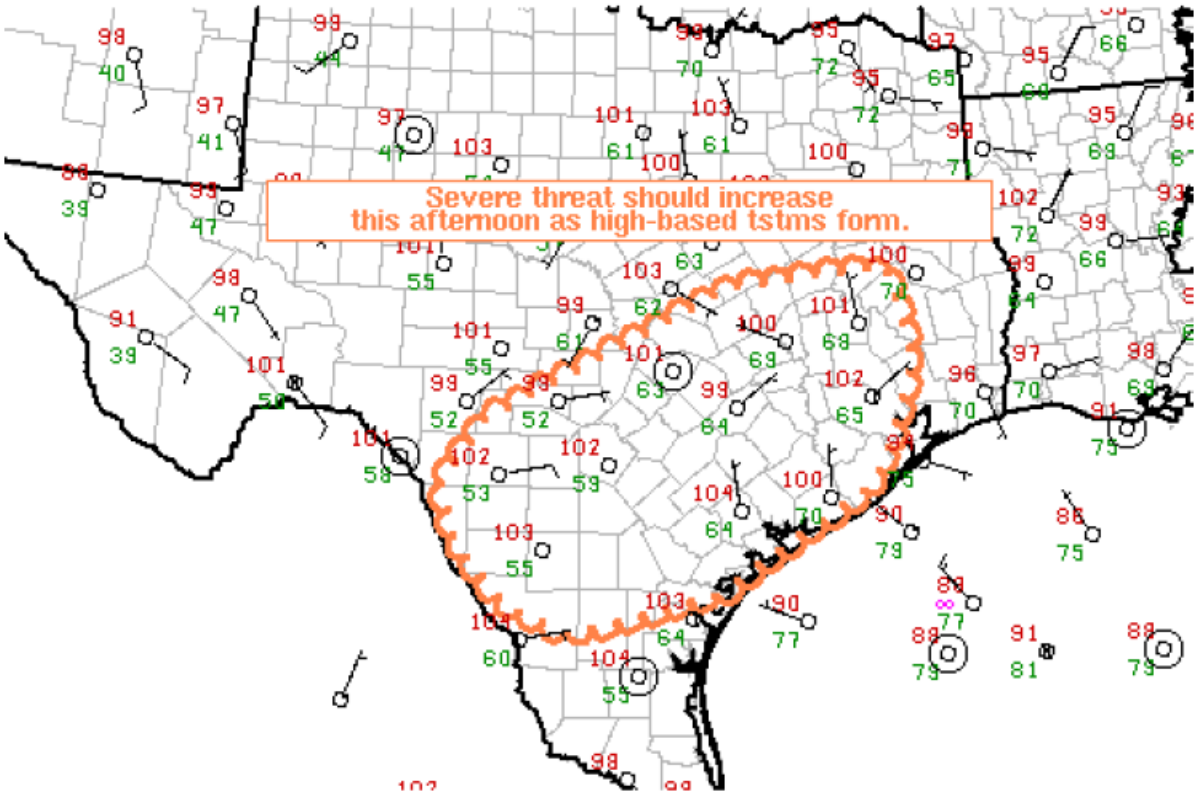
DISCUSSION...CU HAS INCREASED IN THE PAST HOUR IN VISIBLE SATELLITE IMAGERY ALONG THE COASTAL PLAIN AND HILL COUNTRY. PRESENCE OF SCATTERED CIRRUS SUGGESTS A SUBTLE UPPER-LEVEL IMPULSE ALONG THE WRN GULF COAST MAY BE ENHANCING ASCENT. WITH SURFACE TEMPERATURES NOW REACHING 100-105...MLCIN SHOULD BE WEAK WITH A DEEPLY-MIXED BOUNDARY LAYER PER ACARS DATA INVOF AUS. GUIDANCE IS FAIRLY CONSISTENT THAT TSTMS SHOULD FORM...ALTHOUGH THE LACK OF WELL-DEFINED SURFACE/UPPER-LEVEL FEATURES BREEDS UNCERTAINTY IN WHERE DEVELOPMENT WILL FOCUS. NEVERTHELESS...PRESENCE OF 30-35 KT MID-LEVEL NELYS SAMPLED IN THE LEDBETTER TX PROFILER WOULD BE SUFFICIENT FOR ORGANIZING UPDRAFTS. THE STEEP LAPSE RATE ENVIRONMENT SHOULD PROMOTE RISKS FOR SEVERE WIND AND SOME HAIL.

..GRAMS/WEISS.. 06/26/2012

ATTN...WFO...HGX...FWD...CRP...EWX...

LAT...LON 29779993 30519839 31169694 31319508 30339483 29149531
27999721 27599886 27869963 28460022 29090042 29779993

(Severe Potential Graphic)



SPC MCD #1289

APPENDIX B - Preliminary Local Storm Report Event Sources and Types

PRELIMINARY LOCAL STORM REPORT EVENT SOURCES

AIRPLANE PILOT
AMATEUR RADIO
ASOS
AWOS
BROADCAST MEDIA
BUOY
C-MAN STATION
COAST GUARD
CO-OP OBSERVER
COUNTY OFFICIAL
DEPT OF HIGHWAYS
EMERGENCY MNGR
FIRE DEPT/RESCUE
INSURANCE CO
LAW ENFORCEMENT
MESONET
NEWSPAPER
NWS EMPLOYEE
NWS STORM SURVEY
OFFICIAL NWS OBS
OTHER FEDERAL
PARK/FOREST SRVC
POST OFFICE
PUBLIC
SHIP
STORM CHASER
TRAINED SPOTTER
UNKNOWN
UTILITY COMPANY

PRELIMINARY LOCAL STORM REPORT WEATHER EVENT TYPES

AVALANCHE
BLIZZARD
*DENSE FOG
*DOWNBURST
DROUGHT
DUST STORM
EXCESSIVE HEAT
EXTREME COLD
EXTR WIND CHILL
FLASH FLOOD
FLOOD
FREEZE
*FREEZING RAIN
FUNNEL CLOUD
*HAIL
HEAVY RAIN
*HEAVY SNOW
HIGH ASTR TIDES
*HIGH SUST WINDS
HURRICANE
ICE STORM
LIGHTNING
*MARINE HAIL
*MARINE TSTM WIND
NON-TSTM WND DMG
*NON-TSTORM WND GST
RIP CURRENTS
SEICHE
*SLEET
*SNOW
STORM SURGE
TORNADO
TROPICAL STORM
TSTM WND DMG
*TSTM WND GST
WATER SPOUT
WILDFIRE

*Events which require an estimated (E), measured (M) or unknown origin (U) designation.

NATIONAL WEATHER SERVICE INSTRUCTION 10-315
FEBRUARY 11, 2020
Operations and Services
Marine and Coastal Weather Services, NWSPD 10-3
MARINE WEATHER MESSAGE

NOTICE: This publication is available at: http://www.nws.noaa.gov/directives/.

OPR: W/AFS26 (D. Wright) **Certified by:** W/AFS26 (D. Wright)
Type of Issuance: Routine

SUMMARY OF REVISIONS: This directive supersedes NWSI 10-315, *Marine Weather Message*, dated August 20, 2018. This directive includes the following changes:

1. Marine Hazard products issued under the Marine Weather Message (MWW) have changed their format and Small Craft Advisories have been consolidated into one product. See Service Change Notice 19-83 for more information: https://www.weather.gov/media/notification/scn18-83hazsimp_marineaab.pdf
2. Figures 1a, 1b, 2a, 2b, and 3 were all updated with the new format.
3. Removed the "Overview Section" for the Watch, Warning and Advisory sections.
4. Updated sections 1, 5.2.2.1, 5.3.4, 5.3.4.1, 6.2.2.1, 6.3.4, 6.3.4.1, 7.2.2.1, 7.3.3.1 with the new format.
5. Table 5. was also updated with the consolidation of Small Craft Advisory to a single product.
6. Updated Appendix A with examples with the new format.

Signed 01/28/2020
Andrew D. Stern Date
Director
Analyze, Forecast and Support Office

Marine Weather Message

Table of Contents **Page**

1 Introduction

This procedural directive describes the marine weather message products issued by National Weather Service (NWS) Weather Forecast Offices (WFOs) serving the U.S. coastal waters and Great Lakes (except in Alaska), guidelines associated with this product, and detailed content and format. Marine Hazard products issued under the Marine Weather Message (MWW) have changed their format and Small Craft Advisories have been consolidated into one product.

2 Marine Weather Event

A marine weather event is a meteorological phenomenon that impacts public safety, transportation, and/or commerce. A marine weather event (watch/warning/advisory) will apply to an entire marine zone.

2.1 Marine Weather Event Beginning Time

A marine weather event begins either when the issuance criteria are forecast to be initially met or exceeded, or when public safety, transportation and/or commerce are adversely affected as a direct result of the expected or occurring meteorological conditions before criteria are met.

2.2 Marine Weather Event Ending Time

A marine weather event ends when the issuance criteria are forecast to no longer be met, when meteorological conditions are expected to no longer pose a threat to public safety, transportation and/or commerce, or when such conditions are forecast to end.

2.3 Event Tracking Number (ETN) and Storm/Cyclone Identifier Number

The ETN used for tropical hazards in the Marine Weather Message (MWW) comes from the storm/cyclone identifier number assigned in the tropical cyclone public advisory (TCP) associated with the storm. Section 1.1.3.4 of NWS Instruction (NWSI) 10-607, *Tropical Cyclone Forecast Center Products*, points to the location of the storm/cyclone identifier number in the TCP Mass News Disseminator (MND) header. Information about the numbering process for ETNs and storm/cyclone identifier numbers for tropical cyclone watches and warnings is outlined in section 2.1.6.1 of NWSI 10-1703, *Valid Time Event Code (VTEC)*.

3 Multi-tiered Concept

The NWS marine weather warning program should use, when appropriate, the multi-tiered concept to increase public awareness and promote a proper response to the impending hazardous marine weather event. Generically, the multi-tiered concept is:

a. **Outlook:** An outlook is used to indicate that a hazardous marine weather event may develop. It is intended to provide information to those who need considerable lead time to prepare for the event. Marine outlooks are issued with a Hazardous Weather Outlook (HWO) and/or a Marine Weather Statement (MWS).

b. **Watch:** A watch is used when the risk of a hazardous marine weather event has increased, but its occurrence, location, and/or timing is still uncertain. It is intended to provide enough lead time so those who need to set their plans in motion can do so.

c. **Warning:** A warning is used when a hazardous marine weather event is occurring, is

imminent, or has a very high probability of occurrence. A warning is used for conditions posing a threat to life or property.

d. **Advisory:** An advisory is used for less serious conditions that cause significant inconvenience and, if caution is not exercised, could lead to situations that may threaten life and/or property.

To properly apply the multi-tiered concept, it is important to have agreement between the forecast staff and other affected WFOs to reach a forecast consensus. This will increase consistency and decrease geographical/time discontinuities, especially for the longer duration products like outlooks and watches. Proper coordination will enable the NWS to speak with one voice when alerting users to the potential for such an event.

4 Marine Weather Outlook (product category HWO or MWS)

4.1 Mission Connection

Marine Weather Outlooks provide our users and partners three- to five-day advance notice of a hazardous marine weather event which has the potential to threaten life or property. The primary goal of this product is to provide information to those who need considerable lead time to prepare for the event.

4.2 Issuance Guidelines

WFOs should use the HWO and/or the MWS to highlight hazardous marine weather conditions beyond 48 hours.

4.3 Technical Description

Marine Weather Outlooks should follow the format and content described in NWSI 10-517, *Multi-Purpose Weather Products Specification*, section 4.3 for the HWO, and NWSI 10-314, *Marine Weather Statements*, section 2.3 for the MWS.

5 Marine Weather Watches (product category MWW)

5.1 Mission Connection

Marine Weather Watches provide our users and partners 12 to 48 hours advance notice of hazardous marine weather events which have the potential to threaten life or property. The primary goal of this product is to provide enough lead time for mariners who may wish to consider altering their plans.

5.2 Issuance Guidelines

5.2.1 Creation Software

WFOs will use the Advanced Weather Interactive Processing System (AWIPS) Graphical Hazard Generator (GHG) as the primary software to create and issue Marine Weather Watches.

5.2.2 Issuance Criteria

WFOs should issue a Marine Weather Watch when conditions are favorable for a hazardous marine weather event to develop over part or all of the marine forecast area, but the occurrence is uncertain. WFOs should issue a Marine Weather Watch for the second, third, fourth, or occasionally fifth forecast periods when there is a significant chance of a hazardous marine weather event meeting or exceeding warning criteria.

5.2.2.1 Marine Weather Watch Products

All possible Marine Weather Watch products affecting marine areas and subsequent issuance criteria are listed in Table 1. Marine MWW Watch products in Table 1 will follow the WHAT, WHERE, WHEN, IMPACTS, ADDITIONAL DETAILS (optional), and PRECAUTIONARY/PREPAREDNESS format as described in section 5.3.4.2.

Table 1: Marine Weather Watch Product Table

Marine Watch Product Name	Issuance Criteria
Gale Watch	Conditions are favorable for a gale force wind event to meet the Gale Warning criteria of sustained winds or frequent gusts* of 34 knots (39 mph) to 47 knots (54 mph) in the next 12 to 60 hours.
Storm Watch	Conditions are favorable for a storm force wind event to meet Storm Warning criteria of sustained winds or frequent gusts* of 48 knots (55 mph) to 63 knots (73 mph) in the next 12 to 60 hours.
Hurricane Force Wind Watch	Conditions are favorable for a hurricane force wind event to meet or exceed Hurricane Force Wind Warning criteria of sustained winds or frequent gusts* of 64 knots (74 mph) or greater in the next 12 to 60 hours.
Heavy Freezing Spray Watch	Conditions are favorable for a heavy freezing spray event to meet Heavy Freezing Spray Warning criteria in the next 12 to 60 hours.
Hazardous Seas Watch	Conditions are favorable for a hazardous seas event to meet or exceed Hazardous Seas Warning criteria in the next 12 to 60 hours.
Tropical Storm Watch for the Atlantic, Eastern Pacific, Central Pacific, and western North Pacific Hurricane basins	Sustained winds of 34 to 63 knots (39 to 73 mph or 63 to 118 km/hour) are possible within the specified area within 48 hours in association with a potential or ongoing tropical cyclone, a subtropical cyclone, or a post-tropical cyclone.
Hurricane/Typhoon Watch for the Atlantic, Eastern Pacific, Central Pacific, and western North Pacific	Sustained winds of 64 knots (74 mph or 119 km/hour) or higher are possible within the specified area in association with a potential or ongoing tropical cyclone, a subtropical cyclone, or a post-tropical cyclone. Because hurricane

hurricane basins	preparedness activities become difficult once winds reach tropical storm force, the hurricane/typhoon watch is issued 48 hours in advance of the anticipated onset of tropical storm force winds.

*Frequent Gusts: For 2 or more hours during a 12 hour forecast period

5.2.3 Issuance Time

The Marine Weather Watch is an event-driven product. WFOs should issue the initial MWW when the watch issuance criteria are met. Subsequent updates are issued at least once every 12 hours until a warning or advisory is issued or the Marine Weather Watch is cancelled.

5.2.4 Valid Time

A Marine Weather Watch is valid for 12 to 60 hours after the issuance time. The valid time (event start and end time) is placed in the Product Valid Time Event Code (P-VTEC) line and described in the watch headline. For tropical storm, hurricane, and typhoon watches, the event starts upon issuance and is in effect until cancelled. Event start and end times are not included in the watch headline because of inherent uncertainties in forecasting tropical cyclones.

5.2.5 Product Expiration Time

The product expiration time is generally 12 hours after the issuance time and is placed at the end of the Universal Geographic Code (UGC) string. The product expiration time is the time when users can expect to receive an updated Marine Weather Watch.

5.2.6 Event Ending Time

The event ending time is when the marine hazardous event is expected to end. The event ending time is placed in the P-VTEC line and described in the watch headline (e.g., GALE WATCH IN EFFECT FROM LATE SUNDAY NIGHT TO MONDAY MORNING). See 5.2.4 for tropical exceptions.

5.3 Technical Description

Marine Weather Watches will follow the format and content described in this section.

5.3.1 Universal Geographic Code (UGC) Type

Marine Weather Watches will use the (Z) form of the UGC.

5.3.2 Mass News Disseminator (MND) Broadcast Instruction Line

Not applicable.

5.3.3 MND Product Type Line

The Marine Weather Watch MND line is “URGENT - MARINE WEATHER MESSAGE”.

5.3.4 Marine Weather Watch Content

The Marine Weather Watch will not contain an overview section, but will include segmented forecast information.

5.3.4.1 Segmented Forecast Information

Each segment of the Marine Weather Watch will include a watch headline. Each segment describes a specific hazardous marine weather event(s) for the same geographical area.

a. Watch Headline. The watch headline will include the following elements in the order shown:

1. Leading ellipsis (...)
2. Valid watch product name listed in Table 1
3. Event action phrase defined in Table 2
4. Appropriate event beginning day and time phrase from Tables 1-3 of NWSI 10-310. **
5. Appropriate event ending day and time phrase from Tables 1-3 of NWSI 10-310. **
6. Trailing ellipsis (...)

Generic Watch Headline Format:
(1) Used when watch product is in effect:
...<watch product name> <event action phrase> FROM <event beginning date and time phrase> THROUGH <event ending date and time phrase>...

(2) Used to cancel a watch prior to event beginning date and time:
...<watch product name> IS CANCELLED...

Event Action Phrase. The event action phrase in the watch headline corresponds with the VTEC action code. Only the following event action phrases in Table 2 will be used in marine weather watch headlines:

Table 2: Event Action Phrases for Marine and Tropical Weather Watch Headlines

VTEC Action Code	Description	Required Event Action Phrase	Include Time/Date Phrase?
NEW	Initial Issuance	IN EFFECT	Yes**
EXA	Expansion of watch area	IN EFFECT	Yes**
EXB*	Expansion of watch area and change to watch valid time	IN EFFECT	Yes
CON	Continuation or update of event	REMAINS IN EFFECT	Yes**
EXT*	Extend/shorten event start and/or ending date/time	NOW IN EFFECT	Yes
CAN	Product cancelled prior to event end time	IS CANCELLED	No
UPG	Upgrade watch - no headline		

* Not valid for tropical hazards.
** Except for tropical hazards.

b. Watch Headline Examples:

1) Initial Issuance:
...GALE WATCH IN EFFECT FROM SUNDAY MORNING THROUGH MONDAY MORNING...

2) Update:
...GALE WATCH REMAINS IN EFFECT FROM SUNDAY MORNING THROUGH MONDAY MORNING...

3) Extended event end time:
...GALE WATCH NOW IN EFFECT FROM SUNDAY MORNING THROUGH MONDAY AFTERNOON...

4) Expansion of watch area and shortened event start and end time:
...GALE WATCH IN EFFECT FROM SATURDAY EVENING THROUGH SUNDAY EVENING...

5) Watch cancelled prior to event end time/date:
...GALE WATCH IS CANCELLED...

6) Initial Issuance:
…TROPICAL STORM WATCH IN EFFECT…

7) Update:
…TROPICAL STORM WATCH REMAINS IN EFFECT…

8) Cancel:
…TROPICAL STORM WATCH IS CANCELLED…

c. Bullet Format. Bullet format MWWs ensure brevity and more efficient communication of critical information. Bullets should be one or two sentences and used to present critical information for a hazardous event.

Watches - The following bullets will be used; “WHAT”, “WHERE”, “WHEN”, and “IMPACTS” followed by “PRECAUTIONARY/PREPAREDNESS ACTIONS”. Further details which haven’t been previously mentioned may be provided in an “ADDITIONAL DETAILS” bullet following the “WHEN” bullet.

The “WHAT” bullet will begin with the expected phenomenon followed by the word “possible”. The wording of the phenomenon will remain editable for forecasters. For watch products, the word “possible” is mandatory and will always be followed by a period (.). The content of the "WHAT" bullet should be numerically-specific, when possible, particularly with respect to expected wind speeds, e.g. "Wind speeds 35 to 40 knots with gusts to 45 knots…". Wave hazards may also depend on steepness, but if a specific height range is expected, it should also be

included.

Each bulleted segment will be followed by a brief precautionary/preparedness action.

See Figure 1: Generic Format for MWW Watches except for Tropical Storm and Hurricane/Typhon Watches

d. Order of Segments: Marine Weather Watches are usually placed last in the order of segments. This order was designed to place the most important and/or time sensitive information near the beginning of the message. The order of segments is:

1. Cancellation
2. Warnings
3. Advisories
4. Watches

5. Multiple Headlines: More than one headline is allowed in a segment when two or more marine weather events are forecast to occur for the same UGC or geographical area.

Example:

Small Craft Advisory and Gale Watch in effect for the same geographical area:
...SMALL CRAFT ADVISORY IN EFFECT UNTIL 9 AM EST THIS MORNING...
...GALE WATCH IN EFFECT FROM THURSDAY AFTERNOON THROUGH FRIDAY AFTERNOON...

Figure 1: Generic MWW Format for Marine Watches

Product Format	Description of Entry
WHaaii cccc ddhhmm	*(WMO Header)*
MWWxxx	*(AWIPS ID)*
URGENT - MARINE WEATHER MESSAGE	*(Product Name* or *MND)*
National Weather Service city state	*(Issuing Office)*
time am/pm time_zone day mon dd yyyy	*(Issuance time/date)*
mmZxxx-xxx-xxx-ddhhmm-	(*UGC: Z and expiration time)*
/k.aaa.cccc.pp.s.####.yymmddThhnnZB-yymmddThhnnZE/	*(P-VTEC Line(s))*
zone-zone-zone-	*(Zone Names)*
time am/pm time_zone day mon dd yyyy	*(Issuance time/date)*
...WATCH HEADLINE...	
* WHAT	*(In bullet format)*
* WHERE	Bullets should be one or two sentences and used to present critical information.
* WHEN	

* IMPACTS	
* ADDITIONAL DETAILS	*(Optional)*
PRECAUTIONARY/PREPAREDNESS ACTIONS...	*(Start of CTA Marker)*
&&	*(End of CTA Marker)*
$$	*(UGC Delimiter)*
Name/Initials/Forecaster ID	*(Optional after last segment)*

5.4 Updates, Cancellations, and Corrections

WFOs will update Marine Weather Watches at least once every 12 hours, or when there is a significant change in timing, areal extent, or expected conditions. WFOs should issue the updated Marine Weather Watch before the product expiration time is reached.

Marine Weather Watches are either upgraded to warnings or advisories, or cancelled.

WFOs will issue a MWW to cancel a watch when the forecaster believes the threat of hazardous marine weather will not develop.

WFOs will issue correction statements for format or grammatical errors as required. To reduce format or grammatical errors, forecasters should proofread the product before transmission.

5.5 Upgrade Watch to Warning or Advisory

When a Marine Weather Watch is upgraded to a Marine Weather Warning or Marine Weather Advisory for the same geographical area, the MWW segment will contain one headline and two P-VTEC lines. The headline will list the new warning or advisory only. The first P-VTEC line will use the upgrade (UPG) action code to show the old marine weather watch is being upgraded. The second P-VTEC line will either use the NEW action code to start the new marine weather warning or advisory, or use the expand in area (EXA) or expand in area and change time (EXB) action code to extend an existing marine weather warning or advisory into this geographical area.

5.5.1 Upgrade Watch to Warning Segment Examples

ANZ050-050245-
/O.UPG.KCAR.SR.A.0001.060805T0800Z-060805T2300Z/ *(P-VTEC line 1)*
/O.NEW.KCAR.SR.W.0001.060805T0800Z-060805T2300Z/ *(P-VTEC line 2)*
Coastal Waters from Eastport ME to Stonington ME out 25 NM-
237 PM EDT Fri Aug 4 2006

...STORM WARNING IN EFFECT FROM 4 AM TO 7 PM EDT SATURDAY...
(Only one headline used - lists active Marine Weather Warning)

<descriptive text>

$$

Tropical Example:

GMZ430-432-450-202330-
/O.UPG.KLCH.TR.A.1003.000000T0000Z-000000T0000Z/
/O.EXA.KLCH.TR.W.1003.000000T0000Z-000000T0000Z/
Sabine Lake-Calcasieu Lake-
Coastal waters from Cameron LA to High Island TX out 20 NM-
1022 AM CDT Tue Jun 20 2017

...TROPICAL STORM WARNING IN EFFECT...
(Only one headline used - lists active Tropical Weather Warning)

<descriptive text>

$$

6 Marine Weather Warnings (product category MWW)

6.1 Mission Connection

Marine Weather Warnings provide our users and partners advance notice of hazardous marine weather events that threaten life or property.

6.2 Issuance Guidelines

6.2.1 Creation Software

WFOs will use AWIPS GHG as the primary software to create and issue Marine Weather Warnings.

6.2.2 Issuance Criteria.

WFOs will issue Marine Weather Warnings when hazardous marine weather is imminent, occurring or highly likely over part or all of the forecast area. WFOs should issue a Marine Weather Warning for the first, second, third, or occasionally fourth forecast periods, when there is high confidence of a hazardous marine weather event meeting or exceeding warning criteria.

6.2.2.1 Marine Weather Warning Products

The list of all possible warning products affecting marine areas and subsequent issuance criteria are listed in Table 3. MWW Marine products in Table 3 will follow the WHAT, WHERE, WHEN, IMPACTS, ADDITONAL DETAILS (optional), and PRECAUTIONARY/PREPARDNESS format as described in section 6.3.4.2.

Table 3: Marine Weather Warning Product Table

Warning Product Name	Issuance Criteria
Ashfall Warning	A warning issued for a volcano undergoing a major eruption where mariners will be affected to a significant extent such as greater than or equal to ¼" of ashfall accumulation, significant debris, lava or lahar flows.
Gale Warning	Sustained surface winds, or frequent gusts* in the range of 34 knots (39 mph) to 47 knots (54 mph) inclusive, either predicted or occurring, and not directly associated with a tropical cyclone.
Storm Warning	Sustained surface winds, or frequent gusts* in the range of 48 knots (55 mph) to 63 knots (73 mph) inclusive, either predicted or occurring, and not directly associated with a tropical cyclone.
Hurricane Force Wind Warning	Sustained winds, or frequent gusts* of 64 knots (74 mph) or greater, either predicted or occurring, and not directly associated with a tropical cyclone.
Heavy Freezing Spray Warning	An accumulation of freezing water droplets on a vessel at a rate of 2 cm per hour or greater caused by some appropriate combination of cold water, wind, cold air temperature, and vessel movement.
Hazardous Seas Warning	Wave heights and/or wave steepness values meeting or exceeding locally defined warning criteria.
Tropical Storm Warning for the Atlantic, Eastern Pacific, Central Pacific, and Western North Pacific Hurricane basins	Sustained winds of 34 to 63 knots (39 to 73 mph or 63 to 118 km/hour) are expected somewhere within the specified area within 36 hours (24 hours for the western North Pacific) in association with a potential or ongoing tropical cyclone, a subtropical cyclone, or a post-tropical cyclone.
Hurricane/Typhoon Warning for the Atlantic, Eastern Pacific, Central Pacific, and western North Pacific Hurricane basins	Sustained winds of 64 knots (74 mph or 119 km/hour) or higher are expected somewhere within the specified area in association with a potential or ongoing tropical cyclone, a subtropical cyclone, or a post-tropical cyclone. Because hurricane preparedness activities become difficult once winds reach tropical storm force, the hurricane/typhoon warning is issued 36 hours in advance of the anticipated onset of tropical storm force winds (24 hours for the western North Pacific). A hurricane or typhoon warning can remain in effect when dangerously high water or a combination of dangerously high water and waves continue, even though winds may be less than hurricane or typhoon force.

*Frequent Gusts: For 2 or more hours during a 12 hour forecast period

6.2.3 Issuance Time

A Marine Weather Warning is an event-driven product and is initially issued when a hazardous marine weather event is expected to meet or exceed local warning criteria. WFOs should issue updated warnings at least once every six to eight hours until the event ends or is canceled.

6.2.4 Valid Time.

A Marine Weather Warning is valid up to 36 hours after the issuance time. The valid time (event start and end times) is placed in the P-VTEC line(s) and is described in the warning headline. In extreme cases, the valid time may exceed 36 hours from the time of issuance. For tropical storm, hurricane, and typhoon warnings, the event starts upon issuance and is in effect until cancelled. Event start and end times are not included in the warning headline because of inherent uncertainties in forecasting tropical cyclones.

6.2.5 Product Expiration Time

The product expiration time is generally 6 to 8 hours after the issuance time and should coincide with the next expected update or when the event is forecast to end. The product expiration time is placed in the UGC line.

6.2.6 Event Ending Time

The event ending time is when the hazardous marine weather event is expected to end. The event ending time can match the product expiration time if the warning is in effect for eight hours or less. The event ending time is placed in the P-VTEC line and is described in the warning headline (e.g., STORM WARNING IN EFFECT UNTIL 9 AM EST TODAY). The event ending time should generally not exceed 36 hours from the time of issuance. See 6.2.4 for tropical exceptions.

6.3 Technical Description

Marine Weather Warnings will follow the format and content described in this section

6.3.1 UGC Type

Marine Weather Warnings will use the (Z) form of the UGC.

6.3.2 MND Broadcast Instruction Line

Not applicable.

6.3.3 MND Product Type Line

The Marine Weather Warning MND line is “URGENT - MARINE WEATHER MESSAGE”.

6.3.4 Marine Weather Warning Content

The Marine Weather Warning will not contain an overview section, but will include segmented forecast information.

6.3.4.1 Segmented Forecast Information

Each segment of a Marine Weather Warning will include a warning headline. Each segment describes a specific hazardous marine weather event(s) for the same geographical area.

a. Warning Headline. The warning headline should include the following elements in the order

shown:

1. Leading ellipsis (...)
2. Valid marine weather warning product name listed in Table 3
3. Event action phrase defined in Table 4
4. Appropriate event beginning day and time phrase from Tables 1-3 of NWSI 10-310. **
5. Appropriate event ending day and time phrase from Tables 1-3 of NWSI 10-310. **
6. Trailing ellipsis (...)

Generic Warning Headline Format:
(1) Warning product issuance time prior to event beginning time:
...<warning product name> <event action phrase> FROM <event beginning date and time phrase> TO <event ending date and time phrase>...

(2) Warning product issuance time equals event beginning time:
...<warning product name> <event action phrase> UNTIL <event ending date and time phrase>...

(3) Warning product cancellation or expiration statement:
...<warning product name> <event action phrase>...

Event Action Phrase. The event action phrase in the warning headline corresponds with the VTEC action code. Only the following event action phrases in Table 4 will be used in marine weather warning headlines:

Table 4: Event Action Phrases for Marine Weather Warning Headlines

VTEC Action Code	Description	Required Event Action Phrase	Include Time/Date?
NEW	Initial warning issuance	IN EFFECT	Yes**
EXA	Expansion of warning area	IN EFFECT	Yes**
EXB*	Expansion of warning area and change to warning valid time	IN EFFECT	Yes
CON	Continuation or update of warning	REMAINS IN EFFECT	Yes**
EXT*	Extend/shorten warning start and/or ending date/time	NOW IN EFFECT	Yes
CAN	Warning cancelled prior to event end time	IS CANCELLED	No

EXP*	Advisory approaching the expiration time. Used up to 30 minutes prior to advisory end time.	WILL EXPIRE AT	Yes
	Advisory has expired. Used up to 30 minutes after advisory expiration has passed.	HAS EXPIRED	No
UPG	Upgrade applies only from Tropical Storm Warning to Hurricane Warning. Only Hurricane Warning headline used.	IN EFFECT	No

* Not valid for tropical hazards.
** Except for tropical hazards.

a. Warning Headline Examples:

(1) Initial issuance or expansion in area:
...STORM WARNING IN EFFECT FROM 7 AM THIS MORNING TO 11 AM EST WEDNESDAY...

(2) Update:
...STORM WARNING REMAINS IN EFFECT UNTIL 11 AM EST WEDNESDAY...

(3) Change to event end time:
...STORM WARNING NOW IN EFFECT UNTIL 5 PM EST WEDNESDAY...

(4) Cancelled prior to event end time/date:
...STORM WARNING IS CANCELLED...

(5) Expiration statement up to 30 minutes prior to event end time:
...STORM WARNING WILL EXPIRE AT 5 PM EST THIS AFTERNOON...

(6) Expiration statement up to 30 minutes after event end time:
...STORM WARNING HAS EXPIRED...

(7) Initial issuance:
…TROPICAL STORM WARNING IN EFFECT…

(8) Update:
…TROPICAL STORM WARNING REMAINS IN EFFECT…

(9) Cancel:
…HURRICANE WARNING IS CANCELLED…

b. Bullet Format. Bullet format MWWs ensure brevity and more efficient communication of critical information. Bullets should be one or two sentences and used to present critical information for a hazardous event.

Warning - The following bullets will be used; “WHAT”, “WHERE”, “WHEN”, and “IMPACTS”

followed by “PRECAUTIONARY/PREPAREDNESS ACTIONS”. Further details which haven’t been previously mentioned may be provided in an “ADDITIONAL DETAILS” bullet following the “WHEN” bullet.

The “WHAT” bullet will begin with the expected phenomenon followed by the word “expected.” The wording of the phenomenon will remain editable for forecasters. For warnings the “expected” term may be amended during an event to other terms including “ongoing” or “continuing”, or the ongoing hazard may be described instead of using the word “expected”. The content of the "WHAT" bullet should be numerically-specific, when possible, particularly with respect to expected wind speeds, e.g. "Wind speeds 35 to 40 knots with gusts to 45 knots…". Wave hazards may also depend on steepness, but if a specific height range is expected, it should also be included.

Each bulleted segment will be followed by a brief precautionary/preparedness action.

See Figure 2: Generic MWW Format for Warnings

c. Order of Segments. Marine Weather Warnings are placed second in the order of segments. This order was designed to place the most important and/or time sensitive information near the beginning of the message. The order of segments is:

1. Cancellation
2. Warnings
3. Advisories
4. Watches

d. Multiple Headlines. More than one headline is allowed in a segment when two or more marine weather events are forecast to occur for the same UGC or geographical area.

Example:

Gale Warning and Storm Watch in effect for the same geographical area:

...GALE WARNING IN EFFECT UNTIL 9 AM EST THIS MORNING...
...STORM WATCH IN EFFECT FROM THURSDAY AFTERNOON THROUGH FRIDAY AFTERNOON...

Figure 2: Generic MWW Format for Warnings

Product Format	Description of Entry
WHaaii cccc ddhhmm	*(WMO Header)*
MWWxxx	*(AWIPS ID)*
URGENT - MARINE WEATHER MESSAGE	*(Product Name* or *MND)*
National Weather Service city state	*(Issuing Office)*
time am/pm time_zone day mon dd yyyy	*(Issuance time/date)*
mmZxxx-xxx-xxx-ddhhmm- /k.aaa.cccc.pp.s.####.yymmddThhnnZB-yymmddThhnnZE/	(*UGC: Z & expiration time) (P-VTEC Line(s))*

zone-zone-zone- time am/pm time_zone day mon dd yyyy ...WARNING HEADLINE... * WHAT * WHERE * WHEN * IMPACTS * ADDITIONAL DETAILS PRECAUTIONARY/PREPAREDNESS ACTIONS... && $$ Name/Initials/Forecaster ID	*(Zone Names)* *(Issuance time/date)* *(In bullet format)* Bullets should be one or two sentences and used to present critical information. *(Optional)* *(Start of CTA Marker)* *(End of CTA Marker)* *(UGC Delimiter)* *Optional after last segment)*

6.4 Updates, Cancellations, and Corrections

WFOs will update Marine Weather Warnings at least once every six to eight hours until the event ends or is canceled. WFOs should issue the updated MWW before the product expiration time is reached. Frequent updates help to keep our users and partners informed on the current and short term aspects of the hazardous weather event. Update warnings whenever there is a change in timing, areal extent, or expected conditions.

WFOs will issue a MWW to cancel a warning when the forecaster believes the weather threat has diminished before the valid time expires.

WFOs will issue correction statements for format or grammatical errors as required. To reduce format or grammatical errors, forecasters should proofread the product before transmission.

6.5 Downgrade Warning to Advisory

When a Marine Weather Warning is downgraded to a Marine Weather Advisory or a lower level warning (e.g., Storm Warning to Gale Warning) for the same geographical area, the MWW segment will contain two P-VTEC lines.

6.5.1 Downgrade Warning to Advisory Segment Example

LHZ421-422-441>443-032230-
/O.CAN.KDTX.GL.W.0003.000000T0000Z-040103T2300Z/ *(P-VTEC line 1)*
/O.NEW.KDTX.SC.Y.0050.040103T0900Z-040103T2300Z/ *(P-VTEC line 2)*
Outer Saginaw Bay-Inner Saginaw Bay- Port Austin to Harbor Beach MI-Harbor Beach to Port Sanilac MI-Port Sanilac to Port Huron MI-

400 AM EST Sat Jan 3 2004

...SMALL CRAFT ADVISORY IN EFFECT UNTIL 6 PM EST THIS EVENING...
...GALE WARNING IS CANCELLED...

(Two headlines used - lists new advisory, then cancelled warning)

<descriptive text>

$$

6.6 Upgrade Tropical Storm Warning to Hurricane Warning

When a Tropical Storm Warning is upgraded to a Hurricane Warning for the same geographical area, the MWW segment will contain two PVTEC lines but only one headline.

6.6.1 Upgrade Tropical Storm Warning to Hurricane Warning Segment Example

AMZ250-252-254-256-080400-
/O.UPG.KILM.TR.W.1013.000000T0000Z-000000T0000Z/
/O.NEW.KILM.HU.W.1013.161007T1559Z-000000T0000Z/
Coastal waters from Surf City to Cape Fear NC out 20 nm-
Coastal waters from Cape Fear NC to Little River Inlet SC out 20 nm-
Coastal waters from Little River Inlet to Murrells Inlet SC out 20 nm-
Coastal waters from Murrells Inlet to South Santee River SC out 20 nm-
1159 AM EDT Fri Oct 7 2016

...HURRICANE WARNING IN EFFECT...

(One headline used – for the new Hurricane Warning)

<descriptive text>

$$

7 Marine Weather Advisories (product category MWW)

7.1 Mission Connection

Marine Weather Advisories provide our users and partners advance notice of hazardous marine weather events which could lead to life-threatening situations if caution is not exercised.

7.2 Issuance Guidelines

7.2.1 Creation Software

WFOs will use AWIPS GHG as the primary software to create and issue Marine Weather Advisories.

7.2.2 Issuance Criteria

WFOs should issue Marine Weather Advisories for hazardous marine weather events that cause significant inconveniences and, if caution is not exercised, could lead to life-threatening situations over part or all of the forecast area.

WFOs should issue Marine Weather Advisories for the first, second, third, or occasionally fourth forecast periods, when there is high confidence of a hazardous marine weather event meeting or exceeding local advisory criteria.

7.2.2.1 Marine Weather Advisory Products

The list of all possible advisory products affecting marine areas and subsequent issuance criteria are listed in Table 5. Marine MWW products in Table 5 will follow the WHAT, WHERE, WHEN, IMPACTS, ADDITONAL DETAILS (optional), and PRECAUTIONARY/PREPARDNESS format as described in section 7.3.3.2.

Table 5: Marine Weather Advisory Product Table

Advisory Product Name	Issuance Criteria
Ashfall Advisory	An advisory issued for a volcano undergoing a minor eruption where there is the potential that mariners could be affected by a limited hazard extent such as less than ¼" of ashfall accumulation, pumice rafts or some floating debris.
Brisk Wind Advisory	Small Craft Advisory winds expected for ice covered waters.
Dense Fog Advisory	Widespread or localized fog reducing visibilities to 1 nautical mile or less (regionally or locally defined)**.
Dense Smoke Advisory	Widespread or localized smoke reducing visibilities to 1 nautical mile or less (regionally or locally defined)**.
Freezing Spray Advisory	Light to moderate accumulation of ice is expected on vessels.
Low Water Advisory	Water levels are significantly below average and may cause impact to safe marine navigation. The need for this product is locally determined**.
Small Craft Advisory	Sustained wind speeds or frequent gusts* of 20 to 33 knots (regionally defined**) and/or seas or waves 4 feet and greater and/or waves or seas are potentially hazardous due to wave period, steepness, or swell direction and/or waves in or near bars are hazardous to mariners due to the interaction of swell, tidal or river currents in relatively shallow water. (Regionally and locally defined**) Wind speeds are lower than Small Craft Advisory criteria, yet waves or seas are potentially hazardous due to wave period, steepness, or swell direction. The criteria are regionally defined**.

	Waves in or near bars are hazardous to mariners due to the interaction of swell, tidal or river currents in relatively shallow water. Threshold criteria are locally defined** and are specific to local geographic areas, and are based upon parameters such as wave steepness, wind speed and direction, and local bathymetry. When wave heights and/or wave steepness are lower than Small Craft Advisory criteria, yet wind speeds are potentially hazardous.

*Frequent Gusts: For 2 or more hours during a 12 hour forecast period
**Refer to NWSI 10-303 (Appendix A) for Regional and Local Criteria

7.2.3 Issuance Time

Advisories are event-driven products and are initially issued when a hazardous marine weather event is expected to meet or exceed local advisory criteria. WFOs should issue updated advisories at least once every six to eight hours until the event ends or is canceled.

7.2.4 Valid Time

A Marine Weather Advisory is valid up to 36 hours after the issuance time. The valid time (event start and end times) is placed in the P-VTEC line(s) and is described in the warning headline. In extreme cases, the valid time may exceed 36 hours from the time of issuance.

7.2.5 Product Expiration Time

The product expiration time should be 6 to 8 hours after the issuance time and should coincide with the next expected update or when the event is forecast to end. The product expiration time is placed in the UGC line.

7.2.6 Event Ending Time

The event ending time is when the hazardous marine weather event is expected to end. The event ending time can match the product expiration time if the advisory is in effect for eight hours or less. The event ending time is placed in the P-VTEC line and is described in the advisory headline (e.g., SMALL CRAFT ADVISORY IN EFFECT UNTIL 9 AM EST MONDAY). The event ending time should generally not exceed 36 hours from the time of issuance.

7.3 Technical Description

Marine Weather Advisories will follow the format and content described in this section.

7.3.1 UGC Type

Marine Weather Advisories will use the (Z) form of the UGC.

7.3.2 MND Broadcast Instruction Line

Not applicable.

7.3.3 MND Product Type Line

The Marine Weather Advisory MND line is “URGENT - MARINE WEATHER MESSAGE”.

7.3.4 Marine Weather Advisory Content

The Marine Weather Advisory will not contain an overview section, but will include segmented forecast information.

7.3.4.1 Segmented Forecast Information

Each segment of a Marine Weather Advisory will include the advisory headline. Each segment describes a specific hazardous marine weather event(s) for the same geographical area.

a. Advisory Headline. The advisory headline should include the following elements in the order shown:

1. Leading ellipsis (...)
2. Valid marine weather advisory product name listed in Table 5
3. Event action phrase defined in Table 6
4. Appropriate event beginning day and time phrase from Tables 1-3 of NWSI 10-310.
5. Appropriate event ending day and time phrase from Tables 1-3 of NWSI 10-310.
6. Trailing ellipsis (...)

Generic Advisory Headline Format:

(1) Advisory product issuance time prior to event beginning time:
...<advisory product name> <event action phrase> FROM <event beginning date and time phrase> TO <event ending date and time phrase>...

(2) Advisory product issuance time equals event beginning time:
...<advisory product name> <event action phrase> UNTIL <event ending date and time phrase>...

(3) Advisory product cancellation or expiration statement:
...<advisory product name> <event action phrase>...

Event Action Phrase. The event action phrase in the advisory headline corresponds with the VTEC action code. Only the following event action phrases in Table 6 will be used in marine weather advisory headlines:

Table 6: Event Action Phrases for Marine Weather Advisory Headlines

VTEC Action Code	Description	Required Event Action Phrase	Include Time/Date?
NEW	Initial advisory issuance	IN EFFECT	Yes
EXA	Expansion of advisory area	IN EFFECT	Yes
EXB	Expansion of advisory area and change to advisory valid time	IN EFFECT	Yes

CON	Continuation or update of advisory	REMAINS IN EFFECT	Yes
EXT	Extend/shorten advisory start and/or ending date/time	NOW IN EFFECT	Yes
CAN	Advisory cancelled prior to event end time	IS CANCELLED	No
EXP	Advisory approaching the expiration time. Used up to 30 minutes prior to advisory end time.	WILL EXPIRE AT	Yes
EXP	Advisory has expired. Used up to 30 minutes after advisory expiration has passed.	HAS EXPIRED	No
UPG	Upgrade to warning - no headline		

a. Advisory Headline Examples:

(1) Initial issuance or expansion in area:
...SMALL CRAFT ADVISORY IN EFFECT FROM 7 AM THIS MORNING TO 11 AM EST WEDNESDAY...

(2) Update:
...SMALL CRAFT ADVISORY REMAINS IN EFFECT UNTIL 11 AM EST WEDNESDAY...

(3) Extend event end time:
...SMALL CRAFT ADVISORY NOW IN EFFECT UNTIL 5 PM EST WEDNESDAY...

(4) Cancelled prior to event end time/date:
...SMALL CRAFT ADVISORY IS CANCELLED...

(5) Expiration statement up to 30 minutes prior to event end time:
...SMALL CRAFT ADVISORY WILL EXPIRE AT 5 PM EST THIS AFTERNOON...

(6) Expiration statement up to 30 minutes after event end time:
...SMALL CRAFT ADVISORY HAS EXPIRED...

b. Bullet Format. Bullet format MWWs ensure brevity and more efficient communication of critical information. Bullets should be one or two sentences and used to present critical information for a hazardous event.

The following bullets will be used; “WHAT”, “WHERE”, “WHEN”, and “IMPACTS” followed by “PRECAUTIONARY/PREPAREDNESS ACTIONS”. Further details which haven’t been previously mentioned may be provided in an “ADDITIONAL DETAILS” bullet following the

"WHEN" bullet.

For MWW advisory products the "WHAT" bullet will begin with the expected phenomenon followed by the word "expected." The wording of the phenomenon will remain editable for forecasters. For advisories the "expected" term may be amended during an event to other terms including "ongoing" or "continuing", or the ongoing hazard may be described instead of using the word "expected". The content of the "WHAT" bullet should be numerically-specific, when possible, particularly with respect to expected wind speeds, e.g. "Wind speeds 20 to 25 knots with gusts to 30 knots…". Wave hazards may also depend on steepness, but if a specific height range is expected, it should also be included.

Each bulleted segment will be followed by a brief precautionary/preparedness action.

See Figure 3: Generic Format for a Marine Weather Advisory

c. Order of Segments. Advisories are placed third in the order of segments. This order was designed to place the most important and/or time sensitive information near the beginning of the message. The order of segments is:

1. Cancellation
2. Warnings
3. Advisories
4. Watches

d. Multiple Headlines. More than one headline is allowed in a segment when two or more marine weather events are forecast to occur for the same UGC or geographical area.

Example: Dense Fog Advisory and Storm Watch in effect for the same geographical area:

...DENSE FOG ADVISORY IN EFFECT UNTIL 9 AM EST THIS MORNING...
...STORM WATCH IN EFFECT FROM THURSDAY AFTERNOON TO FRIDAY AFTERNOON...

Figure 3: Generic Format for a Marine Weather Advisory

Product Format	Description of Entry
WHaaii cccc ddhhmm	*(WMO Header)*
MWWxxx	*(AWIPS ID)*
URGENT - MARINE WEATHER MESSAGE	*(Product Name* or *MND)*
National Weather Service city state	*(Issuing Office)*
time am/pm time_zone day mon dd yyyy	*(Issuance time/date)*
mmZxxx-xxx-xxx-ddhhmm- /k.aaa.cccc.pp.s.####.yymmddThhnnZB-yymmddThhnnZE/	(*UGC: Z & expiration time) (P-VTEC Line(s))*
zone-zone-zone-	*(Zone Names)*
time am/pm time_zone day mon dd yyyy	*(Issuance time/date)*
...ADVISORY HEADLINE...	

* WHAT * WHERE * WHEN * IMPACTS	*(In bullet format)* Bullets should be one or two sentences and used to present critical information.
* ADDITIONAL DETAILS	*(Optional)*
PRECAUTIONARY/PREPAREDNESS ACTIONS...	*(Start of CTA Marker)*
&&	*(End of CTA Marker)*
$$	*(UGC Delimiter)*
Name/Initials/Forecaster ID	*(Optional after last segment)*

7.4 Updates, Amendments, and Corrections

WFOs will update advisories at least once every six to eight hours until the event ends or is canceled. WFOs should issue the updated MWW before the product expiration time is reached. The frequent updates help to keep our users and partners informed on the current and short term aspects of the marine weather event. Update advisories whenever there is a change in timing, areal extent, or expected conditions. WFOs will issue a MWW to cancel an advisory when the forecaster believes the weather threat has ended before the valid time expires.

WFOs will issue correction statements for format or grammatical errors as required. To reduce format or grammatical errors, forecasters should proofread the product before transmission.

7.5 Upgrade Advisory to Warning

When a Marine Weather Advisory is upgraded to a Marine Weather Warning for the same geographical area, the MWW segment will contain one headline and two P-VTEC lines. The headline will list the new warning only. The first P-VTEC line will use the UPG action code to show the old advisory is being upgraded. The second P-VTEC line will either use the NEW action code to start the new warning, or use the EXA or EXB action code to extend an existing advisory into this geographical area.

7.5.1 Upgrade Advisory to Warning Segment Example

PZZ350-356-370-376-092300-
/O.UPG.KMFR.SC.Y.0051.000000T0000Z-180310T0500Z/ *(P-VTEC line 1)*
/O.NEW.KMFR.GL.W.0003.180309T1600Z-180310T0500Z/ *(P-VTEC line 2)*
Coastal waters from Florence to Cape Blanco OR out 20 nm-
Coastal waters from Cape Blanco OR to Pt. St. George CA out 20 nm-
Waters from Florence to Cape Blanco OR from 20 to 60 nm-
Waters from Cape Blanco OR to Pt. St. George CA from 20 to 60 nm-
705 AM PST Fri Mar 9 2018

...GALE WARNING IN EFFECT UNTIL 9 PM PST THIS EVENING...

(One headline used - lists new warning only)

<descriptive text>

APPENDIX A — Marine Weather Message Product Examples

Below are 10 examples of Marine Weather Watch and Warning products.

1. Gale Watch

An example of a Gale Watch

WHUS73 KMQT 241509
MWWMQT

URGENT - MARINE WEATHER MESSAGE
National Weather Service Marquette MI
1109 AM EDT Thu May 24 2019

LSZ263-264-266-242315-
/O.CON.KMQT.GL.A.0015.190525T0600Z-190525T1600Z/
Lake Superior from Saxon Harbor WI to Upper Entrance to Portage Canal MI 5NM off shore to the US/Canadian border including Isle Royale National Park-
Lake Superior from Upper Entrance to Portage Canal to Manitou Island MI 5NM off shore to the US/Canadian border-
Lake Superior east of a line from Manitou Island to Marquette MI and west of a line from Grand Marais MI to the US/Canadian border beyond 5NM from shore-
1109 AM EDT Thu May 24 2019

...GALE WATCH REMAINS IN EFFECT FROM LATE TONIGHT THROUGH FRIDAY MORNING...

* WHAT…Gale force winds up to 30 kt possible with gusts up to 34 kt.

* WHERE…Lake Superior locations.

* WHEN…The maximum winds are expected Friday morning.

* IMPACTS…Strong winds can cause hazardous seas which could capsize or damage vessels and reduce visibility.

PRECAUTIONARY/PREPAREDNESS ACTIONS…

Mariners should consider altering plans to avoid possible hazardous conditions. Remain in port, seek safe harbor, alter course, and/or secure the vessel for severe wind and seas.

&&

$$

2. Gale Warning

Below is an example of a Gale Warning, first issuance.

WHUS76 KPQR 220940
MWWPQR

URGENT - MARINE WEATHER MESSAGE
National Weather Service Portland OR
240 AM PDT Tue May 22 2019

PZZ250-255-270-275-221745-
/O.UPG.KPQR.GL.A.0016.190522T1800Z-190523T0000Z/
/O.NEW.KPQR.GL.W.0034.190522T1700Z-190523T0500Z/
Coastal waters from Cape Shoalwater WA to Cascade Head OR out 10 nm-
Coastal waters from Cascade Head to Florence OR out 10 nm-
Waters from Cape Shoalwater WA to Cascade Head OR from 10 to 60 nm-
Waters from Cascade Head to Florence OR from 10 to 60 nm-
240 AM PDT Tue May 22 2019

...GALE WARNING IN EFFECT FROM 10 AM THIS MORNING TO 10 PM PDT THIS EVENING...

* WHAT…North winds 20 to 30 kt with gusts to 40 kt and seas 10 to 20 feet expected.

* WHERE…Cape Shoalwater WA to Florence, OR out to 60 nm.

* WHEN…From 10 AM this morning to 10 PM PDT this evening. The worst conditions are expected this afternoon and evening.

* IMPACTS…Strong winds will cause hazardous seas which could capsize or damage vessels and reduce visibility.

* ADITIONAL DETAILS…Longer period west swells later this afternoon and evening. Seas will subside below 10 feet later tonight or early Wednesday.

PRECAUTIONARY/PREPAREDNESS ACTIONS…

Mariners should alter plans to avoid these hazardous conditions. Remain in port, seek safe harbor, alter course, and/or secure the vessel for severe conditions.

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3. Hurricane Force Wind Warning

Below is an example of a continuation of a Hurricane Force Wind Warning.

WHUS76 KPQR 120949
MWWPQR

URGENT - MARINE WEATHER MESSAGE
National Weather Service Portland OR
249 AM PDT Mon Mar 12 2018

PZZ250-270-121800-
/O.CON.KPQR.HF.W.0002.000000T0000Z-190312T2000Z/
Coastal waters from Cape Shoalwater WA to Cascade Head OR out 10 NM-
Waters from Cape Shoalwater WA to Cascade Head OR from 10 to 60 NM-
249 AM PDT Mon Mar 12 2019

...A HURRICANE FORCE WIND WARNING REMAINS IN EFFECT UNTIL 1 PM PDT THIS AFTERNOON...

* WHAT…South winds 40 to 60 kt with gusts to 70kt with seas building to 32 to 35 feet.

* WHERE…Cape Shoalwater, WA to Cascade, OR out to 60 NM.

* WHEN…Until 1 PM this afternoon.

* IMPACTS…Strong winds will cause hazardous seas which could capsize or damage vessels and reduce visibility.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

Mariners should alter plans to avoid these hazardous conditions. Remain in port, seek safe harbor, alter course, and/or secure the vessel for severe conditions.

&&

$$

4. Ashfall Warning

Below is an example of an Ashfall Warning, first issuance.

WHUS76 KSEA 071340
MWWSEA

URGENT - MARINE WEATHER MESSAGE
National Weather Service Seattle WA

640 AM PDT Fri May 7 2021

PZZ135-072200-
/O.NEW.KSEW.MH.W.0012.210507T1340Z-210508T0400Z/
Puget Sound and Hood Canal-
640 AM PDT Fri May 7 2021

…ASHFALL WARNING IN EFFECT UNTIL 9 PM PDT TONIGHT…

* WHAT…Heavy ashfall from the volcanic eruption of Mount Rainer.

* WHEN…Until 9 PM this evening.

* WHERE…Puget Sound and Hood Canal.

* IMPACTS…Falling volcanic ash and debris can cause respiratory distress in people, and render engines or electronics inoperative.

* ADDITIONAL DETAILS…Additional information is available at vulcan.wr.usgs.gov.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

Vessels should consider remaining in port or avoiding the warning area. Those with respiratory sensitivities should take extra precautions to minimize exposure. Protect electronics and cover air intakes. Remove ash from surfaces with water if possible, to prevent excessive accumulation.

&&

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5. Small Craft Advisory

Below is an example of a Small Craft Advisory

WHUS71 KBOX 260828
MWWBOX

URGENT - MARINE WEATHER MESSAGE
National Weather Service Taunton MA
428 AM EDT Thu Jun 26 2019

ANZ254-261630-
/O.NEW.KBOX.SC.Y.0078.190627T0400Z-190627T2200Z/
Coastal waters from Provincetown MA to Chatham MA to Nantucket MA out 20 NM-
428 AM EDT Thu Jun 26 2019

...SMALL CRAFT ADVISORY IN EFFECT FROM MIDNIGHT TONIGHT TO 6 PM EDT

FRIDAY...

* WHAT…North winds 10 to 15 kt with gusts up to 20 kt expected with seas 3 to 5 feet.

* WHERE…Coastal waters from Provincetown, MA to Nantucket, MA out to 20 NM.

* WHEN…Midnight tonight until 6 PM Friday.

* IMPACTS…Wind and/or wave conditions will be hazardous to small craft.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

Inexperience mariners, especially those operating smaller vessels, should avoid navigating in hazardous conditions.

&&

$$

ANZ255-261630-
/O.NEW.KBOX.SC.Y.0078.190627T1000Z-190627T2200Z/
Coastal waters extending out to 25 NM south of Martha's Vineyard and Nantucket-
428 AM EDT Thu Jun 26 2019

...SMALL CRAFT ADVISORY IN EFFECT FROM 6 AM TO 6 PM EDT FRIDAY...

* WHAT…North winds 10 to 15 kt with gusts up to 20 kt expected with seas 3 to 5 feet.

* WHERE…Coastal waters extending out 25 NM south of Martha's Vineyard, MA and Nantucket, MA.

* WHEN…Friday 6 AM to 6 PM.

* IMPACTS…Wind and/or wave conditions will be hazardous to small craft.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

Inexperience mariners, especially those operating smaller vessels, should avoid navigating in hazardous conditions.

&&

$$

6. Small Craft Advisory with Rough Bar Conditions

Below is an example of a Small Craft Advisory with Rough Bar conditions.

PZZ210-261500-
/O.CON.KPQR.SC.Y.0107.000000T0000Z-190626T1500Z/
Columbia River Bar-
300 AM PDT Thu Jun 26 2019

...SMALL CRAFT ADVISORY REMAINS IN EFFECT UNTIL 8 AM PDT THIS MORNING...

* WHAT…Seas will temporarily build to 7 feet during a strong ebb around 445 AM.

* WHERE…Columbia River Bar.

* WHEN…Until 8 AM this morning.

* IMPACTS…Conditions will be hazardous to small craft especially when navigating in or near harbor entrances.

* ADDITIONAL DETAILS…Seas in the main channel will be generally 2 to 4 feet through Thursday. Seas will temporarily build to 5 feet with a weaker ebb around 515 PM.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

Small craft should use extreme caution when navigating in or near harbor entrances.

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7. Cancelled Small Craft Advisory

Below is an example of a cancelled Small Craft Advisory.

WHUS76 KSGX 181457
MWWSGX

URGENT - MARINE WEATHER MESSAGE
National Weather Service San Diego CA
757 AM PDT Fri May 18 2019

PZZ775-181600-
/O.CAN.KSGX.SC.Y.0012.000000T0000Z-190519T0300Z/
Waters from San Mateo Point to the Mexican Border extending 30 to 60 NM out including San Clemente Island-
757 AM PDT Fri May 18 2019

...SMALL CRAFT ADVISORY IS CANCELLED...

Winds are expected to remain below 25 knots over the outer waters today.

&&

$$

8. Tropical Storm Watch

Below is an example of a new Tropical Storm Watch.

AMZ354-212330-
/O.NEW.KCHS.TR.A.1004.190921T1516Z-000000T0000Z/
Waters from Savannah GA to Altamaha Sound GA out 20 NM, including
Grays Reef National Marine Sanctuary-
1116 AM EDT Thu Sep 21 2019

...TROPICAL STORM WATCH IN EFFECT...

* WHAT...Northeast winds 35 to 45 kt with gusts up to 60 kt and seas 12 to 16 feet.

* WHERE...Savannah to Altamaha Sound out 20 NM.

* WHEN...Tropical Storm force winds possible Friday night through Saturday afternoon.

* IMPACTS...Very strong winds will cause hazardous seas which could capsize or damage vessels and reduce visibility.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

Mariners should consider altering plans to avoid possible hazardous conditions. Remain in port, seek safe harbor, alter course, and/or secure the vessel for severe wind and seas.

&&

$$

9. Tropical Storm Warning

Below is an example of a new Tropical Storm Warning.

AMZ352-374-212330-
/O.NEW.KCHS.TR.W.1004.190921T1516Z-000000T0000Z/
Waters from Edisto Beach SC to Savannah GA out 20 NM-
Waters from Savannah GA to Altamaha Sound GA from 20 to 60 NM-
1116 AM EDT Thu Sep 21 2019

...TROPICAL STORM WARNING IN EFFECT...

* WHAT...Northeast winds 35 to 45 kt with gusts up to 55 kt and seas 9 to 12 feet.

* WHERE...Edisto Beach to Savannah out 20 NM and Savannah to Altamaha Sound from 20 to 60 NM.

* WHEN...Tropical Storm force winds possible until Friday afternoon.

* IMPACTS...Very strong winds will cause hazardous seas which could capsize or damage vessels and reduce visibility.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

Mariners should alter plans to avoid these hazardous conditions. Remain in port, seek safe harbor, alter course, and/or secure the vessel for severe conditions.

&&

$$

10. Hurricane Warning

Below is an example of a new Hurricane Warning.

AMZ350-212330-
/O.NEW.KCHS.HU.W.1004.190921T1516Z-000000T0000Z/
Waters from South Santee River to Edisto Beach SC out 20 NM-
1116 AM EDT Thu Sep 21 2019

...HURRICANE WARNING IN EFFECT...

* WHAT...Northeast winds 65 to 85 kt with gusts up to 105 kt and seas 14 to 20 feet.

* WHERE...South Santee River to Edisto Beach out 20 NM.

* WHEN...Tropical Storm force winds possible until Friday afternoon. Hurricane force winds possible from early this evening until Friday morning.

* IMPACTS...Extremely strong winds will cause hazardous seas which will likely capsize or damage vessels and severely reduce visibility.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

Mariners should remain in port, alter course, and/or secure the vessel for extreme conditions.

&&

$$

11. Tropical Storm Watch Upgraded to Tropical Storm Warning

Below is an example of a Tropical Storm Watch upgraded to a warning.

AMZ354-212330-
/O.UPG.KCHS.TR.A.1004.000000T0000Z-000000T0000Z/
/O.EXA.KCHS.TR.W.1004.000000T0000Z-000000T0000Z/
Waters from Savannah GA to Altamaha Sound GA out 20 NM, including
Grays Reef National Marine Sanctuary-
1120 AM EDT Thu Sep 21 2019

...TROPICAL STORM WARNING IN EFFECT...

* WHAT...Northeast winds 35 to 45 kt with gusts up to 60 kt and seas 4 to 6 feet.

* WHERE...Savannah to Altamaha Sound out 20 NM.

* WHEN...Tropical Storm force winds possible until Friday morning.

* IMPACTS...Very strong winds will cause hazardous seas which could capsize or damage vessels and reduce visibility.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

Mariners should alter plans to avoid these hazardous conditions. Remain in port, seek safe harbor, alter course, and/or secure the vessel for severe conditions.

&&

$$

12. Tropical Storm Warning Upgraded to a Hurricane Warning

Below is an example of a Tropical Storm Warning upgraded to a Hurricane Warning.

AMZ352-212330-
/O.UPG.KCHS.TR.W.1004.000000T0000Z-000000T0000Z/
/O.EXA.KCHS.HU.W.1004.000000T0000Z-000000T0000Z/
Waters from Edisto Beach SC to Savannah GA out 20 NM-
1120 AM EDT Thu Sep 21 2019

...HURRICANE WARNING IN EFFECT...

* WHAT...Northeast winds 55 to 75 kt with gusts up to 105 kt and seas 4 to 7 feet.

* WHERE...Edisto Beach to Savannah out 20 NM.

* WHEN...Tropical Storm force winds possible until Friday afternoon. Hurricane force winds possible from early this evening until Friday morning.

* IMPACTS...Extremely strong winds will cause hazardous seas which will likely capsize or damage vessels and severely reduce visibility.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

Mariners should remain in port, alter course, and/or secure the vessel for extreme conditions.

&&

NATIONAL WEATHER SERVICE INSTRUCTION 10-314
MAY 29th, 2019

Operations and Services
Marine, Tropical, and Tsunami Services Branch NWSPD 10-3

MARINE WEATHER STATEMENTS

NOTICE: This publication is available at: http://www.nws.noaa.gov/directives/.

OPR: W/AFS26 (J. Kuhn) **Certified by:** W/AFS26 (A. Allen)
Type of Issuance: Routine

SUMMARY OF REVISIONS: This directive supersedes NWSI 10-314, Marine Weather Statements, dated February 20, 2017. This Instruction includes the following changes:

1. Changed OPR
2. Figure 1 and 2 updated for mixed case
3. Updated examples in Appendix A for mixed case

Signed 5/15/19

Andrew D. Stern Date
Director,
Analyze, Forecast, and Support Office

MARINE WEATHER STATEMENTS
Table of Contents

1 Introduction. This procedural instruction provides detailed information on the Marine Weather Statement (MWS) product issued by National Weather Service (NWS) Weather Forecast Offices (WFOs) and Weather Service Office (WSO) Pago Pago to cancel a Special Marine Warning (SMW) or provide the public with follow-up information to SMWs (reference NWS Instruction (NWSI) 10-313, *Special Marine Warnings*). This instruction also provides information on general purpose usage of the MWS (see section 2.2.2).

2 Marine Weather Statement (product category MWS)

2.1 Mission Connection. MWSs are used in two distinct ways: 1) To provide the public with detailed marine weather information describing non-severe, but potentially hazardous, conditions and information for a variety of conditions not covered by warnings or routine forecasts. 2) MWSs also provide follow-up information to a SMW including cancellation of all or part of the SMW.

2.2 Issuance Guidelines

2.2.1 Creation Software. WFOs use the Advanced Weather Interactive Processing System (AWIPS) WarnGen application to issue MWSs to cancel, update, or expire SMWs, or for non-severe convective events. In addition, WFOs may use the AWIPS Interactive Forecast Preparation System (IFPS) Graphical Hazards Generation (GHG) application to create MWSs for long term events and short term non-severe events.

2.2.2 Issuance Criteria. WFOs and WSO Pago Pago will issue MWSs to provide notification when a SMW will expire or has expired, to cancel all or portions of an SMW, or to provide updates to the SMW. The MWS will use the Valid Time Event Code (VTEC) phenomena and significance code, MA.W when issued to follow-up the SMW.

Each NWS office having coastal waters or Great Lakes forecast responsibility (reference NWSI 10-302, *Marine and Coastal Services Area of Responsibility*) will issue MWSs as necessary. MWSs are not issued for the offshore or high seas areas.

Non-Severe, Short-term Wind Events: Forecasters may issue MWSs to describe short duration, non-severe, but potentially hazardous conditions, in which sustained winds or gusts to 33 knots (KT) are expected for 2 hours or less. WFOs use WarnGen to generate MWS for sustained winds or gusts to 33 KT.

Non-Severe, Long-term Events: Forecasters may issue MWSs to provide details on significant conditions that affect marine operations prevailing for periods exceeding 2 hours. For example: dense fog, hazardous materials spills; volcanic impacts, trends for increasing and / or decreasing wind and wave/seas conditions; or to advise for the potential development of warning conditions. Headlines for events may be manually inserted to describe the conditions associated with non-severe long-term events. For hazardous weather events see NWSI 10-315, *Marine Weather Message*.

Forecasters may issue MWSs during coastal or lakeshore flood events to provide information specifically relating to mariners. WFOs may also issue MWSs to alert mariners of significant weather features expected in the 3 to 5 day forecast period.

Funnel Clouds. Offices should issue MWSs to report funnel clouds either forecast by the office or reported to the office by external sources. If supporting data is sufficient and confidence is high, offices may wish to consider issuance of a Special Marine Warning (reference NWSI 10-313).

Tsunami Events. WFOs may issue MWSs during tsunami events to provide information specifically relating to mariners, e.g., strong currents in bays and harbors.

Marine Debris. WFOs may issue MWSs for marine debris including from tsunamis.

Ice Changes. WFOs should issue MWSs to inform mariners of weather events likely to impact the formation or destruction of sea ice or Great Lake ice.

Freezing Spray Advisories. Forecasters may issue a MWS to direct users to the MWW for a Freezing Spray Advisory. This option is intended for areas where freezing spray is a rare event.

Ashfall Advisories. In Alaska Region, and Pacific Region offices where marine VTEC is not used, issue the MWS for Ashfall Advisories or to describe heightened states of volcanic unrest.

2.2.3 Issuance Time. The MWS is a non-scheduled, event-driven product issued by WFOs and WSO Pago Pago.

2.2.4 Valid Time. The MWS is valid from the time of issuance until the expiration time.

2.2.5 Universal Geographic Code (UGC). The MWS will contain marine-based zone UGC codes.

2.2.6 Product Expiration Time. The product expiration time is not more than 15 minutes after the warning or expiration time of SMWs; and not more than 12 hours after the time of issuance for other events described in the issuance criteria section.

2.3 Technical Description. The MWS will follow the format and content described in this section.

2.3.1 Mass News Disseminator (MND) Broadcast Line. None.

2.3.2 MND Header. The MWS MND Header is "Marine Weather Statement".

2.3.3 Content. Offices should use headlines to highlight important information related to the issuance of MWSs. MWSs will follow the format described in section 2.3.4.

2.3.4 Format. The format of the MWS (VTEC version) can be seen in Figure 1. The format of the MWS (non-VTEC version) can be seen in Figure 2. The MWS (both versions) is a segmented product. Please reference NWSI 10-1702, *Universal Geographic Code (UGC),* for additional information on product segmentation. For detailed VTEC information, please reference NWSI 10-1703, *Valid Time Event Code (VTEC).* For more detailed product format information consult NWSI 10-1701, *Text Product Formats and Codes*.

This product is available in industry standard encoding and languages, and may include, but not be limited to, American Standard Code for Information Interchange, Extensible Markup Language, Wireless Markup Language and HyperText Markup Language.

(WMO HEADER)(UTC ISSUANCE DATE TIME)
(AWIPS ID)

Marine Weather Statement
National Weather Service (City)(State)
Time AM/PM TIME_ZONE Day_of_week Mon DD YYYY

(AREAL UGC CODE[S])-(EXPIRATION TIME)-
(VTEC STRING)
Time AM/PM TIME_ZONE Day_of_week Mon DD YYYY

...HEADLINE...

Narrative text.

&& (optional)

LAT…LON
TIME…MOT…LOC

(Marine Weather Statements may include special tags after the && to provide better definition, similar to other short term statements).
$$
Forecaster Name (Optional)

Figure 1. **MWS Format VTEC Version**

(WMO HEADER)(UTC ISSUANCE DATE TIME)
(AWIPS ID

Marine Weather Statement
National Weather Service (City)(STATE)
Time AM/PM TIME_ZONE Day_of_week Mon DD YYYY
)

(AREAL UGC CODE[S])-(EXPIRATION TIME)-
(Marine Zone Names [If MWS is created by GHG))
Time AM/PM TIME_ZONE Day_of_week Mon DD YYYY
...HEADLINE (If Needed)...

Narrative text.

LAT…LON
TIME…MOT…LOC

[If MWS is created by WarnGen, list of latitude / longitude points outlining the forecaster-drawn polygon in WarnGen and time, movement, and location of event being tracked]

$$
Forecaster name (Optional)

Figure 2. **MWS Format non-VTEC Version**

2.4 Updates, Amendments and Corrections. The MWS should be updated or corrected as needed.

APPENDIX A – Examples of the Marine Weather Statement

1 The MWS issued for Non-Severe Short Term Wind Events

FZUS71 KAKQ 251953
MWSAKQ

Marine Weather Statement
National Weather Service Wakefield VA
353 PM EDT Wed Apr 25 2018

ANZ632-634-636>638-654-252045-
353 PM EDT Wed Apr 25 2018

...STRONG THUNDERSTORMS APPROACHING THE WATERS...

The areas affected include...
Chesapeake Bay from New Point Comfort to Little Creek VA...
entrance to the Chesapeake Bay including the Chesapeake Bay Bridge Tunnel...
James River from Jamestown to the Hampton Roads Bridge Tunnel...
York River...

Coastal Waters from Parramore Island to Cape Charles Light VA out 20 NM...

At 353 PM EDT, Doppler radar indicated strong thunderstorms, capable of producing winds to around 30 knots and small hail. These thunderstorms were located along a line extending from Dominion Pier to near Chesapeake Bay Bridge Tunnel, moving northeast at 25 knots.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

Mariners can expect gusty winds to around 30 knots, locally higher waves, and lightning strikes. Boaters should seek safe harbor immediately until these storms pass.

&&

LAT...LON 3712 7648 3708 7647 3703 7641 3709 7634
3712 7637 3711 7644 3715 7646 3733 7635
3732 7627 3731 7627 3729 7589 3708 7593
3689 7604 3693 7655 3695 7657 3695 7659

$$

2 The MWS issued for Non-Severe Long Term Events

FZUS76 KLOX 151141
MWSLOX

Marine Weather Statement
National Weather Service Los Angeles/Oxnard CA
341 AM PST Mon Jan 15 2018

PZZ650-655-673-676-151945-
East Santa Barbara Channel from Pt. Conception to Pt. Mugu CA
including Santa Cruz Island-
Inner waters from Point Mugu to San Mateo Pt. CA including Santa
Catalina and Anacapa Islands-
Waters from Pt. Sal to Santa Cruz Island CA and westward 60 nm
including San Miguel and Santa Rosa Islands-
Outer waters from Santa Cruz Island to San Clemente Island to
60 NM offshore including San Nicolas and Santa Barbara Islands-
341 AM PST Mon Jan 15 2018

...AREAS OF DENSE FOG ACROSS THE COASTAL WATERS THROUGH THIS
AFTERNOON...

Mariners should be prepared for abrupt visibility changes down to
one nautical mile or less. Reduce speeds and be on the lookout for
exposed rocks and other vessels, including large ships in the
shipping lanes. Use radar or GPS navigation if available, and
consider remaining in harbor if such equipment is unavailable.

$$

3 MWSs created by WarnGen used to update a Special Marine Warning (SMW), cancel a SMW, cancel part of a SMW, and expire a SMW

MWS used to update a SMW:

FZUS74 KLCH 270716
MWSLCH

Marine Weather Statement
National Weather Service Lake Charles LA
216 AM CDT Thu Sep 27 2018

GMZ472-270745-
/O.CON.KLCH.MA.W.0078.000000T0000Z-180927T0745Z/
216 AM CDT Thu SEP 27 2018

...A SPECIAL MARINE WARNING REMAINS IN EFFECT UNTIL 245 AM CDT...

For the following areas...
Waters from Intracoastal City to Cameron LA from 20 to 60 NM...

At 216 AM CDT, strong thunderstorms were located along a line
extending from near West Cameron 248 to near East Cameron 157 to near
West Cameron 269, moving east at 10 knots.

HAZARD...Wind gusts 34 knots or greater.

SOURCE...Radar indicated.

IMPACT...Small craft could be damaged in briefly higher winds and
suddenly higher waves.

Locations impacted include...
West Cameron 269, West Cameron 368 and West Cameron 248.

LAT...LON 2891 9334 2895 9315 2914 9310 2915 9295
2889 9292 2878 9314
TIME...MOT...LOC 0716Z 273DEG 10KT 2909 9302 2891 9297 2885 9307

HAIL...0.00IN
WIND...>34KTS

$$

MWS used to cancel a SMW:

FZUS71 KPHI 231751
MWSPHI

Marine Weather Statement
National Weather Service Mount Holly NJ
1251 PM EST Tue Jan 23 2018

ANZ455-473-475-231801-
/O.CAN.KPHI.MA.W.0006.000000T0000Z-180123T1815Z/
1251 PM EST Tue Jan 23 2018

...THE SPECIAL MARINE WARNING IS CANCELLED...

The affected areas were...
Coastal waters from Cape Henlopen to Fenwick Island DE out 20 nm...
Waters from Cape May NJ to Fenwick Island DE out 20 to 40 nm...
Waters from Great Egg Inlet NJ to Cape May NJ out 20 to 40 nm...

The thunderstorms have moved out of the area, therefore the special
marine warning has been cancelled.

LAT...LON 3842 7492 3903 7422 3892 7381 3876 7400
3870 7415 3861 7417 3851 7426 3842 7426
3826 7444
TIME...MOT...LOC 1746Z 250DEG 54KT 3916 7336 3865 7405

$$

MWS used to cancel part of a SMW:

FZUS73 KGRR 030320
MWSGRR

Marine Weather Statement
National Weather Service Grand Rapids MI
1120 PM EDT Wed May 2 2018

LMZ848-870-030329-
/O.CAN.KGRR.MA.W.0005.000000T0000Z-180503T0400Z/
1120 PM EDT Wed May 2 2018

...THE SPECIAL MARINE WARNING IS CANCELLED...

The affected areas were...
Nearshore and Open Waters from Whitehall to Pentwater MI...

The thunderstorms have moved out of the warned area and no longer
pose a significant threat to boaters.

LAT...LON 4246 8699 4324 8634 4309 8626 4292 8621
4270 8621 4241 8629 4244 8636
TIME...MOT...LOC 0319Z 308DEG 45KT 4318 8629 4278 8651

$$

LMZ845>847-872-874-876-030400-
/O.CON.KGRR.MA.W.0005.000000T0000Z-180503T0400Z/
1120 PM EDT Wed May 2 2018

...A SPECIAL MARINE WARNING REMAINS IN EFFECT UNTIL MIDNIGHT EDT...

For the following areas...
Nearshore and Open Waters from South Haven to Whitehall MI...

At 1119 PM EDT, strong thunderstorms were located along a line extending from
near the Muskegon Light to 13 nm west of The Holland Light, moving southeast
at 45 knots.

HAZARD...Wind gusts to nearly 50 knots.

SOURCE...Radar indicated.

IMPACT...Hazardous conditions above deck in briefly higher winds and suddenly
higher waves.

Locations impacted include...
The Grand Haven Light, Port Sheldon, the Holland Light, the Muskegon Light.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

Move to safe harbor immediately as gusty winds and high waves are
expected.

&&

LAT...LON 4246 8699 4324 8634 4309 8626 4292 8621
4270 8621 4241 8629 4244 8636

TIME...MOT...LOC 0319Z 308DEG 45KT 4318 8629 4278 8651

HAIL...0.00IN
WIND...49KTS

$$

MWS used to expire the SMW:

FZUS73 KDLH 252022
MWSDLH

Marine Weather Statement
National Weather Service Duluth MN
322 PM CDT Fri May 25 2018

LSZ142-143-162-252045-
/O.CON.KDLH.MA.W.0001.000000T0000Z-180525T2045Z/
322 PM CDT Fri May 25 2018

...A SPECIAL MARINE WARNING REMAINS IN EFFECT UNTIL 345 PM CDT...

For the following areas...
Lake Superior west of a line from Saxon Harbor WI to Grand Portage MN
beyond 5NM...
Silver Bay Harbor to Two Harbors MN...
Taconite Harbor to Silver Bay Harbor MN...

At 322 PM CDT, Doppler radar indicated a strong thunderstorm,
capable of producing winds to 40 knots and penny size hail, located near Split Rock Lighthouse,
moving east at 25 knots.

At 319 PM CDT, dime size hail was reported at Gooseberry Falls State
Park on the Lake Superior shoreline.

Locations impacted include...
Beaver Bay, Split Rock Lighthouse, Split Rock Bay, Twin Points Safe
Harbor, and Castle Danger.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

Mariners can expect wind gusts to 40 knots, small hail, high waves,
dangerous lightning, and heavy rains. Boaters should seek safe harbor
immediately until this storm passes.

&&

LAT...LON 4711 9153 4715 9149 4731 9126 4734 9107
4721 9106 4705 9124
TIME...MOT...LOC 2020Z 271DEG 18KT 4716 9138

$$

MWS issued for volcanic impacts:

FZAK78 PAFC 040733
MWSAFC

Marine Weather Statement
National Weather Service Anchorage AK
1023 PM AKST Tue Jan 3 2017

PKZ170-040930-
1023 PM AKST Tue Jan 3 2017

...BOGOSLOF VOLCANO HAS ERUPTED...

The areas affected include...
Cape Sarichef to Nikolski Bering Side...

At 920 PM AKST...Seismic activity and satellite imagery indicated that Bogoslof volcano, located at 53.9 N 168.0 W or 53 NM west of Unalaska was erupting, with light volcanic ashfall. The light volcanic ashfall will remain over mainly open waters.

Mariners could be affected by a limited hazard extent, such as less than 1/4 inch of ashfall, pumice rafts, or some floating debris. Mariners traveling in the vicinity of Bogoslof volcano are advised to use caution.

Please report any observations of ash to the Alaska Volcano Observatory at 907-786-7497.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

Ash is an eye and respiratory irritant and is abrasive. Those with respiratory sensitivities should take extra precautions to minimize exposure. Protect electronics and cover air intakes if ashfall is expected or confirmed. Remove ash from surfaces with water if

Possible to prevent excessive accumulation.

&&

LAT...LON 5386 16752 5381 16842 5464 16867 5516 16731
5458 16703

$$

MWS issued for Ashfall Advisory:

Note: Where the MWW is issued Ashfall Warnings are carried in the MWW (see NWSI 10-315).

FZAK78 PAFC 171943
MWSAFC

MARINE WEATHER STATEMENT
NATIONAL WEATHER SERVICE ANCHORAGE AK
1041 AM AKST Fri Feb 17 2017

PKZ170-172015-
1041 AM AKST Fri Feb 17 2017

...ASHFALL ADVISORY IN EFFECT FOR TRACE OR DUSTING OF VOLCANIC ASH...

The areas affected include...
Cape Sarichef to Nikoski Bering Side...

At 1041 AM AKST, seismic activity and satellite imagery indicated that Bogoslof volcano was erupting, with trace or dusting of volcanic ash, reducing visibility to near 5 NM.

An ashfall advisory means that the volcano is undergoing a minor eruption and there is the potential that mariners could be affected by a limited hazard extent...such as less than 1/4 inch of ashfall, pumice rafts, or some floating debris.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

Ash is an eye and respiratory irritant and is abrasive. Those with respiratory sensitivities should take extra precautions to minimize exposure. Protect electronics and cover air intakes if ashfall is expected or confirmed. Remove ash from surfaces with water if possible to prevent excessive accumulation.

&&

LAT...LON 5391 16757 5374 16776 5374 16856 5419 16991
5488 16819

$$

Department of Commerce • National Oceanic & Atmospheric Administration • National Weather Service

NATIONAL WEATHER SERVICE INSTRUCTION 10-303
JANUARY 3, 2018

Operations and Services
Marine And Coastal Weather Services, NWSPD 10-3
MARINE AND COASTAL SERVICES STANDARDS AND GUIDELINES

NOTICE: This publication is available at: http://www.nws.noaa.gov/directives/.

OPR: W/AFS26 (W. Weeks) **Certified by:** W/AFS26 (A. Allen)
Type of Issuance: Routine

SUMMARY OF REVISIONS: This directive supersedes NWSI 10-303, *Marine and Coastal Services Standards and Guidelines*, dated October 24, 2014. Changes made to reflect the NWS Headquarters reorganization effective April 1, 2015. Additional changes include:

1. Section 1.2, Reference to the Interactive Forecast Preparation System (IFPS) has been changed to "tools at their disposal."
2. A new link to FTPMAIL has been added to 7.5. **FTPMAIL**.
3. Definitions of Marine Wind and Marine Gust have been added to Appendix A.
4. Deleted reference to NWSI 10-310 (formerly Section 6. Marine Standards), because all relevant content is now contained within this NWSI 10-303.
5. In order to be consistent with NWSI 10-604 TROPICAL CYCLONE DEFINITIONS, the word "marine" is included in this instruction in the definitions of gale warnings, storm warnings, and hurricane force wind warnings.
6. The words, "and not directly associated with a tropical cyclone," were added to the definitions of Hurricane Force Wind Watch and Hurricane Force Wind Warning.
7. The phrase "(24 hours for the western North Pacific)" has been added to the definition of Tropical Storm Warning.

Signed 12/20/2017
Andrew D. Stern Date
Director
Analyze, Forecast, and Support Office

Marine and Coastal Services Standards and Guidelines

Table of Contents Page

1 Purpose

To have the most value, it is essential that National Weather Service (NWS) marine weather products are consistent, accurate, available, and transmitted to and received by users in a timely manner. To this end, they are made available through a wide variety of dissemination vehicles outlined in this instruction. A complete discussion of the communication requirements and formats is given in NWS Instruction (NWSI) 10-1701.

1.1 Responsibilities

To ensure NWS marine weather products are effectively processed and disseminated, offices issuing them will ensure their products are clear, properly disseminated, and properly formatted.

1.2 General Guidelines

Forecasters are responsible for the timeliness, currency, and accuracy of the marine weather products issued for the marine area of responsibility. However, to the extent possible, forecasters should try to maintain spatial and temporal consistency between adjoining offices and from one forecast period to the next. Forecasters from Weather Forecast Offices (WFOs), as well as the Ocean Prediction Center (OPC) and the Tropical Analysis and Forecast Branch (TAFB), will use the tools at their disposal to minimize discontinuities in gridded products prepared at adjoining offices as much as possible.

Marine forecasts will include significant or predominant weather events impacting marine users. Wind and sea conditions will always be included in NWS marine forecasts. To most effectively describe these conditions, one value or a small range of values should be used. To avoid confusion, transition terms for winds and seas should be discrete and consistently used. Wind speed transition terms, such as “INCREASING” and “DIMINISHING,” and direction transition terms, such as “BECOMING” and “SHIFTING,” should be used to add clarity to the forecast trends. The terms “VEERING,” “BACKING,” “BECOMING,” “SHIFTING,” or “RISING” may be used when appropriate, but **not** “DECREASING.” For seas, transition terms such as “BUILDING” and “SUBSIDING” should be used.

NWS marine products may include tidal information. If tidal information is included, it should cover no more than 24 hours, and will be based on official government observations or predictions.

Marine forecasts should not use the word “under” when describing winds below a certain threshold. Instead, use the words “less than.” For instance, in the High Seas Forecast, state “WINDS LESS THAN 20 KT” versus “WINDS UNDER 20 KT.” Similarly, do not use the word “below” when describing seas less than a certain threshold. Instead, use “less than.” For instance, in the High Seas Forecast, state “SEAS LESS THAN 8 FT” versus “SEAS BELOW 8 FT.” Also, use separate sentences when describing the wind and sea conditions in the Offshore Waters and High Seas Forecasts.

2 Update Guidelines

Forecasters should update gridded and text forecasts whenever existing or expected weather conditions differ significantly (i.e., there is a change in a warning or advisory status) from the forecast and are expected to continue for more than two hours. If an amendment is needed near the next scheduled forecast time (i.e., within an hour), the forecaster may issue that forecast early in lieu of an amendment. Specific instructions and criteria are described in NWSIs 10-310, 10-311, and 10-312.

Based on available information, use the following guidelines for updating marine forecasts. The regions and local offices may develop local updating procedures and criteria to supplement these guidelines.

2.1 Wind

Amend if the following occur or may occur:

a. There is an unpredicted change in status of advisories or warnings.
b. Highest sustained wind speed increases or diminishes 10 knots (KT) or more from forecast (20 KT or more if no change in hurricane force wind warning status occurs).
c. Mean wind direction changes by more than 45 degrees from forecast when speeds are 20 KT or greater.
d. Mean wind direction changes by more than 60 degrees from forecast when speeds are less than 20 KT).
e. Sustained wind and/or gust conditions may begin to affect marine operations adversely or favorably.

2.2 Seas

Amend if unpredicted wind wave, swell, or combined seas may begin to affect marine operations either adversely or favorably.

2.3 Visibility

For WFOs providing visibility forecasts, amend if the following occur:

a. No restriction to visibility is in the forecast and the forecast visibility of five nautical miles (NM) or more changes to **one NM** or less over a significant part of the forecast area.
b. Forecast visibility of one NM or less increases to **five NM** or more over a significant part of the forecast area.

2.4 Weather

Amend if significant, unpredicted changes in weather may begin to affect marine operations either adversely or favorably.

2.5 Severe Local Storm Watches

If a watch for severe local storms is issued over Coastal or Nearshore Waters marine zones, the routine marine forecast will be updated.

3 Warning/Advisory Guidelines

Criteria for all marine warnings and advisories are defined in Appendix A. Instructions on short-duration warning events (less than two hours) are contained in NWSI 10-313.

Headline standards and other appropriate methods for highlighting long duration events (more than two hours) are described in NWSIs 10-310, 10-311, and 10-312.

If, in a forecast, a forecaster includes a range of winds or seas that cross a warning or advisory threshold, the highest value will determine the advisory or warning category (e.g., a gale warning is issued for a forecast of "Winds 25 to 35 KT").

Forecasters may use frequent gusts rather than the sustained winds if these values better describe existing conditions. Refer to Appendix A for the definition of "frequent gusts."

If a tropical cyclone is anticipated to impact a marine area, the headlines associated with that system, as issued by the National Hurricane Center (NHC), Central Pacific Hurricane Center (CPHC), or WFO Guam (based on Joint Typhoon Warning Center guidance) supersede all other headlines.

4 Coordination and Collaboration

Field offices with adjoining or overlapping areas of responsibility should coordinate and collaborate to ensure products are consistent and compatible. This effort includes communication with appropriate governmental forecast agencies outside the United States.

Forecasters should reference Section 4, Inter-site Coordination and Collaboration, of NWSI 10-201, *National Digital Forecast Database and Local Database Description and Specifications*, for detailed information on the coordination and collaboration processes for gridded forecasts and analyses. This document is available at: http://www.nws.noaa.gov/directives/sym/pd01002001curr.pdf.

4.1 U.S. Coast Guard (USCG)

The USCG disseminates marine safety messages, including marine weather forecasts and warnings, to mariners in and around the U.S. coastline. It also retrieves and forwards observational data to the NWS. National, regional, and local level NWS managers should closely work with their USCG counterparts to ensure the most effective level of service is provided.

4.2 Assistance to the NOAA Office of Response and Restoration (NOAA HAZMAT)

For Hazardous materials (HAZMAT) releases: NWS marine forecast offices will maintain current phone numbers and contact information of their National Oceanic and Atmospheric Administration (NOAA) HAZMAT Scientific Support Coordinator(s) (SSC). Offices will also maintain standard procedures to anticipate and respond to the specialized forecasting needs of an oil spill or other marine HAZMAT release. http://response.restoration.noaa.gov.

4.3 Users

To ensure user needs are being met, the NWS will maintain regular contact with users of its marine products (i.e., USCG, recreational and commercial mariners, U.S. Power Squadrons, etc.). Similarly, the NWS will cooperate with other NOAA offices to meet organizational goals.

5 Product Header Formats

All marine products issued by the NWS will have common product headers. Included in these headers are:

(WMO ID)(ISSUANCE TIME)(AMENDMENT/CORRECTION IDENTIFIER)

(AWIPS ID)

PRODUCT NAME [+ Optional descriptor]

NATIONAL WEATHER SERVICE (CITY)(STATE)(or OFFICE ID)

(VALID TIME) AM/PM (TIME ZONE)(DAY)(DATE-MON DAY YEAR)

[Refer to NWSI 10-1701 for further guidance on headers]

5.1 World Meteorological Organization (WMO) Identifier (ID)

The WMO has established a scheme used throughout the world for identifying meteorological products. These codes are defined in WMO Manual 386: http://www.wmo.int/pages/prog/www/WIS/Publications/WMO_386/WMO_386_Vol_I_en.pdf Each alphanumeric marine product issued by the NWS will have an appropriate WMO header.

5.2 Issuance Time

This time is automatically placed on every product transmitted.

5.3 Amendment/Correction Identifier

This is a three letter code to denote if a product has been non-routinely amended (AAX) or corrected (CCX). Use separate letters to denote more than one change (e.g., CCA, CCB, and CCC).

5.4 Advanced Weather Interactive Processing System (AWIPS) ID

Each NWS alphanumeric product has been assigned a six-letter identifier (see Appendix C). Each alphanumeric marine product issued by the NWS will include an appropriate AWIPS ID.

5.5 Product Name

This is the common phrase describing what the product is (e.g., COASTAL WATERS FORECAST). Each alphanumeric marine product issued by the NWS will include an appropriate product name.

5.6 City/State

Each alphanumeric marine product issued by the NWS will include the appropriate city and state in which the office issuing the product is located.

5.7 Office ID

The forecast branches of the NHC and OPC should include their office identifiers in this location.

5.8 Issuance Date/Time

This is the date/time the product was issued in local time. In products that span multiple time zones, the date/time may be shown in Coordinated Universal Time (UTC), rather than local time. For high seas forecasts broadcast via SafetyNET, the date/time should reflect the scheduled broadcast time of the forecast.

5.9 Universal Geographic Code (UGC) Codes

In the coastal and offshore waters and Great Lakes, all marine zones have been assigned UGCs as noted in NWSI 10-302. Forecasts, statements, and warnings including these areas will contain the UGC code line identifying the marine zones impacted by the product. As in NWSI 10-1702, the format of this line is: "(UGC CODE[S])-(EXPIRATION TIME)-."

5.10 Valid Time Event Code (VTEC)

When required, VTEC line(s) will be included on the line immediately below the UGC Code line as in NWSI 10-1703. The current VTEC-enabled NWS product suite, along with other information regarding implementation of VTEC, is available on the Internet at http://www.nws.noaa.gov/os/vtec/.

6 Communication Systems

Marine products are disseminated through a variety of systems, including the following: NOAA Weather Radio; USCG and other governmental and commercial radio stations, Navigational Teleprinter Exchange (NAVTEX), Simplex Telephone Exchange Over Radio (SITOR), and radio facsimile broadcasts; Internet and other computer-to-computer systems; and satellite based systems, such as SafetyNET and the Emergency Managers Weather Information Network (EMWIN). Complete information on these systems can be found via the NWS Marine Forecasts webpage at: www.nws.noaa.gov/om/marine/home.htm. Other systems may be added with coordination through NWS headquarters, Office of Operational Systems. Several of the most widely used marine dissemination systems are described below.

6.1 NOAA Weather Radio (NWR)

NWSI 10-1710 provides overall policy on NWR. The marine portion of the NWR program should routinely include the latest forecasts for marine areas within the radio's broadcast area and a summary of local area marine observations. Marine watches, warnings, and advisories should be emphasized. Additional information, such as offshore waters forecasts, oceanographic conditions, tidal data, etc., may be included based on local user requirements. The amount and

content of the marine products broadcast over the NWR may be adjusted according to the time of day and season.

Special Marine Warnings (SMWs) affecting any part of a NWR listening area should be immediately placed in the broadcast cycle. Use of the 1050 Hertz (Hz) warning alarm for SMWs is at the forecaster's discretion, in accordance with NWSI 10-1710. Broadcast of other non-routine marine products is at the discretion of the local office manager, based on local user requirements. Broadcasts of emergency marine information, such as MAYDAYS and Public Service Announcements, should be in accordance with NWSI 10-1710.

6.1.1 NWR Specific Area Message Encoding (SAME)

The SAME event codes, listed below, should be broadcast via NWR. WFOs should periodically review, as well as immediately inform, the Analyze, Forecast, and Support Office, Marine and Coastal Services Branch (W/AFS26) of any changes to NWR programming as listed at http://www.nws.noaa.gov/om/marine/marsame.htm by sending corrections via e-mail to marine.weather@noaa.gov.

EVENT	SAME EVENT CODE
Hurricane Watch*	HUA
Hurricane Warning*	HUW
Hurricane Local Statement*	HLS
Severe Thunderstorm Watch	SVA
Special Marine Warning	SMW
Tornado Watch	TOA
Tropical Storm Watch*	TRA
Tropical Storm Warning*	TRW
Tsunami Watch#	TSA
Tsunami Warning#	TSW

*Not applicable to Great Lakes and Alaska forecast areas
#Not applicable to Great Lakes

6.2 USCG Radio Broadcasts

The USCG is a prime disseminator of marine weather information for the United States via high frequency (HF), medium frequency (MF) and very high frequency (VHF) voice, NAVTEX (an international automated MF direct-printing service), SITOR, and radio facsimile (U.S. Navy in Hawaii). Lists of NWS products and broadcast schedule information are available under the NWS Marine Forecasts webpage at http://www.nws.noaa.gov/om/marine/home.htm. The USCG receives NWS text forecasts via the NOAA Weather Wire System (NWWS), using the Internet as a backup.

6.3 WWV/WWVH HF Voice (Time Tick)

Brief recorded statements on major storm systems are prepared and recorded by the offices listed below for hourly broadcast over the time and frequency radio stations WWV (Fort Collins, Colorado) and WWVH (Honolulu, Hawaii) operated by the National Institute of Standards and Technology.

From WWV, Atlantic high seas warnings are broadcast at seven and eight minutes past the hour, while Pacific high seas warnings are broadcast at nine minutes past the hour.

From WWVH, Pacific high seas warnings are broadcast from 48 to 51 minutes past the hour.

STATION	AREA	OFFICE
WWV	Western North Atlantic Gulf of Mexico Caribbean Sea	OPC
WWVH	Eastern Pacific North Pacific Tropical South Pacific	WFO Honolulu

The script is a brief summary describing the location and movement of storms producing, or expected to produce, gale, storm, or tropical cyclone force winds and associated seas. This service is intended to supplement the primary marine weather broadcasts that give more complete information. When time permits, add the following:

"More complete information is available from other marine broadcast stations."

6.4 Internet

All NWS marine weather products, text and graphics, should be accessible on the Internet, to the extent possible. Each WFO and National Center should maintain a marine webpage providing such information as local forecasts, tide predictions, and local observations.

6.5 FTPMAIL

NWS radiofax charts, marine text products, and buoy/Coastal-Marine Automated Network (C-MAN) observations are available via e-mail. The FTPMAIL server will be maintained by NWS headquarters and is intended to allow Internet access for mariners and other users, who do not have direct access to the World Wide Web, but who are equipped with an e-mail system. For the FTPMAIL "Frequently Asked Questions" file, see:
http://www.nws.noaa.gov/om/marine/faq.htm#3.

6.6 Digital Marine Weather Dissemination System (DMAWDS)

DMAWDS is a web-based system with restricted access, Volunteer Observing Ship (VOS) participants, and other users authorized by WFOs receive products from it.

6.7 Radiofax

Per NWSI 10-311, NWS prepares high seas weather maps, satellite images, ice charts, etc., for broadcast via four USCG stations (Boston, New Orleans, Pt. Reyes, and Kodiak) and one Department of Defense (DoD) transmitter site (Honolulu). Content and scheduling of these broadcasts is centrally managed by the NWS Marine, Coastal and Tsunami Branch (AFS26). Proposed changes to the product suite or broadcast times will be coordinated with AFS26, National Centers, and adjacent WFOs from earliest development stages. User notification will be in accordance with NWSI 10-1805. User notification for major changes should also include the USCG's and the National Geospatial-Intelligence Agency's (NGA's) "Notices to Mariners," which will be coordinated by AFS26. General information on radiofax and links to products may be found at: http://www.nws.noaa.gov/om/marine/radiofax.htm.

6.8 Other Dissemination Systems

NWS marine products are distributed by other means, including several common to other NWS forecasts including telephone recordings, live HF and VHF marine broadcasts in Alaska, NOAA Weather Wire Service (NWWS), Emergency Managers Weather Information Network (EMWIN), NOAA's Satellite Broadcasting Network (NOAAPORT), etc. For more detailed information, see the NWS Marine forecasts webpage at: http://www.nws.noaa.gov/om/marine/home.htm.

Appendix A – Definitions

Ashfall Advisory: An advisory issued for a volcano undergoing a minor eruption where there is the potential mariners could be affected significantly by hazards such as less than ¼" of ashfall accumulation, pumice rafts, or some floating debris.

Ashfall Warning: A warning issued for a volcano undergoing a major eruption where there is the likelihood that mariners could be affected significantly by hazards such as greater than or equal to 1/4" of ashfall accumulation, significant debris, lava, or lahar flows.

Brisk Wind Advisory: A small craft advisory issued for ice-covered waters. Not issued for the Great Lakes.

Coastal/Lakeshore Hazard Message (CFW): An NWS product issued to describe coastal and lakeshore flooding, high surf, and, at WFO option, a high risk of rip currents. A Coastal/ Lakeshore Flood Advisory will be issued when minor flooding is possible (i.e., over and above normal high tide levels). A Coastal/Lakeshore Flood Watch will be issued when flooding with significant impacts is possible. Additionally, a Coastal/Lakeshore Flood Warning will be issued when flooding that will pose a serious threat to life and property is occurring, imminent, or highly likely. See NWSI 10-320 for more information.

Coastal Waters Forecast (CWF): The marine forecast for areas, including bays, harbors, and sounds, from a line approximating the mean high water mark (average height of high water over a 19-year period) along the mainland or near shore islands extending out to as much as 100 NM. Refer to NWSI 10-302 for a complete list of marine zones.

Cold Front: The leading, progressive edge of a density discontinuity ahead of a cooler/drier airmass. These boundaries tend to be narrower than warm fronts due to the higher density low-level air in their wake which helps drive their forward motion. Over the continent, a minimum of 6°C (10°F) over 500 kilometers (300 NM) is usually needed for a frontal zone with smaller differences needed over the oceans.

Dense Fog Advisory: An advisory for widespread or localized fog reducing visibilities to regionally or locally defined limitations not to exceed one NM.

Dense Smoke Advisory: An advisory for widespread or localized smoke reducing visibilities to regionally or locally defined limitations not to exceed one NM.

Developing Gale/Storm: In the High Seas and Offshore forecasts, this terminology is a headline used in the warnings section to indicate that gale/storm force winds are not now occurring but are expected before the end of the forecast period.

Dryline: The leading edge of a significant density/dewpoint discontinuity forced by foehn winds off the Rockies, usually ahead of a significant synoptic scale system moving through the West/Southwest United States. They usually progress eastward during the heating of the day, and westward at night. A tight 14°C (25°F), or a broader 17°C (30°F), dewpoint gradient is used to help determine the existence of a dryline. The dryline does not have to be the leading edge of all the change in the dewpoint, merely where the best gradient/leading edge of foehn winds exists (mainly after Bluestein).

Freezing Spray Advisory: This is an advisory for an accumulation of freezing water droplets on a vessel at a rate of less than two centimeters (cm) per hour caused by some appropriate combination of cold water, wind, cold air temperature, and vessel movement.

Frequent Gusts: Wind gusts of long duration, typically greater than two hours during a 12-hour forecast period.

Gale Warning: A marine warning of sustained surface winds, or frequent gusts, in the range of 34 knots (39 miles per hour (mph)) to 47 knots (54 mph) inclusive, either predicted or occurring, and not directly associated with a tropical cyclone.

Gale Watch: A watch for an increased risk of a gale force wind event for sustained surface winds, or frequent gusts, of 34 knots (39 mph) to 47 knots (54 mph) inclusive, but its occurrence, location, and/or timing is still uncertain.

Great Lakes Marine Alert Message (MAW): A message generated whenever storm force or greater winds are included in any open lakes forecast.

Great Lakes Marine Forecast (MAFOR): A coded version appended to each of the Great Lakes open lakes forecasts.

Great Lakes Weather Broadcast (LAWEB): An observation summary prepared to provide Great Lakes mariners with a listing of weather observations along or on the Lakes.

Hazardous Seas Warning: A warning for wave heights and/or wave steepness values meeting or exceeding locally defined warning criteria.

Hazardous Seas Watch: A watch for an increased risk of a hazardous seas warning event to meet Hazardous Seas Warning criteria but its occurrence, location, and/or timing is still uncertain.

Heavy Freezing Spray Warning: A warning for an accumulation of freezing water droplets on a vessel at a rate of two cm per hour or greater caused by some appropriate combination of cold water, wind, cold air temperature, and vessel movement.

High Pressure System: A relative maximum in the pressure pattern, usually accompanied by at least one closed isobar, which normally has an outward, clockwise circulation from its center in the Northern Hemisphere and an outward, counterclockwise circulation in the Southern Hemisphere.

High Seas Forecasts (HSF): Marine forecasts for the major oceans of the world. In this context, major gulfs or seas (e.g., the Gulf of Mexico or the Bering Sea) are included within these forecast areas. Areas of responsibility for the United States are determined by international agreements under the auspices of the WMO.

High Surf Advisory: A High Surf Advisory is issued when breaking wave action poses a threat to life and property within the surf zone. High surf criteria vary by region. High Surf Advisories are issued using the Coastal Hazard Message (CFW) product.

High Surf Warning: A High Surf Warning is issued when breaking wave action results in an especially heightened threat to life and property within the surf zone. High surf criteria vary by region. High Surf Warnings are issued using the Coastal and Lakeshore Hazard Message (CFW) product.

Hurricane/Typhoon Warning: For the Atlantic, Eastern Pacific, Central Pacific, and Western North Pacific hurricane basins, an announcement that sustained winds of 64 knots (74 mph or 119 km/hour) or higher are expected somewhere within the specified area in association with a tropical, subtropical, or post-tropical cyclone. Because hurricane preparedness activities become difficult once winds reach tropical storm force, the hurricane warning is issued 36 hours in advance of the anticipated onset of tropical storm force winds (24 hours for the Western North Pacific). A hurricane or typhoon warning can remain in effect when dangerously high water or a combination of dangerously high water and waves continue, even though winds may be less than hurricane or typhoon force.

Hurricane Force Wind Warning: A marine warning for sustained winds, or frequent gusts, of 64 knots (74 mph) or greater, either predicted or occurring, and not directly associated with a tropical cyclone.

Hurricane Force Wind Watch: A watch for an increased risk of a hurricane force wind event for sustained surface winds, or frequent gusts of 64 knots (74 mph) or greater, but its occurrence, location, and/or timing is still uncertain, and not directly associated with a tropical cyclone.

Low Pressure System: A relative minimum in the pressure pattern, usually accompanied by at least one closed isobar, which normally has an inward, counterclockwise circulation in the Northern Hemisphere and an inward, clockwise circulation in the Southern Hemisphere.

Low Water Advisory: An advisory to describe water levels which are significantly below average levels over the Great Lakes, coastal marine zones, and any tidal marine area, waterway,

or river inlet within or adjacent to a marine zone that would potentially be impacted by low water conditions creating a hazard to navigation.

Marine Weather Message (MWW): A product issued to describe long duration (greater than two hours) marine weather hazards impacting the coastal waters and Great Lakes. This product is used to issue marine watches, marine warnings, and marine advisories (e.g., gale, storm, hurricane force wind events). See NWSI 10-315 for more information.

Marine Weather Statement (MWS): A product issued to provide mariners with details on significant or potentially hazardous conditions not otherwise covered in existing marine warnings and forecasts. See NWSI 10-314 for more information.

Marine Wind: The wind value stated in a Marine or Great Lakes National Weather Service forecast is an expected wind at 10 meters above the sea surface averaged over a two--minute period.

Marine Wind Gust: The wind gust value stated in a Marine or Great Lakes National Weather Service Forecast is an expected maximum three-second wind speed forecast to occur within a two--minute interval at a height of 10 meters above the sea surface.

Nearshore Marine Forecast (NSH): The marine forecast for an area of the Great Lakes from a line approximating mean low water datum along the coast or an island, including bays, harbors, and sounds, out to five NM. Refer to NWSI 10-302 for a complete list of zones.

Occluded Front: A front that forms southeast/east of a cyclone that moves deeper into colder air, in the late stages of wave-cyclone development. Cold occlusions result when the coldest air surrounding the cyclone is behind its cold front, and are normally seen on the west sides of ocean basins and with clipper systems descending from the arctic. Warm occlusions form when the coldest air surrounding the cyclone is ahead of its warm front, forcing the cold front aloft. Warm occlusions are normally seen on the east side of ocean basins and just to the lee of the United States portion of the continental divide (mainly after Glickman, 2000).

Offshore Waters Forecast (OFF): A marine forecast for that portion of the oceans, gulfs, and seas beyond the coastal waters extending to a specified distance from the coastline, to a specified depth contour, or covering an area defined by specific latitude and longitude points. Refer to NWSI 10-302 for a complete list of zones.

Open Lakes Forecast (GLF): The marine forecast for the U.S. waters within a Great Lake not including the waters covered by an existing Nearshore Waters Forecast. Refer to NWSI 10-302 for a complete list of zones.

Outflow Boundary: A mesoscale surface boundary formed by the horizontal spreading of thunderstorm-cooled air. These features may last more than a day (after Glickman, 2000).

Severe Thunderstorm Watch: A watch issued when conditions become favorable for severe thunderstorms to develop and headlined in the Coastal Waters Forecast, the Great Lakes Open Lakes Forecast, and the Nearshore Marine Forecast. Reference NWSI 10-512 for severe thunderstorm watch criteria.

Shearline: The final stage in the life cycle of a cold front over the subtropics and tropics. Lying equatorward of the subtropical ridge, these boundaries have lost all temperature contrast over the warm ocean and have minimal dewpoint contrast across them. They delineate an area where wind speed quickly increases on the poleward side at least 10 knots from nearly the same direction (within 45 degrees). Since mid- and high-level cloudiness previously associated with the cold front has dissipated due to lack of upper level support, a shearline is indicated on satellite imagery as the leading edge of a line of low-level clouds with tops near 10,000 feet. Shearlines lie in troughs, but due to lack of surface data over the subtropical/tropical ocean, the trough may not be recognized in the available surface observations. Using streamline analysis, a shearline is denoted by a confluence of streamlines equatorward and west of the col area where a cold front divides the subtropical ridge. The symbol for shearline is a red colored alternating dot-dash pattern.

Small Craft Advisory (SCA): An advisory issued by coastal and Great Lakes WFOs for areas included in the Coastal Waters Forecast or Nearshore Marine Forecast products. Thresholds governing the issuance of small craft advisories are specific to geographic areas.

NWS Region Thresholds for SCAs

Eastern - Sustained winds or frequent gusts ranging between 25 and 33 knots (except 20 to 25 knots, lower threshold area dependent, to 33 knots for harbors, bays, etc.) and/or seas or waves four to seven feet and greater, area dependent (four feet on the Chesapeake Bay).

Central - Sustained winds or frequent gusts (on the Great Lakes) between 22 and 33 knots inclusive, and/or seas or waves greater than four feet.

Southern - Sustained winds of 20 to 33 knots, and/or forecast seas seven feet or greater that are expected for more than 2 hours.

Western - Sustained winds of 21 to 33 knots, or frequent gusts, and/or wave heights exceeding 10 feet (or wave steepness values exceeding local thresholds).

Alaska - Sustained winds or frequent gusts of 23 to 33 knots. A small craft advisory for rough seas may be issued for sea/wave conditions deemed locally significant, based on user needs, and should be no lower than eight feet.

Pacific - Sustained winds 25 to 33 knots and/or seas 10 feet or greater; except in Guam and the Northern Marianas Islands where it is sustained winds or frequent gusts of 22 to 33 knots and/or

seas of 10 feet or greater, and in American Samoa where it is sustained winds of 20 to 33 knots and/or seas of eight feet or greater.

Small Craft Advisory for Hazardous Seas (SCAHs): An advisory for wind speeds lower than small craft advisory criteria, yet waves or seas are potentially hazardous due to wave height, wave period, steepness, or swell direction. Thresholds governing the issuance of SCAHs are specific to geographic areas.

NWS Region Thresholds for SCAHs

Eastern - Seas or waves four to seven feet and greater, area dependent (four feet on the Chesapeake Bay).

Central - Seas or waves greater than four feet.

Southern - Seas or wave conditions deemed locally significant, based on user needs, and should be no lower than seven feet.

Western - Criteria for wave heights and/or wave steepness are locally defined; refer to Western Region Supplement 12-2003, *Marine Weather Services*.

Alaska - Seas or wave conditions deemed locally significant, based on user needs, and should be no lower than eight feet.

Pacific - Seas 10 feet or greater; except in American Samoa, where it is seas eight feet or greater.

Small Craft Advisory for Rough Bar (SCARB): An advisory for specialized areas near harbor or river entrances known as bars. Waves in or near such bars may be especially hazardous to mariners due to the interaction of swell, tidal and/or river currents in relatively shallow water. Thresholds governing the issuance of SCARBs are specific to local geographic areas, and are based upon parameters such as wave steepness, wind speed and direction, and local bathymetry.

Small Craft Advisory for Winds (SCAW): An advisory issued when wave heights are lower than SCA criteria, yet wind speeds are still potentially hazardous.

NWS Region Thresholds for SCAWs

Eastern - Sustained winds ranging between 25 and 33 knots (except 20 to 25 knots, lower threshold area dependent, to 33 knots for harbors, bays, etc.).

Central - Sustained winds or frequent gusts (on the Great Lakes) between 22 and 33 knots inclusive.

Southern - Sustained winds of 20 to 33 knots that are expected for more than two hours.

Western - Sustained winds of 21 to 33 knots, or frequent gusts.

Alaska - Sustained winds or frequent gusts of 23 to 33 knots.

Pacific - Sustained winds 25 to 33 knots; except in Guam and the Northern Marianas Islands where it is sustained winds or frequent gusts of 22 to 33 knots, and in American Samoa where it is sustained winds of 20 to 33 knots.

Special Marine Warning (SMW): A warning of potentially hazardous weather conditions usually of short duration (two hours or less) producing sustained marine thunderstorm winds or associated gusts of 34 knots or greater; and/or hail 3/4 inch or more in diameter; and/or waterspouts affecting areas included in a Coastal Waters Forecast, a Nearshore Marine Forecast, or an Great Lakes Open Lakes Forecast that is not adequately covered by existing marine warnings. Also used for short duration mesoscale events such as a strong cold front, gravity wave, squall line, etc., lasting two hours or less and producing winds or gusts of 34 knots or greater. In offices without VTEC, the Special Marine Warning can be utilized to issue Ashfall Warnings. See NWSI 10-313 for more information.

Squall Line: A solid line of convection, usually associated with rapid pressure fluctuations and high winds. The squall line will normally be placed at the leading edge of the wind shifts and inside the leading pressure trough. The symbol for squall line is a red colored alternating two dot-dash pattern.

Stationary Front: The equatorward edge of a slow-moving density discontinuity with a motion of less than 10 knots (12 mph). Winds tend to lie parallel to these boundaries. Over the continent, a minimum of 6°C (10°F) over 500 km (300 NM) is usually needed for a frontal zone with smaller differences required over the oceans.

Storm Warning: A marine warning of sustained surface winds, or frequent gusts, in the range of 48 knots (55 mph) to 63 knots (73 mph) inclusive, either predicted or occurring, and not directly associated with a tropical cyclone.

Storm Watch: A watch for an increased risk of a storm force wind event for sustained surface winds, or frequent gusts, of 48 knots (55 mph) to 63 knots (73 mph) inclusive, but its occurrence, location, and/or timing is still uncertain.

Surf Zone Forecast (SRF): A forecast issued for the very narrow area of water between the high tide level on the beach and the seaward side of breaking waves.

Tornado Watch: A watch issued when conditions become favorable for tornadoes to develop and headlined in the Coastal Waters Forecast, the Great Lakes Open Lakes Forecast, and the Nearshore Marine Forecast. Reference NWSI 10-512 for tornado watch criteria.

Tropical Storm Warning: An announcement that sustained winds of 34 to 63 knots (39 to 73 mph or 63 to 118 km/hour) are *expected* somewhere within the specified area within 36 hours (24 hours for the western North Pacific) in association with a tropical, subtropical, or post-tropical cyclone.

Tropical Wave (formerly known as inverted trough): A trough or cyclonic curvature maximum in the trade wind easterlies. The wave may reach maximum amplitude in the lower middle troposphere, or may be the reflection of an upper tropospheric cold low or an equatorward extension of a mid-latitude trough.

Trough: An elongated area of low pressure with no distinct low level center. Winds usually flow cyclonically through it, outside of terrain influences.

Warm Front: The equatorward edge of a density discontinuity behind a retreating/modified cool/dry airmass. This type of frontal zone is significantly broader than a cold front, due to the slower erosion of the superior density airmass ahead of the boundary. Over the continent, a minimum of 6°C (10°F) over 500 km (300 NM) is usually needed for a frontal zone while smaller differences are necessary over the oceans.

Appendix B – Accepted Abbreviations

The following have been agreed to by the NWS and the USCG for use in marine text forecasts.

Day of Week	SUN, MON, TUE, WED, THU, FRI, SAT
Months	JAN, FEB, MAR, APR, MAY, JUN, JUL, AUG, SEP, OCT, NOV, DEC
Direction	N, NE, E, SE, S, SW, W, NW
Latitude / Longitude	N, S, E, W (e.g., 27N 97W)
Latitude / Longitude Points	e.g., 05N 109.5W, 16N 108W, 00N 76W, 27N 180W (Avoid decimals where possible)

Atlantic = ATLC
Average = AVG
Degree = DEG
Equator = EQ
Fathom(s) = FM
Foot / Feet = FT
Hurricane = HURCN
Intertropical Convergence Zone = ITCZ
Knot(s) = KT
Latitude = LAT
Longitude = LONG
Millibar(s) = MB
Nautical Mile(s) = NM
Pacific = PAC
Pressure = PRES
Position = PSN
Quadrant = QUAD
Thunderstorm(s) = TSTM(S)
Visibility = VSBY

The following additional terms may be used for radiofax graphics; however, they should be shown in a radiofax Legends Key and other outreach materials to assist mariners in learning the meaning of these terms. Additional abbreviations may be used following coordination among Offices /Centers producing radiofax products and AFS26.

Tropical Depression = TD
Tropical Storm = TS

Appendix C – Text Marine Product List by AWIPS ID

XXX is the three letter identifier of the office issuing the product; VVV is a two or three letter identifier designating specific areas for the High Seas, NAVTEX, or Offshore Waters Forecasts; ZZ is a two letter identifier designating a specific Great Lake for the Open Lake Forecast; and YYY is a three letter identifier of the appropriate ocean (PAC (Pacific) or ATL (Atlantic)) for the Marine Weather Discussion.

PRODUCT	AWIPS IDENTIFIER
Coast Guard Report	CGRXXX
Coastal / Lakeshore Hazard Message	CFWXXX
Coastal Waters Forecast	CWFXXX
Open Lakes Forecast	GLFZZ
High Seas Forecast	HSFVVV
Marine Forecast Matrix	MFMXXX
Marine Weather Discussion	MIMYYY
MAROB Observations	MOBXXX (experimental)
Marine Weather Statement	MWSXXX
Marine Weather Message	MWWXXX
Nearshore Forecast	NSHXXX
NAVTEX Forecast	OFFVVV
Offshore Forecast	OFFVVV
Other Marine Report	OMRXXX
Plain Language Ship Report	PLSXXX
Special Marine Warning	SMWXXX
Surf Zone Forecast	SRFXXX
Tide Report	TIDXXX

Department of Commerce • National Oceanic & Atmospheric Administration • National Weather Service

NATIONAL WEATHER SERVICE INSTRUCTION 10-1701
OCTOBER 29, 2019

Operations and Services
Dissemination Services NWSPD 10-17

TEXT PRODUCT FORMATS AND CODES

NOTICE: This publication is available at: http://www.nws.noaa.gov/directives/.

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SUMMARY OF REVISIONS: This directive supersedes NWSI 10-1701, *"Text Product Formats and Codes,"* dated March 29, 2018. Changes were made to reflect the addition of Section 8 – 11 to address actions to take when inadvertent messages are sent by NWS or by a third party.

Content changes were made to:

1. Throughout the document, updated titles and sections for formatting, section reference numbers and web links to correct sites.
2. Add Section 8, Recommended Actions to Take Following the Inadvertent NWS Dissemination of Messages by NWS Offices.
3. Add Section 9, Steps to Take After a Correctly-Formatted NWS Message is Incorrectly Disseminated by a Third Party
4. Add Section 10, Steps to Take for Messaging After an Inadvertent Dissemination of Test Alerts by a Third Party
5. Add Section 11, Role of NWS Rapid Response Team
6. Updated Appendix B, Section 2.3 to rewrite message example in mixed case.

/signed/ 10/15/19
Michelle Mainelli-McInerney Date
Director, Office of Dissemination

Text Product Formats and Codes – Table of Contents

Tables Page

1. Introduction. This instruction provides rules for formats and codes applicable to National Weather Service (NWS) World Meteorological Organization (WMO)-formatted text products intended for the public. Text product formats include communication header and trailer codes, geographic identifier and certain event codes and associated plain language identification, and the main informational text (narrative and any data). These text product formats are produced by the various Advanced Weather Interactive Processing System (AWIPS) formatters and other product generation systems. Excluded from the rules in this instruction are certain technically oriented text products including, but not limited to, those for aviation, forecast guidance, internal use, and summaries and reports that contain embedded data (see Section 2.4 for certain exceptions). Also excluded are text products in Extensible Markup Language (XML) or other markup languages. This instruction is supplemented by on-line references as indicated in the text and by:

> *Interface Control Document (ICD) - "AWIPS NWWS-2 Configuration"* on the Internet can be found at: https://www.nws.noaa.gov/nwws/updates.html. Click on Configuration at the top of the page then scroll down and click on "NWWS Interface Information Document" that is found below the sections that list the hardware & software proposed configurations.

Completed examples showing the rules and formats described in this instruction (but generally without specific text) are in Appendix B and in NWS Instruction (NWSI) 10-1702, *Universal Geographic Code (UGC)*, which provides comprehensive details of UGC rules and formats. The UGC identifies the affected geographic area and is an aid in the automated delivery of NWS text products to users. A brief summary of the UGC rules is included in this instruction in Section 3.7. The Valid Time Event Code (VTEC) is used in conjunction with the UGC in certain products to further aid that automated delivery. The VTEC identifies characteristics of the event, such as its status, type, tracking number, and beginning and ending times. Rules and examples of this code are provided in NWSI 10-1703, *Valid Time Event Code*, and are on the

Internet at https://www.weather.gov/vtec/. A brief summary of the VTEC rules is included in this instruction in Section 3.8.

Section 1.3 below lists the format conventions used in this document and its Appendices. While Appendix B provides a sampling of typical text product formats, it cannot show all available formats. For formats, codes, and content to be used in each product category, see the respective Product Specification documents on the NWS Directives System website at https://www.nws.noaa.gov/directives. The NWSIs mentioned above are also on this website.

1.1 Mission Connection. The NWS mission to protect life and property is carried out by the timely delivery of warnings, watches, forecasts, and other relevant weather, water, climate, and critical non-weather-related information through a variety of dissemination systems under the "all-hazards" concept (see definition in NWS Policy Directive (NWSPD) 10-17, *Dissemination Services*, on the Internet at the Directives website listed in Section 1). Correct use of product formats and codes is essential to ensure this delivery and to allow users to select, manipulate, and redistribute the information regardless of the dissemination method.

1.2 Text Products in Languages Other than English. This instruction covers official NWS text products written in American English. There may be local requirements or needs for official NWS text products to be prepared and disseminated in languages other than English. NWS Regions, National Centers, Weather Forecast Offices (WFOs), Weather Service Offices (WSOs), and/or River Forecast Centers (RFCs) that provide non-English text products will develop consistent standard translations of product header and text terminology in cooperation with the appropriate local, regional, national, or international user groups who require NWS text products in other languages.

1.3 Format of Text Examples. Table 1 below shows the conventions used for all text examples in this instruction and appendices.

Table 1: Format Conventions Used for Text Examples in this Instruction

Formatted element or group	How it appears	Sample
Actual ASCII text - as would appear in an NWS text product	upper case Courier New font	TORNADO
code groups - representing the precise number of alphanumeric characters that would appear in an NWS text product	lower case Courier New font	ddhhmm
text placeholders - representing a variable number of alphanumeric characters that would appear in an NWS text product	lower case italicized Times New Roman font inside of brackets	<*text*>
printable punctuation and symbols, when first defined	Courier New font inside of parentheses	($$)
all blank spaces within actual text or code groups, including each mandatory blank space in format header blocks	underscore in Courier New font	TORNADO_WARNING
ASCII control characters, including carriage return and line feed	lower case Courier New font inside of brackets	<cr>

2. Characters, Case, and Punctuation. Section 2.1 describes the standard rules, in accordance with the WMO Manual 386, *Manual on the Global Telecommunication System*. Sections 2.2 through 2.4 describe certain NWS permitted exceptions to the WMO manual. The WMO Manual 386 is available on the web.

2.1 Characters, Case, and Punctuation for Narrative Text. Narrative text uses upper case and only the following punctuation marks in the text: the period (.); the three-dot ellipsis (...); the forward-slash (/); the dash (-); and the plus (+). Use of other characters may inhibit the proper dissemination or automated processing by certain users' systems.

While the NWS transitions towards the use of mixed-case letters in the narrative portion of text products, the following portions of text products must always be capitalized:

- WMO Abbreviated Heading
- AWIPS Identifier
- Broadcast Instruction Line, if used
- UGC Line, if used
- VTEC Line, if used
- Headlines, if used
- Section Headers, if used
- Precautionary/Preparedness Actions, if used
- Phrases such as TORNADO EMERGENCY, EXTREMELY DANGEROUS SITUATION, TAKE COVER IMMEDIATELY
- In test products, THIS MESSAGE IS FOR TEST PURPOSES ONLY and DO NOT TAKE ACTION

The NWS is moving towards mixed-case letters and additional punctuations in text products. NWS will maintain current text rules in products under the purview of the WMO requirements or as required by international or national agreements. Offices will abide by the rules in the paragraph above and in the following sections of this document until such changes are officially announced via Public Information Statements.

2.2 Other Permitted Characters. Other permitted characters - only within the routinely coded part of specific products - are the "greater than" symbol (>) in the UGC (see NWSI 10-1702), the double dollar ($$), and the double ampersand (&&). The asterisk (*) is used in the bullet format of certain warning products (see Section 5.4 and Product Specification documents for details). An equal sign (=) is used as a delimiter to signal the end of discrete parts of certain products, as specified in Section 3.5.

2.3 Use of URLs and E-mail Addresses. Internet Universal Resource Locators (URLs) that use only characters permitted in Section 2.1 (e.g., www.spc.noaa.gov/climo/) are allowed in products, where appropriate. The special "at" symbol (@) associated with e-mail addresses is also permitted, but use of e-mail addresses should be limited to administrative-type products and Public Information Statements (AWIPS Product Category PNS). These products are less likely to adversely affect dissemination of high priority information on certain users' systems. **URLs and e-mail addresses will not be used in short duration warning products.**

2.4 Special Circumstances. Certain primarily administrative, coded or tabular products are permitted to use upper and lower cases and normal punctuation marks, such as commas (,), colons (:), the asterisk (*), (<) and (>), etc. Examples include water resources products that use the NWS Standard Hydrologic Exchange Format (SHEF) code, administrative-type products, PNSs, and State or Regional Weather Roundups (RWR, HRR, or HWR) and Temperature and Precipitation Tables (RTP). Any NWS field office requests for variance from these exceptions require the approval of the Office of Dissemination.

3. Overall Product Format Rules. The following subsections provide communications information that apply to all format blocks in products intended for the general public.

3.1 Left Justification. Left justify all major blocks of the product. Exceptions may occur within the narrative portion of the content block of certain products to offset or highlight certain information, as in the bullet format of short duration warnings or for certain tabular or coded data. This will be covered in the NWS Product Specification document for the product.

3.2 End-of-Line Characters. All lines of a message between the communications start-of-message and end-of-message should end in a three-character carriage return, carriage return, line feed (<cr><cr><lf>). The AWIPS formatters and message handling system should provide these automatically.

3.3 Length of Line. All lines of a message will be 69 characters or less. Note: This does not normally include the three-character end-of-line. However, when feasible, it is recommended this also include the end-of-line, leaving up to 66 characters per line for actual text.

3.4 Length of Product. When feasible, products should be kept under 15,000 characters. If a product exceeds 15,000 characters, it may be segmented for transmission either by AWIPS or by processing sites such as the AWIPS Network Control Facility or the NWS Telecommunications Gateway, in accordance with rules in WMO Manual 386. Product users' software should recombine segments according to their needs. Note: The end-of-report (see Section 3.5) can be used to help create a logical break point for segmentation.

3.5 End-of-Report Characters. For products containing discrete observations, reports or Terminal Aerodrome Forecasts, there will be an equal sign (=) at the end of the last word or line of each discrete part as described in the Product Specification documents. The equal sign is followed immediately by an end-of-line. Note: If text products exceed the 15,000 character message limit (see Section 3.4), the = character can also be used to break them into discrete parts during message transmission.

3.6 Blank Lines. There are a number of places where a blank line (only <cr><cr><lf> with no printable characters) should occur to separate major format blocks and other distinctive lines of information as a visual aid for easier reading:

a. between the AWIPS Product Identifier (Section 4.1) and the Mass News disseminator (MND) Block (Section 4.2);
b. between the MND Block and the product content block (Section 5); specifically

following the MND Block to separate any headline(s) or any "reason for the corrected/updated/amended line" (see Section 4.2.2) from the rest of the MND block;

c. after the segment header block (Section 4.3) in a segmented product;
d. before and after any double ampersand (&&) to separate differing types of information (see Section 5.4);
e. before and after the double dollar ($$) (see Section 5.8 and NWSI 10-1702, Section 4); and
f. before and after any Call-to-Action markers (see Section 5.5).

3.7 Universal Geographic Code (UGC). The purposes of the UGC are to specify (1) the affected geographic area of the event, typically by state, county, or parish (the "C" form of UGC, see Section 4.3.3), or unique NWS zone (land and/or marine - the "Z" form of UGC): and (2) the product expiration time. The only exception to (1) above is to define the weather synopsis of certain marine products (see NWSI 10-302, *Marine and Coastal Services Areas of Responsibility*). To use NWS information and codes, such as the UGC and VTEC, effectively, it is important to understand the definitions in Sections 3.9.1 and 3.9.2 below. Depending on the class of the product as defined in Product Specification documents, the UGC is placed within the product in one of two ways:

a. For non-segmented products, UGC will appear on the line immediately after the AWIPS Product Identifier with no intervening blank line or plain language geographic names, but followed immediately by any VTEC string(s) if required (see Section 4.1); or

b. For segmented products (normally multi-segments within one product header, i.e., under one AWIPS Product Identifier - see Section 3.9.1.b below), UGC will appear at the beginning of each segment's narrative text, followed by (if required): any VTEC string(s); plain language geographic names, including optional two-letter state IDs as needed for clarity (see examples in Section 4.3.5); and a repeat of the issuance date/timeline. See Section 4.3 for more information on segmented products. Note that the first segment (and its UGC) will immediately follow the MND Block and a blank line (see Section 4.2). See NWSI 10-1702 for a complete discussion of the rules and formats of the UGC.

3.8 Valid Time Event Code (VTEC)

The VTEC is used in event-driven NWS text products (primarily hydrometeorological watches, warnings, and advisories) as an aid in product parsing by users. The purpose of the VTEC is to identify the "what" and "when" of an event, specifically whether:

- Event is operational, experimental, or a test
- Action being performed on the event with the product issuance
- Issuing office
- Event phenomenon and significance level
- Tracking number
- Beginning and ending time.

Additional hydrologic VTEC information is included for many flood events. For both segmented and non-segmented products, the VTEC (when used) will appear on the line(s) immediately following each UGC string.

See NWSI 10-1703 for a complete discussion of the rules and formats for VTEC.

3.9 Events, Segments, and Products.

3.9.1 Definitions. To use text product formats and codes properly, it is important to understand the distinction between an "event," a "segment," and a "product."

a. **Event**: A specific combination of phenomenon (e.g., type of weather or flood) and level of significance (e.g., Watch, Warning, Advisory). Common examples of events include Tornado Warning, Winter Storm Watch, Wind Advisory, Flood Warning, and Special Marine Warning. See NWSI 10-1703 for a list of hydrometeorological phenomena and significance levels.

b. **Segment**: Each segment (of a segmented product) consists of routine or event-driven weather, water resources, marine or other information that uniquely applies to a geographic area.* The area typically includes one or more counties or NWS land or marine zones. The segment format includes the UGC string, and as may be appropriate: any VTEC; any UGC-associated plain language geographic names (not included in non-segmented products); and a repeat of the Date/Timeline. Note that while in certain cases a segmented product may contain only a single segment, the segmented formatting rules still apply.

   * An exception: Certain water resources products that cover large areas or have multiple forecast points within the same county or zone may have segments describing differing events for the same geographic area. See NWSI 10-922, *Weather Forecast Office Water Resources Products Specification*, for more information.

c. **Product**: The entire segmented or non-segmented message issued to the public under a single MND header, which may include information on one or more events.

Note that the product for a short duration event (typically non-segmented) generally has the same title as the name of the event itself, e.g., Tornado Warning. Many long-duration Watch/Warning/Advisory (W/W/A) products, however, can include more than one type of event and therefore have a different title than the event names included in them, e.g., Winter Storm Warnings, Watches and Advisories (WSW) is the product title and can include a variety of winter events, such as a Winter Storm Warning and/or a Freezing Rain Advisory.

For example, if "heat" is the phenomenon and "advisory" is the significance level, then a "Heat Advisory" is the event, and the public receives the information by the Non-Precipitation Weather (NPW) product.

Similarly, a Blizzard Warning and a Lake Effect Snow Advisory are each events. The public receives the information for either event (or both, if they are occurring within the same geographical area [i.e., zone or county]) in a WSW product. If each event were for a different geographic area, then the WSW would be issued with two segments.

3.9.2 Product Expiration Time versus Event Ending Time.

a. **Product Expiration Time:** Also referred to as the product purge time. Found at the end of the UGC string for an event, it is the time at which the product or product segment should no longer be used. In long-duration W/W/A products and for ongoing events, the product expiration time is the latest time when product users can expect to receive an updated product. For advisories, watches, and warnings, the product expiration time should not exceed 24 hours from the time of issuance. Failure to update the product prior to the product expiration time will result in significant dissemination issues. In VTEC and Common Alerting Protocol (CAP) the event becomes "orphaned", a situation in which the event is still valid but the associated product has expired without being updated. Some automated processing systems of VTEC and CAP operated by dissemination partners will end the event when an unexpired product does not exist. If a product describing the event is later generated, it will not be properly distributed by dissemination partners.

b. **Event Ending Time**: It is the time when the event is no longer valid for a given area (i.e., when the W/W/A conditions are no longer expected to occur). This time will be found within the narrative part of the product and, in coded format, in the last group of the Primary- or P-VTEC string for products containing VTEC. For most W/W/A products that are valid for less than six hours, the Event Ending Time will often be the same as the Product Expiration Time. For events valid "Until Further Notice," either where the ending time cannot yet be specified (as with very long duration flooding) or is defined as open-ended (as with tropical cyclones), the P-VTEC Event Ending Time will be coded as zeros. See NWSI and individual Product Specifications for further details.

3.9.3 Time Zone Indicators. Time zone indicators <*tz*> will be used in NWS text products in the following situations:

a. After the explicit time(s) given in the Issuance Date/Time Line of MND and segment header blocks. See Sections 4.2.5 and 4.3.4.
b. In product headlines when explicit beginning or ending times are given. See Appendix A, Section 1.1.
c. After all explicit times in the body of short duration warnings.
d. Whenever explicit times from two or more different time zones are mentioned in the same product segment.
e. Elsewhere, when required by the governing Product Specification.

Time zone indicators may be used in other situations when they would make the time reference more clear to those using the product.

Time zone indicators will take the form

<*time*>_AM_<*tz*> or **<*time*>_PM_<*tz*>** or **<*time*>_UTC**

where

<time> refers to the specific hour, and minutes when included; and
<tz> refers to the time zone indicator, which is listed in Table 2.

Table 2: Time Zone Names and Indicators <tz> Used in NWS Text Products

Time Zone Name	Standard		Daylight (if used)	
	Indicator	Difference from UTC, in hours	Indicator	Difference from UTC, in hours
Coordinated Universal Time	**UTC** [1]			
Atlantic	**AST**	UTC-4		
Eastern	**EST**	UTC-5	**EDT**	UTC-4
Central	**CST**	UTC-6	**CDT**	UTC-5
Mountain	**MST**	UTC-7	**MDT**	UTC-6
Pacific	**PST**	UTC-8	**PDT**	UTC-7
Alaska	**AKST**	UTC-9	**AKDT** [2]	UTC-8
Hawaii	**HST**	UTC-10		
Samoa	**SST**	UTC-11		
Chamarro (Guam and the Northern Marianas)	**CHST**	UTC+10		

Notes:
1 - The time zone indicator `Z` may appear in lieu of `UTC` in the **body** of certain national and international products that span multiple time zones.

See Section 5.2 and Appendix A, Section 1.2 for special rules regarding the use of **NOON** and **MIDNIGHT** in text and in long duration product headlines, respectively.

3.9.4 Multiple Time Zones Within W/W/A Products. Multiple time zone indicators should be avoided in watch, warning, and advisory (W/W/A) products (including follow-up statements), in order to prevent misunderstanding by users of the products. This is especially true when dealing with short duration warnings that mention specific times when the weather hazard will arrive at various locations (i.e., pathcast). However, since the county warning areas of some WFOs span multiple time zones, this is not always possible.

The following rules will apply to all WFO W/W/A products as well as NWS National Center W/W/A products that span multiple time zones and are issued using local time zones (and not UTC):

a. If a W/W/A product segment or a non-segmented W/W/A product is confined to a single time zone, multiple time zones should not be mentioned in the body of the text or in any headline, even if the issuing office is in a different time zone. For

consistency, the Segment Header Issuance Date/Time Line (in segmented products) and/or the MND Issuance Date/Time Line (in both segmented and non-segmented products) should reference the same time zone used in the body of the segment and/or product.

b. If a W/W/A product segment or a non-segmented W/W/A product encompasses multiple time zones, whenever a specific time is mentioned in the body of the text or in any headline, the other time zone(s) will appear immediately after that time and a space, and surrounded by forward slashes, in the format:

<*time*>_xM_<*tz1*>_/<*time*>_xM_<*tz2*>/

where

<*time*> - specific hour, and minutes when included
xM - **AM** or **PM**
<*tz1*> and **<*tz2*>** - time zone indicators, as shown in Table 2

c. If a W/W/A product segment encompasses multiple time zones, the Segment Header Issuance Date/Time Line (in segmented products) will either use both (in the case of two) time zones in the following format

<*time*>_xM_<*tz1*>_day_mon_<*dd*>_year_/<*time*>_xM_<*tz2*>_day_mon_<*dd*>_year/

where

<*time*> - specific hour, and minutes when included
xM - **AM** or **PM**
<*tz1*> and **<*tz2*>** - time zone indicators, as shown in Table 2
day - three letter abbreviation of the day of the week
mon - three letter abbreviation of the month
<*dd*> - one- or two-digit date, without any leading zeros
year - four digit year
/ - separator

or else use only the time zone in effect at the issuing office (when the product segment includes two or more time zones).

d. If a W/W/A product (segmented or non-segmented) encompasses multiple time zones, the MND Issuance Date/Time Line should use the time zone in effect at the issuing office.

These rules are summarized in Table 3.

Table 3: Use of Multiple Time Zones in W/W/A Products

This table shows how specific time references should be handled in both segmented and non-segmented Watch, Warning, Advisory (W/W/A) products.

	Segmented						Non-Segmented		
	segment body	Segment headline	segment header	overview body	overview headline	MND date/time line	product body	product headline	MND date/time line
Single time zone in segment Single time zone in product	segment	segment	segment	product	product	product	product	product	product
Single time zone in segment Multiple time zones in product	segment	segment	segment	all	all	office			
Multiple time zones in segment Multiple time zones in product	all	all	both or office	all	all	office	all	all	office

KEY:
segment - the time zone of the geographic area covered by the product segment
product - the time zone of the geographic area covered by the product
all - all of the time zones of the geographic area covered by the product or product segment
both - both of the two time zones of the geographic area covered by the product or product segment
office - the time zone at the location of the issuing office

4. Product Header Blocks. This section provides information on the construction and appearance of the specific format blocks of text products. Appendix B presents completed generic examples of formats (generally without specific text information), including an information key for each example.

4.1 Advanced Weather Interactive Processing System (AWIPS) Product Identifier. The following subsections provide the rules for each line of the AWIPS Product Identifier. The AWIPS Product Identifier begins all products and consists of:

a. Start-of-message code (Section 4.1.1),
b. WMO abbreviated heading (Section 4.1.2), and
c. AWIPS Identifier (AI) (Section 4.1.3).

See Section 4.1.4 for examples of AWIPS Product Identifiers. They are also included in every example in Appendix B.

The AWIPS Product Identifier uniquely identifies the specific product, the area to which it applies, the originating office, and the product issuance time. AWIPS produces these fields automatically from information derived from operator input.

Note: In non-segmented products, any UGC string would occur immediately after the AWIPS Product Identifier without any intervening blank line; and any VTEC string(s) would be placed on line(s) immediately below the UGC. The UGC and VTEC are not part of the AWIPS Product Identifier.

For explanations, examples, product lists, and details on the structure of the AWIPS Product Identifier, see the Office of the Chief Information Officer (OCIO) document:

> "NWS Communications Header Policy Document" which can be found at the NWS Telecommunications Operations Center website.

4.1.1 Start-of-Message Code. This is sometimes called the Communications Header. All complete product examples in this document will use the double pound sign (##) to indicate the start-of-message code. These codes may be visible on certain user devices, but are not visible on AWIPS. See communications documents for specific dissemination systems' printable and non-printable start-of-message codes. They are available at: https://www.weather.gov/tg/ or, specifically for the NWWS, on the website mentioned in Section 1.

4.1.2 World Meteorological Organization (WMO) Abbreviated Heading. Table 4 describes the format for the WMO abbreviated heading.

Table 4: Format of the WMO Abbreviated Heading

The WMO abbreviated heading is in the form:

`ttaaii_cccc_ddhhmm_bbb`

where:

Code Group	Meaning
`ttaaii`	data type/location, defined in WMO Manual 386, where: **`tt`** two letters, signifying Data type and/or Form Designators **`aa`** two letters, signifying Geographical and/or Data Type and/or Time Designators; **`ii`** two numbers, used to differentiate two or more bulletins with the same code, or from the same area or center. **`ii`** = **`01`** to **`19`** for global distribution **`ii`** = **`20`** to **`39`** for regional or interregional distribution **`ii`** = **`40`** to **`89`** for national or bilaterally agreed distribution **`ii`** = **`90`** to **`99`** reserved
`cccc`	International 4-letter identifier of issuing office, e.g., **`KLWX`** for WFO Sterling, Virginia
`ddhhmm`	product issuance date/time in UTC, where: **`dd`** day of the month, including any leading zero **`hh`** hour, including any leading zero **`mm`** minute, including any leading zero
`bbb` (used as appropriate)	designator has two purposes: (1) to differentiate between the original transmission of a product and any retransmissions due to: amendments or updates; corrections; product delays; or multiple products of the same type within the same minute; all of which would otherwise have identical WMO headings; and (2) to identify the reason for the retransmission, as shown immediately below. If amended or updated, **`bbb`** = **`AAx`** If corrected, **`bbb`** = **`CCx`** If delayed, or if the particular WMO header with that issuance time (i.e., the same hour and minute) has already been used, **`bbb`** = **`RRx`** In all cases, **`x = A, B, C...X`**, i.e., **`AAA`** = first amendment or update to the same product; **`CCB`** = second correction to the issuance of the same product, etc., through **`X`** if needed. After **`X`**, **`Z`** should be used for each additional case. More information on using the **`bbb`** group is in Section 4.2.2.

4.1.3 AWIPS Identifier (AI). Table 5 describes the format of the AI.

Table 5: Format of the AWIPS Identifier

The AI is in the form:

nnnxxx

where:

Code Group	Meaning
nnn	specific product category (will be three characters)
xxx	three-character NWS Location Identifier (NWSLI) that gives the originating office or the area designator. This **xxx** field will contain 3 characters. If only one or two characters are printable, the field will be left justified with the trailing spaces added.

4.1.4 Examples of AWIPS Product Identifiers.

a. Zone Forecast Product (ZFP) issued by WFO Baltimore/Washington (KLWX) on February 11, 2007 at 0924 UTC. Note that the month and year do NOT appear in the AWIPS Product Identifier. They will be determined from the MND Header Block (Section 4.2) or Segment Header Block (Section 4.3), if included.

```
##                      (appropriate start-of-message communications code)
FPUS51_KLWX_110924      (WMO abbreviated heading)
ZFPLWX                  (AI)
```

b. Corrected Public Severe Thunderstorm Watch Notification Message (SEL) for Watch Number 240 issued by the NWS Storm Prediction Center (KWNS) in Norman Oklahoma on April 26, 2008. The original product was issued at 0434 UTC, and the first correction was sent at a later time that would be reflected in any MND or segment header block. Note the two spaces at the end of the AI (shown as a long continuous dash below) to make it six characters long.

```
##
WWUS20 KWNS 270434 CCA
SEL0__
```

4.2 Mass News Disseminator (MND) Header Block. The following subsections provide the rules for each line of the MND header block. The MND header block consists of:

a. a broadcast instruction line (as appropriate, Section 4.2.1),
b. a product type line (Section 4.2.2),
c. an issuing office line (Sections 4.2.3 and 4.2.4), and
d. an issuance date/time line (Section 4.2.5).

See Section 4.2.6 for examples of MND header blocks. MND header blocks are also included in every example in Appendix B.

4.2.1 Broadcast Instruction Line (as appropriate). Many potentially life-threatening warning, watch or other hazard products contain a broadcast instruction line, to indicate to broadcasters and other users the importance of the message. The broadcast instruction line may be included in products originated by the NWS as well as in non-weather-related emergency messages relayed by the NWS at the request of the external authorizing government agency. The broadcast instruction line in NWS products typically includes one of the following phrases, in descending order of urgency:

- BULLETIN_-_EAS_ACTIVATION_REQUESTED
- BULLETIN_-_IMMEDIATE_BROADCAST_REQUESTED
- URGENT_-_IMMEDIATE_BROADCAST_REQUESTED
- URGENT_-_WINTER_WEATHER_MESSAGE
- URGENT_-_WEATHER_MESSAGE

Note that the use of the phrases EAS_ACTIVATION_REQUESTED or IMMEDIATE_BROADCAST_REQUESTED is at the discretion of state and local Emergency Alert System (EAS) plans, and that the space dash space (_-_) separates BULLETIN or URGENT from any other instructions in that line.

The use of BULLETIN and URGENT follows the convention established by the print and electronic media. These terms signify levels of dissemination urgency. The NWS uses only BULLETIN and URGENT in weather-related messages, but other instructions may be used at the request of the external authorizing government agency in non-weather-related emergency messages. The complete list of broadcast instructions for non-weather-related messages is given in Table 6.

Table 6: Broadcast Instructions for Non-Weather-Related Messages

Broadcast Instruction	Use of Instruction
FLASH_-_	only for world changing events, such as a Presidential assassination
BULLETIN_-_	when the information is sufficiently urgent to warrant breaking into the normal broadcast
URGENT_-_	when the information may wait until a “stop-set” (break in the broadcast routine)
REGULAR_-_	when the information should be broadcast at regular news times
HOLD_-_	not broadcast at this time; may be upgraded or updated with a higher priority later

4.2.2 Product Type Line. This MND line contains the name of the specific product being issued, e.g., ZONE_FORECAST, STATE_WEATHER_ROUNDUP, TROPICAL_CYCLONE_DISCUSSION, SPECIAL_MARINE_WARNING, FLOOD_WARNING. The Product Type Line should be limited to one line (an exception is given in the first note in Table 7 below) and should be used consistently, according to individual Product Specification documents. The only permitted punctuation mark is the ellipsis (...), which is used with the additional terms in Table 7 below.

Table 7 lists additional terms that may be included in the Product Type Line. The first five will appear at the end of the Product Type Line, while TEST and EXPERIMENTAL will appear in

different locations in the Product Type Line. (Any other additional terms are defined in appropriate NWS Product Specification documents.)
The WMO abbreviated header is discussed in Section 4.1.2. Additional information on test and practice wording is discussed in Section 7.

Table 7: Additional Terms Included in the Product Type Line

Situation	Product Type Line Format	BBB Field	Issuance Time included in the:		For an example see
			WMO abbreviated heading	MND date-time line	
Updated or Amended	<*product name*>**...UPDATED** or <*product name*>**...AMENDED**	**AAx**	original	current	Appendix B Example 4
Corrected	<*product name*>**...CORRECTED**	**CCx**	original	current	Appendix B Example 5
Corrected Update	<*product name*>**...CORRECTED UPDATE**	**CCx**	original	current	Section 4.2.6.b
Resent (retransmitted)	<*product name*>**...RESENT**	none	original	original	Section 4.2.6.c
Delayed	<*product name*>**...DELAYED**	**RRx**	original	current	
Test or Practice	**TEST...**<*product name*>**...TEST**	none	current	current	Appendix B Example 3
Experimental	**EXPERIMENTAL...**<*product name*>	none	current	current	

Notes:
- In rare instances, especially when including one of the additional terms listed above, the Product Type Line may be too long to fit on one line. In such a case, the additional text will appear, left-justified, on the next line. See Section 4.2.6.e, Example.

- It is optional, but serves the product user well, to provide a brief reason for the action using the appropriate term above, typically in one line, and left justified. This "reason-for-the-action" line should always begin with `CORRECTED`, `UPDATED` or `AMENDED`, etc., as indicated in respective Product Specification documents. Insert a blank line before and after this "reason" line, to make it more visible from the rest of the content block. Do **NOT** begin or end this line with an ellipsis so that the line is not used as a standard headline to trigger media display (see Section 5.1). Placement of the "reason" line should occur after the MND block and a blank line in non-segmented products, and after the segment header block (see Section 4.3) and a blank line (before the text) of any appropriate segments within a segmented product (see Appendix B and NWSI 10-1702 for more details). For example:

```
UPDATED_WIND_SPEED_AND_DIRECTION_FOR_THIS_AFTERNOON
```

- See Table 4 for an additional use of the `RRx` BBB field that does not involve additional terms in the Product Type Line.

4.2.3 Issuing Office Line. For field offices, this MND line contains the words `NATIONAL_WEATHER_SERVICE` followed by the issuing office's city <*city*> (or other regionally approved name) and state. Use the standard U.S. Postal Service two-letter state abbreviation `ss`. National Centers should use the acronym `NWS` followed by the National Center's name and <*city*>`_ss`. The issuing office information should be on one line.

Examples of field office line:
(1) NATIONAL_WEATHER_SERVICE_BOISE_ID

(2) NATIONAL_WEATHER_SERVICE_KANSAS_CITY/PLEASANT_HILL_MO

Examples of National Center line:
(1) NWS_WEATHER_PREDICTION_CENTER_COLLEGE_PARK_MD

(2) NWS_STORM_PREDICTION_CENTER_NORMAN_OK

4.2.4 Multiple Issuing Office Lines. There are a few instances when a product or product segment will include two issuing office lines in a single MND header block.

a. When a product is issued by a backup office, two "issuing office" lines are included in the MND header block. The first includes the office with the primary responsibility (which cannot issue the product) as described above; the second line begins with ISSUED_BY immediately followed by the backup office name. (The AWIPS Product Identifier is that of the primary office.) The following format is used:

NATIONAL_WEATHER_SERVICE_<*city*>_ss	(primary office)
ISSUED_BY_NATIONAL_WEATHER_SERVICE_<*city*>_ss	(backup office)

b. When a non-weather-related emergency message is originated by an external agency, but disseminated by an NWS office, two "issuing office" lines are included in the MND header block. The first includes the external agency information; the second line begins with RELAYED_BY immediately followed by the NWS office name. The following format is used:

<*external_agency*>_<*city/county/or state name*>_ss
RELAYED_BY_NATIONAL_WEATHER_SERVICE_<*city*>_ss

See Section 4.2.6.d for an example:

4.2.5 Issuance Date/Time Line. Table 8 shows the format of the MND Issuance Date/Time Line.

Table 8: Format of the MND Issuance Date/Time Line

The MND Issuance Date/Time line is in the form:

<*hhmm*>_xM_<*tz*>_day_mon_<*dd*>_year

or

<*hhmm*>_UTC_day_mon_<*dd*>_year

where:

Code Group	Meaning
<*hhmm*>	Issuance time in hours and minutes. The minutes digits are required. When local time is used, leading zeros are not used (e.g., 9:00 a.m. is formatted as 900_AM). For certain national products, UTC may be used. UTC times will be expressed as four digits (e.g., 0900_UTC).
xM	For local time, either **AM** or **PM**. Noon is expressed as **1200_PM**, while midnight is expressed as 1200_**AM**. Not used with UTC.
<*tz*>	Time zone indicator. See Table 2.
day	Three letter abbreviation of the day of the week, i.e., **SUN**, **MON**, **TUE**, **WED**, **THU**, **FRI**, **SAT**.
mon	Three letter abbreviation of the month, i.e., **JAN**, **FEB**, **MAR**, **APR**, **MAY**, **JUN**, **JUL**, **AUG**, **SEP**, **OCT**, **NOV**, **DEC**.
<*dd*>	Date. Leading zeros are not used.
year	Year, expressed in four digits.

4.2.6 Examples of MND Blocks. Following are examples of MND header blocks. An identification key of each MND line is included with the first example.

a. Test Warning product including Broadcast Instruction Line.

```
BULLETIN_-_EAS_ACTIVATION_REQUESTED          (Broadcast instruction)
TEST...TORNADO_WARNING...TEST                (Product type)
NATIONAL_WEATHER_SERVICE_ABERDEEN_SD         (Issuing office)
654_PM_CDT_THU_APR_24_2008                   (Issuance date/time - local time)
```

b. Corrected Update product.

```
AREA_FORECAST_DISCUSSION...CORRECTED_UPDATE
NATIONAL_WEATHER_SERVICE_GRAND_RAPIDS_MI
345_PM_EDT_THU_MAY_1_2008
```

c. Resent product.

```
PUBLIC_INFORMATION_STATEMENT...RESENT
NATIONAL_WEATHER_SERVICE_JACKSON_KY
500_AM_EDT_WED_AUG_27_2008
```

d. Product originated by an external agency.

```
BULLETIN_-_EAS_ACTIVATION_REQUESTED
```

```
FIRE_WARNING
TEXAS_EMERGENCY_MANAGEMENT_AGENCY_LUBBOCK_TX
RELAYED_BY_NATIONAL_WEATHER_SERVICE_LUBBOCK_TX
402_PM_CST_MON_JAN_28_2008
```

e. Product type line too long to fit on one line.

```
ZONE_FORECAST_PRODUCT_FOR_CENTRAL_SOUTH_CAROLINA_AND_EAST_
CENTRAL_GEORGIA...UPDATED
NATIONAL_WEATHER_SERVICE_COLUMBIA_SC
518_AM_EDT_TUE_SEP_30_2008
```

f. National Center product with date/time line in UTC.

```
LATIN_AMERICAN_TEMP_AND_WEATHER_TABLE
NWS_TELECOMMUNICATION_OPERATIONS_CENTER_SILVER_SPRING_MD
0000_UTC_SUN_JUN_1_2008
```

4.3 Segment Header Block. Segmented products will contain a segment header block, which defines the valid area, valid time period, and in some cases valid event(s) described in that particular product segment. A segment header block consists of:

a. UGC string (Section 4.3.1),
b. VTEC string(s) (as appropriate, Section 4.3.2),
c. UGC associated plain language names (as appropriate, Section 4.3.3), and
d. Issuing date/time line (as appropriate, Section 4.3.4).

Refer to the appropriate Product Specification to get the requirements for individual products. See Section 4.3.5 for examples of segment header blocks. They are also included in the segmented examples (4, 5, and 6) in Appendix B.

4.3.1 UGC String. The UGC string will be the first line(s) of the product segment. See NWSI 10-1702 for a complete discussion on the rules and formats of the UGC. Refer to the relevant Product Specification document for the type of UGC (zone or county based) used in a given product type.

4.3.2 VTEC String(s) (as appropriate). VTEC string(s) normally appear in event-driven water resources products (warnings, watches, advisories, and some statements). The VTEC, when it appears in a product, will always be located on the line(s) immediately following the UGC string. See NWSI 10-1703 for a complete discussion on the rules and formats of the VTEC, as well as links to tables listing the specific product types that will contain it.

4.3.3 UGC Associated Plain Language Names (as appropriate). The plain language names, when included, will consist of zone name(s) or county, parish, and/or independent city name(s), depending on whether the Z or C form of UGC is used in the product. The names will be separated by a hyphen (-). In either case, the two letter state postal code abbreviation may be appended (after a space) if multiple states are referenced in the product or if the same zone/county name appears in multiple states in the area. Refer to the appropriate Product Specification documents for the rules and requirements for a given product type.

Additionally, individual cities located in the zone(s) or county(s) of the product segment may be mentioned beginning on the line following the last line of zone or county names, and will begin with the leading phrase "`INCLUDING_THE_CITIES_OF...`" (or the phrase "`INCLUDING_THE_CITY_OF...`" for a single city). Multiple city names will be separated by an ellipsis (`...`). The city names may have the two letter state postal codes appended to them (after a space).

Examples of plain language names are in Section 4.3.5 and in Examples 4 and 5 in Appendix B.

4.3.4 Issuance Date/Time Line (as appropriate). The content of the segment header block issuance date/time line, when included, normally will be the same as in the MND block issuance date/time line. Refer to Section 4.2.5 for more information.

A difference may occur when the product segment covers multiple time zones. In such a case, the segment header block issuance date/time line may include up to two different time zones, in the format:

`<`*hhmm*`>_xM_<`*tz1*`>_day_mon_<`*dd*`>_year_/<`*hhmm*`>_xM_<`*tz2*`>_day_mon_<`*dd*`>_year/`

where the data elements are the same as in Table 8, except that `<`*tz1*`>` refers to the first time zone indicator and `<`*tz2*`>` refers to the second time zone indicator. No more than two time zones should be included in the segment header block issuance date/time line. If there are more than two time zones covered by a product segment, the single time zone of the location of the issuing office should be used.

4.3.5 Examples of Segment Header Blocks. Here are examples showing some of the variations of information included in segment header blocks. An identification key of each section is included with the first example.

a. Complete Segment Header Block. This long duration W/W/A product (Flood Watch) contains UGC, two VTEC strings (the second being H-VTEC [hydrologic]), long lists of plain language zone and city names, and a date-time line with two time zones.

```
INZ076>079-083-084-089>092-KYZ023>043-045>049-053>057-     (UGC)
061>067-070>078-081-082-130930-
/O.CON.KLMK.FA.A.0001.000000T0000Z-070115T0900Z/           (VTEC)
/00000.0.ER.000000T0000Z.000000T0000Z.000000T0000Z.OO/
ORANGE_IN-WASHINGTON_IN-SCOTT_IN-JEFFERSON_IN-DUBOIS_IN-   (zones)
CRAWFORD_IN-PERRY_IN-HARRISON_IN-FLOYD_IN-CLARK_IN-HANCOCK_KY-
BRECKINRIDGE_KY-MEADE_KY-OHIO_KY-GRAYSON_KY-HARDIN_KY-BULLITT_KY-
JEFFERSON_KY-OLDHAM_KY-TRIMBLE_KY-HENRY_KY-SHELBY_KY-FRANKLIN_KY-
SCOTT_KY-HARRISON_KY-SPENCER_KY-ANDERSON_KY-WOODFORD_KY-
FAYETTE_KY-BOURBON_KY-NICHOLAS_KY-NELSON_KY-WASHINGTON_KY-
MERCER_KY-JESSAMINE_KY-CLARK_KY-LARUE_KY-MARION_KY-BOYLE_KY-
GARRARD_KY-MADISON_KY-BUTLER_KY-EDMONSON_KY-HART_KY-GREEN_KY-
TAYLOR_KY-CASEY_KY-LINCOLN_KY-LOGAN_KY-WARREN_KY-SIMPSON_KY-
ALLEN_KY-BARREN_KY-MONROE_KY-METCALFE_KY-ADAIR_KY-RUSSELL_KY-
CUMBERLAND_KY-CLINTON_KY-
INCLUDING_THE_CITIES_OF...PAOLI...SALEM...SCOTTSBURG...    (cities)
MADISON...JASPER...MARENGO...TELL_CITY...CORYDON...NEW_ALBANY...
JEFFERSONVILLE...HAWESVILLE...HARDINSBURG...BRANDENBURG...
BEAVER_DAM...LEITCHFIELD...ELIZABETHTOWN...FORT_KNOX...
MOUNT_WASHINGTON...SHEPHERDSVILLE...LOUISVILLE...LA_GRANGE...
BEDFORD...NEW_CASTLE...SHELBYVILLE...FRANKFORT...GEORGETOWN...
CYNTHIANA...TAYLORSVILLE...LAWRENCEBURG...VERSAILLES...
LEXINGTON...PARIS...CARLISLE...BARDSTOWN...SPRINGFIELD...
HARRODSBURG...NICHOLASVILLE...WINCHESTER...HODGENVILLE...
LEBANON...DANVILLE...LANCASTER...RICHMOND...MORGANTOWN...
BROWNSVILLE...MUNFORDVILLE...GREENSBURG...CAMPBELLSVILLE...
LIBERTY...STANFORD...RUSSELLVILLE...BOWLING_GREEN...FRANKLIN...
SCOTTSVILLE...GLASGOW...TOMPKINSVILLE...EDMONTON...COLUMBIA...
JAMESTOWN...BURKESVILLE...ALBANY
953_PM_EST_FRI_JAN_12_2007_/853_PM_CST_FRI_JAN_12_2007/    (date-time)
```

b. Complete Block, but Without Plain Language City Names. The segment header block for this short duration warning follow-up statement includes UGC and VTEC strings, plain language zone names (but not city names), and a date-time line.

```
TXC101-345-091525-
/O.CAN.KLUB.SV.W.0004.000000T0000Z-080409T1530Z/
MOTLEY_TX-COTTLE_TX-
1015_AM_CDT_WED_APR_9_2008
```

c. UGC, Plain Language Zone and City Names and Date-Time Line, but no VTEC. The segment header block from this Zone Forecast product does not contain VTEC, but uses the `INCLUDING_THE_CITIES_OF` line with plain language city names.

```
MEZ002-200600-
NORTHEAST_AROOSTOOK-
INCLUDING_THE_CITIES_OF...PRESQUE_ISLE...CARIBOU...VAN_BUREN...
MARS_HILL
1156_AM_EDT_MON_MAY_19_2008
```

d. UGC, VTEC, and Date-Time Line Only. This segment header block from a National Hurricane Center Tropical Cyclone VTEC (TCV) product contains UGC, two VTEC strings, and the date/time line. The place names are included in

the body of the segment.

```
LAZ051-TXZ215-130900-
/O.CAN.KNHC.TR.W.1009.000000T0000Z-000000T0000Z/
/O.NEW.KNHC.HU.W.1009.070913T0515Z-000000T0000Z/
1215_AM_CDT_THU_SEP_13_2007
```

e. UGC and Date-Time Line Only. This segment header from the Synopsis of a Coastal Waters Forecast contains just UGC and a date/time line.

```
PZZ100-252245-
905_AM_PDT_SUN_MAY_25_2008
```

f. UGC and VTEC only. The segment header block from this Watch Outline Update (WOU) product, issued by the NWS Storm Prediction Center, contains only UGC and VTEC. The plain language place names are included in the body of the segment, so are not included in the segment header block.

```
TNC017-023-033-039-045-047-053-069-071-075-077-079-095-097-109-
113-131-157-167-183-060600-
/O.NEW.KWNS.TO.A.0037.080205T2110Z-080206T0600Z/
```

5. Product Content Block. The product content block, or product body, is the main informational part of any non-segmented or segmented product and occurs after the MND block and a blank line and before the communications trailer code.

The content block for each segment within a segmented product is defined as containing the following items generally in this order:

a. The Segment Header Block (see Section 4.3) that includes:
   (1) UGC string;
   (2) VTEC string(s), as appropriate;
   (3) UGC associated plain language names, as appropriate;
   (4) Issuance date/time line, as appropriate;
b. All text information (defined as a subset of the Product Content Block), which includes the following:
   (1) Headlines and/or other plain language headline-type information, such as a “reason for the update” line or a synopsis occurring before the main narrative and/or data;
   (2) Narrative and/or data provided in the product and described in the respective Product Specification documents;
c. Optional double ampersand && (see Section 5.4)
d. Call-to-Action statement(s) and markers, when required (see Section 5.5)
e. Latitude-longitude information, when required (see Section 5.6)
f. Time-motion-location markers, when required (see Section 5.7)
g. Double dollar $$ (see Section 5.8)
h. Equal sign = when required (see Section 2.2).

Non-segmented products will contain all the same items, except for the explicit Segment Header Block. Any UGC or VTEC strings would appear immediately below the AWIPS Product Identifier (see Section 4.1).

Content will vary according to the individual product or class of products as described in the respective Product Specification documents.

5.1 Headlines. One or more headlines, as appropriate, may begin the narrative/data part of the product content block. This would be after the Segment Header Block in a segmented product and after the MND in a non-segmented product. Each headline will be on a separate line (or lines) and be preceded and followed by an ellipsis. When including multiple headlines, the most important event should be listed first, unless the Product Specification document specifies otherwise. Second and subsequent lines of headlines will be left-justified.

Headlines should normally include the "what" and "when" (or time inference) of the event. The "where" should only be included if the headline does not apply to the entire area of the segment or product. A blank line will separate any headline(s) from the rest of the content block. Example (1) uses one headline. Example (2) uses two headlines, with the more important event listed first. Example (3) limits the hazard to a certain part of the UGC-defined product or segment area.

Examples:

(1)
```
...WINTER_STORM_WATCH_REMAINS_IN_EFFECT_FROM_THURSDAY_EVENING_
THROUGH_FRIDAY_AFTERNOON...
```

(2)
```
...WINTER_STORM_WARNING_IN_EFFECT_UNTIL_11_PM_MST_TONIGHT...
...WIND_CHILL_ADVISORY_NOW_IN_EFFECT_UNTIL_11_PM_MST_FRIDAY_NIGHT...
```

(3)
```
...WINTER WEATHER_ADVISORY_IN_EFFECT_FROM_MIDNIGHT_TONIGHT_TO_2_PM_
PST_TUESDAY_ABOVE_3500_FEET...
```

See Appendix A for standardized headline instructions for long duration products. Refer to individual Product Specification documents for details of headlines used in other products.

5.2 Explicit Time-of-Day References in Text. When explicit times of day are referenced in product text, the following rules will apply:

a. The explicit time of day will be expressed in the general format:

<*hhmm*>_xM_<*tz*> or **<*hhmm*>_UTC**

where

<***hhmm***> hours and minutes. Leading zeros in the hour should be dropped, and times in whole hours need not include the minutes, unless other non-whole hour times are mentioned elsewhere in the text or headline(s) of the product.

xM either **AM** or **PM**. See below for special rules regarding NOON and MIDNIGHT. Not used with UTC.

<tz> optional time zone indicator. See values for ***<tz>*** in Table 2. The time zone indicator need not be mentioned unless:

(1) the product is a short duration warning (where it is always required)

(2) more than one time zone is mentioned in the product segment or non-segmented product (see Section 3.9.4); or

(3) not including the time zone indicator might cause confusion or misunderstanding by users of the product.

b. A calendar day time phrase (e.g., **THIS_MORNING**, **MONDAY_EVENING**) may follow if it clarifies.

c. Use NOON, followed by the day of the week (or TODAY), rather than 12_PM.

d. Use **MIDNIGHT**, followed by ***<day of week>*_NIGHT** or **TONIGHT**, rather than 12_AM.

See also Appendix A, Section 1.2 for specific rules regarding explicit time-of-day terms in headlines of long duration products.

5.3 Bullet Format. Selected NWS text products (primarily short duration warnings), as stipulated in Product Specification documents, use the bullet format to highlight key parts of the text. Following are general rules for use of the bullet format:

a. Use an asterisk (*) at the left-justified margin position to start the first line of each bullet.

b. For the first line of a given bullet, place one space '_' between the asterisk and the start of text. For subsequent lines in the bullet, indent two spaces '__' from the left margin.

c. The length limit for the text that follows a bullet (i.e., number of characters or lines) is given in Product Specification documents.

d. Bullet text should be kept as brief as possible.

5.4 Content-Type Separator Code (Double Ampersand [&&] - Optional). The && code optionally may be used (one or more times) to separate differing kinds of information within the content block of a non-segmented product, or within any segment(s) of a segmented product. The && also may be used in a product that does not include the UGC string. Individual

Product Specification documents will describe the use of the && within a given product type.

Note: The && should be on its own line, left justified, and followed immediately by an end of line (<cr><cr><lf>). A blank line (see Section 3.6) should precede and follow the && before other information is presented, for ease of reading.

5.5 Call-to-Action (CTA) Statement (as appropriate). The CTA is the part of a hazard message that prompts the public to respond with appropriate action, in effect completing the hazard message. A CTA statement may provide actionable or awareness information for any hazard event including those not addressed by a watch, warning or advisory. For example, a CTA may be included in an event cancellation or expiration statement, a Short Term Forecast, or other appropriate product. (The Short Term Forecast will not have CTA markers as described in Section 5.5.1.) The CTA should:

- tell users what can be done to prevent, avoid, or minimize the danger and prompt users to put their severe or adverse weather plans into action;
- reflect the degree of danger posed by the particular event;
- convey as much useful information as possible and be as specific as possible, while also being as brief as possible;
- convey a sense of emergency and urgency that relates to the potential impact of the hazard or event;
- in long duration events, provide a definition of the active watch, warning, or advisory.

Writers of watch, warning, advisory, and follow-up statement products should be concise and clear; especially for watches and warnings that are broadcast automatically on NOAA Weather Radio (NWR) using Specific Area Message Encoding (SAME) and on the Emergency Alert System (EAS). The length of the audio broadcast is limited (FCC and NWS specifications) to two minutes, including tones. The NWR broadcast management system and EAS decoders will truncate any audio message longer than two minutes.

5.5.1 CTA Markers. Certain NWS text products, primarily W/W/A products, will include CTA markers to identify the beginning and end of the CTA statement(s). The format of the CTA markers is shown in Table 9. This practice enables specialized use of CTAs by Partners and other users, and enables NWS production of alert messages in Common Alerting Protocol (CAP). If a CTA consists of more than one sentence, or there is more than one statement, all sentences and paragraphs will be consecutive with only one CTA "beginning" marker and one CTA "ending" marker. The markers will be inserted automatically in NWS W/W/A text by the product generation software.

Table 9: Format of the CTA Markers

The CTA Markers take the following form: *(blank line)* **PRECAUTIONARY/PREPAREDNESS_ACTIONS...** *(blank line)* ***<single- or multi-line text content of call-to-action, instructions, etc.>*** *(blank line, if additional calls-to-action follow)* ***<additional call-to-action, instructions, etc., if needed>*** *(blank line)* **&&** *(blank line)*
Note. The PRECAUTIONARY/PREPAREDNESS ACTIONS... and && character strings are the CTA "beginning" and "ending" markers, respectively. They will be left justified with no other printable characters on the same line of text.

5.5.2 CTA and CTA Marker Usage. The CTA and associated markers will be inserted into each product segment or only in the Overview/Synopsis section of the product, but not in both in a single WMO-formatted text product. There will be only one set of CTA markers in a given product segment or Overview/Synopsis section, even if multiple CTAs are used.

If there is no CTA in a W/W/A product, CTA markers are not included in the product. This occurs most frequently with cancellation or expiration follow-up statements.

Individual Product Specification documents will describe the use of the CTA and the location of the CTA and CTA markers within a given product class or product type.

5.5.3 Examples of CTAs.

a. Multiple CTAs from a long duration Fire Weather Red Flag Warning product. One of the CTAs is the definition of the hazard.

```
PRECAUTIONARY/PREPAREDNESS_ACTIONS...

A_RED_FLAG_WARNING_MEANS_THAT_CRITICAL_FIRE_WEATHER_CONDITIONS_ARE_
EITHER_OCCURRING...OR_WILL_OCCUR_WITHIN_24_HOURS.

PLEASE_REFER_TO_THE_LOCAL_BURN_PERMITTING_AUTHORITIES_ON_WHETHER_
YOU_MAY_BURN_OUTDOORS._IF_YOU_DO_BURN_OUTSIDE...USE_EXTREME_
CAUTION.

PLEASE_ADVISE_THE_APPROPRIATE_OFFICIALS_OR_FIRE_CREWS_IN_THE_FIELD_
OF_THIS_RED_FLAG_WARNING.

&&
```

From the Overview/Synopsis Section of a Flood Warning Product. The format of the CTA markers is the same as when the markers appear in a product segment

```
PRECAUTIONARY/PREPAREDNESS_ACTIONS...

Never drive vehicles through flooded areas. The water may be too
deep to allow safe passage. Never allow children to play in or
near flood waters. Stay tuned to NOAA Weather Radio or local media
for further statements and updated forecasts.

&&
```

b. CTA from a short duration Tornado Warning.

```
PRECAUTIONARY/PREPAREDNESS_ACTIONS...

THIS_IS_AN_EXTREMELY_DANGEROUS_AND_LIFE_THREATENING_SITUATION._A large
tornado has been confirmed. If you are in the path of this destructive
tornado...TAKE COVER IMMEDIATELY in a basement or other underground
shelter and get under something sturdy.

&&
```

5.6 Coded Latitude/Longitude Information (as appropriate). Certain NWS text products, primarily short duration warnings, will include coded latitude/longitude (or lat/lon) information that identifies the valid area or the area of concern of the product or product segment. There are two different formats currently in use with the `LAT...LON` marker, one by WFOs (shown in Table 10) and the other from National Centers (shown in Table 11).

Table 10: Format of coded latitude/longitude information in WFO text products

The latitude/longitude information is in the form:

`LAT...LON_lata_<`*`longa`*`>_latb_<`*`longb`*`>_latc_<`*`longc`*`>` (etc.)

where:

Code Group	Meaning
`LAT...LON`	code indicating the start of the latitude/longitude information
`lata_<`*`longa`*`>` **`latb_<`*`longb`*`>`** **`latc_<`*`longc`*`>`**	coded pairs identifying the latitude and longitude of a single point, in degrees and hundredths. Longitudes of less than 100 degrees will have four digits. East or West longitude is understood by the local office; however, if a given product straddles 180 degrees longitude, those points west of 180 degrees will be given as if they were west longitude; i.e., 179.00 E would be coded as **`18100`**.

Notes:
- The maximum number of points included will be 20.
- Normally there will be four points given per line of text, as needed.
- The last point connects back to the first point.

Table 11: Format of coded latitude/longitude information in National Center text products

The latitude/longitude information is in the form:

LAT...LON<*sp*>latalona_latblonb_latclonc (etc.)

where:

Code Group	Meaning
LAT...LON	code indicating the start of the latitude/longitude information
<*sp*>	one or more spaces
latalona latblonb latclonc	coded pairs identifying the latitude (four digits) and longitude (four digits) of a single point, in degrees and hundredths. Longitudes of greater than 100 degrees will drop the leading 1; i.e., 105.22 W would be coded as **0522**.

Notes:
- The points will proceed either clockwise or counterclockwise, defining a polygon.
- At a minimum, three points (i.e., lat/lon pairs) will be included.
- Normally there will be six points given per line of text, as needed.
- The last point either connects back to the first point or is a repeat of the first point.

Refer to the appropriate Product Specification to determine whether or not a particular product requires coded latitude/longitude information.

Here are examples of coded latitude/longitude information:

a. WFO product with a multi-line latitude/longitude data with a warning area that straddles 100 degrees west longitude.

```
LAT...LON 4896 10015 4789 10017 4787 9995 4842 9987
          4842 9955 4897 9958
```

The warning encompasses the area bounded by 48.96 N 100.15 W, 47.89 N 100.17 W, 47.87 N 99.95W, 48.42 N 99.87 W, 48.42 N 99.55 W, and 48.97 N 99.58 W.

b. WFO product with a warning area in East longitude (from WFO Guam). Since WFO Guam's warning area is entirely in East longitude, the longitude numbers are coded with the absolute value.

```
LAT...LON 1360 14509 1371 14495 1348 14463 1325 14492
```

This warning encompasses the area bounded by 13.60 N 145.09 E, 13.71 N 144.95 E, 13.48 N 144.63 E and 13.25 N 144.92 E.

c. National Center watch product describing an area west of 100 degrees West longitude. The leading 'one' is left off of the longitude numbers.

`LAT...LON_46680254_49089563_47069563_44650254`

This watch encompasses the area bounded by 46.68 N 102.54 W, 49.08 N 95.63 W, 47.06 N 95.63 W, and 44.65 N 102.54 W.

There are other examples of WFO-issued `LAT...LON` data in the products in Appendix B (see Examples 2 and 6).

5.7 Coded Time, Motion, and Location Information (as appropriate). NWS text products containing coded latitude/longitude information may also include coded time, motion, and location information that identifies the position and motion of an event being tracked at a given time. When used, the coded time, motion, and location information will appear in the line immediately below the coded latitude/longitude information discussed in Section 5.6. The format is shown in Table 12.

Table 12: Format of coded time, motion, and location information

The time, motion, and location information is in the form:

`TIME...MOT...LOC_hhmmZ_dirDEG_<`*sp*`>KT_lata_<`*longa*`>` (etc.)

where:

Code Group	Meaning
`TIME...MOT...LOC`	code indicating the start of the time, motion, and location information.
`hhmm`	the four-digit UTC time when the motion and location were measured, appended by the code **`Z`**.
`dir`	three-digit direction the event is moving from, in degrees from **`000`** to **`360`**, appended by the code **`DEG`**. A motion of less than 0.5 knots may have a non-zero direction.
`<`*sp*`>`	speed of movement of the event, in knots from **`0`** to **`99`** (without a leading zero), appended by the code **`KT`**. If the speed is less than 0.5 knots, it will be rounded down to zero.
`lata_<`*longa*`>`	coded pair(s) identifying the latitude and longitude of a single point (in the case of one pair) or a line (if more than one pair is used), in degrees and hundredths. Longitudes of less than 100 degrees will have four digits. East or West longitude is understood by the local office; however, if a given product straddles 180 degrees longitude, those points west of 180 degrees will be given as if they were west longitude; i.e., 179.00 E would be coded as **`18100`**.

Refer to the appropriate Product Specification to determine whether or not a particular product requires coded time, motion, and location information.

Here are examples of coded time, motion, and location information:

a. Time, motion, and location information, showing the leading zeroes used in the coded time and direction of motion, but not in the coded speed.

```
TIME...MOT...LOC_0128Z_004DEG_9KT_3480_10318
```

b. Nearly stationary cell, with a coded motion of zero knots. Note that the direction is non-zero.

```
TIME...MOT...LOC_1959Z_254DEG_0KT_3253_11464
```

c. Time, motion, and location group for a line, with the two latitude/longitude pairs.

```
TIME...MOT...LOC_2113Z_345DEG_4KT_2760_8211_2724_8198
```

There are other examples of `TIME...MOT...LOC` data in the products in Appendix B (see Examples 2, 3 and 6).

5.8 End of Product or Product Segment Code (Double Dollar [$$]). The double dollar ($$) is used to end the Content Block of a non-segmented product and to end the Content Block of each segment of a segmented product. This includes those products that do not use the UGC.

Note: The `$$` should be on its own line, left justified, and followed immediately by an end of line (`<cr><cr><lf>`). A blank line should precede and follow the `$$` (if other information is presented after it).

6. End of Product.

6.1 Forecaster Identifier (optional). Forecasters may affix their initials or some other form of identifier at the end of the product content block, after the `$$` and an optional blank line. Providing this optional identification in the various NWS products depends on guidelines in the appropriate Product Specification document.

6.2 Communications Trailer. This is the communications end-of-message code. It may be visible on certain user devices, but not on AWIPS.

Note: All complete product examples in this document will use the double asterisk (`**`) to indicate a communications end-of-message code. These codes are not visible on AWIPS. See communications documents for specific dissemination systems' printable and non-printable end-of-message codes. They are available on the Internet at: https://www.weather.gov/tg/ or, specifically for the NWWS, on the website mentioned in Section 1.

7. Test and Practice Message Wording. The use of standardized language in test or practice NWS text products is very important. The inadvertent dissemination of test or practice products without proper test language, especially short duration warning products and non-weather emergency messages, can cause unnecessary confusion and panic with the public, emergency managers, NWS Partners, and other users. The multiple and often automated dissemination paths can make any errant product immediately visible to a large audience.

Test and practice products are messages generated for: the purpose of evaluation; practice; the conduct of a communications test; or the conduct of a weather drill or test - regardless of any

intention of transmitting the product. Test and practice messages may be modeled after operational products or experimental products, but content will not suggest or reflect real-time environmental conditions or events. Test and practice messages or products include, but are not limited to, messages created on AWIPS or AWIPS-related equipment for:

a. internal office drills
b. external drills held in conjunction with partners and other users
c. office training or practice sessions
d. software installation and configuration sessions

In short, assume any message or product created on AWIPS or AWIPS-related equipment will be read and/or heard by the public.

7.1 Test Messages. All test messages will be worded in a professional manner and include the items in the following sections. These items should be added into the message automatically when produced by the NWS baseline product generation software. See Appendix B, Section 2.3 (Example 3) for an example of a test short duration warning complete with the appropriate test language.

7.1.1 VTEC String. All test products containing VTEC will use the `T` fixed identifier signifying a Test Product (see NWSI 10-1703 Section 2.1.1 for more information).

7.1.2 MND Header Block. All test products will include the MND wording specified in the Test row of Table 7.

7.1.3 Headlines.

a. Boilerplate. The following boilerplate headline will appear after the MND header and after each occurrence of the segment header:

```
...THIS_MESSAGE_IS_FOR_TEST_PURPOSES_ONLY...
```

A single sentence may be added at the end of the headline to address specific test or training goals.

b. Actual. Should an actual headline appear in the product, as often occurs in long-duration W/W/As, it will appear after the boilerplate headline above, and begin and end with the word `TEST`. For example:

```
...THIS_MESSAGE_IS_FOR_TEST_PURPOSES_ONLY...
...TEST_BLIZZARD_WARNING_IN_EFFECT_UNTIL_11_AM_MDT_TH
IS MORNING_TEST...
```

7.1.4 Free Text, including Bullets.

a. The sentence `THIS_IS_A_TEST_MESSAGE` will appear in the body of the message, at the beginning of the text of each line preceded by a blank line (but after a leading bullet (i.e., asterisk, `*`) or leading period (`.`), if present), with some exceptions. The exceptions are:

(1) Any line beginning with an ellipsis (`...`).
(2) Any line containing the opening Call-to-Action marker (see Section 5.5), or coded latitude/longitude or time, motion, and location information (see Sections 5.6 and 5.7).
(3) In a bullet-formatted product, a line beginning with `UNTIL`.
(4) In a bullet-formatted product, a line beginning with `FOR_THE_FOLLOWING`.
(5) In a bullet-formatted product, the next line of text that follows the line ending with the text `<`*phenomenon*`>_WARNING_FOR`, `FOR_THE_FOLLOWING`, or `FOR_THE_FOLLOWING_LOCATIONS`.
(6) In a bullet-formatted product, the next line of text that follows the text line `THE_NATIONAL_WEATHER_SERVICE_IN_<`*city*`>_HAS_ISSUED_A` (see rule c below)

b. In a bullet-formatted product, the next line of text that follows the text line `THE_NATIONAL_WEATHER_SERVICE_IN_<`*city*`>_HAS_ISSUED_A`, will have the single word TEST added at the beginning of the text.

c. The following boilerplate sentences will appear at the end of each segment immediately before the double dollar (`$$`), or immediately before the `LAT...LON` data, if present (but will not be included in the overview section of products that have one):

```
THIS_IS_A_TEST_MESSAGE._DO_NOT_TAKE_ACTION_BASED_ON_
THIS_TEST_MESSAGE.
```

WFOs may substitute different language in the second sentence above (e.g., `DO_NOT_TAKE_ACTION <`*etc*`>`) when they are running a severe weather drill. In such a case, they may want the intended audience of the product (either of the written text or NOAA Weather Radio audio broadcast) to take specific actions based on the Test Warning. These actions will be pre-coordinated with the appropriate Emergency Manager(s) and/or user group(s) (e.g., school districts).

7.2 Practice Messages. Text produced while in practice mode will contain the same test wording as text produced in test mode.

7.3 Recovery After an Inadvertent Test or Practice Message is Sent. If a test or practice message is sent without the proper test wording, the following steps will be taken by the issuing office:

a. The errant product will be cancelled/retracted immediately using the follow-up product prescribed in the Product Specification document of the errant product. The follow-up product will be issued for the same geographic area as the errant product. If the errant product included VTEC event(s), the VTEC event(s) will be cancelled in the follow-up product.

b. The follow-up product will state that the errant product was issued in error and, if the errant product was a watch, warning, advisory, or statement, that no significant weather or hazardous event is expected.

c. The issuing office will perform notifications and file a Significant Event Reports according to the instructions in NWSI 10-1603, *Operational Readiness and Significant Event Reporting*, and the *Hydrometeorology Duty Officer Manual*.

8. Recommended Actions to Take Following the Inadvertent NWS Dissemination of Messages by NWS Offices. This section provides guidance and procedures to follow after any inadvertent, high-visibility, WMO-formatted text product is disseminated by NWS Weather Forecast Offices (WFOs), River Forecast Centers (RFCs), Center Weather Service Units (CWSUs) or National Centers. High visibility products include inadvertent tests, drills or practice messages, and other errant WMO messages with false watch, warning, advisory, or statement information and are typically associated with high-impact events, such as tornadoes. This guidance serves to complement the policy in NWSI 10-1603, Operational Readiness and Significant Event Reporting.

WMO products are an origination source for multiple, and often automated, message dissemination paths which can make any errant product immediately visible to large audiences via formats such as social media, Instant Messaging and web pages. Therefore, fast action to cancel, retract, and otherwise correct false information in the public space is very important.

8.1 Recommended actions to take following the inadvertent NWS dissemination of a weather message. For inadvertent weather messages (e.g., sent without the proper test wording, sent without proper coding to denote test messages, or containing false information), the issuing office will take the following steps:

1. Immediately cancel the errant WMO whenever possible using the follow-up product prescribed in the Product Specification document of the errant product. Issue the recovery product for the same geographic area as the errant product. If the errant product included VTEC event(s), cancel the VTEC event(s) in the follow-up product.

2. State in the follow-up product that the errant product was issued in error. If the errant product was a watch, warning, advisory, or statement, the follow-up

product will state that no significant weather or hazardous event is expected or state if any other watch, warning, advisory, or statement is in effect.

3. The WFO, RFC, and/or CWSU will notify their regional headquarters following regional policy and procedures for all incidents of inadvertent message dissemination. The region's Regional Operations Center (ROC) will contact the NWS Operations Center (NWSOC). In turn, the Region and the NWSOC will coordinate to determine if further escalation is warranted. NWS headquarters or the regional headquarters may provide offices with additional guidance for handling communication with the public regarding the inadvertent message.

   If the issuing office is an NCEP Center, the Center will notify both the NWSOC and the Senior Duty Meteorologist (SDM). In turn, the SDM and the NWSOC will coordinate to determine if further escalation is warranted. Additional guidance may be provided to the affected offices.

8.2 Recommended actions to take following the inadvertent NWS dissemination of a Non-Weather Emergency Message (NWEM). (See *NWSI 10-518, Non-Weather Emergency Products Specification*). For inadvertent NWEMs sent by an alerting authority without the proper test wording or with false information, the following steps will be taken:

1. If the NWEM was not disseminated via NWS systems, the WFO within the Area of Responsibility that includes the external entity referred to in the inadvertent NWEM will contact the external entity to ensure they are aware of the inadvertent message, if not already aware, and coordinate recovery steps. The NWS will offer assistance but take no further action (except as outlined in steps 2 and 3) unless explicitly requested by the external entity or as part of existing procedures established with the state or local emergency communications committee, Emergency Alert System plan partners, or other entity..

2. If the inadvertent NWEM was disseminated via NWS systems, contact and coordinate with (but do not dictate to) the external entity for both the recovery message and method of dissemination, to ensure consistent recovery messaging. The text of the recovery messages disseminated by the external authority and NWS should be identical to the extent possible. The external authority and the NWS should disseminate the recovery message using the identical NWEM category or a follow-up category (e.g., If a false Civil Emergency Message (CEM) is disseminated, the external authority may decide to issue the recovery message using an Administrative Message (ADR). In this situation, the NWS should also issue an ADR and ensure the recovery message is disseminated via the same NWS systems and for the same geographic area as the inadvertent message.

3. The WFO will notify their regional headquarters following regional policy and procedures for all incidents involving inadvertent message dissemination. The region's ROC will contact the NWSOC. In turn, the regions and the NWSOC will coordinate if further escalation is warranted. NWS headquarters or the

Regional headquarters may provide offices with additional guidance for handling communication with the public regarding the inadvertent message.

8.3 Examples of Recovery Messages. The examples below are intended to provide guidance to WFOs of the language in the recovery message in order to minimize preparation and response times, should a message be issued in error. In response to external queries concerning the cause leading to the inadvertent message dissemination, do not provide any explanations for the causes of any errors, as information may change during discovery process.

Example 1:
There is NO TORNADO THREAT in Jackson County Missouri or adjacent counties in Missouri and Kansas. The Tornado Warning issued at 3:45 PM this afternoon was sent out as an error. Repeat, there is no tornado threat for Jackson County Missouri or adjacent areas. We apologize for any confusion or inconvenience this errant message may have caused.

Example 2:
There is NO FLASH FLOOD THREAT in Yuma County Arizona. The Flash Flood Warning issued at 3:45 PM this afternoon was sent out as an error. Repeat there is no flash flood threat in Yuma County Arizona. We apologize for any confusion or inconvenience this errant message may have caused.

Example 3:

Public Information Statement
National Weather Service Honolulu HI
825 AM HST Sat Jan 13 2018

...PREVIOUS WARNING MESSAGE WAS A TEST MESSAGE...

The Warning Message received by the National Weather Service from Hawaii state officials has been confirmed to be a test message. Repeating, the Warning Message received this morning DOES NOT DEPICT A REAL MISSILE THREAT. It was a test message.

9. Steps to Take After a Correctly-Formatted NWS Message is Incorrectly Disseminated by a Third Party. Many private enterprise weather companies and emergency messaging services process NWS messages and further convey them to specific customer communities, often reaching very wide audiences. Examples of these services include mobile applications and emergency notification systems used by municipalities and wireless emergency alerts. There have been situations when correctly formatted NWS messages were processed by third parties and incorrectly disseminated to the public and have caused major messaging consequences. For example, if a correctly formatted Tsunami Warning test message subsequently conveyed by a third party, *not* denoted as a test message but as a real warning, reaches the public through various non-NWS dissemination systems.

The NWS office issuing the original weather message will take the following steps:

The WFO, RFC, and/or CWSU will contact their Regional headquarters following regional policy and procedures. The Region's ROC will contact the NWSOC. A National Center will contact the SDM and the NWSOC. If an impacted office is initially unaware of inappropriate messaging that impacts their area of responsibility, and is informed of the situation through NWS Public Affairs, regional headquarters, another NWS office, or other entity, the issuing office should still ensure their regional headquarters is informed as quickly as possible and that all relevant details are shared at the local, regional, and national levels. The regional headquarters will ensure that all impacted offices within their region are aware of the issue.

10. Steps to Take for Messaging After an Inadvertent Dissemination of Test Alerts by a a Third Party

For situations where the field office is not responding directly to an inquiry but is aware that third-party dissemination of an NWS test alert has caused confusion, a statement (see standard messages, below) should be issued only if the office cannot reasonably respond to individual inquiries. In particular, NWS tweets about these messages should be used only in extreme cases so as not to increase confusion. In conjunction with issuing a statement, field offices may want to reach out to local media sources that disseminate NWS warnings to ensure they are aware of the potential confusion. If additional information beyond the statements is requested from media sources, the field office should refer the individual requester to NWS Public Affairs (301-427-9000).

Standard message (e.g., via Facebook):

> *"The National Weather Service (NWS) does not have a {type of alert or warning} in effect for the {identifying information} area at this time. NWS did issue a TEST {type of alert or warning}.We are aware that a third party provider may have disseminated this alert without the TEST designation to its client[s] which may have been shared with others. If and when NWS issues an official warning, they are broadcast on NOAA Weather Radio and are posted on WFO web pages, accessible via weather.gov. As appropriate, Wireless Emergency Alerts, NOAA Weather Radio tone alerts, or television crawl message systems may also be activated. The NWS is the official federal government source of weather watches, warnings, and advisories to the public for the protection of life and property."*

Tweeted message, if warranted:

> *"There is no NWS {type of alert or warning} warning in effect for {area} at this time. See {office webpage URL} for the latest."*

Followed by:

> *"NWS warnings are broadcast on NOAA Weather Radio and may trigger Wireless Emergency Alerts, NWR tone alerts, or television crawls. See {office webpage URL} for the latest."*

11. Role of NWS Rapid Response Team. The NWSOC and the respective regional headquarters, or National Center, will confer and determine if an inadvertent message dissemination is deemed as significant. (See NWSI 10-1603, Operational Readiness and Significant Event Reporting.) When significant dissemination errors occur, the NWSOC will notify the NWS Rapid Response Team (RRT) at NWS headquarters and the RRT will prepare a holding statement for use to respond to public and media inquiries. Once developed and fully cleared (which could take some time, depending on the nature of the problem and how long it takes to obtain critical facts from the technical review), this statement will be shared by the NWSOC with the regional headquarters, and affected NWS offices. Regardless of mode of dissemination (e.g., NWR, Public Information Statements and other WMO text messages, web pages, social media, telephone), offices must use the exact wording in the holding statement. Until such time that an approved statement is distributed, NWS offices should identify to any inquirers what watches, warnings, and advisories are in effect, if any, for their area of responsibility and refer additional media questions to the NWS Public Affairs Office at 301-427-9000. Do not provide any additional information other than the official information approved for external release by the NWS Public Affairs Office as part of the RRT.

APPENDIX A - Standardized Headline Instructions For Long Duration Products

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1. Introduction. NWS product generation software is set up to provide standardized wording for the headlines used in many long duration mostly event-driven text product classes. The headlines should be produced automatically by the software, using the parameters defined by the forecaster. This appendix provides standardized headline formatting rules for the following classes:

a. Winter Storm Watch/Warning/Advisory (WSW)
b. Non-Precipitation Watch/Warning/Advisory (NPW)
c. Fire Weather Watch and Red Flag Warning (RFW)
d. Flood Watch (FFA)
e. Coastal/Lakeshore flood products (CFW) containing watch, warning, and/or advisory headlines.
f. Coastal Waters Forecast (CWF) containing watch, warning, and/or advisory headlines.
g. Nearshore Forecast (NSH) containing watch, warning, and/or advisory headlines.
h. Marine Weather Message (MWW)
I. Hurricane Local Statement (HLS)

Product classes not listed here are not required to use standardized headlines unless otherwise directed to in Product Specification documents.

Standardized headline formatting rules for long duration warning and advisories are given in Section 2 and for long duration watches in Section 4. Special formatting requirements for some routine marine forecasts (Coastal Waters Forecast and Nearshore Forecast) are listed in Section 3. Special formatting requirements for some water resources and coastal/lakeshore watch products are listed in Section 5. Guidelines on editing the standardized headline wording are given in Section 6.

1.1 Time Zone Indicators. Long duration warning and advisory headlines (and some watch headlines, see Section 5) will include a time zone indicator after the explicit time. If two times are listed, then place the time zone indicator only after the second time listed. However, see the special case below. See also Section 3.9.4 in the main body of this document for rules governing multiple time zones.

Example:
```
...EXCESSIVE_HEAT_WARNING_IN_EFFECT_FROM_1_PM_THIS_AFTERNOON_TO_8_PM
EST_THIS_EVENING...
```

1.1.1 Special Case: Headline Valid Period Spans the Switch to /from Daylight Time. If the valid period of the headline spans the time when Daylight Time either begins or ends (e.g., it begins in Standard Time and ends in Daylight Time), **and both the explicit beginning and ending times are included in the headline**, then both time zone indicators will be used.

Example:
```
...WIND_CHILL_WARNING_IN_EFFECT_FROM_MIDNIGHT_CST_TO_7_PM_CDT_SUNDAY...
```

1.2 Uniform Format for Explicit Time-of-Day Terms. The explicit time of day will be expressed in the general format **<*hhmm*>_AM/PM_<*tz*>**, in accordance with the main body of

this document. Note: Follow time zone indicator rules in Section 1.1.

a In the **<*hhmm*>** field, the minute digits are required and rounded to the nearest 15 minutes. However, leading and trailing zeroes are not used (e.g., use 9_PM instead of 0900_PM).

b Use **NOON_<*tz*>_TODAY** in place of 12_PM_<*tz*>_THIS_AFTERNOON.
Use **NOON_<*tz*>_<*day*>** in place of 12_PM_<*tz*>_<*day*>.

c Use **MIDNIGHT_<*tz*>_TONIGHT** instead of 12_AM_<*tz*>_<*day+1*>.
Use **MIDNIGHT_<*tz*>_<*day+1*>_NIGHT** instead of 12_AM_<*tz*>_<*day+2*>_NIGHT.

***Example*: Ashfall Advisory**

Product Issuance Time	*Event Beginning Time*	*Event Ending Time*
4 AM EST Wednesday	12 PM EST Wednesday	12 AM EST Thursday

...ASHFALL_ADVISORY_IN_EFFECT_FROM_NOON_TODAY_TO_MIDNIGHT_EST_WEDNESDAY_NIGHT...

2. Long Duration Warnings and Advisories.

2.1 Order of Elements. The long duration warning and advisory headline will include the following elements in the order shown:

a. Leading ellipsis (. . .)
b. Valid warning or advisory product name (see appropriate product specification)
c. Event action phrase (Table A-1)
d. Event beginning date and time (when applicable - Section 2.4)
e. Event ending date and time (when applicable - Section 2.4)
f. Trailing ellipsis (. . .)

Exceptions: When necessary (e.g., in mountainous terrain), areal descriptive terms, elevation indicators, or reasons for the warning/advisory are permitted after the ending day and time phrase and before the trailing ellipsis, or for better readability placed immediately after the warning or advisory product name (see Sections 6.3 and 6.5).

2.2. Event Action Phrases. The long duration headline event action phrase corresponds to the VTEC action code used for the segment. Only the event action phrases shown in Table A-1 will be used in long duration headlines.

2.3 Headline Examples.

a. Initial issuance:
...BLIZZARD_WARNING_**IN_EFFECT**_FROM_7_AM_THIS_MORNING_TO_11_AM_EST_WEDNESDAY...

b. Update:
...BLIZZARD_WARNING_**REMAINS_IN_EFFECT**_UNTIL_11_AM_EST_WEDNESDAY...

c. Extended event ending time:
`...BLIZZARD_WARNING_`**`NOW_IN_EFFECT`**`_UNTIL_5_PM_EST_WEDNESDAY...`

d. Shortened event ending time:
`...BLIZZARD_WARNING_`**`NOW_IN_EFFECT`**`_UNTIL_8_AM_EST_WEDNESDAY...`

e. Cancelled prior to event ending time/date:
`...BLIZZARD_WARNING_`**`IS_CANCELLED`**`...`

f. Expiration statement prior to event ending time:
`...BLIZZARD_WARNING_`**`WILL_EXPIRE_AT`**`_4_PM_EST_THIS_AFTERNOON...`

g. Expiration statement after event ending time to clear products (event ending time + 30 minutes):
`...BLIZZARD_WARNING_`**`HAS_EXPIRED`**`...`

Table A- 1: Event action phrases for warning and advisory headlines

VTEC Action Code	Description	Required Event Action Phrase	Include Time/Date?
NEW	Initial Issuance	**IN_EFFECT**	Yes
CON	Continuation or update of event.	**REMAINS_IN_EFFECT**	Yes
EXT	Extend or shorten warning or advisory start and/or ending date/time.	**NOW_IN_EFFECT**	Yes
EXA	Expansion of event geographic area.	**IN_EFFECT**	Yes
EXB	Valid time period and area have been extended.	**NOW_IN_EFFECT**	Yes
CAN	Hazard terminated prior to event ending time.	**IS_CANCELLED**	No
EXP	Product approaching hazard expiration.	**WILL_EXPIRE_AT**	Yes
	Product has expired. Used after hazard expiration has passed.	**HAS_EXPIRED**	No
UPG	Upgrade from advisory to warning, or from one marine or tropical warning to another with higher wind criteria - no headline for the upgraded event		

2.4 Expression of Event Beginning and Ending Times. Long duration warning and advisory headlines will include the time, time zone indicator and day the warning/advisory is in effect.

a. Beginning and Ending Times Listed. When the beginning and ending times are listed, the beginning time is preceded by the word FROM, and the ending time is preceded by the word TO.

b. Only Ending Time Listed. When the ending time is listed by itself (for an event already in effect), the ending time is preceded by the word UNTIL.

2.4.1 Issuance Time and Event Beginning Time on the Same Calendar Day. When the issuance time and event beginning time occur on the same calendar day, the warning and advisory headline will include the time phrases listed in Table A-2.

***Example*: Winter Storm Warning**

Product Issuance Time	***Event Beginning Time***	***Event Ending Time***
4 AM Tuesday	7 AM Tuesday	11 AM Wednesday

`...WINTER_STORM_WARNING_IN_EFFECT_FROM_7_AM_`**`THIS_MORNING`**`_TO_11_AM_EST_`
`WEDNESDAY``...`

Table A- 2: Headline time phrases for long duration warnings and advisories in effect on same calendar day of issuance

Time Period Covered	Same Calendar Day Time Phrase
Midnight - 5:59 AM	**EARLY_THIS_MORNING**
6 AM - 11:59 AM	**THIS_MORNING**
Noon	**TODAY**
12:01 PM - 5:59 PM	**THIS_AFTERNOON**
6 PM - 11:59 PM	**THIS_EVENING**

a. Special Case #1: Same Time Phrase for the Event Beginning and Ending Times. If the event beginning and ending times use the same time phrase, then only one time phrase will be used and it will be placed after the end time.

***Example*: Dust Storm Warning**

Product Issuance Time	*Event Beginning Time*	*Event Ending Time*
10 AM Tuesday	1 PM Tuesday	5 PM Tuesday

`...DUST_STORM_WARNING_IN_EFFECT_FROM_1_PM_TO_5_PM_MDT_`**`THIS_`**
`AFTERNOON``...`

b. Special Case #2: Use of "Early This Morning" with "This Morning." If the beginning time uses EARLY_THIS_MORNING and the ending time uses THIS_MORNING, then only place the time phrase THIS_MORNING after the end time.

***Example*: Dense Fog Advisory**

Product Issuance Time	*Event Beginning Time*	*Event Ending Time*
1 AM CST Tuesday	4 AM CST Tuesday	9 AM CST Tuesday

`...DENSE_FOG_ADVISORY_IN_EFFECT_FROM_4_AM_TO_9_AM_CST_`**`THIS_MORNING`**`...`

2.4.2 Issuance Time and Event Beginning Time are on Different Calendar Days. When the issuance time and event beginning time occur on different calendar days, the warning or advisory headline will include the time and the day(s) of the week on which the event begins and/or ends.

***Example*: Ice Storm Warning**

Product Issuance Time	***Event Beginning Time***	***Event Ending Time***
3 PM EST Tuesday	5 AM EST Wednesday	5 AM EST Thursday

`...ICE_STORM_WARNING_IN_EFFECT_FROM_5_AM_`**`WEDNESDAY`**`_TO_5_AM_EST_`**`THURSDAY`**`...`

a. Special Case: Event Beginning Time and Event Ending Time are on the Same Day. If the event beginning time and ending time occur on same day, then the day phrase will be used after the event ending time only.

***Example*: Red Flag Warning**

Product Issuance Time	*Event Beginning Time*	*Event Ending Time*
10 PM CST Tuesday	5 AM CST Wednesday	5 PM CST Wednesday

`...RED_FLAG_WARNING_IN_EFFECT_FROM_5_AM_TO_5_PM_CST_`**`WEDNESDAY`**`...`

2.4.3 Event Beginning Time Occurs at Issuance Time, or Within Three Hours of Issuance Time. When the product issuance time and event beginning time occur simultaneously or when the event beginning time is within three hours of the issuance time, the warning and advisory headline will only include the event ending time in the headline.

a. Special Case #1: Issuance Time and Event Ending Time are on the Same Day. If the event ending time occurs on same calendar day as the issuance time, then use the same calendar rules for the end time phrase set in Table A-2.

***Example*: Blowing Dust Advisory**

Product Issuance Time	*Event Beginning Time*	*Event Ending Time*
4 AM PST Tuesday	6 AM PST Tuesday	8 PM PST Tuesday

`...BLOWING_DUST_ADVISORY_IN_EFFECT_UNTIL_8_PM_PST_`**`THIS_EVENING`**`...`

b. Special Case #2: Issuance Time and Event Ending Time are on Different Days. If the event ending time occurs on a different day than the issuance time, then the day word or phrase will be used after the event ending time.

***Example*: Wind Advisory**

Product Issuance Time	*Event Beginning Time*	*Event Ending Time*
4 PM CST Tuesday	4 PM CST Tuesday	6 AM CST Wednesday

...WIND_ADVISORY_IN_EFFECT_UNTIL_6_AM_CST_**WEDNESDAY**...

3. Special Requirements for Marine Hazards Carried in Coastal Waters Forecasts and Nearshore Forecasts. Standardized warning and advisory headlines carried in the Marine Weather Message (MWW) product will follow the guidelines set in Section 2. However, until software can be changed, the standardized headlines that appear in Coastal Waters Forecasts (CWF) or Great Lakes Nearshore Forecasts (NSH) for the same marine warnings and advisories as the MWW will follow somewhat different rules.

a. CONUS Region Coastal Waters Forecasts and Great Lakes Nearshore Forecasts. The standardized headlines for CONUS Region (defined as the NWS Eastern, Southern, Western, and Central Regions) marine warnings and advisories will use explicit times within 12 hours and general times, as defined in Section 4 for watches, beyond 12 hours.

b. OCONUS Region Marine Hazards Carried in Coastal Waters Forecasts. Because of larger marine zones, the standardized headlines for OCONUS Region (i.e., NWS Alaska and Pacific Regions) marine warnings and advisories use general times for their entire forecast period, with three hour resolution within the first 12 hours of issuance, and six hour resolution beyond 12 hours. The first 12 hour phrasing is described in Table A-3, while the phrasing for beyond 12 hours is in Table A-4.

Table A- 3: Headline time phrases for times within 12 hours of issuance used in OCONUS Region Coastal Waters Forecasts

Time Covered	Same Calendar Day as Issuance	Day + 1 Calendar Day
Midnight to 2:59 AM	**LATE_TONIGHT** (See **Note** below)	**LATE_TONIGHT**
3 AM to 5:59 AM	**EARLY_THIS_MORNING**	**EARLY_<*day+1*>_MORNING**
6 AM to 8:59 AM	**THIS_MORNING**	**<*day+1*>_MORNING**
9 AM to 11:59 AM	**LATE_THIS_MORNING**	**LATE_<*day+1*>_MORNING**
Noon to 2:59 PM	**EARLY_THIS_AFTERNOON**	Will always be beyond 12 hours of issuance, so phrases from Table A-4 will be used.
3 PM to 5:59 PM	**LATE_THIS_AFTERNOON**	
6 PM to 8:59 PM	**THIS_EVENING**	
9 PM to 11:59 PM	**TONIGHT**	
Note: This phrase would only appear for an event that was issued after Midnight and began and ended before 3 AM.		

Table A- 4: Headline time phrases for times beyond 12 hours of issuance used in OCONUS Region Coastal Waters Forecasts

Time Period	Time Phrase Used for Event Beginning Time	Time Phrase Used for Event Ending Time
Midnight to 5:59 AM	**LATE_TONIGHT** or **LATE_<*day*>_NIGHT**	**EARLY_<*day*>_MORNING**
6 AM to 11:59 AM	**<*day*>_MORNING**	**<*day*>_MORNING**
Noon to 5:59 PM	**THIS_AFTERNOON** or **<*day*>_AFTERNOON**	**THIS_AFTERNOON** or **<*day*>_AFTERNOON**
6 PM to 11:59 PM	**THIS_EVENING** or **<*day*>_EVENING**	**THIS_EVENING** or **<*day*>_EVENING**

3.1 Event Beginning Date/Time is at least three hours after the product issuance time, but is within the first 12 hour period, and the Event Ending Date/Time is also within the first 12 hour period.

a. CONUS Regions. Follow headline requirements for long duration warnings and advisories (Section 2) in specifying both times - i.e., in headline, use explicit times in the Event Beginning Date/Time and Event Ending Date/Time.

***Example*: CONUS Region Small Craft Advisory**

Product Issuance Time	*Event Beginning Time*	*Event Ending Time*
AM CST Tuesday	8 AM CST Tuesday	3 PM CST Tuesday

...SMALL_CRAFT_ADVISORY_IN_EFFECT_FROM_8_AM_THIS_**MORNING**_TO_3_PM_CDT_THIS_**AFTERNOON**...

b. OCONUS Regions. Both the Event Beginning and Ending Times will come from Table A-3.

***Example*: OCONUS Region Small Craft Advisory**

Product Issuance Time	*Event Beginning Time*	*Event Ending Time*
4 AM HST Tuesday	8 AM HST Tuesday	3 PM HST Tuesday

...SMALL_CRAFT_ADVISORY_IN_EFFECT_FROM_**THIS_MORNING**_TO_**LATE_THIS_AFTERNOON**...

3.2 Event Beginning Date/Time is within three hours of the product issuance time and the Event Ending Date/Time is within the first 12 hour period.

a. CONUS Regions. Follow headline requirements for other long duration warnings and advisories (Section 2) - i.e., in the headline, use an explicit time in the Event Ending Date/Time.

***Example*: CONUS Region Gale Warning**

Product Issuance Time	*Event Beginning Time*	*Event Ending Time*
4:30 AM CDT Tuesday	4:30 AM CDT Tuesday	3 PM CDT Tuesday

...GALE_WARNING_IN_EFFECT_UNTIL_**3_PM_CDT_THIS_AFTERNOON**...

b. OCONUS Regions. The Event Beginning Time is not mentioned, and the Event Ending Date/Time comes from Table A-3.

***Example*: OCONUS Region Gale Warning**

Product Issuance Time	*Event Beginning Time*	*Event Ending Time*
4:30 AM CHST Tuesday	4:30 AM CHST Tuesday	3 PM CHST Tuesday

...GALE_WARNING_IN_EFFECT_UNTIL_**LATE_THIS_AFTERNOON**...

3.3 Event Beginning Date/Time is at least three hours after the product issuance time, but is within the first 12 hour period, and the Event Ending Date/Time is outside the first 12 hour period.

a. CONUS Regions. Use a hybrid of headline requirements for long duration warnings and advisories (Section 2) and long duration watches (Section 4) - i.e., in the headline, use an explicit time in the Event Beginning Date/Time with a time zone appended, but use a general time phrase from Table A-6 in the Event Ending Date/Time.

***Example*: CONUS Region Storm Warning**

Product Issuance Time	*Event Beginning Time*	*Event Ending Time*
4:30 PM EST Tuesday	8 PM EST Tuesday	8 PM EST Wednesday

...STORM_WARNING_IN_EFFECT_FROM_**8_PM_EST_THIS_EVENING**_THROUGH_**WEDNESDAY_EVENING**...

b. OCONUS Regions. The Event Beginning Date/Time comes from Table A-3, while the Event Ending Date/Time comes from Table A-4.

***Example*: OCONUS Region Storm Warning**

Product Issuance Time	*Event Beginning Time*	*Event Ending Time*
4:30 AM AKST Tuesday	10 AM AKST Tuesday	10 PM AKST Wednesday

...STORM_WARNING_IN_EFFECT_FROM_**LATE_THIS_MORNING**_THROUGH_**WEDNESDAY_EVENING**...

3.4 Event Beginning Date/Time is within three hours of the product issuance time and the Event Ending Date/Time is more than 12 hours after the product issuance time.

a. CONUS Regions. Follow headline requirements for long duration watches (Section 4) - i.e., in the headline, use a general time phrase from Table A-6 in the Event Ending Date/Time.

***Example*: CONUS Region Freezing Spray Advisory**

Product Issuance Time	*Event Beginning Time*	*Event Ending Time*
4 PM EST Tuesday	6 PM EST Tuesday	4 PM EST Wednesday

...FREEZING_SPRAY_ADVISORY_IN_EFFECT_THROUGH_**WEDNESDAY_AFTERNOON**...

b. OCONUS Regions. The Event Beginning Time is not mentioned, and the Event

Ending Time comes from Table A-4.

***Example*: OCONUS Region Freezing Spray Advisory**

Product Issuance Time	*Event Beginning Time*	*Event Ending Time*
4 PM AKST Tuesday	6 PM AKST Tuesday	4 PM AKST Wednesday

...FREEZING_SPRAY_ADVISORY_IN_EFFECT_THROUGH_**WEDNESDAY**_
AFTERNOON...

3.5 Event Beginning Date/Times and Event Ending Date/Times are both more than 12 hours after the product issuance time.

a. CONUS Regions. Follow the headline requirements for long duration watches (Section 4) in specifying both times - i.e., in headline, use general time phrases from Table A-6 in both the Event Beginning Date/Time and the Event Ending Date/Time.

***Example*: CONUS Region Heavy Freezing Spray Warning**

Product Issuance Time	*Event Beginning Time*	*Event Ending Time*
AM PST Tuesday	5 PM PST Tuesday	5 AM PST Friday

...HEAVY_FREEZING_SPRAY_WARNING_IN_EFFECT_FROM_THIS_**AFTER
NOON**_ THROUGH_**LATE_TONIGHT**...

b. OCONUS Regions. Both times come from Table A-4.

***Example*: OCONUS Region Heavy Freezing Spray Warning**

Product Issuance Time	*Event Beginning Time*	*Event Ending Time*
4 AM AKST Tuesday	5 PM AKST Tuesday	5 AM AKST Friday

...HEAVY_FREEZING_SPRAY_WARNING_IN_EFFECT_FROM_**THIS_AFTERNOON**_
THROUGH_**EARLY_FRIDAY_MORNING**...

4. Long Duration Watches.

4.1 Order of Elements. The long duration watch headline will include the following elements:

a. Leading ellipsis (. . .)
b. Valid watch product name (see appropriate directive)
c. Event action phrase (see Table A-5)
d. General event beginning day and time phrase (when applicable - see Section 4.4)
e. General event ending day and time (when applicable - see Section 4.4)
f. Trailing ellipsis (. . .)

Exceptions: When necessary (e.g., in mountainous terrain), areal descriptive terms, elevation indicators, or reasons for the watch are permitted after the ending day and time phrase and before the trailing ellipsis, or for better readability placed immediately after the watch product name (see Sections 6.3 and 6.5).

4.2 Event Action Phrases. The long duration watch headline event action phrase corresponds to the VTEC action code. Only the following event action phrases will be used in

long duration headlines as shown in Table A-5.

Table A- 5: Event action phrases for watch headlines

VTEC Action Code	Description	Required Event Action Phrase	Include Time/Date?
NEW	Initial Issuance	**IN_EFFECT**	Yes
CON	Continuation or update of event.	**REMAINS_IN_EFFECT**	Yes
EXT	Extend watch start and/or ending date/time.	**NOW_IN_EFFECT**	Yes
EXA	Expansion of event geographic area.	**IN_EFFECT**	Yes
EXB	Valid time period and area have been extended.	**IN_EFFECT**	Yes
CAN	Product cancelled prior to event ending time.	**IS_CANCELLED**	No
EXP ***Valid for FFA only***	Product approaching hazard expiration.	**WILL_EXPIRE_AT**	Yes
	Product has expired. Used after hazard expiration has passed.	**HAS_EXPIRED**	No
UPG	Upgrade to warning or advisory - no headline for upgraded event.		

4.3 Headline Examples.

a. Initial issuance:
`...WINTER_STORM_WATCH_`**`IN_EFFECT`**`_FROM_SUNDAY_MORNING_THROUGH_MONDAY_MORNING...`

b. Update:
`...WINTER_STORM_WATCH_`**`REMAINS_IN_EFFECT`**`_FROM_SUNDAY_MORNING_THROUGH_MONDAY_MORNING...`

c. Extended event ending time:
`...WINTER_STORM_WATCH_`**`NOW_IN_EFFECT`**`_FROM_SUNDAY_MORNING_THROUGH_MONDAY_AFTERNOON...`

d. Shortened event beginning and end time:
`...WINTER_STORM_WATCH_`**`NOW_IN_EFFECT`**`_FROM_SATURDAY_NIGHT_THROUGH_SUNDAY_NIGHT...`

e. Cancelled prior to event ending time/date:
`...WINTER_STORM_WATCH_`**`IS_CANCELLED`**`...`

f. Expiration statement for FFA after event ending time to clear products (event ending time + 30 minutes):
`...FLOOD_WATCH_`**`HAS_EXPIRED`**`...`

4.4 Expression of Event Beginning and Ending Times. A long duration watch headline will include general time phrase(s) and the day(s) the watch begins and/or ends, as specified in Table A-6.

a. Beginning and Ending Times Listed. When the beginning and ending general time phrases are listed, the beginning time phrase is preceded by the word FROM, and the ending time phrase is preceded by the word THROUGH.

b. Only Ending Time Listed. When the ending time is listed by itself, the ending time is preceded by the word THROUGH.

Table A- 6: Headline time phrases for long duration watches

Time Period Covered	Same Calendar Day Time Phrase	Day +1 Calendar Day Time Phrase	Day + 2 Calendar Day Time Phrase
Midnight to 5:59 AM		**LATE_TONIGHT**	**LATE_<*day+1*>_NIGHT**
6 AM to 11:59 AM		**<*day+1*>_MORNING**	**<*day+2*>_MORNING**
Noon to 5:59 PM	**THIS_AFTERNOON**	**<*day+1*>_AFTERNOON**	**<*day+2*>_AFTERNOON**
6 PM to 11:59 PM	**THIS_EVENING**	**<*day+1*>_EVENING**	**<*day+2*>_EVENING**
Note: See Section 5 for special rules when the Event Beginning and/or Ending time(s) is (are) within the Zero to 12 hour time period.			

4.4.1 Issuance Time and Event Beginning Time on the Same Calendar Day. When the issuance time and event beginning time occur on the same calendar day, the watch headline will include the time phrases listed in Table A-4.

***Example*: Blizzard Watch**

Product Issuance Time	*Event Beginning Time*	*Event Ending Time*
4 AM AKST Tuesday	8 PM AKST Tuesday	4 PM AKST Wednesday

...BLIZZARD_WATCH_IN_EFFECT_FROM_**THIS_EVENING**_THROUGH_**WEDNESDAY_AFTERNOON**...

a. Special Case: Similar Time Phrase for the Start and End Times. If the start and end time use the same time phrase, then the time phrase will be used once.

***Example*: High Wind Watch**

Product Issuance Time	*Event Beginning Time*	*Event Ending Time*
4 AM CHST Tuesday	6 PM CHST Tuesday	11 PM CHST Tuesday

...HIGH_WIND_WATCH_IN_EFFECT_**THIS_EVENING**...

4.4.2 Issuance Time and Event Beginning Time are on Different Calendar Days. When the issuance time and event beginning time occur on different calendar days, the watch headline will include the time phrase(s) (Table A-2) and day(s) on which the event begins and/or ends.

***Example*: Wind Chill Watch**

Product Issuance Time	*Event Beginning Time*	*Event Ending Time*

3 PM MST Tuesday	5 AM MST Wednesday	5 AM MST Thursday

...WIND_CHILL_WATCH_IN_EFFECT_FROM_**LATE_TONIGHT**_THROUGH_**LATE_WEDNESDAY_NIGHT**...

***Example*: Lake Effect Snow Watch**

Product Issuance Time	*Event Beginning Time*	*Event Ending Time*
4 PM CST Tuesday	6 AM CST Wednesday	5 PM CST Thursday

...LAKE_EFFECT_SNOW_WATCH_IN_EFFECT_FROM_**WEDNESDAY_MORNING**_THROUGH_**THURSDAY_AFTERNOON**...

5. Special Requirements for Watches when Event Beginning and/or Ending Times are within 12 Hours of Issuance. Because many Flood and Coastal/Lakeshore Watches begin (and can end) within the twelve-hour cutoff time for other long-duration watches, the requirements for these headlines are a hybrid between long-duration watches and long-duration warnings. The standardized headlines follow the same rules as CONUS Region Marine warnings and advisories (in Section 3.a), and use explicit times within 12 hours of issuance and general times (as defined in Section 4) beyond 12 hours of issuance. Note that other types of long duration watches will behave the same way if still in effect within 12 hours of the event beginning time.

5.1 Event Beginning Date/Time is at least three hours after the product issuance time, but is within the first 12 hour period, and the Event Ending Date/Time is also within the first 12 hour period. Follow headline requirements for long duration warnings and advisories (Section 2) in specifying both times - i.e., use explicit times in the Event Beginning Date/Time and Event Ending Date/Time.

***Example*: Flash Flood Watch**

Product Issuance Time	*Event Beginning Time*	*Event Ending Time*
8 AM MDT Tuesday	1 PM MDT Tuesday	7 PM MDT Tuesday

...FLASH_FLOOD_WATCH_IN_EFFECT_FROM_**1_PM_THIS_AFTERNOON**_TO_**7_PM_MDT_THIS_EVENING**...

5.2 Event Beginning Date/Time is within three hours of the product issuance time and the Event Ending Date/Time is within the first 12 hour period. Follow headline requirements for other long duration warnings and advisories (Section 2) - i.e., use a explicit time in the Event Ending Date/Time.

***Example*: Coastal Flood Watch**

Product Issuance Time	*Event Beginning Time*	*Event Ending Time*
8 AM CDT Tuesday	10 AM CDT Tuesday	7 PM CDT Tuesday

...COASTAL_FLOOD_WATCH_IN_EFFECT_UNTIL_**7_PM_CDT_THIS_EVENING**...

5.3 Event Beginning Date/Time is at least three hours after the product issuance time, but is within the first 12 hour period, and the Event Ending Date/Time is outside the first 12 hour period. Use a hybrid of headline requirements for long duration warnings and advisories (Section 2) and long duration watches (Section 4) - i.e., use an explicit time in the Event Beginning Date/Time with the time zone appended, but use a general time phrase in the Event Ending Date/Time.

***Example*: Flood Watch**

Product Issuance Time	*Event Beginning Time*	*Event Ending Time*
8 AM EST Tuesday	2 PM EST Tuesday	8 AM EST Wednesday

`...FLOOD_WATCH_IN_EFFECT_FROM_2_PM_EST_THIS_AFTERNOON_THROUGH_WEDNESDAY_MORNING...`

6. Editing Long Duration Watch/Warning/Advisory Headlines. When standardized headline wording was first implemented, the headline text was "locked"; i.e., the text of the headline was not editable from within the product generation and editing software. Because of the complicated nature of NWS long duration W/W/A products, it was soon discovered that the software occasionally produces confusing or inaccurate headlines. Forecasters are now permitted (with Regional Office approval) to fix some of the confusing wording, inconsistencies, and errors. The subsections below serve to provide guidance to forecasters on when editing of the headline is appropriate and when it is not. The overall goal of unlocking long duration headlines is to provide users with clear, concise information in a consistent format.

NWS Regional Office Meteorological Services Divisions (MSD) or equivalents will play an active role in determining whether WFOs in their Region will have the option to turn off the software defaults and allow the optional headline editing mode. Unlocking long duration W/W/A headlines is not a free license to change headline language and format to personal preferences; the established headline policy set in Sections 1 through 5 above and in Regional supplements to this directive remain in effect. Forecasters or WFOs who repeatedly misuse headline editing will lose the option of editing.

A vast majority of the long duration W/W/A headlines automatically produced by the software should NOT need editing. Further, many problems found in bad headlines have their roots in the creation of the underlying hazard grids. Forecasters should ensure their hazard grids are accurate and reflect their intent before any headline is edited. Before attempting to edit the headline, all attempts should be made to fix the grids first. This ensures the proper VTEC coding will appear throughout the life of the event, as an edited headline does not carry forward to future products.

Forecasters will also be aware that:

- VTEC code may **not** be edited at any time
- The MND header and UGC strings may **not** be edited at any time

The following sections detail the types of situations where headline editing is allowed. Please refer questions to Regional MSD (or equivalent) if situations not covered in this policy are encountered.

6.1 Upgrade/Downgrade Situations.

6.1.1 Upgrades. Upgrades (as defined in NWSI 10-1703 Section 2.1.2) occur when: a watch is replaced by an advisory or warning; an advisory is replaced by a warning; or a marine or tropical hazard with discrete wind criteria is replaced by another marine or tropical hazard with the same significance level (see NWSI 10-1703 Section 2.1.5) but higher discrete wind criteria.

In some upgrade cases, two headlines are produced. One will state that a cancellation has occurred. At a minimum, forecasters should delete the "cancelled" headline, and may then use "upgraded" wording as shown below:

> ...<*hazard name*>_UPGRADED_TO_<*hazard name*>...IN_EFFECT_(FROM_<*beginning valid time*>)_UNTIL/THROUGH_<*ending valid time*>...

6.1.2 Downgrades and Replacements. Downgrades (as defined in NWSI 10-1703 Section 2.1.2) occur when either: a warning is changed to an advisory; or a marine or tropical hazard with discrete wind criteria is replaced by another marine or tropical hazard with the same significance level but lower discrete wind criteria. Replacements (also as defined in NWSI 10-1703 Section 2.1.2) occur when a hazard is replaced by a related hazard (without discrete wind criteria) with the same significance level.

In some downgrade and replacement cases, two headlines are produced. As with upgrades, any headline signaling that a hazard has been cancelled should be removed; and a "replaced by" headline should be used:

> ...<*hazard name*>_REPLACED_BY_<*hazard name*>...IN_EFFECT_(FROM_<*beginning valid time*>)_UNTIL/THROUGH_<*ending valid time*>...

6.1.3 Upgrade, Downgrade, and Replacement Examples.

```
...WINTER_WEATHER_ADVISORY_UPGRADED_TO_WINTER_STORM_WARNING...IN_EFFECT_
UNTIL_3_AM_MST_FRIDAY...

...HIGH_WIND_WARNING_REPLACED_BY_WIND_ADVISORY...IN_EFFECT_UNTIL_7_PM_
MST_THIS_EVENING...

...WINTER_STORM_WARNING_REPLACED_BY_BLIZZARD_WARNING...IN_EFFECT_FROM_2_
PM_THIS_AFTERNOON_UNTIL_2_AM_PST_TUESDAY...
```

6.2 Corrections and Late Extensions. In the event that errors in W/W/A timing occur, or if hazards are not extended in time before they expire, the resulting corrective actions will often cause the software to generate two headlines (one for the cancellation or expiration, and one for the “new” hazard) that cannot be changed in a way that makes sense to those reading the product. When these situations occur, the forecaster should delete the cancellation/expiration headline. The VTEC strings associated with both hazards, however, will remain. Here are two examples:

a. Dense fog advisory mistakenly issued for the wrong time period 24 hours in the future, and then corrected:

```
...DENSE_FOG_ADVISORY_CANCELLED...
...DENSE_FOG_ADVISORY_IN_EFFECT_FROM_11_PM_TONIGHT_UNTIL_9_AM_CST_
WEDNESDAY...
```

In this case, the first headline (for the cancellation) should be deleted.

b. Dense Fog Advisory extended just after the original expiration time:

```
...DENSE_FOG_ADVISORY_IN_EFFECT_UNTIL_10_AM_PST_THIS_MORNING...
...DENSE_FOG_ADVISORY_HAS_EXPIRED...
```

In this case, the second headline (for the expiration) should be deleted.

6.3 Placement of Elevation/Location in Headline. When long duration hazards are expected to affect only portions of a zone (such as a particular area[s] or above, below, or between certain elevations), the location and/or elevation range may be added to the headline immediately following the hazard instead of at the end of the headline. This is often more clear and makes more sense to the reader. Here are a few examples:

```
...WINTER_STORM_WARNING_ABOVE_4000_FEET_UNTIL_5_PM_MST_THIS_AFTERNOON...

...LAKE_WIND_ADVISORY_FOR_LAKE_TAHOE_IN_EFFECT_FROM_10_AM_UNTIL_7_PM_
PDT_THIS_EVENING...
```

6.4 Marine - Reduce Number of Headlines. There are two common situations where unnecessary headlines can be eliminated in marine products: when wind and/or sea conditions are ramping up and back down during the forecast period; and when forecasting Small Craft Advisory conditions.

6.4.1 Ramping Up and Down. During major weather events affecting marine areas, the ramping up and down of wind and/or sea conditions (e.g., from Small Craft Advisory to Gale Warning to Storm Warning and back) can generate multiple headlines. Marine warnings and advisories are only mandated in the first 12-hour forecast period. In most situations, the forecaster can leave off the hazards after the upgrade or the most severe hazard.

For example, in a Coastal Waters Forecast, instead of:

```
...SMALL_CRAFT_ADVISORY_IN_EFFECT_UNTIL_1_PM_EST_THIS_AFTERNOON...
...GALE_WARNING_IN_EFFECT_FROM_1_PM_EST_THIS_AFTERNOON_THROUGH_THIS
EVENING...
...SMALL_CRAFT_ADVISORY_NOW_IN_EFFECT_FROM_THIS_EVENING_THROUGH_FRIDAY
MORNING...
```

it should be sufficient to use:

```
...SMALL_CRAFT_ADVISORY_IN_EFFECT_UNTIL_1_PM_EST_THIS_AFTERNOON...
...GALE_WARNING_IN_EFFECT_FROM_1_PM_EST_THIS_AFTERNOON_THROUGH_THIS
EVENING...
```

6.4.2 Small Craft Advisories. There are four types of Small Craft Advisories that can be used in the CWF, NSH, or MWW. The only nationally mandated one is the generic Small Craft Advisory. Use of the other optional varieties of Small Craft Advisory (for Hazardous Seas, for Hazardous Winds, and for Rough Bar) is left to forecaster discretion. Forecasters should only use one type of Small Craft Advisory in a forecast segment unless they are reasonably sure of user understanding. Use of two or more types of Small Craft Advisory in combination with more severe marine warnings (e.g. Gale Warning) is especially discouraged.

For example, in a Marine Weather Message (MWW) product, instead of:

```
...SMALL_CRAFT_ADVISORY_FOR_WINDS_REMAINS_IN_EFFECT_FROM_7_AM_THIS_
MORNING_THROUGH_7_PM_EST_THIS_EVENING...
...SMALL_CRAFT_ADVISORY_FOR_HAZARDOUS_SEAS_REMAINS_IN_EFFECT_FROM_7_AM_
THROUGH_7_PM_EST_THIS_EVENING...
...GALE_WATCH_REMAINS_IN_EFFECT_FROM_4_PM_THURSDAY_AFTERNOON_THROUGH_7_
PM_EST_FRIDAY_EVENING...
```

it should be sufficient to use:

```
...SMALL_CRAFT_ADVISORY_REMAINS_IN_EFFECT_FROM_7_AM_THIS_MORNING_
THROUGH_7_PM_EST_THIS_EVENING...
...GALE_WATCH_REMAINS_IN_EFFECT_FROM_4_PM_THURSDAY_AFTERNOON_THROUGH_7_
PM_EST_FRIDAY_EVENING...
```

6.5 Fire Weather Headlines. Where desired, Fire Weather Watch and Red Flag Warning headlines may be altered to include the reason for the watch or warning and/or the area affected within the main portion of the headline, instead of appended to the end. Here is an example:

```
...RED_FLAG_WARNING_FOR_STRONG_WIND_AND_LOW_HUMIDITY_IN_EFFECT_FOR_
THE_SAN_BERNARDINO_MOUNTAINS_FROM_9_AM_THIS_MORNING_UNTIL_8_PM_PDT_
TONIGHT...
```

6.6 Flood Watch Issues. In cases where Flood Warnings have been issued for an area covered by a Flood Watch and the WFO wishes to remove the now-unnecessary watch, the software generates a cancellation message without any mention of the warning(s), since they appear in separate product(s). Forecasters are encouraged to remove the cancellation headline and replace it with a statement that warnings are in effect. Also, in the event multiple Flood Watches and Flood Watches for Forecast Points are in effect and one is cancelled, the resultant multiple headlines are confusing. Again, forecasters should remove the "cancelled" headline when appropriate.

6.7 Duplicate Headlines. In cases where the software erroneously produces duplicate headlines (and VTEC) for the same hazard, one of the headlines should be deleted.

6.8 Timing Changes. In some cases, changing the valid time of a hazard can create confusing multiple headlines. For example, if a forecaster changes the valid times in a case where a Wind Advisory follows a High Wind Warning, and both are valid within the first three hours after issuance, two headlines will be generated implying that both hazards are in effect simultaneously. For example:

```
...HIGH_WIND_WARNING_IN_EFFECT_UNTIL_1_PM_PST_THIS_AFTERNOON...
...WIND_ADVISORY_NOW_IN_EFFECT_UNTIL_6_PM_PST_THIS_AFTERNOON...
```

Generally speaking, whenever the three hour “now in effect” rules causes confusing headlines, forecasters should edit them to make them clear to the reader. Oftentimes, it is easiest to edit the future event to show the explicit beginning time. For the example above:

```
...HIGH_WIND_WARNING_IN_EFFECT_UNTIL_1_PM_PST_THIS_AFTERNOON...
...WIND_ADVISORY_IN_EFFECT_FROM_1_PM_UNTIL_6_PM_PST_THIS_AFTERNOON...
```

6.9 Midnight/Noon Issues. In some cases, the software will use the times 12_AM or 12_PM in headlines instead of MIDNIGHT or NOON. For clarity, forecasters should edit the headlines to change the explicit time to the proper day word or phrase.

6.10 Order of Headlines. In cases where the software creates multiple headlines in order of event significance level rather than in chronological order, the forecaster may rearrange the order of headlines so the first headline relates to the first expected hazard, the second headline relates to the second, etc.

6.11 Statements and Short Term Forecasts. In addition to the Watch, Warning, and Advisory products covered in this appendix, Special Weather Statements (SPS) and Short Term Forecasts (NOW) may also be given multiple headlines. The forecaster may edit/delete them as necessary to create a more clear and readable product.

In cases where grammatical or spelling errors are inadvertently issued to the public in certain statements, the software may repeat the error in subsequent products. The forecaster should edit the headline to correct errors when updating the product.

APPENDIX B - Completed Examples

Table of Contents: Page

1. **Introduction**. The following completed examples are representative of the typical format blocks (but generally without specific text) of a majority of products, as discussed in the main body of this document. Not all variations of formats, however, can be shown in this appendix. See appropriate Product Specification documents for details on how formats, text and certain codes are handled in individual product classes.

The product format structure comes in two basic versions, i.e., non-segmented and segmented. The UGC string, as well as any associated VTEC string(s), and certain other (parts of) format blocks, are placed in different locations in each. The UGC and VTEC strings are shown in each of the examples.

The following apply to all of the examples below:

- Text (narrative and any data) is a subset of the Product Content Block. See definitions in Section 5 of the main body of this document.
- Required spaces between characters are identified by an underscore (_) in all examples.
- The **$$** always ends a non-segmented product, even if the UGC is not used; and each segment in a segmented product.
- An information key describing each line follows each example.

2. **Non-Segmented Product Examples**. Examples 1, 2, and 3 show non-segmented products.

2.1 **Example 1**: Non-segmented routine product. It could be either with (or without) UGC and optional **&&**. Note the UGC string (line 4), when used, occurs immediately after the AWIPS Product Identifier (lines 1 to 3) in a non-segmented product. A non-segmented product without the UGC would follow the same format, except that the UGC would be eliminated and line 5 (blank line) would move up to line 4, and so on.

```
1)    ##    (not visible on AWIPS)
2)    FPUS63_KDMX_112101
3)    SFPIA
4)    IAZ001>099-121115-
5)
6)    STATE_FORECAST_FOR_IOWA
7)    NATIONAL_WEATHER_SERVICE_DES_MOINES_IA
8)    402_PM_CDT_WED_JUN_11_2008
9)
10)   ...HEADLINE(S)...
11)
12)   <text>
13)
14)   &&
15)
16)   <text continues>
17)
18)   $$
19)
20)   XYZ
21)   **    (not visible on AWIPS)
```

Information Key (for Example 1):

1) ## Communications Start-of-Message Code (Lines 1 to 3 are collectively the AWIPS Product Identifier)
2) WMO Abbreviated Heading
3) AWIPS Identifier - AI
4) UGC String
5) blank line
6) Product Type Line (lines 6 to 8 collectively are the MND Block)
7) Issuing Office Line
8) Issuance Date/Time Line
9) blank line
10) Headline(s) (as needed) (lines 4 and 10 to 18 collectively are the Content Block)
11) blank line
12) Text (typically multiple lines)
13) blank line
14) && (optional separator of information)
15) blank line
16) Text (typically multiple lines, continues)
17) blank line
18) $$ ends the product
19) blank line (optional)
20) Forecaster ID (optional - see Product Specifications)
21) ** Communications End-of Message Code

2.2 **Example 2**: Non-segmented warning product. It contains UGC (line 4), VTEC (line 5), broadcast instruction (line 7), and issuing office (line 10). Note that this product will use the bullet format, and includes Call-to-Action (CTA) markers (lines 15 and 19), Lat/Lon information (lines 21 and 22) and storm location and motion information (line 23) to conclude the content block. These occur before the $$ (line 25).

```
1)    ##    (not visible on AWIPS)
2)    WUUS53_KILX_041851
3)    SVRILX
4)    ILC035-049-079-041915-
5)    /O.NEW.KILX.SV.W.0121.080604T1851Z-080604T1915Z/
6)
7)    BULLETIN_-_EAS_ACTIVATION_REQUESTED
8)    SEVERE_THUNDERSTORM_WARNING
9)    NATIONAL_WEATHER_SERVICE_LINCOLN_IL
10)   ISSUED_BY_NATIONAL_WEATHER_SERVICE_CHICAGO/ROMEOVILLE_IL
11)   151_PM_CDT_WED_JUN_4_2008
12)
13)   <text>
14)
15)   PRECAUTIONARY/PREPAREDNESS ACTIONS...
16)
17)   <text>
18)
19)   &&
20)
21)   LAT...LON_3894_8801_3903_8865_3921_8870_3922_8865
22)          _____3922_8864_3922_8848_3928_8847_3938_8810
23)   TIME...MOT...LOC_1851Z_257DEG_45KT_3914_8855
24)
```

```
25)   $$
26)
27)   XYZ
28)   **    (not visible on AWIPS)
```

Information Key (for Example 2)

1) ## Communications Start-of-Message Code (Lines 1 to 3 collectively are the AWIPS Product Identifier)
2) WMO Abbreviated Heading
3) AWIPS Identifier
4) UGC String
5) P-VTEC String
6) blank line
7) Broadcast Instruction Line (Lines 7 to 11 are collectively the MND Block)
8) Product Type Line
9) Primary Office Line
10) Issuing Office Line
11) Issuance Date/Time Line
12) blank line
13) Text (typically multiple lines - uses asterisks [*] in bullet format for this short duration warning) (Lines 4 to 5 and 13 to 19 collectively are the Content Block)
14) blank line
15) PRECAUTIONARY/PREPAREDNESS ACTIONS... (beginning call-to-action marker)
16) blank line
17) Call-to-Action Text (typically multiple lines)
18) blank line
19) && (ending call-to-action marker)
20) blank line
21-22) Lat/Lon (perimeter points that describe the affected area)
23) Time/Mot/Loc (identifies location and movement of storm at issuance time)
24) blank line
25) $$ ends the product
26) blank line
27) Forecaster ID (optional - see Product Specifications)
28) ** Communications End-of Message Code

2.3 **Example 3**: TEST non-segmented warning product. This example includes the actual text in it, to show how the test wording (discussed in Section 7.1 in the main body of this document) would appear. It contains UGC (line 4), VTEC (lines 5 and 6) and broadcast instruction (line 8). Note that this product will use the bullet format, and includes Lat/Lon (line 41 - in this case, the actual perimeter points that describe the affected area) to conclude the content block. The Lat/Lon and a blank line (line 42) occur before the $$ (line 43). See NWSI 10-922, *Weather Forecast Office Water Resources Products Specification*, for information on the inclusion of VTEC strings in water resources products.

```
1)    ##    (not visible on AWIPS)
2)    WGUS56_KOTX_141831
3)    FFWOTX
4)    WAC043-141900-
5)    /T.NEW.KOTX.FF.W.0002.070914T1831Z-070914T1900Z/
6)    /00000.U.GO.000000T0000Z.000000T0000Z.000000T0000Z.OO/
7)
8)    BULLETIN_-_EAS_ACTIVATION_REQUESTED
9)    TEST...Flash Flood Warning...TEST
```

```
10)   National Weather Service Spokane WA
11)   1131 AM_PDT_FRI_SEP_14 2007
12)
13)   ...THIS MESSAGE IS FOR TEST PURPOSES ONLY...
14)
15)   The National Weather Service in Spokane has issued a
16)
17)   *_TEST Flash Flood Warning for a Glacial Lake Dam Outburst in...
18)     Central Lincoln County in east central Washington…
19)
20)   *_Until NOON PDT
21)
22)   *_THIS IS A TEST MESSAGE. At 1131 am PDT, Emergency Management
23)   __reported a glacier at Davenport has melted, releasing large _
24)   __quantities of impounded water and causing flash flooding.
25)   __Affected locations include Davenport.
26)   __
27)   __HAZARD...THIS IS A TEST MESSAGE. Flash flooding caused by a
28)              glacier-dammed lake outburst.
29)
30)     SOURCE...THIS IS A TEST MESSAGE. Emergency Management.
31)
32)     IMPACT...THIS IS A TEST MESSAGE. Flash flooding in Davenport.
33)
34)   PRECAUTIONARY/PREPAREDNESS ACTIONS...
35)
36)   THIS IS A TEST MESSAGE. Most flood deaths occur in automobiles.
37)   Never drive your vehicle into areas where the water covers the
38)   roadway. Floodwaters are usually deeper than they appear. Just
39)   one foot of flowing water is powerful enough to sweep vehicles
40)   off the road. When encountering flooded roads make the smart
41)   choice, Turn around…Don't drown.
42)
43)   &&
44)
45)   THIS IS A TEST MESSAGE. DO NOT TAKE ACTION BASED ON THIS MESSAGE.
46)
47)   LAT...LON 4771 11790 4733 11790 4733 11846 4771 11846
48)
49)   FLASH FLOOD...OBSERVED
50)   FLASH FLOOD DAMAGE THREAT...CONSIDERABLE
51)
52)   $$
53)
54)   **   (not visible on AWIPS)
```

Information Key (for Example 3):

1) ## Communications Start-of-Message Code (lines 1 to 3 collectively are the AWIPS Product Identifier)
2) WMO Abbreviated Heading
3) AWIPS Identifier
4) UGC String
5-6) VTEC Strings
7) blank line
8) Broadcast Instruction Line (lines 8 to 11 collectively are the MND Block)
9) Product Type Line (Note use of TEST both before and after the actual product type name).
10) Issuing Office Line
11) Issuance Date/Time Line

12) blank line
13-45) Text (Note use of * in bullet format, test language, and appropriate blank lines.) Lines 4 to 6 and 13 to 50 collectively are the Content Block. Lines 34 and 43 are the Call-to-Action markers.
46) blank line
47) Lat/Lon (perimeter points that describe the affected area)
48) blank line
49-50) Impact-Based Warning Tags
51) blank line
52) $$ ends the product
53) blank line
54) ** Communications End-of-Message Code

3. **Segmented Product Examples.** Examples 4, 5 and 6 show segmented products. Note that when plain language geographic names are used, two-letter state IDs may be included with each name for added clarity (see Section 3.7 in the main body of this document as well as Example 6 below).

3.1 **Example 4**: Segmented routine product. It contains plain language geographical names, uses an additional term (UPDATED) at end of Product Type Line (line 5), uses an associated "BBB" field in WMO abbreviated heading (line 2), and a "reason for update" line in each segment (lines 14 and 25).

```
1)    ##    (not visible on AWIPS)
2)    FPUS53_KARX_200233_AAA
3)    ZFPARX
4)
5)    ZONE_FORECASTS...UPDATED
6)    NATIONAL_WEATHER_SERVICE_LA_CROSSE_WI
7)    933_PM_CDT_FRI_SEP_19_2008
8)
9)    MNZ086-087-094-095-200915-
10)   DODGE-OLMSTED-MOWER-FILLMORE-
11)   INCLUDING_THE_CITIES_OF...ROCHESTER...AUSTIN
12)   933_PM_CDT_FRI_SEP_19_2008
13)
14)   UPDATED_RAIN_WORDING_AND_WINDS_TONIGHT
15)
16)   <text>
17)
18)   $$
19)
20)   IAZ008>010-018-019-029-200915-
21)   MITCHELL-HOWARD-WINNESHIEK-FLOYD-CHICKASAW-FAYETTE-
22)   INCLUDING_THE_CITIES_OF...DECORAH...CHARLES_CITY...OELWEIN
23)   933_PM_CDT_FRI_SEP_19_2008
24)
25)   UPDATED_WINDS_TONIGHT
26)
27)   <text>
28)
29)   $$
30)
```

(Other segments may follow. Last segment ends with $$, followed by a blank line, an optional forecaster ID and **. See the other examples in this Appendix for the typical ending of products.)

Information Key (for Example 4)

1) ## Communications Start-of-Message Code (Lines 1 to 3 are collectively the AWIPS Product Identifier)
2) WMO Abbreviated Heading (with required "BBB" field. AAA = first update)
3) AWIPS Identifier
4) blank line
5) Product Type Line (includes . . . UPDATED) (Lines 5 to 7 are the MND Block)
6) Issuing Office Line
7) Issuing Date/Time Line
8) blank line
9) UGC String (Lines 9 to 30 [and beyond, if additional segments are included] collectively are the Content Block)
10) Plain Language Geographic Names
11) "Including The Cities Of" Line
12) Issuing Date/Time Line (repeated for each segment)
13) blank line
14) "Reason For Update" Line
15) blank line
16) Text (typically multiple lines)
17) blank line
18) $$ ends the segment
19) blank line
20) UGC String
21) Plain Language Geographic Names
22) "Including The Cities Of" Line
23) Issuing Date/Time Line (repeated for each segment)
24) blank line
25) "Reason For Update" Line
26) blank line
27) Text (typically multiple line)
28) blank line
29) $$ ends the segment
30) blank line

3.2 **Example 5**: Segmented long duration warning product. It uses a special MND header, i.e., the Broadcast Instruction Line and Product Type Line are combined into a generic line (line 5). The example includes plain language geographical names (lines 13 and 25 to 26), uses an

additional term (CORRECTED) at end of "Combined" Product Type Line (line 5), uses an associated "BBB" field in the WMO abbreviated heading (line 2), and has a "reason for correction" line in the corrected segment (lines 29 and 30).

```
1)    ##    (not visible on AWIPS)
2)    WWUS76_KSGX_192312_CCA
3)    NPWSGX
4)
5)    URGENT_-_WEATHER_MESSAGE...CORRECTED
6)    NATIONAL_WEATHER_SERVICE_SAN_DIEGO_CA
7)    406_PM_PDT_THU_JUN_19_2008
8)
9)    <optional headline and/or overview text>
10)
11)   CAZ061-062-201330-
12)   /O.NEW.KSGX.EH.W.0001.080620T1700Z-080621T0300Z/
13)   COACHELLA_VALLEY-SAN_DIEGO_COUNTY_DESERTS-
14)   406_PM_PDT_THU_JUN_19_2008
15)
16)   ...EXCESSIVE_HEAT_WARNING_IN_EFFECT_FROM_10_AM_TO_8_PM_PDT
17)   FRIDAY...
18)
19)   <text>
20)
21)   $$
22)
23)   CAZ048-050-201330-
24)   /O.COR.KSGX.EH.W.0001.080620T1800Z-080621T0300Z/
25)   SAN_BERNARDINO_AND_RIVERSIDE_COUNTY_VALLEYS-THE_INLAND_EMPIRE-
26)   SAN_DIEGO_COUNTY_VALLEYS-
27)   406_PM_PDT_THU_JUN_19_2008
28)
29)   CORRECTED_TO_ADD_A_HIGH_TEMPERATURE_FORECAST_FOR_THE_SAN_DIEGO
30)   VALLEYS.
31)
32)   ...EXCESSIVE_HEAT_WARNING_IN_EFFECT_FROM_11_AM_TO_8_PM_PDT
33)   FRIDAY...
34)
35)   <text>
36)
37)   $$
38)
39)   **
```

Information Key (for Example 5)

1) ## Communications Start-of-Message Code (Lines 1 to 3 are collectively the AWIPS Product Identifier)
2) WMO Abbreviated Heading (includes the "BBB" field, where CCB = 2nd correction)
3) AWIPS Identifier
4) blank line
5) Special Broadcast Instruction/Product Type Line (includes ...CORRECTED) (Lines 5-7 collectively are the MND Block)
6) Issuing Office Line
7) Issuance Date/Time Line
8) blank line

9) Text of Product Headline(s) and/or Overview (both optional, and may be multiple lines)
10) blank line
11) UGC String
12) VTEC String
13) Plain Language Geographic Names
14) Issuance Date/Time Line (repeated for each segment)
15) blank line
16-17) ...Headline...
18) blank line
19) Text (typically multiple lines)
20) blank line
21) $$ ends the segment
22) blank line
23) UGC String (begins new segment)
24) VTEC String
25-26) Plain Language Geographic Names
27) Issuance Date/Time Line (repeated for each segment)
28) blank line
29-30) "Reason for Corrected" Lines (occurs before any headline or text for each segment)
31) blank line
32-33) ...Headline...
34) blank line
35) Text (typically multiple lines)
36) blank line
37) $$ ends the segment
38) blank line
39) ** Communications End-of-Message Code

3.3 **Example 6**: Segmented short duration warning follow-up product. This short duration warning follow-up product is in a segmented format, with the UGC (line 9), VTEC (line 10), plain language geographic name (line 11), and a repeat of the issuance date-time line (line 12) occurring after the MND block (lines 5 to 7). Note that although this particular product contains only one segment, it is prepared in a segmented format as are all products of this type.

```
1)    ##    (not visible on AWIPS)
2)    WWUS53_KIWX_152137
3)    SVSIWX
4)
5)    SEVERE_WEATHER_STATEMENT
6)    NATIONAL_WEATHER_SERVICE_NORTHERN_INDIANA
7)    537_PM_EDT_WED_OCT_15_2008
8)
9)    INC183-152147-
10)   /O.EXP.KIWX.SV.W.0158.000000T0000Z-081015T2145Z/
11)   WHITLEY_IN-
12)   537_PM_EDT_WED_OCT_15_2008
13)
14)   ...THE_SEVERE_THUNDERSTORM_WARNING_FOR_EASTERN_WHITLEY_COUNTY_
15)   WILL_EXPIRE_AT_545_PM_EDT_/445_PM_CDT/...
16)
17)   <text>
18)
19)   LAT...LON_4102_8556_4103_8555_4119_8555_4128_8534
20)   ______4125_8532_4122_8532_4120_8532_4119_8534
21)   ______4104_8534_4101_8562
```

```
22)   TIME...MOT...LOC_2137Z_251DEG_44KT_4122_8502
23)
24)   $$
25)
26)   **    (not visible on AWIPS)
```

Information Key (for Example 6):

1) ## Communications Start-of-Message Code (lines 1 to 3 collectively are the AWIPS Product Identifier)
2) WMO Abbreviated Heading
3) AWIPS Identifier
4) blank line
5) Product Type Line
6) Issuing Office Line
7) Issuance Date/Time Line
8) blank line
9) UGC String (begins product segment)
10) VTEC String
11) Plain Language Geographic Name
12) Issuance Date/Time Line (repeated for each segment)
13) blank line
14-15) Headline, with multiple time zones included
16) blank line
17) Text (typically multi-lines)
18) blank line
19-21) Lat/Lon information
22) Time, Motion, and Location information
23) blank line
24) $$ ends the segment, and in this case the product
25) blank line
26) ** Communications End-of-Message Code

Department of Commerce • National Oceanic & Atmospheric Administration • National Weather Service

NATIONAL WEATHER SERVICE INSTRUCTION 10-1710

February 1, 2018

Operations and Services

Dissemination Policy NWSPD 10-17

NOAA WEATHER RADIO ALL HAZARDS (NWR) DISSEMINATION

NOTICE: This publication is available at: https://www.nws.noaa.gov/directives/.

OPR: W/DIS (C. Hodan) **Certified by:** W/DIS (Kevin C. Cooley)

Type of Issuance: Routine

SUMMARY OF REVISIONS: This directive supersedes NWSI 10-1710, *"NOAA Weather Radio (NWR) Dissemination,"* dated October 1, 2002. Changes were made to reflect the NWS Headquarters reorganization effective April 1, 2015.

Content changes were made to:

1. Directive Name Change to NOAA Weather Radio All Hazards (NWR) Dissemination
2. Remove Console Replacement System (CRS) and the Voice Improvement Processor (VIP)
3. Add Broadcast Message Handler (BMH)
4. Remove "Backup Live;" function does not exist in current BMH configuration
5. Add BMH Practice Mode for proficiency requirements
6. Change RWT to be issued between "10:00am and 1:00pm.
7. Add length of record retention for message, system and error logs
8. Add procedures for recovery after an inadvertent alert is transmitted
9. Update numerous references to be consistent with other NWS documents
10. Update Appendix F to delete references to red-bordered envelope containing approved text of nuclear attack warning.
11. Change Appendix G to add NWR and Specific Area Message Encoding (SAME) relationship to the Emergency Alert System (EAS); and expand guidance on use of alert tones and Program Interrupt for SAME and EAS events

/signed/ 1/18/18

Kevin C. Cooley Date

Acting Director, Office of Dissemination

NOAA Weather Radio All Hazards (NWR) Dissemination

Table of Contents **Page**

1 Introduction

This National Weather Service (NWS) Instruction (NWSI) provides service guidelines and instructions for broadcasting weather information (watches, warnings, advisories, forecasts, etc.) and Non-Weather Emergency Messages (NWEM's), on the National Oceanic and Atmospheric Administration (NOAA) Weather Radio All Hazards (NWR). This instruction identifies policies and operational duties associated with NWR dissemination. Guidelines and instructions for overall system management, engineering, maintenance, logistics, and other support related to the NWR are addressed in NWSI 10-1711, *NOAA Weather Radio All Hazards (NWR) System Management*.

1.1 Mission Connection

NWR programming can be broadcast to the public using low cost, widely available radio receivers that have 162.400 megahertz (MHz) – 162.550 MHz frequency bands (or channels) commonly referred to as the "Weatherband." NWR is used by television and radio broadcasters as a primary NWS input to the Federal Communications Commission's (FCC) Emergency Alert System (EAS). The NWR network has the potential to reach over 97% of the U.S. population with all-hazards information.

1.2 Fundamental Broadcast Concepts

NWR is a broadcast service by the NWS designed to warn of weather and non-weather hazards that threaten life and property within approximately 40 miles of the NWR broadcast tower by local NWS Weather Forecast Offices (WFO). Each WFO will use any of seven (7) available NWR channels (see a-g below) identified for the designated area NWR broadcast.

a. 162.400 MHz
b. 162.425 MHz
c. 162.450 MHz
d. 162.475 MHz
e. 162.500 MHz
f. 162.525 MHz
g. 162.550 MHz

1.2.1 Use of NWR Automated Voice

To broadcast critical information as quickly as possible, NWS uses automated voice technology for broadcast of messages. Text messages generated by the NOAA Weather Radio with All-Hazards VTEC Enhanced Software (NWRWAVES) formatter are processed, converted to voice, and scheduled for NWR broadcast by the AWIPS Broadcast Message Handler (BMH). Any text to be converted automatically to speech should have full sentences, correct spelling, and effective punctuation to achieve clear communication. Text products containing text to be converted should meet specifications stated in NWSI 10-1701, Text product Formats and Codes, and the NWSI product specification relevant to the respective product. BMH also supports live audio broadcast for extreme weather emergencies, NWEM's, and manual weather message creation either in text or audio recordings. To maintain proficiency in live audio broadcasts and other critical operator functions, WFO staff should use BMH practice mode. See procedures

outlined in Appendix A.

1.2.2 NWR "All Hazards" Concept

NWS will continue efforts to expand NWR to an "All-Hazards" service, in support of Federal, state, tribal, and local governments, as well as private sector efforts to provide timely warnings of events that threaten life and property. All-Hazards include natural disasters (e.g., weather, floods, dust storms, extreme heat, sea/lake ice, earthquakes, volcanic activity, forest fires, solar activity, etc.) and non-weather emergency messages, whether accidental or intentional (e.g., chemical or biological releases, quarantines, oil spills, space debris, or nuclear incidents, etc.), and other emergency support activities. These "other emergency support activities" may include local emergency management incidents (e.g., train derailments, airplane crashes, marine collisions, industrial fires and accidents, etc.), law enforcement emergencies (e.g., sniper alerts, prisoner escapes, abductions, hostage situations, etc.), search and rescue missions, and "all clear" notifications. Non-Weather Emergency Message types are listed in Appendix A of NWSI 10-1708, "All-Hazards Emergency Message Collection System (HazCollect).

1.2.3 Official Voice of the NWS

NWR is the sole government-operated radio system providing direct warnings to the public. To many listeners, the NWR is the "voice" of the NWS. It is therefore critical NWR broadcasts adhere to the highest standards of timeliness, completeness, accuracy, and clarity.

2 Technical Description

The NWR system provides continuous automated real-time, or recorded, text-to-voice FM-radio broadcasts. The system consists of:

a. A computer-based broadcast management system which provides audio message generation, message scheduling and broadcast audio stream;

b. A communication link (dedicated telephone line, ultra-high frequency radio, or microwave radio) between the transmitter audio output of the audio switching assembly and the broadcast transmitter. Each transmitter has its own dedicated communication link;

c. A narrow-band Very High Frequency (VHF) frequency modulation (FM) transmitter operating on one of the following government-assigned frequencies: 162.400, 162.425, 162.450, 162.475, 162.500, 162.525, and 162.550 MHz; and

d. Remote Off-Air Monitoring System (ROAMS) (see Section 8.1 and Appendix B), emergency power systems, telephone and other utilities, and services required for continuous operation.

e. A 1050 Hertz (Hz) Warning Alarm Tone (WAT) and NWR Specific Area Message Encoding (NWR SAME) transmission. Both either sound an alarm or switch specially

equipped NWR receivers from standby to full "ON" mode for user-specified weather or non-weather emergency messages (see Section 6).

3 Procedural Responsibilities

3.1 Weather Service Headquarters (WSH)

The Office of Dissemination (DIS) provides service requirements and instructions for NWR broadcasts contained in this document in coordination with the Analyze, Forecast, and Support Office (AFS), and the regional headquarters, with input from WFOs. The DIS Dissemination Systems Team (DST) provides technical program management support, including operational procedures for expanding the network, maintaining a national NWR database, engineering, communications, equipment maintenance, and procedures for resolving interference issues (see NWSI 10-1711, *NOAA Weather Radio All Hazards (NWR) System Management*).

3.2 Regional Headquarters

Each regional headquarters manages the NWR program within its region and should have a designated regional focal point to oversee day-to-day broadcast operations. In addition, each regional headquarters will oversee a NWR Operator Proficiency Program (see Section 8 and Appendix A) and review and evaluate NWR broadcasts within its region. The regional headquarters also will coordinate, define, and document in regional supplements, as necessary, the broadcast service areas for all NWR stations in the region (see Section 4.1).

3.3 Weather Forecast Offices (WFO)

WFO management adopts these guidelines and regional supplements consistent with local service requirements and staffing. Each WFO should have a NWR program leader (see Section 8.3). All operational employees must be proficient at disseminating warnings, watches, and advisories on the NWR system and any backup broadcast system (see Appendix A, NWR Operator Proficiency Program).

3.3.1 Record Keeping

The NWR system at each WFO will automatically maintain a log to help monitor the currency of all broadcast material and the operational status of the equipment. In the event of a NWR system failure, the WFO should maintain a manual log, status board, or other equivalent mechanism for this purpose. Message, system and error logs are retained for at least 60 days to support review of broadcast management and system activity at any time and in particular after a weather or non-weather hazard event. Logs covering the period of a hazardous or severe weather event or non-weather hazard emergency that initiated a NOAA or NWS service assessment of any type or known legal action against the NWS are retained for a period of five years. An office must keep either a hard copy or electronic version of the logs. Electronic logs may include those maintained by AWIPS or NWR operational software if they are captured and retained before being overwritten.

3.3.2 NWR Outreach

The WFO Warning Coordination Meteorologist (WCM) or designee will work in concert with regional headquarters and DIS to communicate with local and state government emergency

officials/agencies concerning NWR coverage, emergency messaging, efforts to improve alert and warning dissemination, and communication of any issues, problems, public concerns, and solutions.

4 Broadcast Programming Goal

4.1 Broadcast Service Area

The broadcast service area for each transmitter site is defined by counties, parts of counties, or other defined areas and adjacent coastal or offshore waters where there is a reliable free space signal. Under ideal conditions (i.e., no obstructions to the signal within a uniform landscape), this would be a uniform ground-level signal of 8 microvolts within a 40-mile radius of the NWR transmitter/broadcast tower. The signal level will vary as a result of terrain, urban density, obstructions, and antenna mounting arrangements. The broadcast service area also is the region for which the NWR Weather Alert Code (WAT) and Specific Area Message Encoding (SAME) use is authorized. Any changes must be approved by the regional headquarters.

Because a broadcast service area depends on signal reception, it may extend beyond the programming office's warning and forecast area of responsibility. For areas with overlapping coverage by multiple transmitters, WFOs may broadcast program content for the overlapped area solely on the transmitter providing the best coverage. Periodic announcements over NWR should mention or define the broadcast service area. WFOs should distribute maps showing the broadcast service area as part of any NWR publicity, and post the maps on their website.

Do not extend a NWR broadcast service area beyond its normal boundaries to accommodate listeners employing sophisticated high gain receiving equipment.

4.2 Broadcast Quality

While automated broadcasts will use the following broadcast practices, WFOs should also adopt these practices when manually inserting products for broadcast to improve program quality and usability.

4.2.1 Style of Presentation

The broadcasts should include complete sentences for both the lead-in and main text. Use the word "you" as appropriate when referring to listeners as this projects interest and concern. Also, the following should be considered:

a. Summarizing: summarize tabular data, except in cases where precise listings are necessary or preferred by listeners;

b. Wording: all messages should use the past or future tense;

c. Time on Messages: broadcasts should include time on messages containing highly perishable material. These include observations, radar or other position reports, and river stages. Issue times should normally not be broadcast for forecasts, watches, warnings, or

related statements. Generally, use times only for occurrences and expiration of an event; and

d. Word Pronunciation: give careful attention to correct word pronunciations including indigenous proper, place names and homographs (words that are spelled the same but pronounced differently) through staff training and use of NWR software designed to improve pronunciation.

5 Broadcast Message Priority

The four major elements of broadcast priority in descending order for the broadcast service area are:

a. Messages for Critical Events. These normally include warnings, short duration watches, and other weather and non-weather-related hazard information (see Section 6);

b. Basic Core Messages. These should always be included unless de-emphasized or pre-empted by messages for critical events. These normally include the station identification, the hourly weather roundup, the service area forecast and synopsis, a marine forecast if that information meets the predominant needs of the community, and optionally a regional forecast. The basic core messages may vary according to local customer needs. See Appendix C for program guidelines;

c. Special Customer Messages (desirable). These normally include marine forecasts (if not already part of the basic core messages), lake and river stage reports, recreation forecasts, climatic data, fire weather forecasts, air quality information, weather-related road information, Ultraviolet Index (UVI) forecasts, and non-weather-related announcements. See Appendix C for program guidelines. Although there is special customer programming for groups with similar interests, NWR broadcasts will not be tailored to the needs of any individual person or individual business entity; and

d. Educational and Promotional Messages (desirable, but optional). These normally include safety messages and announcements of awareness activities.

5.1 Broadcast Management Guidelines

The NWR broadcast management system can provide a more customer-oriented broadcast than a simple sequencing of standard products. Offices should find innovative uses of the enhanced scheduling functionality to best meet the preferences of the listeners. The dynamic use of time-insertion for certain products and frequent cycling of others is a good option. One example of this time-based information includes broadcasts of specific information at a prescribed time during the hour, day, week, month, or year.

AWIPS and other software provide text formatters to produce NWR messages in a conversational style. Follow basic format requirements in manual mode as well. When manually recording products, use a professional, but conversational, news style delivery.

During critical events, place emphasis on watch/warning repetition, updates, and call to action statements. Product content with low (or even no) priority should be reserved for routine core and special customer broadcasts. For basic terms, approaches, and definitions related to the NWR system broadcast scheduling see Appendix D, and the appropriate NWR software operations manual or other local instructions. See Sections 5.2 and 6 for detailed guidelines on broadcasting operations for critical events.

5.2 Broadcast Content

Focus messages on what has recently happened and what is forecast to happen. Messages should be concise, avoiding acronyms and offensive language, and be mission related. Normally, messages should not be broadcast longer than 6 hours after issuance (zone forecasts are an exception, usually updated every 12 hours). Offices with broadcast service areas crossing state lines will provide balanced information and not favor one state over the other.

If state or area weather summaries providing past weather information are broadcast, only air them for a limited time. Do not broadcast messages of national coverage except to highlight an event of long-term interest, such as a hurricane threatening the United States, a major winter storm, or a NWEM of national significance.

5.3 Unauthorized Material

Ensure no unauthorized or improper material (or improper language) is broadcast, either directly or indirectly (through background noise when in manual broadcast mode). If the NWR system is in the WFO operational area, remember to limit or restrict background noise when recording manually.

Specific material restricted from NWR broadcasts include:

a. aviation weather in any form (i.e., ceilings, altimeter, terminal forecasts, etc.);
b. music in any form or style, except as authorized by regional headquarters;
c. encoded data, except NWR SAME;
d. excessive technical terms;
e. foreign languages (except when authorized by regional headquarters);
f. bulletin board announcements, such as meetings and activities for civic, business, and hobby clubs, lodges, professional and fraternal organizations, unions, business clubs, charities, fund raising, etc.;
g. profanity and loud background noise; and
h. proprietary data provided by private weather companies, unless permitted by agreement.

5.4 Non-Weather Related Announcements

Only announcements (from NWS or from non-NWS sources) fitting one of the following criteria should be permitted. Non-NWS sources of information should be identified in the message.

a. Activities helping the NWS to fulfill its primary mission, such as requests for NWR listener feedback, major public preparedness activities, open houses, dedications, safety

information, Skywarn training meetings, and educational and promotional information about NWS products and services.

(1) Some of these announcements are appropriate for random or occasional broadcast. These messages should be shorter than 60 seconds, preferably between 15 and 20 seconds. Use no more than two such messages at any one time. Prerecorded messages may be used.

(2) Announcements for the recall of NWR receivers may be broadcast, following the guidelines in Appendix E, "NWS Action Plan for NWR Receiver Recall." This appendix, approved by General Counsel, should be used to address each receiver recall in the same manner.

b. Non-Weather Emergency Messages (NWEMs) authorized in Section 6.4.

c. Other messages requested through official channels by the DOC/NOAA and construed to be time critical and related to the NOAA mission.

d. Safety, security messages and limited public service information messages requested by the United States Coast Guard (USCG) will be broadcast when relevant to the NWR broadcast service area. Procedures in Section 6.3.5, Warnings for Marine and Other Marine Events, relating to the USCG should be followed.

If doubt exists whether a message meets one of the criteria, the WFO will coordinate with their regional headquarters. If further doubt exists within the regional headquarters, coordinate with the DIS/DST.

6 Operations for Critical Events

The following information must broadcast as soon as possible:

a. All watches, advisoriies and warnings issued by the NWS for the broadcast service area.
b. All statements related to severe weather, floods, flash floods, dust storms, tsunamis, blizzards, and short-duration winter hazards, and marine weather.
c. Any NWEM (as per agreements with federal, state and local authorities) affecting the broadcast service area (see Section 6.4).

The automated text-to-speech feature of the NWR system is the most effective way to broadcast warnings as quickly as possible. Offices should strive to automate as much of their warning programming as possible.

Offices should rarely modify these broadcast messages other than to:

a. Form complete sentences (if necessary);
b. Include appropriate punctuation;
c. Eliminate:
   (1) naming of counties/areas outside the broadcast service area;

(2) material that is relevant only to areas outside the broadcast service area;
(3) generic calls to action if calls to action are included elsewhere in the broadcast program; and
(4) acronyms;

d. Summarize tables and lists

6.1 Role of NWR in the National Warning System (NAWAS)

The role of NWR in support of national defense and homeland security and as part of an "all hazards" emergency alert network is covered in detail in Appendix F.

6.2 Initial Issuance of Short Duration Watches, Warnings and Related Statements

Broadcast the initial issuance of a short duration watch, warning, and related statements valid for the NWR broadcast service area immediately using automated means unless it is absolutely necessary to broadcast manually. Start these initial broadcasts with the NWR SAME and the 1050 Hz WAT. These codes and alarms may also precede, at regional headquarters' option, other watches, warnings, and certain related follow-up statements (see Appendix G). The rules for initial broadcasts of these messages are described below. Do not broadcast numbers and plotting points for convective watches.

Initial Watch/Warning Broadcast Rules

a. Transmission of the NWR SAME followed by the 1050 Hz WAT.

b. Broadcast the watch/warning information. This information may be abbreviated to suit emergency management or media needs, but more detailed information should then follow without the codes and alarms. To minimize any lag time between issuance and broadcast of a short duration warning when in manual mode, you should broadcast the initial warning live.

c. Repeat highlights (i.e., what, where, and when).

d. NWR SAME end-of-message code.

To assist monitoring requirements of the Emergency Alert System (EAS), certain short duration warnings with NWR SAME, for counties/parishes/census areas/boroughs just outside the NWR broadcast service area, may be broadcast without the 1050 Hz WAT as per local agreement.

6.3 Programming after Initial Watch/Warning Issuances

Highlight or summarize most public watches and warnings in the service area forecasts or optional regional forecasts, as outlined in Exhibit 1. But, use separate messages for details of hurricane, tropical storm, storm surge warnings and short duration warnings for tornadoes, severe thunderstorms, and flash floods.

As threatening weather gets closer to the broadcast service area or when ongoing conditions become more hazardous, eliminate less essential parts of the broadcast program to allow additional time for watch, warning, or special/severe weather statement information.

Announce safety and preparedness information in advance of hazardous weather when possible as a supplement to hazardous weather outlooks. Include safety rules and/or call to action statements appropriate to the hazard when watches or warnings are in effect if time permits.

The remaining subsections in 6.3 provide guidance on how to conduct programming during specific hazardous events. Within these subsections, the term "regional area" means beyond the broadcast service area to around 300 miles or so from the NWR station. "Nearby" means only locations in the regional area adjoining the official NWR broadcast service area. Exhibit 1 provides a tabular summary of the guidelines in the following subsections for handling critical NWR information.

Exhibit 1: Guidelines for Handling Critical Information on NWR*

Event	Area Affected	Summarize in Regional Forecast (optional)	Highlight n Service Area Forecast	Detail in Separate Message	Program Status: Normal or as Marked
SHORT DURATION					
Thunderstorm/Tornado/ Flash Flood Watches	Svc area Region		X	X N(3)	
Thunderstorm/Tornado/ Flash Flood Watches	Svc area Region			X N(3)	limited
Special Marine Warning	Svc area			X	
LONG-FUSE					
Winter Storm/High Wind Watches	Svc area Region	X X		X(3)	
Winter Storm/High Wind Warnings	Svc area Region	X(4) X(5)	X	X N	(4)
Hurricane/Tropical Storm Watches	Svc area Region	X X(5)	X	X	
Hurricane/Tropical Storm Warnings	Svc area Region	X(5)	X	X N	limited
Storm Surge Watches	Svc area Region	X	X	X	
Storm Surge Warnings	Svc area Region	X	X	X	limited
Flood Watches/ Warnings	Svc area Region	X X	X(3)	X N(3)	
MISCELLANEAOUS					
Marine Warning (non special)	Area (6)			X	
Tsunami Watches and Warnings	Svc area			X	(2) for warnings
Civil Emergency Messages	Svc area			X	(3)
Nuclear Attack	anywhere			X	limited

*Definitions

(1) Definition of area:
Svc area: broadcast services are as defined in Section 4.1
Region: outside of broadcast service area to radius to about 300 miles
N: only those "nearby" areas in the region adjoining the broadcast area
(2) Limited program status means to confine information to the hazard, eliminating some basic or special customer programming
(3) Optional
(4) Should limit programming when conditions actually affect area
(5) May include areas at appropriate distances beyond the region
(6) Marine forecast: see appendix C

6.3.1 Watches for Tornadoes, Severe Thunderstorms and Flash Floods

After the initial watch message is aired, highlight information on short duration watches for the NWR broadcast service area in the service area forecast and/or include in a separate message.

6.3.2 Warnings for Tornadoes, Severe Thunderstorms and Flash Floods

Replace the short duration warning message with any updated severe weather/flash flood statements issued after initial broadcast of these warnings. These replacement statements should briefly restate the essential basics of the warning (what, where, when) followed by the new information concerning the event. The replacement statement will mention if a warning has been cancelled or allowed to expire. A summary message containing up-to-date information on all existing watches, warnings, and advisories in the area may be used, but the summary must include up-to-the-minute current information. When multiple warnings are in effect, include only brief call to action statements that relate to saving lives and property.

6.3.3 Watches and Warnings for Winter Storms, High Winds, and Dust Storms

Highlight information for these watches and warnings in the service area forecast and/or summarize in the optional regional forecast and/or include in a separate message. If it is necessary to broadcast a separate watch or warning message, ensure the message does not contain conflicting information and, to the extent possible, does not contain redundant information not useful for listeners in the broadcast service area.

6.3.4 Watches and Warnings for Hurricanes and Tropical Storms

Broadcast relevant content from the latest Hurricane Local Statement (HLS), the Tropical Cyclone VTEC (TCV) product (where available), and the National Hurricane Center (NHC) or Central Pacific Hurricane Center (CPHC) public advisory, editing for brevity. Do not broadcast the entire NHC or CPHC public advisory due to its lengthy and detailed nature. Indicate cumulative probabilities through 72 up to 120 hours for locations within the broadcast service area as appropriate and as authorized in NWS Instruction 10-601, WFO *Tropical Cyclone Products.* Also highlight watches and warnings in the service area forecast.

During hurricane, tropical storm and storm surge warnings, limit the programming to separate warning message with the advisory, service area forecast, short term forecast, hourly weather roundup, safety rules, or any relevant HLS or TCV.

6.3.5 Warnings for Marine and Other Marine Events

a. Special Marine Warnings and Follow-up Statements. Broadcast information for each event in the broadcast service area as a separate message. See Section 6.3.2 for suggested updating procedures.

b. Other Marine Weather Warnings. Broadcast all other marine warnings, weather-related statements, and advisories that apply to a WFO's marine forecast area (see Appendix C).

c. Special/Urgent Marine Information. In the interest of marine safety and at the request of the USCG or other appropriate authority as designated by regional headquarters, NWS WFOs should broadcast information dealing with an emergency marine situation where: (1) life and/or property is imminently threatened, and (2) such information could help prevent further losses. The USCG selects messages that are within the appropriate NWR listening range and deliver the information ready for broadcast (without editing by the NWS). Any WFO that has effective NWR coverage in the area of USCG concern should broadcast the USCG message as requested.

   Try to limit these USCG or other appropriate marine authority messages to no more than 30 to 40 seconds (about 70 words). Keep the broadcast in the programming until the message is updated (normally 2 to 3 hours) or until the USCG cancels it. Consider using the periodicity feature in the broadcast cycle for messages that are not frequently updated. Do not broadcast these messages for longer than 12 hours or replace any routine weather products broadcast over NWR with them. A sample message follows:

   "The following emergency marine information is transmitted at the request of the U.S. Coast Guard.... An oil tanker and freighter have collided at the entrance to the Puget Sound between Ft. Warden and Ft. Casey. The channel is blocked and oil covers much of the water surface in the area. All mariners are requested to stay clear of the area."

   In the event NWS priorities require temporary suspension of the USCG broadcast, or a station emergency prevents the NWS from broadcasting the message, the NWS should notify the requesting USCG office of the situation as soon as possible.

   The WFO and USCG should periodically review the procedures for delivery and broadcast of these messages. NWR broadcast of broadcast of USCG safety, security and limited public service information via NOAA Weather Radio is addressed in a Memorandum of Agreement between the USCG and NOAA/NWS Regarding the Management of Marine Weather administered by the NWS AFS Marine, Tropical, and Tsunami Services Branch.

6.3.6 Watches, Warnings, and Related Statements for Floods

Broadcast these products (including river, coastal and lakeshore flood) for the broadcast service area in a separate message. WFOs may also summarize them in the service area forecast or

optional regional forecast. This information may also be broadcast for nearby areas to the service area to meet listener needs.

6.3.7 Watches and Warnings for Tsunamis

When these bulletins apply to the broadcast service area, broadcast them as a separate message using only the predictions for the broadcast service area. Because of rapidly changing water levels associated with a tsunami, local water level observations should not be broadcast.

Broadcasting information on tsunami-related evacuation over NWR is only permitted if prior arrangements were made with local emergency management authorities to receive the timely information, such as requests to relay Non-Weather Emergency Messages (see Appendix F and NWSI 10-518). Provide the source of the evacuation information in the message. If there are no such arrangements, the following statement should be read at the end of a tsunami warning issued by the responsible Tsunami Warning Center:

> "Due to rapidly changing conditions associated with tsunami wave activity, listeners are urged to tune to local Emergency Alert System media for the latest information issued by local disaster preparedness authorities. They will provide details on evacuation of low-lying areas, if that is necessary, and when it is safe to return after the tsunami threat has passed."

6.4 Non-Weather Emergency Messages (NWEMs)

The NWS is authorized by FEMA to relay on NWR potential life-saving messages originated and authenticated by state, tribal, local, and other federal government agencies. These messages should meet the requirements outlined in the following subsections. Subsections 6.4.a and 6.4.b provide overall guidelines that apply to all non-weather related emergency messages. Section 6.4.1 provides more specific guidelines that any agreements should follow. Subsection 6.4.2 provides guidelines when agreements do not exist and an emergency occurs. Subsection 6.4.3 provides guidelines on regional/national emergencies. Appendix I provides an example of how these guidelines may be implemented.

a. The lead-in to any NWEM should be as follows:

   "The following (TYPE OF MESSAGE) is transmitted at the request of (OTHER GOVERNMENT AGENCY) (remainder of text)."

b. General Criteria for Broadcasting NWEMs. To be permitted on NWR, these messages should comply with all the following criteria.

   (1) PUBLIC SAFETY IS INVOLVED -- Information will aid in reducing the loss of life or substantial loss of property.

   (2) OFFICIAL INFORMATION -- The source of the information should be a federal, state, tribal, or local government agency whose information directly supports Federal responsibilities concerning the protection of life and property.

(3) TIME CRITICAL -- Event requires immediate public knowledge to avoid adverse impact.

(4) Other means of disseminating the information are not adequate to ensure rapid delivery of urgent information of an immediate threat or of significant importance to life and property.

(5) Information length and format is consistent with other NWR broadcast program material. Inclusion of this information should not compromise the remaining NWR broadcast content.

(6) Information should be non-routine and infrequent.

(7) Information is complementary and not counterproductive to the NWS warning program.

6.4.1 Local Non-Weather-Related Emergencies Covered by Agreement.

As a general rule, there should be only one statewide agreement with one agency, such as a state EAS plan, to cover all the anticipated situations. Keep a copy of agreements and detailed procedures to carry out the agreements near the weather radio operations area. Regional headquarters will approve agreements to broadcast non-weather emergency information (including possible use of the 1050 Hz WAT and NWR SAME), but may assign development and coordination of such agreements to the WFO state liaison office.

6.4.2 Local Non-Weather-Related Emergencies Not Covered by Agreement.

When events occur requiring the use of NWR by external sources not covered by any agreements, the WFO senior official on duty should determine if the event presents a clear and immediate threat to lives and property in the listening area. If it does and the use of NWR could reduce the threat, authorize these broadcasts, as requested by locally recognized public safety officials. The authority is not to be extended to develop or promote any unofficial or non-approved agreements. If time permits, contact the regional headquarters before the broadcast is made. If time does not permit, contact regional headquarters as soon as possible afterward with details of the event. Examples of situations that would fall under this category are (1) a serious chemical spill or leak, (2) a biological release, (3) an explosion in a populated area, (4) a power blackout, (5) a nuclear release, or (6) a riot or other civil disturbance.

6.4.3 National and Regional Non-Weather-Related Emergencies.

In support of FEMA, NWS should disseminate emergency messages over the NWR, including but not limited to, attack warnings and large-scale non-weather-related events, such as earthquakes and volcanic activity. The dissemination rules for national and regional NWEMs, including enemy attack, are described in detail in Appendix H, with broadcast instructions in Exhibit 1.

6.5 Required Weekly Test (RWT)

Activate the 1050 Hz WAT and NWR SAME test code features of NWR for test purposes each Wednesday between 10 a.m. and 1 p.m. local time, except when severe weather is ongoing or threatening. At regional headquarters' discretion, WFOs may broadcast the RWT additionally at certain other times (e.g., evening prime time) to suit stated customer needs and within office capabilities. WFOs should not broadcast the RWT using automated scheduling unless there is a specific procedure to ensure the test does not inadvertently air during threatening weather.

Immediately after transmitting the appropriate NWR SAME and 1050 Hz WAT, broadcast the following message (it may be shortened, at WFO option, except include counties/parishes/areas).

> "This is the National Weather Service Office in ***city***. The preceding signal was a test of the Weather Radio Station ***LLL-NN's*** public warning system. During potentially dangerous weather situations, specially built receivers can be automatically activated by this signal to warn of the impending hazard. Tests of this signal and receivers' performance are normally conducted by the National Weather Service at ***time*** each ***day of the week***. If there is a threat of severe weather, the test will be postponed to the next available good-weather day. Reception of this broadcast, and especially the warning alarm tone, will vary at any given location. This variability, normally more noticeable at greater distances from the transmitter, can occur even though you are using a good quality receiver in good working order. The warning alarm tone will be activated for hazardous watches and warnings for the following ***counties list of counties/parishes/boroughs/independent cities, or other designated areas.*** This concludes the weekly test of Weather Radio Station ***LLL-NN***."

Where more than one state is involved, include the state name before the names of the counties in that state.

If, for any reason, the test was missed during the scheduled time frame, then the next test should not take place until about 24 hours later on the next available good-weather day.

As part of the weekly test, use ROAMS and if implemented, the NWR Status Management System (STATMAN), to quality control the broadcast and validate the proper operation of NWR SAME from all stations (see https://nwr-statman.com/). This procedure is described in Appendix B.

7 Broadcast Outage and Suspension Rules

7.1 Notice of Planned or Unplanned NWR Facility Outage

In the event of a NWR facility outage planned at least 24 hours in advance, broadcast a brief message periodically during the 24-hour period before the outage. Immediately broadcast and frequently repeat planned outages scheduled to occur in less than 24 hours. For example:

"*NOAA Weather Radio station KEC-75, Des Moines, Iowa, will be off the air for maintenance from 10 a.m., Wednesday, until about 9 a.m., Thursday*."

Include the estimated time of return if it is known. Avoid such general terms as "Thursday morning" or "Monday night."

When interference with other agencies requires temporary suspension of NWR broadcasts, a brief message should be aired over the NWR just before the suspension. A sample message follows:

"*NOAA Weather Radio station KHB-36, Washington, DC, will be off the air from 7 a.m. until 3 p.m., Thursday, because of technical difficulties. If weather warnings are required during the period, NOAA Weather Radio will resume broadcasts as soon as possible*."

When NWR equipment is taken off the air, send a Public Information Statement (PNS), prominently announce the outage on the WFO web page, and/or announce it using the local NWS telephone recording system, if feasible. The following is an example of a suggested message that may be used to advise subscribers of a NWR outage.

Example:

NOUS41 KLWX 161230
PNSLWX

PUBLIC INFORMATION STATEMENT
NATIONAL WEATHER SERVICE BALTIMORE/WASHINGTON
830 AM EDT TUE APR 16 2017

NOAA Weather Radio KHB-36 Washington DC will be off the air due to technical difficulties from 10 AM today, Tuesday, until about 9 AM Wednesday. If weather warnings are required during the period, NOAA Weather Radio will resume broadcast at once.
$$

All outages (planned or unplanned) will be reported to the Regional Headquarters and DST NWR Program staff, as quickly as time will allow. All unplanned outages will be documented using the Unscheduled Outage System (USOS), reporting critical outages as described in NWSI 30-2112, Reporting Systems Equipment and Communications Outages

7.2 Broadcast Suspension Rules

Federal, state, tribal, and local government agencies use frequencies near the NWR band. On occasion, these agencies (e.g., Treasury, Forest Service) will temporarily move into a NWR broadcast service area with a mobile radio system to cope with a highly critical situation. When NWR is the suspected cause of interference to another emergency radio system, the NWS will eliminate the radio interference by following procedures in NWS Instruction 10-1711, *NOAA Weather Radio All Hazards (NWR) System Management*. For further help, the Regional

Headquarters may contact the DIS NWR Program Office (DIS/DST). In addition, the following provides rules for when to suspend NWR operations.

7.2.1 Routine Request

Following are guidelines to suspend NWR operations when interference is expected.

a. Designated staff of an agency involved in a critical operation should first prove, by "on-off" short duration tests with the local NWR involved, the interference is actually a result of NWR.

b. If it is shown that the interference can be eliminated by the temporary suspension of a NWR station operation, the designated contact for that agency should request from the WFO a temporary shutdown for that station. The WFO should strive to solve the problem, with immediate notification to the regional headquarters for relay to the NWR Program Manager. If the problem cannot be resolved, the WFO should coordinate with the regional headquarters to notify or coordinate with the NWR Program Manager, if necessary.

   Any WFO office that has been requested to temporarily shut down suspend NWR operations, in accordance with the above guidance, should continue operations—or immediately resume the broadcast operations—during actual or imminent severe weather, flood, or other disasters.

c. If a WFO has temporarily suspended NWR operations, follow notification procedures of the NWR facility outage as outlined in Section 7.1.

Any WFO office that has been requested to temporarily shut down suspend NWR operations, in accordance with the above guidance, should continue operations—or immediately resume the broadcast operations—during actual or imminent severe weather, flood, or other disasters.

d. If a WFO has temporarily suspended NWR operations, follow notification procedures of the NWR facility outage as outlined in Section 7.1.

   Any WFO that has been requested to temporarily suspend NWR operations, in accordance with the above guidance, should continue operations—or immediately resume the broadcast operations—during actual or imminent severe weather, flood, or other disasters. WFOs should inform the regional headquarters when this situation arises and the regional headquarters should relay that information to the NWR Program Manager in DIS/DST, who will relay it to the designated contact for the other agency involved.

7.2.2 Emergency Request

Section 7.2.1 provides guidance for expected interference conditions, but not all situations can be expected. When NWR unexpectedly causes interference to another emergency radio system (i.e., fire trucks, ambulance, etc.) and no severe weather is occurring or imminent, the NWR office should suspend the NWR broadcasts. If a WFO has temporarily suspended NWR operations, follow notification procedures of the NWR facility outage as outlined in Section 7.1. The WFO

should notify the regional headquarters as soon as possible, who will relay it to the NWR Program Manager. The WFO, in coordination with the regional headquarters and the NWR Program Manager, if feasible, should work with the involved parties toward resolution and resume NWR broadcasts as soon as possible.

7.2.3 Fire and Bomb Threats

When a NWR office must evacuate due to a bomb threat, fire, hazardous material incident, or other hazard, add a short message to the broadcast program if time permits. For example, "Some updated information may not be available until further notice." Never announce the office is being evacuated due to a bomb threat or fire. . **For security reasons and to avoid anxiety by listeners, do NOT mention that the office has been evacuated**.

8 Quality Assurance

The WFO and regional headquarters have the primary responsibility for maintaining the quality of NWR broadcasts. The regional headquarters should ensure that appropriate training is available to WFO staff to maintain high broadcast quality. The WFO should assure quality by on-shift monitoring and active participation of a NWR program leader as described in 8.1. See Appendix A for information on training and practice requirements to assure proficiency.

8.1 Quality Assurance on Shift

Monitor the broadcast programming frequently during the shift to ensure the information is timely, complete, consistent, accurate, and of clear audio quality. For those transmitters out of broadcast range of the WFO, check the audio quality using the NWR system monitoring function and ROAMS. Check actual broadcast audio from the transmitter once a week as part of the RWT (see Section 6.5). Each person placing a message in the broadcast program should see that the product is reviewed and proofread, and evaluate the new product's impact on the total program before broadcasting it.

See Appendix B for identification of NWR system problems by ROAMS and the appropriate responses by WFO personnel.

8.2 Recovery after an Inadvertent Alert is Transmitted

If the SAME and/or 1050 Hz WAT is inadvertently transmitted with or without an associated audio message, the issuing WFO will take the following steps:

a. Take the steps described in NWS Instruction 10-1701, Section 7.3, *Recovery After an Inadvertent Test or Practice Message*, if a text product was transmitted in addition to the NWR audio broadcast.
b. Remove the errant message immediately from NWR broadcast and issue a retraction message broadcast as soon as possible.
c. State in the follow-up retraction message that the errant alert tone(s) was issued in error and, as appropriate, no significant weather or hazardous event is expected.

8.3 Drills of Broadcast Rules for Critical Events

Each WFO will conduct and document periodic drills using procedures outlined in Appendix A.

8.4 NWR Program Leaders

Each WFO should have a NWR program leader(s) who will:

a. Ensure manuals, handbooks, and logs are kept up-to-date and all NWR operators are familiar with current operating instructions and techniques for preventive maintenance, as locally determined.

b. Carry out any NWR-related duties assigned by the WFO management.

c. Assist the NWR system focal point (if not the same person) in the programming and maintenance of the NWR system.

d. Ensure educational and promotional materials and the NWR Web page on the WFO Web site, if appropriate, are adequate and up-to-date (see Section 12).

e. Assist WFO management in the NWR Operator Proficiency Program, as described in Appendix A.

9 NWR as a Substitute for Other Means of Dissemination

NWR broadcasts are one method WFO management should use to lighten the total dissemination workload of the office. Recordings created by the NWR broadcast management system should be used to reduce the number and variety of manual telephone recordings, as well as reduce the number of incoming telephone calls to the office.

10 Use of NWR by the Broadcast Industry

The FCC permits all broadcast stations to re-broadcast NWR transmissions. Appendix H is a copy of the FCC rebroadcast rules applicable to all broadcast stations found in Title 47: Telecommunications Part 73, Section 1207. It lists the conditions placed on the blanket re-broadcast authority. The same conditions apply to re-broadcasts of NWR on amateur radio. See also NWSI 10-1711, "*NOAA Weather Radio All Hazards (NWR) System Management,"* for proper process and references to agreement forms for direct access to NWR audio output.

Regional headquarters and WFOs should encourage cable TV systems and radio and TV broadcast stations to: (1) Re-broadcast NWR programming where areal coverage coincides with the NWR broadcast service area and (2) to refrain from the rebroadcast of NWR programming, including warnings, in areas well beyond the NWR listening range.

The NWR serves as the NWS's primary input to the EAS through the use of NWR SAME technology, which has the identical communications protocols as the EAS. The "EAS Participant" definition does not include NWS or NWR stations. NWS at the national, regional

and WFO levels should continue to work closely with their respective broadcast industry and emergency management partners to assure the success of the EAS. WFOs, along with their EAS partners, should be involved in creating state and local EAS plans. See Appendix G for NWS policy regarding the use of the 1050 Hz WAT and authorized NWR SAME codes on NWR broadcast messages.

11 Restrictions under Operating License

The NWS is licensed to operate individual NWRs through the Interdepartmental Radio Advisory Committee (IRAC). The National Telecommunications and Information Administration (NTIA) of the DOC chairs this federal committee. IRAC controls NWS operations of the NWR, and other government-operated radio stations, in the same way the FCC does for commercial and other non-federal groups and organizations. Each NWR license is granted for a particular power setting and frequency at a specific site. The power, frequency, or location of a NWR station cannot be changed without prior coordination with regional headquarters, WSH (DIS) and approval from the IRAC.

12 Public Education and Promotion

To be fully effective, NWR must employ a continuing program of public education and promotion that involves the efforts of WSH, and regional headquarters and WFOs (see also Section 3.3.2). Information on NWR for the public and NWS staff is available on the Internet at https://www.nws.noaa.gov/nwr/

The NWS cannot make any recommendations to individuals or organizations on purchasing specific brands or models of NWR receivers. NWS staff can help answer general questions on receiver functionalities, such as NWR SAME. NWS staff can also help explain the meaning of the Public Alert ™ logo assigned to some receivers.

12.1 General Promotion Activities

WFOs should promote NWR, highlighting the 1050 Hz WAT and NWR SAME features (that limit areas to alert significant zones) and the value of NWR to schools, civic areas, sports complexes, hospitals, industrial centers, and homes. WFOs should also promote NWR awareness through outreach activities at conventions, fairs, boat shows, and other gatherings at the local, regional, and national levels. WFOs should engage and encourage feedback regarding NWR programming from special customer groups and from business groups promoting the sale of NWR receivers (see Section 3.3.2).

NOAA and King Features Syndicate have an agreement allowing for use of the Mark Trail comic strip character as a campaign symbol for promoting NWR. NWS staff should contact their national public affairs officer for guidance on using the Mark Trail image in specific campaigns

The DIS/DST has developed and periodically updates available NWR brochures (https://www.weather.gov/owlie/publication_brochures#radio) and NWR website (https://www.nws.noaa.gov/nwr/).

NWR exhibits are available from the NWR Program Office. Regional headquarters have briefcase-sized NWR exhibits for use by regional and WFO staff to promote NWR. These exhibits are self-contained and unfold to display a variety of NWR receivers with a brief text message on NWR. NWR videotapes and NWR Public Service Announcement video and audio tapes are also available from the NWR Program Office. These videos, exhibit, and brochures can be used in combination to provide an effective presentation.

WFOs should distribute, and post to the WFO Web page, site broadcast maps showing the NWR coverage area incorporating maps maintained by the NWR Program Office when possible. WFOs should also include any unique information about the NWR service. Other public awareness activities may include various newspaper advertisements, featured articles, office telephone recordings, NWS website news headlines and stories, and social media.

A sample advertisement in the newspaper for the weather section or radio station listing section might be as follows:

> WEATHER RADIO
>
> For 24-hour NOAA Weather Radio broadcasts, tune to 162.### MHz.

Brief NWR promotion messages can be placed on the office phone or WFO webpage. An example follows:

> "*Because of high public interest in weather, you may be unable to reach this number (or Web page) during active weather situations. You may wish to tune in to our NOAA Weather Radio station on 162.### MHz to receive the latest weather information broadcast continuously from this office. Consult your radio sales outlet to select a suitable receiver*."

Use the NWR broadcast as "audio" whenever the office telephones are placed on-hold and/or as an audio link off the WFO webpage.

12.2 Promotion with the Broadcast Industry

WFOs should cultivate positive relationships with the local broadcast industry, including television and radio station operators, to facilitate EAS Participants directly re-broadcasting timely NWR SAME-coded emergency messages to the public. WFOs should encourage broadcast stations to rebroadcast more of the NWR broadcasts outside of the EAS arena, including follow-up statements and other supporting forecasts. As examples, some television stations do this through the Secondary Audio Programming (SAP) technology, where people can tune televisions sets to the SAP to hear the information. Some cable television facilities use NWR re-broadcasts as a "voice-over," along with radar or other graphics. These efforts should be expanded where possible.

13 Customer Feedback

WFOs should document and take action on any feedback received from the public. If feedback is not actionable at the local level, but possibly actionable regionally or nationally, WFOs should send it on to the regional focal point and DIS. Noteworthy feedback should be sent to the NWR Program Manager.

14 Gift Cooperator – Operated NWR Systems

The basic NWR network funded by the federal government was completed in the early 1980s. Upgrades to site equipment and transmitters, and the addition of NWR stations over the years, have brought the network size to over 1000 sites. Because the NWR network does not reach every community in the United States, state and local governments, private companies, and various civic groups are encouraged to collaborate on costs for site location, tower or tower space, telecommunications, NWR equipment, operations, and maintenance to help establish new NWR stations or expand broadcast service areas. NWSI 10-1711, "*NOAA Weather Radio All Hazards (NWR) System Management*," provides specific information on collaborative efforts, including agreement forms for NWR donation. If funds are required to set up and maintain the private NWR station and are provided by a Cooperator, the NWS will assist in the analysis necessary for the siting and licensing of the NWR transmitter. A Broadcast Service Agreement will be established between the NWS and the Cooperator. Should a Cooperator wish to donate a transmitter to the NWS, formal acceptance of a donated transmitter will depend on the availability of funds for operations and maintenance and type of transmitter. The NWR internal website will direct NWS personnel to the proper processes and forms to assist the Cooperator.

APPENDIX A - NOAA Weather Radio (NWR) Operator Proficiency Program

Purpose: All NWS operational staff at the WFO must be skilled at disseminating warnings, watches, and advisories on the NWR system, including use of NWR SAME and 1050 Hz WAT, automated word pronunciation techniques, and any backup broadcast systems. Operational staff should be defined by regional and local office staff, but in general should include any individual who in the course of their duties, routine or emergency, would be called upon to perform any AWIPS operation and especially operations that process messages for NWR broadcast.

Background: The NWS's critical mission is to issue warnings, watches, and advisories for the protection of life and property and the enhancement of the national economy. The prompt and efficient issuance of these products on NWR and the EAS provides a far-reaching and effective warning/alert system to the affected U.S. population. Hence, all NWS operational staff at NWR sites must be skilled at providing this warning dissemination service.

Regional Headquarters: Regional headquarters oversee a NWR operator proficiency program in the respective NWS regions. This program will include an annual report from each WFO MIC to their regional headquarters. It will assure that each operational employee performed practice or real-time NWR/EAS warning issuances at enough intervals to show that WFO personnel can disseminate, in an operationally effective time, watches, warnings, advisories, and other appropriate messages over the NWR broadcast system(s) at that office. The report will contain enough detail, as described in the following section, to document the steps taken to confirm this capability. Each regional headquarters will maintain this documentation on file for a period of five (5) years.

Weather Forecast Offices (WFO): All operational employees will perform practice NWR/EAS warning issuance on the NWR system and any backup NWR broadcast systems no less than quarterly, and at other random times determined by the WFO management. These practice sessions will utilize the BMH practice mode functionality which eliminates the possibility of messages being broadcast over the air. For the NWR system, this will include correct and timely use of its Emergency Override function and Weather Message Creation function to disseminate an NWS warning.

One of these practice sessions per year will be for the official record and be monitored by a WFO trainer (SOO, WCM, NWR Program Leader or other trainer selected by the WFO management) for proper rules and timeliness. Once a year, the WFO management will document to their regional headquarters that all quarterly practice sessions were successfully completed by all operational employees, including the date(s) of the monitored NWR/EAS warning issuances. The WFO management will describe other actions taken throughout the year to ensure the skill of the office staff to effectively operate NWR in critical event situations, such as watches, warnings, and advisories.

APPENDIX B - NWR Remote Off-Air Monitoring System (ROAMS)

Purpose: This appendix describes the monitoring capabilities of the ROAMS and the actions that WFO staff should take in response to ROAMS messages to help timely NWR transmitter network maintenance.

ROAMS Operation: ROAMS is designed to monitor and report on the failure status of several transmitter parameters/applications. Among the parameters/applications monitored by ROAMS are: (1) primary transmitter AC power; (2) secondary transmitter AC power; (3) primary transmitter low broadcast power; (4) secondary transmitter low broadcast power; (5) program audio feed (signal at input to transmitter); (6) proper transmission of NWR SAME messages from the transmitters; (7) transmitter radio frequency (RF) carrier output; and (8) lack of broadcast audio output. Additional parameters/applications (e.g., shelter temperature) may be added to this list at regional discretion.

Response to ROAMS Calls: If ROAMS calls the WFO on an administrative telephone line, the operator should log the date and time of the call, the ROAMS ID, and the fault number(s) reported. The operator should send a command to acknowledge the report. Each WFO that is programmed to receive ROAMS calls has instructions on ROAMS remote operation."

Table 1 lists the ROAMS fault numbers and the required actions.

Response to ROAMS Fault Report on the NWR System: If ROAMS calls the NWR system, ROAMS will alert the operator through the Alert Message window. Each ROAMS telephone call will be reported with the transmitter ID in the Alert Message window without detailed alarm status. The operator should use the ROAMS Data window under the Transmitters menu to check the detailed alarm status. Response to ROAMS status should be as listed in Table 1.

Table 1: ROAMS Response Status

ROAMS Fault ID*	Fault Description	Follow-Up Action	Whom to Notify
Input Power Alarm	AC Power Failure to #1 Transmitter and System Power	If not equipped for automatic switch-over, switch to backup transmitter if available	Transmitter Site Power point of contact (POC)
Alarm #1	Transmitter #1 output power is low	Same as for Input Power Alarm	Transmitter Technician
Alarm #2	Transmitter #2 output power is low	Same as for Input Power Alarm	Transmitter Technician
Alarm #3	AC Power Failure to #2 Transmitter	Same as for Input Power Alarm	Transmitter Site Power POC
SAME Alarm #8	Indicates bad SAME message	Retransmit SAME message to determine if bad messages persist	If bad messages persist, National ROAMS Control/ Monitoring point and local office technical staff as necessary
Alarm #9	No broadcast audio	***Response for last three alarms listed:***	
		(a) Use ROAMS to check transmitter input audio	If audio level acceptable, then (b); else (c)
Alarm #10	No RF carrier from transmitter	(b) Use ROAMS to check broadcast audio	If audio level is acceptable, then problem has cleared; else Transmitter Technician
Input Audio Alarm	Audio telephone feed has dropped below level to keep transmitter keyed	(c) Monitor console audio	If console level is acceptable, then Telecommunications POC; else CRS technician

* Note: Coordinate additional faults selected for monitoring at both regional and NWR Program Office levels.

Points of Contact: Table 1 will be included in the station duty manual with telephone numbers for the five points of contact identified in the table.

Action Report: If maintenance action is required for any equipment as the result of a ROAMS report, start an Engineering Management Reporting System (EMRS) report.

APPENDIX C - Guidelines for Basic Core and Special Customer Messages

1. Basic Core Messages. Basic core messages are those to be repeated, often as a set, on a frequent basis. Except for the brief station identification (I.D.), delete or shorten these messages, as appropriate, when warnings are in effect within the broadcast service area. Normally, program this set of core messages in the following order.

    a. Station I.D. A brief station identification should appear with each repetition of the core broadcast. It should include the call sign, general broadcast service area, programming office and, if necessary, attribution information. This may be necessary at sites where free tower rent is provided, but the tower owner requires frequent attribution. At least one version of the I.D. should refer to NWR as the voice of the NWS. Two examples follow:

    "*This is NOAA Weather Radio station KEC-74, serving central Indiana and originating from the National Weather Service Office in Indianapolis. You may also obtain National Weather Service warnings and forecasts on the Internet at weather.gov*."

    "*You are listening to NOAA Weather Radio, the voice of the National Weather Service, serving western Washington and the adjacent coastal waters. KHB-60 Seattle and KIH-36 Neah Bay originate from the National Weather Service Office in Seattle."*

    A more detailed I.D. should be broadcast on a less frequent basis (e.g., once an hour) with appropriate attribution, frequency, and transmitter location and description of the service. The detailed I.D. should not be broadcast during critical event operations; only the brief I.D. should be broadcast. Include requests for feedback concerning NWR programming and scheduling in the detailed I.D.

    b. Synopsis and Optional Regional Forecast. These messages should be updated frequently enough to avoid reference to times that may be surpassed before the issuance of a replacement message. For example, do not say "snow is expected over the Great Lakes by late morning..." if the product will air past noon.

        (1) Synopsis. The general synopsis should contain a discussion of weather systems that will affect the broadcast service area during the valid forecast period. The synopsis should be very brief, in layman's terms, and limited to highlighting only the most significant features. It should emphasize the first 48 hours of the forecast period and indicate pertinent information through the extended forecast periods. If marine messages are part of the core broadcast programming (see Section 2.a below), the marine synopsis may be used instead, provided it describes features affecting both marine and land areas in the broadcast service area.

(2) Regional Forecast (optional). This is an optional overview, created for NWR, of the weather beyond the broadcast service area for a multitude of uses, such as marine, travel, outdoor activities, construction, media re-broadcasts, etc. It normally should not exceed 1 minute in length. The region covered should include the area out to a radius of about 300 miles from the transmitter.

For brevity, include in the forecast portion information for no longer than the next 36 hours. Place emphasis on problem areas associated with rain or snow, severely restricted visibility, and significant variations in temperature. A small number of larger city forecasts may be highlighted where significant listener need or interest exists. Alaska, Hawaii, or Puerto Rico may include weather to common destinations beyond the normal regional range (including mainland United States) or restrict the region to areas reachable by land. The latter would apply to U.S. coastal stations as well.

Information in the regional forecast for winter storm and high wind watches and warnings should be summarized, avoiding specific details. Include specific information in other portions of the broadcasts.

Avoid details on specific severe thunderstorm, tornado, flood, or flash flood watches in the regional forecast. Instead, use language or terms similar to the convective outlook about the potential for severe convective weather and flash floods. Include specific watch and warning information for severe convective weather and flash flooding for the broadcast service area in other portions of the broadcast.

Use information from the latest advisory on hurricane/tropical storm watches and warnings. At a minimum, include the storm location and strength as well as the 24-hour forecast movement and strength. Local offices or Regional Headquarters should set policies or guidelines to broadcast such information for appropriate distances beyond the regional area.

Temperature forecasts should be general and need not be closer than ranges of 10 degrees. Do not mention discussions of current or past weather unless relevant to the forecast conditions or if they will impact customers, such as those traveling into flooding or deep snow.

c. Service Area Forecasts. This forecast should cover, at a minimum, the main population base of the broadcast service area, as covered in the zone forecast product. Also include the extended forecast modified for the broadcast service area but with more general information than the 1- to 3-day forecast. Do not include short duration warnings (e.g., for tornadoes, severe thunderstorms, and flash floods) since they are carried on a separate broadcast segment. Highlight most other watches, warnings, and advisories.

d. Weather Roundups. Broadcast the latest observations within the broadcast service area around-the-clock and update them at least hourly. You may also include in the roundup observations or a summary of weather conditions adjacent to the broadcast service area out to a range of 100 to 300 miles. Offices in Alaska, Hawaii or Puerto Rico, because of their large areas of coverage, may include weather observations of interest to listeners beyond 300 miles. State the time of the observations. Update or remove observed weather from the core set of messages no later than 1 hour and 20 minutes after the valid time of last observation. If for any reason it becomes impossible to update this hourly, either automatically or manually, remove the weather roundup from the broadcast until it can be updated.

Some observations taken at 2- to 3-hour intervals, such as marine, still may be of some value for a longer time. If you include them in later updates, state the specific time of these observations. Use an available formatter to produce the roundup.

e. Short Term Forecast. Broadcast any Short Term Forecast in effect for the broadcast service area. Refer to NWSI 10-517, Multi-Purpose Weather Products Specification.

2. Special Customer Messages. These messages are of interest to well-defined customer groups that make up a large part of the listening audience. To avoid redundancy, limit the parameters to those not included in other broadcast material. With the exception of marine forecasts and forecasts for rivers near or at flood levels, schedule special customer messages in selected and limited time periods. Special customer messages may vary during the day, week, or season as audience needs change. For example, commercial fishermen are closely tuned to marine forecasts early in the morning before leaving port. Messages for special customers include:

a. Marine Forecast. Program the coastal waters forecast or Great Lakes near-shore and open-lake forecast for all NWR stations listed on Marine Weather Service charts. Also broadcast offshore marine forecasts depending on listener interest. Where marine interests are dominant, the marine forecasts may make up a large portion of the broadcast cycle, or even become the core broadcast. For instance, the concept of a "marine hour" may be addressed through scheduling of a marine suite. Some marine programming should be scheduled for landlocked NWRs with significant public interest in marine areas outside the NWR broadcast service area. Include weather information for inland lakes in the NWR service area forecast or recreational/resort area forecast if it is not part of the marine forecast programming. You may also include tidal information and water temperature in marine programming.

b. Climate Data. For a period of 1 to 3 hours every morning and evening, each station should broadcast a brief summary of the day's climate data. This information should take up less than 1 minute and should include high and low temperatures and precipitation. You may broadcast data, such as degree days and normals, solar information, and record reports. You also may program statements summarizing the monthly climatic data, dry spells, or other timely features. Recommended local

broadcast times are from around 7 a.m. to 9 a.m. and 7 p.m. to 9 p.m., depending on listener feedback, AWIPS issuance times, and local staffing considerations.

c. Hydrologic Observations and Forecasts, Tide Data, and Water Temperature. Include this information, according to customer needs, when reasonably large streams, rivers, lakes, or coasts are in or near the broadcast service area according to customer needs. Broadcast this message continuously when a hazard exists. Otherwise, broadcast this message in a limited time interval.

d. Fire Weather Forecasts. Include this information only during the fire season and where major forest, brush, or grass fires are possible or occurring. If the forest is out of the broadcast service area, you could include the information in the regional forecast.

e. Air Quality Information. Broadcast this information when pollution is above a critical safety level and the information is available from a local government agency. Include the time and the source of the report.

f. Recreational Forecasts. Limit these to areas where a significant percentage of the listeners are expected to go. These forecasts should describe weather events that will enhance or restrict activity. Incorporate these forecasts, as desired, in the regional forecast.

g. Weather-Related Road Information. Include road condition reports when there are hazards (typically in winter) and when the reports are easily available with frequent updates from an official source. The data should be summarized and require little or no writing or editing by NWS staff. To aid motorists, if approved by the officials involved, broadcast telephone numbers and web sites of the official sources. Also include the time and source of the report.

Example:

"AT 11:00 AM THE IOWA STATE POLICE REPORT INTERSTATE HIGHWAYS AND MAJOR US ROUTES WEST OF...ARE...."

h. Ultraviolet Index (UVI) Forecasts. WFOs that have UVI forecast sites within their NWR broadcast service area(s) should broadcast those UVI values on the appropriate NWR transmitters.

APPENDIX D - NWR System Basic Terms and Definitions related to Broadcast Scheduling

(Weather) Messages: The most important unit of information that the NWR system handles. A message consists of two parts: the message header (i.e., the message attributes including the message identifier) and the message content (i.e., information intended for broadcast). Messages may be live voice, digitized voice, or ASCII text. They may be input directly at the NWR system (by microphone) or from AWIPS.

Message Type: Name of message. The NWR system uses message types analogous to legacy Automation of Field Operations and Services PILs, i.e., contains information in eight or nine characters (cccnnnxxx or cccnnnxx) about the "ccc" node origination site (source of the message), the "nnn" product category (e.g., severe weather statement), and the "xxx" or "xx" specific product designator.

Broadcast Suite: A list of message types that are eligible to be broadcast when that suite is active. Categorized by "General," "High," and "Exclusive," these are ascending orders of program urgency relating to restricted message types in the suite.

Broadcast Program: Each suite is assigned to a program, and there will be multiple suites assigned to a single program. These programs are then assigned to a specific transmitter and result in the broadcast itself.

Emergency Override: Operation used when the NWR system is working, but an emergency situation exists that requires immediate human access to the transmitter. Cuts off current broadcast for the operator to "go live" with emergency information. These "live" messages can be recorded for subsequent insertion into the ongoing broadcast program.

Listening Area Codes: Also known as LACs, these are essentially Universal Geographic Codes renamed to identify their specific use by the NWR system. It is a code that identifies geopolitical areas (e.g., NWS defined zones, counties/boroughs/census areas, parts of counties, and even independent cities) to which a message applies.

Message Reference Descriptor: Also known as MRD. One of the attributes required to uniquely identify messages in the NWR system. Used ultimately to determine whether a message should be replaced or not.

Periodicity:	Messages may be scheduled so they are inserted at specific time intervals. This time interval is the periodicity (i.e., a message set to broadcast every 10 minutes has a periodicity of 10 minutes).
Broadcast Cycle:	The broadcast cycle can be considered as the core set of messages currently playing, including those playing sequentially and those playing periodically. On the NWR system, the broadcast cycle is depicted as inclusive of those message types listed on the broadcast cycle screen. Broadcast cycle length is the length of time it takes to broadcast all of those messages.
Manual Operations:	Use of the NWR system for manually recording and scheduling messages rather than using automated text-to-voice capability.
Practice Mode:	The mode of operation that allows operators to perform any BMH function without risk of creating messages that will be broadcast over the air.

APPENDIX E - NWS Action Plan for NWR Receiver Recall

At times, the NWS will be made aware of NWR receivers that have been recalled, either voluntarily by the manufacturer, or announced through the U.S. Consumer Product Safety Commission (CPSC) press releases. Based on decisions made by the NWS Action Officer (NAO), NWR Program Manager or DIS/DST designee, action may be required by WFOs. WFOs should not disseminate information or respond to questions about recalled NWR receivers until an official statement has been coordinated and released by the NAO. See NWSI 10-1710, *NOAA Weather Radio All Hazards (NWR) Dissemination*, Section 12, for education information and cautionary statement about making NWR receiver recommendations.

1. The NAO will research available information and determine if the NWR receiver recall circumstances meet criteria for broadcasting a non-weather-related announcement as listed in NWSI 10-1710, *NOAA Weather Radio All Hazards (NWR) Dissemination*, Section 5.4.

2. If the recall circumstances do not meet the criteria, the action officer will inform NWS Headquarters and regional offices of the pertinent facts.

3. If recall circumstances meet the listed criteria, the action officer will:

   a. Coordinate with General Counsel and Public Affairs on a draft Special Announcement, using the Special Announcement template in Attachment 1 as guidance.

   b. Inform the weather radio manufacturer's point of contact of the planned NWS action, provide a copy of the draft Special Announcement if possible, and allow reasonable time (five business days) for comment.

   c. Distribute via email instructions and Special Announcement script to Weather Forecast Office (WFO) Warning Coordination Meteorologists and Regional Headquarters Meteorological Service Divisions (MSD). The MSDs may redistribute at their discretion.

   d. Transmit a version of the scripted Special Announcement via a national Public Information Statement with the following Communications Identifier:

      NOUS41 KWBC (and issuance date/time in UTC)
      PNSWSH

   a. Maintain a weather radio receiver recall link to the U.S. Consumer Product Safety Commission (CPSC) on the NWS NWR receiver information webpage at: https://www.nws.noaa.gov/nwr/info/nwrrcvr.html.

Thanks,

   e.

4. Upon receipt of the instructions and Special Announcement script, WFOs will take the following actions as soon as practicable:

a. Record and broadcast on every NWR transmitter the Special Announcement script provided verbatim without deviation. Broadcast the scripted message once each hour for a seven-day period, then re-record and broadcast twice each day at 9 a.m. and 9 p.m. local time for three additional weeks.

b. WFOs that maintain a local NWR Web page on their WFO Web page will have a weather radio receiver recall link to the CPSC Web site. As a template, use the format seen at: https://www.nws.noaa.gov/nwr/info/nwrrcvr.html.or use the template below (4.d).

c. NWS offices will post a news headline (or teaser) with link to the CPSC news release and/ or link to the CPSC web site on their office webpage with decreasing frequency for up to one year.

d. Provide the following information to telephone and personal inquiries regarding the scripted Special Announcement for the recalled weather radio:

(1) The recalled radio is only (manufacturer and model number).

(2) If they own a (model number) radio, they should call (manufacturer) at (phone number, including hours number is attended if not covering daytime business hours for entire U.S.) or visit the company's website at (company webpage).

(3) The CPSC 24-hour hot-line is 1-800-638-2772, and the CPSC Web site is: https://www.cpsc.gov.

Attachment 1

Weather Radio Receiver Recall Script

THIS IS A SPECIAL ANNOUNCEMENT.

(***Manufacturer***), in cooperation with the U.S. Consumer Product Safety Commission, is (*voluntarily*) recalling one of its Weather Radios, Model (***number***). (Sentence describing appearance of radio and where to find model number, if appropriate). The radios are being recalled because (***reason, taken from CPSC information***). (Advisory information taken from CPSC press release or received from the manufacturer such as "consumers should not rely on the recalled weather radio to receive emergency information.")

Owners of (***model number***) should call (***manufacturer***) at (***phone number***, include hours number is attended if not covering daytime business hours for entire U.S.) (...or visit the company's Web site at (URL) (if Web option available)). This recall is ONLY for (***manufacturer***) Weather Radio (***model number***). This message will be repeated (hourly, daily at 9 a.m. and 9 p.m.).

APPENDIX F - Dissemination Rules for National and Regional Non-Weather Emergency Messages (NWEMs)

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1. Introduction. These procedures will be used to disseminate NWEMs from authorized government agencies (Federal, state, tribal and local) for hazards affecting the Nation or large regions of the country (i.e., several or single states or territories). The phrase 'non-weather emergency messages" are those hazards for which NOAA National Weather Service (NWS) does NOT have mission authority to originate emergency messages. They include, but are not limited to, enemy attack, terrorist-related emergency, avalanche, earthquake and volcano activity, etc. Tsunamis and volcanic ash fall, while normally resulting from earthquake and volcanic activity, respectively, are considered weather-related as the emergency messages are prepared by NWS. Authorization for NWS offices to distribute non-weather emergency messages or all-hazards emergency messages via NWS dissemination systems is addressed in NWSI 10-518 and the National Response Framework.

2. National/Regional NWEMs Received via the National Warning System (NAWAS).

a. Initial Dissemination.

(1) Following a 7-second ring on NAWAS, the National Warning Center, or its authorized alternate, will announce the title of the emergency message.

(2) The regional warning centers or other authorized alternate emergency operation centers (that normally operate in these situations) acknowledge the National Warning Center. The state warning points then acknowledge. The state warning points will then request acknowledgment from locations on the state warning circuits (including NWS locations).

(3) Get the exact text of the message by either transcribing or recording it from the NAWAS. If you get the message from another authorized source, such as AWIPS, e-mail or fax, use the state or locally established

method of authentication.

(4) Determine if message dissemination authority is for
- NWR broadcast only or
- both text product dissemination and NWR broadcast.

Request and obtain specific dissemination authorization from message originator if not provided. Disseminate message ONLY via method(s) specifically authorized. Note that due to NWS system design if a non-weather emergency message is disseminated via an N-AWIPS-generated non-weather emergency message text product it will also be disseminated via NWR. **Do NOT disseminate via text if authorization is not obtained.**

(5) Determine appropriate geographic codes to be used, such as entire geographic area or a specified portion, e.g., entire state, specific county/parish/borough/city FIPS code(s). Request clarification if needed.

(6) (If NWR dissemination only is requested, skip to step 7). If text product dissemination and NWR broadcast is requested, prepare and disseminate the emergency message via text product following NWSI 10-518 and local procedures. Text product dissemination should also result in the message being scheduled for NWR broadcast. Skip to step 8 when text product is disseminated.

(7) If NWR broadcast only is requested, prepare and broadcast message on NWR. Follow established local procedures to broadcast the message. If manually recording, read the message EXACTLY AS WRITTEN with a professional, news style delivery.

(8) Ensure the emergency message is scheduled for immediate broadcast on appropriate NWR stations. See NWSI 10-518, Appendix C and local and/or state EAS plans for guidance on appropriate SAME event code and NWSI 10-1710, Appendix G, Table G-2, for guidance on use of the 1050 Hz WAT.

(9) Continue standard NWR programming or, if appropriate based on content of the emergency message, implement a limited NWR program. If the WFO will be evacuated, broadcast a recurring short message informing listeners that some updated information may not be provided until further notice. **For security reasons and to avoid anxiety by listeners, do NOT mention that the office has been evacuated.**

b. Termination.

(1) For national level events, a termination statement will be announced on

NAWAS. If a message is sent via another authorized method or source, such as AWIPS, e-mail or fax, use the state or nationally established method of confirmation. Include the source and time of the termination statement.

(2) The regional warning centers or other authorized alternate emergency operations centers (which normally operate in these situations) acknowledge to the National Warning Center. The state warning points then acknowledge. The state warning points will then request acknowledgment from locations on the state warning circuits (including NWS locations).

(3) Following acknowledgment to the appropriate warning centers or as soon as the NWS office is again occupied, NWS offices will distribute the cancellation message via the same dissemination systems used for the initial emergency message. Select the NWR SAME/EAS code for Administrative Message (ADR) along with the appropriate geographic codes.

(4) Follow established procedures to disseminate the termination message via NWR or via text product and NWR.

(5) If manually recording, read the message EXACTLY AS WRITTEN with a professional, news style delivery.

(6) Place the CANCELLATION MESSAGE on the NWR routine broadcast cycle for at least one (1) hour.

3. Training Exercises. NWS WFOs will be notified of training exercises in advance by the official government source. WFO management will periodically review these instructions with all staff that might have to broadcast the warning.

APPENDIX G - Use of NWR SAME and 1050 Hz Warning Alarm Tone

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1. Introduction. An important NWR function is to serve as the NOAA National Weather Service's (NWS) primary input to the Emergency Alert System (EAS) through the use of NWR SAME technology. EAS uses the identical communications protocols as NWR SAME.

1.1 EAS Background. In 1951, President Truman established CONELRAD (CONtrol of ELectromagnetic RADiation). Under CONELRAD, during a national emergency only designated radio stations remained on the air and alternated their transmitting frequencies. It was designed to prevent enemy airborne direction finding equipment from using transmissions from broadcast stations as homing beacons.

In the 1960's and 1970's, the "Emergency Broadcast System" (EBS) evolved from CONELRAD. EBS was designed to provide the President with a means to address the American people in the event of a national emergency. Through EBS, the President had access to thousands of broadcast stations to send an emergency message to the public.

In 1994, to overcome some of the limitations of EBS, the Federal Communications Commission (FCC) decided to replace EBS with EAS. The major difference between EBS and EAS is the method used to alert broadcast stations about an incoming message. On January 1, 1997, EAS officially replaced the EBS on radio and television. The transition for cable systems to EAS began on January 1, 1998. EAS is governed by FCC Part 11 Rules (https://www.fcc.gov/wireless/bureau-divisions/technologies-systems-and-innovation-division/rules-regulations-title-47). EAS provides not only the President, but also national, tribal, state and local authorities, with the ability to give emergency information to the general

public via broadcast stations, cable and wireless cable systems. While participation in national level EAS alerts is mandatory for these providers, state and local area EAS participation is voluntary.

An EAS reference document, "The Emergency Alert System (EAS): An Assessment" (http://www.ppw.us/ppw/eas.html) was published in February 2004 by the Partnership for Public Warning. The report contains an overview of EAS and includes a comprehensive history and assessment of the system.

1.2 Updated FCC Part 11 EAS Rules. Periodically FCC Part 11 EAS rule changes affect NWR operations directly or the manner in which EAS participants relay NWR SAME alerts.

On February 26, 2002, the FCC issued a Report and Order (R&O) amending the FCC Part 11 EAS rules. The R&O became effective May 16, 2002. As part of the R&O, the FCC adopted numerous new all-hazards, weather, and natural disaster event codes and NWS marine area location codes.

A FCC R&O released July 11, 2016, adopted three new EAS weather event codes and required EAS equipment manufacturers to integrate the new codes into new equipment and software upgrades to existing equipment no later than January 12, 2017. The new event codes, Extreme Wind Warning (EWW), Storm Surge Warning (SSW) and Storm Surge Watch (SSA) are each tropical cyclone related and the NWS implemented them in NWR SAME at the beginning of the 2017 Hurricane Season.

1.3 State Emergency Communications Committee (SECC) and Local Emergency Communications Committee (LECC). NWS field offices, in conjunction with the NWS State Liaison Office (SLO), should work closely with their SECC/LECC along with other appropriate EAS planning groups to create, maintain, and test state and local EAS plans. The state and local EAS plans written by these groups are used by broadcast and cable facilities to ensure their respective EAS plans are in accord with FCC rules. EAS planning group membership and activities vary by locale, but other members should include representatives from state, local and tribal governments including emergency managers, state broadcaster organization(s), and local chapter(s) of the Society of Broadcast Engineers (SBE) and Society of Cable Telecommunications Engineers (SCTE). The SBE National EAS Committee and the SCTE national EAS Subcommittee are resources also committed to EAS improvement at the state and local levels.

These planning efforts help ensure that weather and NWEMs are appropriately validated, coordinated and disseminated. Planning should include the establishment of alternate methods of message entry and validation for use when the NWS primary method of EAS message entry (NWR) is not available. NWS field offices and regional offices will work diligently to ensure that state and local EAS plans are valid and, to the extent possible, permit NWS field offices to implement the principles and guidelines established in this appendix.

2. NWR SAME. The SAME protocol consists of discrete bursts of digital code embedded in the NWR broadcast, specifying certain information including the event (hazard) type, the geographic area affected by the message, the valid time of the message, and the message originator. See NWSI 10-1712, NWR Specific Area Message Encoding, for the technical specifications, message code format, and protocol for NWR SAME.

2.1 SAME and EAS Compatibility. Compatibility of SAME and EAS protocol and codes allows NWR

broadcast of SAME to be decoded by the EAS equipment at broadcast stations and cable systems. Broadcasters and cable operators can then relay weather emergency messages and all-hazard emergency messages almost immediately to their audiences.

The action taken by each broadcaster is normally guided by plans established by an agreement with the SECC and the LECC if one exists.

Although Common Alerting Protocol (CAP) is a significant new method being phased into the EAS, the SAME protocol continues to be used as the distribution via NWR and EAS. CAP has not yet been incorporated in NWR over-the-air alert broadcasting.

2.2 SAME/EAS Event Codes. NWS weather advisory messages do not have corresponding SAME/EAS event codes and will not be broadcast with any existing SAME/EAS event code or the 1050 Hz WAT. A limited subset of NWS weather statements (Flash Flood Statement, Flood Statement, Hurricane Statement, Special Weather Statement, and Severe Weather Statement) may be broadcast with SAME/EAS event code or the 1050 Hz WAT per coordination with WSH/Regions and agreement with EAS SECC's and/or LECC's.

a. Current event code naming convention. The 2002 FCC EAS R&O adopted the NWS naming conventions for EAS event codes. The third letter of all new hazardous state and local event codes is limited to one of four letters:

"W" for warnings - defined as an event that alone poses a significant threat to public safety and/or property, probability of occurrence and certainty of location is high, and the onset time is relatively short.

"A" for watches - defined as an event that meets the classification of a warning, but either the onset time, probability of occurrence, or location is uncertain.

"E" for emergencies - defined as an event that, by itself, would not kill or injure or do property damage, but indirectly may cause other conditions to develop which could result in a hazard. (This is very similar to the FCC's definition: events that do not meet the definition of warning or watch but are of such a nature that the information is important and may require public response.) For example, a major power or telephone loss in a large city alone is not a direct hazard, but disruption to other critical services could create a variety of conditions that could directly threaten public safety.

"S" for statements - defined as a message containing follow up information to a warning, watch, or emergency.

This naming convention makes possible a wider range of consumer products without lessening the current capabilities of the EAS or NWR SAME. As future NWS or NWEM event codes are developed, consumer receiver devices that meet certain technical standards outlined by Consumer Technology Association (CTA) Standard 2009-B (or current revision), Performance Specification for Public Alert ™ Receivers, and incorporate the NWS and FCC

naming conventions for SAME event codes, can appropriately identify and display the message as a warning, watch, emergency or statement. For example, if the third letter in an event code is "W", the consumer device would recognize the event as a warning message, even if the device does not recognize the first two letters of the event code.

NWS weather advisory messages and associated follow-up statements do not have corresponding SAME/EAS event codes and will not be broadcast with any existing SAME/EAS event code or the 1050 Hz WAT.

b. Carryover Event Codes. Some event codes implemented in 1996 prior to the adoption of the naming convention do not follow the guidelines listed in Section a. above. Due to the desire for backwards compatibility of existing NWR receivers and EAS equipment, those few codes will continue in use (e.g., Tornado Warning [TOR], Severe Thunderstorm Warning [SVR], Evacuation Immediate [EVI], and Civil Emergency Message [CEM]).

c. Forward Compatibility. Most existing NWR SAME receivers should be forward compatible and properly decode new SAME/ES event codes appropriately as an "Unknown Watch", "Unknown Warning" or Unknown Emergency", based on the third character of the SAME event code (A, W, E, respectively), since that specification has existed since the rollout of SAME.

d. Lack of one-to-one correspondence between NWS event types and EAS codes. Not all NWS watch and warning event types are directly represented by an equivalent SAME /EAS event code. Table G-1 lists the NWS product categories (and Advanced Weather Interactive Processing System [AWIPS] codes) and the associated SAME/EAS event name (and NWR SAME/EAS code), if any.

e. Non-Weather Emergency Messages (NWEM). NWEMs are prepared by local or state civil authorities and may be relayed over NWR and EAS. Recommended definitions and content of NWEMs is available in NWS Instruction 10-518 Appendix C.

3. NWR Broadcast of SAME and 1050 Hz Warning Alarm Tone (WAT). Use of SAME protocol and the NWR 1050 Hz WAT provides listeners the capability of an immediate alert and notification of information about life threatening hazards. Figure G-1 provides guiding principles for the use of the SAME and 1050 Hz WAT and when to interrupt programming with watches or warnings. Table G-2 gives specific details for use of NWR SAME, 1050 Hz WAT and Program Interrupt for each weather and non-weather related SAME/EAS event.

Local discretion is permissible in response to customer requirements especially those of emergency managers and broadcasters as agreed to in state and local EAS plans. NWS staff will consider the specific situation and the need for immediate notification.

Pre-written or "canned" emergency messages will not be placed in AWIPS for immediate broadcast over NWR for specific sites (nuclear power plants, major dams, etc.). The danger of accidental broadcast of such messages is too great when files of such messages permanently reside on these systems. Blank templates or pre-formats are permitted in AWIPS. Pre-written messages are permitted on separate,

external storage media for manual loading into AWIPS at the time a message is required for use. Additionally, pre-written, operational messages will not be stored on the same piece of external storage media as "test" or event "exercise" messages, but rather on a different piece.

3.1 Broadcast and Alerting of Messages. NWS offices should use the information in this section, in Figure G-1, and Table G-2 to determine the use SAME and 1050Hz WAT in the broadcast of messages and in the following manner:

a. For counties/boroughs/census areas (or portions thereof) within a NWR station's broadcast service area (BSA), regardless of county warning area (CWA) boundaries, all applicable SAME "event" messages will be broadcast.

b. For counties/boroughs/census areas (or portions thereof) outside a NWR station's BSA, regardless of CWA boundaries, broadcast only those SAME "event" messages that are within range of a local primary station (LP) or state primary station (SP) which cannot be received from another NWR station and as agreed to with the appropriate SECC/LECC. These alerts should be broadcast once (without the 1050 Hz WAT), for entry into the EAS, but should not be included in the NWR cycle.

3.2 Use of 1050 Hz WAT and SAME in the Overnight hours. Listeners have expressed concern about alerts issued during the overnight hours for events that do not pose an immediate life-threatening hazard. Many listeners do not appreciate being awakened during nighttime hours for events they cannot do anything to assist (e.g., for an AMBER or Child Abduction Alert (CAE), they will not be seeing the abductor's car from their bed) or for which no preparations need to be made until after they awake (e.g., a Flood Watch issued in advance of heavy rain beginning after 4:00 PM in the afternoon). When possible, broadcast the message upon issuance, but delay any SAME and/or 1050 Hz WAT until after daybreak for messages that do not immediately threaten the listening public. Figure G-1 provides background information for the overnight use of SAME/EAS and WAT, and Table G-2 provides a tabular breakdown for each SAME/EAS event code.

3.3 NWR and EAS SAME Live (Real) Event Code Tests. Federal Communication Commission (FCC) rules are detailed in 47 CFR Part 11; therein, guidance is provided on Tests of EAS procedures (Section 11.61) and a Prohibition of false or deceptive EAS transmissions (Section 11.45). The rules are designed to prevent public misunderstanding or, far worse, adverse public reaction in connection with EAS activations that do not signal the onset of an actual emergency.

State and local emergency authorities in many areas have concluded they require use of live or real event codes for certain tests usually conducted in conjunction with a hazard(s) or emergency preparedness awareness campaign. Among the many preparations for conducting an EAS test utilizing live event codes, EAS Participants must first obtain a rule waiver from the FCC's Public Safety and Homeland Security (PSHS) Bureau. WFOs are encouraged to collaborate with state and local authorities and the respective State/Local Emergency Communications Committees (SECCs/ LECCs) and state broadcasters associations to adequately prepare for and conduct these tests. NWS regional offices and WFOs should consult the latest guidance for NWR and EAS live or real event code tests prepared and distributed by the NWS Analyze, Forecast, and Support Office (AFS) Digital and Graphical Information Support Branch.

3.4 NWEMs and "Administrative" Event Codes. Non-weather "emergency" event and "administrative" event messages, by definition, contain either information that is not of immediate life threatening hazard or is not the first issuance of immediate life threatening hazard information. As such, the initial broadcast of these messages will be preceded only by the appropriate SAME event code (Child Abduction Alert [CAE], Local Weather Emergency [LAE], 911 Telephone Outage Emergency [TOE], Administrative Massage [ADR]), without the 1050 Hz WAT. This policy allows NWR listeners to toggle off-on the alert feature of those NWR SAME receivers with this capability and not be intrusive to those who do not wish to be alerted for non-life-threatening event messages. Stated another way, do not use the WAT, day or night, for "emergency" event code messages (including AMBER Alerts) or "administrative" event messages including, if and when implemented or permitted, Network Message Notification (NMN), National Information Center (NIC), and Practice/Demo Event (DMO) codes.

This policy allows the NWR listener to select the non-life threatening hazards for which to be alerted. Improper use and/or overuse of the 1050 Hz WAT risks "over warning" listeners, precipitating some listeners to turn off NWR receivers.

3.5 Practice/Demo Event Code (DMO). The Practice/Demo SAME/EAS event code is intended to provide NWS offices and EAS message originators a means of conducting exercises to practice issuing authentic warnings and other critical messages without disrupting the EAS network or turning on receivers used by industry and the general public. However, due to the way the original FCC Part 11 rules were implemented with respect to design and function of the EAS encoder/decoders in place at all broadcast facilities, any transmission of the DMO event code forced unintended actions at broadcast facilities. As a result, the NWS stopped using the DMO event code in 1997. The 2002 FCC EAS R&O adopted changes allowing EAS encoder/decoders to be programmed to disregard the receipt of DMO event codes.

Until further notice, NWS offices will not utilize the DMO event code, unless the applicable SECC/LECC agrees in writing or an email message to NWS use of the DMO event code.

3.6 EAS codes currently not implemented on NWR. The Emergency Action Notification (EAN), Emergency Action Termination (EAT), NIC, and Network Message Notification (NMN) codes are not currently implemented on NWR. For the EAN and EAT, most NWS offices do not have the technical capability to relay a Presidential or national message of undetermined length on a live or delayed basis. The purpose, source or use cases of the NIC, or NMN EAS event codes has not been adequately defined by a recognized authority.

4. Pass through of NWEMs to the BMH.

Until further notice, all NWEMs (Watch, Warning, and Emergency) will be sent to the Pending window of the AWIPS NWR browser. This is due to the need to edit the product issuer field in the text of NWEMs originating through HazCollect Legacy (NWSI 10-1708 *All-Hazards Emergency Message Collection System (HazCollect)*) to permit correct identification of the public safety or emergency management organization issuing the message. All message review will be completed expeditiously and will be for grammatical, technical and pronunciation corrections and adjustments only. This restriction will remain until the HazCollect Legacy software can be updated to create the product issuer field correctly.

Principles for the use of NWR WAT, SAME, and Program Interrupt

NWR SAME
The NWR SAME data burst will be used for:
(a) all short term warnings where any delay in broadcast could result in death or injury to the listener,
(b) the initial broadcast for any jurisdiction of all other watches or warnings,
(c) test or other event messages for which guidance is provided in Table G-2, or
(d) other instances as defined by state and/or local EAS plan(s) or other local needs.

Overnight use of the NWR SAME
The NWR SAME data burst will only be used between the hours of *10 PM and 6 AM* Local Time (*or other locally defined period*) for:
(a) all short term watches and warnings where any delay in broadcast could result in death or injury to the listener,
(b) the initial broadcast for any jurisdiction of all other watches or warnings which either could produce life-threatening conditions before morning or for which there would not be sufficient time to take preventative action if the SAME was delayed until *6 AM* Local Time (*or other locally defined time*), or
(c) other instances as defined by state and/or local EAS plan(s) or other local needs.

1050 Hz WAT
The 1050 Hz Warning Alarm Tone (WAT) will be used for:
(a) all short term watches and warnings where any delay in broadcast could result in death or injury to the listener,
(b) the initial broadcast for that jurisdiction of other watches or warnings which could produce life-threatening conditions,
(c) test or other event messages for which guidance is provided in Table G-2, or
(d) other instances as defined by other local needs.

Overnight use of the 1050 Hz WAT
The 1050 Hz WAT will only be used between the hours of *10 PM and 6 AM* Local Time (*or other locally defined period*) for:
(a) short term watches and warnings where any delay in broadcast could result in death or injury to the listener.
(b) other watches or warnings which either could produce life-threatening conditions before morning or for which there would not be sufficient time to take preventative action if the 1050 Hz WAT was delayed until *6 AM* Local Time (*or other locally defined time*).
(c) other instances as defined by other local needs.

In cases where the 1050 Hz WAT and/or NWR SAME is not used overnight, the watch or warning will still be broadcast when issued, and the message re-sent after *6 AM* Local Time (*or other locally defined time*) with the 1050 Hz WAT and/or NWR SAME included.

Interrupt of NWR programming
The Interrupt feature should only be used for short term warnings where any delay in broadcast could result in death or injury to the listener.

Figure G-1. Use of NWR WAT, SAME codes, and Program Interrupt

Table G-1. NWS Watch, Warning, and Statement Weather-related Product Categories and the Corresponding SAME/EAS event codes (NWS weather advisory messages and associated follow-up statements do not have corresponding SAME/EAS event codes. See Section 2.2.a.)

NWS Product Categories	AWIPS NNN	Associated SAME/EAS Event	NWR SAME code
Blizzard Warning	WSW	Blizzard Warning	BZW
Blizzard Watch	WSW	Winter Storm Watch	WSA
Coastal Flood Warning	CFW	Coastal Flood Warning	CFW
Coastal Flood Watch	CFW	Coastal Flood Watch	CFA
Dust Storm Warning	NPW	Dust Storm Warning	DSW
Excessive Heat Warning	NPW	none	
Extreme Cold Warning (Alaska only)	NPW	none	
Extreme Cold Watch (Alaska only)	NPW	none	
Extreme Wind Warning	EWW	Extreme Wind Warning	EWW
Fire Weather Watch	RFW	none	
Flash Flood Statement	FFS	Flash Flood Statement	FFS
Flash Flood Warning	FFW	Flash Flood Warning	FFW
Flash Flood Watch	FFA	Flash Flood Watch	FFA
Flood Statement (as follow-up to a Flood Warning)	FLS	Flood Statement	FLS
Flood Statement (issued as a Flood Advisory)	FLS	none	
Flood Warning	FLW	Flood Warning	FLW
Flood Watch	FFA	Flood Watch	FLA
Flood Watch for Flash Flooding	FFA	Flash Flood Watch	FFA
Freeze Warning	NPW	none	
Gale Warning	MWW	none	
Heavy Freezing Spray Warning	MWW	none	
High Surf Warning	CFW	Coastal Flood Warning	CFW
High Wind Warning	NPW	High Wind Warning	HWW
High Wind Watch	NPW	High Wind Watch	HWA
Hurricane Force Wind Warning(marine)	MWW	none	
Hurricane Force Wind Watch (marine)	MWW	none	
Hurricane Local Statement	HLS	Hurricane Statement	HLS
Hurricane Warning	HLS/TCV[1]/MWW	Hurricane Warning	HUW
Hurricane Watch	HLS/TCV[1]/MWW	Hurricane Watch	HUA
Ice Storm Warning	WSW	Winter Storm Warning	WSW
Lake Effect Snow Warning	WSW	Winter Storm Warning	WSW
Lake Effect Snow Watch	WSW	Winter Storm Watch	WSA

[1] WCM issued TCV is replacing HLS over multiple years as the NNN for HUW, HUA, TRW, TRA, SSA and SSW. See later Service Change Notices for current status in respective tropical cyclone region.

Table G-1. (continued)

NWS Product Categories	AWIPS NNN	Associated SAME/EAS Event	NWR SAME code
Lakeshore Flood Warning	CFW	Coastal Flood Warning	CFW
Lakeshore Flood Watch	CFW	Coastal Flood Watch	CFA
Marine Weather Statement	MWS	none	
Public Information Statement	PNS	none	
Red Flag Warning (fire weather)	RFW	none	
Severe Thunderstorm Warning	SVR	Severe Thunderstorm Warning	SVR
Severe Thunderstorm Watch	WCN	Severe Thunderstorm Watch	SVA
Severe Weather Statement	SVS	Severe Weather Statement	SVS
Snow Squall Warning	SQW	Severe Weather Statement	SVS
Special Marine Warning	SMW	Special Marine Warning	SMW
Special Weather Statement	SPS	Special Weather Statement	SPS
Storm Surge Warning[2]	TCV	Storm Surge Warning	SSW
Storm Surge Watch[2]	TCV	Storm Surge Watch	SSA
Storm Warning (marine)	MWW	none	
Tornado Warning	TOR	Tornado Warning	TOR
Tornado Watch	WCN	Tornado Watch	TOA
Tropical Storm Warning	HLS/TCV[1]/MWW	Tropical Storm Warning	TRW
Tropical Storm Watch	HLS/TCV[1]/MWW	Tropical Storm Watch	TRA
Tsunami Warning	TSU	Tsunami Warning	TSW
Tsunami Watch	TSU	Tsunami Watch	TSA
Typhoon Local Statement	HLS	Hurricane Local Statement	HLS
Typhoon Warning	HLS	Hurricane Warning	HUW
Typhoon Watch	HLS	Hurricane Watch	HUA
Wind Chill Warning	WSW	Winter Storm Warning	WSW
Wind Chill Watch	WSW	Winter Storm Watch	WSA
Winter Storm Warning	WSW	Winter Storm Warning	WSW
Winter Storm Watch	WSW	Winter Storm Watch	WSA

[2]SSW and SSA will not be issued for the Pacific hurricane basin or WFO San Juan's area of responsibility at this time. See later Service Change Notices for current status in respective tropical cyclone region.

Table G-2. Use of NWR SAME, 1050 Hz WAT and Program Interrupt for Weather Related and Non-Weather Related SAME/EAS events. **Note**: Read rows from left to right. For example, for Hurricane Warning there is a Y (Always) for NWR SAME overnight, but that is only if it is the initial warning issuance for a given location.

SAME/EAS Event	NWR SAME code	AWIPS NNN	NWR SAME		1050 Hz WAT		Intrp
			Y/N	Ovngt	Y/N	Ovngt	
EVENT: Weather Related							
Blizzard Warning	BZW	WSW	I	LTO	I	LTO	N
Coastal Flood Warning	CFW	CFW	LTO	LTO	LTO	LTO	N
Coastal Flood Watch	CFA	CFW	LTO	N	LTO		N
Dust Storm Warning	DSW	NPW	I	LTO	I	LTO	N
Extreme Wind Warning	EWW	EWW	Y	Y	Y	Y	Y
Flash Flood Statement	FFS	FFS	Y or RR	Y or RR	N		N or RR
Flash Flood Warning	FFW	FFW	Y	Y	Y	Y	Y
Flash Flood Watch	FFA	FFA	I	LTO	I	LTO	N
Flood Statement	FLS	FLS	Y or RR	Y or RR	N		N or RR
Flood Warning	FLW	FLW	Y	LTO	Y	LTO	Y
Flood Watch	FLA	FFA	I	LTO	I	LTO	N
High Wind Warning	HWW	NPW/HLS	LTO	LTO	LTO	LTO	LTO
High Wind Watch	HWA	NPW/HLS	I or RR	N or RR	N		N
Hurricane[1] Statement	HLS	HLS	RR	LTO	N		N
Hurricane[1] Warning	HUW	HLS/TCV[2]/ MWW	I	Y	I	Y	Y
Hurricane[2] Watch	HUA	HLS/TCV[2]/ MWW	N	N	N	N	N
Severe Thunderstorm Warning	SVR	SVR	Y	Y	Y	Y	Y
Severe Thunderstorm Watch	SVA	WOU/WCN	Y	Y	Y	Y	N
Severe Weather Statement	SVS	SVS	Y or RR	Y or RR	N or RR	N or RR	N or RR
Special Marine Warning	SMW	SMW	Y	Y	Y	Y	Y
Special Weather Statement	SPS	SPS	N or RR	N	N		N
Storm Surge Warning[3]	SSW	TCV	Y	Y	Y	Y	Y
Storm Surge Watch[3]	SSA	TCV	N	N	N		N
Tornado Warning	TOR	TOR	Y	Y	Y	Y	Y
Tornado Watch	TOA	WOU/WCN	Y	Y	Y	Y	N
Tropical Storm Warning	TRW	HLS/TCV[2]/ MWW	I	Y	I	Y	N
Tropical Storm Watch	TRA	HLS/TCV[2]/ MWW	N	N	N	N	N
Tsunami Warning	TSW	TSU	Y	Y	Y	Y	Y
Tsunami Watch	TSA	TSU	Y	Y	Y	Y	N
Winter Storm Warning	WSW	WSW	I or RR	LTO	I or RR	LTO	N

Winter Storm Watch	WSA	WSW	I or RR	LTO	N		N

SAME/EAS Event	**NWR SAME code**	**AWIPS NNN**	**NWR SAME**		**1050 Hz WAT**		**Intrp**
			Y/N	**Ovngt**[5]	**Y/N**	**Ovngt**[5]	
EVENT: Administrative							
Network Message Notification#	NMN		Not currently implemented on NWR				
Practice/Demo Warning[4]	DMO	DMO	Y N	N	N		N
EVENT: Non-Weather Related							
National Codes (Required for FCC regulated broadcast stations)							
Emergency Action Notification	EAN		Not currently implemented on NWR				
Emergency Action Termination	EAT		Not currently implemented on NWR				
National Information Center*	NIC		Not currently implemented on NWR				
National Periodic Test*	NPT	NPT	Y	N	Y	N	Y
Required Monthly Test*	RMT		Y	N	Y	N	N
Required Weekly Test	RWT		Y	N	Y	N	N
State and Local Codes (Optional for FCC regulated broadcast stations)							
Administrative Message	ADR	ADR	Y	N or RR	N		N
Avalanche Warning	AVW	AVW	Y	Y	Y	Y	Y
Avalanche Watch	AVA	AVA	Y	LTO[6]	Y or RR	LTO[6]	N
Child Abduction Emergency	CAE	CAE	Y	N or RR	Y	N or RR	N
Civil Danger Warning	CDW	CDW	Y	Y	Y	Y	Y
Civil Emergency Message	CEM	CEM	Y	LTO[6]	Y	LTO[6]	Y
Earthquake Warning	EQW	EQW	Y	Y	Y	Y	Y
Evacuation Immediate	EVI	EVI	Y	Y	Y	Y	Y
Fire Warning	FRW	FRW	Y	Y	Y	Y	Y
Hazardous Materials Warning	HMW	HMW	Y	Y	Y	Y	Y
Law Enforcement Warning	LEW	LEW	Y	Y	Y	Y	Y
Local Area Emergency	LAE	LAE	Y	N	N		N
911 Telephone Outage Emergency	TOE	TOE	Y	N	N		N
Nuclear Power Plant Warning	NUW	NUW	Y	Y	Y	Y	Y
Radiological Hazard Warning	RHW	RHW	Y	Y	Y	Y	Y
Shelter in Place Warning	SPW	SPW	Y	Y	Y	Y	Y
Volcano Warning	VOW	VOW	Y	Y	Y	Y	Y

Column Headings:

NWR SAME code - The three character event code that is transmitted to NWR receivers

NWR SAME - Use of the NWR SAME data burst

1050 Hz WAT - Use of the NWR 1050 Hz Warning Alarm Tone

Intrp - Use of Program Interrupt to break into NWR broadcast cycle

Y/N - Conditional use of 1050 Hz WAT or SAME data burst

Ovngt - Overnight use of 1050 Hz WAT or SAME data burst, generally 10 pm – 6 am or locally determined

Table Entries:

Y - always	**LTO** - Immediate or near-term Life Threatening situations Only
N - never	
I - yes for initial issuance for a county/city only	**RR** - Regional or Local Requirements as addressed in Directives Supplement(s)

Definition of Life Threatening: Action must be taken to prevent injury or death to those who will be affected by the event.

Notes:

[1] This SAME/EAS Event also used for Typhoons in western Pacific Ocean
[2] TCV is replacing HLS over multiple years as the NNN for HUW, HUA, TRW, TRA, SSA and SSW. See later Service Change Notices for current status in respective tropical cyclone region
[3] SSW and SSA will not be issued for the Pacific hurricane basin or WFO San Juan's area of responsibility at this time. See later Service Change Notices for current status in respective tropical cyclone region
[4] NWS offices will not utilize the DMO event code, unless the applicable SECC/LECC agrees in writing or an email message to NWS use of the DMO event code.
[5] The **Ovrngt** capability is accomplished by BMH by defining and enabling a tone blackout period.
[6] LTO capability accomplished by NWRWAVES send to pending and adjusting tone attribute in NWR browser.
Not implemented at this time.
* Implementation anticipated in 2018

APPENDIX H - Federal Communications Commission Authorization for NWR Rebroadcast

Current as of January 5, 2018

Title 47, Telecommunication; Part 73, Radio Broadcast Services; Subpart H Rules, Applicable to all Broadcast Systems

Chapter 14.2 § 73.1207 Rebroadcasts

(a) The term *rebroadcast* means reception by radio of the programs or other transmissions of a broadcast or any other type of radio station, and the simultaneous or subsequent retransmission of such programs or transmissions by a broadcast station.

(1) As used in this section, “program” includes any complete programs or part thereof.

(2) The transmission of a program from its point of origin to a broadcast station entirely by common carrier facilities, whether by wire line or radio, is not considered a rebroadcast.

(3) The broadcasting of a program relayed by a remote pickup broadcast station is not considered a rebroadcast.

(b) No broadcast station may retransmit the program, or any part thereof, of another U.S. broadcast station without the express authority of the originating station. A copy of the written consent of the licensee originating the program must be kept by the licensee of the station retransmitting such program and made available to the FCC upon request.

(1) Stations originating emergency communications under a State EAS plan are considered to have conferred rebroadcast authority to other participating stations.

(2) Permission must be obtained from the originating station to rebroadcast any subsidiary communications transmitted by means of a multiplex subcarrier or telecommunications service on the vertical blanking interval or in the visual signal of a television signal.

(3) Programs originated by the Voice of America (VOA) and the Armed Forces Radio and Television Services (AFRTS) cannot, in general, be cleared for domestic rebroadcast, and may therefore be retransmitted only by special arrangements among the parties concerned.

(4) Except as otherwise provided by international agreement, programs originated by foreign broadcast stations may be retransmitted without the consent of the originating station.

(c) The transmissions of non-broadcast stations may be rebroadcast under the following conditions:

(1) Messages originated by privately-owned non-broadcast stations other than those in the Amateur and CB Radio Services may be broadcast only upon receipt of prior permission from the non-broadcast licensee. Additionally, messages transmitted by common carrier stations may be rebroadcast only upon prior permission of the originator of the message as well as the station licensee.

(2) Except as provided in paragraph (d) of this section, messages originated entirely by non-broadcast stations owned and operated by the Federal Government may be rebroadcast only upon receipt of prior permission from the government agency originating the messages.

(3) Messages originated by stations in the Amateur and CB Radio Services may be rebroadcast at the discretion of broadcast station licensees.

(4) Emergency communications originated under a State EAS plan.

(d) The rebroadcasting of time signals originated by the Naval Observatory and the National Bureau of Standards and messages from the National Weather Service stations is permitted without specific authorization under the following procedures:

(1) *Naval Observatory Time Signals.* (i) The time signals rebroadcast must be obtained by direct radio reception from a naval radio station, or by land line circuits.

(ii) Announcement of the time signal must be made without reference to any commercial activity.

(iii) Identification of the Naval Observatory as the source of the time signal must be made by an announcement, substantially as follows: "With the signal, the time will be . . . courtesy of the U.S. Naval Observatory."

(iv) Schedules of time signal broadcasts may be obtained upon request from the Superintendent, U.S. Naval Observatory, Washington, DC 20390.

(2) *National Bureau of Standards Time Signals.* (i) Time signals for rebroadcast must be obtained by direct radio reception from a National Bureau of Standards (NBS) station.

(ii) Use of receiving and rebroadcasting equipment must not delay the signals by more than 0.05 second.

(iii) Signals must be rebroadcast live, not from tape or other recording.

(iv) Voice or code announcements of the call signs of NBS stations are not to be rebroadcast.

(v) Identification of the origin of the service and the source of the signals must be made by an announcement substantially as follows: "At the tone, 11 hours 25 minutes *Coordinated Universal Time.* This is a rebroadcast of a continous service furnished by the National Bureau of Standards, Ft. Collins, Colo." No commercial sponsorship of this announcement is permitted and none may be implied.

(vi) Schedules of time signal broadcasts may be obtained from, and notice of use of NBS time signals for rebroadcast must be forwarded semiannually to:

National Bureau of Standards, Radio Stations WWV/WWVB, 2000 East County Road 58, Ft. Collins, Colorado 80524.

(vii) In the rebroadcasting of NBS time signals, announcements will not state that they are standard frequency transmissions. Voice announcements of *Coordinated Universal Time* are given in voice every minute. Each minute, except the first of the hour, begins with an 0.8 second long tone of 1000 hertz at WWV and 1200 hertz tone at WWVH. The first minute of every hour begins with an 0.8 second long tone of 1500 hertz at both stations. This tone is followed by a 3-second pause, than the announcement, "National Bureau of Standards Time." This is followed by another 3-second pause before station identification. This arrangement allows broadcast stations sufficient time to retransmit the hour time tone and the words "National Bureau of Standards Time" either by manual or automatic switching.

(viii) Time signals or scales made up from integration of standard frequency signals broadcast from NBS stations may not be designated as national standard scales of time or attributed to the NBS as originator. For example, if a broadcasting station transmits time signals obtained from a studio clock which is periodically calibrated against the NBS time signals from WWV or WWVH, such signals may not be announced as NBS standard time or as having been originated by the NBS.

(3) *National Weather Service Messages.* (i) Messages of the National Weather Service must be rebroadcast within 1 hour of receipt.

(ii) If advertisements are given in connection with weather rebroadcast, these advertisements must not directly or indirectly convey an endorsement by the U.S. Government of the products or services so advertised.

(iii) Credit must be given to indicate that the rebroadcast message originates with the National Weather Service.

[44 FR 36040, June 20, 1979, as amended at 45 FR 26065, Apr. 17, 1980; 48 FR 28456, June 22, 1983; 50 FR 25246, June 18, 1985; 59 FR 67102, Dec. 28, 1994; 61 FR 36305, July 10, 1996; 82 FR 41103, Aug. 29, 2017]

APPENDIX I - Sample Implementation of Section 6.4 Non-Weather Emergency Message (NWEM) Broadcast Guidelines

During energy supply crises, such as those experienced in California in 2001, Weather Forecast Offices (WFOs) may be requested to broadcast special energy supply messages on NWR. Actions 1, 2, and 3 below meet the listed criteria for broadcast of Non-Weather Emergency Messages (NWEMs.

The following meet Section 6.4.b. criteria for broadcasting NWEMs:

1. Broadcast of power blackout likelihood on a specific day (e.g., Stage III conditions in California).
   - limited to one message per day
   - include 1050 Hz WAT and SAME, if requested, but only on first day of multiple day event
   - message written by issuing government authority should contain:
     - name of government authority
     - rolling blackout notification and expected times (if known)
     - brief life saving precautions/preparatory information
     - instructions to monitor local radio or television, or other information source such as Internet web site
2. Periodic broadcast (e.g., every 15 minutes) of abbreviated announcement of Stage III or equivalent conditions as long as conditions exist.

3. Broadcast (without 1050 Hz WAT or SAME) of rolling blackout end if no end time was previously mentioned.

Actions 1, 2, and 3:
- limit impact on weather broadcasts and WFO operations
- increase awareness of NWR and NWS warning programs
- encourage state/local agencies to use broadcast media contacts for disseminating rolling blackout information

The following does NOT meet Section 6.4.b. criteria for broadcasting NWEMs:

4. Broadcast of "rolling" blackout information for each new location resulting in frequent, multiple daily messages.

Action 4 would:
- compromise remaining NWR broadcast content, especially in significant weather
- increase NWS workload significantly
- desensitize listeners through multiple alarms not affecting them

Department of Commerce • National Oceanic & Atmospheric Administration • National Weather Service

NATIONAL WEATHER SERVICE INSTRUCTION 10-1711

November 3, 2017

Operations and Services

Dissemination, NDS 10-17

NOAA WEATHER RADIO ALL HAZARDS (NWR) SYSTEMS MANAGEMENT

NOTICE: This publication is available at: http://www.nws.noaa.gov/directives/.

OPR: W/DISS (C. Hodan) **Certified by:** W/DISS (M. Mainelli-McInerney)
Type of Issuance: Routine

SUMMARY OF REVISIONS: This directive supersedes NWSI 10-1711," *NOAA Weather Radio All Hazards (NWR) Systems Management,"* dated April 4, 2011. Changes made to reflect the NWS Headquarters reorganization effective April 1, 2015.

Additional changes replaced "Console Replacement System (CRS)" with "Broadcast Message Handler (BMH)".

Signed October 20, 2017

Michelle Mainelli-McInerney Date
Director (Acting), Office of Dissemination

NOAA WEATHER RADIO ALL HAZARDS (NWR) SYSTEMS MANAGEMENT

Table of Contents **Page**

1 Purpose of Document

This instruction describes how the National Weather Service (NWS) manages and operates the National Oceanic and Atmospheric Administration (NOAA) Weather Radio All Hazards (NWR) network.

2 Description

The NWR network consists of over 1000 very high frequency (VHF) Frequency Modulated (FM) radio broadcast stations located throughout the United States and its Territories, including Puerto Rico, U.S. Virgin Islands, Guam, and the Commonwealth of the Northern Marianas (Saipan) and American Samoa. Most stations are able to broadcast weather and non-weather related emergency messages and other routine content to receivers located within a 40 mile radius from the station. The broadcast provides advanced warning of potentially destructive and life-threatening situations, and gives NWR listeners time to protect family, home, and property.

2.1 Mission of NWR

The mission of the NWR network is to provide a continuous flow of timely weather forecasts, information, advisories, watches and warnings, as well as all-hazards (non-weather) warning information to 98 percent of the general public in the Primary Coverage Area (PCA) 99 percent of the time. The PCA is defined as the area enclosed by a received signal level contour of 8 micro volts per meter. Stations are designed to provide this level of signal at a nominal distance of 40 miles from the station. The size and shape of the PCA at each station is dependent on a number of factors, including the height and placement of the antenna on the tower, terrain and structures in the vicinity of the station, presence of large bodies of water in the immediate area, and transmitter output power. NWS personnel can activate Specific Area Message Encoding (SAME) within specific portions of a PCA.

Under normal circumstances NWR provides timely dissemination of weather forecasts and other meteorological and hydrological information to the general public. Under extreme conditions, where the public is at risk due to severe weather or other natural or human-caused disasters, NWR provides alarms, specific information describing the threat(s), and recommended actions to be taken.

Special receivers can trigger an audible alarm indicating an emergency exists for their area, alerting the listener to pay particular attention to the message being broadcast. Some of these receivers can operate in a muted mode and are automatically turned on when a warning message is received. Warning alarm or alert tone receivers and NWR SAME-capable receivers are especially valuable for schools, stores, sport complexes, hospitals, public safety agencies, news media offices, and any other public gathering areas. The hearing impaired community receives weather and hazard warnings via NOAA Weather Radios using special alerting devices connected to their receivers, such as strobe lights and pillow/bed vibrators. These warning devices plug directly into the NWR receiver and activate when a warning is received; the hearing impaired person then tunes their captioned television or computer to their normal source for news to get complete details.

NWR is available to relay non-weather related hazard alerts received from authorized local, regional and national emergency management agencies (See Appendix A). NWR is part of the National Response Framework, managed by the Federal Emergency Management Agency (FEMA), which is an all-hazards approach to domestic incident response. This framework identifies the key response principles, as well as the roles and structures that are needed to organize a national response. NWR is also a primary activator of the Federal Communications Commission (FCC) Emergency Alert System (EAS).

2.2 Components of NWR

Although a few transmitters were established as early as 1954, NWR was originally established as a broadcast network in the early 1970's. The number of discrete frequencies has grown from the original three to seven; allowing the NWR network to expand from 100 stations in the 1970's to over 1000 in 2008. Each station is remotely programmed from one of over 120 local Weather Forecast Offices (WFOs). Some of these are denoted as Weather Service Offices (WSOs). Each station consists of a radio frequency (RF) transmitter and an antenna interconnected with coaxial cable. Audio programming is delivered from a Broadcast Message Handler (BMH) at the WFO/WSO by means of a telecommunication link to the transmitter. Telecommunication links include ultra-high frequency (UHF) radio sets, private microwave networks or commercial telephone circuits, depending on local circumstances. The BMH capability located at each WFO is an integrated Advanced Weather Interactive Processing System (AWIPS) processing application feeding a Digital to Analog interface. BMH is designed to prepare, store, schedule and simultaneously deliver unique programs to station transmitters. Each BMH provides text-to-synthesized voice conversion, an alert tone for triggering special receivers for severe weather, and other life threatening hazardous events, and an NWR SAME signal used to target specific portions of the PCA.

Since the network has been in service since the 1970s, station equipment configurations vary from station to station. Transmitters at each station vary in type, manufacturer, configuration, and power output. Antennas vary according to area needs. Antennas are generally omnidirectional but may be directional to avoid sending a signal into an area where it may cause interference, to increase the signal level in a certain area, or to otherwise comply with the station operating license issued by the Interdepartmental Radio Advisory Committee of the National Telecommunications and Information Administration (NTIA). Most stations have emergency power available. Station facilities are owned by private companies, groups, individuals, or government organizations and are either leased or donated to the NWS. Maintenance and logistics are provided through numerous means including NWS Electronics Technicians (ET), the NWR National Maintenance Contract, regional and local maintenance contracts, or facility owner technicians.

3 Organizational Responsibilities

This section describes the responsibilities of the NWS Headquarters, Regional Headquarters, Weather Forecast Offices, and maintenance groups for NWR.

3.1 NWS Weather Service Headquarters (WSH)

The Assistant Administrator (AA) for Weather Services has overall responsibility for the WSH NWR program.

3.1.1 Office of Dissemination (DISS)

DISS provides staff assistance to the NOAA AA for Weather Services for NWR program management and configuration control. DISS provides program and financial management as well as operational, engineering and communications support for NWR. DISS oversees the maintenance of the NWR system, manages NWS telecommunication circuits, and provides WSH support for any commercial telecommunications services needed by NWR.

3.1.1.1 Dissemination Systems Team (DST)

DST has overall responsibility for the following:

1. Program management of the entire NWR network. This includes management of the expansion/contraction of the system, financial oversight of the operations and maintenance of the system, operating a national Website for NWR, and maintaining a national station database to manage the configuration for each station.

2. Contract management of the NWR transmitter acquisition contracts and the National Maintenance Contract (NMC). A NMC manager will be assigned as a focal point to provide technical management of the NMC. The NMC manager will also manage all inquiries, issues, and assistance concerning these contracts. The NMC manager will verify those items specified under the NMC are maintained to NWS standards and operational requirements.

3. Engineering and technical support for NWR stations, including BMH audio interface, telecommunications, and station components. This includes upgrades in technology and additional or remote monitoring systems.

4. Configuration management for the components of the NWR system located in the WFOs or at the transmitter stations. This includes tracking component locations, as well as establishing change management for replacement components within the system.

5. Technical and system management liaison with NWR stakeholders, including NWS WSH, Regional Headquarters, WFO NWR focal points, equipment manufacturers, other government agencies, and user communities. This will be accomplished through an NWR national focal point. The NWR national focal point is responsible for the NWR network, communications with the regions, cooperators, patrons, state and local governments, and for any resulting programmatic issues. The national focal point coordinates with the regional focal points to assist with station maintenance, relocation, configuration changes, and the addition/removal of stations to the network.

6. Outreach to government agencies, private organizations and to the public regarding NWR.

7. Supports frequency management of all NWR transmitters and RF telecommunication links.

8. Service requirements and instructions for NWR broadcast content and procedural instructions as described in NWS Instruction (NWSI) 10-1710, *NOAA Weather Radio All Hazards (NWR) Dissemination*.

3.1.2 Office of Observations (OBS) – Services Branch

OBS32 supports system corrective and preventative maintenance requirements and establishes procedures for conducting maintenance as described in NWSI 30-2107. OBS32 tracks and reports measured performance baselines for the operational employment of NWR transmitters and devices.

3.1.3 Office of Central Processing (OCP)

OCP supports the hardware and software for the BMH running in each WFO which originates and controls the broadcast signal running to each of the transmitters.

3.2 Regional Headquarters

Each Regional Headquarter office is responsible for the program content of NWR within its region in accordance with DISS/DST direction. It is also responsible for the management of relocations, expansion/reductions and upgrade efforts for NWR stations in its area of responsibility and for coordinating with WSH on these activities. It is the responsibility of the Regional Headquarters to coordinate with the WFOs for problems or operational changes and to forward to the NWR Program Manager at WSH (DST), any network, system maintenance, or end-user problems which cannot be resolved at the local or regional level. The Regional Headquarters are responsible for maintenance on all NWS-owned transmitters that are not covered by the NMC. The Regional Headquarters will provide WSH DISS (via memorandum with a copy sent to DST) the information concerning the designated focal point(s) for the region, local NWR maintenance contractors, WFOs, and non-NWS stations (station managers and any other personnel designated as NWR focal points for those stations to whom service calls may be initiated on a normal and emergency basis). The information contained in the memorandum should include the focal point's name, e-mail address, and telephone number(s).

3.2.1 Regional Telecommunications Managers (RTMs)

RTMs are responsible for the acquisition and management of NWR telecommunications service used by NWR in their regions

3.2.2 Regional NWR Focal Points

Regional NWR focal points are responsible for coordinating and managing the NWR radio frequencies within their areas of responsibility. This includes timely submission of coverage assessments and inter-modulation studies for new stations, submission of Requests for Frequency Assignments to National Telecommunications and Information Administration, coordination with other NWR focal points when stations are in close proximity to common regional borders,

resolution of interference problems, and to include coordination with counterparts in Canada or Mexico (as necessary) in accordance with established International Telecommunication Union (ITU) guidelines, and the policies and agreements signed by Department of Commerce (NOAA and NWS inclusive) and Department of State.

The Regional NWR focal point initiates a proposal for NWR Network station additions, relocations, reductions or configuration changes. The proposal identifies the type of station, recurring and non-recurring costs and responsibilities, justification, factors for consideration, and special circumstances. The focal point submits the proposal to DST and the NWR Configuration Manager for review and approval of the relocation, removal or addition of the new station into the system. These proposed changes are to be approved before the changes can be implemented. A Request for Change (RC) template is available from DST.

3.3 Weather Forecast Offices

The NWS WFOs and WSOs are responsible for the daily operations and quality control of the NWR broadcast and are the main interface with the external end-user community. They notify the the national maintenance contractor of transmitter system outages (if the station is maintained by the NMC) or notify the regional maintenance contractor or local NWS ET, as appropriate. They report outages in the Unscheduled System Outage System (USOS) so WSH DST can update the NWR outage reporting and webpage.

WFOs support relocations, removals or expansion and upgrade activities in their areas. Each WFO/WSO is responsible for designating a NWR focal point. This focal point ensures all NWR network equipment assigned to their office by their respective region headquarters is maintained in operational readiness according to established NWS policy, standards, and NWR operational requirements. WFO/WSOs focal points routinely monitor NWR stations, equipment, broadcast coverage, and contractor performance for quality assurance.

The local NWR focal point will coordinate and observe NMC work, as directed by the regional and national NWR focal points and the NMC Contracting Officer Representative (COR). The local NWR focal point will report back any discrepancies or issues as a result of NMC maintenance or emergency response.

The local NWR focal point will monitor and assist, as necessary, all state and local NWR stations and the respective contractors (if any) to ensure proper operation and maintenance of the NWR network and compliance with respective contracts or Memorandums of Agreement (MOA). Monitoring may be performed through remote testing using operational systems, random or scheduled station inspections, or in conjunction with contractor follow-up during corrective/preventative maintenance. The local NWR focal point reports all findings and issues to the regional NWR focal point. If an NWR station goes off-line, the local NWR focal point is communicates, coordinates assistance (if any), and reports to the respective NWR focal points as to contractor performance to resolve the problem.

3.4 Regional, State, and Local NWR Maintenance Contractors

Specific work requirements by regional, state, and local contractors should be detailed within specific contracts. One copy of each current regional, state, and/or local NWR maintenance contract (including any and all subsequent updates, changes, addendums and modifications) should be sent to the National NWR focal point (DST). The respective Contract Officer's Technical Representatives (COTR) must keep the regional NWR focal point aware of all logistics and maintenance issues. The regional NWR focal point assists the responsible COTR to resolve any emergency or issue concerning NWR operation or maintenance within their region.

3.5 Non-NWS Owned, Operated, and Maintained NWR Station Support

This includes the personnel maintaining stations not owned, operated, or maintained by NWS, or covered by the NMC, region, or local NWS contracts. They may be covered by federal, state, or local contracts through state or local government agency. The technical Point of Contact (POC) works through the regional NWR focal point for all NWR network, station, and equipment-related issues, including testing and logistic support. POC information for the respective maintenance personnel (NWR station identification/station name, first and last name, e-mail, telephone number, emergency and contact number) should be collected and maintained at Regional Headquarters. The regional NWR focal point should update this contact list and submit a copy to DST at the beginning of each fiscal year.

4 Broadcast Service Area

A broadcast service area for NWR transmitters is defined in NWS Instruction 10-1710, *NOAA Weather Radio (NWR) Dissemination*, Section 4. For the purpose of this document, the broadcast service area is the specified transmitter PCA for each transmitter station.

5 Weather Products and Information

Information broadcast to the public is selected and prioritized based on the weather needs of the people in the service area, and in accordance with the guidelines established in NWSI 10-1710, *NOAA Weather Radio (NWR) Dissemination*, and other applicable instructions.

5.1 Severe Weather Conditions

During severe weather, NWS personnel will, as required, interrupt the routine weather broadcasts and substitute warning messages or initiate live broadcasts. NWS personnel may also activate SAME coding within the PCA.

5.2 Non-Weather Related Emergency and Hazard Warnings

Messages concerning non-weather related emergencies and "all-hazards" type public warnings will be provided by authorized local, state, and federal officials to NWS for dissemination. These messages and the means for their dissemination will comply with NWSI 10-1710, *NOAA Weather Radio Dissemination*, NWSI 10-1712, *Specific Area Message Encoding*, and NWSI 10-518, *National Non-Weather Related Emergency Products Specification*.

6 Access to NWR Broadcast

The NWR broadcast is available free of charge and can be received with any device capable of receiving one of the NWR radio frequencies. Activation of the device or any alerts from the device from the NWR broadcast depends on the strength of the signal at the location of the device. The NWS is not responsible for any devices used to trigger a warning from the NWR broadcast signal.

7 NWR Maintenance

7.1 Authority

The WSH Dissemination Systems Team (DST) performs a staff function within WSH, acting with authority delegated from the AA for Weather Services. It provides direction, assistance, resources, and other support to the regions as addressed in NDS 30-21, *System Maintenance*. WSH and Regional Headquarters manage the NWR maintenance program.

7.2 Transmitters

NWR transmitters are serviced under one of four types of maintenance support: the NMC, a state/local maintenance contract, by government personnel, or privately maintained through the cooperator.

1. The NMC is available for routine, corrective, and emergency maintenance services on NWR transmitters contracted by the NWS. NWR transmitters maintained by the NMC are specifically identified in the maintenance contract.

2. NWR transmitters, not under the NMC, are the responsibility of the local Weather Forecast Office with support, as required, from Regional Maintenance Specialists.

3. NWS regions unable to maintain some of their NWR transmitters through the NMC may contract with a local or regional entity to perform required maintenance on those transmitters, with the approval of DST. Where cost effective, transmitters should be maintained through the NMC or by Regional Maintenance Specialists to reduce the overall cost of maintenance on the NWR system.

4. Maintenance activities for transmitters owned by private interest groups (not considered under the previous three maintenance types) are the responsibility of the private interest group.

8 Cooperators

Cooperators such as local community organizations, state, city, or county government(s), private companies, etc., are encouraged to sponsor and fund the installation, operation and maintenance of new NWR stations. If funds are required to set up and maintain the private NWR station and

are provided by a Cooperator, the NWS will assist in the analysis necessary for the siting and licensing of the NWR transmitter. Information on establishing a private NWR station is available from the DST NWR Program Manager or the Regional Director at any of the NWS Regional Headquarters. A Broadcast Service Agreement will be established between the NWS and the Cooperator. Should a Cooperator wish to donate a transmitter to the NWS, formal acceptance of a donated transmitter is achieved in several different ways, depending on the type of transmitter purchase. The NWR Program Manager will advise and assist in identifying the proper processes and forms to assist the Cooperator.

9 Agreements for Access to NWR Audio Output

Private and public TV and radio stations and other organizations can have access to the signal delivered by NWR. Such an arrangement is mutually beneficial and is encouraged. The station gets a high quality signal, and the NWS has a means of disseminating broadcast material even when the normal communications links and/or transmitter is out of service. Regional Headquarters have the authority to approve and execute agreements allowing users to obtain access to NWR audio output. There are two methods for a private party to obtain access to NWR audio output. One method is a line tap, in which a device is connected to the NWR BMH output at the originating NWS office. The other method is a bridge tap, in which the telephone line from the BMH output to the transmitter is tapped at the telephone company office. Templates for both of these types of agreements are maintained by WSH and are available from the NWR Program Manager. Copies of signed agreements will be kept on file at the Regional Headquarters and appropriate WFOs, with a copy being forwarded to the WSH DST Staff.

10 Notice of Station Outage

There are two types of outages: planned and unplanned.

10.1 Planned Outages

For planned Broadcast Outages and Suspension of Broadcasts, public notification procedures and rules for broadcast suspension due to radio interference are described in NWSI 10-1710, *NOAA Weather Radio (NWR) Dissemination*, Section 7.

10.2 Unplanned Outages

When NWR equipment is taken off the air for reasons other than planned maintenance or an unplanned outage occurs, weather and non-weather related emergency information will be available to television and radio media via NOAA Weather Wire Service (NWWS) and on NWS websites.

10.3 Internal NWS Notifications

There are two types of notifications to be reported internally.

10.3.1 Outages

All outages will be reported to the Regional Headquarters and DST NWR Program staff, as quickly as time will allow. All unplanned outages will be submitted using the Unscheduled Outage System (USOS), reporting critical outages as spelled out in NWSI 30-2112, *Reporting Systems Equipment and Communications Outages*.

10.3.2 Broadcast Suspension

All broadcast suspensions will be reported to Regional Headquarters and DST NWR Program staff, as soon as possible as described in NWSI 10-1710, *NOAA Weather Radio (NWR) Dissemination*, Section 7.

11 NOAA's Weather Radio All Hazards Logo

The NOAA Weather Radio All Hazards logo is a graphic with the words "All Hazards" printed above the acronym "NOAA". Centered below the acronym "NOAA" is the product name, "Weather Radio". Centered below the product name, "Weather Radio", is the agency name, "NOAA's National Weather Service". Detailed information on the logo, its significance, and conditions and restrictions on its use can be found at the website: http://www.nws.noaa.gov/nwr/info/allhazard_logo_info.html.

APPENDIX A - National Policy for the Use of Telecommunications to Warn the General Public

This Appendix includes the most recent affirmation (dated 06/11/02) by FEMA on the use of NWR as an all-hazard warning system and the original National Policy statement (dated 01/13/75) which establishes NWR as the only federally-sponsored radio transmission of warning information to the general public.

Federal Emergency Management Agency
Washington, D.C. 20472

June 11, 2002

John J. Kelly, Jr.
Director
National Weather Service
National Oceanographic and Atmospheric Administration
1325 East-West Highway
Silver Spring, MD 20910

Dear Mr. Kelly:

I am writing to express my support for using National Oceanographic and Atmospheric Administration (NOAA) weather radio for civil emergency messages involving all hazards, not just weather-related ones. Through NOAA weather radio, we have a capability in place that can help save lives. We owe it to the public, as stewards of public safety and of tax dollars, to make maximum use of that capability.

In fact, this Agency already relies on the National Weather Service (NWS) for all-hazard warning to the public. Under Emergency Support Function #2 of the Federal Response Plan, a responsibility of NWS is to "Provide public dissemination of critical pre- and post-event information over the all-hazards National Oceanographic and Atmospheric Administration Weather Radio (NWR) system, the NOAA Weather Wire Service, and the Emergency Managers' Weather Information Network (EMWIN)." This is part and parcel of authority granted to the President under the Robert T. Stafford Disaster Relief and Emergency Assistance Act, and delegated to the Director of the Federal Emergency Management Agency (FEMA), to "utilize … any other Federal communications system for the purpose of providing warning to governmental authorities and the civilian population in areas endangered by disasters" (42 USC 5132 (c)). Under Title VI of the same Act, it is within the FEMA Director's authority to "make appropriate provision for necessary emergency preparedness communications and for dissemination of warnings to the civilian population of a hazard." (42 USC 5196(d)).

I believe use of NOAA weather radio for all-hazard warning to the public is consistent with the Federal Response Plan, the FEMA warning-related authorities I have cited, and good government. As a coordinator of Federal preparedness and response efforts, I support your initiatives to ensure NOAA weather radio is an all-hazard warning system, and I will gladly work with you to integrate your initiatives into our overall preparedness and response program.

Sincerely,

Joe M. Allbaugh
Director

Department of Commerce ● National Oceanic & Atmospheric Administration ● National Weather Service

NATIONAL WEATHER SERVICE INSTRUCTION 10-512

APRIL 9, 2021

Operations and Services

Public Weather Services, NWSPD 10-5

NATIONAL SEVERE WEATHER PRODUCTS SPECIFICATION

NOTICE: This publication is available at: https://www.nws.noaa.gov/directives/

OPR: W/AFS21 (G. Schoor) **Certified by:** W/AFS21 (M. Hawkins)
Type of Issuance: Routine.

SUMMARY OF REVISIONS: This directive supersedes NWSI 10-512, dated October 9, 2017. The following changes were made to this instruction:

1) Updated the Convective Outlook products with the two new risk categories (Marginal and Enhanced) in sections 2.3.3, 2.3.4, 3.3.3, 5.3.3, Tables 1, 3, 4, and 5, and a new points product example (Figure 4).
2) Removed Watch Points Outline Message product from section 15.
3) Updated the format of the Public Watch Notification Messages in sections 12 and 13. Redefined use of "coastal waters" in sections 12.3.3 and 13.3.3.
4) Updated the issuance criteria for the Public Severe Weather Outlook in sections 7.2.2, 7.2.3, and 7.3.3.
5) Modified WMO Headers for each of the Day 1 Outlooks issuance for the NDFD forecast products in section 6.2 (Table 6).
6) Corrected the Forecast Hour Period for Day 3 and Days 4-8 in Tables 1, 2, and 5.
7) Added new Letter Case format text product examples throughout the various sections and in Appendix A and new graphical examples for many products throughout the various sections.

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Date: 2021.03.25 15:47:48 -04'00'

Andrew D. Stern
Director
Analyze, Forecast, and Support Office

Date

National Severe Weather Products Specification

Table of Contents: Page

1. **Introduction**. This procedural instruction describes the narrative and graphical severe weather products issued by the National Centers for Environmental Prediction's (NCEP) Storm Prediction Center (SPC) for the contiguous United States (CONUS).

2. Categorical Convective Outlook.

2.1 Mission Connection. SPC issues narrative and graphical Categorical Convective Outlooks to provide CONUS Weather Forecast Offices (WFOs), the public, media, and emergency managers with the potential for severe thunderstorms through Day 8 and general non-severe thunderstorms through Day 3.

2.2 Issuance Guidelines.

2.2.1 Creation Software. SPC will use the National Center's AWIPS (NAWIPS) and/or the SPC Product Generator (PRODGEN) for these products.

2.2.2 Issuance Criteria. Categorical Outlooks are a scheduled product in UTC time and calendar day.

2.2.3 Issuance Time. Products are issued at times listed in Table 1.

2.2.4 Valid Time. Product valid times are listed in Table 1.

2.2.5 Product Expiration Time. Product expiration time is 1200 UTC the next calendar day. See Table 1

SPC Convective Outlook Schedule

Issuance Time(UTC)	*Valid Time (UTC)*	*AWIPS Text Graphic*	*WMO Graphic Header*	*WMO Text Header*	*NDFD Header*	*WMO Points Product*
0600	1200 Day 1 to 1200 Day 2 (0-24 hour period)	SWODY1 94O	PGWE46	ACUS01 KWNS	LDIZ[11-17]*	WUUS01 PTSDY1
0600 (Daylight) 0700 (Standard)	1200 Day 2 to 1200 Day 3 (24-48 hour period)	SWODY2 98O	PGWI47	ACUS02 KWNS	LDIZ[21-27|]**|	WUUS02 PTSDY2
0730 (Daylight) 0830 (Standard)	1200 Day 3 to 1200 Day 4 (48-72 hour period)	SWODY3 99O	PGWK48	ACUS03 KWNS	LDIZ[37|40|41] cat|prob|sigprob	WUUS03 PTSDY3
0900 (Daylight) 1000 (Standard)	1200 Day 4 to 1200 Day 9 (72- 192 hour period)	SWOD48 [44, 55, 66, 77, 88]O	PGNW[49-53]***	ACUS48 KWNS	LDIZ[4-8]8	WUUS48 PTSD48

1300	1300 Day 1 to 1200 Day 2 (23 hour period)	SWODY1 94O	PGWE46	ACUS01 KWNS	LDIZ[11-17]*	WUUS01 PTSDY1
1630	1630 Day 1 to 1200 Day 2 (19.5 hour period)	SWODY1 94O	PGWE46	ACUS01 KWNS	LDIZ[11-17] *	WUUS01 PTSDY1
1730	1200 Day 2 to 1200 Day 3 (24-48 hour period)	SWODY2 98O	PGWI47	ACUS02 KWNS	LDIZ[21-27|]**|	WUUS02 PTSDY2
2000	2000 Day 1 to 1200 Day 2 (16 hour period)	SWODY1 94O	PGWE46	ACUS01 KWNS	LDIZ[11-17]*	WUUS01 PTSDY1
0100	0100 Day 1 to 1200 Day 2 (11 hour period)	SWODY1 94O	PGWE46	ACUS01 KWNS	LDIZ[11-17] *	WUUS01 PTSDY1

Table 1: Issuance time, valid time, product ID and content of SPC Convective Outlook products

Numbering conventions:
* 11 tornado, 12 hail, 13 wind, 14 sigtorn, 15 sighail, 16 sigwind, and 17 categorical
** 21 tornado, 22 hail, 23 wind, 24 sigtorn, 25 sighail, 26 sigwind, and 27 categorical
*** 49 Day 4, 50 Day 5, 51 Day 6, 52 Day 7, and 53 Day 8

2.3 Technical Description. Categorical outlooks should follow the format and content described in this section.

2.3.1 Mass News Disseminator Broadcast Line. None.

2.3.2 Mass News Disseminator Header. The SWO MND header is "DAY (1, 2, OR 3) CONVECTIVE OUTLOOK".

2.3.3 Content. The Categorical Convective Outlook defines areas of Marginal, Slight, Enhanced, Moderate, and/or High Risk of severe thunderstorms. Thunderstorms that are "severe", according to NWSI 10-511, produce hail that is one inch in diameter (quarter-size) or larger, and/or convective winds of 50 knots (58 mph) or greater. Severe thunderstorms can also produce tornadoes. A "convective day" is defined as a period that is 24-hours or less, beginning at 1200 UTC of one calendar day, or at a scheduled issuance time, and ending at 1200 UTC the next calendar day (i.e. 1200 UTC today to 1200 UTC tomorrow), also known as the current 24-hour period.

The Day 1, Day 2, and Day 3 Outlooks also define areas where there is a 10% or greater probability of (general) thunderstorms. The contour for "General Thunder" in the graphical forecast refers to a 10% or greater probability of non-severe convection. SPC may issue a Moderate or High Risk for the Day 2 Outlook and a Moderate Risk for the Day 3 Outlook, highlighting the possibility for significant severe weather events.

a. Writing Style:

1) Day 1, 2, and 3 Outlook narratives will be in Letter Case with the exception of narrative headline and "SUMMARY" section headers.
2) Narrative headlines will contain the relatively greatest categorical risk area(s). When geographically separated areas of equally greatest risk exist, these areas will be described within the same headline. When geographically separated areas of unequal greatest risk exist and are at least a Slight, the relative maximum of those respective areas will be described in separate headlines.
3) SUMMARY Section will contain a brief description of the highest severe weather risk for the Outlook period, including the what (severe hazards forecasted), where (geographic areas affected), and when (general timing).

2.3.4 Format.

```
ACUS0i (i=1,2,or 3) KWNS ddhhmm
SWODYn
SPC AC ddhhmm

DAY (1,2,3) CONVECTIVE OUTLOOK
NWS STORM PREDICTION CENTER NORMAN OK
time am/pm time_zone day mon dd yyyy

VALID DDHHMMZ - DDHHMMZ

...THERE IS A/AN (MARGINAL, SLIGHT, ENHANCED, MODERATE, HIGH) RISK OF
SEVERE THUNDERSTORMS <location>...
Only the relatively greatest categorical risk area(s) will be headlined.

...SUMMARY...
Brief sentence or two describing the highest risk potential, areas
affected, and general timing.

...Synopsis...
Broad narrative providing a technical discussion of the overall severe
weather pattern.

...Area of Concern #1 (Geographical Qualifiers)...
Areas of highest risk are discussed first (HIGH RISK, MODERATE RISK,
ENHANCED RISK, SLIGHT RISK). The forecast provides a narrative technical
discussion.

...Area of Concern #2 (Geographical Qualifiers)...
Narrative technical discussion.

..Forecaster(s) Name.. MM/DD/YYYY
```

Figure 1: Categorical Outlook Format

2.4 Updates, Amendments and Corrections. Updates are scheduled (see issuance times). SPC will correct outlooks for format and grammatical errors. SPC will amend Day 1 Outlooks when it is recognized that the current forecast does not or will not reflect the ongoing or future convective development. In rare instances when the SPC determines the ongoing forecast needs to be changed, an amendment can be made to the Day 2 and Day 3 Outlooks.

2.5 Graphics PGWE46, PGWI47 and PGWK48. These are the corresponding graphics to the text products and the formats of these products follow Redbook Graphic standards.

3. Probabilistic Convective Outlook.

3.1 Mission Connection. SPC issues probabilistic convective outlooks to provide CONUS WFOs, the public, media, and emergency managers with specific severe weather threats during the next 72 hours. SPC assigns each threat with a percent likelihood of occurrence.

3.2 Issuance Guidelines.

3.2.1 Creation Software. SPC will use the National Centers AWIPS (NAWIPS) and/or the SPC Product Generator (PRODGEN) for these products.

3.2.2 Issuance Criteria. Probabilistic Convective Outlooks are a scheduled product.

3.2.3 Issuance Time. See Table 2.

3.2.4 Valid Time. See Table 2.

SPC PROBABILISTIC FORECAST PRODUCTS
Redbook Graphics Format

Issuance Times (UTC)	*Valid Times (UTC)*	*AWIPS ID*	*WMO Redbook Graphics Header*	*Product Description*
0600	1200 Day 1 to 1200 Day 2 (0-24 hour period)	OH1	PENE00	Hail Probabilities
		OW1	PWNE00	Wind Probabilities
		OT1	PGNE00	Tornado Probabilities
0600 (Daylight) 0700 (Standard)	1200 Day 2 to 1200 Day 3 (24-48 hour period)	OH2	PENE02	Hail Probabilities
		OW2	PWNE02	Wind Probabilities
		OT2	PGNE02	Tornado Probabilities
0730 (Daylight) 0830 (Standard)	1200 Day 3 to 1200 Day 4 (48-72 hour period)	OA3	PZNK00	All Severe Probabilities
0900 (Daylight) 1000 (Standard)	1200 Day 4 to 1200 Day 9 (72-192 hour period)	44O	PGNW49	Day 4 Total Probability of Severe
		55O	PGNW50	Day 5 Total Probability of Severe
		66O	PGNW51	Day 6 Total Probability of Severe
		77O	PGNW52	Day 7 Total Probability of Severe
		88O	PGNW53	Day 8 Total Probability of Severe
1300	1300 Day 1 to 1200 Day 2 (23 hour period)	OH1	PENE00	Hail Probabilities
		OW1	PWNE00	Wind Probabilities
		OT1	PGNE00	Tornado Probabilities
1630	1630 Day 1 to 1200 Day 2 (19.5 hour period)	OH1	PENE00	Hail Probabilities
		OW1	PWNE00	Wind Probabilities
		OT1	PGNE00	Tornado Probabilities
1730	1200 Day 2 to 1200 Day 3 (24-48 hour period)	OH2	PENE02	Hail Probabilities
		OW2	PWNE02	Wind Probabilities
		OT2	PGNE02	Tornado Probabilities

2000	2000 Day 1 to 1200 Day 2 (16 hour period)	OH1	PENE00	Hail Probabilities
		OW1	PWNE00	Wind Probabilities
		OT1	PGNE00	Tornado Probabilities
0100	0100 Day 1 to 1200 Day 2 (11 hour period)	OH1	PENE00	Hail Probabilities
		OW1	PWNE00	Wind Probabilities
		OT1	PGNE00	Tornado Probabilities

Table 2: SPC Probabilistic Outlook Issuance time, valid time, ID and content

3.2.5 Product Expiration Time. Product expiration time is 1200 UTC the next convective day. See Table 2.

3.3 Technical Description. Probabilistic outlooks should follow the format and content described in this section.

3.3.1 Mass News Disseminator Broadcast Line. Not applicable.

3.3.2 Mass News Disseminator Header. Not applicable.

3.3.3 Content. SPC will issue probabilistic convective outlooks in graphic format. The Day 1 and Day 2 Outlooks will consist of separate graphics for tornadoes, hail, and (convective) damaging winds. The Day 3 Outlook will have probabilities for all severe thunderstorm threats (tornado, large hail, and convective wind damage combined) in one graphic. These outlooks provide numerical probabilities of severe weather within 25 statute miles of any point within a given forecast area. The probability thresholds/contours in each graphic are as follows:

Day 1 and Day 2 Outlooks for tornadoes: 2%, 5%, 10%, 15%, 30%, 45% and 60%
Day 1 and Day 2 Outlooks for (convective) damaging winds: 5%, 15%, 30%, 45% and 60%
Day 1 and Day 2 Outlooks for severe hail: 5%, 15%, 30%, 45% and 60%

Day 3 Outlooks (combined events): 5%, 15%, 30% and 45%

SPC will include a hatched area (denoting a significant severe threat) on individual probabilistic graphical products indicating a 10% (or greater) chance of tornadoes that could produce EF2 or greater damage, two inch or greater diameter hail, and/or 65 knot or greater convective wind gusts within 25 miles of any one point of a forecast area. A hatched area on the Day 3 Outlook would indicate a 10% (or greater) probability for a significant wind, hail and/or tornado event.

SPC will issue a Public Severe Weather Outlook (PWO) for all High Risk issuances and for Moderate Risks that contain at least a 15% probability of tornadoes and 10% significant severe or a 45% probability of damaging wind gusts and 10% significant severe. When a 10% (or greater) probability of significant tornadoes (defined as EF2 or greater) is expected to occur between 0300 and 1200 UTC, a PWO is also issued following the issuance of a 2000 UTC and/or 0100 UTC Day 1 Outlook (refer to Section 7). Convective Outlook narratives will reference Public Severe Weather Outlooks when necessary. SPC should issue narrative and graphical forecasts at the same time.

Day 1 and 2 Probability to Categorical Outlook Conversion

Outlook Categories: Marginal (MRGL)-dark green, Slight (SLGT)-yellow, Enhanced (ENH)-orange, Moderate (MDT)-red, and High (HIGH)-magenta

Outlook Probability	TORNADO	WIND	HAIL
2%	MRGL	NOT USED	NOT USED
5%	SLGT	MRGL	MRGL
10%	ENH	NOT USED	NOT USED
10% with Significant Severe	ENH	NOT USED	NOT USED
15%	ENH	SLGT	SLGT
15% with Significant Severe	MDT	SLGT	SLGT
30%	MDT	ENH	ENH
30% with Significant Severe	HIGH	ENH	ENH
45%	HIGH	ENH	ENH
45% with Significant Severe	HIGH	MDT	MDT
60%	HIGH	MDT	MDT
60% with Significant Severe	HIGH	HIGH	MDT

Table 3: Day 1 and 2 Probability to Categorical Outlook Conversion

Day 3 Probability to Categorical Outlook Conversion

Outlook Categories: Marginal (MRGL)-dark green, Slight (SLGT)-yellow, Enhanced (ENH)-orange, Moderate (MDT)-red, and High (HIGH)-magenta

Outlook Probability	Combined TORNADO, WIND, and HAIL
5%	MRGL
15%	SLGT
15% with Significant Severe	SLGT
30%	ENH
30% with Significant Severe	ENH
45%	ENH
45% with Significant Severe	MDT

Table 4: Day 3 Probability to Categorical Outlook Conversion

3.3.4 Format.

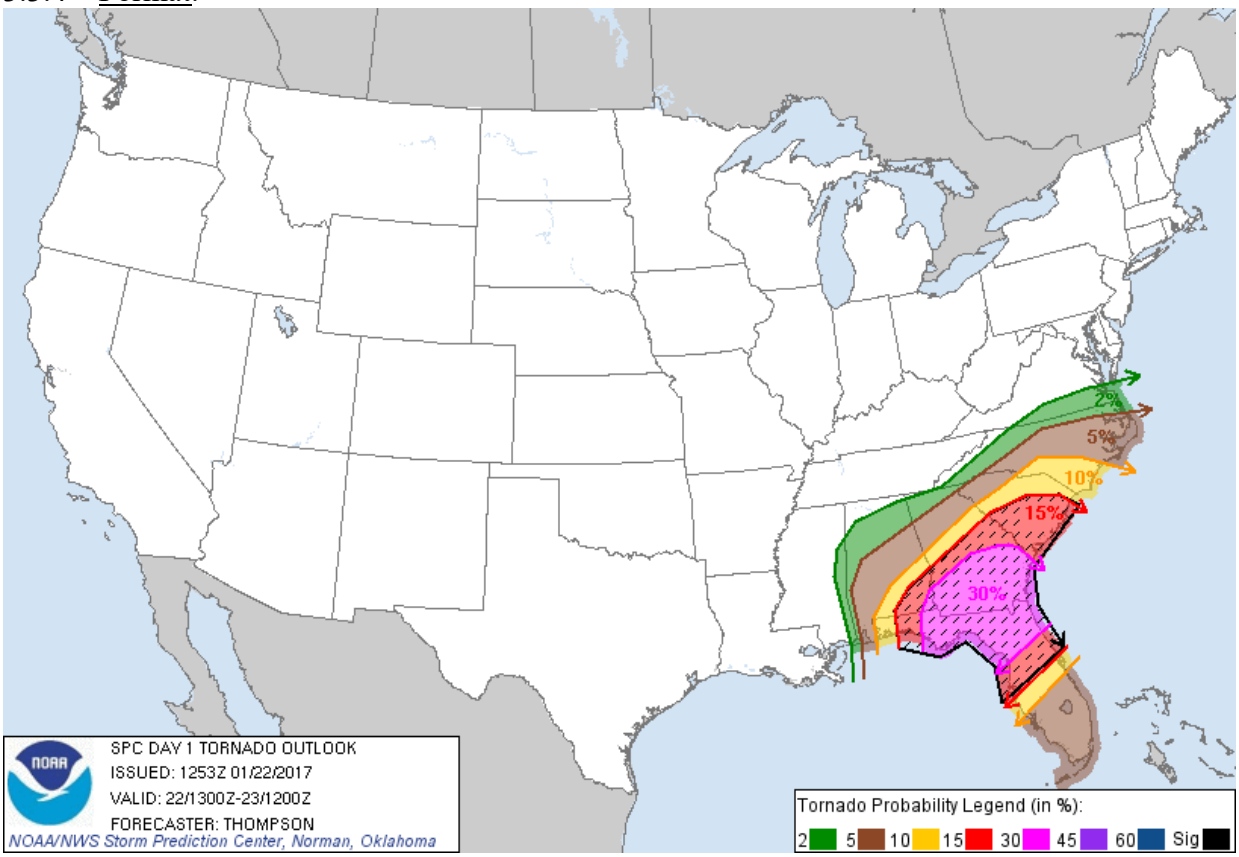

Figure 3: Day One Outlook -- Tornado Probabilities

3.4 Updates, Amendments and Corrections. Updates are scheduled (see issuance times). SPC will amend the Day 1 Outlook when it is recognized that the current forecast does not or will not reflect the ongoing or future convective development. In rare instances when the SPC determines the ongoing forecast needs to be changed, an amendment can be made to the Day 2 and Day 3 Outlooks.

4. Day 4 - 8 Severe Weather Outlook.

4.1 Mission Connection. SPC issues narrative and graphical Day 4-8 Severe Weather Outlook to provide CONUS Weather Forecast Offices (WFOs), the public, media, and emergency managers with the potential for severe convection during the 4-8 Day period. This product will help its users to adequately prepare several days in advance of an expected severe weather episode.

4.2 Issuance Guidelines.

4.2.1 Creation Software. SPC will use the National Center's AWIPS (NAWIPS) and/or the SPC Product Generator (PRODGEN) for these products.

4.2.2 Issuance Criteria. The Day 4-8 Convective Outlook is a scheduled product in UTC time and calendar day.

4.2.3 Issuance Time. Product is issued once daily at 1000 UTC during Standard time and 0900 UTC during Daylight Time. See Table 1.

4.2.4 Valid Time. Product is valid from 1200 UTC on Day 4 to 1200 UTC on Day 9.

4.2.5 Product Expiration Time. Product expiration time is 1200 UTC the next calendar day.

4.3 Technical Description. Day 4-8 outlooks should follow the format and content described in this section.

4.3.1 Mass News Disseminator Broadcast Line. None

4.3.2 Mass News Disseminator Header. The SWO MND header is "DAY 4-8 CONVECTIVE OUTLOOK".

4.3.3 Content.
The Day 4-8 Convective Outlook product will consist of five graphics with an area (s) where severe weather is anticipated during the given forecast day. The severe weather threat area (s) will be depicted with one or two set (s) of closed line (s) and a label (s) indicating 15% and 30% or higher probabilities for severe thunderstorms within 25 miles of a point, respectively, for the given day. A concise text discussion is included daily with each Outlook issuance, even if a severe weather area is not included on the graphic. The Day 4-8 Severe Weather Outlook text will include a standardized headline (see Figure 3) to clearly highlight whenever a severe weather outbreak is forecast. PREDICTABILITY TOO LOW in upper case is placed on the graphic for a given day to indicate severe storms may be possible based on some model scenarios. However, the location or occurrence of severe storms are in doubt due to: 1) large differences in the deterministic model solutions, 2) large spread in the ensemble guidance, and/or 3) minimal run-to-run continuity. POTENTIAL TOO LOW in upper case letters placed on the graphic for a given day indicates the threat for a regional area of organized severe storms appears unlikely (i.e., less than 15% probability within 25 miles of a point) for the forecast day.

a. Writing Style:
    1) The Day 4-8 Outlook narrative will be in Letter Case with the exception of the "Discussion" section header and the optional "Severe Weather Outbreak Possible on DX/day" header.

4.3.4 Format.

```
ACUS48 KWNS ddhhmm
SWOD48
SPC AC ddhhmm

Day 4-8 Convective Outlook
NWS Storm Prediction Center Norman OK
time AM/PM TIME_ZONE Day Mon dd yyyy
```

```
Valid DDHHMMZ - DDHHMMZ

...SEVERE WEATHER OUTBREAK POSSIBLE ON DX/day...
Used for whenever a severe weather outbreak is forecast, where X is the day
number and day is the three-letter abbreviation of the day of the week.
This can include multiple days when necessary.

...DISCUSSION...
A concise text discussion is included daily with each Outlook issuance,
even if a severe weather area is not included on the graphic.

..Forecaster(s) Name.. MM/DD/YYYY
```

Figure 2: Day 4-8 Convective Outlook Text Product Format

4.4 Updates, Amendments and Corrections. SPC will correct outlooks for format and grammatical errors. SPC will typically not amend the Day 4-8 Convective Outlook. However, in rare instances when the SPC determines modifications are needed to the current forecast, an amendment can be issued.

5. SPC Points Product.

5.1 Mission Connection. SPC issues the Points Product to provide CONUS WFOs, the public, media, and emergency managers with the latitude and longitude locations of the points that make up the SPC Categorical and Probabilistic Convective Outlook areas.

5.2 Issuance Guidelines.

5.2.1 Creation Software. SPC uses automated software.

5.2.2 Issuance Criteria. Points Products are scheduled products.

5.2.3 Issuance Time. See Table 5.

5.2.4 Valid Time. See Table 5.

5.2.5 Product Expiration Time. Product expiration time is 1200 UTC the next day.

SPC POINTS FORECAST PRODUCTS

Issuance Times (UTC)	*Valid Times (UTC)*	*AWIPS ID*	*WMO Text Header*	*Product Description*
0600	1200 Day 1 to 1200 Day 2 (0-24 hour period)	PTSDY1	WUUS01 KWNS	Text provides latitude/longitude for each point creating the convective categorical and probabilistic graphics for Day 1. Includes list of anchor points with range/azimuth in statute miles relative to a point

0600 (Daylight) 0700 (Standard)	1200 Day 2 to 1200 Day 3 (24-48 hour period)	PTSDY2	WUUS02 KWNS	Text provides latitude/longitude for each point creating the convective categorical and probabilistic graphics for Day 2. Includes list of anchor points with range/azimuth in statute miles relative to a point
0730 (Daylight) 0830 (Standard)	1200 Day 3 to 1200 Day 4 (48-72 hour period)	PTSDY3	WUUS03 KWNS	Text provides latitude/longitude for each point creating the convective categorical and probabilistic graphics for Day 3. Includes list of anchor points with range/azimuth in statute miles relative to a point
0900 (Daylight) 1000 (Standard)	1200 Day 4 to 1200 Day 9 (72-192 hour period)	PTSD48	WUUS48 KWNS	Text provides latitude/longitude for each point creating an area or areas as discussed in the day 4-8 Convective Outlook Product. Each day is listed separately or combined (multiple days are listed last). If the potential or predictability for severe thunderstorms is too low for a given day. No outline is listed for that day.
1300	1300 Day 1 to 1200 Day 2 (23 hour period)	PTSDY1	WUUS01 KWNS	Text provides latitude/longitude for each point creating the convective categorical and probabilistic graphics for Day 1. Includes list of anchor points with range/azimuth in statute miles relative to a point
1630	1630 Day 1 to 1200 Day 2 (19.5 hour period)	PTSDY1	WUUS01 KWNS	Text provides latitude/longitude for each point creating the convective categorical and probabilistic graphics for Day 1. Includes list of anchor points with range/azimuth in statute miles relative to a point
1730	1200 Day 2 to 1200 Day 3 (24-48 hour period)	PTSDY2	WUUS02 KWNS	Text provides latitude/longitude for each point creating the convective categorical and probabilistic graphics for Day 2. Includes list of anchor points with range/azimuth in statute miles relative to a point
2000	2000 Day 1 to 1200 Day 2 (16 hour period)	PTSDY1	WUUS01 KWNS	Text provides latitude/longitude for each point creating the convective categorical and probabilistic graphics for Day 1. Includes list of anchor points with range/azimuth in statute miles relative to a point
0100	0100 Day 1 to 1200 Day 2 (11 hour period)	PTSDY1	WUUS01 KWNS	Text provides latitude/longitude for each point creating the convective categorical and probabilistic graphics for Day 1. Includes list of anchor points with range/azimuth in statute miles relative to a point

Table 5: Issuance time, valid time, product ID and content of SPC Points Forecast products

5.3 Technical Description. The SPC Points Product should follow the format and content described in this section.

5.3.1 Mass News Disseminator Broadcast Line. Not applicable.

5.3.2 Mass News Disseminator Header. DAY (1, 2, 3, or 4-8) CONVECTIVE OUTLOOK AREAL OUTLINE

5.3.3 Content. SPC will issue separate products for the Day 1, Day 2, Day 3, and Day 4-8 outlooks. The Day 1 and 2 products provides the points for the Probabilistic Outlooks for tornado, large hail and damaging winds, and the associated Categorical Outlooks. The Day 2, 3,

and 4-8 products list the points for the Probabilistic Outlook for all severe (tornadoes, large hail, and convective damaging winds combined) weather events and the associated Categorical Outlook (Day 3 only). Points for areas of significant events (Day 1, 2 and 3) are also part of this product.
Possible values in the product include:

Probability:	0.05, 0.15, 0.30, 0.45, 0.60, also 0.02 and 0.10 for tornado probability.
Significant Severe:	SIGN
Categorical:	TSTM, MRGL, SLGT, ENH, MDT, HIGH

Lat/lon values themselves are in decimal degrees, for example: 29450281 is 29.45N and -102.81W. 99999999 is an indicator that the previous point connects to the following point. For example:

```
0.05  29450281 32590195 35550068 37480057 38290123 38480333
      39070480 40250518 42580209 46060143 48050263 49150265
      99999999 48729380 46749177 42609035 41508994 36608550
      35208574 33688795 33509118 33249404 27990024
```

0.05 is the 5% probability line, described by the following lat/lon points.
29450281 is 29.45N and -102.81W and is the first point in this line
49150265 99999999 48729380 is 49.15N -102.65W connects to 48.72N -93.80W
27990024 is 27.99N and -100.24W and is the last point in the series.

On the Day 4-8 Convective Outlook Areal Outline, each day is listed separately (D4, D5, etc.) and combined days are listed last. In the example below Day 8 is not listed since the potential or predictability for severe thunderstorms is too low on Day 8:

```
D6    43738110 41628135 39388310 38558585 38499110 39439365
      40109439 41409470 43099400 45318996 46248525
D7    45377505 43397287 41357249 39727395 38537638 37688426
      38198516 40098507 42068280 43278023
```

5.3.4 Format.

```
WUUS01 KWNS 281959
PTSDY1

DAY 1 CONVECTIVE OUTLOOK AREAL OUTLINE
NWS STORM PREDICTION CENTER NORMAN OK
0258 PM CDT WED OCT 28 2020

VALID TIME 282000Z - 291200Z

PROBABILISTIC OUTLOOK POINTS DAY 1

... TORNADO ...

0.02   28339128 29399112 31009020 32698785 34178598 34478465
       34538292 33968253 32418424 30548468 28998459
```

```
0.05   28519071 29289065 29959049 30778988 32178793 32398640
       32008577 31328544 30438546 29208535
&&

... HAIL ...

&&

... WIND ...

0.05   29708815 30818863 31458848 32808674 33538528 33748394
       33168348 32398427 31098457 29338573
&&

CATEGORICAL OUTLOOK POINTS DAY 1

... CATEGORICAL ...

SLGT   28409076 29299072 29959049 30798995 31778863 32228796
       32288639 32018577 31318545 30418547 29208534
MRGL   28509128 29339116 29889093 30949030 32888763 34198591
       34478470 34538290 33978254 32418422 30558469 29028462
TSTM   28269475 29149534 29669555 30489579 32749658 34169709
       35269885 35270044 35520144 35840189 36740230 37130223
       37780178 38130038 38079897 38029732 38029620 38209486
       38419188 38828895 38798648 38398465 38068342 37608237
       36978127 36198101 34868117 33688182 32858283 32048351
       31228354 30758340 30228312 29098222 27818174 26638148
       25768218

&&
THERE IS A SLGT RISK OF SVR TSTMS TO THE RIGHT OF A LINE FROM 80 S
HUM 20 S HUM 15 WSW MSY 30 NNW ASD 40 S MEI 45 E MEI MGM 15 ENE TOI
DHN 20 NE PFN 40 SSW AAF.

THERE IS A MRGL RISK OF SVR TSTMS TO THE RIGHT OF A LINE FROM 80 SSW
HUM 35 WSW HUM 25 NW HUM 20 SSE MCB 25 S TCL 20 NNE GAD 30 ENE RMG
10 WNW AND 40 SSE AND 40 WSW MCN 25 WNW TLH 55 SSE AAF.

GEN TSTMS ARE FCST TO THE RIGHT OF A LINE FROM 75 SE LBX 10 E LBX 15
W HOU 25 SW UTS 15 ESE DAL 10 SSW ADM 20 ESE CSM 60 N CDS 10 S BGD
30 WNW BGD 30 SW EHA 20 WNW EHA 55 ESE LAA 25 NE GCK 55 S RSL 25 NNE
ICT 20 S EMP 45 S OJC 20 NNW VIH 10 N SLO 25 SSE BMG 25 N LEX 35 N
JKL 55 S HTS 25 S BLF 40 NNE HKY 25 SSW CLT 25 NNE AGS 50 ENE MCN 45
S MCN 20 ENE MGR VLD 40 SSE VLD OCF 30 WNW AGR 25 E FMY 35 SW APF.
```

Figure 3: Day 1 SPC Points Product Format

5.4 Updates, Amendments and Corrections. Updates are scheduled (see issuance times). SPC will correct outlooks for format errors. SPC will amend the Day 1 Points Product when it is recognized that the current forecast does not or will not reflect the ongoing or future convective development. In rare instances when the SPC determines the ongoing forecast needs to be changed, an amendment can be made to the Day 2, Day 3, and Day 4-8 Points Products.

6. SPC NDFD Forecast Products.

6.1 Mission Connection. SPC issues the NDFD Forecast Product to provide CONUS WFOs, partners, and users with the graphical display that make up the SPC Categorical and Probabilistic Convective Outlook areas.

6.2 Issuance Guidelines.

SPC NDFD FORECAST PRODUCTS

Issuance Times (UTC)	*Valid Times (UTC)*	*WMO Header (grib2)*	*Product Description*
0600	1200 Day 1 to 1200 Day 2 (0-24 hour period)	LDIZ11 KWNS	Tornado Probabilities
		LDIZ12 KWNS	Hail Probabilities
		LDIZ13KWNS	Dmg Wind Probabilities
		LDIZ14KWNS	Sig Tor Probabilities
		LDIZ15 KWNS	Sig Hail Probabilities
		LDIZ16 KWNS	Sig Dmg Wind Probabilities
		LDIZ17 KWNS	Categorical Outlook
0600 (Daylight) 0700 (Standard)	1200 Day 2 to 1200 Day 3 (24-48 hour period)	LDIZ21 KWNS	Tornado Probabilities
		LDIZ22 KWNS	Hail Probabilities
		LDIZ23 KWNS	Dmg Wind Probabilities
		LDIZ24 KWNS	Sig Tor Probabilities
		LDIZ25 KWNS	Sig Hail Probabilities
		LDIZ26 KWNS	Sig Dmg Wind Probabilities
		LDIZ27 KWNS	Categorical Outlook
0730 (Daylight) 0830 (Standard)	1200 Day 3 to 1200 Day 4 (48-72 hour period)	LDIZ40 KWNS	Total Prob. of Severe Thunderstorms
		LDIZ41 KWNS	Total Prob. of Extreme Severe Thunderstorms
		LDIZ37 KWNS	Categorical Outlook
0900 (Daylight) 1000 (Standard)	1200 Day 4 to 1200 Day 9 (72-192 hour period)	LDIZ48 KWNS	Day 4 Total Prob. of Severe Thunderstorms
		LDIZ58 KWNS	Day 5 Total Prob. of Severe Thunderstorms
		LDIZ68 KWNS	Day 6 Total Prob. of Severe Thunderstorms
		LDIZ78 KWNS	Day 7 Total Porb. of Severe Thunderstorms
		LDIZ88 KWNS	Day 8 Total Prob. of Severe Thunderstorms
1300	1300 Day 1 to 1200 Day 2 (23 hour period)	LDIZ11KWNS	Tornado Probabilities
		LDIZ12KWNS	Hail Probabilities
		LDIZ13KWNS	Dmg Wind Probabilities
		LDIZ14KWNS	Sig Tor Probabilities
		LDIZ15KWNS	Sig Hail Probabilities
		LDIZ16KWNS	Sig Dmg Wind Probabilities
		LDIZ17KWNS	Categorical Outlook
1630	1630 Day 1 to 1200 Day 2 (19.5 hour period)	LDIZ11KWNS	Tornado Probabilities
		LDIZ12KWNS	Hail Probabilities
		LDIZ13KWNS	Dmg Wind Probabilities
		LDIZ14KWNS	Sig Tor Probabilities
		LDIZ15 KWNS	Sig Hail Probabilities
		LDIZ16 KWNS	Sig Dmg Wind Probabilities
		LDIZ17 KWNS	Categorical Outlook

1730	1200 Day 2 to 1200 Day 3 (24-48 hour period)	LDIZ21 KWNS	Tornado ProbabilitiesCategorical Outlook
		LDIZ22 KWNS	Hail Probabilities
		LDIZ23 KWNS	Dmg Wind Probabilities
		LDIZ24 KWNS	Sig Tor Probabilities
		LDIZ25 KWNS	Sig Hail Probabilities
		LDIZ26 KWNS	Sig Dmg Wind Probabilities
		LDIZ27 KWNS	Categorical Outlook
2000	2000 Day 1 to 1200 Day 2 (16 hour period)	LDIZ11KWNS	Tornado Probabilities
		LDIZ12KWNS	Hail Probabilities
		LDIZ13KWNS	Dmg Wind Probabilities
		LDIZ14KWNS	Sig Tor Probabilities
		LDIZ15KWNS	Sig Hail Probabilities
		LDIZ16KWNS	Sig Dmg Wind Probabilities
		LDIZ17 KWNS	Categorical Outlook
0100	0100 Day 1 to 1200 Day 2 (11 hour period)	LDIZ11KWNS	Tornado Probabilities
		LDIZ12 KWNS	Hail Probabilities
		LDIZ13 KWNS	Dmg Wind Probabilities
		LDIZ14 KWNS	Sig Tor Probabilities
		LDIZ15 KWNS	Sig Hail Probabilities
		LDIZ16 KWNS	Sig Dmg Wind Probabilities
		LDIZ17 KWNS	Categorical Outlook

Table 6: Issuance time, valid time, product ID and content of SPC NDFD Forecast products (only entire CONUS Grid (U) listed).

6.2.1 Creation Software. SPC uses automated software.

6.2.2 Issuance Criteria. SPC NDFD Forecast Products are scheduled products.

6.2.3 Issuance Time. See Table 6.

6.2.4 Valid Time. See Table 6.

6.2.5 Product Expiration Time. Product expiration time is 1200 UTC the next day.

6.3 Technical Description.

6.3.1 Mass News Disseminator Broadcast Line. Not applicable.

6.3.2 Mass News Disseminator Header. Not applicable.

6.3.3 Content. SPC will issue three separate products for the Day 1, Day 2, and Day 3 outlooks. The Day 1 and 2 products provides the NDFD graphical products for the Probabilistic Outlooks for tornado, large hail and damaging winds, and the associated Categorical Outlooks. The Day 3 product provides the NDFD graphical products for the Probabilistic Outlook for all severe (tornadoes, large hail, and convective damaging winds combined) weather events and the associated Categorical Outlook. NDFD graphics for areas of significant severe events are also part of this product.

6.4 Updates, Amendments and Corrections. Updates are scheduled (see issuance times). SPC will correct outlooks for format errors. SPC will amend the Day 1 NDFD Forecast Products when it is recognized that the current forecast does not or will not reflect the ongoing or future convective development. In rare instances when the SPC determines the ongoing forecast needs to be changed, an amendment can be made to the Day 2 and Day 3 NDFD Forecast Products.

7. Public Severe Weather Outlook (WMO header WOUS40, AWIPS ID PWOSPC).

7.1 Mission Connection. Public Severe Weather Outlooks (PWOs) narrative and graphic alert the CONUS WFOs, public, media, and emergency managers to a potentially significant or widespread severe weather outbreak. These outlooks also define the threat area and provide information on the timing of the outbreak.

7.2 Issuance Guidelines.

7.2.1 Creation Software. SPC will use SPC Product Generator (PRODGEN) for these products.

7.2.2 Issuance Criteria. When a potential exists for a significant or widespread convective outbreak, which is implied with tornado and/or damaging wind probabilities indicative of a High Risk or a Moderate Risk that contains at least a 15% probability of tornadoes and 10% significant severe or a 45% probability of damaging wind gusts and 10% significant severe, a PWO will be issued. Also, when a 10% (or greater) probability of significant tornadoes is expected to occur between 0300 and 1200 UTC, a PWO is issued following the issuance of a 2000 UTC and/or 0100 UTC Day 1 Outlook.

7.2.3 Issuance Time. The PWO is an event driven product (see 7.3.3 for more details). The PWO is issued by1100 UTC if the 0600 UTC Day 1 Outlook initiates a HIGH Risk or a MODERATE Risk that contains at least a 15% probability of tornadoes and 10% significant severe or a 45% probability of damaging wind gusts and 10% significant severe, and by 1400 UTC if the 1300 UTC Day 1 Outlook initiates a HIGH Risk or a MODERATE Risk with the above criteria. The PWO is then updated by 1800 UTC following the issuance of the 1630 UTC Day 1 Outlook. The PWO may be written by 2100 UTC if the 2000 UTC Day 1 Outlook is upgraded to HIGH Risk. The PWO is issued by 2100 UTC and/or 0200 UTC for nighttime significant tornadoes as defined in section 7.2.2. The PWO is not issued for a “hail only” MODERATE Risk.

7.2.4 Valid Time. The valid time is from the time of issuance to expiration.

7.2.5 Product Expiration Time. The product expiration time will be the time of the next PWO issuance or 0200 UTC if no other issuances are expected. A PWO issued at 0100 UTC expires at 1200 UTC.

7.3 Technical Description. Public Weather Outlooks should follow the format and content described in this section.

7.3.1 Mass News Disseminator Broadcast Line. None.

7.3.2 Mass News Disseminator Header. The PWO MND header is "PUBLIC SEVERE WEATHER OUTLOOK."

7.3.3 Content. SPC will issue a Public Severe Weather Outlook when it forecasts any of the following conditions in the Day 1 Outlook:

a) A High Risk of severe storms;
b) A Moderate Risk of severe storms that contains at least a 15% probability of tornadoes and 10% significant severe, or a 45% probability of (convective) damaging winds and 10% significant severe;
c) A 10% (or greater) probability of nighttime significant tornadoes.

7.3.4 Format. Following a narrative headline, the Public Severe Weather Outlook uses a bulleted format to describe locations, hazards, and a summary of the expected evolution of the severe-weather threat. There are three bullets; each preceded by a left justified asterisk and a single space. The bullets provide:

- LOCATIONS
- HAZARDS based on Day 1 Convective Outlook Probabilities (see Section 3.3.3)
- SUMMARY

All other text in the bulleted area will be preceded by two spaces.

Call-To-Action (CTA) statements are preceded by the marker "Preparedness actions..." and end with the && character strings. The "Preparedness actions..." and && character strings will be left justified with no other characters on the same line of text.

See Figure 5 for an example of the Public Severe Weather Outlook format.

```
WOUS40 KWNS ddhhmm
PWOSPC
STZ000>099-CWZ000>099-ddhhmm-

PUBLIC SEVERE WEATHER OUTLOOK
NWS STORM PREDICTION CENTER NORMAN OK
time am/pm time_zone day mon dd yyyy

...Narrative headline (location and timing)...

* LOCATIONS...
  Portion(s) of State

* HAZARDS...
  Plain-language description of the expected hazards based on the Day 1
Convective Outlook Probabilities (listed in order of greater threat).
  Several tornadoes, a few intense
  Widespread large hail, some baseball size
  Widespread damaging winds

* SUMMARY...
```

```
  Brief sentence or two describing the greatest risk potential, areas
affected, and general timing.

Preparedness actions...

Call-to-action statements that vary based on the hazards and timing of the
expected threat.

&&


..FORECASTER NAME.. MM/DD/YYYY
```

Figure 4: Public Severe Weather Outlook Format

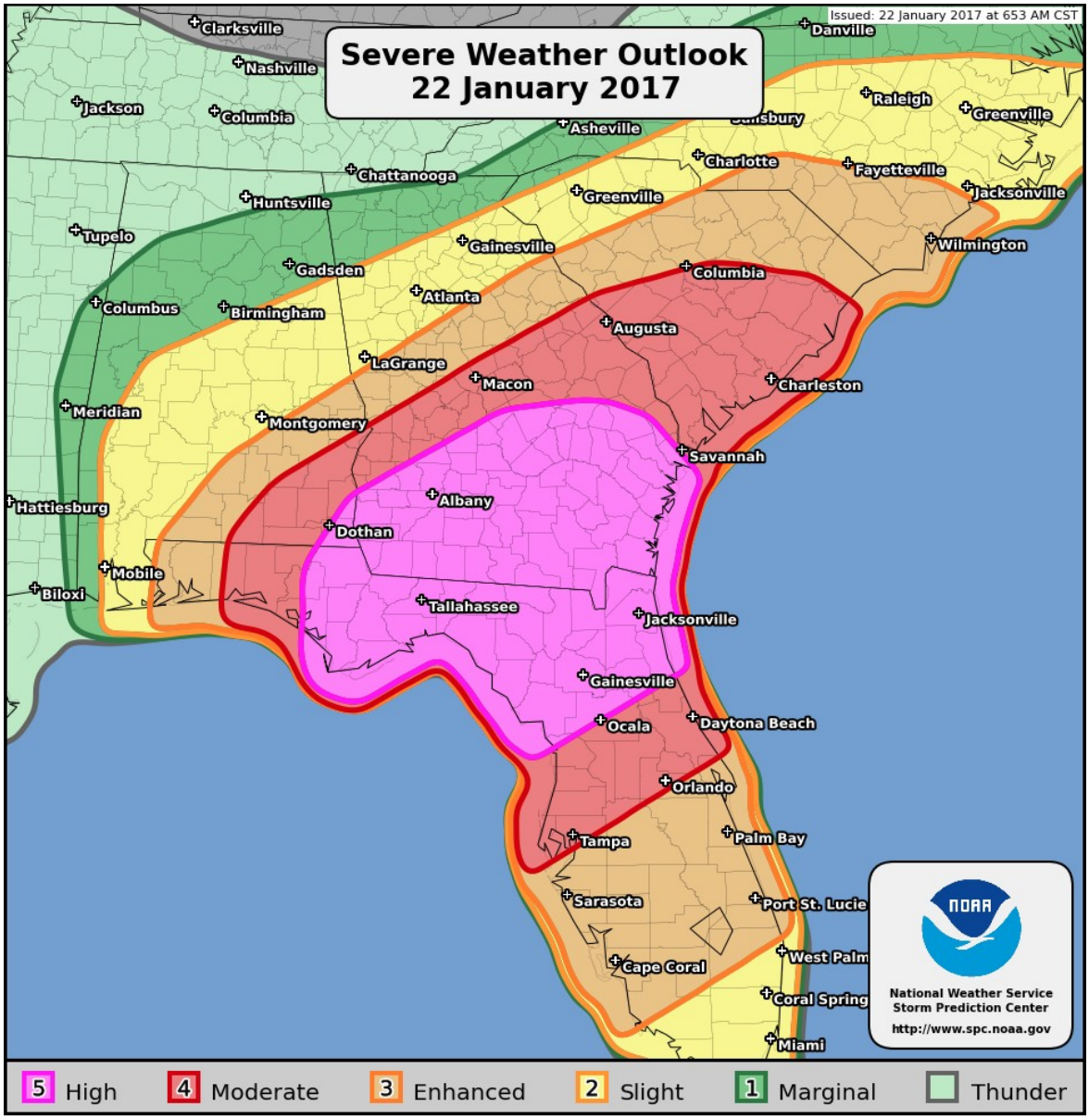

Figure 6. Public Severe Weather Outlook Graphic (Web-based).

7.4 Updates, Amendments and Corrections. Updates are scheduled (see issuance times). SPC will correct outlooks for format and grammatical errors. PWOs will not be amended.

8. SPC Thunderstorm Outlook (Web-based Graphic).

8.1 Mission Connection. Forecasts of thunderstorms are critical for the protection of life and property since every thunderstorm contains lightning that is a potential killer. The high temporal and spatial resolution of the SPC Thunderstorm Outlook will aid both NWS forecasters and NWS Partners in time sensitive decisions related to thunderstorms, and ultimately provide greater safety for the continental United States public.

8.2 Issuance Guidelines.

8.2.1 Creation Software. SPC will use SPC Product Generator (PRODGEN) for these products.

8.2.2 Issuance Criteria. SPC Thunderstorm Outlooks are scheduled products.

8.2.3 Issuance Time. See Table 7.

8.2.4 Valid Time. See Table 7.

SPC Thunderstorm Outlooks	
Issuance Time (UTC)	**Valid Periods (UTC)**
0600	1200-1600, 1600-2000, 2000-0000
1300	1600-2000, 2000-0000, 0000-0400
1700	2000-0000, 0000-0400, 0400-1200
2100	0000-0400, 0400-1200
0130	0400-1200

Table 8: SPC Thunderstorm Outlooks Issuance Time and Valid Time

8.2.5 Product Expiration Time. The product expiration time will be the time of the next Thunderstorm Outlook issuance.

8.3 Technical Description. The SPC Thunderstorm Outlook should follow the format and content described in this section.

8.3.1 Mass News Disseminator Broadcast Line. None

8.3.2 Mass News Disseminator Header. None

8.3.3 Content. The SPC Thunderstorm Outlook depicts the expected geographic areas of thunderstorms including 10, 40, and 70% probabilities in 4 or 8 hour time periods. A 40% probability means that given similar environmental conditions, a thunderstorm would be observed at any one location (in either a county or city) within the 40% thunder probability area four times out of ten, or 40% of the time.

8.3.4 Format. The SPC Thunderstorm Outlook is a web-based graphic online at: https://www.spc.noaa.gov/products/exper/enhtstm/

8.4 Updates, Amendments and Corrections. Updates are scheduled (see issuance times). SPC will correct outlooks for format errors. SPC Thunderstorm Outlooks will not be amended.

9. Watch County List (WMO header NWUS64, AWIPS ID WCL [A-J]).

9.1 Mission Connection. SPC issues Watch County Lists to collaborate with CONUS WFOs on proposed counties, parishes, independent cities and/or adjacent coastal water marine zones to be included in a convective watch. The AWIPS Message Handling System is used to keep the Watch County List product internal to the NWS.

9.2 Issuance Guidelines.

9.2.1 Creation Software. SPC will use the National Centers AWIPS (NAWIPS) and/or the SPC Product Generator (PRODGEN) for these products.

9.2.2 Issuance Criteria. SPC forecasts weather conditions expected to approach or exceed Severe Thunderstorm or Tornado Watch issuance criteria (see Sections 12.2.2 or 13.2.2, respectively).

9.2.3 Issuance Time. Watch County Lists are non-scheduled, event driven products.

9.2.4 Valid Time. Not applicable. Watch County Lists are an internal product.

9.2.5 Product Expiration Time. Not applicable.

9.3 Technical Description. Watch county lists will follow the format and content described in this section.

9.3.1 Mass News Disseminator Broadcast Line. Not applicable.

9.3.2 Mass News Disseminator Header. Not applicable.

9.3.3 Content. CONUS WFOs and SPC are partners in the convective watch process. In the spirit of partnership, WFOs, and SPC work toward a consensus convective watch area and duration before, during and at the end of convective watches.

SPC uses the Watch County List (WCL) to alert affected WFOs to a proposed convective watch. WFOs may call the SPC and propose a new watch area. SPC will provide the watch type and proposed counties or parishes and independent cities segmented by state and coastal water marine zones and a proposed expiration time. SPC will include the term "coastal waters" when the watch affects coastal waters within 20 nautical miles of the Pacific, Atlantic, or Gulf of Mexico coast, and for outer marine zones when requested for inclusion in the watch by a WFO. An "outer marine zone" is a WFO's responsibility located between 20-60 nautical miles for oceans and Gulf of Mexico. All U.S. Great Lakes marine zones may be included in proposed convective watches.

SPC generates and sends the list through AWIPS to the affected WFOs. SPC will list WFOs in the proposed watch in the ATTN Line. AWIPS software decodes this list into a graphical display of counties and independent cities in each WFO's County Warning Area (CWA). The list and graphical display on AWIPS serve as the basis for a mandatory collaboration conference call between SPC and the affected WFOs prior to a watch issuance. SPC will attempt to individually contact affected WFO(s) which were unable to participate in the collaboration conference call. The affected WFOs and SPC will collaborate on the watch type, the final list of proposed counties or parishes, independent cities and marine zones to be included in the initial convective watch area. If a consensus cannot be reached through collaboration or SPC is unable to contact an affected WFO(s) during the collaboration call or individually, SPC will decide on the final list of counties or parishes, independent cities and marine zones for all affected WFOs for the initial convective watch area.

9.3.4 Format.

```
NWUS64 KWNS ddhhmm
WCLx

.(TORNADO OR SEVERE THUNDERSTORM) WATCH x
COORDINATION COUNTY LIST FROM THE NWS STORM PREDICTION CENTER EFFECTIVE
UNTIL HHMM UTC.

STC001-003-ddhhmm-

ST
.    STATE 1 COUNTIES INCLUDED ARE

LIST OF COUNTIES

STATE 1  INDEPENDENT CITIES INCLUDED ARE

LIST OF INDEPENDENT CITIES
$$

STC001-003-ddhhmm-

ST
.    STATE 2 COUNTIES INCLUDED ARE

LIST OF COUNTIES

STATE 2  INDEPENDENT CITIES INCLUDED ARE
```

```
LIST OF INDEPENDENT CITIES
$$

CW
.   ADJACENT COASTAL WATERS INCLUDED ARE

LIST OF MARINE ZONES
$$

ATTN...WFO...CCC...CCC...CCC... (WFOS AFFECTED BY THE PROPOSED WATCH).
```

Figure 7: Watch County List Format

9.4 Updates, Amendments and Corrections. Updates are not applicable. SPC will correct lists for format errors. WCLs will not be amended.

10. Watch Outline Update Message (WMO header WOUS64, AWIPS ID WOU#).

10.1 Mission Connection. SPC issues Watch Outline Update Messages (WOU) to provide CONUS WFOs, emergency managers, the media, and the general public with the names of all counties or parishes, independent cities and marine zones in a convective watch area. The WOU product defines the initial list of counties in a watch. The Aviation Watch Notification (SAW) and Public Watch Notification (SEL) products describe an approximation of the watch area via a parallelogram. The SAW and SEL refer to the WOU product for the watch area.

10.2 Issuance Guidelines.

10.2.1 Creation Software. SPC will use the National Centers AWIPS (NAWIPS) and/or the SPC Product Generator (PRODGEN) for these products.

10.2.2 Issuance Criteria. SPC will issue an initial WOU for every CONUS convective watch. SPC will issue updated WOUs as needed when changes are made to Watch County Notification (WCN) messages issued by WFOs to update counties within active convective watches. SPC will issue a final WOU to notify users that a watch has been cancelled or allowed to expire. The cancellation WOU message is issued when all WFOs in the affected watch issue WCNs that cancel the counties within their respective CWAs.

10.2.3 Issuance Time. SPC will issue initial WOUs at the same time the Aviation Watch Notification Message is issued. SPC will issue updated WOUs as needed for active convective watches when WCNs are received from WFOs. SPC will issue final WOUs at the watch expiration time, or when all counties are cleared through the WCN product issued by the WFOs.

10.2.4 Valid Time. WOUs are valid until the product is updated, cancelled or expires.

10.2.5 Product Expiration Time. The product expiration time is the watch expiration time.

10.3 Technical Description. WOUs will follow the format and content described in this section.

10.3.1 MND Broadcast Line. SPC will use "BULLETIN - IMMEDIATE BROADCAST REQUESTED" in WOUs only for the initial issuance of this watch product. The term "BULLETIN" is used when information is sufficiently urgent to warrant breaking into a normal broadcast.

10.3.2 MND Header. The WOU MND header is "TORNADO (or SEVERE THUNDERSTORM) WATCH OUTLINE UPDATE FOR W(S or T) nnnn" where "nnnn" is the watch number. The watch number will be a consecutive number beginning with number 1 at the start of each calendar year.

10.3.3 Content. SPC will issue WOUs for the time zone(s) in the defined watch area. WOUs will be segmented by states and associated marine areas. WOUs will include all counties or parishes, independent cities and adjacent coastal water marine zones in a watch area (including nearshore zones out to 20 nautical miles and outer zones from 20-60 nautical miles). All Great Lakes marine zones within the United States will be included in convective watches. The initial WOU automatically generates the initial Watch County Notification Messages (WCN) for the affected WFOs. As a result of a collaboration call with those WFOs for which their CWA is included within a proposed convective watch, the counties or parishes, independent cities and marine zones listed in the initial WOU will match those listed in the initial WCNs issued by the affected WFOs.

The content of the WOU updates are collected from the latest WCNs issued by the WFOs and issued as needed. WOU updates will include all counties or parishes, independent cities and marine zones which remain in or have been added to the watch area since the initial issuance or update. SPC will issue a final WOU when all counties are cleared through a WFO WCN to inform national and regional partners and users that the convective watch is no longer in effect for any portion of the watch area. SPC and affected WFOs will collaborate when counties or parishes, independent cities, or marine zones are transferred from an existing convective watch to a new watch (e.g., watch replacement), or added to an ongoing watch. Per collaboration between the SPC and all WFOs within a watch, a watch can be extended in time and/or area. Watch extensions should generally be confined to those situations where another watch is not likely to be issued beyond the current issuance and the ongoing threat is best covered by a small extension in time (up to 2 hours) and/or area (typically less than 8000 square miles).

10.3.4 Format.

```
WOUS64 KWNS ddhhmm
WOUn
BULLETIN - IMMEDIATE BROADCAST REQUESTED (Initial Issuance Only)
TORNADO (or SEVERE THUNDERSTORM) WATCH OUTLINE UPDATE FOR W(S or T) nnnn
NWS STORM PREDICTION CENTER NORMAN OK
time am/pm time_zone day mon dd yyyy

TORNADO (or SEVERE THUNDERSTORM) WATCH nnnn IS IN (or REMAINS IN) EFFECT
UNTIL hhmm AM/PM XDT FOR THE FOLLOWING LOCATIONS:

STC001-003-ddhhmm-
/k.aaa.cccc.pp.s.####.yymmddThhnnZB-yymmddThhnnZE/
```

```
ST
.    STATE 1 COUNTIES INCLUDED ARE

LIST OF COUNTIES

STATE 1  INDEPENDENT CITIES INCLUDED ARE

LIST OF CITIES
$$

nMZ001-003-ddhhmm-
/k.aaa.cccc.pp.s.####.yymmddThhnnZB-yymmddThhnnZE/

CW
.   ADJACENT COASTAL WATERS INCLUDED ARE

LIST OF MARINE ZONES
$$
ATTN...WFO...CCC...CCC...CCC... (WFOS AFFECTED BY THE WATCH).
```

Figure 8: Watch Outline Update Message

(Watch No Longer in Effect- Final Update)

```
WOUS64 KWNS ddhhmm
WOUn

TORNADO (or SEVERE THUNDERSTORM) WATCH OUTLINE UPDATE FOR W(S or T) nnnn
NWS STORM PREDICTION CENTER NORMAN OK
time am/pm time_zone day mon dd yyyy

TORNADO (or SEVERE THUNDERSTORM) WATCH nnnn IS NO LONGER IN EFFECT.

STZ000-nMZ000-ddhhmm-
/k.aaa.cccc.pp.s.####.yymmddThhnnZB-yymmddThhnnZE/

NO COUNTIES (OR PARISHES, INDEPENDENT CITIES) REMAIN IN THE WATCH.

NO MARINE ZONES REMAIN IN THE WATCH (if Marine Zones were in the original
watch area)
$$

ATTN...WFO...CCC...CCC...CCC... (ALARM/ALERT INFORMATION, WFOS ORIGINALLY
AFFECTED BY THE WATCH).
```

Figure 9: Example of an updated Watch Outline Update

10.4 Updates, Amendments and Corrections. When appropriate, SPC may correct WOUs for areal omissions and expiration time. WOUs are updated as-needed and at least every 30 minutes around :03 and :33 minutes after the top of each hour.

11. Aviation Watch Notification Message (WMO header WWUS30, AWIPS ID SAW#)

11.1 Mission Connection. SPC issues Aviation Watch Notification Messages to provide an area threat alert for the aviation meteorology community to forecast organized severe

thunderstorms that may produce tornadoes, large hail, and/or convective damaging winds as indicated in Public Watch Notification Messages. The SAW product is an approximation of the area in a watch, for the official area covered by a watch see the corresponding WOU product.

11.2 Issuance Guidelines.

11.2.1 Creation Software. SPC will use the National Centers AWIPS (NAWIPS) and/or the SPC Product Generator (PRODGEN) for these products.

11.2.2 Issuance Criteria. A convective watch is in effect.

11.2.3 Issuance Time. Aviation Watch Notification Messages are non-scheduled, event driven products.

11.2.4 Valid Time. The valid time is from the time of issuance to expiration or cancellation time.

11.2.5 Product Expiration Time. The expiration time is at the end of the watch valid time.

11.3 Technical Description. Aviation Watch Notification Messages will follow the format and content described in this section.

11.3.1 Mass News Disseminator Broadcast Line. Not applicable.

11.3.2 Mass News Disseminator Header. Not applicable.

11.3.3 Content. SPC will issue the SAW after the proposed convective watch area has been collaborated with the affected WFO CWAs defining the approximate areal outline of the watch. SPC forecasters may define the area as a rectangle or parallelogram (X miles either side of line from point A to point B), or (X miles north and south or east and west of line from point A to point B). Distances of the axis coordinates should be in statute miles. The aviation coordinates reference navigational aid VHF Omni-Directional Range (VOR) locations and state distances will be in nautical miles. SPC will provide valid times in UTC. The watch half width will be in statute miles. The Aviation Watch Notification Message will contain hail size in inches (omitted at forecaster discretion when hail is not anticipated) surface and aloft, surface convective wind gusts in knots, maximum cloud tops, and the Mean Storm Motion Vector, and replacement information, if necessary.

11.3.4 Format.

```
WWUS30 KWNS ddhhmm
SAWn
SPC AWW ddhhmm
WWnnnn SEVERE TSTM ST LO DDHHMMZ - DDHHMMZ
AXIS...XX STATUTE MILES EITHER SIDE (or North and South, or East and West)
OF A LINE
XXDIR CCC/LOCATION ST/ - XXDIR CCC/LOCATION ST
..AVIATION COORD.. XX NM EITHER SIDE /XXDIR CCC - XXDIR CCC
```

```
HAIL SURFACE AND ALOFT..X X/X.X INCHES/INCH (can be omitted when hail is
not anticipated). WIND GUSTS..XX KNOTS.
MAX TOPS TO XXX. MEAN STORM MOTION VECTOR DIR/SPEED.

LAT...LON

THIS IS AN APPROXIMATION TO THE WATCH AREA. FOR A COMPLETE DEPICTION OF THE
WATCH SEE WOUS64 KWNS FOR WOUn.
```

Figure 10: Aviation Severe Weather Watch Notification Message Format

11.4 Updates, Amendments and Corrections. Updates and amendments are not applicable. SPC will correct watches for format and grammatical errors.

12. Public Severe Thunderstorm Watch Notification Message (WMO header WWUS20, AWIPS ID SEL#).

12.1 Mission Connection. SPC issues Public Severe Thunderstorm Watch Notification Messages to alert CONUS WFOs, the public, media and emergency managers to organized thunderstorms forecast to produce six or more hail events of one inch (quarter-size) diameter and/or greater or convective damaging winds of 50 knots (58 mph) or greater. The SEL product is an approximation of the area in a watch, for the official area covered by a watch see the corresponding WOU product.

12.2 Issuance Guidelines.

12.2.1 Creation Software. SPC will use the National Centers AWIPS (NAWIPS) and/or the SPC Product Generator (PRODGEN) for these products.

12.2.2 Issuance Criteria. SPC should issue a Public Severe Thunderstorm Watch Notification Message when there is a forecast of six or more hail events of one inch (quarter-size) diameter or greater or convective damaging winds of 50 knots (58 mph) or greater. The forecast event minimum thresholds should be at least 2 hours over an area at least 8,000 square miles. Below these thresholds, SPC in collaboration with affected WFO CWAs may issue for smaller areas and for shorter periods of time when conditions warrant, and for convective watches along coastlines, and near the Canadian and Mexican borders.

12.2.3 Issuance Time. Public Severe Thunderstorm Watch Notification Messages are non-scheduled, event driven products.

12.2.4 Valid Time. The valid time is from the time of issuance to expiration or cancellation.

12.2.5 Product Expiration Time. The expiration time is the end of the watch valid time.

12.3 Technical Description. Public Severe Thunderstorm Watch Notification Messages will follow the format and content described in this section.

12.3.1 Mass News Disseminator Broadcast Line. Public Severe Thunderstorm Watch Notification Messages will include the broadcast line "URGENT – IMMEDIATE BROADCAST REQUESTED". The term "URGENT" is used when the information may wait until a "stop-set" (break in the broadcast routine).

12.3.2 Mass News Disseminator Header. The Public Severe Thunderstorm Watch Notification Message MND header is "Severe Thunderstorm Watch Number nnnn."

12.3.3 Content. A Public Severe Thunderstorm Watch Notification Message will contain the approximate area description and axis, effective time of the watch, a list of primary threats including hail size and thunderstorm wind gusts expected, a brief summary describing the evolution of the severe weather threat, the definition of a watch, a call to action statement, a list of other valid watches, a list of watches cancelled/replaced by a new watch, and a brief description of the severe weather threat to the aviation community.

SPC will include the term "coastal waters" when the watch affects coastal waters within 20 nm of the Pacific, Atlantic, or Gulf of Mexico coast, and for outer marine zones when requested for inclusion in the watch by a WFO. An "outer marine zone" is a WFO's responsibility located between 20-60 nautical miles for oceans and Gulf of Mexico. If a Great Lake is included in a watch, then the Lake (such as, Northern Lake Michigan) is included in the listing of states or Great Lakes within the United States.

SPC will coordinate with affected WFOs to determine which counties or parishes, independent cities, and/or marine zones are in the initial watch and meteorological reasoning prior to a watch being issued. SPC will issue a watch cancellation message (under SEL, SAW, and WOU products) when there are no counties or parishes, independent cities and/or marine zones remaining in the watch area prior to the expiration time, after WFOs have cleared all counties via WCNs. The text of the message will specify the number and area of the cancelled watch.

SPC will enhance a Public Severe Thunderstorm Watch Notification Message by using the words, "THIS IS A PARTICULARLY DANGEROUS SITUATION" when conditions are favorable for widespread significant non-tornadic severe weather events (convective winds at least 75 mph). An example is a well-defined large bow echo with destructive convective winds occurring at the surface, and downstream conditions suggest the bow echo will be maintained or intensify for the duration of the watch.

12.3.4 Format. The Public Severe Thunderstorm Watch Notification Message uses a bulleted format that includes primary threat information statements. There are three bullets; each proceeded by a left justified asterisk and a single space. The bullets provide:

- Watch type and an area description
- Watch effective time
- List of primary threats in order of importance based on Watch Hazard Probabilities (see Section 14.3.3)

All other text in the bulleted area will be preceded by two spaces.

The Public Severe Thunderstorm Watch Notification Message includes "...THIS IS A PARTICULARLY DANGEROUS SITUATION..." between the second and third bullet when conditions are favorable for widespread significant non-tornadic severe weather events (convective winds at least 75 mph) in a severe thunderstorm watch.

Following the three bullets will be a summary consisting of two to three sentences describing the expected evolution of the severe-weather threat, including timing, storm mode, and type of severe-weather risk.
The summary text is preceded on the same line by the marker "SUMMARY…".
The "SUMMARY…" will be left justified.

Following the SUMMARY will be a paragraph with a general area description including the axis of the watch.

Call-To-Action (CTA) statements are preceded by the marker "PRECAUTIONARY/PREPAREDNESS ACTIONS... " and end with the && character strings. The "PRECAUTIONARY/PREPAREDNESS ACTIONS... " and && character strings will be left justified with no other characters on the same line of text.

Following the CTA will be the following two sections:

- OTHER WATCH INFORMATION...
- AVIATION...

The watch will end with:
…Forecaster Last name

See Figure 11 for an example of the Public Severe Thunderstorm Watch Notification Message format.

```
WWUS20 KWNS ddhhmm
SELn
SPC WW ddhhmm
STZ000>099-CWZ000>099-ddhhmm-

URGENT - IMMEDIATE BROADCAST REQUESTED
Severe Thunderstorm Watch Number nnnn
NWS Storm Prediction Center Norman OK
hhmm AM/PM TIME_ZONE Day Mon dd yyyy

THE NWS Storm Prediction Center has issued a

* Severe Thunderstorm Watch for portions of
  Portion(s) of State

* Effective (Time period) from hhmm AM/PM until hhmm AM/PM TIME_ZONE.

...THIS IS A PARTICULARLY DANGEROUS SITUATION (if necessary)...

* Primary threats include...
```

```
  Scattered damaging wind gusts to NNN mph possible
  Isolated large hail events to N.N inches in diameter possible

SUMMARY... Two to three sentences describing the expected evolution of the
severe-weather threat, including timing, storm mode, and type of severe-
weather risk.

Narrative description of approximate watch area using a line and anchor
points. Distances to either side of the line will be in statue miles. This
section indicates the watch area is an approximation and "For a complete
depiction of the watch see the associated watch outline update (WOUS64 KWNS
WOUn)."

PRECAUTIONARY/PREPAREDNESS ACTIONS...

REMEMBER...A Severe Thunderstorm Watch means conditions are
favorable for severe thunderstorms in and close to the watch area.
Persons in these areas should be on the lookout for threatening
weather conditions and listen for later statements and possible
warnings. Severe thunderstorms can and occasionally do produce
tornadoes.

&&

OTHER WATCH INFORMATION...CONTINUE...WW nnnn...WW nnnn...

AVIATION...Brief description of severe weather threat to the aviation
community. Hail size will be given in inches and wind gusts in knots.
Maximum storm tops and a mean storm motion vector will also be given.

...Forecaster Last name
```

Figure 11: Public Watch Notification Message Format (For Severe Thunderstorms)

12.4 Updates, Amendments and Corrections. Updates are not applicable. SPC will correct watches for format and grammatical errors.

13. Public Tornado Watch Notification Message (WMO header WWUS20, AWIPS ID SEL#).

13.1 Mission Connection. SPC issues Public Tornado Watch Notification Messages to alert CONUS WFOs, the public, media, and emergency managers to organized thunderstorms forecast to produce two or more tornadoes or any tornado which could produce EF2 or greater damage. The SEL product is an approximation of the area in a watch, for the official area covered by a watch see the corresponding WOU product.

13.2 Issuance Guidelines.

13.2.1 Creation Software. SPC will use the National Centers AWIPS (NAWIPS) and/or the SPC Product Generator (PRODGEN) for these products.

13.2.2 Issuance Criteria. SPC should issue a Public Tornado Watch Notification Message when there is a forecast of multiple weak tornadoes or any tornado which could produce EF2 or greater damage. The forecast event minimum thresholds should be at least 2 hours over an area at least 8,000 square miles. Below these thresholds, SPC in collaboration with affected WFOs and their CWAs may issue for smaller areas and for shorter periods of time when conditions warrant, and for convective watches along coastlines, and near the Canadian and Mexican borders.

13.2.3 Issuance Time. Public Tornado Watch Notification Messages are non-scheduled, event driven products.

13.2.4 Valid Time. The valid time is from the time of issuance to expiration or cancellation time.

13.2.5 Product Expiration Time. The expiration time is the end of the watch valid time.

13.3 Technical Description. Public Tornado Watch Notification Messages will follow the format and content described in this section.

13.3.1 Mass News Disseminator Broadcast Line. Public Tornado Watch Notification Messages will include the broadcast line "URGENT - IMMEDIATE BROADCAST REQUESTED." The term "URGENT" is used when the information may wait until a "stop-set" (break in the broadcast routine).

13.3.2 Mass News Disseminator Header. The Public Tornado Watch Notification Message MND header is "Tornado Watch Number nnnn."

13.3.3 Content. A Public Tornado Watch Notification Message will contain the area description and axis, effective time of the watch, a list of primary threats including the largest hail size and strongest thunderstorm wind gusts, a brief summary describing the evolution of the severe weather threat, the definition of a watch, a call to action statement, a list of other valid watches, a list of watches cancelled or replaced by new watches, and a brief description of the severe weather threat to the aviation community (see Figure 12). Mention of hail size associated with tropical cyclones is optional.

SPC will include the term "coastal waters" when the watch affects coastal waters within 20 nm of the Pacific, Atlantic, or Gulf of Mexico coast, and for outer marine zones when requested for inclusion in the watch by a WFO. An "outer marine zone" is a WFO's responsibility located between 20-60 nautical miles for oceans and Gulf of Mexico. If a Great Lake is included in a watch, the Lake (such as, Northern Lake Michigan) is included in the listing of states or Great Lakes within the United States.

SPC will coordinate with affected WFOs to determine which counties or parishes, independent cities and/or marine zones are in the initial watch and meteorological reasoning prior to a watch being issued. SPC will issue a watch cancellation message (under SEL, SAW and WOU products) whenever a watch is cancelled prior to the expiration time. The text of the message will specify the number and area of the cancelled watch. SPC may enhance a Public Tornado

Watch Notification Message by using the words "THIS IS A PARTICULARLY DANGEROUS SITUATION" when there is a likelihood of multiple strong (damage of EF2 or EF3) or violent (damage of EF4 or EF5) tornadoes.

13.3.4 Format. The Public Tornado Watch Notification Message uses a bulleted format that includes primary threat information statements. There are three bullets; each preceded by a left justified asterisk and a single space. The bullets provide:

- Watch type and an area description
- Watch effective time
- List of primary threats in order of importance based on Watch Hazard Probabilities (see Section 14.3.3)

All other text in the bulleted area will be preceded by two spaces.

The Public Tornado Watch Notification Message includes "...THIS IS A PARTICULARLY DANGEROUS SITUATION..." between the second and third bullet when there is a likelihood of multiple strong or violent (EF2 - EF5) tornadoes in a tornado watch.

Following the three bullets will be a summary consisting of two to three sentences describing the expected evolution of the severe-weather threat, including timing, storm mode, and type of severe-weather risk.
The summary text is preceded on the same line by the marker "SUMMARY…".
The "SUMMARY…" will be left justified.

Following the SUMMARY will be a paragraph with a general area description including the axis of the watch.

Call-To-Action (CTA) statements are preceded by the marker "PRECAUTIONARY/PREPAREDNESS ACTIONS... " and end with the && character strings. The "PRECAUTIONARY/PREPAREDNESS ACTIONS... " and && character strings will be left justified with no other characters on the same line of text.

Following the CTA will be the following two sections:

- OTHER WATCH INFORMATION...
- AVIATION...

The watch will end with:
…Forecaster Last name

See Figure 12 for an example of the Public Tornado Watch Notification Message format.

```
WWUS20 KWNS ddhhmm
SELn
SPC WW ddhhmm
STZ000>099-CWZ000>099-ddhhmm-

URGENT - IMMEDIATE BROADCAST REQUESTED
Tornado Watch Number nnnn
```

```
NWS Storm Prediction Center Norman OK
hhmm AM/PM TIME_ZONE Day Mon dd yyyy

THE NWS Storm Prediction Center has issued a

* Tornado Watch for portions of
  Portion(s) of State

* Effective (Time period) from hhmm AM/PM until hhmm AM/PM TIME_ZONE.

...THIS IS A PARTICULARLY DANGEROUS SITUATION (IF NECESSARY)...

* Primary threats include...
  Numerous tornadoes and several intense tornadoes expected
  Widespread damaging winds and scattered significant gusts to NNN mph
    expected
  Widespread large hail and scattered very large hail events to N.N
    inches in diameter expected

SUMMARY... Two to three sentences describing the expected evolution of the
severe-weather threat, including timing, storm mode, and type of severe-
weather risk.

Narrative description of approximate watch area using a line and anchor
points. Distances to either side of the line will be in statue miles.  This
section indicates the watch area is an approximation and "For a complete
depiction of the watch see the associated watch outline update (WOUS64 KWNS
WOUn)."

PRECAUTIONARY/PREPAREDNESS ACTIONS...

REMEMBER...A Tornado Watch means conditions are favorable for
tornadoes and severe thunderstorms in and close to the watch
area. Persons in these areas should be on the lookout for
threatening weather conditions and listen for later statements
and possible warnings.

&&

OTHER WATCH INFORMATION...CONTINUE...WW nnnn...WW nnnn...

AVIATION...Brief description of severe weather threat to the aviation
community. Hail size will be given in inches and wind gusts in knots.
Maximum storm tops and a mean storm vector will also be given.

...Forecaster Last name
```

Figure 12: Public Watch Notification Message Format (for Tornadoes)

13.4 Updates, Amendments and Corrections. Updates are not applicable. SPC will correct Public Watch Notification Messages for format and grammatical errors.

14. Watch Hazard Probabilities (WMO header WWUS40, AWIPS ID WWP).

14.1 Mission Connection. SPC issues Watch Hazard Probabilities to provide affected users with probabilities of tornado and severe weather events for all active convective watches.

14.2 Issuance Guidelines.

14.2.1 Creation Software. SPC uses automated software.

14.2.2 Issuance Criteria. A convective watch is in effect.

14.2.3 Issuance Time. Watch Hazard Probabilities are non-scheduled, event driven products.

14.2.4 Valid Time. The valid time is listed in the products (WOU, SAW, or SEL).

14.2.5 Product Expiration Time. The expiration time is listed in the product (WOU, SAW, or SEL).

14.3 Technical Description. Watch Hazard Probabilities will follow the format and content described in this section.

14.3.1 Mass News Disseminator Broadcast Line. Not applicable.

14.3.2 Mass News Disseminator Header. Not applicable.

14.3.3 Content. SPC will issue Watch Hazard Probabilities to provide CONUS WFOs, the public, media and emergency managers with a set of seven severe weather probabilities for all issued convective watches.

The minimum tornado watch probability of two or more tornadoes is 30%. When "THIS IS A PARTICULARLY DANGEROUS SITUATION" is contained in the Public Tornado Watch Notification Message (see section 13.3.3), the minimum probability of one or more EF2 to EF5 tornadoes is 80%.

The minimum severe thunderstorm watch probability of six or more severe weather events is 40%. However, if a WFO requests a severe thunderstorm watch, or if the probability of one or more wind events greater than or equal to 75 mph and/or the probability of one or more events of hail greater than two inches in diameter is 30% or greater, a 30% probability is permissible for watch issuance. When "THIS IS A PARTICULARLY DANGEROUS SITUATION" is contained in the Public Severe Thunderstorm Watch Notification Message (see section 12.3.3), the minimum probability of one or more convective wind events of 75 mph or greater is 80%. When a severe thunderstorm watch is not a "PARTICULARLY DANGEROUS SITUATION", the maximum probability of two or more tornadoes and one or more EF2 to EF5 tornadoes is 20%.

14.3.4 Format.

```
WWUS40 KWNS 101848
WWP0

TORNADO WATCH PROBABILITIES FOR WT 0090
NWS STORM PREDICTION CENTER NORMAN OK
0148 PM CDT WED APR 10 2013

WT 0090
PROBABILITY TABLE:
PROB OF 2 OR MORE TORNADOES                          :  70%
PROB OF 1 OR MORE STRONG /EF2-EF5/ TORNADOES         :  40%
PROB OF 10 OR MORE SEVERE WIND EVENTS                :  50%
PROB OF 1 OR MORE WIND EVENTS >= 65 KNOTS            :  30%
PROB OF 10 OR MORE SEVERE HAIL EVENTS                :  60%
PROB OF 1 OR MORE HAIL EVENTS >= 2 INCHES            :  50%
PROB OF 6 OR MORE COMBINED SEVERE HAIL/WIND EVENTS : >95%

&&
ATTRIBUTE TABLE:
MAX HAIL /INCHES/                              : 2.5
MAX WIND GUSTS SURFACE /KNOTS/                 : 60
MAX TOPS /X 100 FEET/                          : 550
MEAN STORM MOTION VECTOR /DEGREES AND KNOTS/ : 23040
PARTICULARLY DANGEROUS SITUATION               : NO

&&
FOR A COMPLETE GEOGRAPHICAL DEPICTION OF THE WATCH AND
WATCH EXPIRATION INFORMATION SEE WOUS64 FOR WOU0.

$$
```

Figure 5: Example Watch Hazards Probabilities Product

14.4 Updates, Amendments and Corrections. Updates are not applicable. SPC will correct Watch Hazard Probabilites for format and grammatical errors.

15. Watch Status Message (WMO header WOUS20, AWIPS ID WWASPC).

15.1 Mission Connection. SPC issues Watch Status Messages to provide CONUS WFOs, media, emergency managers and the public with an assessment of the severe weather threat within each active convective watch area.

15.2 Issuance Guidelines.

15.2.1 Creation Software. SPC uses the National Centers AWIPS (NAWIPS) and/or the SPC Product Generator (PRODGEN) for these products.

15.2.2 Issuance Criteria. A convective watch is in effect.

15.2.3 Issuance Time. SPC should issue a Watch Status Message at approximately 30 minutes past the hour for each active convective watch area.

15.2.4 Valid Time. The status message is valid for one hour.

15.2.5 Product Expiration Time. The expiration time is one hour after the issuance time.

15.3 Technical Description. Watch status messages will follow the format and content described in this section.

15.3.1 Mass News Disseminator Broadcast Line. Not applicable.

15.3.2 Mass News Disseminator Header. Not applicable.

15.3.3 Content. SPC uses the Watch Status Message to help CONUS WFOs, media, emergency management, and the public determine portions of a convective watch where the threat of severe weather continues. This message will include a recommended list of what counties or parishes, independent cities and marine zones should remain in the watch area, and a geographical linear description of the continued severe weather hazard using known points. SPC should refer users to related mesoscale convective discussions (product SWOMCD) for additional information on mesoscale features related to the severe weather hazard, and local convective watch products for the official list of counties, parishes, independent cities and marine zones cleared from the watch area.

The second segment of the product, following the "&&" begins with: "STATUS REPORT W(S or T) #", where # is the watch number (e.g. 1, 21, 321, 1021). The WS or WT depicts if the watch is a Severe Thunderstorm or Tornado watch respectively. The remainder of this product is formatted similar to the WOU product, i.e., UGC for each state with a county listing segmented by "$$", except for a lack of VTEC. Marine zones will be included as applicable.

15.3.4 Format.

```
WOUS20 KWNS ddhhmm
WWASPC
SPC WW-A ddhhmm
STZ000-STZ000-STZ000-ddhhmm

STATUS REPORT ON WT (or WS) nnnn

SEVERE WEATHER THREAT CONTINUES TO THE RIGHT OF A LINE FROM XX DIR CCC...XX
DIR CCC...XX DIR CCC.

THE SEVERE WEATHER THREAT CONTINUES FOR THE FOLLOWING AREAS

&&

STC001-003-ddhhmm-

ST
.    STATE 1 COUNTIES INCLUDED ARE
```

```
LIST OF COUNTIES

STATE 1  INDEPENDENT CITIES INCLUDED ARE

LIST OF CITIES

$$

MZ001-003-ddhhmm-

CW
.   ADJACENT COASTAL WATERS INCLUDED ARE

LIST OF MARINE ZONES

$$

FOR ADDITIONAL INFORMATION...SEE MESOSCALE DISCUSSION XXX.

THE WATCH STATUS MESSAGE IS FOR GUIDANCE PURPOSES ONLY. PLEASE REFER TO
LOCAL SPECIAL WEATHER STATEMENTS FOR OFFICIAL INFORMATION ON
COUNTIES...INDEPENDENT CITIES AND MARINE ZONES CLEARED FROM SEVERE
THUNDERSTORM AND TORNADO WATCHES.
$$
```

Figure 6: Watch Status Message Format

15.4 Updates, Amendments and Corrections. Updates should be issued approximately 30 minutes past the hour. When appropriate, SPC may correct messages for format and grammatical errors.

16. Hourly Severe Weather Report Log (WMO headers NWUS22, PMNA00, AWIPS ID STAHRY).

16.1 Mission Connection. SPC issues Hourly Severe Weather Report Logs to provide WFOs, the public, media, and emergency managers with hourly text and graphical reports of severe weather events within the CONUS.

16.2 Issuance Guidelines.

16.2.1 Creation Software. SPC uses automated software.

16.2.2 Issuance Criteria. WFOs issue new Preliminary Local Storm Reports (LSR) since the last hourly report.

16.2.3 Issuance Time. SPC will issue a report log each hour.

16.2.4 Valid Time. Report logs are valid upon issuance.

16.2.5 Product Expiration Time. Not applicable.

16.3 Technical Description. Hourly reports will follow the format and content described in this section.

16.3.1 Mass News Disseminator Broadcast Line. None.

16.3.2 Mass News Disseminator Header. The Hourly Report MND header is "SPC HOURLY TORNADO AND SEVERE THUNDERSTORM REPORTS."

16.3.3 Content. SPC issues hourly report logs to inform the public, the media and emergency managers to severe weather events on a national scale. SPC updates this log on an hourly basis and lists all events since 1200 UTC. Severe weather events reported in Preliminary Storm Reports (LSR) are automatically included in hourly report logs. Events reported in other products, such as the Severe Weather Statement (SVS), or other sources may be manually inserted into hourly report logs. These reports are considered preliminary information. Final severe weather event information is found in monthly Storm Data reports (see NWSI 10-1605 "Storm Data Preparation") filed by each WFO and published by the National Centers for Environmental Information (NCEI).

16.3.4 Format.

```
NWUS22 KWNS 081806
STAHRY

                    SPC TORNADO AND SEVERE THUNDERSTORM REPORTS
               UNOFFICIAL - FOR OFFICIAL REPORTS, SEE PUBLICATION 'STORM DATA'
                    FOR 06CST SAT AUG  8 2020 THRU 12CST SAT AUG 8  2020

      EVENT    LOCATION                        REMARKS                (CST)TIME

  .....TORNADO REPORTS..........TORNADO REPORTS..........TORNADO REPORTS.....


     NONE REPORTED



 .......LRG HAIL/STRONG WIND RPTS.............LRG HAIL/STRONG WIND RPTS......

   9  G 57  3 N HERREID SD      (29 NE MBG)                                 8/0639
                                                                ABR/LSR   458710007
   1  A150  5 S WILTON MN      (6 SSW BJI)                                 8/0955
                                                                FGF/LSR   4743 9499
   6  A150  2 ENE LAKE GEORGE MN      (21 S BJI)                          8/1111
           VARIABLE FROM SMALL MARBLE TO A FEW PING PONG  FGF/LSR   4721 9495
                    BALL SIZED. EVENT ONGO
   8  WNDG  CANBY MN      (38 NE BKX)                                     8/1142
           LARGE TREES DOWN... UPROOTED.                  MPX/LSR   4471 9628


 .........OTHER SEVERE REPORTS..................OTHER SEVERE REPORTS.........

   2  A100  5 SSW BEMIDJI MN      (6 S BJI)                               8/1007
           NEAR LAKE PLANTAGENET.                         FGF/LSR   4742 9492
   3  A100  NARY MN      (11 SSE BJI)                                    8/1008
           HAIL NEAR LAKE PLANTAGENET. NEAR THE BELTRAMI  FGF/LSR   4737 9482
```

```
                  COUNTY LINE.
4 A100 5 WNW NARY MN        (8 S BJI)                                  8/1008
         HAIL NEAR LAKE PLANTAGENET. NEAR THE BELTRAMI   FGF/LSR   4739 9492
                  COUNTY LINE.
5  A100  2 N LAKE GEORGE MN      (20 S BJI)                           8/1052
         NICKEL TO QUARTER SIZED HAIL FOR A COUPLE OF    FGF/LSR   4723 9499
                  MINUTES.
7  A100  4 SSE LAKE GEORGE MN      (25 S BJI)                        8/1133
         NICKEL TO QUARTER SIZED HAIL.                   FGF/LSR   4715 9496
```

Figure 7: Hourly Report Log Example

16.4 Updates, Amendments and Corrections. This product is issued hourly and is not updated. SPC will correct logs for format and grammatical errors.

17. **Daily Severe Weather Report Log (WMO headers NWUS20, PMNE00, AWIPS ID STADTS)**.

17.1 Mission Connection. SPC issues Daily Severe Weather Report Logs to provide CONUS WFOs, the public, media, and emergency managers with text and graphical reports of severe weather events on a national scale for the previous day.

17.2 Issuance Guidelines.

17.2.1 Creation Software. SPC uses automated software.

17.2.2 Issuance Criteria. SPC issues this report log daily at 1200 UTC.

17.2.3 Issuance Time. The issuance time will be 1200 UTC. SPC will issue an update at 1800 UTC.

17.2.4 Valid Time. Report logs are valid upon issuance.

17.2.5 Product Expiration Time. Not applicable.

17.3 Technical Description. Daily report logs will follow the format and content described in this section.

17.3.1 Mass News Disseminator Broadcast Line. None.

17.3.2 Mass News Disseminator Header. The Daily Report MND header is “SPC DAILY TORNADO AND SEVERE THUNDERSTORM REPORTS.”

17.3.3 Content. SPC issues daily report logs in a text and graphical format to display all severe weather reports across the CONUS for use by the media and emergency managers. These reports are considered preliminary information. Final severe weather event information is found in monthly Storm Data reports (see NWSI 10-1605 “Storm Data Preparation”) filed by each WFO and published by the National Centers for Environmental Information (NCEI).

17.3.4 Format.

```
NWUS20 KWNS 081755
STADTS

                      SPC TORNADO AND SEVERE THUNDERSTORM REPORTS
                UNOFFICIAL - FOR OFFICIAL REPORTS, SEE PUBLICATION 'STORM DATA'
                     FOR 06CST FRI AUG  7 2020 THRU 06CST SAT AUG 8  2020

      EVENT    LOCATION                          REMARKS                 (CST)TIME

  .....TORNADO REPORTS..........TORNADO REPORTS..........TORNADO REPORTS.....

   1 *TORN  1 NNW PARK RAPIDS MN      (38 E DTL)                             7/1830
            POSSIBLE TORNADO TOUCHDOWN WEST SIDE OF        FGF/LSR   4693 9507
                     FISHHOOK LAKE NEAR HWY


 .......LRG HAIL/STRONG WIND RPTS.............LRG HAIL/STRONG WIND RPTS......

  14  WNDG  1 ENE RIVERSIDE PA      (25 SE IPT)                             7/0730
            MULTIPLE LARGE TREES DOWN ON AVE F.            CTP/LSR   4095 7663
  15  WNDG  3 W CATAWISSA PA      (29 SE IPT)                              7/0742
            TREES DOWN ON ROAD REPORTED AT 300 BLOCK LEGIONCTP/LSR   4095 7651
                     RD MONTOUR COUNTY.
  16  WNDG  2 SSE WASHINGTONVILLE PA      (20 SE IPT)                      7/0755
            MULTIPLE TREES AND WIRES DOWN. REPORTED AT     CTP/LSR   4103 7666
                     MOUNTOUR AND COLUMBIA
  17  WNDG  2 ENE NORTHUMBERLAND PA      (24 SSE IPT)                     7/0800
            POINT TOWNSHIP DRIVE-IN THEATER SCREEN BLEW    CTP/LSR   4091 7676
                     OVER REPORTED AT POINT
  18  WNDG  2 NE NUMIDIA PA      (36 SE IPT)                              7/0814
            TREES DOWN ON WIRES ON OLD READING ROAD AND    CTP/LSR   4092 7638
                     CREEK ROAD.
  19  WNDG  5 NW RINGTOWN PA      (39 SE IPT)                             7/0818
            TREES DOWN ON WIRES.                           CTP/LSR   4090 7631
  20  WNDG  1 N SHARPSBURG MD      (13 ENE MRB)                           7/1221
            TREES DOWN ON MD-65 SHARPSBURG PIKE NEAR DUNKERLWX/LSR   3947 7775
                     CHURCH ROAD.
  21      WNDG  FAIRPLAY MD   (11 S HGR)                                  7/1240
            WIRES DOWN ON TILGHMANTON RD                   LWX/LSR   3954 7774
  22  WNDG  2 SE MYERSVILLE MD      (17 SE HGR)                           7/1252
            MULTIPLE TREES DOWN ON US-40 BALTIMORE NATIONALLWX/LSR   3949 7753
                     PIKE NEAR HARMONY ROAD
  23  WNDG  1 NW BOLIVAR MD      (16 SSE HGR)                             7/1254
            TREE DOWN ON THE 1700 BLOCK OF OLD NATIONAL    LWX/LSR   3948 7761
                     PIKE
  24  WNDG  2 SE MYERSVILLE MD      (17 SSE HGR)                          7/1304
            TREE DOWN NEAR THE INTERSECTION OF MYERSVILLE  LWX/LSR   3948 7754
                     ROAD AND BIDLE HILL CO
  25  WNDG  2 SE MYERSVILLE MD      (17 SE HGR)                           7/1311
            TREE DOWN NEAR THE OVERPASS OF HARMONY ROAD ANDLWX/LSR   3949 7753
                     ROUTE 40
  26  WNDG  7 ENE RIDGEWAY SC      (33 NNE CAE)                           7/1420
            STEEPLE BLOW OFF AND SHINGLES RIPPED OFF       CAE/LSR   3436 8085
                     LONGTOWN PRESBYTERIAN
  27  WNDG  RIDGELEY WV      (45 WNW MRB)                                7/1422
            A TREE WAS DOWN ALONG VETERANS MEMORIAL HIGHWAYLWX/LSR   3964 7877
                     IN RIDGELEY.
  28  WNDG  CUMBERLAND MD      (45 WNW MRB)                              7/1427
            REPORT OF TREE DAMAGE ON PRIVATE PROPERTY NEAR LWX/LSR   3965 7876
                     THE RAILROAD TRACKS IN
  29  WNDG  2 NNW SADSBURYVILLE PA      (27 NW ILG)                       7/1502
```

```
            DOWN TREE IN WIRES ON OLD WILMINGTON ROAD AND  PHI/LSR   4000 7591
                    OAK STREET. TIME ESTIM
 30  WNDG   MOUNT VERNON PA      (24 WNW ILG)                          7/1503
            DOWNED TREE INTO WIRES ON PA 472 NEAR OXFORD.  PHI/LSR   3981 7602
                    TIME ESTIMATED FROM RA
 31  WNDG   COCHRANVILLE PA      (22 NW ILG)                           7/1505
            TREE BLOWN DOWN BLOCKING SOUTHBOUND LANE AT THEPHI/LSR   3989 7592
                    INTERSECTION OF LIMEST
 32  WNDG   1 NE LONDONDERRY TWP PA      (19 NW ILG)                   7/1508
            SEVERAL TREES DOWN ALONG PORTIONS OF ROUTE 41. PHI/LSR   3987 7588
                    TIME ESTIMATED FROM RA
 33  WNDG   1 SSW EAST BRANDYWINE T PA      (25 NNW ILG)               7/1512
            SEVERAL TREES AND POLES DOWN JUST NORTH OF     PHI/LSR   4002 7577
                    FISHERVILLE ROAD. TIME
 34  WNDG   4 S STAUNTON ARPT VA      (4 S SHD)                       7/1517
            NUMEROUS TREES DOWN... SOME ON CARS... ON      LWX/LSR   3821 7890
                    VA-608 BATTLEFIELD ROA
 35  WNDG   4 S GROTTOES VA      (5 SE SHD)                          7/1523
            NUMEROUS TREES AND WIRES DOWN INCLUDING ON CARSLWX/LSR   3822 7883
                    ON US-340 EASTSIDE HIG
 36  WNDG   HOCKESSIN DE      (8 NNW ILG)                           7/1538
            SOME TREES DOWN IN HOCKESSIN. TIME ESTIMATED   PHI/LSR   3979 7569
                    FROM RADAR.
 37  WNDG   1 ESE TWIN CITY GA      (29 NNE VDI)                     7/1540
            A TREE WAS REPORTED DOWN NEAR THE INTERSECTION FFC/LSR   3257 8214
                    OF BEAGLE RD AND GEORG
 38  WNDG   1 SE WEST GOSHEN PA      (17 WNW PHL)                    7/1540
            DOWNED TREE IN WIRES ON WESTTOWN THORNTON ROAD PHI/LSR   3996 7556
                    AND FIVE POINTS ROAD.
 39  WNDG   2 SE EAST NANTMEAL TWP PA      (28 NW PHL)               7/1550
            TREE REPORTED DOWN AT BLACK HORSE RD IN WEST   PHI/LSR   4011 7569
                    VINCENT TOWNSHIP. TIME
 40  WNDG   WEST HAVEN DE      (5 N ILG)                             7/1550
            NUMEROUS TREES DOWN OR SNAPPED WITH SOME ONTO  PHI/LSR   3976 7559
                    HOMES. TIME ESTIMATED
 41  WNDG   1 N MONTCHANIN DE      (8 N ILG)                         7/1550
            TREES AND WIRES DOWN ALONG MONTCHANIN RD NORTH PHI/LSR   3980 7559
                    OF WILMINTON. TIME EST
 42  WNDG   GREENVILLE DE      (6 N ILG)                             7/1550
            TREES DOWN IN GREENVILLE. TIME ESTIMATED BY    PHI/LSR   3978 7560
                    RADAR.
 43  WNDG   1 NE WOODDALE DE      (6 N ILG)                          7/1550
            SEVERAL TREES DOWN ALONG CENTERVILLE ROAD IN   PHI/LSR   3978 7562
                    WESTERN GREENVILLE. TI
 44  WNDG   GREENVILLE MANOR DE      (6 N ILG)                       7/1552
            TREES AND POWER POLES DOWN IN GREENVILLE. TIME PHI/LSR   3978 7560
                    ESTIMATED FROM RADAR.
 45  WNDG   WILMINGTON DE      (5 NNE ILG)                           7/1555
            SEVERAL REPORTS OF TREES DOWN IN WILMINGTON.   PHI/LSR   3975 7556
                    TIME ESTIMATED FROM RA
 46  WNDG   PHILLIPS HEIGHTS DE      (7 NE ILG)                       7/1555
            TREE DOWN ONTO POWER LINES AT WILMINGTON       PHI/LSR   3977 7551
                    WASHINGTON STREET EXTE
 47  WNDG   WILMINGTON DE      (5 NNE ILG)                           7/1555
            TREES DOWN OR SNAPPED ON NORTH MADISON STREET  PHI/LSR   3975 7555
                    BETWEEN WEST 9TH AND W
 48  WNDG   ROCK MANOR DE      (6 NNE ILG)                           7/1555
            LARGE TREE UPROOTED AND BLOCKING SCHOOL ROAD INPHI/LSR   3977 7555
                    ALAPOCAS. TIME ESTIMAT
 49  WNDG   4 S GROTTOES VA      (5 SE SHD)                          7/1557
            NUMEROUS TREES AND WIRES DOWN INCLUDING ON CARSLWX/LSR   3822 7883
                    ON US-340 EASTSIDE HIG
```

```
 50  WNDG  EDGEMOOR GARDENS DE      (7 NE ILG)                          7/1557
           TREE ONTO A HOUSE WITH PEOPLE TRAPPED IN       PHI/LSR   3976 7550
                  EDGEMOOR GARDENS. POWE
 51  WNDG  2 WNW BYNUM MD      (30 NNE BWI)                             7/1558
           TREE DOWN ACROSS ROADWAY NEAR 711 W            LWX/LSR   3958 7641
                  JARRETTSVILLE RD.
 52  WNDG  WINTERTHUR DE      (8 N ILG)                                 7/1609
           TREES AND WIRES DOWN AT KENNETT PIKE AND OLD   PHI/LSR   3980 7561
                  KENNETT ROAD.
 53  WNDG  2 NNW KINGSVILLE MD      (23 NNE BWI)                       7/1610
           LARGE TREE DOWN BLOCKING THE ROADWAY ON PARK   LWX/LSR   3947 7644
                  FORREST LANE.
 54  WNDG  1 NNE KINGSVILLE MD      (24 NE BWI)                        7/1614
           TREES DOWN ON US-1 BELAIR ROAD NEAR NEW CUT    LWX/LSR   3947 7641
                  ROAD. TREES DOWN ON MD
 55  WNDG  MEDIA PA      (8 WNW PHL)                                   7/1615
           SEVERAL TREES DOWN ACROSS THE SOUTHERN PORTION PHI/LSR   3992 7539
                  OF DELAWARE COUNTY. TI
 56  WNDG  1 SE ABERDEEN MD      (32 WSW ILG)                          7/1618
           TREE ACROSS WIRES NEAR 12 CHESAPEAKE CT.       LWX/LSR   3950 7616
 57  WNDG  1 NW HARMONY GA      (33 S AHN)                             7/1631
           MULTIPLE TREES REPORTED DOWN NEAR THE          FFC/LSR   3347 8336
                  INTERSECTION OF COCHRA
  4  A175  3 N ROCHFORD SD      (34 WNW RAP)                          7/1635
                                                         UNR/LSR   441710372
 58  WNDG  YARDLEY PA      (2 SSW TTN)                                7/1650
           SEVERAL TREES AND WIRES REPORTED DOWN IN THE   PHI/LSR   4024 7484
                  AREA OF YARDLEY AND WO
 59  WNDG  WOODSTOWN NJ      (14 E ILG)                               7/1650
           SOME TREES DOWN IN THE WOODSTOWN AREA. TIME    PHI/LSR   3966 7533
                  ESTIMATED FROM RADAR.
 60  WNDG  3 NNE JOPPA MD      (26 NE BWI)                            7/1658
           TREE DOWN ACROSS ROADWAY AT THE INTERSECTION OFLWX/LSR   3947 7634
                  SINGER RD AND WINTERS
 61  WNDG  2 SW GLENDORA NJ      (9 ESE PHL)                          7/1700
           DOWNED TREE... POLE AND WIRES ON NJ 41 BOTH    PHI/LSR   3982 7509
                  DIRECTIONS NORTH OF GO
 62  WNDG  1 SW SWORDS GA      (28 S AHN)                             7/1703
           MULTIPLE TREES DOWN ALONG I-20 IN BETWEEN MILE FFC/LSR   3354 8331
                  MARKERS 123 AND 126 EA
 74  G 77  2 NNE SEABROOK FARMS NJ      (23 S PHL)                   7/1705
           RUTGERS AGRICULTURAL RESEARCH AND EXTENSION    PHI/LSR   3953 7520
                  CENTER AT UPPER DEERFI
 63  WNDG  1 ENE EDGEWOOD MD      (27 NE BWI)                        7/1708
           TREE LIMBS AND POWERLINES DOWN ON THE 300 BLOCKLWX/LSR   3943 7628
                  OF REGINA DRIVE
 64  WNDG  3 SSE STAUNTON VA      (12 SW SHD)                         7/1711
           TREE FELL ONTO POWER LINES ON PARTRIDGE CT.    LWX/LSR   3812 7904
 75  G 60  4 NNW SEABROOK FARMS NJ      (21 ESE ILG)                 7/1717
           69 MPH THUNDERSTORM WIND GUST MEASURED ON ROUTEPHI/LSR   3955 7524
                  77 AT MILE MARKER 9.
  7  A125  1 SSW BEULAH ND      (32 SSW N60)                          7/1720
                                                         BIS/LSR   472410178
  8  A150  BEULAH ND      (31 SSW N60)                               7/1725
           RELAYED VIA BROADCAST MEDIA.                   BIS/LSR   472610178
 65  WNDG  4 N BEMIDJI MN      (2 ENE BJI)                          7/1730
           TREES DOWN HWY 71 AND GLIDDEN RD               FGF/LSR   4754 9488
 66  WNDG  1 E JOPPA MD      (24 NE BWI)                            7/1738
           TREE DOWN IN THE 1100 BLOCK OF CLAYTON ROAD    LWX/LSR   3943 7634
 67        WNDG  3 WNW BYNUM MD(30 NNE BWI)                         7/1744
           TREE DOWN ON THE 900 BLOCK OF WEST             LWX/LSR   3958 7641
                  JARRETTSVILLE ROAD
```

```
  68  WNDG  1 NW MINOTOLA NJ      (21 WNW ACY)                          7/1745
            TELEPHONE PONES SNAPPED IN HALF WITH WIRES DOWNPHI/LSR   3953 7496
                    ON BREWSTER AND FOREST
  69  WNDG  2 W PENNINGTON MN      (19 E BJI)                            7/1800
            TREES BLOCKING POWER DAM ROAD AND CONNOR ROAD  FGF/LSR   4748 9452
  70  WNDG  1 ENE STATHAM GA       (14 W AHN)                            7/1806
            A TREE WAS REPORTED DOWN ACROSS A DRIVEWAY     FFC/LSR   3397 8358
                    ALONG PROVIDENCE CIRCL
  11  A150  DORSET MN      (38 S BJI)                                    7/1850
                                                           FGF/LSR   4696 9495
  71  WNDG  1 ENE SEAVILLE NJ      (16 SSW ACY)                          7/1850
            CORRECTS PREVIOUS TSTM WND DMG REPORT FROM 1   PHI/LSR   3922 7468
                    ENE SEAVILLE. TREE DOW
  12  A175  NEVIS MN      (38 S BJI)                                    7/1910
            NEAR LAKE BELLE TAINE                          FGF/LSR   4697 9484
  72  WNDG  1 ENE SEAVILLE NJ      (16 SSW ACY)                          7/1918
            TREE DOWN ON GARDEN STATE PARKWAY NEAR MILE    PHI/LSR   3922 7468
                    MARKER 21.9.
  13  A125  CARSON ND      (44 NE Y22)                                   7/1950
                                                           BIS/LSR   464210156
  73  WNDG  7 SSW KELDRON SD      (15 ESE Y22)                          8/0430
            TREE BRANCHES BLOWN DOWN WHICH CAUSED POWER    ABR/LSR   458410187
                    OUTAGES.


.........OTHER SEVERE REPORTS..................OTHER SEVERE REPORTS.........

   2  A100  2 SSE MYERSVILLE MD      (17 SSE HGR)                          7/1256
                                                           LWX/LSR   3948 7756
   3  A100  2 ENE MIDDLETOWN MD      (20 SE HGR)                           7/1257
            MEASURED NEAR MILE-MARKER 46 ON I-70 NEAR      LWX/LSR   3946 7751
                    MIDDLETOWN ...MD
   5  A100  LAKE ITASCA MN      (22 SW BJI)                               7/1650
                                                           FGF/LSR   4725 9521
   6  A100  ROCHFORD SD      (33 W RAP)                                    7/1658
                                                           UNR/LSR   441210372
   9  A100  7 W NEW SALEM ND      (38 W BIS)                            7/1835
            HAIL WAS ACCOMPANIED BY STRONG WINDS THAT      BIS/LSR   468510156
                    DAMAGED WIND BREAKS. R
  10  A100  NEW SALEM ND      (31 W BIS)                                7/1845
            RELAYED FROM BROADCAST MEDIA.                  BIS/LSR   468510141
```

Figure 8: Daily Report Log Example

How to read an SPC report log:

Event Number: 40 (in chronological order, the 40th severe event received during this 24 hour period).
Event: "WNDG" Wind Damage.
Location: “WEST HAVEN DE (5 N ILG)” Event occurred in West Haven, Delaware, or 5 statute miles north of Wilmington, Delaware (ILG).
Date/Time: 7/1550 Occurred on the 7th day of the month at 1550 CST.
Description (If included): NUMEROUS TREES DOWN OR SNAPPED WITH SOME ONTO HOMES. TIME ESTIMATED.
Source: “PHI/LSR. Preliminary Local Storm Report issued by the National Weather Service office at Mount Holly, New Jersey.

Latitude Longitude: 3976 7559 The latitude and longitude of the event not including decimal point or negative value for given hemisphere

17.4 Updates, Amendments and Corrections. SPC issues a scheduled update at 1800 UTC. SPC will rerun the program, at times, to add additional data from late LSRs into this report log.

18. Monthly Tornado Statistics (WMO header NWUS21, AWIPS ID STAMTS).

18.1 Mission Connection. SPC issues Monthly Tornado Summary to provide WFOs, the public, media, and emergency managers with a preliminary number of tornado reports on a national scale.

18.2 Issuance Guidelines.

18.2.1 Creation Software. SPC will use the National Centers AWIPS (NAWIPS) and/or the SPC Product Generator (PRODGEN) for these products.

18.2.2 Issuance Criteria. This summary is a non-scheduled, event-driven product.

18.2.3 Issuance Time. SPC will issue this summary when tornado numbers are updated and confirmed.

18.2.4 Valid Time. Summaries are valid upon issuance.

18.2.5 Product Expiration Time. Not applicable.

18.3 Technical Description. Summaries will follow the format and content described in this section.

18.3.1 Mass News Disseminator Broadcast Line. None.

18.3.2 MND Header. The Monthly Summary MND header is “TORNADO TOTALS AND RELATED DEATHS”.

18.3.3 Content. This summary tabulates the preliminary number of tornado reports listed in WFO LSR(s) issued during the previous month. These numbers consist of reported and confirmed tornadoes. SPC will create the count of tornadoes when Storm Data is made available by the NWS Performance and Evaluation Branch (PEB). The National PEB Verification Program, the National Climatic Data Center, and SPC will confirm the total number of tornadoes, and provide the final update to the monthly summary.

The monthly summary will include final data from each of the last three years and a three year average. The summary will also include the number of killer tornadoes and number of deaths for the current year and average from the previous three years.

18.3.4 Format.

```
ZCZC STAMTS ALL
NWUS21 KWNS 021742

TORNADO TOTALS AND RELATED DEATHS...THROUGH 01 NOV 2020
NWS STORM PREDICTION CENTER NORMAN OK
1142 AM CST MON NOV 02 2020

     ...NUMBER OF TORNADOES...        NUMBER OF       KILLER
                                      TORNADO DEATHS  TORNADOES
     ..2020..  2019 2018 2017   3YR              3YR             3YR
    PREL  ACT   ACT  ACT  ACT    AV   20 19 18 17 AV  20 19 18 17 AV
----- ------ ============== ------ ------ -------   --- --- --- --- ---  --- --- --- --- ---
JAN   90     -    21   15  137    57    7  0  0 20  6   3  0  0  3  1
FEB   51     -    26   48   69    47    1  1  2  5  2   1  1  2  4  3
MAR  101     -   107   55  192   118   25 23  0  0  7   3  1  0  0  0
APR  351     -   272  130  214   205   40  7  1  8  5  14  4  1  5  3
MAY  140     -   506  170  291   322    1  7  1  2  3   1  4  1  2  2
JUN  109     -   172  155  146   157    0  0  0  0  0   0  0  0  0  0
JUL  116     -    99   92   81    90    1  0  1  0  0   1  0  1  0  0
AUG  169     -    73   81  119    91    3  0  0  0  0   2  0  0  0  0
SEP   37     -   87*  108   51   82*    0  0  1  0  0   0  0  1  0  0
OCT   19     -   66*  123   75   88*    0  0  0  0  0   0  0  0  0  0
NOV    0     -   19*   83   42   48*    -  0  3  0  1   -  0  2  0  0
DEC    -     -   72*   66   12   50*    -  3  1  0  1   -  2  1  0  1
----- ------ ============== ------ ------- -------   --- --- --- --- ---  --- --- --- --- ---
SUM 1183     - 1520* 1126 1429 1355*   78 41 10 35 25  25 12  9 14 10

*PRELIMINARY REPORTS.
^PRELIMINARY/INCOMPLETE VERSION OF FINAL COUNTS.

PREL = 2020 PRELIMINARY COUNT FROM ALL NWS LOCAL STORM REPORTS.
ACT  = ACTUAL TORNADO COUNT BASED ON NWS STORM DATA SUBMISSIONS.

COMPARISONS BETWEEN PRELIMINARY AND ACTUAL COUNTS SHOULD BE AVOIDED.

..MARSH..11/02/2020

$$
```

Figure 9: Monthly Tornado Statistics Example

The statistics are broken down by month and contain final data for the last three years. A "-" in a column means the data is missing or not yet available.

The SPC includes all reports of tornadoes, including "unconfirmed," "possible," "suspected" and duplicate reports from Local Storm Reports issued by WFOs. The "PREL" column lists the number of preliminary tornadoes from the Local Storm Reports.

When the digital Storm Data database arrives from the NWS Performance and Evaluation Branch, the actual tornado counts are entered in the column labeled "ACT".

Along the bottom of the report are totals for the columns. In the example, there were 1183

preliminary (PREL) tornadoes reported through November 2020.

18.4 Updates, Amendments and Corrections. SPC should update this report at least twice per month. SPC will correct reports for inaccurate statistical information, when possible.

19. Killer Tornado Statistics (WMO header NWUS23, AWIPS ID STATIJ).

19.1 Mission Connection. SPC issues Killer Tornado Statistics to provide WFOs, the public, media and emergency managers with a list of the dates, locations and number of deaths due to tornadoes since the start of the calendar year on a national scale.

19.2 Issuance Guidelines.

19.2.1 Creation Software. SPC will use the National Centers AWIPS (NAWIPS) and/or the SPC Product Generator (PRODGEN) for these products.

19.2.2 Issuance Criteria. SPC issues a new list of statistics following new killer tornado events.

19.2.3 Issuance Time. This list is non-scheduled, event driven.

19.2.4 Valid Time. Lists are valid upon issuance.

19.2.5 Product Expiration Time. Not applicable.

19.3 Technical Description. Lists will follow the format and content described in this section.

19.3.1 Mass News Disseminator Broadcast Line. None.

19.3.2 Mass News Disseminator Header. The Statistics MND header is "(YEAR) PRELIMINARY KILLER TORNADOES

19.3.3 Content. This summary will list the dates, times, locations, and number of deaths from killer tornadoes from Jan 1 of the current calendar year to the time of the latest report, whether the deaths occurred in a tornado or severe thunderstorm watch, near a watch, or with no watch in effect, the watch number where the death occurred, and the EF-scale damage, if available. The summary should list the circumstances in which each death occurred. The summary will also list the number of tornado deaths by state.

19.3.4 Format.

```
2020 PRELIMINARY KILLER  TORNADOES
NWS STORM PREDICTION CENTER NORMAN OK
0859 PM CDT MON AUG 31 2020

#    DATE TIME-CST  COUNTIES  STATE DEATHS  A B C D  WATCH EF LOCATION
---  ------ ----------- ------------  -------- --------  ---------- -------- --- -----------
01 JAN 10  2330  NACOGDOCHES     TX      1  1 - - -  WT005  1 01M
```

```
02 JAN 11  0145      BOSSIER     LA      3  3 - - -  WT005  2 03M
03 JAN 11  1115      PICKENS     AL      3  3 - - -  WT013  2 03M
04 FEB 06  0214      MARENGO     AL      1  1 - - -  WT025  1 01M
05 MAR 02  2310       BENTON     TN      1  - - 1 -  WT035  2 01M
06 MAR 03  0045    DAVIDSON/     TN      2  2 - - -  WT036  3 02O
           0100       WILSON     TN      3  3 - - -  WT036  3 02H 01P
07 MAR 03  0150       PUTNAM     TN     19 19 - - -  WT036  4 12H 05M
                                                              02P
08 APR 12  1500    WALTHALL/     MS      2  2 - - -  WT107  4 02U
                    LAWRENCE     MS      2  2 - - -  WT107  4 02M
09 APR 12  1520   JEFFERSON-
                      DAVIS/     MS      4  4 - - -  WT107  4 04P
                       JONES     MS      4  4 - - -  WT107  4 04U
10 APR 12  1950       MURRAY     GA      7  7 - - -  WT112  2 07M
11 APR 12  2120     HAMILTON     TN      3  - - 3 -  WT113  3 03U
12 APR 12  2315       BARTOW     GA      1  1 - - -  WT115  1 01H
13 APR 13  0120       OCONEE     SC      1  1 - - -  WT116  3 01U
14 APR 13  0345   ORANGEBURG     SC      2  2 - - -  WT117  3 02M
15 APR 13  0410      HAMPTON     SC      5  5 - - -  WT117  4 05M
16 APR 13  0450     COLLETON     SC      1  1 - - -  WT117  1 01U
17 APR 19  1830       MARION     MS      1  1 - - -  WT121  4 01M
18 APR 19  2245        HENRY     AL      1  1 - - -  WT125  2 01M
19 APR 22  1600     MARSHALL     OK      2  2 - - -  WT134  2 01V 01O
20 APR 22  1650         POLK     TX      3  3 - - -  WT133  3 03U
21 APR 22  2030      RAPIDES     LA      1  1 - - -  WT135  2 01M
22 MAY 17  1935       ACADIA     LA      1  - - - 1  -----  3 01M
23 JUL 08  1610   OTTER TAIL     MN      1  - 1 - -  WS344  4 01P
24 AUG 03  2315       BERTIE     NC      2  2 - - -  WT414  3 02M
25 AUG 30  1715         HAND     SD      1  - 1 - -  WS475  2 01V

                                                    _ _ _
TOTALS:                                        78 71 2 4 1

FATALITIES BY STATE: TN28 MS13 SC09 GA08 AL05 LA05 TX04 OK02 NC02
                     MN01 SD01
FATALITIES BY CIRCUMSTANCE/LOCATION: 36M 15H 08P 03O 02V 14U

A = IN TORNADO WATCH
B = IN SEVERE THUNDERSTORM WATCH
C = CLOSE TO THE WATCH /15 MINUTES OR 25 MILES/
D = NO WATCH IN EFFECT
H = HOUSE
M = MANUFACTURED/MOBILE HOME
O = OUTDOORS
P = PERMANENT BUILDING/STRUCTURE
V = VEHICLE
U = UNKNOWN
WS = SEVERE THUNDERSTORM WATCH /NUMBER/
WT = TORNADO WATCH /NUMBER/
EF = ENHANCED FUJITA SCALE RATING

MAP OF ANNUAL U.S. KILLER TORNADOES (LOWER CASE):
HTTP://WWW.SPC.NOAA.GOV/CLIMO/TORN/FATALMAP.PHP

..MARSH..09/01/2020

$$
```

Figure 10: Killer Tornado Statistics Example

The killer tornadoes are listed in the chronological order of occurrence, by DATE and CST TIME. LOCATION is the county or parish and state where the first tornado-related deaths occurred. Each event will be numbered according to the actual tornado rather than segment when crossing state borders. This list may be updated as Storm Data information is available through the NCDC. "DEATHS" is the number of deaths in the whole tornado path, not just the given location. The ABCD column letters represent the number of deaths:

A = In tornado watch
B = In severe thunderstorm watch
C = "Close" to the watch (15 minutes or 25 miles)
D = No watch in effect

If the tornado was in a watch, the watch type and number is given. For example, WT008 is Tornado Watch number 8. If known, the EF-scale damage rating of the tornado is listed; if not, a "?" mark is entered. The deaths are broken down by the following circumstances of the victims, if known:

H = House (permanent foundation)
M = Mobile home (a.k.a. "manufactured home")
O = Outdoors (not inside any vehicle, mobile home or permanent building)
P = Permanent structure (school, garage, factory, store, warehouse, etc.)
V = Vehicle (includes parked RVs)
? = Unknown

Information for the killer tornadoes list comes from Preliminary Local Storm Reports or Public Information Statements (PNS) issued by WFOs, supplemented by NWS event memorandums and media accounts and monthly Storm Data Reports filed by the WFOs. Since killer tornado information, especially death counts, circumstances and EF scale, may not be completely known until many days after an event, these numbers are subject to change as more information becomes available.

19.4 Updates, Amendments and Corrections. SPC will update this report as the information becomes available and is deemed reliable. SPC may also verify the information as Storm Data is updated through the NCEI.

20. Operations Administrative Message (WMO header NOUS74, AWIPS ID ADMSPC).

20.1 Mission Connection. SPC issues Operations Administrative Messages to inform WFOs of changes in SPC operational status (going to or from backup operations) or communications issues (i.e. advance notice of upcoming test convective watches).

21. Backup Operations.

21.1 Backup. Storm Prediction Center emergency backup operations are supported by the Air Force Weather Agency (AFWA) as specified within a Memorandum of Understanding (MOU) between the National Weather Service and the U. S. Air Force. When emergency backup operations are active, only select high priority products for protection of life and property are routinely disseminated. Transitions to (or from) emergency backup status or to a backup exercise are announced via an administrative message. Additional information on Storm Prediction Center backup can be found in NWSI 10-2201.

APPENDIX A – Examples

Table of Contents: Page

1. **Introduction.** This appendix provides WFOs and the public with examples of national severe weather products.

2. Categorical Convective Outlook (Graphic).

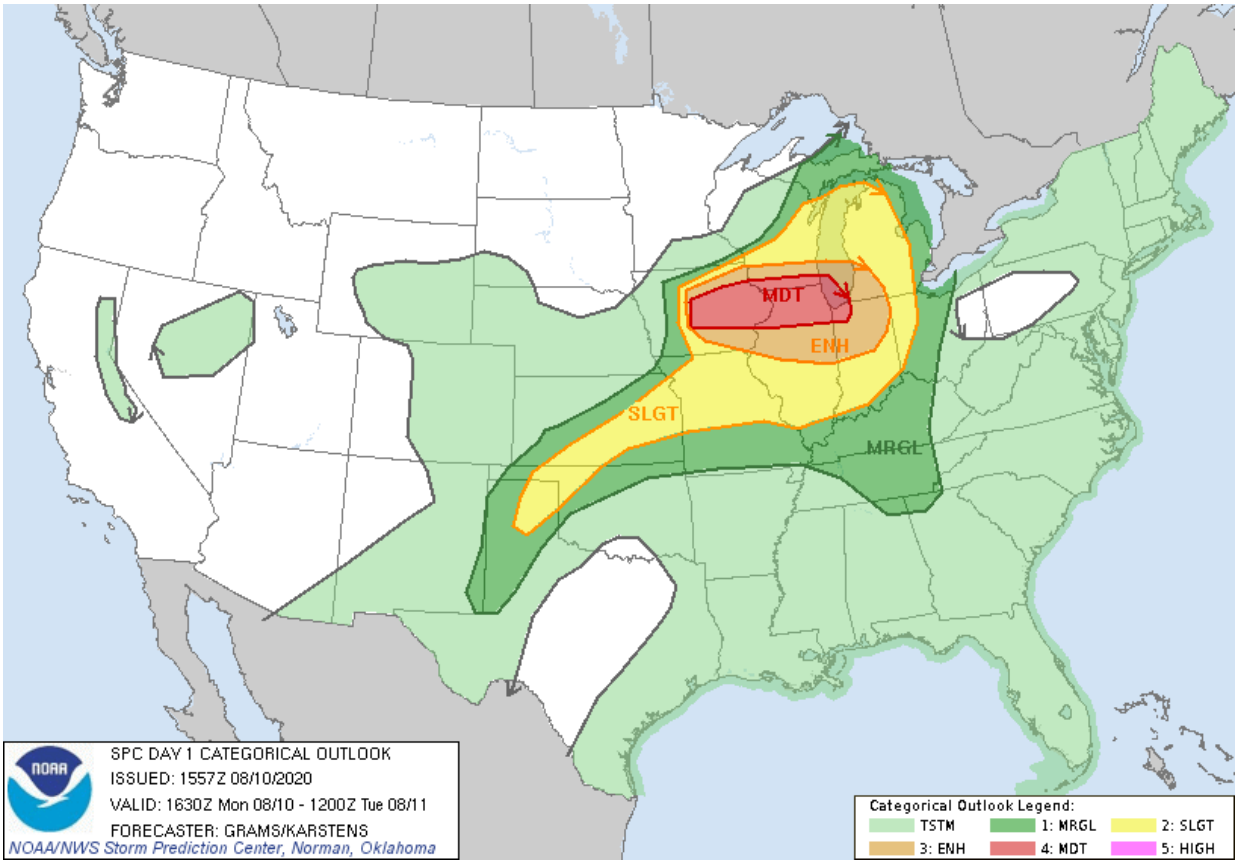

Figure 19: Day One Outlook – Categorical Graphic

3. Categorical Convective Outlook (Narrative).

```
SPC AC 101557

Day 1 Convective Outlook
NWS Storm Prediction Center Norman OK
1057 AM CDT Mon Aug 10 2020

Valid 101630Z - 111200Z

...THERE IS A MODERATE RISK OF SEVERE THUNDERSTORMS CENTRAL AND
EASTERN IOWA...NORTHERN ILLINOIS...FAR SOUTHERN WISCONSIN...AND FAR
NORTHWEST INDIANA...

...SUMMARY...
```

A derecho producing widespread damaging winds, some of which should be intense, is expected to persist and expand east from Iowa into parts of the Midwest through this evening.

...IA to the Midwest...
A pair of impulses embedded within a shortwave trough over the Upper Midwest will rapidly progress east. A 50+ kt jetlet should persist from eastern SD into southern WI through early evening. An intense MCS with a well-developed rear-inflow jet is ongoing to the south of the mid-level jet across central IA. Very steep mid-level lapse rates around 9 C/km per 12Z OAX and DVN soundings along with robust boundary-layer heating ahead of it should support maintenance of this MCS this afternoon. On the fringe of the stronger mid-level westerlies, a pronounced bow should sweep eastward across eastern IA and the northern IA vicinity. The MCS should enlarge as well as convection develops northeast along a surface front into southern WI. For more in-depth discussion of the short-term severe threat, please see MCD 1450.

Given large buoyancy and steep low to mid-level lapse rates within the gradient of moderate to strong mid-level westerlies, potential will exist for a derecho with intense severe gusts and widespread wind damage across parts of central to eastern IA into northern IL and far southern WI.

The MCS will likely persist east into Lower MI and IN while developing southwestward into a high MLCAPE environment to the southwest in central and southern IL. While deep-layer shear will drop off with southern extent and steeper lapse rates with eastern extent, a severe risk mainly in the form of damaging winds will probably continue on a more scattered basis this evening in the Midwest before eventual decay tonight.

...MO to the TX Panhandle..
Pockets of strong surface heating will result in a plume of large buoyancy ahead of a southward-moving cold front. Scattered late afternoon and evening multicell thunderstorms are expected to develop, with the strongest cells primarily capable of severe wind gusts.

..Grams/Karstens.. 08/10/2020

4. Day 4-8 Convective Outlook (Graphics; by Individual Days).

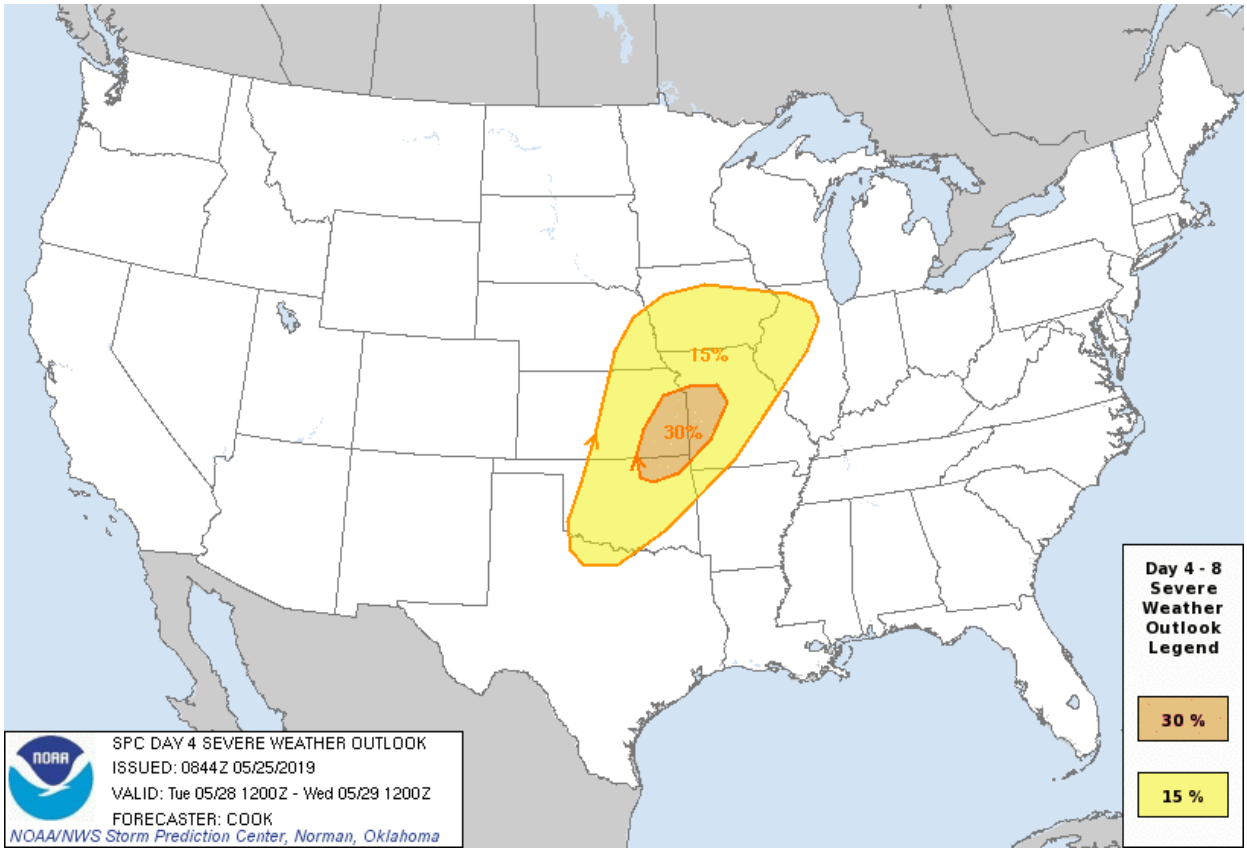

Figure 20a: Day 4 Convective Outlook Graphic

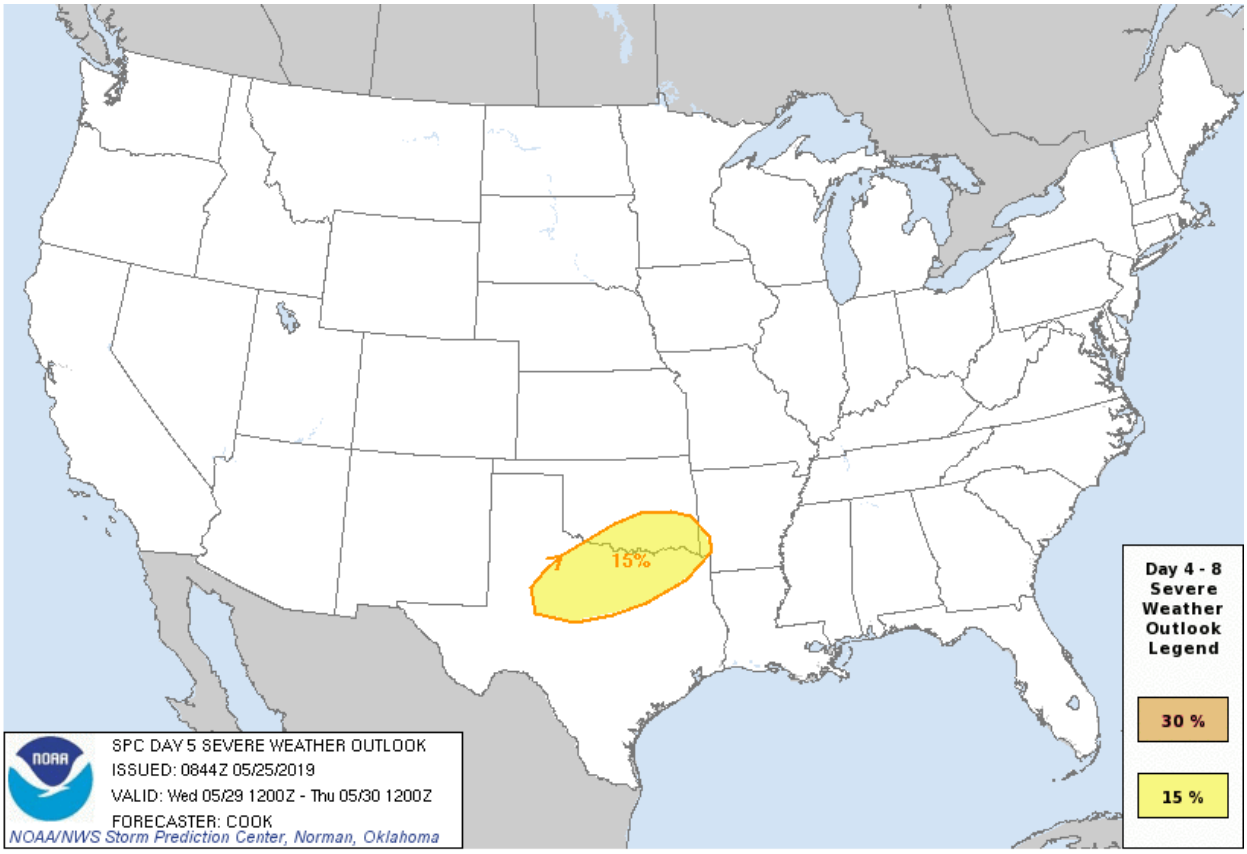

Figure 20b: Day 5 Convective Outlook Graphic

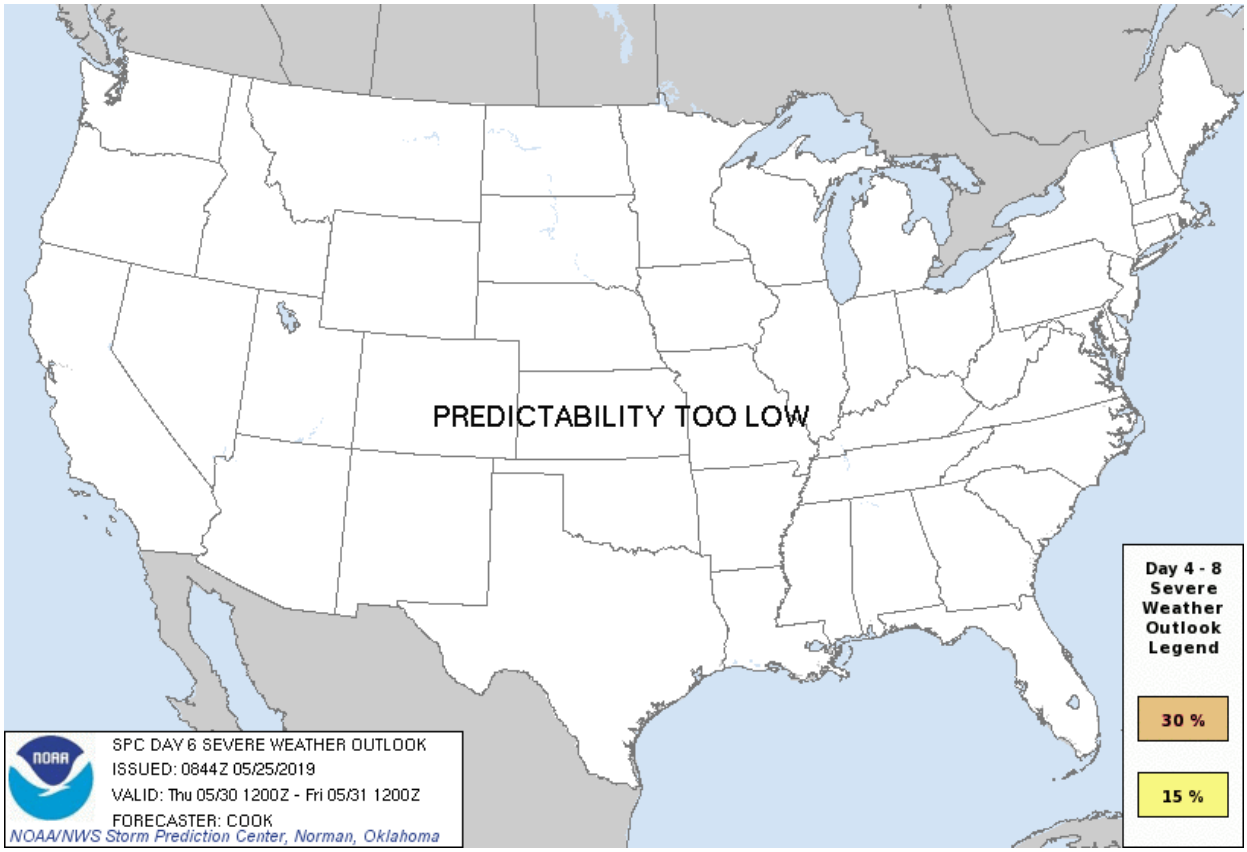

Figure 20c: Day 6 Convective Outlook Graphic

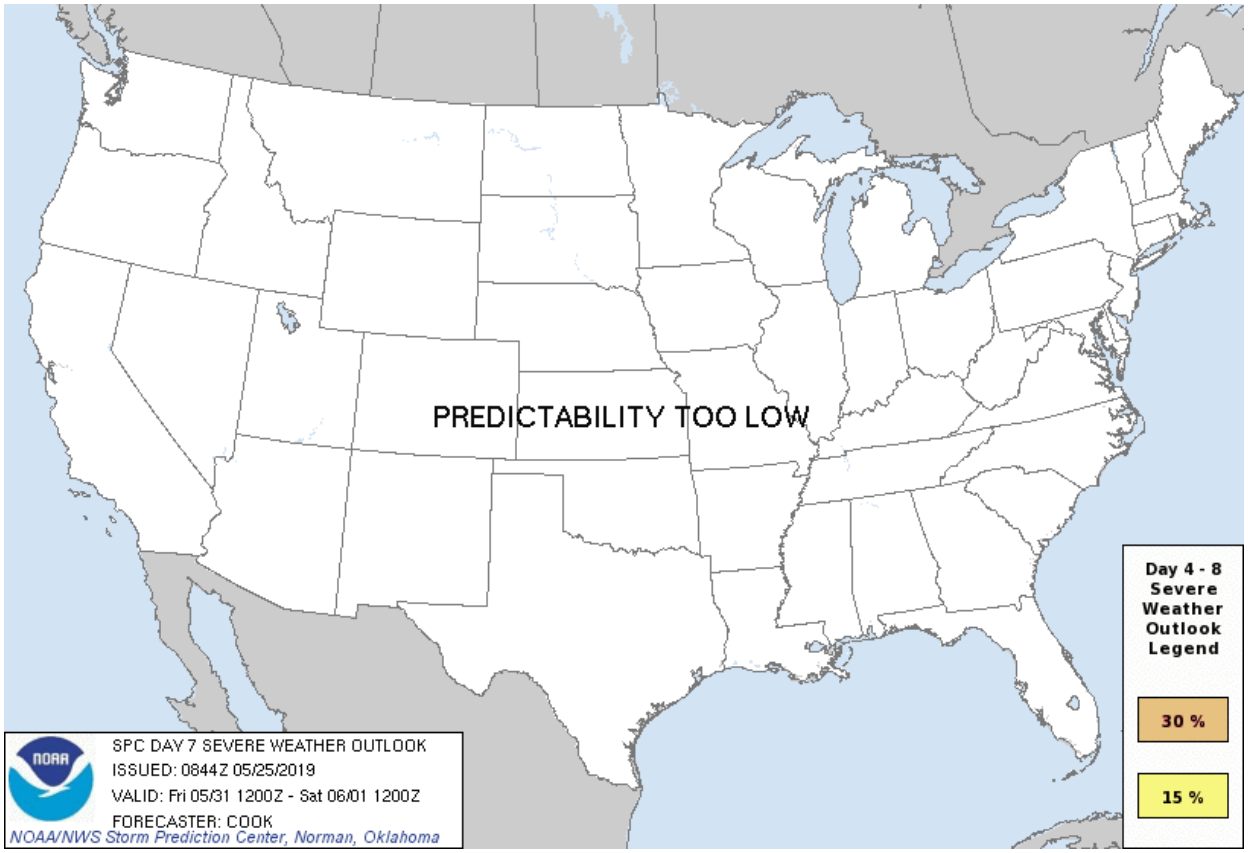

Figure 20d: Day 7 Convective Outlook Graphic

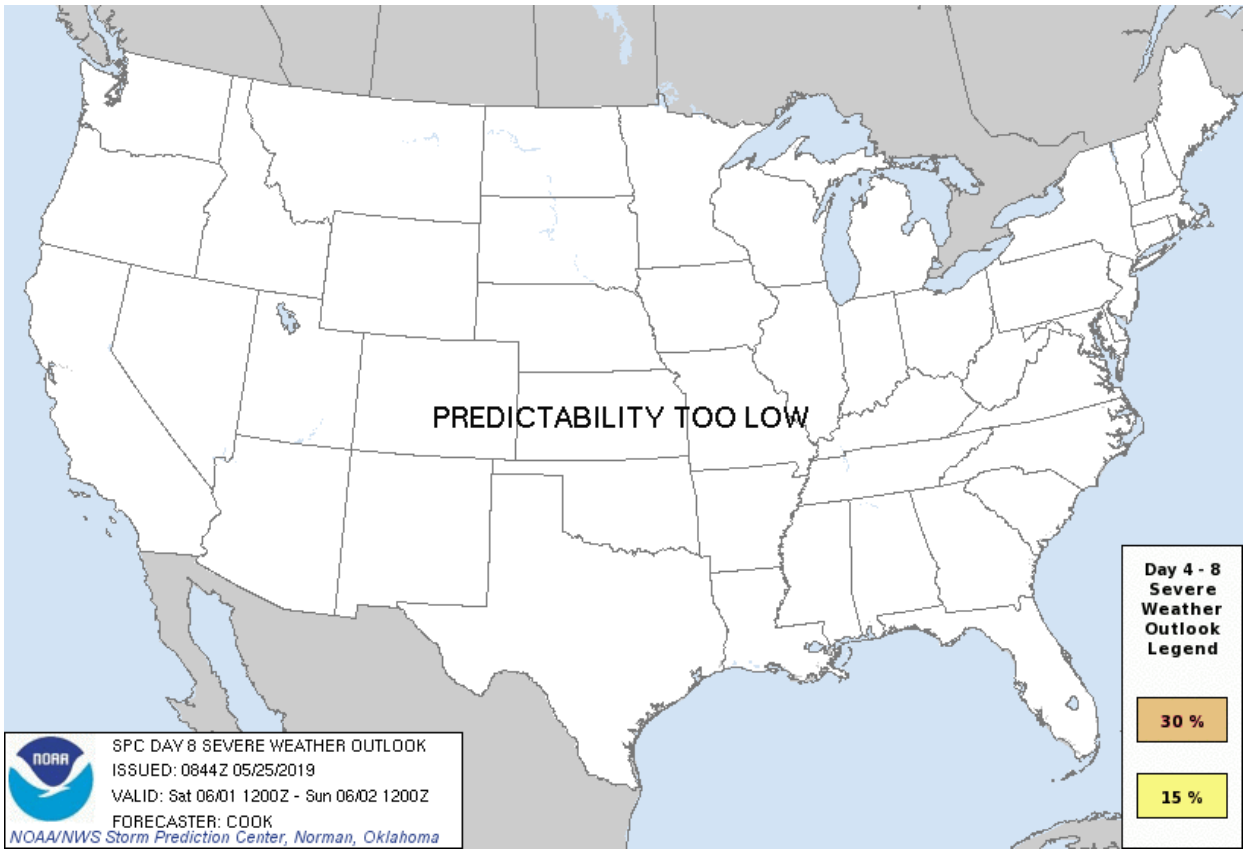

Figure 20e: Day 8 Convective Outlook Graphic

5. Day 4-8 Convective Outlook (Narrative).

```
ZCZC SPCSWOD48 ALL
ACUS48 KWNS 250844
SPC AC 250844

Day 4-8 Convective Outlook
NWS Storm Prediction Center Norman OK
0344 AM CDT Sat May 25 2019

Valid 281200Z - 021200Z

...DISCUSSION...
The main wave associated with persistent long-wave troughing over
the West will finally begin to eject over the central Plains on
D4/Tuesday. This wave will result in a 70-knot mid-level jet
overspreading western portions of a strongly buoyant air mass that
should be mostly undisturbed from any prior convection.  An
expansive area of convection should evolve along and ahead of a
surface dryline located from western Oklahoma northward to
southeastern Nebraska and along a warm front extending from a
surface low in eastern Nebraska eastward to southern lower Michigan.
Although mesoscale details are still unclear at this timeframe, the
```

extent of convective coverage over the warm sector within a parameter space potentially supporting significant severe weather justifies introduction of a 30% area (equivalent to Enhanced Slight) in eastern Kansas, western Missouri, and northeastern Oklahoma within a broader area of 15% probabilities from the Oklahoma/Texas Red River northeastward to Iowa/Illinois. The specific locations of heightened risk may change with subsequent outlooks.

This wave will shift northeastward and weaken as the attendant surface front/dryline stalls or retreats slightly northwestward ahead of another disturbance that will eject from New Mexico into the southern and central Plains on D5/Wednesday. Models suggest that a cluster of storms will evolve in north Texas and vicinity in response to the wave, convergence along remaining surface boundaries, and strong warm-sector instability. A 15% area has been added to address this threat.

Later in the period (D7/Fri), a strong mid/upper disturbance will amplify while taking on a negative tilt over Ontario/Quebec. Strong mid/upper flow will overspread portions of the Northeast and Appalachians during this time. Meanwhile a cold front will migrate southeastward into an air mass that should be weakly to moderately unstable around peak heating hours barring any rainfall or prior widespread convective overturning. It appears that this pattern will support a severe risk in portions of the area, though convective coverage is not spatially focused in guidance to justify a 15% delineation at this time. This region will be monitored in future outlooks for a more consistent convective signal that would justify probabilities.

..Cook.. 05/25/2019

6. SPC Points Products.

```
DAY 1 CONVECTIVE OUTLOOK AREAL OUTLINE
NWS STORM PREDICTION CENTER NORMAN OK
0653 AM CST SUN JAN 22 2017

VALID TIME 221300Z - 231200Z

PROBABILISTIC OUTLOOK POINTS DAY 1

... TORNADO ...

0.02   29018865 30268857 32578890 33528864 34328774 34818593
       35058395 36508081 37067907 37257723 37177473
0.05   29088824 30338814 32048833 33038774 34088527 35558133
       36287935 36257712 35977462
0.10   29808760 31048757 32038671 34178298 34638166 35327982
       34997790 34067602 99999999 28497995 26678285
0.15   28908031 27338313 99999999 29928670 31188666 31888597
       33858222 34168068 33987926 33157835
0.30   29698583 30918572 31658520 32628331 32758225 32678177
       32518137 31568052 99999999 29798073 28508322
```

```
SIGN   28928044 27528316 28758323 29738411 29418522 29928670
       31158667 31798610 33838227 34178061 34007930 33467856
       31728090 30468105 28928044
&&

... HAIL ...

0.05   29168837 30778829 31998848 33328796 34928373 36637928
       36227463
0.15   29268808 30508801 32168822 33058768 34418439 35328129
       35717922 35397816 34227667
0.30   29818635 31018639 31758583 33268239 33148101 32178006
       99999999 29848063 29818064 28508320
&&

... WIND ...

0.05   28908867 30158854 32558892 33528864 34278780 34788607
       35088392 36568065 37037919 37257723 37177489
0.05   38522437 38512263 37362155 35712074 34412182
0.15   29058824 30408816 32048831 33028777 34098525 35558135
       36277937 36257718 35997472
0.30   29848719 31168718 31788665 32798493 34208212 34728032
       34517865 33797748 99999999 27217919 25488231
&&

CATEGORICAL OUTLOOK POINTS DAY 1

... CATEGORICAL ...

HIGH   29678580 30868575 31648522 32618331 32748214 32548141
       31698063 99999999 29828066 28508320
MDT    28918029 27328315 99999999 29908674 31118671 31778613
       33148361 33828219 34178059 33997935 33337836
ENH    29798759 31028757 32028671 34138306 34928085 35327983
       34967781 34147615 99999999 27187924 25468235
SLGT   29158823 30238817 32058831 33038776 34008542 34858320
       35788065 36257936 36277729 35977478
MRGL   29078864 30158856 32538890 33528865 34298776 34798598
       35068391 36558070 37017921 37247734 37187509
MRGL   38502397 38532267 37362153 35712075 34472177
TSTM   28719217 29519171 30779147 31799195 33959468 35119596
       36909626 37909554 38249437 38509281 38079131 37429013
       36448723 36028358 36388237 39267817 39597611 38837394
       99999999 46322475 45232410 42722386 40862332 39812250
       38612049 35801850 34401806 33751832 33151922

&&
THERE IS A HIGH RISK OF SVR TSTMS TO THE RIGHT OF A LINE FROM 40 S
PFN 35 W MAI 25 NNE DHN 20 ESE MCN 40 NNE VDI 30 NNW SAV 45 SE SAV
...CONT... 40 ESE SGJ 50 NW PIE.

THERE IS A MDT RISK OF SVR TSTMS TO THE RIGHT OF A LINE FROM 50 ESE
DAB 35 W SRQ ...CONT... 50 SSE PNS 25 NNW CEW 10 SW TOI 30 N MCN 35
NNW AGS 35 ENE CAE 25 ESE FLO 40 SE CRE.
```

```
THERE IS A ENH RISK OF SVR TSTMS TO THE RIGHT OF A LINE FROM 55 SSW
PNS 40 SW GZH 25 SW MGM 20 NE AHN 20 SSE CLT 25 WNW SOP 15 NW OAJ 80
SSW HSE ...CONT... 65 ENE PBI 60 SW APF.

THERE IS A SLGT RISK OF SVR TSTMS TO THE RIGHT OF A LINE FROM 70 E
BVE 30 S MOB 30 SE MEI 15 SSW TCL 30 SSW RMG 35 NW AND 40 E HKY 20 S
DAN 25 ESE RZZ 70 NE HSE.

THERE IS A MRGL RISK OF SVR TSTMS TO THE RIGHT OF A LINE FROM 50 ESE
BVE 35 ESE GPT 15 NNW MEI 15 SW CBM 35 SSW MSL 45 ENE HSV 55 S TYS
40 S PSK 20 S LYH 20 S RIC 55 SSE WAL.

THERE IS A MRGL RISK OF SVR TSTMS TO THE RIGHT OF A LINE FROM 60 SW
UKI 50 SE UKI 20 E SJC PRB 70 WSW VBG.

GEN TSTMS ARE FCST TO THE RIGHT OF A LINE FROM 75 S 7R4 30 SE 7R4 25
NW BTR 35 NE ESF 15 WSW DEQ 20 NNW MLC 15 NW BVO 15 N CNU 45 SSE OJC
35 W JEF 25 E VIH 30 SSE FAM 15 SE CKV 25 ENE TYS TRI 15 SW MRB 30
WSW ILG 55 SE ACY ...CONT... 45 WNW AST 45 N ONP 50 NNE 4BK 40 ESE
ACV 25 SSW RBL 35 SW TVL 40 NE BFL 15 S PMD 10 WSW LGB 75 S OXR.
```

(Day 4-8 Points Product)

```
DAY 4-8 CONVECTIVE OUTLOOK AREAL OUTLINE
NWS STORM PREDICTION CENTER NORMAN OK
0344 AM CDT SAT MAY 25 2019

VALID TIME 281200Z - 021200Z

SEVERE WEATHER OUTLOOK POINTS DAY 4

... ANY SEVERE ...

0.15   37799864 40689771 41809681 42519542 42779348 42228968
       41788868 41218845 40178918 36749271 34499585 33349789
       33389914 33879969 34889983 36219927 37799864
0.30   37049692 37999656 39079559 39369448 39349324 38759284
       37499370 36439511 36179628 36329675 37049692
&&

SEVERE WEATHER OUTLOOK POINTS DAY 5

... ANY SEVERE ...

0.15   33750009 34809792 35159679 35179554 34949471 34279405
       33729396 32829505 32089669 31749805 31509956 31790110
       32670134 33210078 33750009
&&

SEVERE WEATHER OUTLOOK POINTS DAY 6

... ANY SEVERE ...
```

```
&&

SEVERE WEATHER OUTLOOK POINTS DAY 7

... ANY SEVERE ...

&&

SEVERE WEATHER OUTLOOK POINTS DAY 8

... ANY SEVERE ...

&&
```

7. Public Severe Weather Outlook.

```
ZCZC SPCPWOSPC ALL
   WOUS40 KWNS 221302
   ALZ000-FLZ000-GAZ000-221800-

   PUBLIC SEVERE WEATHER OUTLOOK
   NWS STORM PREDICTION CENTER NORMAN OK
   0702 AM CST SUN JAN 22 2017

   ...Outbreak of tornadoes and severe thunderstorms expected over
   parts of the north Florida and south Georgia today...

   * LOCATIONS...
     South Georgia
     North Florida
     Extreme southeast Alabama

   * HAZARDS...
     Numerous tornadoes, several intense and long track
     Scattered damaging winds
     Scattered large hail

   * SUMMARY...
     A severe thunderstorm and tornado outbreak is expected today
     across north Florida and south Georgia, with the significant
     severe threat also expected to extend southward into central
     Florida and northeastward into South Carolina this evening. A
     few long-track, strong tornadoes will be possible.

   Preparedness actions...

   Review your severe weather safety procedures for the possibility
   of dangerous weather today. Stay tuned to NOAA Weather Radio,
   weather.gov, or other media for watches and warnings. A tornado
   watch means that conditions are favorable for tornadoes to form
   during the next several hours. If a tornado warning is issued for
   your area, move to a place of safety, ideally in a basement or
   interior room on the lowest floor of a sturdy building.
```

```
&&

..Thompson.. 01/22/2017

$$
```

8. Watch County List.

```
NWUS64 KWNS 281844
WCLA

.TORNADO WATCH A
COORDINATION COUNTY LIST FROM THE NWS STORM PREDICTION CENTER
EFFECTIVE UNTIL 0300 UTC.


KSC003-005-031-041-043-045-059-061-085-087-091-103-107-111-121-
127-139-143-149-177-197-209-290300-

KS
.     KANSAS COUNTIES INCLUDED ARE

ANDERSON           ATCHISON           COFFEY
DICKINSON          DONIPHAN           DOUGLAS
FRANKLIN           GEARY              JACKSON
JEFFERSON          JOHNSON            LEAVENWORTH
LINN               LYON               MIAMI
MORRIS             OSAGE              OTTAWA
POTTAWATOMIE       SHAWNEE            WABAUNSEE
WYANDOTTE
$$


MOC001-021-025-033-037-041-047-049-061-063-079-095-101-107-115-
117-121-165-175-177-195-211-290300-

MO
.     MISSOURI COUNTIES INCLUDED ARE

ADAIR              BUCHANAN           CALDWELL
CARROLL            CASS               CHARITON
CLAY               CLINTON            DAVIESS
DEKALB             GRUNDY             JACKSON
JOHNSON            LAFAYETTE          LINN
LIVINGSTON         MACON              PLATTE
RANDOLPH           RAY                SALINE
SULLIVAN
$$


ATTN...WFO...TOP...EAX...
```

9. Watch Outline Update Message.

(Initial Issuance)

```
WOUS64 KWNS 281854
WOU5

BULLETIN - IMMEDIATE BROADCAST REQUESTED
TORNADO WATCH OUTLINE UPDATE FOR WT 275
NWS STORM PREDICTION CENTER NORMAN OK
155 PM CDT TUE MAY 28 2019

TORNADO WATCH 275 IS IN EFFECT UNTIL 1000 PM CDT FOR THE
 FOLLOWING LOCATIONS

KSC003-005-027-031-041-043-045-059-061-085-087-091-103-107-111-
121-127-139-143-149-161-177-197-209-290300-
/O.NEW.KWNS.TO.A.0275.190528T1855Z-190529T0300Z/

KS
.    KANSAS COUNTIES INCLUDED ARE

ANDERSON             ATCHISON            CLAY
COFFEY               DICKINSON           DONIPHAN
DOUGLAS              FRANKLIN            GEARY
JACKSON              JEFFERSON           JOHNSON
LEAVENWORTH          LINN                LYON
MIAMI                MORRIS              OSAGE
OTTAWA               POTTAWATOMIE        RILEY
SHAWNEE              WABAUNSEE           WYANDOTTE
$$


MOC001-021-025-033-037-041-047-049-061-063-079-095-101-107-115-
117-121-165-175-177-195-211-290300-
/O.NEW.KWNS.TO.A.0275.190528T1855Z-190529T0300Z/

MO
.    MISSOURI COUNTIES INCLUDED ARE

ADAIR                BUCHANAN            CALDWELL
CARROLL              CASS                CHARITON
CLAY                 CLINTON             DAVIESS
DEKALB               GRUNDY              JACKSON
JOHNSON              LAFAYETTE           LINN
LIVINGSTON           MACON               PLATTE
RANDOLPH             RAY                 SALINE
SULLIVAN
$$


ATTN...WFO...TOP...EAX...
```

(Hourly Update)

```
WOUS64 KWNS 282123
WOU5

TORNADO WATCH OUTLINE UPDATE FOR WT 275
NWS STORM PREDICTION CENTER NORMAN OK
423 PM CDT TUE MAY 28 2019

TORNADO WATCH 275 REMAINS IN EFFECT UNTIL 1000 PM CDT FOR THE
FOLLOWING LOCATIONS

KSC003-005-027-031-041-043-045-059-061-085-087-091-103-107-111-
121-127-139-143-149-161-177-197-209-290300-
/O.CON.KWNS.TO.A.0275.000000T0000Z-190529T0300Z/

KS
.    KANSAS COUNTIES INCLUDED ARE

ANDERSON             ATCHISON            CLAY
COFFEY               DICKINSON           DONIPHAN
DOUGLAS              FRANKLIN            GEARY
JACKSON              JEFFERSON           JOHNSON
LEAVENWORTH          LINN                LYON
MIAMI                MORRIS              OSAGE
OTTAWA               POTTAWATOMIE        RILEY
SHAWNEE              WABAUNSEE           WYANDOTTE
$$


MOC001-021-025-033-037-041-047-049-061-063-079-095-101-107-115-
117-121-165-175-177-195-211-290300-
/O.CON.KWNS.TO.A.0275.000000T0000Z-190529T0300Z/

MO
.    MISSOURI COUNTIES INCLUDED ARE

ADAIR                BUCHANAN            CALDWELL
CARROLL              CASS                CHARITON
CLAY                 CLINTON             DAVIESS
DEKALB               GRUNDY              JACKSON
JOHNSON              LAFAYETTE           LINN
LIVINGSTON           MACON               PLATTE
RANDOLPH             RAY                 SALINE
SULLIVAN
$$


ATTN...WFO...TOP...EAX...
```

(Final)

```
WOUS64 KWNS 290304
WOU5

TORNADO WATCH OUTLINE UPDATE FOR WT 275
NWS STORM PREDICTION CENTER NORMAN OK
1003 PM CDT TUE MAY 28 2019

TORNADO WATCH 275 IS NO LONGER IN EFFECT.

KSZ000-MOZ000-290300-
/O.EXP.KWNS.TO.A.0275.000000T0000Z-190529T0300Z/

NO COUNTIES OR PARISHES REMAIN IN THE WATCH.

$$

ATTN...WFO...TOP...EAX...
```

10. Aviation Watch Notification Message.

```
WWUS30 KWNS 281854
SAW5
SPC AWW 281854
WW 275 TORNADO KS MO 281855Z - 290300Z
AXIS..50 STATUTE MILES NORTH AND SOUTH OF LINE..
35SSE IRK/KIRKSVILLE MO/ - 25SSW MHK/MANHATTAN KS/
..AVIATION COORDS.. 45NM N/S /33SSE IRK - 37ESE SLN/
HAIL SURFACE AND ALOFT..3 INCHES. WIND GUSTS..70 KNOTS.
MAX TOPS TO 550. MEAN STORM MOTION VECTOR 24035.

LAT...LON 38909230 38069684 39529684 40369230

THIS IS AN APPROXIMATION TO THE WATCH AREA.  FOR A
COMPLETE DEPICTION OF THE WATCH SEE WOUS64 KWNS
FOR WOU5.
```

11. Public Watch Notification Message (Tornado and Severe Thunderstorm).

```
WWUS20 KWNS 281854
SEL5
SPC WW 281854
KSZ000-MOZ000-290300-

URGENT - IMMEDIATE BROADCAST REQUESTED
Tornado Watch Number 275
NWS Storm Prediction Center Norman OK
155 PM CDT Tue May 28 2019

The NWS Storm Prediction Center has issued a
```

* Tornado Watch for portions of
  Northeastern Kansas
  Northwestern Missouri

* Effective this Tuesday afternoon and evening from 155 PM until
  1000 PM CDT.

* Primary threats include...
  A few tornadoes likely with a couple intense tornadoes possible
  Widespread large hail and scattered very large hail events to 3
    inches in diameter likely
  Widespread damaging winds and isolated significant gusts to 80
    mph likely

SUMMARY...Initially elevated storms could become rooted near the surface along a slow-moving front from northeastern Kansas into northern Missouri this afternoon. Additional storms are expected to form and spread northeastward into the watch area from the southwest by mid-late afternoon. Supercells are expected with very large hail and potentially a few tornadoes, especially with storms able move along the front. Upscale growth into a cluster is also possible late this afternoon/evening, with an increasing threat for damaging winds.

The tornado watch area is approximately along and 50 statute miles north and south of a line from 35 miles south southeast of Kirksville MO to 25 miles south southwest of Manhattan KS. For a complete depiction of the watch see the associated watch outline update (WOUS64 KWNS WOU5).

PRECAUTIONARY/PREPAREDNESS ACTIONS...

REMEMBER...A Tornado Watch means conditions are favorable for tornadoes and severe thunderstorms in and close to the watch area. Persons in these areas should be on the lookout for threatening weather conditions and listen for later statements and possible warnings.

&&

OTHER WATCH INFORMATION...CONTINUE...WW 272...WW 273...WW 274...

AVIATION...Tornadoes and a few severe thunderstorms with hail surface and aloft to 3 inches. Extreme turbulence and surface wind gusts to 70 knots. A few cumulonimbi with maximum tops to 550. Mean storm motion vector 24035.

...Thompson

12. Watch Status Message.

```
WOUS20 KWNS 282334
WWASPC
SPC WW-A 282335
KSZ000-MOZ000-290040-

STATUS REPORT ON WW 275

THE SEVERE WEATHER THREAT CONTINUES ACROSS THE ENTIRE WATCH AREA.

..KERR..05/28/19

ATTN...WFO...TOP...EAX...

&&

STATUS REPORT FOR WT 275

SEVERE WEATHER THREAT CONTINUES FOR THE FOLLOWING AREAS

KSC003-005-027-031-041-043-045-059-061-085-087-091-103-107-111-
121-127-139-143-149-161-177-197-209-290040-

KS
.    KANSAS COUNTIES INCLUDED ARE

ANDERSON             ATCHISON            CLAY
COFFEY               DICKINSON           DONIPHAN
DOUGLAS              FRANKLIN            GEARY
JACKSON              JEFFERSON           JOHNSON
LEAVENWORTH          LINN                LYON
MIAMI                MORRIS              OSAGE
OTTAWA               POTTAWATOMIE        RILEY
SHAWNEE              WABAUNSEE           WYANDOTTE
$$


MOC001-021-025-033-037-041-047-049-061-063-079-095-101-107-115-
117-121-165-175-177-195-211-290040-

MO
.    MISSOURI COUNTIES INCLUDED ARE

ADAIR                BUCHANAN            CALDWELL
CARROLL              CASS                CHARITON
CLAY                 CLINTON             DAVIESS
DEKALB               GRUNDY              JACKSON
JOHNSON              LAFAYETTE           LINN
LIVINGSTON           MACON               PLATTE
RANDOLPH             RAY                 SALINE
SULLIVAN
$$
```

THE WATCH STATUS MESSAGE IS FOR GUIDANCE PURPOSES ONLY. PLEASE
REFER TO WATCH COUNTY NOTIFICATION STATEMENTS FOR OFFICIAL
INFORMATION ON COUNTIES...INDEPENDENT CITIES AND MARINE ZONES
CLEARED FROM SEVERE THUNDERSTORM AND TORNADO WATCHES.

$$

Department of Commerce · National Oceanic & Atmospheric Administration · National Weather Service

NATIONAL WEATHER SERVICE INSTRUCTION 10-517
October 9, 2017

Operations and Services
Public Weather Services, NWSPD 10-5

MULTI-PURPOSE WEATHER PRODUCTS SPECIFICATION

NOTICE: This publication is available at: http://www.nws.noaa.gov/directives/

OPR: W/AFS21 (G. Schoor) **Certified by:** W/AFS21 (M. Hawkins)
Type of Issuance: Routine

SUMMARY OF REVISIONS: This directive supersedes NWSI 10-517, "*Multi-Purpose Weather Products Specification*", dated September 28, 2012. Changes made to reflect the NWS Headquarters reorganization effective April 1, 2015. No content changes were made.

Signed 9/25/2017
Andrew D. Stern Date
Director
Analyze, Forecast, and Support Office

Multi-Purpose Weather Products Specification

Table of Contents: Page

1. Introduction. This procedural directive provides detailed information on routine short-term forecast products issued by National Weather Service (NWS) Weather Forecast Offices (WFO) and multi-purpose products issued for severe, fire, marine, tropical, winter and/or non-precipitation weather and flooding hazards issued by WFOs and the NWS' Storm Prediction Center (SPC).

2. Short Term Forecast (product category NOW).

2.1 Mission Connection. Short Term Forecasts provide the public with detailed weather information occurring within 6 hours of product issuance.

2.2 Issuance Guidelines.

2.2.1 Creation Software. WFOs should use Graphical Hazards Generation Editor (GHG) or WarnGen software to issue Short Term Forecasts.

2.2.2 Issuance Criteria. WFOs may issue Short Term Forecasts to discuss the evolution of convective and stratiform precipitation, winter weather, sea breezes, marine weather, fog, winds, and temperatures within their geographic area of responsibility. The NOW will not duplicate or contradict information contained in the SPS or other watch, warning, or advisory text products. At regional discretion, offices may issue graphical short term forecasts via WFO Internet pages that compliment or replace the NOW. If an office issues both a NOW and a graphical short term forecast, the forecasts will be consistent.

2.2.3 Issuance Time. Short Term Forecasts are non-scheduled, event-driven products.

2.2.4 Valid Time. Short Term Forecasts are valid from the time of issuance until the expiration time.

2.2.5 Product Expiration Time. The product expiration time is not more than 6 hours after the time of issuance.

2.3 Technical Description. Short Term Forecasts will follow the format and content described in this section.

2.3.1 UGC Type. NOWs will use the Zone (Z) code of the UGC.

2.3.2 Mass News Disseminator Header. The Short Term Forecast MND header is "SHORT TERM FORECAST."

2.3.3 Content. WFOs will write Short Term Forecasts in non-technical terms. WFOs should write Short Term Forecasts in future tense, focusing on precipitation location, movement, intensity, amounts and duration. Short Term Forecasts should be concise. WFOs should segment Short Term Forecast into separate zone groupings based on common weather conditions. WFOs may include additional information as time permits.

2.3.4 Format.

```
FPaaii cccc ddhhmm
NOWccc

SHORT TERM FORECAST
NATIONAL WEATHER SERVICE CITY STATE
time am/pm time_zone day mon dd yyyy

STZ001-002-003-ddhhmm-
ZONE 1-ZONE 2-ZONE 3-
INCLUDING THE CITIES OF...TOWN A...TOWN B...TOWN C
time am/pm time_zone day mon dd yyyy

.NOW...
...OPTIONAL HEADLINE...

THIS SECTION CONTAINS A CONCISE NON-TECHNICAL FREE TEXT PARAGRAPH
DESCRIBING NON-HAZARDOUS WEATHER TIMING...DURATION...AND FORECAST
CONDITIONS.

$$


STZ004-005-006-ddhhmm-
ZONE 4-ZONE 5-ZONE 6-
INCLUDING THE CITIES OF...TOWN D...TOWN E...TOWN F
time am/pm time_zone day mon dd yyyy

OPTIONAL ADDITIONAL SEGMENT WITH SAME FORMAT AS THE FIRST SEGMENT.

$$


FORECASTER NAME/NUMBER (OPTIONAL)
```

Figure 1. Short Term Forecast Format

2.4 Updates, Amendments and Corrections. Short Term Forecasts are not updated or amended. WFOs will correct Short Term Forecasts for format and grammatical errors.

3. **Special Weather Statement (product category SPS)**.

3.1 Mission Connection. Special Weather Statements (SPS) provide the public with information concerning ongoing or imminent weather hazards, which require a heightened level of awareness or action. Although typically used for hazards within 6 hours of product issuance, the SPS may also be used to heighten the awareness of a major event forecast to occur beyond 6 hours.

3.2 Issuance Guidelines.

3.2.1 Creation Software. WFOs should use GHG or WarnGen to issue SPSs.

3.2.2 Issuance Criteria. The criteria are dependent on the situation for which the SPS is issued. Issuance criteria guidelines by weather hazard are as follows:

a. Developing Hazardous Convective Weather. WFOs may issue SPSs to heighten public awareness about ongoing or imminent hazardous convective weather expected to continue/dissipate, or expand/decrease in geographical coverage within the next hour or two.

b. Sub-Severe Thunderstorms. WFOs should issue an SPS for strong thunderstorms that approach, or are expected to approach, severe convective criteria. General criteria for a strong thunderstorm is considered to be one or a combination of the following events:
   (1) Sustained winds or gusts of 40 to 57 mph (lower values may be used at forecaster's discretion)
   (2) hail less than 1 inch in diameter
   (3) frequent to continuous lightning
   (4) funnel clouds not expected to become a tornado threat

c. Other Short-term Hazards. WFOs may issue SPSs for high-impact events to supplement information contained in other hazardous weather products, providing high-resolution details when possible. Examples include but are not limited to:
   (1) "black ice"
   (2) short-duration heavy snow bands
   (3) lake-effect snow bands that briefly reduce visibility
   (4) heavy rainfall that is not expected to cause flooding
   (5) heat indices or wind chill near "advisory" level for an hour or two
   (6) local areas of blowing dust where wind is below advisory criteria

d. Major Events Forecast to Occur Beyond 6 Hours. WFOs may issue SPSs to heighten awareness of major events forecast to occur beyond 6 hours. Priority should be given to ongoing or imminent events such as those listed above.

3.2.3 Issuance Time. SPSs are non-scheduled, event-driven products.

3.2.4 Valid Time. SPSs are valid from time of issuance until the expiration or update time.

3.2.5 Product Expiration Time. The product expiration time is not more than 6 hours after the time of issuance, except for an SPS covering an event forecast to occur beyond 12 hours, for which the product expiration time is not more than 12 hours after the time of issuance.

3.3 Technical Description. SPSs will follow the format and content described in this section.

3.3.1 UGC Type. SPSs will use the Zone (Z) code of the UGC.

3.3.2 Mass News Disseminator Header. The SPS MND header is "SPECIAL WEATHER STATEMENT."

3.3.3 Content. The SPS will be consistent with other hazardous weather products. WFOs should describe weather hazards in concise, non-technical terms.

3.3.4 Format. WFOs may use the term "SIGNIFICANT WEATHER ADVISORY" in the text and/or headline(s) of the SPS with Regional concurrence.

Latitude/longitude polygon delineation of the threat area may be included for those hazardous events where observational and model data support sub-County Warning Area (CWA) scale specificity (e.g., bands of heavy snow, strong thunderstorms, etc.). SPS for events with more indefinite areal bounds, or CWA-wide events (e.g., general change to unseasonably cold weather, or "heads up" to a long-term winter storm threat), do not need to include a polygon segment.

```
WWaa8i cccc ddhhmm
SPSccc

SPECIAL WEATHER STATEMENT
NATIONAL WEATHER SERVICE CITY STATE
time am/pm time_zone day mon dd yyyy

STZ001-002-003-ddhhmm-
ZONE 1-ZONE 2-ZONE 3-
INCLUDING THE CITIES OF TOWN A...TOWN B...TOWN C
time am/pm time_zone day mon dd yyyy

...OPTIONAL HEADLINE...

CONCISE FORECAST OF HAZARDOUS WEATHER CONDITIONS.

LAT...LON AAaa BBbb AAaa BBBbb AAaa BBBbb ... (Optional list of at
least three latitude/longitude coordinates outlining the forecaster-
drawn threat area.)

$$

STZ004-005-006-ddhhmm-
ZONE 4-ZONE 5-ZONE 6-
INCLUDING THE CITIES OF TOWN D...TOWN E...TOWN F
time am/pm time_zone day mon dd yyyy

...OPTIONAL HEADLINE...

OPTIONAL SECOND SEGMENT WITH THE SAME FORMAT AS THE FIRST SEGMENT.

LAT...LON AAaa BBbb AAaa BBBbb AAaa BBBbb ...

$$


FORECASTER NAME/NUMBER (OPTIONAL)
```

Figure 2. Special Weather Statement Format, where AAaa indicated latitude in decimal degrees north to two decimal places (without the decimal point), and BBBbb indicated longitude in decimal degrees west to two decimal places (without the decimal point and with no leading zero).

3.4 Updates, Amendments and Corrections. SPSs should be updated as needed. WFOs will correct SPSs for format and grammatical errors.

4. **Hazardous Weather Outlook (product category HWO)**.

4.1 Mission Connection. WFOs issue Hazardous Weather Outlooks (HWO) to provide the public, media, and emergency managers with a single source of information regarding expected hazardous weather through the seven-day forecast period. The HWO is a brief description of the potential for hazardous weather. The HWO provides (but is not limited to) outlooks of

hazardous winter weather, fire weather, non-precipitation, convective weather, tropical, marine and/or flood hazards (see Section 4.3.3.d for content guidelines by weather hazard).

4.2 Issuance Guidelines.

4.2.1 Creation Software. WFOs should use GHG to issue HWOs.

4.2.2 Issuance Criteria. The issuance criteria for the HWO varies by WFO and region. The HWO may be issued 1) as a daily routine product, 2) on an event-driven basis, or 3) not at all. The decision on which one of these three criteria WFOs use should be made in coordination with primary users and their regional office to best meet the local needs. If a WFO uses the product either on a daily routine basis or an event-driven basis, it should be updated whenever necessary to always depict the latest expected weather hazards for the seven day forecast period.

4.2.3 Issuance Time. WFOs should issue HWOs between 5 am and 7 am local time, except where local users request a different issuance time.

4.2.4 Valid Time. An outlook is valid from the time of issuance until the next scheduled issuance or update, unless the HWO is issued on an event-driven basis.

4.2.5 Product Expiration Time. The product expiration time is 24 hours from the routine issuance time, including updated or corrected HWOs, unless issued on an event-driven basis.

4.3 Technical Description. HWOs will follow the format and content described in this section.

4.3.1 UGC Type. HWOs will use the Zone (Z) code of the UGC.

4.3.2 Mass News Disseminator Header. The HWO MND header is "HAZARDOUS WEATHER OUTLOOK."

4.3.3 Content. HWOs will describe in concise non-technical terms the specific weather hazards of concern for the first and second forecast period. HWOs should also briefly discuss in non-technical terms any weather hazards in the Day Two through Seven time period. A weather hazard is considered to be any weather phenomenon that may require the issuance of a watch, warning, or advisory. WFOs should include a general time and location for the hazardous weather event, possible impact, and degree of uncertainty. The HWO will not be updated to address specific short-fuse warning and advisory products (Tornado Warning, Severe Thunderstorm Warning, Flash Flood Warning, Special Marine Warning, etc.). The HWO may reference readers to other long-fuse WFO watch, warning, or advisory products rather than duplicating the information therein.

a. Headlines. WFOs may include headlines for watches, warnings, advisories and significant weather hazards. (Note: Headlines are mandatory for tropical cyclone watches and warnings – see Section 4.3.3.d(7)). If the HWO includes headlines, the WFO should issue an update to the HWO any time those headlines change.

b. Geographic Locations. The HWO should include a short description of the geographical area covered. HWOs may be written to include the entirety of any WFO's geographic area of responsibility in one or more segments to cover specific weather hazards and/or geographic areas. If the HWO contains more than one segment, these segments should add up to cover all of a WFO's geographic area of responsibility each time the outlook is issued.

c. Days of Week. WFOs may include actual days of the week such as "TODAY" after ".DAY ONE..." and "SATURDAY THROUGH THURSDAY" after ".DAYS TWO THROUGH SEVEN..."

d. Content Guidelines By Weather Hazard.

(1) Convective Weather. WFOs will discuss convective weather hazards such as large hail, damaging winds, and tornadoes for all or portions of their geographic area of responsibility. WFOs should include Storm Prediction Center Categorical Convective Outlook information for Day 1, Day 2, and Day 3 Risks (Slight, Moderate and High) of organized severe convective weather. WFOs may include information on strong (less than severe) convection.

(2) Winter Weather. WFOs will discuss winter weather hazards such as wind chill, freezing fog, significant snow, freezing rain, sleet, or a mixture of these weather phenomena for all or portions of their geographic area of responsibility. WFOs should mention winter weather hazards in the Day 3 through Day 7 time period when there is a 30 percent or greater chance of these types of weather events meeting or exceeding local warning or advisory criteria. WFOs should mention active winter weather watches, warnings, and advisories for Days 1 and 2 in the HWO.

(3) Non Precipitation. WFOs will discuss non-precipitation weather hazards such as strong winds, excessive heat, extreme cold, blowing dust/sand, freezing temperatures during the growing season, and dense fog for all or portions of their geographic area of responsibility. WFOs should mention active non-precipitation watches, warnings, and advisories for Days 1 and 2 in the HWO. WFOs should mention non-precipitation weather hazards in the Day 3 through Day 7 time period when there is a 30 percent or greater chance of these types of weather events meeting or exceeding local warning or advisory criteria.

(4) Fire Weather. WFOs will discuss fire weather hazards such as extremely dry conditions, strong gusty winds, and dry thunderstorms for all or portions of their geographic area of responsibility. WFOs should mention active Fire Weather Watches and Red Flag Warnings for Days 1 and 2 in the HWO. WFOs may include SPC Fire Weather Outlook (Day 1 and Day 2) information in the HWO.

(5) Flooding. WFOs will discuss flood hazards for all or portions of their geographic area of responsibility. This includes inland flooding associated with a tropical cyclone. WFOs may include information on small stream flood situations and life threatening flood prone areas such as narrow canyons.

(6) Marine. WFOs will discuss the following marine hazards: high winds, high seas, high surf, coastal flooding, and waterspouts for all or portions of their area of responsibility. Rip currents may be discussed following the rip current guidance in NWSI 10-310, Section 3.6. WFOs routinely providing rip current information will include this information in the Day 1 portion of the HWO when forecasting a high risk of rip currents. Marine hazards that do not directly affect the coastline or lakeshore, such as those associated with Small Craft Advisories and Gale Warnings, may be omitted from the HWO based on local user needs.

(7) Tropical. WFOs will headline the Day 1 Tropical Cyclone Watches and Warnings issued by the National Hurricane Center (NHC), Central Pacific Hurricane Center (CPHC), or Joint Typhoon Warning Center (JTWC). The HWO should urge users to consult Hurricane Local Statements issued by the WFO to obtain detailed information concerning potential hazards such as strong winds, storm surge, and excessive rainfall. WFOs should be consistent with official guidance and products issued by the NHC/HPC in the Days 2 through 7 time period of the HWO. If a WFO forecasts a potential impact to all or portions of its geographic area of responsibility in Days 2 through 5, WFOs may use the following statement in the HWO: "CONSULT THE LATEST GUIDANCE AND INFORMATION FROM THE NATIONAL HURRICANE CENTER CONCERNING THE POSSIBLE EFFECTS OF (HURRICANE OR TROPICAL STORM) xxxx" where (xxxx is the name of the storm). WFOs will not reference tropical cyclone activity beyond the time period addressed by official tropical cyclone products (currently 5 days).

e. "Nil" Statement. If the HWO is a routine product and no weather hazards are expected, WFOs will include one of the following statements in the Day One and/or Days Two through Seven sections:

"NO HAZARDOUS WEATHER IS EXPECTED AT THIS TIME" or
"THE PROBABILITY FOR WIDESPREAD HAZARDOUS WEATHER IS LOW"

The HWO should not contain "nil" statements for specific types of weather hazards.

f. Spotter Instructions. HWOs should include instructions to spotters and emergency managers for any time during the seven day forecast period.

g. Grids and Graphics. WFOs may produce information supplemental to the text HWO in the form of grids or graphics with Regional concurrence. Any supplemental grids or graphics will be consistent with the text HWO.

4.3.4 Format.

```
FLaa4i cccc ddhhmm
HWOccc

HAZARDOUS WEATHER OUTLOOK
NATIONAL WEATHER SERVICE city state
time am/pm time_zone day mon dd yyyy

STZ001-002-003-ddhhmm-
ZONE 1-ZONE 2-ZONE 3-
time am/pm time_zone day mon dd yyyy

...HEADLINE FOR ACTIVE TROPICAL CYCLONE WATCHES AND WARNINGS...
(MANDATORY)

...HEADLINE FOR ALL OTHER ACTIVE WATCHES, WARNINGS, ADVISORIES OR
SIGNIFICANT WEATHER HAZARDS...  (OPTIONAL)

THIS HAZARDOUS WEATHER OUTLOOK IS FOR PORTION OF STATE(S).

.DAY ONE...ACTUAL DAY OF THE WEEK (Optional - SUCH AS TODAY OR THIS
AFTERNOON)

WFOS WILL DISCUSS IN CONCISE NON-TECHNICAL TERMS EACH HAZARD'S IMPACT
IN A FREE TEXT FORMAT FOR THE FIRST AND SECOND FORECAST PERIODS.
WFOS MAY REFERENCE SUPPORTING WARNINGS, WATCHES, ADVISORIES, AND
STATEMENTS.

.DAYS TWO THROUGH SEVEN...ACTUAL DAYS OF THE WEEK (Optional - SUCH AS
MONDAY THROUGH SATURDAY)

WFOS SHOULD DISCUSS IN CONCISE NON-TECHNICAL TERMS EACH HAZARD'S
IMPACT IN A FREE TEXT FORMAT FOR DAYS TWO THROUGH SEVEN.  WFOS MAY
REFERENCE SUPPORTING WARNINGS, WATCHES, ADVISORIES, AND STATEMENTS.
THIS SECTION IS A "HEADS UP" FOR PLANNING PURPOSES.

.SPOTTER INFORMATION STATEMENT...

INSTRUCTIONS TO SPOTTERS OR EMERGENCY MANAGERS.  WFOS MAY OMIT THIS
SECTION IF NO HAZARDOUS WEATHER IS EXPECTED IN BOTH THE DAY ONE AND
DAYS TWO THROUGH SEVEN TIME PERIODS.

$$

STZ004-005-006-ddhhmm-
ZONE 4-ZONE 5-ZONE 6-
time am/pm time_zone day mon dd yyyy

OPTIONAL SECOND SEGMENT WITH THE SAME FORMAT AS THE FIRST SEGMENT.

$$

FORECASTER NAME/NUMBER (OPTIONAL)
```

Figure 3. Hazardous Weather Outlook Format

4.4 Updates, Amendments and Corrections. WFOs should update the HWO if the forecast for hazardous weather changes. WFOs will place higher priority on updating the relevant watch, warning, and advisory products. WFOs will correct outlooks for format and grammatical errors.

5. **Preliminary Local Storm Report (product category LSR).**

5.1 Mission Connection. Preliminary Local Storm Reports (LSR) provide the Storm Prediction Center (SPC), River Forecast Centers (RFCs), adjacent WFOs, the public, media and emergency managers with reported observations of hazardous weather events. Preliminary Local Storm Reports also serve as the primary basis for the official monthly publication *Storm Data*.

5.2 Issuance Guidelines.

5.2.1 Creation Software. WFOs should use the AWIPS LSR generation software for reports. Other LSR generation software may be used with Regional concurrence.

5.2.2 Issuance Criteria. WFOs will issue LSRs for severe weather events such as tornadoes, waterspouts, large hail, thunderstorm/marine wind gusts and flash floods. WFOs should issue LSRs for other events listed in Appendix B. LSRs should be issued for events that meet or exceed applicable warning criteria. WFOs should issue LSRs for hail reports equal to or larger than 0.75 inches in diameter. WFOs may issue LSRs for other hazardous weather events that do not exceed applicable warning criteria. LSRs should be issued as close to real time as possible. WFOs should issue LSRs to "summarize" a list of reports during and/or at the end of an event (e.g. severe weather outbreak, winter storm). Events reported more than seven days after occurrence will be included in monthly *Storm Data* reports instead of LSRs.

5.2.3 Issuance Time. LSRs are non-scheduled, event-driven products.

5.2.4 Valid Time. LSRs are valid upon issuance.

5.2.5 Product Expiration Time. Not applicable.

5.3 Technical Description. LSRs will follow the format and content described in this section.

5.3.1 UGC Type. Not applicable.

5.3.2 Mass News Disseminator Header. The LSR MND header is "PRELIMINARY LOCAL STORM REPORT."

5.3.3 Content. LSRs will follow a national standard format. WFOs should denote whether the magnitude of a report was measured, estimated or of unknown origin for thunderstorm or non-thunderstorm wind gusts, marine thunderstorm wind gusts, downburst winds, high sustained winds, ice accumulation associated with freezing rain, sleet accumulation, snow accumulation, hail size, and visibility restrictions due to fog or dense fog. Many users decode the LSR and the SPC decodes the report to produce national hourly and daily reports. All fields of data will begin at the prescribed column of the page. The report should include type of phenomenon, date/time of occurrence, location of event (including state, county, direction, distance from a well-known site and Latitude/Longitude points), source of the report, damage, deaths, and/or injuries and

remarks to convey other noteworthy information about the event. The remarks section of the LSR should use plain English and be written in full sentences. After all weather events listed in the LSR, WFOs may use a delimiter "&&" to provide a narrative summary of weather events in plain English sentences.

LSRs are preliminary in nature. The final report of verified weather events will be listed in monthly *Storm Data* reports in accordance with NWSI 10-1605. Please refer to the NDS procedural directives or associated regional supplements for warning threshold criteria for the following weather phenomena:

Marine Weather	NWSI 10-313 (Special Marine Warnings)
Severe Weather	NWSI 10-511 (WFO Severe Weather Products Specification)
Winter Weather	NWSI 10-513 (WFO Winter Weather Products Specification)
Non Precipitation	NWSI 10-515 (WFO Non-Precipitation Weather Products Specification)
Tropical Weather	NWSI 10-601 (Tropical Cyclone Products)
Flooding	NWSI 10-922 (WFO Hydrologic Products Specification)

Please refer to Appendix B for a list of event sources and weather event types.

5.3.4 Format.

```
NWaa5i Kccc DDHHMM
LSRccc

PRELIMINARY LOCAL STORM REPORT
NATIONAL WEATHER SERVICE CITY STATE
time am/pm time_zone day mon dd yyyy

..TIME...   ...EVENT...      ...CITY LOCATION...     ...LAT.LON...
..DATE...   ....MAG....      ..COUNTY LOCATION..ST.. ...SOURCE....
            ..REMARKS..

hhmm qM|xxx|EVENT           |DIST DIR CITY          |LL.LLd LLL.LLd|x|
MM/DD/YYYY||EMAG UNIT    |xx|COUNTY            |ST|x|SOURCE          |
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
xxxxxxxxxx|*** # FATAL, # INJ *** OR REMARKS                          |
xxxxxxxxxx|REMARKS CONTINUED FOR UP TO 500 CHARACTERS TOTAL          |
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

&&

OPTIONAL FREE TEXT SUMMARY.

$$

FORECASTER NAME/NUMBER (OPTIONAL)
```

Figure 4. Local Storm Report Format. The "x" and "|" symbols indicate blank spaces. See Table 1 for explanation of fields within individual reports.

Item	Description	Example(s)	Line:Chars	Length
hhmm qM	time: hour and minute with am/pm qualifier, and preceding zero if necessary	0109 PM	1:1-7	7
EVENT	event type from the list in Appendix B	TORNADO TSTM WIND GST	1:13-28	16
DIST	distance from city	10	1:30-52	23
DIR	direction from city	NW		
CITY	City name (obtained from list)	NECHE		
LL.LLd	latitude to 2 decimal places and direction	38.31N	1:54-67	14
LLL.LLd	longitude to 2 decimal places and direction, no negative sign, no leading zero	104.92W		
MM/DD/YYYY	date: month / day / 4-digit year, no leading zero on month	8/22/2009	2:1-10	10
EMAG	event magnitude value, led by determination method designator (E/M/U) for those event types listed with an asterisk in Appendix B	E2.5 M59 U6.50 EF4	2:13-25	13
UNIT	units of the magnitude value	INCHES MPH		
COUNTY	county name	PEMBINA	2:30-47	18
ST	state 2-letter postal abbreviation	ND	2:49-50	2
SOURCE	source of the report from list in Appendix B	TRAINED SPOTTER	2:54-69	16
FATAL INJ	numbers of fatalities and injuries, surrounded by 3 asterisks, separated by a comma, with spaces in between, at the beginning of the remarks section	*** 1 FATAL, 2 INJ *** *** 4 INJ ***	4+:13-69	57 to 500

Table 1. Explanation of fields within individual reports in the LSR format described in Figure 4.

5.4 Updates, Amendments and Corrections. Updates and amendments are not applicable. WFOs will issue a new LSR if the office receives new reports of weather events which meet or exceed warning criteria or updated information on previously reported weather events. WFOs will correct statements for format and grammatical errors.

6. **Mesoscale Discussion (product category MD)**.

6.1 Mission Connection. SPC issues Mesoscale Discussions (MD) to convey to CONUS WFOs, the public, media, emergency managers, and other specialized users, the location and current meteorological reasoning for short term hazardous weather concerns.

6.2 Issuance Guidelines.

6.2.1 Creation Software. SPC will use the N-AWIPS graphics creation tool in NMAP and SPC web-based product generation software to create and issue MDs.

6.2.2 Issuance Criteria. MD issuance criteria depend on the type of weather hazard. Refer to Section 6.3.3 for details.

6.2.3 Issuance Time. MDs are non-scheduled, event-driven products.

6.2.4 Valid Time. The valid time is from the time of issuance until the next update time.

6.3 Technical Description. MDs will follow the format and content described in this section.

6.3.1 UGC Type. MDs will use the Zone (Z) code of the UGC.

6.3.2 Mass News Disseminator Header. The MD MND header is "MESOSCALE DISCUSSION nnnn", where nnnn is a four-digit number reset to 0001 on 1 January at 0000 UTC.

6.3.3 Content. SPC uses the Mesoscale Discussion (MD) to alert WFOs and various users to different types of short term weather hazards. Types of MD by weather hazard are as follows:

a. Severe Potential. SPC should issue a MD to discuss convective trends and severe thunderstorm potential as follows:

(1) Watch likely. This type of MD should be issued in an area where organized severe convection is expected, and should precede Severe Thunderstorm or Tornado Watch issuance by about 1 to 2 hours, allowing time for collaboration with the affected WFOs.

(2) Watch possible. This type of MD may be issued in an area where organized severe convection is possible, but it is unclear whether a Severe Thunderstorm or Tornado Watch will be needed in the next 1 to 2 hours.

(3) Watch unlikely. This type of MD may be issued in an area where isolated strong to severe convection is ongoing or expected, but is not expected to reach the severity or coverage criteria for a Severe Thunderstorm or Tornado Watch in the next 1 to 2 hours. SPC should also issue an MD for severe potential when it is monitoring an area for a potential convective watch or when thunderstorm development is potentially severe, but will not have enough areal coverage or duration that is expected to last long enough for a convective watch issuance.

(4) Watch needed soon. This type of MD may be issued in an area where organized severe convection may develop very rapidly and a Severe Thunderstorm or Tornado Watch will be issued within the next 15-30 minutes.

(5) Probability of watch issuance. This qualifies the likelihood of watch issuance contained in the Severe Potential line, using the following probability values: 5 and 20 percent (watch unlikely); 40 and 60 percent (watch possible); 80 and 95% (watch likely). A probability of 95 percent is also used for "watch needed soon" situations.

b. Watch Update. SPC should issue a MD at least once every 2 to 3 hours for each convective watch that is in effect and focus on mesoscale and storm scale features affecting the severe weather within the watch area. A MD should also be issued within the last 1-2 hours before convective watch expiration detailing expected SPC actions for possible new watch issuance. The text of the MD should begin "THE SEVERE WEATHER THREAT FOR (SEVERE THUNDERSTORM/TORNADO) WATCH nnnn CONTINUES."

c. Heavy Rainfall. SPC should issue a MD for:

- Localized areas of convective rainfall where rates equal to or greater than 3 inches per hour
- Two or more inches are expected at any one location in one hour, **or**
- Rainfall rates of 1.5 inches per hour are expected to occur for 3 hours or greater.

SPC may issue a Convective Heavy Rain MD to forecast the end of a heavy rain event.

d. Heavy Snow. SPC should issue a MD for snowfall accumulation rates of 1 inch per hour or greater for a period of 2 hours or greater at elevations below 4000 feet MSL (mean sea level) and accumulation rates of 2 inches per hour or greater for a period of 2 hours or greater at elevations above 4000 feet MSL. Discussions may also address precipitation trends (increasing or decreasing rates), and climatologically rare events.

e. Freezing Rain. SPC should issue a MD for freezing rain accumulations greater than .05 inch per hour for a period of 3 hours or greater. Discussions may also address where a precipitation type is forecast to change from liquid to freezing or from freezing to liquid.

f. Blizzard. SPC should issue a MD for mesoscale blizzard conditions forecast to persist 3 hours or greater.

g. Convective Outlook Upgrade. SPC should issue a MD when upgrading a Day 1 convective outlook risk category to "moderate" or "high" risk. SPC will issue this type of MD prior to the 1300, 1630, 2000, or 0100 UTC convective outlook issuance times, and briefly describe the area to be upgraded. This MD will refer to the ensuing outlook discussion.

6.3.4 Format for Severe Potential Mesoscale Discussion.

```
ACUS11 KWNS ddhhmm
SWOMCD
SPC MCD ddhhmm
STZ000-STZ000-ddhhmm-

MESOSCALE DISCUSSION nnnn
NWS STORM PREDICTION CENTER NORMAN OK
time am/pm time zone day mon dd yyyy

AREAS AFFECTED...(PORTION OF STATES OR GEOGRAPHICAL AREAS)...

CONCERNING...(TYPE OF MD)

VALID DDHHMMZ - DDHHMMZ

PROBABILITY OF WATCH ISSUANCE...[increments of 20 percent from 20-80
percent, including 5 and 95 percent]

SUMMARY...[A concise statement regarding the forecast
   (timing, coverage, intensity, and mode) severe threat.]

DISCUSSION...[The description of significant mesoscale features and
   atmospheric processes which will likely result in the expected
   event.]

..FORECASTER NAME.. mm/dd/yyyy

...PLEASE SEE WWW.SPC.NOAA.GOV FOR GRAPHICAL PRODUCT...

ATTN...WFO A...WFO B... (affected WFOs)

LAT...LON AAaaBBbb AAaaBBbb AAaaBBbb AAaaBBbb AAaaBBbb AAaaBBbb
          AAaaBBbb AAaaBBbb (list of latitude/longitude coordinates
          outlining the for MD graphic area)
```

Figure 5. Severe Potential Mesoscale Discussion format, where AAaa=Latitude north in degrees to two decimal places (without decimal point), BBbb=Longitude west in degrees to two decimal places (without decimal point and without leading 1 west of 100 degrees west).

6.3.5 Format for all other Mesoscale Discussions (Watch Update, Winter, Heavy Rain, and Outlook Upgrade MDs)

```
ACUS11 KWNS ddhhmm
SWOMCD
SPC MCD ddhhmm
STZ000-STZ000-ddhhmm-

MESOSCALE DISCUSSION nnnn
NWS STORM PREDICTION CENTER NORMAN OK
time am/pm time zone day mon dd yyyy

AREAS AFFECTED...(PORTION OF STATES OR GEOGRAPHICAL AREAS)...

CONCERNING...(TYPE OF MD)

VALID DDHHMMZ - DDHHMMZ

SUMMARY...[A concise statement regarding the forecast
   (timing, coverage, intensity, and mode) severe threat.]

DISCUSSION...[The description of significant mesoscale features and
   atmospheric processes which will likely result in the expected
   event.]

..FORECASTER NAME.. mm/dd/yyyy

...PLEASE SEE WWW.SPC.NOAA.GOV FOR GRAPHICAL PRODUCT...

ATTN...WFO A...WFO B... (affected WFOs)

LAT...LON AAaaBBbb AAaaBBbb AAaaBBbb AAaaBBbb AAaaBBbb AAaaBBbb
          AAaaBBbb AAaaBBbb (corner points for MD graphic)
```

Figure 6. Mesoscale Discussion format (other than Severe Potential Discussions), where AAaa=Latitude north in degrees to two decimal places (without decimal point), BBbb=Longitude west in degrees to two decimal places (without decimal point and without leading 1 west of 100 degrees west).

6.4 Updates, Amendments and Corrections. SPC will issue MDs as needed and there are no updates. SPC will correct messages for format and grammatical errors.

APPENDIX A - Product Examples

Table of Contents: Page

1. Introduction. This appendix provides product examples for the WFOs, SPC and the public.

2. Short Term Forecast.

(Non-segmented version)

```
FPUS74 KSHV 070258
NOWSHV

SHORT TERM FORECAST
NATIONAL WEATHER SERVICE SHREVEPORT LA
958 PM CDT WED JUN 6 2012

ARZ070-OKZ077-TXZ096-097-108>112-124>126-136>138-149>153-165>167-
070500-
MILLER-MCCURTAIN-RED RIVER-BOWIE-FRANKLIN-TITUS-CAMP-MORRIS-CASS-
WOOD-UPSHUR-MARION-SMITH-GREGG-HARRISON-CHEROKEE-RUSK-PANOLA-
NACOGDOCHES-SHELBY-ANGELINA-SAN AUGUSTINE-SABINE TX-
INCLUDING THE CITIES OF...TEXARKANA...IDABEL...CLARKSVILLE...
MT VERNON...MT PLEASANT...PITTSBURG...DAINGERFIELD...ATLANTA...
QUITMAN...GILMER...JEFFERSON...TYLER...LONGVIEW...MARSHALL...
RUSK...HENDERSON...CARTHAGE...NACOGDOCHES...CENTER...LUFKIN...
SAN AUGUSTINE...HEMPHILL
958 PM CDT WED JUN 6 2012

.NOW...
SHOWERS AND THUNDERSTORMS...ALONG WITH A LARGE AREA OF LIGHT TO
MODERATE RAIN OVER EAST TEXAS...WILL CONTINUE TO MOVE SLOWLY TO THE
EAST THROUGH MIDNIGHT. A FEW OF THE STRONGER STORMS MAY PRODUCE GUSTY
WIND...BRIEF HEAVY RAINFALL...AND DANGEROUS CLOUD TO GROUND LIGHTNING.
RAINFALL AMOUNTS OF A QUARTER TO A HALF INCH CAN BE EXPECTED WEST OF A
```

```
DAINGERFIELD...LONGVIEW...MOUNT ENTERPRISE LINE...WITH AMOUNTS OF OVER
AN INCH POSSIBLE FROM A FEW STORMS.

$$
```

(Segmented version)

```
FPUS75 KCYS 070512
NOWCYS

SHORT TERM FORECAST
NATIONAL WEATHER SERVICE CHEYENNE WY
1112 PM MDT WED JUN 6 2012

WYZ106>108-117>119-070700-
CENTRAL LARAMIE RANGE AND SOUTHWEST PLATTE COUNTY-
EAST PLATTE COUNTY-GOSHEN COUNTY-SOUTH LARAMIE RANGE FOOTHILLS-
CENTRAL LARAMIE COUNTY-EAST LARAMIE COUNTY-
INCLUDING THE CITIES OF...BORDEAUX...GLENDO...WHEATLAND...
CHUGWATER...GUERNSEY...TORRINGTON...HORSE CREEK...HARRIMAN...
WHITAKER...CHEYENNE...BURNS...CARPENTER...ALBIN...PINE BLUFFS
1112 PM MDT WED JUN 6 2012

.NOW...

NUMEROUS SHOWERS AND THUNDERSTORMS WILL CONTINUE OVER SOUTHEAST
WYOMING TO THE EAST OF THE LARAMIE RANGE THROUGH 100 AM. THE STRONGEST
THUNDERSTORM IS CURRENTLY JUST TO THE EAST OF CHEYENNE AND MOVING
TO THE EAST AT AROUND 20 MPH. HEAVY RAIN AND SOME PEA SIZED HAIL CAN
BE EXPECTED FROM THIS STORM.

$$

NEZ002-003-019>021-054-055-095-096-070700-
DAWES-BOX BUTTE-SCOTTS BLUFF-BANNER-MORRILL-KIMBALL-CHEYENNE-
NORTH SIOUX-SOUTH SIOUX-
INCLUDING THE CITIES OF...CHADRON...ALLIANCE...SCOTTSBLUFF...
GERING...HARRISBURG...BRIDGEPORT...BAYARD...KIMBALL...SIDNEY...
HARRISON...AGATE
1112 PM MDT WED JUN 6 2012

.NOW...

SCATTERED LIGHT RAIN SHOWERS WILL CONTINUE OVER PORTIONS OF THE
NEBRASKA PANHANDLE THROUGH 100 AM. RAINFALL AMOUNTS WILL GENERALLY
BE LESS THAN A FEW TENTHS OF AN INCH.

$$
```

(Segmented version broken down by time periods)

```
FPUS74 KTSA 122156
NOWTSA

SHORT TERM FORECAST
NATIONAL WEATHER SERVICE TULSA OK
356 PM CST SAT DEC 12 2009

OKZ060-130400-
TULSA-
INCLUDING THE CITIES OF...TULSA...
356 PM CST SAT DEC 12 2009

THROUGH 6 PM...INCREASING CLOUDS. WINDY. TEMPERATURES 65 TO 68.
SOUTHEAST WINDS 15 TO 25 MPH WITH GUSTS TO 40 MPH.

6 PM TO 8 PM...CLOUDY WITH A FEW SHOWERS DEVELOPING. TEMPERATURES 64
TO 66. SOUTH WINDS SHIFTING TO WEST 10 TO 20 MPH.

8 PM TO 10 PM...CLOUDY AND WINDY. RAIN...HEAVY AT TIMES. TEMPERATURES
FALLING TO AROUND 50. WINDS BECOMING NORTHWEST AT 25 TO 30 MPH.

$$

ARZ019-029-130400-
CRAWFORD-SEBASTIAN-
INCLUDING THE CITIES OF...FORT SMITH...VAN BUREN...
356 PM CST SAT DEC 12 2009

THROUGH 6 PM...CLEAR. TEMPERATURES 55 TO 60. EAST WINDS 10 TO 15 MPH.

6 PM TO 8 PM...INCREASING CLOUDS. TEMPERATURES 53 TO 58. SOUTHEAST 15
TO 20 MPH.

8 PM TO 10 PM...CLOUDY WITH SHOWERS AND THUNDERSTORMS INCREASING.
TEMPERATURES 52 TO 57. SOUTHEAST WINDS 15 TO 25 MPH.

$$
```

3. Special Weather Statement.

(Sub-severe thunderstorm with optional headline)

```
WWUS84 KSJT 140313
SPSSJT

SPECIAL WEATHER STATEMENT
NATIONAL WEATHER SERVICE SAN ANGELO TX
1013 PM CDT WED JUN 13 2012

TXZ049-140400-
```

```
FISHER TX-
1013 PM CDT WED JUN 13 2012

...SIGNIFICANT WEATHER ADVISORY IN EFFECT FOR FISHER COUNTY UNTIL 1100
PM CDT...

AT 1007 PM CDT...A STRONG THUNDERSTORM WAS INDICATED BY NATIONAL
WEATHER SERVICE DOPPLER RADAR OVER HOBBS...OR ABOUT 19 MILES EAST OF
SNYDER...MOVING NORTHEAST AT 20 MPH.

* THE STRONG THUNDERSTORM WILL BE NEAR...
  ROTAN BY 1035 PM CDT
  HITSON BY 1100 PM CDT

DIME SIZE HAIL AND WIND GUSTS TO 50 MPH ARE LIKELY WITH THIS STORM.
HEAVY RAINFALL WILL CAUSE PONDING OF WATER ON AREA ROADWAYS...
ESPECIALLY THOSE IN POOR DRAINAGE AREAS. RESIDENTS ARE ENCOURAGED TO
MONITOR THE SITUATION CLOSELY AND BE PREPARED TO TAKE THE PROPER
ACTIONS SHOULD A WARNING BE ISSUED.

LAT...LON 3296 10023 3278 10014 3267 10014 3260 10063
      3269 10067 3289 10066 3297 10055
TIME...MOT...LOC 0313Z 241DEG 18KT 3281 10058

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(Severe thunderstorms approaching the area)

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WWUS83 KLOT 142103
SPSLOT

SPECIAL WEATHER STATEMENT
NATIONAL WEATHER SERVICE CHICAGO IL
403 PM CDT THU MAY 14 2009

ILZ006-013-014-022-142200-
COOK-DUPAGE-LAKE IL-WILL-
INCLUDING THE CITIES OF...CHICAGO...JOLIET...WAUKEGAN...WHEATON...
403 PM CDT THU MAY 14 2009

A LINE OF SEVERE THUNDERSTORMS WITH A HISTORY OF PRODUCING WIND
DAMAGE IS MOVING EAST AT 50 MPH TOWARD THE AREA. THESE STORMS WILL
REACH THE WESTERN SUBURBS OF CHICAGO AROUND 530 PM AND THE LAKEFRONT
AROUND 600 PM. PEOPLE IN CHICAGOLAND SHOULD BE PREPARED FOR SEVERE
WEATHER INCLUDING STRONG WINDS...FREQUENT LIGHTNING...AND VERY HEAVY
RAIN DURING THE EVENING RUSH HOUR.

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(Local dense fog)

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SPECIAL WEATHER STATEMENT
NATIONAL WEATHER SERVICE TAUNTON MA
1024 PM EDT MON MAY 21 2012

MAZ015>024-RIZ002-004>008-221100-
SUFFOLK MA-EASTERN NORFOLK MA-NORTHERN BRISTOL MA-
WESTERN PLYMOUTH MA-EASTERN PLYMOUTH MA-SOUTHERN BRISTOL MA-
SOUTHERN PLYMOUTH MA-BARNSTABLE MA-DUKES MA-NANTUCKET MA-
SOUTHEAST PROVIDENCE RI-EASTERN KENT RI-BRISTOL RI-WASHINGTON RI-
NEWPORT RI-BLOCK ISLAND RI-
INCLUDING THE CITIES OF...BOSTON...QUINCY...TAUNTON...BROCKTON...
PLYMOUTH...FALL RIVER...NEW BEDFORD...MATTAPOISETT...CHATHAM...
FALMOUTH...PROVINCETOWN...VINEYARD HAVEN...NANTUCKET...
PROVIDENCE...WARWICK...BRISTOL...NARRAGANSETT...WESTERLY...
NEWPORT...BLOCK ISLAND
1024 PM EDT MON MAY 21 2012

...AREAS OF DENSE FOG WILL CONTINUE OVERNIGHT ACROSS PORTIONS OF
SOUTHERN RHODE ISLAND AND EASTERN MASSACHUSETTS...

AREAS OF DENSE FOG WILL REDUCE VISIBILITY TO ONE QUARTER MILE OR
LESS AT TIMES. MOTORISTS SHOULD USE EXTRA CAUTION OVERNIGHT.
VISIBILITIES WILL IMPROVE BY MID MORNING TUESDAY.

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(Snow squall with optional headline)

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WWUS81 KCTP 171037
SPSCTP

SPECIAL WEATHER STATEMENT
NATIONAL WEATHER SERVICE STATE COLLEGE PA
537 AM EST THU DEC 17 2009

PAZ037-171115-
TIOGA PA-
537 AM EST THU DEC 17 2009

...HEAVY SNOW SQUALL AFFECTING TIOGA COUNTY...

A HEAVY SNOW SQUALL WILL MOVE SOUTHEAST AT 10 MPH ACROSS THE TIOGA
AND WELLSBORO AREAS BY 6 AM. VISIBILITY IN THE SQUALL WILL RAPIDLY
DROP TO LESS THAN A MILE WITH A QUICK COATING OF SNOW...CAUSING SUDDEN
HAZARDOUS DRIVING CONDITIONS.  THE SQUALL WILL MOVE INTO THE MANSFIELD
AND BLOSSBURG AREAS SHORTLY AFTER 6 AM.

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(Long-range hazardous weather)

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WWUS86 KEKA 132200
SPSEKA

SPECIAL WEATHER STATEMENT
NATIONAL WEATHER SERVICE EUREKA CA
200 PM PST SUN DEC 13 2009

CAZ001>004-076-140400-
REDWOOD COAST-MENDOCINO COAST-NORTH COAST INTERIOR-
UPPER TRINITY RIVER-MENDOCINO INTERIOR-
200 PM PST SUN DEC 13 2009

...PERIODS OF MODERATE TO HEAVY RAIN EXPECTED MONDAY NIGHT THROUGH
WEDNESDAY...

A STRONG PACIFIC STORM WILL BRING PERIODS OF MODERATE TO HEAVY RAIN
STARTING MONDAY EVENING AND CONTINUING THROUGH WEDNESDAY MORNING.
TOTAL RAINFALL AMOUNTS OF 2 TO 3 INCHES WILL BE POSSIBLE OVER A
WIDESPREAD AREA. THE KING RANGE AND SOUTH FORK WILL LIKELY RECEIVE
GREATER AMOUNTS.

LOCALIZED MINOR FLOODING WILL BE POSSIBLE...ESPECIALLY IN LOW LYING
AREAS. WATER WILL POND ON THE ROADWAYS AND VISIBILITY WILL BE
REDUCED...CAUSING HAZARDOUS DRIVING CONDITIONS.

SNOW OR A MIX OF RAIN AND SNOW IS EXPECTED MONDAY NIGHT THROUGH
WEDNESDAY MORNING ABOVE 5000 FEET. SEVERAL INCHES OF SNOW
ACCUMULATION AND GUSTY WINDS ARE EXPECTED ABOVE 6000 FEET.

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4. Hazardous Weather Outlook.

(Severe Convective Weather and other hazards, with optional headline)

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HAZARDOUS WEATHER OUTLOOK
NATIONAL WEATHER SERVICE ALBANY NY
358 AM EDT WED MAY 16 2012

NYZ032-033-038-042-058-063-082-VTZ013-014-171100-
NORTHERN HERKIMER-HAMILTON-SOUTHERN HERKIMER-NORTHERN WARREN-
WESTERN GREENE-WESTERN ULSTER-NORTHERN FULTON-BENNINGTON-
WESTERN WINDHAM-
358 AM EDT WED MAY 16 2012

THIS HAZARDOUS WEATHER OUTLOOK IS FOR THE SOUTHERN
ADIRONDACKS...WESTERN MOHAWK VALLEY AND CENTRAL AND SOUTHEAST
CATSKILLS OF EAST CENTRAL NEW YORK AND THE SOUTHERN GREEN
MOUNTAINS OF VERMONT.
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.DAY ONE...TODAY AND TONIGHT

THERE IS A SLIGHT RISK OF SEVERE THUNDERSTORMS THIS AFTERNOON INTO EARLY THIS EVENING AHEAD OF A STRONG COLD FRONT. THE POTENTIAL SEVERE THUNDERSTORMS MAY PRODUCE HAIL STONES ONE INCH IN DIAMETER AND LARGER...AND DAMAGING WINDS 58 MPH AND GREATER. THE STORMS MAY FORM INTO ONE OR MORE LINES WHICH WILL MOVE FROM WEST TO EAST AS INDIVIDUAL STORMS TRACK FROM SOUTHWEST TO NORTHEAST AT 35 TO 45 MPH.

.DAYS TWO THROUGH SEVEN...THURSDAY THROUGH TUESDAY

FROST IS POSSIBLE LATE THURSDAY NIGHT INTO EARLY FRIDAY MORNING AS TEMPERATURES ARE EXPECTED TO DROP INTO THE LOW TO MID 30S WITH SOME UPPER 20S POSSIBLE ACROSS THE WESTERN ADIRONDACKS.

.SPOTTER INFORMATION STATEMENT...

SKYWARN ACTIVATION MAY BE REQUESTED THIS AFTERNOON INTO EARLY THIS EVENING. ANY COUNTIES WHERE ACTIVATION IS REQUESTED WILL BE LISTED INDIVIDUALLY IN THIS STATEMENT.

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(Flooding and high winds)

FLUS45 KTWC 181400
HWOTWC

HAZARDOUS WEATHER OUTLOOK
NATIONAL WEATHER SERVICE TUCSON AZ
700 AM MST FRI SEP 18 2009

AZZ019-029>035-191400-
NORTHERN GREENLEE COUNTY-SOUTHEAST PINAL COUNTY-UPPER GILA RIVER VALLEY-WESTERN PIMA COUNTY-TOHONO-OODHAM NATION-TUCSON METRO/MARANA/GREEN VALLEY-SANTA CRUZ COUNTY-COCHISE COUNTY-
700 AM MST FRI SEP 18 2009

THIS HAZARDOUS WEATHER OUTLOOK IS FOR SOUTHEAST ARIZONA

.DAY ONE...TODAY...

THE REMNANTS OF HURRICANE ERIK WILL BRING HEAVY RAIN AND GUSTY WINDS ACROSS THE AREA THIS AFTERNOON AND TONIGHT. NORMALLY DRY WASHES WILL FLOOD QUICKLY AFTER THE HEAVY RAIN BEGINS. URBAN FLOODING IS ALSO LIKELY. DAMAGING WIND GUSTS ARE POSSIBLE AT ELEVATIONS ABOVE 5000 FEET BETWEEN 3 PM AND 9 PM.

.DAYS TWO THROUGH SEVEN...SATURDAY THROUGH THURSDAY

ISOLATED STRONG THUNDERSTORMS ARE POSSIBLE MONDAY AFTERNOON AND

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EVENING AS A STORM SYSTEM MOVES ACROSS THE AREA. OTHERWISE...NO
ADDITIONAL HAZARDOUS WEATHER IS EXPECTED THROUGH THE PERIOD.

.SPOTTER INFORMATION STATEMENT...

SKYWARN SPOTTER ACTIVATION WILL BE NEEDED THIS AFTERNOON AND EVENING.

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(Fire Weather)

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HAZARDOUS WEATHER OUTLOOK
NATIONAL WEATHER SERVICE FLAGSTAFF AZ
328 AM MST WED MAY 16 2012

AZZ004>018-037>040-170715-
KAIBAB PLATEAU-MARBLE AND GLEN CANYONS-GRAND CANYON COUNTRY-
COCONINO PLATEAU-YAVAPAI COUNTY MOUNTAINS-
NORTHEAST PLATEAUS AND MESAS HWY 264 NORTHWARD-CHINLE VALLEY-
CHUSKA MOUNTAINS AND DEFIANCE PLATEAU-
LITTLE COLORADO RIVER VALLEY IN COCONINO COUNTY-
LITTLE COLORADO RIVER VALLEY IN NAVAJO COUNTY-
LITTLE COLORADO RIVER VALLEY IN APACHE COUNTY-
WESTERN MOGOLLON RIM-EASTERN MOGOLLON RIM-WHITE MOUNTAINS-
NORTHERN GILA COUNTY-YAVAPAI COUNTY VALLEYS AND BASINS-
OAK CREEK AND SYCAMORE CANYONS-BLACK MESA AREA-
NORTHEAST PLATEAUS AND MESAS SOUTH OF HWY 264-
328 AM MST WED MAY 16 2012

THIS HAZARDOUS WEATHER OUTLOOK IS FOR PORTIONS OF EAST CENTRAL
ARIZONA...NORTH CENTRAL ARIZONA...NORTHEAST ARIZONA AND WEST
CENTRAL ARIZONA.

.DAY ONE...TODAY AND TONIGHT

EXPECT AREAS OF GUSTY SOUTHWESTERLY WINDS WITH SOME LOCATIONS IN
THE NORTHEAST CORNER OF ARIZONA APPROACHING CRITICAL FIRE WEATHER
CONDITIONS. ONGOING FIRES IN CENTRAL ARIZONA WILL LIKELY PRODUCE
AREAS OF DENSE SMOKE IN OR NEAR CROWN KING /GLADIATOR FIRE/ AND
RYE /SUNFLOWER FIRE/ TONIGHT.

.DAYS TWO THROUGH SEVEN...THURSDAY THROUGH TUESDAY

DRY CONDITIONS AND GUSTY SOUTHWEST WINDS ARE EXPECTED EACH
AFTERNOON THROUGH FRIDAY ACROSS NORTHERN ARIZONA. NEAR CRITICAL
FIRE CONDITIONS ARE EXPECTED ON THURSDAY. A FIRE WEATHER WATCH IS
IN EFFECT FOR FRIDAY AS DRY CONDITIONS AND SOUTHWEST WINDS OF 20
TO 35 MPH WITH GUSTS INTO THE 40 MPH RANGE ARE ANTICIPATED.

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(Marine)

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HAZARDOUS WEATHER OUTLOOK
NATIONAL WEATHER SERVICE CORPUS CHRISTI TX
541 AM CDT WED MAY 16 2012

GMZ230-235-250-255-270-275-TXZ229>234-239>247-171045-
BAYS AND WATERWAYS FROM BAFFIN BAY TO PORT ARANSAS-
BAYS AND WATERWAYS FROM PORT ARANSAS TO PORT O`CONNOR-
COASTAL WATERS FROM BAFFIN BAY TO PORT ARANSAS OUT 20 NM-
COASTAL WATERS FROM PORT ARANSAS TO MATAGORDA SHIP CHANNEL OUT
20 NM-WATERS FROM BAFFIN BAY TO PORT ARANSAS FROM 20 TO 60 NM-
WATERS FROM PORT ARANSAS TO MATAGORDA SHIP CHANNEL FROM 20 TO
60 NM-LA SALLE-MCMULLEN-LIVE OAK-BEE-GOLIAD-VICTORIA-WEBB-DUVAL-
JIM WELLS-KLEBERG-NUECES-SAN PATRICIO-ARANSAS-REFUGIO-CALHOUN-
541 AM CDT WED MAY 16 2012

THIS HAZARDOUS WEATHER OUTLOOK IS FOR SOUTH TEXAS AND THE MIDDLE
TEXAS COASTAL WATERS.

.DAY ONE...TODAY AND TONIGHT

ISOLATED THUNDERSTORMS EXPECTED TODAY OVER THE COASTAL WATERS.

.DAYS TWO THROUGH SEVEN...THURSDAY THROUGH TUESDAY

NO HAZARDOUS WEATHER IS EXPECTED AT THIS TIME.

.SPOTTER INFORMATION STATEMENT...

SPOTTER ACTIVATION IS NOT ANTICIPATED.

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(Long Range Hazardous Weather)

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HAZARDOUS WEATHER OUTLOOK
NATIONAL WEATHER SERVICE MOUNT HOLLY NJ
352 PM EDT TUE JUL 31 2012

MDZ008-012-015-019-020-NJZ001-007>010-012-016-PAZ054-055-060>062-
012000-
CECIL-KENT MD-QUEEN ANNES-TALBOT-CAROLINE-SUSSEX-WARREN-MORRIS-
HUNTERDON-SOMERSET-MIDDLESEX-SALEM-CARBON-MONROE-BERKS-LEHIGH-
NORTHAMPTON-
352 PM EDT TUE JUL 31 2012

THIS HAZARDOUS WEATHER OUTLOOK IS FOR NORTHEAST MARYLAND...NORTHERN
NEW JERSEY...NORTHWEST NEW JERSEY...SOUTHERN NEW JERSEY...EAST
CENTRAL PENNSYLVANIA AND NORTHEAST PENNSYLVANIA.

.DAY ONE...THIS AFTERNOON AND TONIGHT.
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HAZARDOUS WEATHER IS NOT EXPECTED AT THIS TIME.

.DAYS TWO THROUGH SEVEN...WEDNESDAY THROUGH MONDAY.

CLUSTERS OF THUNDERSTORMS MAY BE STRONG WEDNESDAY AFTERNOON AND EVENING AND AGAIN ON SUNDAY OR MONDAY. THEY COULD PRODUCE GUSTY WINDS AND HEAVY DOWNPOURS. EASTERN PENNSYLVANIA...NORTHEAST MARYLAND AND INTERIOR NEW JERSEY APPEAR TO BE THE MOST FAVORED REGION FOR STRONG THUNDERSTORMS ON WEDNESDAY.

.SPOTTER INFORMATION STATEMENT...

SPOTTER ACTIVATION IS NOT EXPECTED AT THIS TIME.

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DEZ001-NJZ015-017>019-PAZ067>071-012000-
NEW CASTLE-MERCER-GLOUCESTER-CAMDEN-NORTHWESTERN BURLINGTON-CHESTER-
MONTGOMERY-BUCKS-DELAWARE-PHILADELPHIA-
352 PM EDT TUE JUL 31 2012

THIS HAZARDOUS WEATHER OUTLOOK IS FOR NORTHERN DELAWARE...CENTRAL NEW JERSEY...SOUTHERN NEW JERSEY AND SOUTHEAST PENNSYLVANIA.

.DAY ONE...THIS AFTERNOON AND TONIGHT.

HAZARDOUS WEATHER IS NOT EXPECTED AT THIS TIME.

.DAYS TWO THROUGH SEVEN...WEDNESDAY THROUGH MONDAY.

CLUSTERS OF THUNDERSTORMS MAY BE STRONG WEDNESDAY AFTERNOON AND EVENING AND AGAIN ON SUNDAY OR MONDAY. THEY COULD PRODUCE GUSTY WINDS AND HEAVY DOWNPOURS.

HEAT INDEX VALUES PARTICULARLY IN URBAN AREAS SHOULD APPROACH OR EXCEED 100 DEGREES FRIDAY THROUGH MONDAY WITH THE GREATEST CHANCES ON THE WEEKEND.

.SPOTTER INFORMATION STATEMENT...

SPOTTER ACTIVATION IS NOT EXPECTED AT THIS TIME.

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(Marine/heavy snow threats, discussion of uncertainty, segmented example)

FLUS41 KBOX 171100
HWOBOX

HAZARDOUS WEATHER OUTLOOK
NATIONAL WEATHER SERVICE TAUNTON MA
600 AM EST THU DEC 17 2009

CTZ002>004-MAZ002>024-026-NHZ011-012-015-RIZ001>008-181100-
HARTFORD CT-TOLLAND CT-WINDHAM CT-WESTERN FRANKLIN MA-

EASTERN FRANKLIN MA-NORTHERN WORCESTER MA-CENTRAL MIDDLESEX MA-
WESTERN ESSEX MA-EASTERN ESSEX MA-WESTERN HAMPSHIRE MA-
WESTERN HAMPDEN MA-EASTERN HAMPSHIRE MA-EASTERN HAMPDEN MA-
SOUTHERN WORCESTER MA-WESTERN NORFOLK MA-SOUTHEAST MIDDLESEX MA-
SUFFOLK MA-EASTERN NORFOLK MA-NORTHERN BRISTOL MA-
WESTERN PLYMOUTH MA-EASTERN PLYMOUTH MA-SOUTHERN BRISTOL MA-
SOUTHERN PLYMOUTH MA-BARNSTABLE MA-DUKES MA-NANTUCKET MA-
NORTHERN MIDDLESEX MA-CHESHIRE NH-EASTERN HILLSBOROUGH NH-
WESTERN AND CENTRAL HILLSBOROUGH NH-NORTHWEST PROVIDENCE RI-
SOUTHEAST PROVIDENCE RI-WESTERN KENT RI-EASTERN KENT RI-BRISTOL RI-
WASHINGTON RI-NEWPORT RI-BLOCK ISLAND RI-
600 AM EST THU DEC 17 2009

THIS HAZARDOUS WEATHER OUTLOOK IS FOR NORTHERN
CONNECTICUT...CENTRAL MASSACHUSETTS...EASTERN
MASSACHUSETTS...NORTHEASTERN MASSACHUSETTS...SOUTHEASTERN
MASSACHUSETTS...WESTERN MASSACHUSETTS...SOUTHERN NEW
HAMPSHIRE...NORTHERN RHODE ISLAND AND SOUTHERN RHODE ISLAND.

.DAY ONE...THIS AFTERNOON AND TONIGHT

NO HAZARDOUS WEATHER IS EXPECTED AT THIS TIME.

.DAYS TWO THROUGH SEVEN...FRIDAY THROUGH WEDNESDAY

A COASTAL STORM MAY BRING ACCUMULATING SNOW TO MUCH OF SOUTHERN NEW
ENGLAND LATE SATURDAY INTO SUNDAY. THE MOST LIKELY SCENARIO WOULD
BRING MODERATE SNOWFALL OF 2 TO 6 INCHES TO NORTHEAST
CONNECTICUT...RHODE ISLAND AND EASTERN MASSACHUSETTS...FROM BOSTON TO
CAPE COD AND THE ISLANDS. STRONG NORTHEAST WINDS ARE POSSIBLE ALONG
THE COAST.

THERE IS UNCERTAINTY AS TO THE TRACK OF THIS STORM. IF IT PASSES
CLOSER TO NANTUCKET...IT WOULD BRING HIGHER ACCUMULATIONS AND AFFECT
MORE OF SOUTHERN NEW ENGLAND. IF IT PASSES FARTHER OUT TO SEA...LESSER
IMPACTS CAN BE EXPECTED ON LAND.

.SPOTTER INFORMATION STATEMENT...

SPOTTER ACTIVATION IS NOT EXPECTED AT THIS TIME.

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ANZ230>237-250-251-254>256-181100-
BOSTON HARBOR-CAPE COD BAY-NANTUCKET SOUND-VINEYARD SOUND-
BUZZARDS BAY-RHODE ISLAND SOUND-NARRAGANSETT BAY-BLOCK ISLAND SOUND-
COASTAL WATERS EAST OF IPSWICH BAY AND THE STELLWAGEN BANK NATIONAL
MARINE SANCTUARY-MASSACHUSETTS BAY AND IPSWICH BAY-COASTAL WATERS
FROM PROVINCETOWN MA TO CHATHAM MA TO NANTUCKET MA OUT 20 NM-COASTAL
WATERS EXTENDING OUT TO 25 NM SOUTH OF MARTHAS VINEYARD AND NANTUCKET-
COASTAL WATERS FROM MONTAUK NY TO MARTHAS VINEYARD EXTENDING OUT TO 20
NM SOUTH OF BLOCK ISLAND-
600 AM EST THU DEC 17 2009

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THIS HAZARDOUS WEATHER OUTLOOK IS FOR MASSACHUSETTS COASTAL WATERS AND
RHODE ISLAND COASTAL WATERS.

.DAY ONE...THIS AFTERNOON AND TONIGHT

NO HAZARDOUS WEATHER IS EXPECTED AT THIS TIME.

.DAYS TWO THROUGH SEVEN...FRIDAY THROUGH WEDNESDAY

HEAVY SNOW AND GALE FORCE NORTH TO NORTHEAST WINDS ARE POSSIBLE
SATURDAY NIGHT INTO SUNDAY AS A COASTAL STORM TRACKS SOUTHEAST OF
NANTUCKET.

.SPOTTER INFORMATION STATEMENT...

SPOTTER ACTIVATION IS NOT EXPECTED AT THIS TIME.

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(No Hazardous Weather)

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HAZARDOUS WEATHER OUTLOOK
NATIONAL WEATHER SERVICE TAUNTON MA
1136 PM EDT SAT JUN 2 2012

CTZ002>004-MAZ002>006-008>014-017-018-020-021-023-024-026-NHZ011-012-
015-RIZ001>008-040345-
HARTFORD CT-TOLLAND CT-WINDHAM CT-WESTERN FRANKLIN MA-
EASTERN FRANKLIN MA-NORTHERN WORCESTER MA-CENTRAL MIDDLESEX MA-
WESTERN ESSEX MA-WESTERN HAMPSHIRE MA-WESTERN HAMPDEN MA-
EASTERN HAMPSHIRE MA-EASTERN HAMPDEN MA-SOUTHERN WORCESTER MA-
WESTERN NORFOLK MA-SOUTHEAST MIDDLESEX MA-NORTHERN BRISTOL MA-
WESTERN PLYMOUTH MA-SOUTHERN BRISTOL MA-SOUTHERN PLYMOUTH MA-
DUKES MA-NANTUCKET MA-NORTHERN MIDDLESEX MA-CHESHIRE NH-
EASTERN HILLSBOROUGH NH-WESTERN AND CENTRAL HILLSBOROUGH NH-
NORTHWEST PROVIDENCE RI-SOUTHEAST PROVIDENCE RI-WESTERN KENT RI-
EASTERN KENT RI-BRISTOL RI-WASHINGTON RI-NEWPORT RI-BLOCK ISLAND RI-
1136 PM EDT SAT JUN 2 2012

THIS HAZARDOUS WEATHER OUTLOOK IS FOR NORTHERN
CONNECTICUT...CENTRAL MASSACHUSETTS...EASTERN
MASSACHUSETTS...NORTHEASTERN MASSACHUSETTS...SOUTHEASTERN
MASSACHUSETTS...WESTERN MASSACHUSETTS...SOUTHERN NEW
HAMPSHIRE...NORTHERN RHODE ISLAND AND SOUTHERN RHODE ISLAND.

.DAY ONE...TONIGHT.

NO HAZARDOUS WEATHER IS EXPECTED AT THIS TIME.

.DAYS TWO THROUGH SEVEN...SUNDAY THROUGH FRIDAY.
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NO HAZARDOUS WEATHER IS EXPECTED AT THIS TIME.

.SPOTTER INFORMATION STATEMENT...

SPOTTER ACTIVATION IS NOT REQUESTED AT THIS TIME.

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5. Preliminary Local Storm Report.

(Winter storm with optional free-text remarks)

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NWUS55 KPIH 161810
LSRPIH

PRELIMINARY LOCAL STORM REPORT...SUMMARY
NATIONAL WEATHER SERVICE POCATELLO ID
1110 AM MST WED DEC 16 2009

..TIME...   ...EVENT...      ...CITY LOCATION...     ...LAT.LON...
..DATE...   ....MAG....      ..COUNTY LOCATION..ST.. ...SOURCE....
            ..REMARKS..

0800 AM     SNOW             KETCHUM                 43.69N 114.38W
12/16/2009  M3.5 INCH        BLAINE             ID   CO-OP OBSERVER

            TOTAL IN THE LAST 24 HOURS WITH 5 INCHES ON THE GROUND.

0800 AM     SNOW             HAILEY                  43.51N 114.30W
12/16/2009  M4.5 INCH        BLAINE             ID   CO-OP OBSERVER

            TOTAL IN THE LAST 24 HOURS WITH 6 INCHES ON THE GROUND.

0958 AM     HEAVY SNOW       5 WSW GANNETT           43.33N 114.27W
12/16/2009  M8.0 INCH        BLAINE             ID   TRAINED SPOTTER

            REPORT INCLUDES ENTIRE STORM ACCUMULATION.

0958 AM     HEAVY SNOW       3 WNW GALENA            43.87N 114.66W
12/16/2009  E10.0 INCH       BLAINE             ID   TRAINED SPOTTER

            REPORT INCLUDES ENTIRE STORM TOTAL ACCUMULATION.

1100 AM     HEAVY SNOW       17 WSW OAKLEY           42.15N 114.19W
12/16/2009  U10.0 INCH       CASSIA             ID   PARK/FOREST SRVC

            REPORTED AT BOSTETTER RANGER STATION AT 7500 FEET.
1100 AM     BLIZZARD         9 ENE BASIN             42.30N 113.62W
12/16/2009  E18.0 INCH       CASSIA             ID   LAW ENFORCEMENT

            NEAR ZERO VISIBILITY ALONG OAKLEY ELBA ROAD ALL
            MORNING WITH DRIFTS TO 4 FEET AND TEMPERATURE NEAR 15.
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1100 AM     HEAVY SNOW       16 WSW KETCHUM          43.60N 114.67W
12/16/2009  E7.5 INCH        CAMAS              ID   MESONET

            REPORTED AT DOLLARHIDE SUMMIT AT 8420 FEET.

1100 AM     HEAVY SNOW       3 W GALENA              43.87N 114.71W
12/16/2009  E7.5 INCH        BLAINE             ID   MESONET

            REPORTED AT GALENA SUMMIT AT 8780 FEET.

&&

OUR THANKS TO NWS SKYWARN STORM SPOTTERS AND COOPERATIVE OBSERVERS
FOR THEIR TIMELY REPORTS DURING THIS WINTER STORM.

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(Tornado with injury)

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NWUS53 KICT 270002
LSRICT

PRELIMINARY LOCAL STORM REPORT...CORRECTED
NATIONAL WEATHER SERVICE WICHITA KS
702 PM CDT SAT MAY 26 2012

..TIME...   ...EVENT...      ...CITY LOCATION...     ...LAT.LON...
..DATE...   ....MAG....      ..COUNTY LOCATION..ST.. ...SOURCE....
            ..REMARKS..

0945 PM     TORNADO          RUSSELL                 42.07N 95.91W
05/25/2012                   RUSSELL            KS   EMERGENCY MNGR

            *** 1 INJ *** TRAINED SPOTTER REPORTED DAMAGE FROM THE
            ROPE TORNADO WHICH DESTROYED ONE MODULAR HOME ON THE
            SOUTH SIDE OF RUSSELL. THE OCCUPANT HAD A FEW CUTS AND WAS
            LATER TRANSPORTED TO THE HOSPITAL FOR A BROKEN COLLAR
            BONE. HOUSES ON EITHER SIDE OF THE HOME RECEIVED MINOR
            DAMAGE.

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(Various events)

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NWUS53 KOAX 281401
LSROAX

PRELIMINARY LOCAL STORM REPORT...SUMMARY
NATIONAL WEATHER SERVICE OMAHA/VALLEY NE
901 AM CDT MON MAY 28 2012

..TIME...   ...EVENT...      ...CITY LOCATION...     ...LAT.LON...
..DATE...   ....MAG....      ..COUNTY LOCATION..ST.. ...SOURCE....
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..REMARKS..

0457 PM	HAIL	5 S WINSIDE		42.11N 97.17W
05/27/2012	E1.75 INCH	WAYNE	NE	CO-OP OBSERVER

0500 PM	HAIL	1 S ELGIN		41.97N 98.08W
05/27/2012	E1.00 INCH	ANTELOPE	NE	TRAINED SPOTTER

A FUNNEL CLOUD WAS REPORTED WITH THIS STORM.

0505 PM	HAIL	ELGIN		41.98N 98.08W
05/27/2012	E1.00 INCH	ANTELOPE	NE	CO-OP OBSERVER

0506 PM	TORNADO	8 SE ELGIN		41.90N 97.97W
05/27/2012		BOONE	NE	LAW ENFORCEMENT

THE TORNADO WAS 6 MILES EAST AND 5 MILES SOUTH OF ELGIN

0512 PM	HAIL	ELGIN		41.98N 98.08W
05/27/2012	E2.50 INCH	ANTELOPE	NE	CO-OP OBSERVER

WINDOWS WERE BROKEN OUT OF CARS AND BUILDINGS. A LARGE TREE WAS DOWN ON ROAD 4 MILES SE OF ELGIN.

0525 PM	HAIL	OAKDALE		42.07N 97.97W
05/27/2012	E2.50 INCH	ANTELOPE	NE	EMERGENCY MNGR

MOST OF THE HAIL WAS GOLF BALL SIZE...BUT SOME WAS TENNIS BALL SIZE. SIDING WAS STRIPPED OFF HOMES. GLASS WAS BROKEN OUT OF CARS AND BUILDINGS.

0537 PM	HAIL	PIERCE		42.20N 97.53W
05/27/2012	M1.75 INCH	PIERCE	NE	CO-OP OBSERVER

0542 PM	FLOOD	1 E ELGIN		41.98N 98.06W
05/27/2012		ANTELOPE	NE	EMERGENCY MNGR

WATER WAS OVER A RURAL ROAD...WASHING OVER A BRIDGE.

0548 PM	HAIL	PRIMROSE		41.62N 98.24W
05/27/2012	E1.50 INCH	BOONE	NE	LAW ENFORCEMENT

THE TIME WAS ESTIMATED

0557 PM	HAIL	5 W RANDOLPH		42.38N 97.46W
05/27/2012	E2.75 INCH	PIERCE	NE	LAW ENFORCEMENT

0605 PM	TORNADO	7 NW NEWMAN GROVE		41.82N 97.87W
05/27/2012		BOONE	NE	PUBLIC

0617 PM	HAIL	6 S UTICA		40.81N 97.35W
05/27/2012	E1.75 INCH	SEWARD	NE	LAW ENFORCEMENT

THE HAIL OCCURRED NEAR MILE MARKER 366 SOUTH OF UTICA.

0630 PM	TORNADO	2 SW BATTLE CREEK		41.98N 97.63W
05/27/2012		MADISON	NE	FIRE DEPT/RESCUE
0635 PM	HAIL	1 S ALBION		41.67N 98.00W
05/27/2012	E1.00 INCH	BOONE	NE	TRAINED SPOTTER
0639 PM	HAIL	ALBION		41.69N 98.00W
05/27/2012	E0.75 INCH	BOONE	NE	LAW ENFORCEMENT
0652 PM	HAIL	DAVID CITY		41.25N 97.13W
05/27/2012	E1.75 INCH	BUTLER	NE	EMERGENCY MNGR

HAIL WAS UP TO GOLFBALL SIZE BUT MOSTLY PING PONG BALL SIZE AND SMALLER.

0725 PM	HAIL	2 ESE SEWARD		40.90N 97.06W
05/27/2012	E1.25 INCH	SEWARD	NE	TRAINED SPOTTER
0735 PM	TSTM WND GST	1 NE WAHOO		41.23N 96.61W
05/27/2012	M58.00 MPH	SAUNDERS	NE	AWOS
0820 PM	HAIL	3 S HUMPHREY		41.64N 97.49W
05/27/2012	E1.00 INCH	PLATTE	NE	TRAINED SPOTTER
0857 PM	FLASH FLOOD	4 NW WAYNE		42.28N 97.07W
05/27/2012		WAYNE	NE	TRAINED SPOTTER

WATER FROM FLOODED CORN FIELDS FLOWED OVER ROADS.

0922 PM	FLASH FLOOD	STANTON		41.95N 97.22W
05/27/2012		STANTON	NE	LAW ENFORCEMENT

STREET FLOODING OCCURRED IN STANTON.

0922 PM	FLASH FLOOD	PILGER		42.01N 97.05W
05/27/2012		STANTON	NE	LAW ENFORCEMENT

STREET FLOODING OCCURRED IN PILGER.

0946 PM	FLASH FLOOD	COLUMBUS		41.43N 97.36W
05/27/2012		PLATTE	NE	TRAINED SPOTTER

WATER WAS OVER ROAD NEAR CARRIAGE HOUSE ESTATES. WATER WAS 4 TO 18 INCHES DEEP.

1001 PM	FLASH FLOOD	1 N COLUMBUS		41.45N 97.36W
05/27/2012		PLATTE	NE	TRAINED SPOTTER

WATER WAS 2 TO 3 FEET DEEP IN PARTS OF NORTH COLUMBUS. THREE CARS STALLED.

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(Marine Event)

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NWUS51 KAKQ 301301
LSRAKQ

PRELIMINARY LOCAL STORM REPORT...SUMMARY
NATIONAL WEATHER SERVICE WAKEFIELD VA
901 AM EDT MON JUL 30 2012

..TIME...   ...EVENT...      ...CITY LOCATION...     ...LAT.LON...
..DATE...   ....MAG....      ..COUNTY LOCATION..ST.. ...SOURCE....
            ..REMARKS..

0800 AM     WATER SPOUT      2 ESE FLEETON           37.81N 76.25W
07/30/2012                   ANZ630             VA   911 CALL CENTER

WATERSPOUT WAS REPORTED BY WATERMAN.

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6. <u>Mesoscale Discussion</u>.

(Winter Weather Discussion)

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NWS STORM PREDICTION CENTER NORMAN OK
1128 PM CST TUE FEB 28 2012

AREAS AFFECTED...NRN LOWER MI

CONCERNING...WINTER MIXED PRECIPITATION

VALID 290528Z - 291130Z

SUMMARY...HEAVY SNOW WILL DEVELOP ACROSS NORTHERN PORTIONS LOWER
MICHIGAN OVER THE NEXT COUPLE OF HOURS AND PERSIST THROUGH EARLY
MORNING. SNOWFALL RATES WILL MAINLY RANGE FROM .5 TO 1 IN/HR. FURTHER
SOUTH ACROSS THE DISCUSSION AREA...MIXED PRECIPITATION TYPES OF
FREEZING RAIN AND SLEET ARE EXPECTED TO PREVAIL.

DISCUSSION...A SFC LOW CURRENTLY LOCATED OVER NORTHEAST NEBRASKA WILL
CONTINUE TO TRACK NORTHEAST THROUGH THE EARLY MORNING HOURS AS WILL
THE ASSOCIATED UPPER LEVEL TROUGH...NOW SITUATED FROM CENTRAL KANSAS
NORTHWESTWARD TOWARD THE WESTERN DAKOTAS. AS THIS SYSTEM LIFTS
NORTHEAST...A BAND OF FRONTOGENESIS AROUND THE 850-700 MB LAYER WILL
PIVOT EASTWARD FROM MINNESOTA AND WISCONSIN INTO NORTHERN MICHIGAN.
AIDED BY DEEP LAYER ASCENT THROUGH A DEEP SATURATED ENVIRONMENT AND
NEARLY 50 MB DEEP DENDRITIC ZONE...PERIODS OF HEAVY SNOW ARE
EXPECTED. POINT FORECAST SOUNDING INDICATE THAT THE VERTICAL THERMAL
PROFILE WILL REMAIN SUB-FREEZING THROUGHOUT AND THE PRECIPITATION
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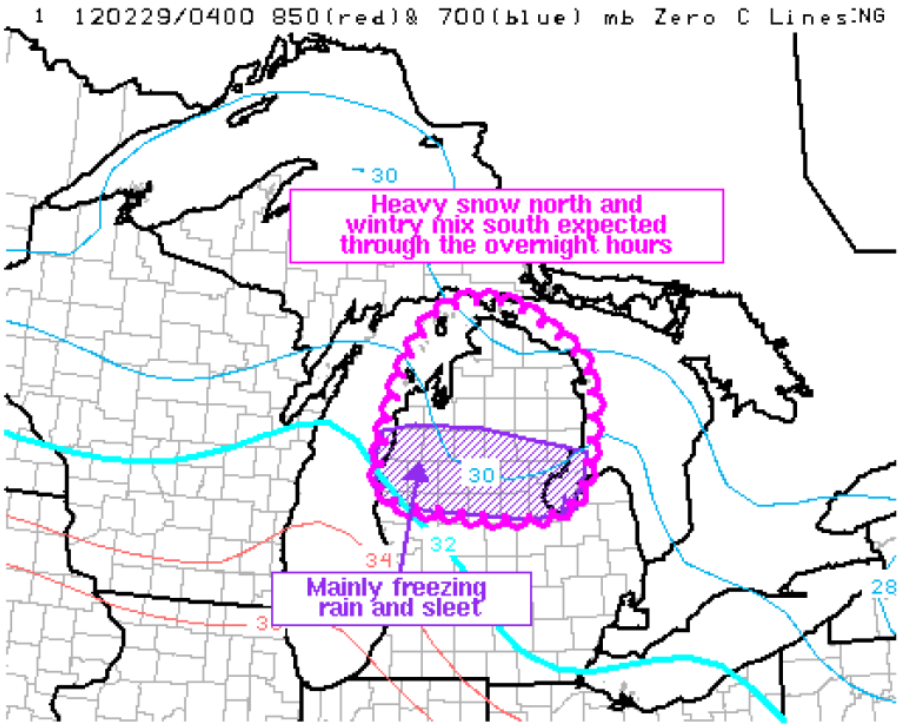
TYPE WILL REMAIN ALL SNOW THROUGH THE EARLY MORNING HOURS.

FURTHER SOUTH ACROSS THE DISCUSSION AREA...WARMER MIDLEVEL TEMPERATURES ON THE ORDER OF 1 TO 3 DEG C WILL LEAD TO MAINLY SLEET AND FREEZING RAIN AT THE SFC. SOME AREAS MAY EVEN TRANSITION TO RAIN BY 12Z ACROSS FAR SOUTHERN PARTS OF THE MCD AREA.

..LEITMAN.. 02/29/2012

ATTN...WFO...DTX...APX...GRR...
LAT...LON 44618635 45248609 45848561 45948504 45938455 45888430
45468355 45398345 45018315 44378321 43878335 43608366
43548436 43648580 43768644 44098645 44618635

(Winter Weather Graphic)



SPC MCD #0174

(Heavy Rainfall Discussion)

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MESOSCALE DISCUSSION 0112
NWS STORM PREDICTION CENTER NORMAN OK
0342 AM CST SAT FEB 04 2012

AREAS AFFECTED...PORTIONS S-CENTRAL/SE TX.

CONCERNING...HEAVY RAINFALL

VALID 040942Z - 041245Z

INITIALLY WIDELY SCATTERED AREAS OF 1-3 INCH/HOUR RAIN RATES MAY
BECOME MORE WIDESPREAD AS BAND OF TSTMS OVER S-CENTRAL THROUGH
E-CENTRAL TX BECOMES BETTER-DEFINED BY FRONTAL INTRUSION/ASCENT.
PEAK OF HEAVY RAIN THREAT...INCLUDING SUSTAINED RAINFALL WITH
SLOW-MOVING/MERGING/TRAINING CELLS...WILL BE THROUGH 12Z.

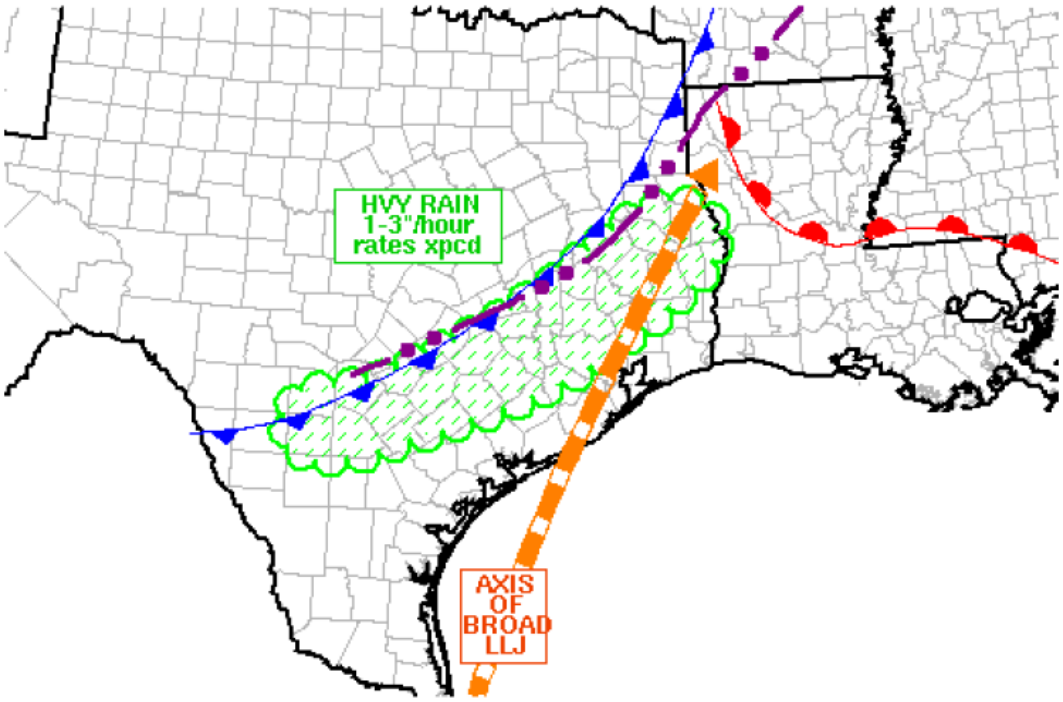
09Z SFC MESOANALYSIS SHOWED COLD FRONT...EXTENDING SWWD FROM WEAK
LOW OVER WRN AR TO JUST SE OF TXK-GGG-HDO LINE. FRONT HAS CAUGHT UP
TO PRE-EXISTING CONVECTIVE BAND FROM ABOUT I-45 SWWD...AND SHOULD DO
SO OVER REMAINDER E TX SEGMENT DURING NEXT 2 HOURS. COLD FRONT HAS
UNDERCUT TSTM LINE OVER SAT AREA...THOUGH CONVECTION IS PERSISTING
AND MAY EVEN BACKBUILD AS FRONTAL ASCENT ACTS ON FAVORABLE
MOISTURE/BUOYANCY IN ELEVATED LOW-LEVEL AIR MASS. ENHANCED LIFT
FROM FRONTAL FORCING ALL ALONG THIS BAND...AND STORM-RELATIVE INFLOW
AIDED BY BROAD/20-30 KT LLJ...WILL ACT TO CONCENTRATE/ENHANCE PRECIP
FIELDS. INFLOW SECTOR WILL REMAIN CHARACTERIZED BY UPPER 60S TO LOW
70S SFC DEW POINTS...LAYER RH AOA 90%...AND PW REACHING 1.5-1.75
INCH RANGE. PRECIP LOADING ALSO MAY CONTRIBUTE TO THREAT FOR
ISOLATED/LOCALIZED DAMAGING GUSTS...HOWEVER SVR HAZARD APPEARS TOO
DISORGANIZED FOR WW AND IS SECONDARY TO THREAT FROM HEAVY RAIN. AS
FRONT CONTINUES TO CROSS S AND SE TX...ESPECIALLY AFTER ABOUT
12Z...NET SEWD MOTION OF TSTM BAND SHOULD ACCELERATE...REDUCING
AMOUNT OF TIME THAT HEAVIEST RAIN RATES ARE LIKELY TO REMAIN OVER
MOST SPOTS.

..EDWARDS.. 02/04/2012


ATTN...WFO...LCH...SHV...HGX...CRP...EWX...

LAT...LON   29369925 29569821 30569620 31559472 31589382 30919374
            29709549 28909760 28559894 28829946 29369925
```

(Heavy Rainfall Graphic)



SPC MCD #0112

(Watch Update Discussion)

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MESOSCALE DISCUSSION 1147
NWS STORM PREDICTION CENTER NORMAN OK
0738 PM CDT TUE JUN 12 2012

AREAS AFFECTED...ERN NM...WEST TX

CONCERNING...SEVERE THUNDERSTORM WATCH 383...

VALID 130038Z - 130145Z

THE SEVERE WEATHER THREAT FOR SEVERE THUNDERSTORM WATCH 383 CONTINUES.

SUMMARY...SEVERE THREAT PERSISTS ACROSS THE SRN HIGH PLAINS THIS
EVENING...ESPECIALLY ACROSS SERN NM INTO THE PERMIAN BASIN OF WEST TX.

DISCUSSION...SEVERAL STORM CLUSTERS...WITH ISOLATED SUPERCELLS...HAVE
EVOLVED ACROSS THE SRN HIGH PLAINS FROM SERN NM TO NEAR MAF. THIS
ACTIVITY INITIATED WITHIN UPSLOPE REGIONS WHERE STRONG HEATING
CONTRIBUTED TO AIRMASS DESTABILIZATION. 00Z SOUNDING FROM MAF APPEARED
TO SAMPLE ENVIRONMENT JUST WEST OF OUTFLOW PER STEEP LOW LEVEL LAPSE
RATES AND MID 50S DEW POINTS. THIS SOUNDING SUPPORTS SUPERCELL
STRUCTURES THAT WILL LIKELY PROPAGATE SLOWLY EWD... ESPECIALLY GIVEN
THAT A SEGMENT OF THE LLJ SHOULD INCREASE ACROSS THE PERMIAN BASIN
INTO SERN NM OVER THE NEXT NEW HOURS. WITH INCREASING SHEAR ALONG WWD
MOVING OUTFLOW BOUNDARY IT WOULD SEEM THESE STORMS WILL EXPERIENCE
```

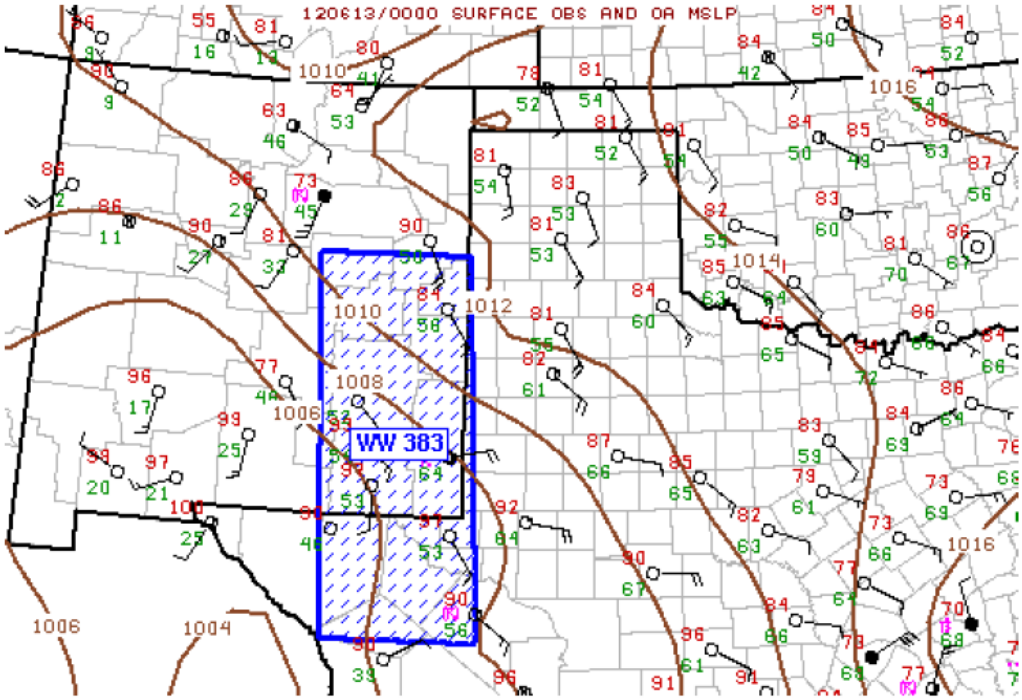
SOME LONGEVITY AND PERSIST WELL AFTER DARK. LARGE HAIL REMAINS THE PRIMARY SEVERE THREAT.

..DARROW.. 06/13/2012

ATTN...WFO...LUB...AMA...MAF...ABQ...EPZ...

LAT...LON 30570486 34990512 34980300 30580283 30570486

(Watch Update Graphic)



SPC MCD #1147

(Severe Potential Mesoscale Discussion)

MESOSCALE DISCUSSION 1289
NWS STORM PREDICTION CENTER NORMAN OK
0202 PM CDT TUE JUN 26 2012

AREAS AFFECTED...S-CNTRL/SERN TX

CONCERNING...SEVERE POTENTIAL...WATCH POSSIBLE

VALID 261902Z - 262100Z

PROBABILITY OF WATCH ISSUANCE...60 PERCENT

SUMMARY...AT LEAST ISOLATED HIGH-BASED TSTMS SHOULD FORM WITHIN A

HOT THERMODYNAMIC ENVIRONMENT BY LATE AFTERNOON. WITH MODERATE MID-LEVEL NELYS...UPDRAFTS COULD COALESCE INTO AN ORGANIZED CLUSTER WITH THREATS OF ISOLATED SEVERE WIND AND HAIL.

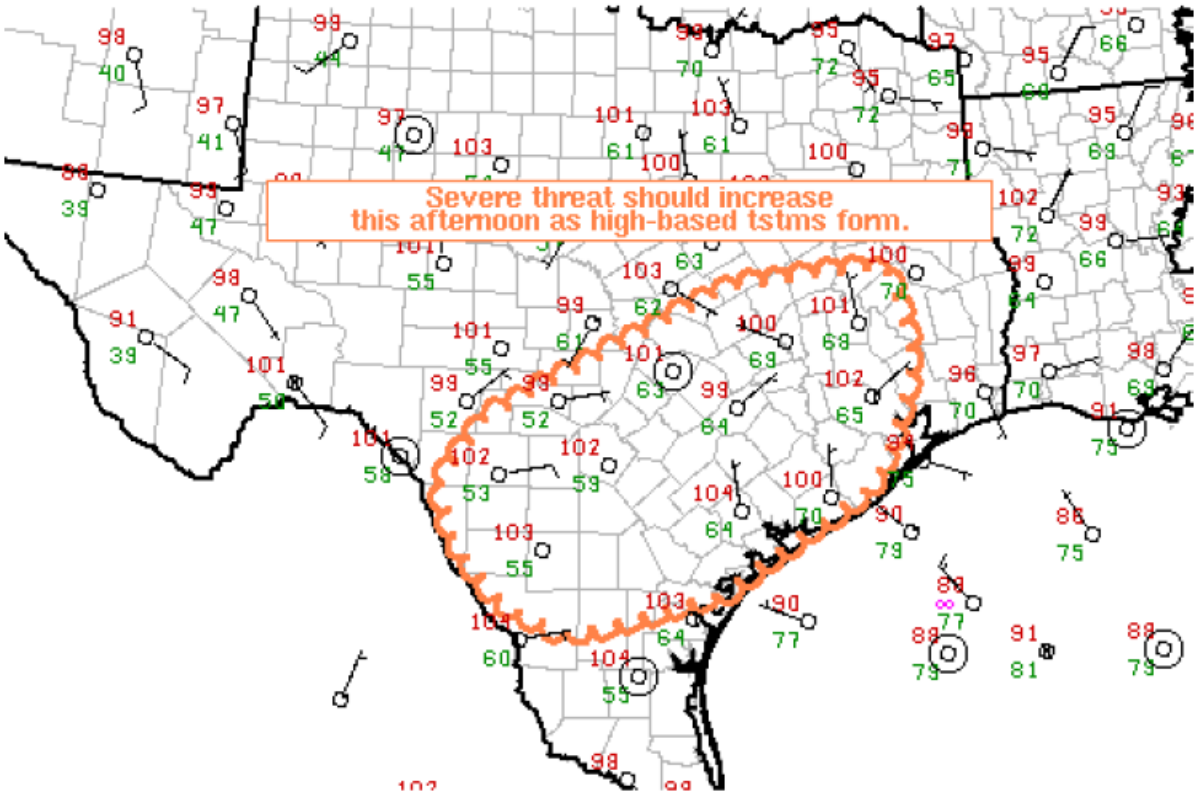
DISCUSSION...CU HAS INCREASED IN THE PAST HOUR IN VISIBLE SATELLITE IMAGERY ALONG THE COASTAL PLAIN AND HILL COUNTRY. PRESENCE OF SCATTERED CIRRUS SUGGESTS A SUBTLE UPPER-LEVEL IMPULSE ALONG THE WRN GULF COAST MAY BE ENHANCING ASCENT. WITH SURFACE TEMPERATURES NOW REACHING 100-105...MLCIN SHOULD BE WEAK WITH A DEEPLY-MIXED BOUNDARY LAYER PER ACARS DATA INVOF AUS. GUIDANCE IS FAIRLY CONSISTENT THAT TSTMS SHOULD FORM...ALTHOUGH THE LACK OF WELL-DEFINED SURFACE/UPPER-LEVEL FEATURES BREEDS UNCERTAINTY IN WHERE DEVELOPMENT WILL FOCUS. NEVERTHELESS...PRESENCE OF 30-35 KT MID-LEVEL NELYS SAMPLED IN THE LEDBETTER TX PROFILER WOULD BE SUFFICIENT FOR ORGANIZING UPDRAFTS. THE STEEP LAPSE RATE ENVIRONMENT SHOULD PROMOTE RISKS FOR SEVERE WIND AND SOME HAIL.

..GRAMS/WEISS.. 06/26/2012

ATTN...WFO...HGX...FWD...CRP...EWX...

LAT...LON 29779993 30519839 31169694 31319508 30339483 29149531
27999721 27599886 27869963 28460022 29090042 29779993

(Severe Potential Graphic)



SPC MCD #1289

APPENDIX B - Preliminary Local Storm Report Event Sources and Types

PRELIMINARY LOCAL STORM REPORT EVENT SOURCES

AIRPLANE PILOT
AMATEUR RADIO
ASOS
AWOS
BROADCAST MEDIA
BUOY
C-MAN STATION
COAST GUARD
CO-OP OBSERVER
COUNTY OFFICIAL
DEPT OF HIGHWAYS
EMERGENCY MNGR
FIRE DEPT/RESCUE
INSURANCE CO
LAW ENFORCEMENT
MESONET
NEWSPAPER
NWS EMPLOYEE
NWS STORM SURVEY
OFFICIAL NWS OBS
OTHER FEDERAL
PARK/FOREST SRVC
POST OFFICE
PUBLIC
SHIP
STORM CHASER
TRAINED SPOTTER
UNKNOWN
UTILITY COMPANY

PRELIMINARY LOCAL STORM REPORT WEATHER EVENT TYPES

AVALANCHE
BLIZZARD
*DENSE FOG
*DOWNBURST
DROUGHT
DUST STORM
EXCESSIVE HEAT
EXTREME COLD
EXTR WIND CHILL
FLASH FLOOD
FLOOD
FREEZE
*FREEZING RAIN
FUNNEL CLOUD
*HAIL
HEAVY RAIN
*HEAVY SNOW
HIGH ASTR TIDES
*HIGH SUST WINDS
HURRICANE
ICE STORM
LIGHTNING
*MARINE HAIL
*MARINE TSTM WIND
NON-TSTM WND DMG
*NON-TSTORM WND GST
RIP CURRENTS
SEICHE
*SLEET
*SNOW
STORM SURGE
TORNADO
TROPICAL STORM
TSTM WND DMG
*TSTM WND GST
WATER SPOUT
WILDFIRE

*Events which require an estimated (E), measured (M) or unknown origin (U) designation.

Department of Commerce • National Oceanic & Atmospheric Administration • National Weather Service

NATIONAL WEATHER SERVICE INSTRUCTION 10-310

JUNE 18, 2019

Operations and Services

Marine, Tropical, and Tsunami Services Branch, NWSPD 10-3

COASTAL WATERS FORECAST

NOTICE: This publication is available at: http://www.nws.noaa.gov/directives/.

OPR: AFS26 (W. Presnell) **Certified by:** AFS2 (A. Allen)

Type of Issuance: Routine

SUMMARY OF REVISIONS: This instruction supersedes NWSI 10-310, *Coastal Waters Forecast*, dated April 18, 2017.

The following revisions were made to this directive:

1. Updated examples to show use of mixed case.
2. Adjusted wording to reflect consolidation of Small Craft Advisories into one headline.
3. In section 2.2.3, removed the phrase "but no earlier than 1 hour before this issuance time."
4. In section 2.3.5 b1, edited first sentence to read "When a tropical cyclone warning is in effect, the warning headline should supersede all other headlines in the area covered by the tropical cyclone warning."
5. Removed Note indicating an exception for Alaska Region (top of page 8)
6. In section 2.3.8, added wording that knots should be the unit used to represent wind speed and the term "knot(s)" or "kt" is acceptable in representing wind speed. Also, removed any use of "kts" for knots and used "knot" in body and used "kt" to indicate knots in examples.
7. In section 2.3.8c, indicated that "visibility" should be spelled out and not abbreviated.
8. In section 2.4, added that NWSI 10-1701 has information on character line and total character limitations.

Signed 06/04/2019

_____

Andrew D. Stern Date
Director
Analyze, Forecast, and Support Office

COASTAL WATERS FORECAST

Table of Contents **Page**

1 Introduction

This procedural instruction provides product specifications for the main alphanumeric coastal weather products issued by the National Weather Service (NWS) Weather Forecast Offices (WFOs) and Weather Service Office (WSO) Pago Pago.

2 Coastal Waters Forecast (Product Category CWF)

2.1 Mission Connection

The Coastal Waters Forecast (CWF) is a text product issued by all coastal WFOs and WSO Pago Pago to explicitly state expected weather conditions within their marine forecast area of responsibility through Day 5. The CWF is used by a wide variety of marine users and partners including the media, emergency managers, and the general public. It is primarily used as a tool for planning purposes to support and promote safe transportation across the coastal waters.

2.2 Issuance Guidelines

Forecasters should ensure the values included within the CWF are consistent with the values from the associated gridded forecast elements.

2.2.1 Creation Software

WFOs will produce the CWF using the Advanced Weather Interactive Processing System (AWIPS) software formatters. The Interactive Forecast Preparation System (IFPS) Graphical Forecast Editor (GFE) application formatting tools will be used for generation of product content. All WFOs with the exception of American Samoa and WFO Guam (for the East and West Micronesia forecast) offices will use the Graphical Hazard Generator (GHG) to produce hazard headlines. American Samoa (WSO Pago Pago) and Guam (for Micronesia) offices will use regionally-approved creation software until AWIPS capabilities become available.

2.2.2 Issuance Criteria

The CWF will be issued twice per day with updates as necessary. Regions, as dictated by user requirements, may require scheduled updates.

2.2.3 Issuance Time

CWFs are issued routinely. Two daily issuances are mandatory. Some offices will issue more than two routine forecasts daily. Forecasters should make the CWF available to users by the scheduled issuance time. The issuance time is expressed in Coordinated Universal Time (UTC), while the mass media header is expressed in local time. The issuance time in the mass media header is the same time the product is issued by the WFO/WSO. WFOs/WSO should issue CWFs based on the following, except during tropical cyclone events, when the routine issuance time may be delayed:

Region/Office		Scheduled Issuance Time (UTC)	
Eastern(Standard/Daylight)		0900/0800	2100/2000
Southern	(EST/CST)	0900/1000	2100/2200
	(EDT/CDT)	0800/0900	2000/2100
WFO San Juan		0800	2000
Western	(Standard/Daylight)	1100/1000	2300/2200
Alaska	(Standard/Daylight)	1300/1200	0100/0000
WFO Honolulu		0145 0800	1345 2200
		0800-1000	2000-2200
WFO Guam	(Marianas/Guam)	0700	2000
WFO Guam	(East Micronesia)	0500	1700
WFO Guam	(West Micronesia)	0700	1900
WSO Pago Pago		0200 0900	1800

During a tropical cyclone event, WFOs/WSO may delay the "scheduled" issuance of the CWF until after advisories from the National Hurricane Center (NHC), Central Pacific Hurricane Center (CPHC) or Joint Typhoon Warning Center (JTWC) or RSMC Nadi Tropical Cyclone Center are issued. In these circumstances, the CWF should be issued as soon as reasonably possible, but no later than 1.5 hours after receiving the message from the appropriate hurricane center.

In all forecasts, include forecast periods as shown below. All forecast periods beyond the current day will be described by the day of the week. For example, a forecast issued Sunday evening will include: TONIGHT, MONDAY, MONDAY NIGHT, TUESDAY, TUESDAY NIGHT, WEDNESDAY, THURSDAY, and FRIDAY. Forecast periods of the CWF are shown below:

The early morning forecast will cover:

Today	(Issuance time to 6PM local time)	1st Period
Tonight	(6PM to 6AM)	2nd Period
Day 2	(6AM to 6PM)	3rd Period
Day 2 Night	(6PM to 6AM)	4th Period
Day 3	(6AM to 6AM)	5th Period
Day 3 Night (Optional)	(6PM to 6AM)	6th Period
Day 4	(6AM to 6AM)	Day 4
Day 5	(6AM to 6AM)	Day 5

The last two 24-hour days may be broken up into two 12 hour periods:

Day 4	(6AM to 6PM)
Day 4 Night	(6PM to 6AM)
Day 5	(6AM to 6PM)
Day 5 Night	(6PM to 6AM)

The late afternoon forecast will cover:

Tonight	(Issuance time to 6AM local time)	1st Period
Tomorrow	(6AM to 6PM)	2nd Period

Tomorrow Night	(6PM to 6AM)	3rd Period
Day 2	(6AM to 6PM)	4th Period
Day 2 Night	(6PM to 6AM)	5th Period
Day 3	(6AM to 6AM)	6th Period
Day 3 Night (Optional)	(6PM to 6AM)	7th Period
Day 4	(6AM to 6AM)	Day 4
Day 5	(6AM to 6AM)	Day 5

The last two 24-hour days may be broken up into two 12 hour periods:

Day 4	(6AM to 6PM)
Day 4 Night	(6PM to 6AM)
Day 5	(6AM to 6PM)
Day 5 Night	(6PM to 6AM)

2.2.4 Valid Time

CWFs are valid from the time of issuance until the expiration time.

2.2.5 Universal Geographic Code (UGC)

CWFs will contain marine-based zone UGC codes.

2.2.6 Product Expiration Time

The CWF product expiration time is not more than 13 hours from the initial valid time, except up to 14 hours for OCONUS WFOs/WSO.

2.3 Technical Description

CWFs will follow the format and content described in this section.

2.3.1 Mass News Disseminator (MND) Broadcast Line

None.

2.3.2 MND Header

The CWF MND Header is “Coastal Waters Forecast [+ Optional Descriptor]”.

2.3.3 Content

Follow the format for the CWF as shown in section 2.4. In each marine zone, include all required forecast periods and forecast parameters. Forecasters may subdivide areas (e.g., NORTHERN HALF, SOUTHERN HALF, WATERS WITHIN 5 NM OF SHORE, OPEN WATERS; etc.) to describe significant differences. If geographical reference points are used in the subdivision, forecasters should ensure they are well known. Forecasters should combine

marine zones for which they are responsible if conditions are expected to be homogeneous. However, do not combine one marine zone with just a part of another.

Forecasters should include applicable National Marine Sanctuaries (NMS), as noted in NWS Instruction (NWSI) 10-302, in the appropriate CWF. These NMS names should be included in the specific zone(s) and/or general area description.

The forecaster may combine forecast periods (beyond the first period) if, in the forecaster's opinion, the weather elements in each are consistent (Regional supplements should be consulted). Also, the forecaster may subdivide the first period of the forecast to account for rapid weather changes.

2.3.4 Synopsis

The synopsis for the CWF is a brief description of surface weather features which cause significant winds and seas over the forecast area during the forecast period. Areas in the tropics often have significant upper level features which are the dominant cause of the weather (e.g., Tropical Upper Tropospheric Troughs (TUTTs)). The synopsis may mention these features. At a minimum, it should identify the strength, trend and movement of each major weather system affecting the area.

The synopsis may be broadcast over the marine radio, and therefore, it should contain complete and grammatically correct sentences. All synopses will be meteorologically consistent with other products issued by the WFO/WSO. For consistency, all distances should be in nautical miles (NM).

When ashfall from a volcanic eruption is expected to affect marine areas, a brief statement will be included in the synopsis after coordination with the appropriate NWS Volcanic Ash Advisory Center (VAAC). For example: "Westdahl Volcano, 70 NM southwest of Cold Bay, is currently active."

If a tropical cyclone with winds of tropical storm force or higher is expected to impact the forecast area, WFOs/WSO should include in the synopsis appropriate identification of the tropical cyclone, its last location (local time), and the direction and speed of movement. Give the location as distance (nautical miles) and direction (16-point compass) from a known landmark or breakpoint. The forecaster may use generic terms if a tropical cyclone is expected to develop in later periods of the forecast. See section 2.3.7 for an example.

2.3.5 Headlines

Use headlines to emphasize weather events likely to have a significant impact on mariners or marine operations. Marine warnings and advisories are only mandated in the first 12-hour forecast period. In most situations, to reduce multiple headlines, the forecaster can leave off the hazards after the upgrade or the most severe hazard.

The headlines generated by GHG software are sorted in chronological order by start time, then

by action, by significance, and alphabetically by phenomena. These headlines should contain the hazard, and the action and timing phrases. For offices that issue the Marine Weather Message, please refer to NWSI 10-315, Marine Weather Message, NWSI 10-1703, Valid Time Event Code (VTEC), NWSI 10-1701, Text Product Formats and Codes, and section 2.3.9 of this instruction for additional details.

Refer to NWSI 10-303, Marine and Coastal Services Standards and Guidelines, for Regionally-defined Small Craft Advisory issuance criteria, as well as definitions for Gale, Storm and Hurricane Force Wind Watches and Warnings.

a. Non-Tropical Cyclone Related Headlines.
Non-tropical cyclone watch and warning marine headlines are included in the CWF.

Watch headlines. WFOs/WSO should include watch headlines when criteria are met for the second, third, or occasionally fourth and fifth periods, when there is significant chance of a hazardous marine weather event meeting or exceeding warning criteria. In areas where hazardous conditions are climatologically common, watches (other than convective), may be reserved for advanced notice of unusual or "first of the season" events. The following watch headlines are included in the CWF if a decision has been made by a WFO/WSO or the Storm Prediction Center (SPC) as appropriate, to issue one of these watches:

Tornado Watch (issued by SPC and only for CONUS)
Severe Thunderstorm Watch (issued by SPC and only for CONUS)
Gale Watch
Storm Watch
Hurricane Force Wind Watch
Heavy Freezing Spray Watch
Hazardous Seas Watch (Optional)

Warning Headlines. WFOs/WSO will include the following warning headlines when criteria are met for the first period, and may issue warning headlines for events that begin in the second, third or fourth periods when forecaster confidence is high.

Hurricane Force Wind Warning
Storm Warning
Gale Warning
Heavy Freezing Spray Warning
Ashfall Warning
Hazardous Seas Warning (Optional)

In situations where winds gust frequently to or above advisory / warning thresholds, forecasters should use discretion in issuing advisories or warnings, as appropriate, to alert users and partners to hazardous marine conditions. Gusts occurring for more than 2 hours during a 12 hour forecast period are considered frequent.

b. Tropical Cyclone Related Headlines.
WFOs/WSO issue tropical cyclone watches and warnings using the Marine Weather Message (MWW) in their coastal waters, and will coordinate their issuance with NHC, CPHC, JTWC, and adjacent WFOs. WSO Pago Pago may issue the Hurricane Local Statement in lieu of the MWW. WSO Pago Pago will coordinate Samoa Meteorology Division, RSMC Nadi, and CPHC. Refer to NWSI 10-601, *Weather Forecast Office Tropical Cyclone Products* for additional details. When tropical cyclone related headlines are issued, they will be included in the CWF. Existing headlines for marine zones should be replaced with applicable tropical cyclone headlines. Tropical Cyclone headlines have the highest priority of any headline included in the CWF. Tropical Cyclone headlines listed in priority order are:

1. Hurricane or Typhoon Warning
2. Tropical Storm Warning
3. Hurricane or Typhoon Watch
4. Tropical Storm Watch

As a tropical cyclone leaves an area, forecasters should headline watch and warning cancellations. A qualitative description of wind conditions in the wake of the tropical cyclone (e.g., gale force winds) should be included in the synopsis. Tropical cyclone cancellation headlines may co-exist with non-tropical warnings and advisories, but are not used for upgrading to higher priority warnings and watches. For example, the headline "Tropical Storm Warning Is Cancelled" is not used simultaneously within the CWF with a "Hurricane Warning In Effect".

Once the tropical cyclone is no longer impacting the marine zone, forecasters should again headline appropriate advisories or warnings not associated with the tropical cyclone.

b.1. Usage of Small Craft Advisories and Related Cautionary Statements.

When a tropical cyclone warning is in effect, the warning headline should supersede all other headlines in the area covered by the tropical cyclone warning.

When a tropical cyclone watch is in effect, or a tropical cyclone is approaching or departing, and conditions warrant, forecasters may include the headline "Small Craft Advisory." In addition, "Small Craft Should Remain in Port" may be manually appended.

c. Small Craft / Brisk Wind Advisory headlines.
The four headlines for Small Craft Advisories: Small Craft Advisory (SCA), Small Craft Advisory for Hazardous Seas (SCAHS), the Small Craft Advisory for Winds (SCAW), and the Small Craft Advisory for Rough Bar (SCARB) have been consolidated into one headline, Small Craft Advisory. See NWSI 10-303 for a general definition of this advisory.

Based on Local or Regional policy, WFOs/WSO may manually include cautionary statements (e.g., "SMALL CRAFT SHOULD EXERCISE CAUTION") in situations below SCA criteria.

Advisory Headlines. WFOs/WSO should include the following advisory headlines when criteria

are met for the first period, and may issue advisory headlines for events that begin in the second, third or fourth periods when forecaster confidence is high:

- Small Craft Advisory
- Brisk Wind Advisory

When sufficient observational data is available, WFOs/WSO should include the following advisory headlines when criteria are met for the first period, and may issue advisory headlines for events that begin in the second or third periods when forecaster confidence is high:

- Dense Fog Advisory
- Dense Smoke Advisory
- Freezing Spray Advisory
- Ashfall Advisory
- Low Water Advisory

2.3.6 1-3 Day Forecast Periods

Except as noted below, forecasts of wind and sea state will be included in each discrete forecast period of the CWF. When sufficient (supporting) data exists, forecasters should also include forecasts of other weather significantly impacting the marine zone(s) (e.g., ice accretion, precipitation, wave periods, low visibilities, ashfall, ice crystals, freezing fog, ice coverage, etc.). Always emphasize the most critical conditions.

Exception: WFO/WSOs, after coordinating with their Region, may specify certain bays, inlets, harbors, inland waters, and estuaries for which sea state need not be included in forecasts if complexities in these areas (e.g., fetch, water depth, currents, etc.) make wave forecasts impractical. In these areas, forecasters may use general descriptions of sea conditions (e.g., rough, moderate, etc.).

2.3.7 4-5 Day Forecast Periods

Aside from the two exceptions noted below, always include wind and sea height information in each 24 hour period, or optional 12 hour period. Above that, forecasters should include only the more threatening weather conditions.

Exception 1: When a tropical cyclone threatens to impact a marine zone, indicate the possible tropical cyclone conditions, based on NHC, CPHC, WFO Guam, WSO Pago Pago, and / or Weather Prediction Center (WPC) guidance, for the specific day(s) impacted. Because large positional and intensity errors are possible in these cases, forecasters should not give specific wind and sea values.

Example:

.FRIDAY...Southeast winds 25 kt increasing. Seas 12 ft.
.SATURDAY...Tropical storm conditions possible.
.SUNDAY...Hurricane conditions possible.

Exception 2: For marine areas heavily influenced by topography, (e.g., Puget Sound, Southeast Alaska), forecasters may give trend forecasts in lieu of specific wind and sea heights.

Example:
Tuesday and Wednesday...Increasing East winds and higher seas enhanced by a strong southeast swell."

2.3.8 CWF - Forecast Parameters

a. Wind. Wind represents predominant conditions 10 meters above the surface of the water. Forecasters should give direction to eight points of the compass. Avoid such phrases as "North to Northeast winds". Wind speed forecasts should use knots as the unit of measurement with the term "knot(s)" or "kt" acceptable according to World Meteorological Organization (WMO) policy. One knot is equal to 1 nautical mile per hour. Forecasters should round speeds to the nearest 5 knots in forecasting specific wind speeds and ranges in wind speed.

In the CWF, include only sustained winds unless there are significant differences between sustained winds and peak gusts (e.g., Northwest wind 20 kt with gusts to 35 kt).

Reference NWSI 10-303 for more detailed instructions on wording on wind and seas forecasts. Where there is sufficient open water (ice-free seas) to include a sea state forecast, an SCA will be issued when appropriate. If sea heights are omitted due to ice coverage, the proper hazard type is Brisk Wind Advisory. The Brisk Wind Advisory should use the same regionally determined wind thresholds as the SCA.

b. Seas (or Combined Seas). Include sea state as a combined sea height or break it down into appropriate components (e.g., Wind waves 2 to 4 ft, Northeast swell 10 ft, or seas 12 ft). Whenever a swell is specified, include the direction from which the swell is propagating, to 8 points of the compass. Mention of swell period and secondary swell (i.e., height, period, and direction) are a regional option. Forecasters may only use descriptive words such as Moderate or Rough in regionally specified bays, inlets, harbors, estuaries, etc.

Transition terms such as "building" and "subsiding" should be used to add clarity to forecast trends. Forecast changes in sea state should be meaningful (at least 3 feet in outer coastal waters and at least 2 feet in sheltered bays, inlets, etc.). Trends may be used to express more subtle changes, e.g., "seas 4 ft subsiding Wed afternoon."

Sea state forecasts will be included for marine areas or portions of marine areas not covered by ice. For other marine areas where coverage of 7/10 or more of sea ice is expected, forecasts of sea state are usually omitted; however, if the area has at least 10% contiguous open water, sea state forecasts may be given. In these cases, use the phrase "seas in ice free waters".

An SCA headline should be included for sea state, even if the wind threshold is not met. Thresholds for a small craft advisory due to rough seas (and winds) are locally and regionally

defined based upon expressed user needs specific to the area.

c. Significant Weather / Visibility. When it is expected, forecasters should include significant weather posing a hazard to navigation (i.e., widespread fog or other restriction lowering visibilities to 1 NM or less, or thunderstorms). Forecasters should emphasize thunderstorms in the CWF product. They may include the phrase "winds and waves higher near thunderstorms" for the areas over which significant thunderstorms are anticipated. Based on forecaster discretion, and/or expected impact to users, forecasters may include obstructions to visibility ranging between 1 ½ NM to 5 NM. The word "visibility" should be written out and not abbreviated, for example, "…visibility 3 NM." Forecasters may use precipitation probability terms such as "chance", "occasional", etc., as defined in NWSI 10-204, and they may include specific visibility distances. However, do not include sky cover.

d. Icing. The forecaster should include freezing spray or freezing fog in the body of the forecast whenever ice accretion on exposed surfaces is likely. When freezing spray is forecast to meet warning or advisory thresholds, a headline should also be included (e.g., ...HEAVY FREEZING SPRAY WARNING...).

e. Air Temperatures. Air temperatures are optional, and may be included if they are forecast to be at or below freezing and if the forecaster considers this information to be significant.

2.3.9 CWF - Forecast Time Phrases

The selection of the time phrases used in advisory and warning headlines within the CWF is dependent upon the number of hours that have transpired since the time of product creation rather than the product issuance time. The selection of time phrases used in Watch, Warning, and Advisory headlines also depends upon the type of event.

Timing phrases described in Tables 1, 2 and 3 are included in headlines issued for the following Watches, Warnings and Advisories:

- Gale Watch
- Storm Watch
- Hurricane Force Wind Watch
- Heavy Freezing Spray Watch
- Hazardous Seas Watch
- Hurricane Force Wind Warning
- Storm Warning
- Gale Warning
- Heavy Freezing Spray Warning
- Hazardous Seas Warning
- Small Craft Advisory
- Freezing Spray Advisory
- Dense Fog Advisory
- Dense Smoke Advisory

- Ashfall Advisory
- Brisk Wind Advisory
- Low Water Advisory

Headlines for the following Watches and Advisories include explicit times at offices which use VTEC operationally:

- Tornado Watch
- Severe Thunderstorm Watch
- Dense Fog Advisory
- Dense Smoke Advisory
- Ashfall Advisory

Headlines for the following Watches and Warnings do not include explicit times or timing phrases:

- Hurricane, Typhoon, or Tropical Storm Warnings
- Hurricane, Typhoon, or Tropical Storm Watches

a. First Period. An advisory or warning event in effect for the first period will use explicit time phrases. When the issuance time and event start and/or end time occur on the same calendar day, the warning and advisory headline will include the time phrase listed in Table 1, except for products issued from the Pacific and Alaskan WFOs.

Time Period Covered	Time Phrases
Midnight – 5:59 AM	EARLY THIS MORNING
6 AM – 11:59 AM	THIS MORNING
Noon	TODAY
12.01 PM – 5:59 PM	THIS AFTERNOON
6 PM – 11:59 PM	THIS EVENING

Table 1. Time Phrase Format for Coastal Waters Forecast (CWF) Advisory and Warning Headlines for Events Beginning in First Forecast Period on Same Calendar Day of Issuance.

For products issued with GHG software and VTEC from the Pacific and Alaskan WFOs, an advisory or warning event in effect for the first period on the same calendar day of issuance will use time phrases as described in Table 2.

Time Period Covered	Time Phrases
Midnight – 2:59 AM	LATE TONIGHT
3:00 AM – 5:59 AM	EARLY THIS MORNING
6:00 AM – 8:59 AM	THIS MORNING
9:00 AM – 11:59 AM	LATE THIS MORNING
12:00 PM – 2:59 PM	EARLY THIS AFTERNOON
3:00 PM – 5:59 PM	LATE THIS AFTERNOON
6:00 PM – 8:59 PM	THIS EVENING
9:00 PM – 11:59 PM	TONIGHT

Table 2. Time Phrase Format for Coastal Waters Forecast (CWF) Advisory and Warning Headlines Issued with GHG software (except for offices which do not have AWIPS) by Pacific and Alaska Region WFOs and WSO Pago Pago for Events Beginning in First Forecast Period on Same Calendar Day of Issuance.

b. Beyond the First Period. A headline for an advisory or warning event in effect not meeting criteria described in part a above will use generic time phrases as described in Table 3.

Time Period Covered	Same Calendar Day Time Phrases	Day + 1 Time Phrases	Day + n Time Phrases Where $1 < n \leq 5$
Midnight – 5:59 AM		LATE TONIGHT	LATE (Day + (n -1)) NIGHT
6 AM – 11:59 AM		(Day + 1) MORNING	(Day + n) MORNING
NOON – 5:59 PM	THIS AFTERNOON	(Day + 1) AFTERNOON	(Day + n) AFTERNOON
6 PM – 11:59 PM	THIS EVENING	(Day + 1) EVENING	(Day + n) EVENING

Table 3. Time Phrase Format for Coastal Waters Forecast (CWF) Watch, Warning and Advisory Headlines in Effect or Ending Beyond First Period.

2.3.10 Coordination and Collaboration

Field offices with adjoining or overlapping areas of responsibility should coordinate and collaborate to ensure products are consistent and compatible. This effort includes communication with appropriate governmental forecast agencies outside the United States.

Forecasters should refer to Section 5, Digital Forecast Collaboration, of NWSI 10-201, *National Digital Forecast Database and Local Database Description and Specifications*, for detailed information on the coordination and collaboration processes for gridded forecasts and analyses, available at: http://www.nws.noaa.gov/directives/sym/pd01002001curr.pdf.

2.4 Format

The format of the CWF can be seen in Figure 1. For more detailed product format information consult NWSI 10-1701, *Text Product Formats and Codes*. Please consult NWSI 10-1701 sections 3.3 - 3.5, for information on the character line and total character limitations of the CWF. This product is available in industry standard encoding and languages, and may include, but not limited to, American Standard Code for Information Interchange (ASCII), Extensible Markup Language (XML), Wireless Markup Language (WML) and HyperText Markup Language (HTML).

2.4.1 Updates, Amendments and Corrections

CWFs and the appropriate gridded forecast fields will be updated or corrected when the on-duty forecast team believes the current forecast is not representative, or when significant format or content errors are detected. See NWSI 10-303 for detailed information.

(WMO ID)(UTC ISSUANCE DATE TIME)
(AWIPS ID)

Coastal Waters Forecast [+ Optional Descriptor]
National Weather Service (City)(State)
(Issuance Time) AM/PM (Local Time Zone)(Day)(Date)

(Overall Area Covered By This Forecast)

(Synopsis Ugc Code)-(Expiration Time)-
(Issuance Time) AM/PM (Local Time Zone)(Day)(Date)

.SYNOPSIS FOR (WFO/WSO Marine Area)...Text.

$$
(Areal Ugc Code[S])-(Expiration Time)-
(Forecast Areal Descriptor[S])
(Issuance Time) AM/PM (Local Time Zone)(Day)(Date)

...HEADLINES (If needed)...

.PERIOD 1...
.PERIOD 2...
.PERIOD 3...
.PERIOD 4...
.PERIOD 5...
.PERIOD 6 (Optional period for the morning issuance)...
.PERIOD 7 (Optional period for the afternoon issuance)…
.(DAY 4)...
.(DAY 5)...

$$
Forecaster Name (Optional)

Figure 1. Coastal Waters Forecast (CWF) Format.

2.4.2 CWF - Unscheduled Forecasts

As needed, append either "...UPDATED" or "...CORRECTED" to the product header whenever, respectively, an unscheduled CWF is issued or when an error in the CWF is corrected. A short description may be added for the updated or corrected items just below the areal header to

highlight the change.

Coastal Waters Forecast**...Updated (Or ...Corrected)**
National Weather Service (City)(State)
(Valid Time) AM/PM (Local Time Zone)(Day)(Date)

(Reason For Corrected/Updated/Amended). [Optional]

(Overall Area Covered By This Forecast)

(Synopsis Ugc Code)-(Expiration Time)-

(Issuance Time) Am/Pm (Local Time Zone)(Day)(Date)

.Synopsis For (WFO Marine Area)...Text.

$$

Figure 2. Unscheduled Coastal Waters Forecast (CWF) Format.

Appendix A - Examples of NWS Coastal Waters Forecasts

Example 1:

FZUS52 KILM 141405
CWFILM

Coastal Waters Forecast
National Weather Service Wilmington NC
905 AM EST Fri Dec 14 2018

SURF CITY NC TO SOUTH SANTEE RIVER SC OUT 20 NM

AMZ200-142215-
905 AM EST Fri Dec 14 2018

.Synopsis for coastal waters from Surf City North Carolina to South Santee River South Carolina out to 20 nautical miles...
Low pressure will move northeast across the central Carolinas today followed by a cold front later Saturday. High pressure will build in from the west early next week, remaining over the waters through mid week.

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AMZ250-142215-
Coastal waters from Surf City to Cape Fear NC out 20 nm-
905 AM EST Fri Dec 14 2018

...SMALL CRAFT ADVISORY IN EFFECT THROUGH LATE SATURDAY NIGHT...

.REST OF TODAY...SE winds 15 to 20 kt, increasing to 20 to 25 kt early this afternoon, then diminishing to 15 to 20 kt late. Seas 4 to 6 ft, building to 5 to 8 ft this afternoon. Showers. Visibility 1 to 3 NM late.
.TONIGHT...S winds 15 to 20 kt. Seas 5 to 8 ft. Showers with isolated tstms. Visibility 1 to 3 NM, decreasing to 1 NM or less after midnight.
.SAT...SW winds 10 to 15 kt. Seas 5 to 7 ft. Showers with isolated tstms in the morning, then scattered showers in the afternoon. Visibility 1 NM or less, increasing to 1 to 3 NM in the afternoon.
.SAT NIGHT...W winds 10 to 15 kt. Seas 4 to 6 ft. Scattered showers, mainly in the evening.
.SUN...W winds 10 to 15 kt, increasing to 15 to 20 kt in the afternoon. Seas 4 to 5 ft.
.SUN NIGHT...NW winds 10 to 15 kt. Seas 4 to 5 ft.
.MON...NW winds 10 to 15 kt. Seas 3 to 4 ft.
.TUE...N winds 10 to 15 kt. Seas 3 to 4 ft.

Winds and seas higher in and near tstms.

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AMZ252-142215-
Coastal waters from Cape Fear NC to Little River Inlet SC out 20 nm-
905 AM EST Fri Dec 14 2018

...SMALL CRAFT ADVISORY IN EFFECT THROUGH LATE SATURDAY NIGHT...

.REST OF TODAY...SE winds 15 to 20 kt, increasing to 20 to 25 kt this afternoon. Seas 5 to 8 ft. Showers. Visibility 1 to 3 NM.
.TONIGHT...S winds 15 to 20 kt. Seas 5 to 8 ft. Showers with isolated tstms. Visibility 1 to 3 NM, decreasing to 1 NM or less after midnight.
.SAT...SW winds 10 to 15 kt. Seas 5 to 7 ft. Scattered showers with isolated tstms in the morning, then scattered showers in the afternoon. Visibility 1 NM or less in the morning.
.SAT NIGHT...W winds 10 to 15 kt. Seas 4 to 6 ft. Scattered showers, mainly in the evening.
.SUN...W winds 10 to 15 kt, increasing to 15 to 20 kt in the afternoon. Seas 4 to 5 ft.
.SUN NIGHT...NW winds 10 to 15 kt. Seas 3 to 4 ft.
.MON...NW winds 10 to 15 kt. Seas 3 to 4 ft.
.TUE...N winds 10 to 15 kt. Seas 2 to 3 ft.

Winds and seas higher in and near tstms.

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AMZ254-142215-
Coastal waters from Little River Inlet to Murrells Inlet SC out 20 nm-
905 AM EST Fri Dec 14 2018

...SMALL CRAFT ADVISORY IN EFFECT THROUGH LATE SATURDAY NIGHT...

.REST OF TODAY...SE winds 15 to 20 kt. Seas 5 to 8 ft. Showers. Visibility 1 to 3 NM.
.TONIGHT...S winds 15 to 20 kt. Seas 5 to 7 ft. Showers with isolated tstms. Visibility 1 to 3 NM, decreasing to 1 NM or less after midnight.
.SAT...SW winds 10 to 15 kt. Seas 4 to 6 ft. Scattered showers with isolated tstms in the morning, then scattered showers in the afternoon. Visibility 1 NM or less in the morning.
.SAT NIGHT...W winds 10 to 15 kt. Seas 4 to 5 ft. Scattered showers, mainly in the evening.
.SUN...W winds 10 to 15 kt. Seas 4 to 5 ft.
.SUN NIGHT...NW winds 10 to 15 kt. Seas 3 to 4 ft.
.MON...NW winds 10 to 15 kt. Seas 2 to 3 ft.
.TUE...N winds 10 kt. Seas 2 ft.

Winds and seas higher in and near tstms.

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AMZ256-142215-
Coastal waters from Murrells Inlet to South Santee River SC out 20 nm-
905 AM EST Fri Dec 14 2018

...SMALL CRAFT ADVISORY IN EFFECT THROUGH LATE SATURDAY NIGHT...

.REST OF TODAY...SE winds 15 to 20 kt. Seas 5 to 8 ft. Showers. Visibility 1 to 3 NM.
.TONIGHT...S winds 15 to 20 kt, diminishing to 10 to 15 kt after midnight. Seas 5 to 7 ft. Showers. Isolated tstms. Visibility 1 NM or less.
.SAT...SW winds 10 to 15 kt. Seas 4 to 6 ft. Showers with a slight chance of tstms in the morning, then scattered showers in the afternoon. Visibility 1 NM or less in the morning.
.SAT NIGHT...W winds 10 to 15 kt. Seas 4 to 5 ft. Scattered showers, mainly in the evening.
.SUN...W winds 10 to 15 kt. Seas 4 to 5 ft.
.SUN NIGHT...NW winds 10 to 15 kt. Seas 3 to 4 ft.
.MON...NW winds 10 to 15 kt. Seas 2 to 3 ft.
.TUE...N winds 10 to 15 kt. Seas 2 to 3 ft.

Winds and seas higher in and near tstms.

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Example 2:

FZUS52 KKEY 141657 AAA
CWFKEY

Coastal Waters Forecast for the Florida Keys...UPDATED
National Weather Service Key West FL
1156 AM EST Fri Dec 14 2018

Updated to increase wind in Straits of Florida

Florida Bay...Hawk Channel and Straits of Florida from Ocean Reef to south of Dry Tortugas...and the extreme southeastern Gulf of Mexico...including The Florida Keys National Marine Sanctuary

Seas are given as significant wave height...which is the average height of the highest 1/3 of the waves. Individual waves may be more than twice the significant wave height.

GMZ005-142345-
Synopsis for Keys coastal waters from Ocean Reef to Dry Tortugas
1156 AM EST Fri Dec 14 2018

.SYNOPSIS...Low pressure will move slowly to the east-northeast from the Lower Mississippi Valley to the mid-Atlantic coast through Saturday night, then move offshore from the northeastern states on Sunday. Showers and thunderstorms ahead of the trailing cold front may affect the Keys coastal waters tonight, and the front is expected to move through the area on Saturday. A westerly swell approaching 8 feet will affect the deep Gulf waters and the western Florida Straits from Saturday into early Sunday.

The Approximate Shoreward Edge of the Gulf Stream as of December 13...

33 NM South of Dry Tortugas Light...on Loggerhead Key.
18 NM South of Cosgrove Shoal Light...off the Marquesas Keys.
17 NM South of Sand Key Light...off Key West.
24 NM South of Looe Key...off Big Pine Key.
25 NM South of Sombrero Key Light...off Marathon.
8 NM Southeast of Alligator Reef Light...off Islamorada.
3 NM Southeast of Molasses Reef Light...off Key Largo.
1 NM East of Carysfort Reef Light...off Ocean Reef.

Gulf Stream Information Courtesy of the Naval Oceanographic Office.

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GMZ031-142345-
Florida Bay including Barnes Sound, Blackwater Sound, and Buttonwood Sound-
1156 AM EST Fri Dec 14 2018

...SMALL CRAFT SHOULD EXERCISE CAUTION UNTIL WINDS DECREASE...

.THIS AFTERNOON...Southeast to south winds 15 to 20 knots, decreasing to near 15 knots this afternoon. Bay waters choppy, becoming a moderate chop. Isolated showers and late afternoon thunderstorms.
.TONIGHT...South winds 10 to 15 knots. Bay waters a light to moderate chop. Scattered showers and thunderstorms in the evening, then numerous showers and scattered thunderstorms after midnight.
.SATURDAY...Southwest to west winds 5 to 10 knots. Bay waters smooth to a light chop. Scattered showers and thunderstorms.
.SATURDAY NIGHT...Northwest to north winds 5 to 10 knots. Bay waters smooth to a light chop. Scattered showers.
.SUNDAY...Northwest winds 5 to 10 knots. Bay waters smooth to a light chop. Isolated showers.
.SUNDAY NIGHT AND MONDAY...Northwest to north winds 10 to 15 knots. Bay waters a light to moderate chop.
.MONDAY NIGHT AND TUESDAY...Northwest to north winds 5 to 10 knots. Bay waters smooth to a light chop.
.TUESDAY NIGHT...Northeast winds 5 to 10 knots. Bay waters smooth to a light chop.

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GMZ032-035-142345-
Bayside and Gulf side from Craig Key to west end of Seven Mile Bridge-Gulf of Mexico from west end of Seven Mile Bridge to Halfmoon Shoal out to 5 Fathoms-
1156 AM EST Fri Dec 14 2018

...SMALL CRAFT SHOULD EXERCISE CAUTION...

.THIS AFTERNOON...Southeast to south winds 15 to 20 knots. Seas 1 to 3 feet, except 2 to 4 feet west of the Marquesas Keys. Nearshore waters choppy. Scattered showers in the morning, then isolated showers and thunderstorms in the afternoon.
.TONIGHT...South to southwest winds 10 to 15 knots. Seas 1 to 2 feet. Nearshore waters a light to moderate chop. Scattered showers and thunderstorms in the evening, then numerous showers and scattered thunderstorms after midnight.
.SATURDAY...West winds 5 to 10 knots. Seas 1 foot or less, building to 1 to 2 feet in the afternoon. West of the Marquesas Keys, seas 1 to 3 feet, building to 3 to 5 feet in the afternoon. Nearshore waters smooth to a light chop. Scattered showers and thunderstorms.
.SATURDAY NIGHT...Northwest to north winds 5 to 10 knots. Seas 1 to 3 feet, except 4 to 6 feet west of the Marquesas Keys. Nearshore waters smooth to a light chop. Scattered showers.
.SUNDAY...Northwest to north winds 10 to 15 knots. Seas 1 to 3 feet, except 3 to 5 feet west of the Marquesas Keys. Nearshore waters a light to moderate chop. Isolated showers.
.SUNDAY NIGHT...North winds 10 to 15 knots. Seas 1 to 2 feet. Nearshore waters a light to moderate chop.
.MONDAY THROUGH TUESDAY...North winds 10 to 15 knots. Seas 1 to 2 feet. Nearshore waters a light to moderate chop.
.TUESDAY NIGHT...Northeast winds 5 to 10 knots. Seas 1 foot or less. Nearshore waters smooth to a light chop.

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GMZ042-142345-
Hawk Channel from Ocean Reef to Craig Key out to the reef-
1156 AM EST Fri Dec 14 2018

...SMALL CRAFT ADVISORY IN EFFECT...

.THIS AFTERNOON...Southeast to south winds near 20 knots, decreasing to 15 to 20 knots late this afternoon. Seas 2 to 4 feet. Nearshore waters rough, becoming choppy. Isolated showers and late afternoon thunderstorms.
.TONIGHT...South winds 10 to 15 knots. Seas 2 to 3 feet. Nearshore waters a light to moderate chop. Scattered showers and thunderstorms.
.SATURDAY...Southwest winds 10 to 15 knots. Seas 1 to 2 feet. Nearshore waters a light to moderate chop. Scattered showers and thunderstorms.
.SATURDAY NIGHT...Northwest winds near 10 knots. Seas 1 to 2 feet. Nearshore waters a light chop. Scattered showers.

.SUNDAY...Northwest to north winds 5 to 10 knots. Seas 1 to 2 feet. Nearshore waters smooth to a light chop. Isolated showers.
.SUNDAY NIGHT AND MONDAY...Northwest to north winds 10 to 15 knots. Seas 1 to 2 feet. Nearshore waters a light to moderate chop.
.MONDAY NIGHT...Northwest to north winds near 10 knots. Seas 1 foot or less. Nearshore waters a light chop.
.TUESDAY...North to northeast winds 5 to 10 knots. Seas 1 foot or less. Nearshore waters smooth to a light chop.
.TUESDAY NIGHT...Northeast to east winds 5 to 10 knots. Seas 1 foot or less. Nearshore waters smooth to a light chop.

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GMZ043-044-142345-
Hawk Channel from Craig Key to west end of Seven Mile Bridge out to the reef-
Hawk Channel from west end of Seven Mile Bridge to Halfmoon Shoal out to the reef-
1156 AM EST Fri Dec 14 2018

...SMALL CRAFT ADVISORY IN EFFECT...

.THIS AFTERNOON...Southeast to south winds near 20 knots this morning, decreasing to near 15 knots this afternoon. Seas 3 to 5 feet. Nearshore waters rough, becoming choppy. Isolated showers and late afternoon thunderstorms.
.TONIGHT...South to southwest winds 10 to 15 knots. Seas 1 to 3 feet. Nearshore waters a light to moderate chop. Scattered showers and thunderstorms in the evening, then numerous showers and scattered thunderstorms after midnight.
.SATURDAY...West winds 5 to 10 knots. Seas 1 to 2 feet, building to 2 to 3 feet in the afternoon. Nearshore waters smooth to alight chop. Scattered showers and thunderstorms.
.SATURDAY NIGHT...Northwest to north winds near 10 knots. Seas 1 to 3 feet, except 3 to 5 feet west of Cosgrove Shoal Light. Nearshore waters a light chop. Scattered showers.
.SUNDAY...Northwest to north winds 10 to 15 knots. Seas 2 to 3 feet. Nearshore waters a light to moderate chop. Isolated showers.
.SUNDAY NIGHT THROUGH MONDAY NIGHT...North winds 10 to 15 knots. Seas 1 to 3 feet. Nearshore waters a light to moderate chop.
.TUESDAY...North winds 5 to 10 knots. Seas 1 to 2 feet. Nearshore waters smooth to a light chop.
.TUESDAY NIGHT...Northeast to east winds 5 to 10 knots. Seas 1 to 2 feet. Nearshore waters smooth to a light chop.

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GMZ052-072-142345-
Straits of Florida from Ocean Reef to Craig Key out 20 NM-
Straits of Florida from Ocean Reef to Craig Key 20 to 60 NM out-
1156 AM EST Fri Dec 14 2018

...SMALL CRAFT ADVISORY IN EFFECT...

.THIS AFTERNOON...Southeast winds near 20 knots, decreasing to 15 to 20 knots late this afternoon. Seas 3 to 5 feet. Isolated showers, with isolated thunderstorms in the afternoon.
.TONIGHT...South winds 10 to 15 knots. Seas 3 to 5 feet. Scattered showers and thunderstorms.
.SATURDAY...Southwest winds 10 to 15 knots. Seas 2 to 4 feet. Numerous showers and scattered thunderstorms.
.SATURDAY NIGHT...West winds near 10 knots, becoming northwest to north after midnight. Seas 3 to 5 feet. Numerous showers and isolated thunderstorms in the evening, then scattered showers after midnight.
.SUNDAY...Northwest to north winds near 10 knots. Seas 3 to 5 feet. Isolated showers.
.SUNDAY NIGHT AND MONDAY...North winds 10 to 15 knots. Seas 2 to 4 feet.
.MONDAY NIGHT...North winds 5 to 10 knots. Seas 2 to 3 feet.
.TUESDAY...North to northeast winds 5 to 10 knots. Seas 1 to 2 feet. Isolated showers.
.TUESDAY NIGHT...Northeast to east winds 5 to 10 knots. Seas 1 to 2 feet. Isolated showers.

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GMZ053>055-073>075-142345-
Straits of Florida from Craig Key to west end of Seven Mile
Bridge out 20 NM-Straits of Florida from west end of Seven Mile Bridge to south of
Halfmoon Shoal out 20 NM-Straits of Florida from Halfmoon Shoal to 20 NM west of Dry
Tortugas out 20 NM-Straits of Florida from Craig Key to west end of Seven Mile
Bridge 20 to 60 NM out-Straits of Florida from west end of Seven Mile Bridge to south of
Halfmoon Shoal 20 to 60 NM out-Straits of Florida from Halfmoon Shoal to 20 NM west of Dry
Tortugas 20 to 60 NM out-
1156 AM EST Fri Dec 14 2018

...SMALL CRAFT ADVISORY IN EFFECT...

.THIS AFTERNOON...Southeast to south winds 20 to 25 knots, decreasing to 15 to 20 knots late this afternoon. Seas 4 to 6 feet. Isolated showers and late afternoon thunderstorms.
.TONIGHT...South to southwest winds 10 to 15 knots. Seas 2 to 4 feet. Scattered showers and thunderstorms in the evening, then numerous showers and scattered thunderstorms after midnight.
.SATURDAY...West winds 5 to 10 knots. Seas 2 to 4 feet, except building to 4 to 8 feet west of Sand Key in a west swell. Numerous showers and scattered thunderstorms.
.SATURDAY NIGHT...Northwest to north winds 10 to 15 knots. Seas 4 to 8 feet in a west swell, highest west of Sand Key. Scattered showers. Isolated thunderstorms in the evening.
.SUNDAY...North winds 10 to 15 knots. Seas 4 to 6 feet in a west swell. Isolated showers.
.SUNDAY NIGHT AND MONDAY...North to northeast winds 10 to 15 knots. Seas 3 to 5 feet.
.MONDAY NIGHT...North winds 10 to 15 knots. Seas 2 to 3 feet.
.TUESDAY...North to northeast winds 5 to 10 knots. Seas 1 to 3 feet. Isolated showers.
.TUESDAY NIGHT...Northeast to east winds 5 to 10 knots. Seas 1 to 2 feet. Isolated showers.

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GMZ033-034-142345-
Gulf waters from East Cape Sable to Chokoloskee 20 to 60 NM out and beyond 5 fathoms-
Gulf of Mexico including Dry Tortugas and Rebecca Shoal Channel-
1156 AM EST Fri Dec 14 2018

...SMALL CRAFT ADVISORY IN EFFECT...

.THIS AFTERNOON...Southeast to south winds near 20 knots, decreasing to 15 to 20 knots late this afternoon. Seas 3 to 5 feet. Scattered showers in the morning, then scattered showers and isolated thunderstorms in the afternoon.
.TONIGHT...Southeast to south winds near 15 knots, becoming west to northwest after midnight. Seas 2 to 4 feet. Numerous showers and scattered thunderstorms.
.SATURDAY...Northwest winds 5 to 10 knots. Seas 2 to 3 feet, building to 4 to 8 feet in a west swell. Scattered showers and thunderstorms in the morning. Scattered showers and isolated thunderstorms in the afternoon.
.SATURDAY NIGHT...Northwest winds 10 to 15 knots. Seas 4 to 8 feet in a west swell. Scattered showers.
.SUNDAY...Northwest to north winds 10 to 15 knots. Seas 4 to 6 feet in a west swell.
.SUNDAY NIGHT AND MONDAY...North winds 10 to 15 knots. Seas 3 to 5 feet.
.MONDAY NIGHT...North winds 5 to 10 knots. Seas 2 to 3 feet.
.TUESDAY...North to northeast winds 5 to 10 knots. Seas 1 to 2 feet.
.TUESDAY NIGHT...Northeast to east winds 5 to 10 knots. Seas 1 to 2 feet.

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Example 3:

FZUS56 KSEW 141654
CWFSEW

Coastal Waters Forecast for Washington
National Weather Service Seattle WA
854 AM PST Fri Dec 14 2018

Inland waters of western Washington and the northern and central Washington coastal waters including the Olympic Coast National Marine Sanctuary

PZZ100-150200-
854 AM PST Fri Dec 14 2018

.Synopsis for the northern and central Washington coastal and inland waters...Strong frontal systems will move across the area today through next week. Small craft and gale force winds are likely at times through the week ahead.

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PZZ150-153-156-150200-
Coastal Waters From Cape Flattery To James Island Out 10 Nm-
Coastal Waters From James Island To Point Grenville Out 10 Nm-
Coastal Waters From Point Grenville To Cape Shoalwater Out 10 Nm-
854 AM PST Fri Dec 14 2018

...GALE WARNING IN EFFECT THROUGH THIS EVENING...

.TODAY...S wind 25 to 35 kt rising to 35 to 45 kt with gusts near 60 kt in the afternoon. Combined seas 18 to 21 ft with a dominant period of 14 seconds. Rain.
.TONIGHT...W wind 25 to 35 kt becoming SW 15 to 25 kt after midnight. Combined seas 21 to 24 ft with a dominant period of 12 seconds subsiding to 16 to 18 ft with a dominant period of 12 seconds after midnight. Showers likely in the evening then a chance of showers after midnight.
.SAT...S wind 15 to 25 kt becoming SE 20 to 30 kt in the afternoon. Wind waves 2 to 4 ft building to 4 to 6 ft in the afternoon. W swell 14 ft at 11 seconds becoming SW 11 ft at 10 seconds in the afternoon. A slight chance of rain in the morning then a chance of rain in the afternoon.
.SAT NIGHT...SE wind 25 to 35 kt. Combined seas 11 to 14 ft with a dominant period of 10 seconds building to 16 to 19 ft with a dominant period of 13 seconds after midnight.
.SUN...SE wind 25 to 35 kt easing to 20 to 30 kt in the afternoon. Combined seas 20 to 23 ft with a dominant period of 15 seconds.
.SUN NIGHT...S wind 20 to 25 kt easing to 15 to 20 kt after midnight. Wind waves 3 to 4 ft subsiding to 2 to 3 ft after midnight. W swell 25 ft at 20 seconds.
.MON...S wind 15 to 25 kt rising to 25 to 35 kt. Combined seas 18 to 21 ft.
.TUE...S wind 20 to 30 kt becoming SW 15 to 25 kt. Wind waves 3 to 5 ft subsiding to 2 to 4 ft. SW swell 22 ft becoming W and subsiding to 18 ft.

$$

PZZ170-173-176-150200-
Coastal Waters From Cape Flattery To James Island 10 To 60 Nm-
Coastal Waters From James Island To Point Grenville 10 To 60 Nm-
Coastal Waters From Point Grenville To Cape Shoalwater 10 To 60 Nm-
854 AM PST Fri Dec 14 2018

...GALE WARNING IN EFFECT THROUGH THIS EVENING...

.TODAY...S wind 35 to 40 kt becoming 35 to 45 kt in the afternoon. Combined seas 21 to 24 ft with a dominant period of 14 seconds. Rain.
.TONIGHT...W wind 25 to 35 kt becoming SW 15 to 25 kt after midnight. Combined seas 23 to 26 ft with a dominant period of 12 seconds subsiding to 17 to 20 ft with a dominant period of 11 seconds after midnight. A chance of showers.
.SAT...S wind 20 to 25 kt becoming SE 25 to 35 kt in the afternoon. Combined seas 13 to 15 ft with a dominant period of 11 seconds. A slight chance of rain in the morning then a chance

of rain in the afternoon.
.SAT NIGHT...SE wind 30 to 40 kt. Combined seas 16 to 19 ft with a dominant period of 11 seconds building to 22 to 25 ft with a dominant period of 13 seconds after midnight.
.SUN...SE wind 30 to 35 kt. Combined seas 23 to 26 ft with a dominant period of 15 seconds.
.SUN NIGHT...S wind 20 to 25 kt. Wind waves 3 to 4 ft. W swell 27 ft at 20 seconds.
.MON...S wind 15 to 25 kt rising to 30 to 35 kt. Combined seas 22 to 25 ft.
.TUE...S wind 20 to 30 kt becoming SW 20 to 25 kt. Wind waves 3 to 5 ft. SW swell 24 ft becoming W and subsiding to 20 ft.

$$

PZZ130-150200-
West Entrance U.S. Waters Strait Of Juan De Fuca-
854 AM PST Fri Dec 14 2018

...GALE WARNING IN EFFECT THROUGH THIS EVENING...

.TODAY...SE wind 25 to 35 kt. Combined seas 15 to 17 ft with a dominant period of 14 seconds. Rain likely in the morning then rain in the afternoon.
.TONIGHT...W wind 30 to 40 kt becoming SW 15 to 25 kt after midnight. Combined seas 18 to 19 ft with a dominant period of 12 seconds subsiding to 15 to 16 ft with a dominant period of 12 seconds after midnight. Showers in the evening then a chance of showers after midnight.
.SAT...S wind 5 to 15 kt becoming SE 15 to 25 kt in the afternoon. Wind waves 1 to 2 ft building to 2 to 4 ft in the afternoon. SW swell 11 ft at 11 seconds subsiding to 9 ft at 11 seconds in the afternoon. A slight chance of rain.
.SAT NIGHT...E wind 25 to 30 kt becoming SE 20 to 25 kt after midnight. Wind waves 3 to 5 ft. SW swell 10 ft at 10 seconds building to 16 ft at 14 seconds after midnight.
.SUN...SE wind 20 to 25 kt becoming 15 to 25 kt in the afternoon. Wind waves 2 to 4 ft. SW swell 18 ft at 14 seconds.
.SUN NIGHT...SE wind 15 to 25 kt becoming S 15 to 20 kt after midnight. Wind waves 2 to 4 ft. W swell 21 ft at 20 seconds.
.MON...S wind 10 to 20 kt becoming SE 15 to 25 kt. Wind waves 2 to 4 ft. W swell 18 ft subsiding to 16 ft.
.TUE...S wind 15 to 20 kt. Wind waves 1 to 3 ft. W swell 16 ft.

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PZZ131-150200-
Central U.S. Waters Strait Of Juan De Fuca-
854 AM PST Fri Dec 14 2018

...GALE WARNING IN EFFECT FROM 4 PM PST THIS AFTERNOON THROUGH THIS EVENING...

.TODAY...E wind 15 to 25 kt. Wind waves 2 to 4 ft. A chance of rain in the morning then rain in the afternoon.

.TONIGHT...W wind 35 to 45 kt with gusts near 60 kt becoming SW 10 to 20 kt after midnight. Wind waves 6 to 8 ft subsiding to 1 to 3 ft after midnight. Showers in the evening then a chance of showers after midnight.
.SAT...Variable wind 5 to 15 kt becoming SE 10 to 20 kt in the afternoon. Wind waves 1 to 3 ft. A slight chance of rain.
.SAT NIGHT...E wind 20 to 30 kt becoming SE 15 to 25 kt after midnight. Wind waves 3 to 5 ft.
.SUN...SE wind 15 to 25 kt. Wind waves 2 to 4 ft.
.SUN NIGHT...SE wind 15 to 20 kt becoming variable 5 to 15 kt after midnight. Wind waves 1 to 3 ft.
.MON...Variable wind 5 to 15 kt becoming SE 15 to 25 kt. Wind waves 2 ft or less building to 2 to 4 ft.
.TUE...S wind 10 to 20 kt becoming variable 5 to 15 kt. Wind waves 1 to 3 ft.

$$

PZZ132-150200-
East Entrance U.S. Waters Strait Of Juan De Fuca-
854 AM PST Fri Dec 14 2018

...GALE WARNING IN EFFECT THROUGH THIS EVENING...

.TODAY...SE wind 25 to 35 kt rising to 30 to 40 kt in the afternoon. Wind waves 5 to 7 ft. A slight chance of rain in the morning then rain likely in the afternoon.
.TONIGHT...SW wind 35 to 45 kt becoming S 10 to 20 kt after midnight. Wind waves 6 to 8 ft subsiding to 1 to 3 ft after midnight. Showers in the evening then a chance of showers after midnight.
.SAT...SE wind 10 to 20 kt rising to 15 to 25 kt in the afternoon. Wind waves 2 to 4 ft. A slight chance of rain.
.SAT NIGHT...SE wind 20 to 30 kt easing to 15 to 25 kt after midnight. Wind waves 3 to 5 ft.
.SUN...SE wind 20 to 25 kt. Wind waves 3 to 4 ft.
.SUN NIGHT...SE wind 15 to 20 kt. Wind waves 2 to 3 ft.
.MON...SE wind 5 to 15 kt rising to 15 to 25 kt. Wind waves 2 ft or less building to 2 to 4 ft.
.TUE...SE wind 15 to 25 kt becoming S 5 to 15 kt. Wind waves 2 to 4 ft subsiding to 2 ft or less.

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PZZ134-150200-
Admiralty Inlet-
854 AM PST Fri Dec 14 2018

...GALE WARNING IN EFFECT THROUGH THIS EVENING...

.TODAY...S wind 25 to 35 kt. Wind waves 4 to 6 ft. A slight chance of rain in the morning then rain likely in the afternoon.

.TONIGHT...SE wind 25 to 35 kt with gusts near 50 kt becoming S 5 to 15 kt after midnight. Wind waves 4 to 6 ft subsiding to 2 ft or less after midnight. Showers in the evening then a chance of showers after midnight.
.SAT...SE wind 5 to 15 kt rising to 15 to 25 kt in the afternoon.
Wind waves 2 ft or less building to 2 to 4 ft in the afternoon. A slight chance of rain.
.SAT NIGHT...SE wind 5 to 15 kt rising to 15 to 20 kt after midnight. Wind waves 1 to 3 ft.
.SUN...SE wind 15 to 20 kt. Wind waves 2 to 3 ft.
.SUN NIGHT...SE wind 15 to 20 kt. Wind waves 1 to 3 ft.
.MON...SE wind 5 to 15 kt rising to 15 to 25 kt. Wind waves 2 ft or less building to 2 to 4 ft.
.TUE...SE wind 15 to 20 kt becoming S 5 to 15 kt. Wind waves 1 to
3 ft.

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PZZ133-150200-
Northern Inland Waters Including The San Juan Islands-
854 AM PST Fri Dec 14 2018

...GALE WARNING IN EFFECT THROUGH THIS EVENING...

.TODAY...S wind 30 to 40 kt. Wind waves 5 to 7 ft in the afternoon. A slight chance of rain in the morning then rain likely in the afternoon.
.TONIGHT...S wind 30 to 40 kt becoming SW 15 to 25 kt after midnight. Wind waves 5 to 7 ft subsiding to 2 to 4 ft after midnight. Showers in the evening then a chance of showers after midnight.
.SAT...SE wind 15 to 25 kt. Wind waves 2 to 4 ft. A slight chance of rain.
.SAT NIGHT...SE wind 15 to 25 kt. Wind waves 2 to 4 ft.
.SUN...E wind 15 to 25 kt becoming SE 15 to 20 kt in the afternoon. Wind waves 2 to 4 ft.
.SUN NIGHT...SE wind 15 to 20 kt. Wind waves 2 to 3 ft.
.MON...SE wind 5 to 15 kt rising to 15 to 25 kt. Wind waves 2 ft or less building to 2 to 4 ft.
.TUE...SE wind 15 to 25 kt becoming S 5 to 15 kt. Wind waves 2 to 4 ft subsiding to 2 ft or less.

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PZZ135-150200-
Puget Sound and Hood Canal-
854 AM PST Fri Dec 14 2018

...GALE WARNING IN EFFECT THROUGH THIS EVENING...

.TODAY...S wind 5 to 15 kt rising to 25 to 35 kt in the afternoon. Wind waves 2 ft or less building to 4 to 6 ft in the afternoon. A chance of rain in the morning then rain in the afternoon.
.TONIGHT...S wind 20 to 30 kt becoming SW 10 to 20 kt after midnight. Wind waves 3 to 5 ft subsiding to 1 to 3 ft after midnight. Showers in the evening then a chance of showers after midnight.

.SAT...S wind 10 to 20 kt becoming SE 5 to 15 kt in the afternoon. Wind waves 1 to 3 ft. A slight chance of rain in the morning.
.SAT NIGHT...SE wind 5 to 15 kt becoming 10 to 20 kt after midnight. Wind waves 1 to 3 ft.
.SUN...SE wind 10 to 20 kt becoming 5 to 15 kt in the afternoon. Wind waves 1 to 3 ft.
.SUN NIGHT...S wind 5 to 15 kt. Wind waves 2 ft or less.
.MON...S wind 5 to 15 kt becoming 10 to 20 kt. Wind waves 1 to 3 ft.
.TUE...S wind 10 to 20 kt becoming 5 to 15 kt. Wind waves 1 to 3 ft.

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PZZ110-150200-
Grays Harbor Bar-
854 AM PST Fri Dec 14 2018

...SMALL CRAFT ADVISORY IN EFFECT THROUGH THIS EVENING...

Combined seas 15 to 20 feet with breakers possible. Bar conditions severe. Maximum ebb currents will occur around 930 AM and 9 PM today and 1030 AM Saturday.

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Example 4:

FZAK51 PAFC 141256
CWFAER

Coastal Waters Forecast
National Weather Service Anchorage Alaska
356 AM AKST Fri Dec 14 2018

Coastal Waters Forecast for the Northern Gulf of Alaska Coast up to 100 nm out including Kodiak Island and Cook Inlet.

Wind forecasts reflect the predominant speed and direction expected. Sea forecasts represent an average of the highest one-third of the combined wind wave and swell height.

PKZ197-150145-
356 AM AKST Fri Dec 14 2018

.SYNOPSIS FOR THE NORTH GULF COAST+KODIAK ISLAND WATERS+
COOK INLET...

A North Gulf Coast front pushes into Southeast Alaska Sat morning. A 956 mb low 290 nm south of Dutch Harbor moves to 380 nm southeast of Kodiak City at 968 mb late Sat night. A 960 mb low forms 275 nm southeast of Chignik Sat morning and moves to 75 nm south of Middleton Island at 967 mb Sat night.

$$

PKZ119-150145-
Cape Suckling to Cape Cleare-
356 AM AKST Fri Dec 14 2018

...GALE WARNING TONIGHT AND SATURDAY...

.TODAY...S wind 25 kt. Seas 12 ft. Rain and snow.
.TONIGHT...E wind 35 kt. Seas 16 ft.
.SAT...E wind 45 kt. Seas 24 ft.
.SAT NIGHT...E wind 50 kt. Seas 26 ft.
.SUN...SE wind 40 kt. Seas 22 ft.
.MON...E wind 25 kt. Seas 14 ft.
.TUE...NE wind 25 kt. Seas 13 ft.

$$

PKZ120-150145-
Cape Cleare to Gore Point-
356 AM AKST Fri Dec 14 2018

...GALE WARNING TONIGHT AND SATURDAY...

.TODAY...SW wind 25 kt becoming SE in the afternoon. Seas 12 ft. Snow with rain.
.TONIGHT...E wind 35 kt. Seas 17 ft. Snow with rain.
.SAT...E wind 40 kt. Seas 23 ft. Rain and snow.
.SAT NIGHT...NE wind 45 kt. Seas 25 ft.
.SUN...E wind 30 kt. Seas 20 ft.
.MON...NE wind 20 kt. Seas 14 ft.
.TUE...N wind 20 kt. Seas 13 ft.

$$

PKZ121-150145-
Resurrection Bay-
356 AM AKST Fri Dec 14 2018

...SMALL CRAFT ADVISORY SATURDAY...

.TODAY...Variable wind less than 10 kt becoming N 10 kt in the afternoon. Seas 2 ft. Snow.
.TONIGHT...N wind 15 kt. Seas 3 ft. Snow.
.SAT...N wind 25 kt. Seas 5 ft. Snow.
.SAT NIGHT...N wind 30 kt. Seas 6 ft.
.SUN...N wind 20 kt. Seas 4 ft.

.MON...N wind 15 kt. Seas 3 ft.
.TUE...N wind 25 kt. Seas 5 ft.

$$

PKZ125-150145-
Prince William Sound-
356 AM AKST Fri Dec 14 2018

...SMALL CRAFT ADVISORY THROUGH SATURDAY...

.TODAY...South wind 15 kt increasing to E 25 kt in the afternoon. Seas 5 ft. Snow.
.TONIGHT...SE wind 25 kt. Seas 5 ft. Snow.
.SAT...NE wind 25 kt. Seas 5 ft.
.SAT NIGHT...N wind 25 kt. Seas 6 ft.
.SUN...E wind 30 kt. Seas 7 ft.
.MON...E wind 25 kt. Seas 6 ft.
.TUE...NE wind 15 kt. Seas 3 ft.

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PKZ126-150145-
Port Valdez-
356 AM AKST Fri Dec 14 2018

.TODAY...Variable wind less than 10 kt. Seas 2 ft. Snow.
.TONIGHT...Variable wind less than 10 kt. Seas 2 ft. Snow.
.SAT...Variable wind less than 10 kt becoming E 10 kt in the afternoon. Seas 2 ft.
.SAT NIGHT...NE wind 15 kt. Seas 3 ft.
.SUN...NE wind 20 kt. Seas 4 ft.
.MON...NE wind 10 kt. Seas 2 ft.
.TUE...NE wind 15 kt. Seas 2 ft.

$$

PKZ127-150145-
Valdez Narrows-
356 AM AKST Fri Dec 14 2018

...SMALL CRAFT ADVISORY SATURDAY...

.TODAY...NE wind 15 kt. Seas 3 ft. Snow.
.TONIGHT...NE wind 20 kt. Seas 3 ft. Freezing spray. Snow.
.SAT...NE wind 25 kt. Seas 3 ft.
.SAT NIGHT...NE wind 20 kt. Seas 3 ft.
.SUN...NE wind 30 kt. Seas 4 ft.

.MON THROUGH TUE...NE wind 15 kt. Seas 3 ft.

$$

PKZ128-150145-
Valdez Arm-
356 AM AKST Fri Dec 14 2018

.TODAY...NE wind 10 kt. Seas 2 ft. Snow.
.TONIGHT...NE wind 15 kt. Seas 3 ft. Snow.
.SAT...NE wind 20 kt. Seas 4 ft.
.SAT NIGHT...NE wind 20 kt. Seas 4 ft.
.SUN...NE wind 25 kt. Seas 5 ft.
.MON THROUGH TUE...NE wind 15 kt. Seas 3 ft.

$$

PKZ129-150145-
Passage Canal-
356 AM AKST Fri Dec 14 2018

.TODAY...Variable wind less than 10 kt. Seas 2 ft. Snow.
.TONIGHT...E wind 10 kt increasing to 15 kt after midnight. Seas 2 ft. Snow.
.SAT...E wind 15 kt diminishing to 10 kt in the afternoon. Seas 2 ft. Snow.
.SAT NIGHT...Variable wind less than 10 kt. Seas 2 ft.
.SUN...E wind 25 kt. Seas 4 ft.
.MON...E wind 20 kt. Seas 3 ft.
.TUE...W wind 15 kt. Seas 2 ft.

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PKZ130-150145-
West of Barren Islands including Kamishak Bay-
356 AM AKST Fri Dec 14 2018

...GALE WARNING TONIGHT...

.TODAY...NE wind 30 kt. Seas 9 ft. Freezing spray. Snow.
.TONIGHT...NE wind 40 kt. Seas 11 ft. Freezing spray. Snow.
.SAT...NE wind 30 kt. Seas 9 ft. Snow showers.
.SAT NIGHT...N wind 30 kt. Seas 10 ft.
.SUN...NW wind 25 kt. Seas 8 ft.
.MON THROUGH TUE...NW wind 30 kt. Seas 9 ft.

$$

PKZ131-150145-
Barren Islands East-
356 AM AKST Fri Dec 14 2018

...GALE WARNING TONIGHT AND SATURDAY...

.TODAY...SW wind 20 kt becoming E 25 kt in the afternoon. Seas 11 ft. Snow and rain.
.TONIGHT...E wind 35 kt. Seas 19 ft. Rain and snow.
.SAT...E wind 40 kt. Seas 24 ft. Rain.
.SAT NIGHT...NE wind 45 kt. Seas 27 ft.
.SUN...NW wind 25 kt. Seas 19 ft.
.MON...N wind 25 kt. Seas 14 ft.
.TUE...NW wind 30 kt. Seas 14 ft.

$$

PKZ132-150145-
Marmot Island to Sitkinak-
356 AM AKST Fri Dec 14 2018

...GALE WARNING TONIGHT AND SATURDAY...

.TODAY...E wind 20 kt increasing to 30 kt in the afternoon. Seas 11 ft. Rain and snow.
.TONIGHT...E wind 45 kt. Seas 18 ft building to 25 ft after midnight. Rain.
.SAT...NE wind 40 kt. Seas 27 ft. Widespread rain showers.
.SAT NIGHT...N wind 45 kt. Seas 28 ft.
.SUN...NW wind 30 kt. Seas 21 ft.
.MON...NW wind 30 kt. Seas 15 ft.
.TUE...NW wind 35 kt. Seas 15 ft.

$$

PKZ136-150145-
Chiniak Bay-
356 AM AKST Fri Dec 14 2018

...GALE WARNING SATURDAY...

.TODAY...Variable wind less than 10 kt becoming NE 20 kt in the afternoon. Seas 3 ft building to 6 ft in the afternoon. Snow and rain.
.TONIGHT...E wind 30 kt. Seas 10 ft. Rain and snow.
.SAT...NE wind 35 kt. Seas 13 ft. Widespread rain showers.
.SAT NIGHT...N wind 40 kt. Seas 16 ft.
.SUN...NW wind 25 kt. Seas 4 ft.
.MON...NW wind 20 kt. Seas 3 ft.
.TUE...NW wind 25 kt. Seas 4 ft.

$$

PKZ137-150145-
Marmot Bay-
356 AM AKST Fri Dec 14 2018

...SMALL CRAFT ADVISORY TONIGHT AND SATURDAY...

.TODAY...NE wind 10 kt increasing to 15 kt in the afternoon. Seas 4 ft. Widespread snow showers.
.TONIGHT...E wind 25 kt. Seas 10 ft. Snow and rain.
.SAT...NE wind 30 kt. Seas 11 ft. Widespread rain showers and snow.
.SAT NIGHT...N wind 35 kt. Seas 14 ft.
.SUN THROUGH MON...NW wind 20 kt. Seas 3 ft.
.TUE...NW wind 25 kt. Seas 4 ft.

$$

PKZ138-150145-
Shelikof Strait-
356 AM AKST Fri Dec 14 2018

...GALE WARNING TONIGHT...

.TODAY...NE wind 15 kt increasing to 30 kt in the afternoon. Seas 4 ft building to 8 ft in the afternoon. Snow.
.TONIGHT...NE wind 35 kt. Seas 10 ft. Snow with rain.
.SAT...NE wind 30 kt. Seas 10 ft. Widespread rain showers and snow.
.SAT NIGHT...N wind 30 kt. Seas 10 ft.
.SUN THROUGH MON...NW wind 25 kt. Seas 7 ft.
.TUE...NW wind 30 kt. Seas 9 ft.

$$

PKZ139-150145-
Cook Inlet Kalgin Island to Point Bede-
356 AM AKST Fri Dec 14 2018

...GALE WARNING TONIGHT...

.TODAY...NE wind 25 kt. Seas 7 ft. Freezing spray. Snow.
.TONIGHT...NE wind 35 kt. Seas 9 ft. Freezing spray. Snow.
.SAT...NE wind 30 kt. Seas 8 ft. Freezing spray.
.SAT NIGHT...N wind 30 kt. Seas 7 ft.
.SUN...N wind 25 kt. Seas 6 ft.

.MON THROUGH TUE...N wind 20 kt. Seas 5 ft.

$$

PKZ140-150145-
Cook Inlet North of Kalgin Island-
356 AM AKST Fri Dec 14 2018

...SMALL CRAFT ADVISORY TODAY AND SATURDAY...

.TODAY...N wind 25 kt diminishing to 15 kt in the afternoon. Seas 6 ft subsiding to 4 ft in the afternoon. Freezing spray. Snow.
.TONIGHT...N wind 20 kt. Seas 5 ft. Freezing spray. Snow.
.SAT...N wind 25 kt. Seas 5 ft. Freezing spray.
.SAT NIGHT...N wind 20 kt. Seas 4 ft.
.SUN...N wind 20 kt. Seas 5 ft.
.MON THROUGH TUE...N wind 15 kt. Seas 4 ft.

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PKZ141-150145-
Kachemak Bay-
356 AM AKST Fri Dec 14 2018

.TODAY...NE wind 15 kt. Seas 3 ft. Snow.
.TONIGHT...NE wind 15 kt. Seas 3 ft. Snow.
.SAT...NE wind 20 kt. Seas 3 ft.
.SAT NIGHT...NE wind 15 kt. Seas 3 ft.
.SUN...N wind 20 kt. Seas 2 ft.
.MON THROUGH TUE...NW wind 15 kt. Seas 2 ft.

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Department of Commerce • National Oceanic & Atmospheric Administration • National Weather Service

NATIONAL WEATHER SERVICE INSTRUCTION 10-813
NOVEMBER 18, 2020

Operations and Services

Aviation Weather Services, NWSPD 10-8

TERMINAL AERODROME FORECASTS

NOTICE: This publication is available at: http://www.nws.noaa.gov/directives/.

OPR: W/AFS24 (M. Graf) **Certified by:** W/AFS24 (B. Entwistle)

Type of Issuance: Routine

SUMMARY OF REVISIONS: This directive ***s***upersedes NWS Instruction 10-813, *Terminal Aerodrome Forecasts*, dated November 21, 2016. Changes made include:

- Section 3 – updated links and removed unnecessary footnote
- Section 4 – updated ICAO and WMO manual and regulation numbers
- Section 4 – allowed up to 8 FM groups for 30 hour TAF locations
- Section 4.1 – updated coordination section to include the AWC (including NAMs) and the AAWU. Also included the 10-803 link.
- Section 4.2 – Introduced topic of Digital Aviation Services (DAS)
- Section 4.2 – added the word "specifically" to the definition of vicinity as defined by the FAA
- Section 4.3 – updated to include the link for ASOS/AWOS limitations.
- Section 4.9 – added ICAO verbiage to address the grey window for 00/06/12/18 UTC issuances
- Section 4.11 – updated to include the link to the FAA's list of core airports.
- Section 4.13 – revised TAF examples to clearly show format of AMD NOT SKED
- Section 6 – updated to include the link to 10-2003.
- Section 7 – updated the Performance and Evaluation Branch's verification link.
- Appendix A – updated the definitions of Hail (GR) and Snow Pellets (GS) in the table.
- Appendix B – renumbered sections
- Appendix B Section 1 – the IWXXM TAF is explained (LT)
- Appendix B Section 2.4.2 – updated wording to add more detail for low winds
- Appendix B Section 2.6 – added verbiage to use 3 winter weather types judiciously
- Appendix B Section 2.8 – LLWS section rewritten to improve clarity
- Appendix B Section 2.9.1 – moved NDFD wording from TCF discussion to section 2.6
- Appendix B Section 2.9.1 – updated CDM/CCFP to TFM/TCF.
- Appendix B Section 2.9.2 – added examples for reasons to add a new FM group
- Appendix B Section 2.9.3 – removed the first 9 hour restriction for TEMPO
- Appendix C Section 1.3.1 – updated the CAC process and spreadsheet link.

- Appendix D – renumbered the sections
- Appendix D Section 1 – updated to include links for 10-1805 and 10-101.
- Appendix D Section 2 – updated to clarify adding a new TAF verbiage
- Appendix D Section 2– added verbiage to highlight the use of temporary TAFs
- Appendix D Section 3 – updated to include additional data for observations outages.
- Appendix D Section 4.1 – updated NIL TAF reporting process.
- Appendix E – reformatted table
- Appendix F – is new, lists all NWS TAFs valid for 30 hours

STERN.ANDREW.D.1382920348 Digitally signed by STERN.ANDREW.D.1382920348 Date: 2020.11.04 14:02:32 -05'00'

November 4, 2020

Andrew D. Stern
Director
Analyze, Forecast and Support Office

Date

Terminal Aerodrome Forecasts

Table of Contents **Page**

1 General

This instruction describes Terminal Aerodrome Forecast (TAF) preparation by National Weather Service (NWS) Weather Forecast Offices (WFOs). TAFs, also known as Aerodrome Forecasts, are a critical element of NWS aviation weather services because they are a key product in decisions for flight planning and for aircraft movement within the National Airspace System (NAS).

2 Background

TAFs are used by a variety of aviation users, including domestic and international commercial airlines, general aviation (GA), civilian, and military operators. TAFs will be prepared, issued, and distributed on a timely basis to meet the requirements of the U.S. Aviation Meteorological Authority, the Federal Aviation Administration (FAA), and the International Civil Aviation Organization (ICAO) using a code format designed by the World Meteorological Organization (WMO) for both domestic and international use.

3 Responsibility

WFO Meteorologists in Charge (MICs) are responsible for maintaining a consistent and accurate aviation forecast program for their offices. TAFs are prepared by designated NWS offices for the sites listed here. TAF sites are listed alphabetically by the four-letter ICAO identifier followed by the state, city, and airport name. The Analyze, Forecast, and Support Office's Aviation and Space Weather Services Branch (AFS24) at NWS Headquarters (NWSH) will update this list as needed.

4 Aerodrome Forecast

NWS TAFs consist of the expected meteorological conditions significant to aviation at an airport for a specified time period. For the U.S., this is the area within five (5) statute miles (SM) of the center of an airport's runway complex. Forecasters will prepare and monitor TAFs using the best professional judgment to optimize timeliness and representativeness, with an awareness of the potential operational impact of each forecast element. TAFs should remain as concise as possible to describe changes in flight conditions and generally not exceed 6 "From" (`FM`) groups for most TAF sites and 8 `FM` groups for locations with 30 hour TAFs (excluding a `TEMPO` group) except when absolutely necessary to describe relevant weather conditions. `FM` groups are described in Section 4.12.

TAFs in the U.S. are prepared, with allowed modifications, following requirements and regulations set by the International Civil Aviation Organization (ICAO) in the Standards and Recommended Practices (SARPS) Annex 3 *Meteorological Service for International Air Navigation*, the WMO Technical Regulations No. 49 Volume II — *Meteorological Service for International Air Navigation*; Manual on Codes, International Codes Volume I.1 Part A, Alphanumeric Codes; and the FAA regulations. U.S. modifications will be held to a minimum.

4.1 Coordination

Forecasters should coordinate with each other across appropriate NWS offices, including the servicing Center Weather Service Unit (CWSU), the Aviation Weather Center (AWC) (including the National Aviation Meteorologists (NAMs)), and the Alaska Aviation Weather Unit (AAWU), along with adjacent WFOs in accordance with NWSI 10-803, *Support to Air Traffic Control*

Facilities to ensure consistency between the TAF and the Impact-based Decision Support Services (IDSS) provided by the CWSU and NAMs. Where applicable, TAFs should also be consistent with the public forecast and other aviation products.

4.2 Composing the TAF

A complete TAF includes a forecast of surface wind (speed and direction), surface visibility, weather, obstructions to vision (if any), clouds (or vertical visibility into a surface-based obscuration), Low Level Wind Shear (LLWS), and any expected significant change(s) to one or more of these elements during the specified time period, ordinarily 24 hours. However, specified international airports require 30-hour TAFs. See Appendix F.

Forecasters should keep the following in mind when composing a TAF:

- Be aware of operationally significant weather for the airport including FAA Traffic Flow Management Weather Information requirements.
- Be aware of amendment criteria when formulating the forecast, but do not forecast to satisfy criteria.
- Include more detail in the first 12 hours of the TAF. The latter hours in the TAF may contain less detail but should highlight significant changes that impact the terminal, as this is used for strategic planning, particularly by the NWS Meteorologists at the FAA Command Center and airline dispatch operations.
- Those offices using Digital Aviation Services (DAS) should start their TAFs from the TAFs developed from the gridded forecast and modify as needed.

TAFs may also include specified significant meteorological phenomena expected to occur in the airport's vicinity (`VC`) during any part of the valid period as `VC` weather codes (`VCFG`, `VCSH`, `VCTS`). In the United States, vicinity is defined specifically as the area between 5 and 10 statute miles (`SM`) from the center of the runway complex of an airport.

The forecaster will maintain a watch of weather conditions for all pertinent TAF sites, including sites with scheduled part-time observations, automated observing sites requiring part-time augmentation, and non-augmented automated observing sites.

4.3 TAFs for Automated Systems

TAFs for Automated Surface Observing System (ASOS) and Automated Weather Observing System (AWOS) sites have limitations, and forecasts for these sites should take the limitations into consideration. For example, if the forecaster expects clouds above 12,000 feet, zero visibility, and/or ice pellets, the TAF should reflect these conditions even when an automated system reports clear skies (below 12,000 feet) and/or visibility of `M1/4SM` (which indicates visibility of < ¼ SM). For additional information on ASOS/AWOS limitations, please reference NWSI 10-1301 *Aviation and Synoptic Observations*, Section 5.3. Additionally, forecasters should be familiar with local considerations outlined in the local office SDM.

4.4 Format

The format of the TAF follows ICAO standards as outlined in Appendix B. The length of a line will not exceed 69 spaces, including typed characters, spaces, returns, and the end-of-report separator.

4.5 Contractions

The only contractions used in NWS TAFs are those terms defined in this instruction and its appendices, which are derived from the WMO Codes Manual and from the ICAO document *ICAO Abbreviations and Codes*. All valid contractions for TAFs are included in Appendix A.

4.6 TAF Corrections

Corrections to the TAF should be issued as soon as the forecaster becomes aware of the error. Normally a correction is issued within a half hour of the issuance of the original forecast. Corrections made later than one hour after a TAF has been issued should be sent as an amendment, with forecast conditions updated as the original mistake is corrected.

4.7 TAF Amendments

The decision to amend the TAF relies on the forecaster's assessment of existing conditions and expectations. If conditions change earlier or later than forecast but the TAF shows the expected trend and will soon recover, an amendment may not be needed. Additionally, small fluctuations in the observation should not result in a minor adjustment to the TAF (chasing the observation). However, if improving weather conditions occur sooner than forecast, then an amended TAF is necessary.

TAF amendments are issued promptly when:

a. Conditions meeting amendment criteria are expected or have occurred, and those conditions will, in the forecaster's estimation, persist, or
b. New guidance/information indicates future conditions are expected to be in a different category than originally forecast, especially in the 1-6 hour time-period.

Forecasters should maintain a weather watch and amend forecasts prior to weather conditions meeting amendment criteria. Additionally, forecasters should issue TAF AMDs for significant forecast changes immediately rather than waiting for the next regularly scheduled TAF release time, even if that release time is close to an upcoming or previous routine or amended TAF issuance.

4.8 TAF Collectives

When a WFO transmits more than one TAF in a collective, each forecast is started on the line immediately following the previous TAF with the location identifier at the left margin. Each complete TAF is followed by an end-of-report separator (an equal sign [=]), which denotes the end of a complete TAF for each location. The end-of-report separator is followed by a return.

4.9 Issuance Times

Scheduled TAFs prepared by NWS offices are issued at least four times a day, every six (6) hours. Some locations have amendments routinely issued three hours after the initial issuance. Issuance times are:

Scheduled Issuance	Valid Period	End Time for 30 Hour	Issuance Window
0000 UTC	0000 to 0000 UTC	0600 UTC	2320 to 2340 UTC
0300 UTC (AMD)	0300 to 0000 UTC	0600 UTC	
0600 UTC	0600 to 0600 UTC	1200 UTC	0520 to 0540 UTC

0900 UTC (AMD)	0900 to 0600 UTC	1200 UTC	
1200 UTC	1200 to 1200 UTC	1800 UTC	1120 to 1140 UTC
1500 UTC (AMD)	1500 to 1200 UTC	1800 UTC	
1800 UTC	1800 to 1800 UTC	0000 UTC	1720 to 1740 UTC
2100 UTC (AMD)	2100 to 1800 UTC	0000 UTC	

The issuance of a new TAF cancels any previous TAF for the same time and location. For example, a forecast issued at 1720 UTC is valid immediately despite the validity period in the TAF starting at 1800 UTC. For a routine TAF, the forecast may still be amended prior to the top of the hour (e.g., an 18Z TAF may be amended between 1720-1759 UTC).

4.10 Time References

The times in TAFs are stated in Universal Time Coordinated (UTC). Time references should be as detailed and specific as supporting data and present science allow and do not need to begin at the top of an hour. The letter **Z** is appended to the end of the date-time group of forecast origin. The contraction UTC does not appear in either the WMO abbreviated heading or the forecast text.

4.11 Update Frequency

A WFO may choose to routinely issue TAFs more frequently than every six hours as a method of keeping the TAF as representative as possible. For example the FAA's core airports receive regularly scheduled amendments at three hour intervals using the suggested amendment times in the table above. These intermediate TAFs are issued as amendments using the TAF AMD header. Offices not issuing for these core airports may issue more frequent updates after coordinating the change with the appropriate Regional Headquarters.

4.12 Length of TAF Change Groups

To forecast a change in weather conditions starting at a particular time, the `FM` (from) contraction is used and is always a single time, to the nearest minute if the expected change can be forecast to that degree of accuracy. Temporary (`TEMPO`) groups do not exceed four (4) hours. Probability (`PROB`) groups are six (6) hours or less. More information on Change Groups can be found in the appendices.

4.13 Sites with Scheduled Part-Time Observations

For TAFs with less than 24-hour observational coverage, the TAFs are valid to the end of the routine scheduled forecast period even when observations end prior to that time. The time observations are scheduled to end and/or resume is indicated by expanding the `AMD NOT SKED` statement. Expanded statements include:

a. Observation ending time (`AFT` Y_1Y_1HHmm, e.g., `AFT 120200`),
b. Scheduled observation resumption time (`TIL` Y_1Y_1HHmm, e.g., `TIL 171200`) or
c. Period of observation unavailability ($Y_1Y_1H_1H_1/Y_eY_eH_eH_e$, e.g., `2502/2512`).

`TIL` is used only when the beginning of the scheduled TAF valid period coincides with the time of the last observation or when observations are scheduled to resume prior to the next scheduled issuance time. When used, these remarks immediately follow the last forecast group. If a routine

TAF issuance is scheduled to be made after observations have ceased, but before they resume, the remark `AMD NOT SKED` immediately follows the last `FM` line of the scheduled issuance.

After sufficient data using the total observation concept has been received, the `AMD NOT SKED` remark is removed.

Examples:

```
TAF AMD
KRWF 150202Z 1502/1600
{TAF text}
AMD NOT SKED 1505/1518=

TAF AMD
KPSP 190230Z 1903/1924
{TAF text}
AMD NOT SKED=
```

5 NWS Forecaster Liability

NOAA's Office of General Counsel, Weather, Satellite and Research Section has advised that NWS forecasters are generally protected from liability when utilizing their discretion:

> *NWS forecasters employ their discretion in issuing forecasts, including utilizing the "total observation concept" for writing and issuing TAFs. In the performance of their jobs, where NWS forecasters utilize their discretion, they are covered under the discretionary function exemption of the Federal Tort Claims Act, 28 U.S.C. §§ 2671* et seq.

6 Records Retention

Records of disseminated TAFs, including amendments, corrections, and delayed issuances, will be maintained in accordance with NWSI 10-2003, *Records Retention*.

7 Quality Assurance of TAFs

Performance reports to the office staff and stakeholders (airport managers/individual airlines) are encouraged to let them know how the office is supporting their mission. In aviation forecasting, the goal is to continually improve forecast service by identifying forecasting weaknesses and developing methods to strengthen those weaknesses.

NWS uses Stats-on-Demand as the primary program for performing verification on TAFs and WFOs verify their respective TAFs in this manner. The Aviation Focal Points (AFPs) may view individual stats for their forecasters with approval from their Meteorologist-in-Charge (MIC). See NWSI 10-1601, Section 6.1.3. (NOTE: Verification is covered in NWSI 10-1601.) Forecast and verification results tracked using the Stats-on-Demand verification program will never be used against forecasters.

Appendix A – Contractions Used in NWS TAFs

AA*x*	Code used in the WMO abbreviated heading to indicate an amended TAF, where *x* is the letter A through X (see Appendix C, Section 1.1). NOTE: AA*x* is not used in the forecast text.
AFT	After
AMD	Amended TAF. Used in the forecast text only. AMD is not used in the WMO abbreviated heading.
BC	Patches
BKN	Broken cloud layer [five (5) to seven (7) oktas cloud amount]. Clouds may be transparent or opaque. Lowest broken layer is implied to be the ceiling.
BL	Blowing
BR	Mist
CB	Cumulonimbus cloud
CCCC	Generic WMO format code group for a four-letter location identifier. Four-letter location identifiers for specific airports are listed in ICAO document 7910 *Location Identifiers*.
CC*x*	Code used in the WMO abbreviated heading to indicate a corrected forecast, where *x* is the letter A through X (see Appendix C, Section 3). CC*x* is not used in the forecast text.
CLD	Cloud
DR	Low drifting
DS	Dust Storm
DU	Dust
DZ	Drizzle
FC	Funnel Cloud
FEW	Few clouds [greater than zero (0) oktas to two (2) oktas cloud amount]
FG	Fog
FM	From the date (*DD*) and time (UTC) indicated by *GGgg*. Generic WMO format code group, indicating a significant and rapid (in less than one hour) change to a new set of prevailing conditions. *GG* is in whole hours, *gg* is in minutes. See Appendix B, Section 2.9.
FU	Smoke
FZ	Freezing
G	Wind gust. Defined as rapid fluctuations in wind speed with a variation of 10 knots or more between peaks and lulls within a 10 minute time period.
GR	Hail
GS	Snow pellets
HZ	Haze
IC	Ice crystals
KT	Knots
LTD	Limited
MI	Shallow
NSW	No Significant Weather. An indication that significant weather conditions, as expressed by WMO Code Table 4678, are forecast to end. See Appendix B, Section 2.6.
OVC	Overcast cloud layer [eight (8) oktas cloud amount]
P6SM	Visibility forecast greater than six (6) statute miles
PL	Ice pellets
PO	Well-developed dust/sand whirls
PR	Partial
PROB*C_2C_2*	Probability of occurrence of a thunderstorm (and associated precipitation) or precipitation event, along with associated weather elements (wind, visibility, and/or sky condition) directly related to the thunderstorm or precipitation event. C_2C_2 refers to the probability of the event. Only PROB30 is allowed. See Appendix B, Section 2.9.4.
PY	Spray
RA	Rain
RR*x*	Code used in the WMO abbreviated heading to indicate a delayed TAF, where *x* is the letter A through X (Appendix C, Section 2). RR*x* is not used in the TAF text.

SA	Sand
SCT	Scattered cloud layer [three (3) to four (4) oktas cloud amount]
SH	Showers
SKED	Scheduled
SM	Statute miles
SN	Snow
SQ	Squall
SS	Sandstorm
TAF	Aerodrome Forecast code format. The international standard for the TAF code, FM 51-X Ext. TAF, is included in WMO Manual on Codes, WMO No. 306, Volume I.1, Part A.
TEMPO	Temporarily. Indicator of temporary fluctuations to forecast conditions which are expected to last < 1 hour in each instance and, in the aggregate, to cover less than half of the indicated period. The period of time covered by a TEMPO group should be the minimum necessary, not to exceed four (4) hours. See Appendix B, Section 2.9.2.
TIL	Until
TS	Thunderstorm
VA	Volcanic Ash
VC	Vicinity — it has two definitions: NWS: A donut-shaped area encompassed between circles with radii of 5 and 10 SM, respectively, from the center of the runway complex of an airport. VC will only be used in the initial time period or in FM groups, all of which forecast prevailing conditions, and will only be used in combination with fog (FG), shower(s) (SH), and thunderstorm(s) (TS). WMO: (An area encompassed) within eight (8) kilometers [five (5) statute miles] of the aerodrome but not at the aerodrome (Words in parentheses inferred. See Note 1 under WMO Regulation 15.8.10). Only used in METARs/SPECIs.
VIS	Visibility
VRB	Variable wind direction. Wind direction is considered variable when it is impossible to forecast a mean wind direction due to its expected variability, e.g., for very light winds [≤ six (6) knots] or during convective activity.
VV	Vertical Visibility
Z	Indicator letter (an abbreviated symbol for Coordinated Universal Time – UTC) appended to the date-time of forecast origin group.

Appendix B – TAF Code Elements

Each group of the TAF code used in NWS TAFs is described in the following sections. Each section includes partial or complete examples of one or more TAFs to clarify descriptions in the text.

B1 Bulletin Headings

TAF bulletins begin with a WMO heading where the four-letter ICAO identifier is the issuing office. For example:

[FT|LT]US42 KMFL 141100 AAx
TAFFLL
TAF (AMD|COR)
KFLL 141123Z 1412/1512 etc…

FT or **LT**	TAF whose valid period exceeds 12 hours. FT designates a Traditional Alphanumeric Code (TAC) product; LT designates the message is in ICAO Meteorological Exchange Model (IWXXM) format[#].
US	Denotes United States airport locations CONUS and abroad.
42	CONUS group location (usually by geographical area).
KMFL	Issuing WFO.
141100	First 2 digits are issuance date; the last four are cardinal hour prior to forecast valid hour, required to meet international requirements for scheduled TAFs.
AA*x*	Used to identify a non-scheduled TAF (corrections, delayed TAFs, amendments, etc.). If not used, simply omit (as in regularly scheduled TAFs). The indicators used are AA*x* for TAF amendments, RR*x* for delayed routine TAFs, and CC*x* for corrections of previously transmitted TAFs. The *x* is the letter A through X, used sequentially which indicate the subsequent use of the heading. For example, the first correction would be CCA, the second CCB, etc.
TAFFLL	First three (3) letters identify a TAF, the last three are the site the TAF is for (this line is deleted during dissemination for disbursement as a group).
TAF	Identifies TAF as the product.
TAF AMD	TAF AMD indicates an amendment.
TAF COR	TAF COR indicates a correction.
KFLL	ICAO identifier of the TAF site*.
141123Z	Time of issuance.
1412/1512	Valid time of new TAF.

[#]In accordance with ICAO and WMO requirements, WFOs simultaneously disseminate TAFs in both Traditional Alphanumeric Code (TAC) and IWXXM data standards. IWXXM uses machine-readable eXtensible Markup Language (XML) for digital communications. IWXXM is generated automatically within NWS production and telecommunications systems.

*ICAO location identifiers in the CONUS begin with the letter K, those in the North Pacific (Hawaii, Alaska, and Guam) begin with P, those in the Caribbean (Puerto Rico, Virgin Islands, etc.) begin with T, and those in the South Pacific begin with N.

B2 Forecast Text

The first line of text in a TAF consists of the contraction `TAF` or `TAF AMD` or `TAF COR`. This indicates if the product is scheduled, amended, or corrected. This information appears only once, on a separate line at the beginning of the product, regardless of how many TAFs it contains. Delayed TAFs are not identified in the text; that information is included at the end of the first line on the WMO header.

The format of text in an NWS TAF is comprised of code groups shown below. Each term and group is described in Sections B2.1 through B2.9 below and in the same sequence as they are required to appear in each forecast group.

GENERIC FORMAT OF THE FORECAST TEXT OF AN NWS-PREPARED TAF

TAF|**TAF AMD**|**TAF COR**
*CCCC YYGGgg*Z $Y_LY_1G_1G_1/Y_2Y_2G_2G_2$ *dddff*Gf_mf_mKT *VVVV w'w'* (NSW) VV$h_sh_sh_s$ (SKC)
WS$h_{ws}h_{ws}h_{ws}$/*dddff*KT
FM$Y_1Y_1GGG_eGe$
TEMPO $Y_1Y_1GG/Y_eY_eG_eG_e$|PROB30 $Y_1Y_1GG/Y_eY_eG_eG_e$

B2.1 Location Identifier (*CCCC*)

After the line containing either `TAF` or `TAF AMD` or `TAF COR`, each TAF will begin with its four-letter ICAO location identifier. ICAO Document 7910 contains a complete list of all identifiers.

B2.2 Date/Time of Forecast Origin Group (*YYGGgg*Z)

The date/time of the forecast origin group follows the terminal's location identifier. It contains the day of the month in two (2) digits (*YY*) and time in four (4) digits (*GGgg* in hours and minutes) the forecast is completed and ready for transmission, with a `Z` appended to denote UTC. This time is entered by the forecaster. Section 4.9 of this instruction contains a table of issuance time windows for scheduled TAFs.

B2.3 Valid Period and Routine Issuances ($Y_1Y_1G_1G_1/Y_2Y_2G_2G_2$)

The TAF valid period is the next group. The first two digits (Y_1Y_1) are the day of the month for the start of the TAF. The next two digits (G_1G_1) are the starting hour. Y_2Y_2 is the day of the month for the end of the TAF, and the last two digits (G_2G_2) are the ending hour of the valid period. A forecast period that begins at midnight UTC will be annotated as `00`. If the end time of the valid period is at midnight UTC, it is annotated as `24`. For example, a 00Z TAF issued on the 9th of the month would have a valid period of `0900/0924`.

A TAF issued at one of the airports designated to have a 30-hour valid period will also be formatted $Y_1Y_1G_1G_1/Y_2Y_2G_2G_2$. For example, a 00Z TAF issued on the 11th of the month for 30 hours would have a valid period of `1100/1206`.

B2.4 Wind Group (*ddd**ff*G*f*$_m$*f*$_m$KT)

The initial time period and any subsequent FM groups will begin with a mean surface wind forecast for that period. Wind forecasts are expressed as the mean three-digit direction (*ddd* – relative to true north) rounded to the nearest ten degrees and the mean wind speed in knots (*ff*) for the time period.

B2.4.1 Wind Gusts (G)

If wind gusts, defined as rapid fluctuations in wind speeds with a variation of 10 knots or more between peaks and lulls, are forecast, they are indicated immediately after the mean wind speed by the letter G, followed by the peak gust speed expected. KT is appended to the end of the wind forecast group. Any wind speed of 100 knots or more will be encoded in three digits. Encode calm winds as 00000KT.

B2.4.2 Wind Direction (*ddd*)

The prevailing wind direction will be forecast for any speed greater than or equal to seven (7) knots. However, the forecaster should strive to forecast a mean wind direction with low wind speeds, especially if the weather is expected to, or has already, impacted the TAF site. Wind direction forecasts, even at low speeds, can be critical if the runway(s) are contaminated by ice, snow, or water, creating tighter tailwind and crosswind aircraft tolerances. Additionally, wind direction forecasts can be used by the local tower and/or TRACON to determine runway configurations. Since there are no amendment criteria for low wind speed conditions, forecasters should use their discretion and knowledge of local customer needs to determine if an amendment is necessary.

B2.4.3 Variable Wind (VRB*ff*KT)

The forecast wind direction will be encoded when forecasting a prevailing surface wind direction is not possible due to its expected variability (variations in wind direction ≥ 30 degrees). Meteorologists should avoid using VRB and provide the best forecast direction possible. This enables users to use the wind group for planning purposes. If necessary, two conditions where this can occur are very light winds and convective activity. Variable wind direction for very light winds should have a wind speed of one (1) through six (6) knots inclusive. For convective activity, the wind group may be encoded as VRB*ff*G*f*$_m$*f*$_m$KT, where G*f*$_m$*f*$_m$ is the maximum expected wind gusts. VRB is not used in the non-convective LLWS group (refer to Section B2.8).

When forecasting variable wind direction, there is no requirement to specify direction variability limits in remarks.

B2.4.4 Squalls (SQ)

Squalls are forecast in the wind group as gusts (G), but should be identified in the significant weather group with the code SQ (see Appendix E, Section 4, Footnote 17).

EXAMPLES:

```
TAF
KPIT 231732Z 2318/2418 23010KT 4SM -SHRA BKN030
     FM232200 28020G35KT P6SM OVC020
     FM232330 30015KT P6SM SCT060
     FM240500 30004KT P6SM SCT080=
```

The above example demonstrates rapid changes in wind associated with a frontal passage. Also note the correct format for gusts.

```
TAF
KCSG 060537Z 0606/0706 VRB03KT...
```

This example above shows the correct format and use of variable wind direction with light winds at the beginning of the valid period (0600 UTC).

```
TAF
KROW 021726Z 0218/0318 30008KT 5SM HZ BKN030
      PROB30 0304/0306 27020G45KT 1SM TSRA OVC012CB...
```

This example above depicts using high winds in an organized event.

```
TAF
KAMA 171130Z 1712/1812 00000KT...
```

This example above shows the correct format for calm winds.

```
TAF
PASN 010530Z 0106/0206 080100G140KT...
```

This example above shows the correct format of wind speed of 100 knots or more with the wind from 80 degrees at 100 knots gusting to 140 knots.

```
TAF
KORD 161725Z 1618/1718 27020G35KT P6SM TS FEW020CB
      TEMPO 1618/1619 29040G56KT SQ
     FM161930 30015G25KT P6SM...
```

This example shows the correct format for squalls.

B2.5 Visibility Group (VVVV)

The initial time period and any subsequent FM groups will include a prevailing visibility forecast in statute miles. The valid values for visibility forecasts in NWS TAFs are shown below. Visibility will be forecast rounded down to the next lowest reported value. The contraction SM is appended to the end of the visibility forecast group.

Visibility Forecast Values in Statute Miles (SM)	
0	1/4
1/2	3/4
1	1 1/2
2	3
4	5
6	P6SM

When the prevailing visibility is forecast to be less than or equal to six (6) SM, one or more significant weather groups (see Section 1.2.6) will be included. However, drifting dust (DRDU), drifting sand (DRSA), drifting snow (DRSN), shallow fog (MIFG), partial fog (PRFG), and patchy fog (BCFG) may be forecast with prevailing visibility greater than or equal to seven (7) statute miles.

When a whole number and a fraction are used to forecast visibility, a space will always be included between them (e.g., `1 1/2SM`). Visibility greater than six (6) statute miles will be encoded as `P6SM`.

Prevailing visibility, as described by Federal Meteorological Handbook No. 1 (FMH-l), will be used if the visibility is not expected to be the same in different directions.

When `VA` is forecast in the significant weather group, visibility will be included in the forecast, even if it is unrestricted (`P6SM`). For example, an expected reduction of visibility to 10 statute miles by volcanic ash will be encoded in the forecast as `P6SM VA`.

B2.5.1 Tall Tower Airports

Tall tower airports report the lower visibility of tower or surface visibility as the prevailing visibility in the main body of the observation with the higher visibility in the remarks section. Forecasters need to monitor these airport observations closely to maintain awareness of the surface visibility. For clarification, the TAF will include forecasts of surface conditions, not that of the tower.

B2.6 Significant Weather Group (*w'w'*)

The significant weather group consists of the appropriate qualifier(s) and weather phenomenon contraction(s) (shown in Appendix E, Section 3 and described in FMH-1) or `NSW`, and Section 4 of Appendix E shows all possible valid combinations of weather phenomena codes and should be used to encode *w'w'*.

Forecasters use their judgment when determining how many weather phenomena groups are included. NWS forecasters may include up to three (3) separate *w'w'* groups, if necessary, to accurately describe the expected conditions. Forecaster judgment is used to resolve situations not addressed by these guidelines.

When the National Digital Forecast Database (NDFD) has a 55% or greater chance of precipitation and/or thunderstorms (in the likely category or higher), forecasters should include the phenomenon as prevailing or `TEMPO` (rain, snow, thunder, etc.) at applicable TAF sites for the appropriate period(s) of time.

The following guidance should be used for this group:

- If the initial forecast period and subsequent `FM` groups do not contain an explicit significant weather group, the significant weather group will be omitted.
- Do not use `NSW` in the initial forecast time period or `FM` groups.
- Tornadic activity, including tornadoes, waterspouts, and funnel clouds, should only be included in TAFs when absolutely necessary. Although the probability of occurrence at a specific site is low, it is possible.
- One or more significant weather group(s) is (are) required when the visibility is forecast to be 6SM or less (see Section B2.5).
- `DRDU`, `DRSA`, `DRSN`, `MIFG`, `PRFG`, and `BCFG`, obstructions to vision are only forecast when the prevailing visibility is less than 7 statute miles or, in the judgment of the forecaster, is considered operationally significant.

- VA is always forecast when expected. When VA is included in the significant weather group, visibility is included in the forecast as well, even if the visibility is unrestricted (P6SM).
- NSW is used in place of *w'w'* in a TEMPO group (Section B2.9.3) to indicate when significant weather included in a previous subdivided group is expected to end. This includes vicinity.
  - After NSW is used in a significant weather group, any subsequent significant weather groups will either be omitted or selected from the phenomena listed in Section B4.
  - No two consecutive TEMPO groups can contain NSW as the significant weather group.
  - P6SM NSW is used together in a TEMPO group when the significant weather is forecast to end and the visibility is forecast to be greater than 6 statute miles after, regardless of visibility before the TEMPO event.
- When more than one type of significant weather is forecast in the same forecast time period, the order is:
  - Thunderstorms with/without associated precipitation.
  - Significant weather in order of decreasing dominance based on intensity.
  - Left to right in Appendix E, Section 3 (columns 1 through 5).
- Non-precipitation significant weather elements are encoded after any precipitation, in their own group, separated by a space (e.g., -SHSN BLSN BR). The same is true for encoding *w'w'* groups: first, the appropriate qualifier for intensity or proximity, then the appropriate contraction for the descriptor, and finally the contraction for the observed weather phenomenon or combinations thereof, all without any spaces.
- Multiple precipitation elements are encoded in a single group (e.g., -TSRASN).
  - Up to three (3) appropriate precipitation contractions can be combined in a single group (with no spaces) with the predominant type of precipitation being first. Be aware that in some high traffic corridors this combination can ground flights, so use judiciously.
  - In this single group, the intensity will refer to the total precipitation and be used with either one or no intensity qualifier.
    - The intensity qualifiers (light, moderate, and heavy) refer to the intensity of the precipitation and not to the intensity of any thunderstorms associated with the precipitation.

B2.6.1 Exception for encoding multiple precipitation types

When more than one type of precipitation is forecast in a time period, any precipitation type associated with a descriptor (e.g., FZRA) is encoded first in the precipitation group, regardless of the predominance or intensity of the other precipitation types. Descriptors are not to be encoded with the second or third precipitation type in the group. The intensity is associated with the first precipitation type of a multiple precipitation type group.

For example, a forecast of heavy snow and light freezing rain is properly coded as -FZRASN, although the intensity of the snow is greater than the freezing rain. This is why the descriptor (FZ) and the intensity associated with this precipitation type should be encoded first. In this example, since heavy snow is forecast, it would have to be inferred by a visibility forecast of less than 1/4SM.

B2.6.2 Qualifiers

A qualifier precedes (with no space) the phenomena including the descriptor to which it applies. There are two categories of qualifiers (see Appendix E, Section 3): intensity/proximity or descriptor. Except for VCSH and VCTS, only one intensity or proximity qualifier and descriptor is used for each weather phenomena group. The intensity qualifiers are light (-), moderate (no qualifier), and heavy (+).

- Refer to Section 8.4.1 of FMH-l for criteria in determining intensity associated with these weather elements. Intensity is coded with precipitation types using the following guidance:
- Ice crystals and hail do not have an intensity qualifier.
- No intensity is ascribed to
  - Blowing dust (BLDU)
  - Blowing sand (BLSA)
  - Blowing snow (BLSN)
  - Thunderstorms (TS)
- Only moderate or heavy intensity will be ascribed to sandstorm (SS) and dust storm (DS).

If a significant weather code group is used and conditions are forecast to change, the significant weather entry in the next TEMPO group (Section B2.9.3) should be a different code group or NSW. If the significant weather group does not differ in subsequent TEMPO groups, no change to the significant weather group is necessary and the current significant weather group will apply.

EXAMPLES (combinations of one precipitation and one non-precipitation weather phenomena):

-DZ FG	Light drizzle and fog (obstruction which reduces visibility to < 5/8 SM)
RA BR	Moderate rain and mist (obstruction which reduces visibility to < 7 SM but ≥ 5/8 SM)
-SHRA FG	Light rain showers and fog (visibility < 5/8 statute miles)
+SN FG	Heavy snow and fog

EXAMPLES (showing combinations of more than one type of precipitation):

-RASN FG HZ	Light rain and snow (light rain predominant), fog and haze
TSSNRA	Thunderstorm with moderate snow and rain (moderate snow predominant)
FZRASNPL	Moderate freezing rain, snow, and ice pellets (freezing rain mentioned first due to the descriptor, followed by other precipitation types in order of predominance)
SHSNPL	Moderate snow showers and ice pellets

EXAMPLE TAF:

TAF
KFAR 091739Z 0918/1018 21030G60KT 1/4SM +TSRAGR BKN050CB...

Wind from the southwest at 30 knots, with gusts to 60 knots. Visibility one-quarter statute miles, thunderstorm (severe because of 60KT gusts) with heavy rain and hail. NOTE: the + qualifier is associated with the precipitation (RA) and not the thunderstorm. Broken cumulonimbus (CB) clouds (ceiling) at 5,000 feet.

In the following cases the TS descriptor is treated differently than other descriptors:

1. When dry thunderstorms are forecast, TS may be encoded as the sole significant weather phenomenon; and
2. When forecasting thunderstorms with freezing precipitation (FZRA or FZDZ), include the TS descriptor first, followed by the intensity and weather phenomena.

See the following example:

TAF
KMCI 252335Z 2600/2700 31015KT 1 1/2SM TS -FZRA BKN010CB...

Wind from the northwest at 15 knots. Visibility one and one-half statute miles, thunder with light freezing rain, broken CB clouds (ceiling) at 1,000 feet.

When a TS is included in the significant weather group (even in the vicinity – VCTS), the cloud group ($N_sN_sN_sh_sh_sh_s$) includes a forecast cloud type of CB. See the following example for encoding VCTS:

TAF
KMCI 252335Z 2600/2700 31015KT 1 1/2SM -FZRA VCTS BKN010CB...

Wind from the northwest at 15 knots. Visibility one and one-half statute miles, light freezing rain, broken CB clouds (ceiling) at 1,000 feet, TS in the vicinity.

B2.6.3 Visibility as Significant Weather

When forecasting a fog-restricted visibility from 5/8 SM to 6 SM, the phenomena is coded as BR (mist). When forecasting a fog-restricted visibility that is < 5/8 SM, use code FG. Never encode weather obstruction as mist (BR) when the forecast visibility is > 6 statute miles (P6SM).

The following fog-related terms are used as described below:

Freezing Fog (FZFG)	Any fog (visibility < 5/8 SM) consisting predominantly of water droplets at temperatures ≤ 32 ºF/0ºC, whether or not rime ice is expected to be deposited. FZBR is not a valid significant weather combination and is not used in the TAF.
Shallow Fog (MIFG)	The visibility at 6 feet above ground level is ≥ 5/8 SM and the apparent visibility in the fog layer is < 5/8 SM.
Patchy Fog (BCFG)	Fog patches covering part of the airport. The apparent visibility in the fog patch or bank is < 5/8 SM, with the foggy patches extending to at least 6 feet above ground level.
Partial Fog (PRFG)	A substantial part of the airport is expected to be covered by fog while the remainder is expected to be clear of fog (e.g., a fog bank).

NOTE: MIFG, PRFG, and BCFG may be forecast with prevailing visibility of P6SM.

EXAMPLES:

TAF
KLWS 020530Z 0206/0306 27010KT 1/2SM FG VV008
FM021100 27010KT 3SM BR BKN010...

The example above shows the proper use of FG and BR. When significant weather is not expected in a FM group, the significant weather group is omitted.

```
TAF
KBIL 211140Z 2112/2212 04005KT 1SM -RA BR OVC008
     FM211715 34008KT 3SM -RA BKN050...
```

Change is expected at 1715Z. NOTE: The light rain is repeated in the FM211715 group to indicate that light rain remains in the forecast. The mist is omitted from the FM211715 group, which indicates it is forecast to end at 1715Z.

```
TAF
KMPV 021130Z 0212/0312 04006KT 3SM -DZ OVC008
     FM021800 36010KT P6SM SCT025...
```

Conditions improve at 1800Z to wind from 360 degrees at 10 knots, visibility > 6 SM (unrestricted), and no significant weather.

B2.6.4 Vicinity (VC)

In the United States, vicinity is specifically defined as a donut-shaped area between 5SM and 10SM from the center of the airport's runway complex. NWS TAFs include prevailing condition forecasts of fog, showers, and thunderstorms in the airport's vicinity (≥ 50% probability and expected to occur for more than one-half of the sub-divided forecast time period) in the significant weather section of the TAF. Prevailing conditions are forecast in the initial time period and FM groups. Significant weather in the vicinity is not included in TEMPO or PROB groups.

The following significant weather phenomena are valid for use in prevailing portions of NWS TAFs in combination with VC:

Phenomenon	Coded as**
Fog*	**VCFG**
Shower(s)	**VCSH**
Thunderstorm	**VCTS**

*Always coded as VCFG regardless of visibility in the obstruction, and without qualification as to intensity or type (frozen or liquid)

**The VC group, if used, should be the last entry in any $w'w'$ group.

B2.7 Cloud and Vertical Obscuration Groups ($N_sN_sN_sh_sh_sh_s$/VV$h_sh_sh_s$)

The initial forecast period and any subsequent FM groups includes a cloud group to indicate the cumulative amount ($N_sN_sN_s$) of all cloud layers in ascending order and height ($h_sh_sh_s$) or to indicate a clear sky (SKC) and an obscuration if appropriate to indicate vertical visibility into a surface-based obstructing medium.

All cloud layers and obscurations are considered opaque, defined as when more than 50% of the sky is hidden by the clouds at any layer.

B2.7.1 Cloud Group ($N_sN_sN_sh_sh_sh_s$)

The cloud group is used to forecast cloud amounts for the airport terminal area.

Sky Cover Contraction ($N_sN_sN_s$)	Sky Coverage
SKC	0 oktas
FEW	1 to 2 oktas
SCT	3 to 4 oktas
BKN	5 to 7 oktas
OVC	8 oktas

When zero (0) oktas is forecast, the cloud group is replaced by SKC. The contraction CLR, which is used in the METAR code, is not used in TAFs.

Height of cloud ($h_sh_sh_s$) is forecast in hundreds of feet AGL at the following resolution:

Range of Height Values (in ft)	Reportable Increment (in ft)
> 3,000	To nearest 100
≥ 3,000 but < 5,000	To nearest 500
≥ 5,000	To nearest 1,000

In general, the number of cloud layers in each sub-divided time period should not exceed three.

Additionally, scattered cloud layers are not forecast at a higher level than broken or overcast cloud layers, and broken cloud layers are not forecast at a higher level than overcast layers. Using the principle of at/below, the lowest level at which the cumulative cloud cover equals 5/8 or more of the celestial dome is understood to be the forecast ceiling. For example, VV008, BKN008, or OVC008 all indicate an 800 foot ceiling.

B2.7.2 Vertical Obscuration Group (VV$h_sh_sh_s$)

The vertical obscuration group is used to forecast, in hundreds of feet AGL, the vertical visibility (X) into a surface-based total obscuration. VV$h_sh_sh_s$ is an indefinite ceiling and not an exact ceiling in the forecast. The TAF does not include forecasts of partial obscurations (i.e., FEW000, SCT000, or BKN000).

EXAMPLE:

```
TAF
KCPR 110537Z 1106/1206 24015KT P6SM SKC
     FM110820 24015KT 1SM BR VV008...
```

Note that the wind in the FM group is the same as in the initial forecast period but is repeated since all elements are required to be included in a FM group.

B2.7.3 Cloud Type

The only cloud type included in the TAF is CB. CB follows cloud or obscuration height ($h_sh_sh_s$) without a space. Whenever TS is included in $w'w'$, even if TS is only forecast in the vicinity

(VCTS), CB should be included in $N_sN_sN_sh_sh_sh_s$ or VV$h_sh_sh_s$. CB may not be used alone, as it can be confusing to the users and cause difficulty in air traffic planning.

EXAMPLES:

```
TAF
KORD 110537Z 1106/1206 06008KT P6SM FEW050 SCT100
     FM111115 11010KT 2SM -RA OVC012...
```

Note the initial forecast period (beginning at 0600Z) does not contain $w'w'$. When significant weather is not expected in the initial period of an FM group, $w'w'$ is omitted.

```
TAF
KDAY 221730Z 2218/2318 19010G25KT P6SM BKN040
     FM222230 26025G45KT 1/2SM TSSN OVC010CB...
```

Significant change at 2230Z to wind from 260 degrees at 25 knots gusting to 45 knots, visibility one-half statute miles in a thunderstorm with moderate snow, overcast clouds (ceiling) at 1,000 feet, including CB.

```
TAF
KSYR 230532Z 2306/2406 29012KT 1/2SM SHSN FZFG OVC003
      TEMPO 2306/2309 29014G28KT 1/4SM +TSSNPL BLSN VV004CB
     FM231445 36011KT P6SM FEW008 BKN025
     FM232300 VRB03KT P6SM SKC...
```

Significant change at 1445Z to wind from 360 degrees at 11 knots, visibility greater than 6 statute miles (unrestricted), few clouds at 800 feet and broken clouds at 2,500 feet. Significant change at 2300Z to variable wind direction (light winds), wind speed 3 knots, and clear skies.

B2.8 Non-Convective Low Level Wind Shear Group (WS$h_{ws}h_{ws}h_{ws}$/*dddff*KT).

Forecasts of Low Level Wind Shear (LLWS) in the TAF refer only to non-convective LLWS from the surface up to, and including, 2,000 feet Above Ground Level (AGL). LLWS is always assumed to be present in convective activity. It is included in the TAF on an as-needed basis to focus attention on LLWS problems which currently exist or are expected. Non-convective LLWS may be associated with the following phenomena (list not exhaustive): frontal passage, inversion, low-level jet, lee-side mountain effect, sea breeze front, Santa Ana/Chinook/Föhn winds, etc. Mentioning LLWS whenever conditions are present or possible is highly encouraged as it provides the TAF user with valuable information.

Wind shear is a vector difference, composed of wind direction and wind speed, between two wind velocities. Per the International Civil Aviation Organization (ICAO) Doc 9817 AN/449 - *Manual On Low-level Wind Shear*, "Low-level wind shear, in the broadest sense, encompasses a family of air motions in the lower levels of the atmosphere, ranging from small-scale eddies and gustiness that may affect aircraft as turbulence, to the large-scale flow of one air mass layer past an adjacent layer" (ICAO, 2005).

A sufficient difference in wind speed, wind direction, or both, can severely impact aircraft, especially within 2,000 feet AGL because of limited vertical airspace for recovery. The following taken from ICAO Doc 9817 AN/449 emphasizes the importance of wind shear:

> *It would be difficult to overemphasize that wind shear is a vector, and hence the speed and the direction of the two winds concerned must be taken into account.*

Wind shear cannot be calculated by simple scalar subtraction of the wind speeds, except in the specific case where the direction of the two winds concerned are exactly the same.

In situations where gusty surface winds are expected or occurring, forecasters should consider the low level directional shear to determine whether LLWS or mechanical turbulence is expected or occurring. In a nearly unidirectional low level environment, a well-mixed boundary layer provides gusty winds at the surface and typically will result in mechanical turbulence instead of LLWS. If, instead, strong low level directional shear does exist, especially if a critical layer is present, forecasters should use the vector difference guidance described above to determine if LLWS should be included in the TAF.

For most locations, the TAF should include the lowest layer where the wind shear is at least +/- 30 kts within 2,000 ft AGL. However, some locations could have conditions where users need more specialized criteria. In these cases, the office should work with users to determine what the appropriate minimum wind shear threshold is and consider that when writing the TAF. Once this threshold is determined, a WFO should work with its respective Regional Aviation Meteorologist (RAM) for approval. LLWS criteria for each TAF site will be included in the Categorical Amendment Criteria (CAC) spreadsheet. This criterion should be routinely monitored by offices to ensure it remains correct. See Appendix C Section 1.3.1 and the categorical amendment criteria document for additional information on the CAC process.

An example showing how the height of the `WS` should be encoded in the TAF is in this example, `WS018/27055KT`, thus, inferring that the top of the LLWS layer is at 1,800 feet AGL.

If LLWS is not in the TAF, but reports, such as PIREPs, are received indicating non-convective LLWS within 2,000 feet of the surface causing ≥ 30 kts of an indicated air speed loss or gain to be reported by an aircraft, the forecast should be amended to include LLWS. If a location uses a specialized criteria, then that criteria is used. When LLWS conditions are expected, the non-convective LLWS code `WS` is included in the TAF as the last group after cloud forecast. Once in the TAF, the `WS` group remains the prevailing condition until the next `FM` change group or the end of the TAF valid period. Forecasts of non-convective LLWS are not included in `TEMPO` or `PROB` groups.

The format of the non-convective low-level wind shear group is `WS`$h_{ws}h_{ws}h_{ws}$`/`*dddff*`KT`, where:

WS	Indicator for non-convective LLWS
$h_{ws}h_{ws}h_{ws}$	Height of the top of the WS layer in hundreds of feet AGL
ddd	True direction in ten degree increments at the indicated height (see Note below)
ff	Speed in knots of the forecast wind at the indicated height
KT	Unit indicator for wind

NOTE: **VRB** is not used for direction in the non-convective LLWS forecast group.

EXAMPLE:

TAF
KPUB 181122Z 1812/1912 13012KT 5SM -RA SCT010 OVC035 WS020/27055KT
FM181400 32010KT P6SM FEW008 BKN045...

In this forecast, the wind shear is a prevailing condition from 1200Z until the beginning of the next `FM` group. The same is true for the following example, except it prevails from 0600Z until

the beginning of the next FM group at 1100Z.

```
TAF
KDFW 220539Z 2206/2306 21010KT 3SM BR SCT030 WS015/29065KT
     FM221100 24015KT 1SM TSRA BR OVC010CB
     FM221830...
```

In both examples above, the indicator WS is followed by a three-digit number which is the top of the wind shear layer (020 at KPUB; 015 at KDFW). LLWS is forecast to be present from the surface to this level. After the solidus (/), the five digit wind group is the wind direction and speed at the top of the wind shear layer. It is not a value for the amount of shear. In cases where multiple layers of LLWS exist, the lowest layer in elevation should be included in the TAF, as users have consistently identified this as the most dangerous type of LLWS. For example, if 30 kts of LLWS are present at 1000 ft, and 60 kts at 2000 ft, the 1000 ft layer should be included in the TAF.

LLWS is difficult to define as it is a vector term and is used to describe an impact on pilots with different aircraft types and capabilities. As we are ultimately looking to communicate an impact WFOs and CWSUs should both monitor PIREPs as appropriate and coordinate, in the CWSU NWSChat room, on whether LLWS should be added based on available reports and their forecast experience.

Reference:

International Civil Aviation Organization (ICAO). (2005). *Manual on Low-level Wind Shear*, *First Edition*. Doc 9817 AN/449.

B2.9 Forecast Change Indicator Groups (FM*YYGGgg* and TEMPO *YYGG*/$Y_eY_eG_eG_e$)

Forecast change indicator groups, FM*YYGGgg* and TEMPO *YYGG*/$Y_eY_eG_eG_e$, are contractions which are used to sub-divide the forecast period (24 or 30-hours for scheduled TAFs; less for amended or delayed forecasts) according to significant changes in the weather. Forecasters should remember the lowest meteorological condition contained in a TAF, regardless of any conditional language, including those forecasted in the PROB or TEMPO groups drive user operational decisions. PROB30 and TEMPO should describe short duration forecast weather changes and should be used as sparingly as possible.

B2.9.1 Special Thunderstorm Consistency Guidance

Consider thunderstorms in the TAF, as prevailing conditions or TEMPO, when the Traffic Flow Management (TFM) Convective Forecast (TCF) forecasts thunderstorms with at least medium coverage at an FAA Core Airport.

B2.9.2 FROM Change Group Indicator (FM*YYGGgg*)

The FM change indicator group (FM*YYGGgg*) is used to indicate when prevailing conditions are expected to change significantly over a period of less than one hour. In these instances, the forecast is sub-divided into time periods using the contraction FM followed, without a space, by four digits indicating the time (in hours and minutes in UTC) the change is expected to occur. While the use of a four-digit time in whole hours (e.g., 2100) is acceptable, a forecaster should make every effort to forecast changes with higher temporal resolution. All forecast elements

following FM*YYGGgg* relate to the period of time from the indicated time (*GGgg*) to the end of the valid period of the terminal forecast, or to the next FM*YYGGgg* if the terminal forecast valid period is divided into additional periods.

The FM group is followed by a complete description of the weather and all forecast conditions given before the FM*YYGGgg* group are superseded by those following the group. All elements of the TAF (surface wind, visibility, significant weather, clouds, obscurations, and when expected, non-convective LLWS) are included in each FM group, regardless if they are forecast to change or not. The only exception to this involves significant weather. If no significant weather is expected in the FM time period group, then significant weather is omitted. For example, if forecast cloud and visibility changes warrant a new FM group but the wind does not, the new FM group will include a wind forecast, even if it is the same as the most recently forecast wind.

Instances when a forecaster should consider including a new FM group include but are not limited to:

- The start and/or end of LLWS.
- A 30-degree wind direction change with wind speeds ≥ 12 knots, and/or wind crossing critical threshold (i.e., results in crosswinds/runway change).
- The start and/or end of hail, freezing precipitation, and/or ice pellets.
- Conditions cross Categorical Amendment Criteria (CAC) Thresholds.
- When a thunderstorm begins or ends.

One or more FM groups may be included depending on the prevailing weather conditions expected. In the interest of clarity, each FM group starts on a new line of forecast text, indented five spaces.

EXAMPLES:

```
TAF
KDSM 022336Z 0300/0400 20015KT P6SM BKN015
     FM030230 29020G35KT 1SM +SHRA OVC005
     TEMPO 0303/0304 30030G45KT 3/4SM -SHSN
     FM030500 31010G20KT P6SM SCT025...
```

Note that significant weather is omitted from the initial forecast period, beginning at 0000Z, since none was expected.

```
TAF
KAPN 312330Z 0100/0200 13008KT P6SM SCT030
     FM010320 31010KT 3SM -SHSN BKN015
     FM010500 31010KT 1/4SM +SHSN VV007...
```

Note the wind in the FM010500 group is the same as the previous FM group, but is repeated since all elements are required to be included in a FM group.

B2.9.3 TEMPO Change Indicator (TEMPO *YYGG/$Y_eY_eG_eG_e$*)

The TEMPO change- indicator group (TEMPO *YYGG/$Y_eY_eG_eG_e$*) is used to indicate temporary fluctuations to forecast meteorological conditions which are expected to:

a. Have a high percentage (greater than 50%) probability of occurrence;
b. Last for one hour or less in each instance; and
c. In the aggregate, to cover less than half of the period *YYGG* to $Y_eY_eG_eG_e$.

Temporary changes described by TEMPO groups occur during a period of time defined by a two-digit beginning and two-digit ending time, both in whole hours UTC. If the TEMPO condition is expected to last more than one (1) hour, a FM*YYGGgg* group should be used to forecast conditions different from those forecast prior to *GG*. If the TEMPO condition is expected to last more than half the time period indicated (*YYGG*/$Y_eY_eG_eG_e$), then the TEMPO condition is considered predominant and should instead be entered in the initial forecast period or following a FM group. TEMPO groups do not exceed four hours.

The TEMPO group is placed on a new line in the TAF, indented six (6) spaces from the left margin. The TEMPO identifier is followed by a description of all the elements in which a temporary change is forecast. A previously forecast element which has no change during the TEMPO period is understood to remain the same. Only those weather elements forecast to temporarily change are required to be included in the TEMPO group. However, when a significant reduction in visibility is forecast in a TEMPO group, the significant weather causing the deterioration is also included. If a significant change is expected in the cloud forecast, all cloud layers, including any significant layer not expected to change, are given.

Consecutive TEMPO groups are not used during the initial forecast period or following any subsequent FM group(s). TEMPO groups do not include forecasts of either significant weather in the vicinity (VC) or non-convective LLWS.

EXAMPLES:

TAF
KDDC 221130Z 2212/2312 29010G25KT P6SM SCT025
TEMPO 2215/2217 30025G35KT 1 1/2SM SHRA BKN010...

TAF
KSEA 091125Z 0912/1012 19008KT P6SM SCT010 BKN020 OVC090
TEMPO 0912/0915 -RA SCT010 BKN015 OVC040...

Note the TEMPO 0912/0915 group. All three cloud layers are included though the lowest layer is not forecast to change from the initial time period.

TAF
KBOI 091735Z 0918/1018 24007KT P6SM SCT025 BKN040
TEMPO 0918/0922 -SHSN BKN025 BKN040...

B2.9.4 Probability Group (PROB30 *YYGG*/$Y_eY_eG_eG_e$)

The PROB30 group (PROB30 *YYGG*/$Y_eY_eG_eG_e$) is used to forecast a 30 percent chance of occurrence of a thunderstorm or precipitation event and its associated weather and obscuration elements (wind, visibility and/or sky condition) when occurrence of those elements are directly related to the thunderstorm or precipitation event. Although the TAF area is limited to a 5SM mile radius from the center of a runway complex, forecasters should maintain forecast consistency between the TAF and other aviation and public products to reduce confusion for the users.

The PROB30 group is not used within the first nine (9) hours of the TAF valid period. Only one PROB30 group should be used in any subsequent FM group.

PROB30 is followed by a space, then eight digits (*YYGG/$Y_eY_eG_eG_e$*) stating the beginning and ending time (in hours) of the expected condition. PROB30 is the only PROB group used in NWS TAFs.

The PROB30 group is located within the same line of the prevailing condition group, continuing on the line below if necessary.

PROB30 groups do not include forecasts of significant weather in the vicinity (VC) or non-convective LLWS.

The PROB30 group is not used by NWS offices as a direct modifier of TEMPO. Similarly, TEMPO groups are not used by NWS offices as a direct modifier of the PROB30 group (e.g., TEMPO PROB30 *YY*23/Y_eY_e24).

Appendix C — Unscheduled TAFs

C1 Unscheduled TAFs

Unscheduled TAFs are issued on an as-needed basis as amended, delayed, or corrected messages. They contain the same elements and use the same format as scheduled issuances. The only differences are the date and time of forecast origin (*YYGGgg*) and beginning valid times (for amended and delayed forecasts only). The entire text of each individual TAF which has not yet expired, not just the amended, corrected, or delayed portion, are transmitted.

Amended, delayed, and corrected forecasts include the appropriate *BBB* group in the WMO abbreviated heading. Amended (AA*x*), delayed (RR*x*), and corrected (CC*x*) forecasts are counted (lettered) independently. For example, the first correction to a scheduled forecast would be CCA. If that same corrected forecast needed to be amended, the amendment would be AAA, indicating it is the first amendment of the scheduled TAF, etc. The following table demonstrates the procedures for multiple combinations of corrected, amended, and delayed TAFs:

Time (UTC)	Forecast Issued	*BBB* Indicator
0615	First delayed terminal forecast	**RRA**
0714	First amendment to terminal forecast	**AAA**
1042	Second amendment to terminal forecast	**AAB**
1045	First correction to terminal forecast	**CCA**

C1.1 Amended TAFs

Amendments (AMD) are an effective method to optimize the quality of the TAF. Forecasters should remember the TAF is designed for the end user. The sooner the forecaster provides an amended TAF to the end user, the better. Unforeseen weather changes can have a rippling effect with delays in the NAS. The decision to amend the TAF relies on the forecaster's assessment of existing conditions and expectations. If conditions change earlier or later than forecast but the TAF shows the expected trend and will soon recover, an amendment may not be needed. Additionally, small fluctuations in the observation should not result in a minor adjustment to the TAF (i.e., chasing the observation). However, if improving weather conditions occur sooner than forecast, then an amended TAF is recommended. Further, forecasters should exercise good judgment when using automated observations. Because of their sensitivity, AWOS/ASOS observation data are more likely to fall outside the forecast amendment ranges.

TAF amendments are issued promptly when:

a. Conditions meeting amendment criteria are imminent or have occurred and those conditions will, in the forecaster’s estimation, persist for 30 minutes or longer, or
b. New guidance/information indicates future conditions are expected to be in a different category than originally forecast, especially in the 1-6 hour time-period.

Forecasters use Aviation Forecast Prep Software (AvnFPS) to notify them when a TAF does not meet current criteria. Forecasters should issue TAF AMDs for significant forecast changes immediately rather than update at the next regularly scheduled TAF release time, even if that release time is within a half hour of the amendment time.

C1.2 Amendment Coding

An amended TAF is identified in the WMO abbreviated heading by the contraction AA*x* following the date/time group, where *x* is the letter A through X. For example, AAA would indicate the first amendment of a particular scheduled terminal forecast, AAB, the second amendment of the same scheduled forecast, etc. An amended forecast is also identified by TAF AMD (in place of TAF) on the first line of the forecast text. The date/time group in the WMO abbreviated heading of an amended terminal forecast is the whole hour of issuance.

The amended TAF covers all of the remaining valid period of the original scheduled forecast. Expired portions of the amended forecast or references to weather occurring before the issuance time is omitted from the amendment.

In an amended forecast, the date and time of the forecast origin group (*YYGGgg*Z) reflects the time the amended forecast was prepared. In the forecast valid period group ($Y_1Y_1G_1G_1/Y_2Y_2G_2G_2$), the first four digits ($Y_1Y_1G_1G_1$) reflect the UTC date and time of the beginning of the valid period of the amended TAF. With an issuance time (*YYGGgg*Z) of H+00 to H+29, use the current hour (based on UTC) to denote the beginning valid time; for H+30 to H+59, use the next hour (based on UTC). In either case the forecast is valid from the time of forecast origin (*YYGGgg*) to the valid period ending time of the original scheduled terminal forecast.

Example of amended TAF:

Original	Amended
FTAK31 PAFC 030500	**FTAK31 PAFC 030500 AAA**
TAF	**TAF AMD**
PAEN 030540Z 0306/0406...	**PAEN 031012Z 0310/0406**...

The scheduled forecast was sent and, 4½ hours later, the forecaster prepared the first amendment to that forecast (indicated by AAA), at 1012Z on the 3rd day of the month. The amended TAF shows the time of the original scheduled TAF in the WMO abbreviated header (0500).

C1.3 Amendment Criteria

Amendment criteria values are operationally significant to aircraft and airports. Discrete flight category value changes for VFR, MVFR, IFR and LIFR have significant operational impact (i.e., fuel requirements, alternates) and the TAF should be especially accurate regarding those values. Further, specific airports may have other values which are locally important to operations. Forecasters should be aware of these values when amendments are required and issued.

C1.3.1 Categorical Amendment Criteria (CAC)

WFOs utilize CAC for ceiling and visibility thresholds. CAC Thresholds are updated on a 28-day cycle consistent with the FAA's Terminal Procedure Publications (TPP). NWSH/AFS24 reviews published FAA approach plates every 28 days, updates the Master List of CAC thresholds, and shares this with Aviation Focal Points (AFP) via the Aviation Focal Point email listserv. WFOs are responsible for reviewing the Master List and keeping the CAC thresholds they are using for their TAF sites up to date. WFOs should review the FAA approach plates to verify the accuracy of the Master List and report inaccuracies to their RAM and NWSH/AFS24. See Table C1 for specific CAC categories.

Table C1. Categorical Amendment Criteria

<table>
<tr><td>Forecast Element/
Occurrence</td><td colspan="2">TAF Ceiling and Visibility
Amendment Criteria</td></tr>
<tr><td rowspan="2">a. Ceiling or Visibility observed to decrease to less than a threshold
b. Ceiling and visibility, if one or both are below a threshold, when both elements increase to equal or exceeds threshold
c. See notes for specific details</td><td>Threshold
A (note 2)
B (note 3)
C
D
E
F</td><td>Default Limits
200 ft; 1/2SM
600 ft; 2SM
1,000 ft; 3SM
3,000 ft; 5SM
2,000 ft; ≥ 3SM
Note 4</td></tr>
<tr><td colspan="2">NOTES:
1. Forecast category is determined by the lowest ceiling or visibility value
2. Or the lowest published airfield minimum, where higher minimums apply
3. Or higher thresholds as determined by specific airport requirements
4. Other Conditions Defined by Local Air Traffic Managers or Airport Requirements.</td></tr>
</table>

C1.3.2 Additional U.S. TAF Amendment Criteria

The following are recommended amendment thresholds for NWS TAFs in addition to the CAC thresholds. Offices may develop more restrictive criteria as defined by Local Air Traffic Managers or Airport Requirements.

a. Weather. If thunderstorms, freezing precipitation or ice pellets occur and are not forecasted, or, if forecasted, do not occur.
b. Wind Direction, Speed and Gusts. Forecast mean refers to the mean wind direction or speed expected for the specified forecast group time period.
   (1) Forecast mean wind speed differs by ≥ 10 knots, while original or newly expected mean wind speed is ≥ 12 knots
   (2) Forecast wind gust (or forecast of no gust): differs from observed wind gust by ≥ 10 knots (or above the observed mean wind speed if no gusts are forecast).
c. Non-Convective LLWS (up to 2,000 feet). Amend the TAF if non-convective LLWS is forecasted and does not occur, or if LLWS occurs and is not forecast.

C2 Delayed TAFs

Delayed TAFs are issued as soon as possible after correction of the problem (electrical, mechanical, or other) that caused the delay.

A delayed TAF is identified in the WMO abbreviated heading by the contraction RR*x* following the date/time group, where *x* is the letter A through X, as described in Section C1. For example, RRA indicates the first delayed issuance of a scheduled TAF. Only offices issuing TAFs in collectives need to issue a second (or greater) delayed TAF. No contraction in the TAF text indicates a TAF is delayed; the contraction RR*x* only appears in the WMO abbreviated heading line.

The delayed TAF is valid from the UTC date/time of actual forecast origin (*YYGGggZ*) until the end of the previously scheduled TAF valid period. The date and time of actual forecast origin is determined by the UTC date/time of issue of the delayed TAF. With an issuance time of H+00 to H+29, use the current hour (based on UTC) to denote the beginning valid time; for H+30 to H+59, use the next hour (based on UTC). The TAF is valid from the time of forecast origin to the end of the valid period of the original scheduled TAF. Example of delayed TAF:

Original	Delayed
FTPA31 PHFO 030500 **TAF** **PHMK 030540Z 0306/0406**...	**FTPA31 PHFO 030500 RRA** **TAF RTD** **PHMK 030555Z 0306/0406**...

The forecaster prepared the first delayed TAF (indicated by RRA) at 0555Z on the 3rd day of the month (as shown in the date/time of forecast origin in the text of the TAF). The delayed terminal shows the time of the original scheduled forecast in the WMO abbreviated header (0500).

C3 Corrected TAFs

Corrected TAFs are issued as soon as possible after discovery of an error (typographical or other mistake). A corrected TAF is identified in the WMO abbreviated heading by the contraction CC*x*, which follows the date/time group (*x* is the letter A through X, as described in Section C1). CCA would indicate the first correction of a scheduled TAF, CCB the second correction of the same TAF, etc. There is no contraction in the forecast text to indicate a TAF is corrected; the contraction CC*x* only appears in the WMO abbreviated heading.

The date/time group in the WMO abbreviated heading of a corrected TAF is the same as that of the original TAF unless the date/time group in the WMO abbreviated header contained the error. Refer to the example below.

Example of corrected TAF:

Original	Corrected
FTAK31 PAFG 030500 **TAF** **PAOM 030540Z 0306/0406**...	**FTAK31 PAFG 030500 CCA** **TAF COR** **PAOM 030551Z 0306/0406**...

The scheduled TAF was sent and 11 minutes later, the forecaster discovered an error and prepared the first corrected TAF (indicated by CCA), at 0551Z on the 3rd day of the month (typed in by the forecaster). The corrected TAF shows the time of the original scheduled TAF in the WMO abbreviated header (0500).

C3.1 Correcting Amended or Delayed Forecasts

If an amended or delayed TAF contains an error, it should be corrected following the same procedures described in Section C1. An example of a corrected amendment is shown below:

Example of corrected amendment: Amendment (containing an error):

```
FTUS43 KTOP 271100 AAA
TAF AMD
KMHK 271522Z 2715/2812 VRB03KT P6SM SCT012
      TEMPO 2715/2717 BKN012
     FM271700 11000KT P6SM SCT035
     FM280100 10003KT P6SM SKC=
```

Corrected amendment:

```
FTUS43 KTOP 271100 CCA
TAF COR
KMHK 271602Z 2715/2812 VRB03KT P6SM SCT012
      TEMPO 2715/2717 BKN012
     FM271700 11005KT P6SM SCT035
     FM280100 10003KT P6SM SKC=
```

The amended TAF was prepared on the 27th day of the month at 1522Z (date/time of forecast origin in the forecast text of the amended TAF), and valid from 1500Z on the 27th until 1200Z the next day (the 28th). The amendment contains an error in the `FM271700` group: winds incorrectly encoded as 110 degrees at 00 knots. The forecaster notices the error and prepares the first correction (`CCA`) of the TAF at 1602Z (date/time of forecast origin in the forecast text of the corrected TAF). Note the following in the corrected amendment: 1) the `CCA` replaces the `AAA` in the WMO abbreviated heading which appeared in the first amendment; 2) the first line of the forecast text becomes `TAF COR`; 3) the TAF valid period in the forecast text is the same as the original amendment (`2715/2812`); 4) the error in the `FM271700` group has been corrected.

Appendix D — New TAF Service, Observation Requirements, and Terminating TAF Service

D1 Requests for Preparation of New TAF Service/Changing Existing Part-Time TAF Service

WFOs receiving a request to start a new TAF from the Airport should work with local union rep, local WFO management, and appropriate Regional Aviation Meteorologist (RAM) or equivalent for evaluation. The local community should provide documentation regarding the broad need for a TAF (e.g., letterhead requests from Airport Manager, City or Chamber, Customer or State Aeronautics Board). This way the WFO and Region can better evaluate the request based on availability of data and NWS resources to support the newly requested TAF(s). Upon endorsement, the RAM forwards the recommendation to the Aviation and Space Weather Services Branch (AFS24), AF24 endorses the TAF recommendation, then the RAM completes a Request for Change (RC) and forwards it to the Data Review Group Change Management (DRGCM). Upon DRGCM approval of the RC, or concurrent with the RC approval process, the RAM prepares a Public information Statement (PNS) and forwards to AFS24 for processing and transmission. The PNS is prepared according to instruction in NWSI 10-1805, *Service Outreach*. The RC is prepared according to NWSI 10-102 *Products and Services Change Management*.

Part-time TAF service increases to 24 hours after the appropriate RAM or equivalent prepares a PNS and forwards it to AFS24 for processing and transmission. An RC to expand TAF service to 24 hours is not required because the TAF identifier and communications nodes already exist.

D2 Observation Requirement to Initiate New TAF Service

The following elements, at a minimum, are required for NWS approval of new TAF locations: wind (speed and direction), visibility, sky condition, temperature, dew point, and altimeter setting. Weather and obstructions to vision are desired to initiate new TAF requests, but a TAF may be produced upon coordination with National and Regional Headquarters if those elements are not available. Offices may start new temporary TAFs (collaborated with CWSUs) for large events where air traffic may increase exponentially at an airport with no TAF, or in areas of a natural disaster to assist emergency aviation assets. A set beginning and ending date for these services are needed. In cases of natural disasters, no observation is required for the location, nor does it have to be an airport, instead the office can use the "total observation concept" to support the operation while needed.

These elements can be obtained from commissioned ASOS or AWOS-III observation sites or manual observer sites with equipment. Augmentation is provided in accordance with the agency agreements with augmenters (refer to FAA document 7900.5 series, *Surface Weather Observing — METAR*.

D3 Minimum Observations Requirements for Routine TAF Issuance and Continuation

The aviation forecaster should have certain information for the preparation and issuance of each TAF. Although integral to the TAF writing process, the complete observation is not required. Forecasters should use the "total observation concept" to write TAFs with data including nearby observations, radar, satellite, radiosonde, model data, ACARS, MDCRS, webcams, and other sources.

When communication problems prevent receiving observations into AWIPS, forecasters are encouraged to call the ASOS/AWOS, when possible, in order to obtain the observational data needed to keep a valid TAF in effect. It may be helpful to contact the observer or site owner to advise that observations are not transmitting out via long line due to a communications failure. Forecasters should continue to issue the TAF while acquiring the observation via other methods including, but not limited to dialing directly into the ASOS/AWOS.

D4 TAFs with Incomplete or Missing Observations

If information sources, such as surface observations, are missing, unreliable, or not complete, forecasters should append `AMD NOT SKED` to the end of a TAF. The use of `AMD NOT SKED` indicates the forecaster has enough data, using the total observation concept, to issue a forecast but will not provide updates. This allows airport operations to continue using a valid TAF. Use of the total observation concept, and `AMD NOT SKED` as needed, is strongly encouraged, and should be used as an alternative to a NIL TAF as much as possible. No documentation is necessary for the use of `AMD NOT SKED`.

D4.1 NIL TAF

A NIL TAF should not be issued except in rare situations. In cases where observations are missing for extended periods of time (i.e., more than one TAF cycle of six hours), and the total observation concept cannot provide sufficient information to construct a TAF, then a NIL TAF may be used. A NIL TAF disrupts airline operations, causes inconvenience to the traveling public, forces users to seek weather information from other sources, and should only be used as a last resort.

Upon issuance of a NIL TAF, the WFO forecast team will provide written documentation on the circumstances leading to the decision to issue a NIL TAF. The documentation should include:

a. Station Location, time of NIL TAF, and expected duration of NIL TAF;
b. The condition of the total observation;
c. Which systems or elements were not available;
d. Actions taken to resolve the situation before using NIL TAF;
e. Synoptic or mesoscale events affecting the site, or forecast to do so; and
f. The overall reasoning used to make the NIL TAF decision.

This documentation will be forwarded, as soon as possible, to the appropriate Regional Operation Center (ROC) with the local MIC and RAM copied for awareness. Following regional guidelines, the ROC Duty Officer will determine if it is appropriate to forward to the NWS Operations Center (NWSOC) for senior leadership awareness. Depending on the circumstances and location of the NIL TAF, the ROC should consider alerting the NWSOC via NWSChat or telephone, to meet any reporting or briefing deadlines for senior leadership.

D4.2 Automated Observing Sites Requiring Part-Time Augmentation

Each NWS office with TAF responsibility maintains the latest copy of FAA document 7900.5 series, *Surface Weather Observing – METAR*. Chapter Four (4) of this document is entitled "General Procedures at Automated Weather Stations" and Chapter Five (5) is entitled "Augmentation at Automated Weather Stations."

TAFs for AWOS-III sites which have part-time augmentation are prepared using the procedures for part-time manual observation sites detailed in the previous section, with one exception. This exception is the remark used when the automated system is unattended. Specifically, the time an augmented automated system is scheduled to go into unattended operation and/or the time augmentation resumes is included in a remark unique to automated observing sites: AMD LTD TO CLD VIS AND WIND (AFT *YYHHmm*, or TIL *YYhhmm*, or *YYHH/YYhh*), where *YY* is the date, *HHmm* is the time, in hours and minutes, of the last augmented observation and *hhmm* is the time, in hours and minutes, the second complete observation is expected to be received. This remark, which does not preclude amendments for other forecast elements, is appended to the last scheduled TAF issued prior to the last augmented observation. It is also appended to all subsequent amendments until augmentation resumes.

The AMD LTD TO (elements specified) remark is a flag for users and differs from the AMD NOT SKED AFT Z remark for part-time manual observation sites. AMD LTD TO (elements specified) means users should expect amendments only for those elements and the times specified. The AMD LTD TO (elements specified) remark may also be used without any specified times upon coordination with the region headquarters. In this form the remark flags that certain elements may not be amended at the AWOS-III site. The remark should be by itself as a separate last line of text in the TAF so the forecast user does not overlook it.

Example:

TAF AMD
KCOE 150202Z 1502/1600 text
AMD LTD TO CLD VIS AND WIND 1505/1518=

The amended forecast indicates that amendments will only be issued for wind, visibility and clouds, between 0500Z and 1800Z.

Example:

TAF
KTVL 160520Z 1606/1706 text
AMD LTD TO CLD VIS AND WIND=

The forecast indicates that amendments are only issued for wind, visibility, and clouds. Other elements are included, as noted in the next paragraph, when the forecast is updated for changes in wind, visibility, or clouds.

An amendment includes forecasts for all appropriate TAF elements, even those not reported when the automated site is not augmented. If unreported elements are judged crucial to the representativeness of a TAF and cannot be adequately determined (e.g., fog versus moderate snow), TAF amendments should be suspended (i.e., issue an amended TAF stating AMD NOT SKED).

AWOS-III systems with part-time augmentation, which the forecaster suspects are providing unreliable information when not augmented, should be reported for maintenance and treated the same as part-time manual observation sites. In such cases, the AMD NOT SKED AFT *YYaa*Z remark is used.

D4.3 Non-augmented Automated Observing Sites

TAF amendments issued for a non- augmented ASOS site may be suspended in the event the forecaster is notified of, or strongly suspects, an outage or unrepresentative data. Forecasters may also consider suspension of TAF amendments when an element the forecaster judges to be critical is missing from the observation and cannot be obtained using the total observation concept. The term `AMD NOT SKED` is appended, on a separate line and indented five spaces, to the end of an amendment to the existing TAF when appropriate.

D5 Terminating TAF Service

If a TAF site experiences a drastic, permanent reduction in aviation services, the local WFO management will coordinate with the appropriate Regional Aviation Meteorologist (RAM) (or equivalent) whether TAF service should continue for that site. If the MIC believes the TAF service should be terminated, the MIC forwards a recommendation with justification through the RAM and RH to AFSO. The Aviation and Space Weather Services Branch (AFS24) of AFSO coordinates TAF termination with the FAA, and also with other interested agencies as needed. AFS24 coordinates a PNS and RC as the final step in terminating TAF service.

Appendix E — TAF Code Format, Terminology, and Significant Weather Matrices

E1 Generic International TAF Code Format

The NWS forecaster should be familiar with the International TAF Code Format shown below.

Line 1

TAF or **TAF AMD** or **TAF COR**

Line 2

CCCC	*YYGGgg***Z**	$Y_1Y_1G_1G_1/Y_2Y_2G_2G_2$
[Location identifier]	[Date/time of forecast origin]	[Valid period]

Forecast elements beginning after valid period in Line 2

*dddff***G***fmfm***KT**	*VVVV* or **CAVOK**	*w'w'* or **NSW**	$N_sN_sN_sh_sh_sh_s$, **VV**$h_sh_sh_s$, or **SKC** (**NSC**)
[Wind forecast]	[Visibility forecast]	[Significant weather forecast]	[Cloud and obscuration forecast]
6*IcchLhLhLtL*	**5***BccBhBhBhtL*	**T***TFTF/GFGF***Z**	**QNH***PIPIPIPI***INS**
[Icing forecast]	[Turbulence forecast]	[Temperature forecast]	[Lowest altimeter setting forecast]

TTYYGGgg or *TTTTT* $Y_1Y_1GG/Y_eY_eG_eG_e$ **PROB***C2C2* $Y_1Y_1GG/Y_eY_eG_eG_e$

[Forecast change indicators] [Probability forecast]

E2 International Terminology and Forecast Groups Not Used in NWS TAFs.

a. **CAVOK**: Ceiling and Visibility OK
b. **NSC**: No Significant Clouds
c. **BECMG**: Becoming
d. **PROB***C2C2* $Y_1Y_1GG/Y_eY_eG_eG_e$ in combination with TEMPO
e. Optional Groups: **6***I* (Icing), **5***B* (Turbulence), **T***T* (Temperature), and **QNH** (Altimeter). There is no requirement for NWS WFOs to use these groups in NWS TAFs

E3 Significant Weather: WMO Code Table 4678.

The *w'w'* groups are constructed by considering the columns of the following table in sequence from left to right. For example, heavy rain shower(s) are coded as +SHRA.

Qualifier				Weather Phenomena					
Intensity or Proximity		Descriptor		Precipitation		Obscuration		Other	
–	Light	MI	Shallow	DZ	Drizzle	BR	Mist	PO	Well-developed dust/sand whirls (dust devils)
	Moderate (no qualifier)	BC	Patches	RA	Rain	FG	Fog		
+	Heavy (well developed in the case of dust/sand whirls (dust devils) and funnel clouds)	PR	Partial (covering part of the aerodrome)	SN	Snow	FU	Smoke		
				SG	Snow grains	VA	Volcanic ash	SQ	Squalls
				PL	Ice pellets	DU	Widespread dust	FC[3]	Funnel cloud(s) (tornado or waterspout)
		DR	Low drifting	GR	Hail	SA	Sand		
		BL	Blowing	GS	Snow pellets	HZ	Haze		
		SH	Shower(s)	UP[2]	Unknown precipitation in automated observations			SS	Sandstorm
		TS	Thunderstorm					DS	Duststorm
VC[1]	In the vicinity	FZ	Freezing (supercooled)						

Footnotes for WMO Code Table 4678 above

1. The NWS definition of VC applied to the terminal forecast is: A donut-shaped area encompassed between circles with radii of 5 and 10 statute miles, respectively, from the center of the airport's runway complex.
2. UP is not used in NWS-prepared terminal forecasts
3. Tornadic activity, including tornadoes, waterspouts, and funnel clouds, should only be included in TAFs when absolutely necessary. Although the probability of occurrence at a specific site is low, it is possible.

E4 Significant Weather Phenomena: Matrix for NWS-issued TAFs

WEATHER PHENOMENA	QUALIFIER												
	Intensity or Proximity					Descriptor[1]							
Precipitation		Light	Moderate	Heavy	Vicinity	Shallow	Partial	Patches	Low Drifting[3]	Blowing	Showers	T-storm[4]	Freezing
		-		+	VC[2]	MI	PR	BC	DR	BL	SH	TS	FZ
Drizzle	DZ	-DZ	DZ	+DZ									FZDZ
Rain	RA	-RA	RA	+RA							SHRA	TSRA	FZRA
Snow	SN	-SN	SN	+SN					DRSN	BLSN	SHSN	TSSN	
Snow grains	SG	-SG	SG	+SG									
Ice crystals[5]	IC		IC										
Ice pellets	PL	-PL	PL	+PL							SHPL	TSPL	
Hail[5]	GR		GR								SHGR	TSGR	
Snow pellets[5]	GS		GS								SHGS	TSGS	
Thunderstorms, Showers, Freezing, and their intensity or proximity													
TS	TS		TS		VCTS[6]								
TSRA		-TSRA	TSRA	+TSRA									
TSSN		-TSSN	TSSN	+TSSN									
TSPL		-TSPL	TSPL	+TSPL									
TSGS			TSGS										
TSGR			TSGR										
SH	SH				VCSH[7]								
SHRA		-SHRA	SHRA	+SHRA									
SHSN		-SHSN	SHSN	+SHSN									
SHPL		-SHPL	SHPL	+SHPL									
SHGR			SHGR										
SHGS			SHGS										
FZDZ		-FZDZ	FZDZ	+FZDZ									
FZRA		-FZRA	FZRA	+FZRA									
FZSG			FZSG										
Obscurations													
Mist	BR[8]		BR										
Fog	FG[9]		FG		VCFG[10]	MIFG[11]	PRFG[12]	BCFG[13]					FZFG[14]
Smoke	FU		FU										
Volcanic ash	VA[15]		VA										
Widespread dust	DU		DU						DRDU	BLDU			
Sand	SA		SA						DRSA	BLSA			
Haze	HZ		HZ										
Spray	PY		PY							BLPY			
Blowing Phenomena													
Snow[16]	BLSN		BLSN							BLSN			
Sand	BLSA		BLSA							BLSA			
Duststorm	BLDU		BLDU							BLDU			
Other													
Sand/Dust Whirls	PO		PO										
Squalls[17]	SQ		SQ										
Funnel cloud[18]	FC		FC										
Tornado/ Waterspout[19]	+FC			+FC									
Sandstorm[20]	SS		SS	+SS									
Duststorm[21]	DS		DS	+DS									

Footnotes for Weather Phenomena Matrix for NWS TAFs

1. Only one descriptor is used for each weather phenomena group, e.g., BCFG.
2. In NWS TAFs, vicinity (VC) is defined as a donut-shaped area 5SM to 10SM from the center of the runway complex of an airport. In NWS TAFs, vicinity is combined only with fog (VCFG), showers (VCSH), or thunderstorms (VCTS), and only when forecasting prevailing conditions (i.e., initial time period, or FM groups).
3. Raised by wind to < six (6) feet above the ground.
4. TS may be forecast by itself if no precipitation is associated with the thunderstorm.
5. No intensity is ever given to hail (GR), snow pellets (GS), or ice crystals (IC).
6. VCTS is a valid combination for all airports with TAFs. [In the METAR code, VCTS is only reported by automated stations connected to FAA ALDARS].
7. VCSH is used to forecast showers 5-10SM from the center of the airport. The type and intensity of showers in the vicinity is not specified, i.e., +VCSHRA is not allowed.
8. BR is only used when the visibility is forecast to be > 1/2SM, but ≤ 6SM.
9. For FG to be forecast with any qualifiers, visibility is ≤ 1/2SM.
10. VCFG may be used to forecast fog at any visibility value between 0SM and 6SM in the vicinity (5-10SM) of the airport.
11. For MIFG to be forecast, the visibility at 6 feet above ground level is > 1/2SM and the apparent visibility in the fog layer is expected to be ≤ 1/2SM.
12. PRFG indicates that a substantial part of the airport is forecast to be covered by fog (visibility ≤ 1/2SM) while the remainder of the airport is expected to be clear of fog.
13. BCFG indicates that patches of fog (visibility ≤ 1/2SM) are forecast to randomly cover the airport.
14. FZFG is fog (visibility ≤ 1/2SM) consisting predominantly of water droplets at temperatures ≤ 0°C, whether or not the fog is expected to deposit rime ice.
15. Volcanic Ash (VA) is always included in the forecast when expected. Visibility is not a factor.
16. SN BLSN indicates a combination of snow falling from clouds and blowing snow.
17. SQ (squall) is a sudden increase in wind speed of ≥ 16 knots, the speed rising to 22 knots or more and lasting for at least one minute.
18. Generally, Funnel Clouds should not be forecast.
19. Tornadoes and Waterspouts should rarely be forecast.
20. SS is forecast if visibility is > 1/4SM and ≤ 1/2SM. Forecast +SS if visibility is expected to be ≤ 1/4SM.
21. DS is forecast if visibility is > 1/4SM and ≤ 1/2SM. Forecast +DS if visibility is expected to be ≤ 1/4SM.

No more than three significant weather groups are used to forecast weather phenomena at or near the airport. If more than one significant weather phenomena are expected in the forecast, separate weather groups are included. If more than one form of precipitation is forecast, the appropriate contractions are combined in a single group with the predominant type of precipitation included first. One exception to this is in Appendix B, Section 2.6.1. In such a single precipitation group, the intensity will refer to the total precipitation and be used with one or no intensity qualifier, as appropriate.

Appendix F — 30 Hour TAF Locations

KAUS	Austin TX – Bergstrom International Airport
KATL	Atlanta Intl GA
KBDL	Bradley Intl CT
KBOS	Logan Intl MA
KBWI	Baltimore-Washington Intl MD
KBZN	Bozeman, MT
KCLE	Cleveland Hopkins Intl OH
KCLT	Charlotte Douglas Intl NC
KCVG	Covington/Cincinnati OH
KDCA	Ronald Reagan Washington National VA
KDEN	Denver Intl CO
KDFW	Dallas/Fort Worth Intl TX
KDTW	Detroit MI
KEWR	Newark Liberty Intl NJ
KFLL	Fort Lauderdale/Hollywood Intl FL
KIAD	Washington Dulles Intl VA
KIAH	Houston – George Bush Intl TX
KIND	Indianapolis Intl IN
KJFK	John F. Kennedy Intl NY
KLAS	Las Vegas McCarran Intl NV
KLAX	Los Angeles Intl CA
KLGA	New York LaGuardia NY
KMCO	Orlando Intl FL
KMDW	Chicago Midway IL
KMEM	Memphis Intl TN
KMIA	Miami Intl FL
KMKE	General Mitchell Intl WI
KMSP	Minneapolis-St Paul Intl MN
KMSY	New Orleans Intl LA
KOAK	Oakland Intl CA
KONT	Ontario Intl CA
KORD	Chicago-O'Hare Intl IL
KPHL	Philadelphia Intl PA
KPHX	Phoenix Sky Harbor Intl AZ
KPIT	Pittsburgh Intl PA
KSAN	San Diego Intl CA
KSDF	Louisville Intl KY
KSEA	Seattle-Tacoma Intl WA
KSFO	San Francisco Intl CA
KSLC	Salt Lake City Intl UT
KSTL	Lambert-St Louis Intl MO
KSWF	Stewart Intl NY
KSAT	San Antonio International Airport TX
KTPA	Tampa Intl FL
KTEB	Teterboro NJ
PANC	Anchorage Intl AK
PAFA	Fairbanks Intl AK
PGUM	Guam Intl US Territory
PHNL	Honolulu Intl HI

NATIONAL WEATHER SERVICE INSTRUCTION 10-1605

JULY 26, 2021

Performance and Evaluation, NWSPD 10-16

STORM DATA PREPARATION

NOTICE: This publication is available at: http://www.nws.noaa.gov/directives/.

OPR: W/COO11 (G. Strassberg) **Certified by:** W/COO1 (M. Sowko)

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SUMMARY OF REVISIONS: This Directive supersedes National Weather Service Instruction (NWSI) 10-1605, dated July 16, 2018. The following changes were made:

- Updated broken web links throughout the document.
- Replaced references to casualties to fatalities/injuries for consistency.
- Updated references to other NWS directives and made grammatical corrections.
- Section 2.7 – Removed reference to using Verisk PCS for damage amounts.
- Section 2.9.1 – Added policy guidance on reporting Flood, Flash Flood, and Debris Flow events, per Water Resources Services Branch.
- Appendix A – Expanded definition and event narrative policy for reporting Debris Flow, and updated examples, per Water Resource Services Branch.
- Appendix A – Updated reporting policy for Dust Storm events caused by thunderstorms, per Public and Severe Weather Programs.
- Appendix A – Updated policy information for reporting Flash Flood events in Section 14.1, per Water Resources Services Branch.
- Appendix A – Clarified Hail event sizes to be reported per Severe Weather Program.
- Appendix A --Added policy to include reporting Snow Squalls in Winter Weather events, per Winter Weather Program.

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John D. Murphy Date
Chief Operating Officer

Storm Data Preparation

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1 *Storm Data* Disclaimer. *Storm Data* is an official publication of the National Oceanic and Atmospheric Administration (NOAA) which documents:

a. The occurrence of storms and other significant weather phenomena having sufficient intensity to cause loss of life, injuries, significant property damage, and/or disruption to commerce;

b. Rare, unusual, weather phenomena that generate media attention, such as snow flurries in South Florida or the San Diego coastal area; and

c. Other significant meteorological events, such as record maximum or minimum temperatures or precipitation that occur in connection with another event.

While *Storm Data* serves as official input to the National Weather Service (NWS) verification system for select programs, the primary purpose of *Storm Data* is to accurately describe events, regardless of the impact on verification scores.

Some information appearing in *Storm Data* may be provided by or gathered from sources outside the NWS, such as the media, law enforcement and/or other government agencies, emergency managers, private companies, individuals, etc. An effort is made to use the best available information, but because of time and resource constraints, information from these sources may be unverified by the NWS. Accordingly, the NWS does not guarantee the accuracy or validity of the information. Further, when information appearing in *Storm Data* originated from a source outside the NWS (frequently credit is provided), *Storm Data* users requiring additional information should contact that source directly.

In most cases, NWS employees will not have the knowledge to respond to such requests. In cases of legal proceedings, Federal regulations generally prohibit NWS employees from appearing as witnesses in litigation not involving the United States. Reference NWS Instruction (NWSI) 10-2005, *Handling and Releasing Accident-Related Weather Information*, or the NWS Forensic Services Program Manager for additional guidance. The determination of direct versus indirect causes of weather-related fatalities or injuries is not a legal determination and should not be considered as such. The determination is intended for internal NWS statistical review to assist NWS in its primary mission of issuing forecasts and warnings for hazardous hydrometeorological events.

1.1 Local Data Retention Requirements. All documentation used for the production of *Storm Data* will be retained locally for two years. Note: The National Centers for Environmental Information (NCEI) is the official custodian of NWS weather records and responds to requests for certified records for litigation purposes.

2 *Storm Data* Preparation. The *Storm Data* preparer should allocate a sufficient amount of preparation time to ensure that documentation and verification of significant weather phenomena are as accurate and complete as possible. The preparer will carefully coordinate the time and location of events that cross County Warning Area (CWA) boundaries to prevent inconsistencies in the *Storm Data* database. These quality control procedures are important, especially for events used in the NWS national verification program.

Preparation will be done using the currently authorized on-line *Storm Data* software program. Software methodology and hardware requirements are provided on the Office of Chief Operating Officer (OCOO) Performance and Evaluation Branch's Performance Management Website. Certification of the monthly data will be accomplished electronically on-line. Inclusion of pictures in the monthly reports should be limited to unusual or highly significant events to keep the *Storm Data* publication at a reasonable size. If pictures are not the property of NOAA, proper attribution should be provided.

2.1 Permitted Storm Data Events. The only events permitted in *Storm Data* are listed in Table 1 of section 2.1.1. The chosen event name should be the one that most accurately describes the meteorological event leading to fatalities, injuries, damage, etc. However, significant events, such as tornadoes, having no impact or causing no damage, should also be included in *Storm Data*. See section 5 for detailed examples.

If the event that occurred is considered significant (i.e., met local/regional/national threshold criteria, or generated impact, or was newsworthy), even though it affected a small area, it should be entered into *Storm Data*.

In the event it is obvious that a continuous or nearly continuous swath of thunderstorm wind or hail damage occurred, a single event should be entered into *Storm Data*. This single event would be described as occurring from Point A to Point B, during Time C to Time D. The related event narrative could describe the width and length of the damage swath. Scientifically, a swath is more accurate and reduces the chance of a researcher interpreting a single event as a series of events occurring across multiple points.

Additional details about record values of temperature, precipitation, etc., may be included in the episode narrative of which the appropriate *Storm Data* event is a part. However, only the more significant values should be summarized, such as monthly, seasonal, or yearly records. For example, a new monthly single-storm, snowfall record can be included in the event narrative of a Heavy Snow event, or a new, all-time, 4-hour rainfall record value can appear in the event narrative of a Flash Flood event.

2.1.1 Storm Data Event Table.

Event Name	Designator	Event Name	Designator
Astronomical Low Tide	Z	Freezing Fog	Z
Avalanche	Z	Hail	C
Blizzard	Z	Heat	Z
Coastal Flood	Z	Heavy Rain	C
Cold/Wind Chill	Z	Heavy Snow	Z
Debris Flow	C	High Surf	Z
Dense Fog	Z	High Wind	Z
Dense Smoke	Z	Hurricane (Typhoon)	Z
Drought	Z	Ice Storm	Z
Dust Devil	C	Lake-Effect Snow	Z
Dust Storm	Z	Lakeshore Flood	Z
Excessive Heat	Z	Lightning	C
Extreme Cold/Wind Chill	Z	Marine Dense Fog	M
Flash Flood	C	Marine Hail	M
Flood	C	Marine Heavy Freezing Spray	M
Frost/Freeze	Z	Marine High Wind	M
Funnel Cloud	C	Marine Hurricane/Typhoon	M

Marine Lightning	M	Thunderstorm Wind	C
Marine Strong Wind	M	Tornado	C
Marine Thunderstorm Wind	M	Tropical Depression	Z
Marine Tropical Depression	M	Tropical Storm	Z
Marine Tropical Storm	M	Tsunami	Z
Rip Current	Z	Volcanic Ash	Z
Seiche	Z	Waterspout	M
Sleet	Z	Wildfire	Z
Sneaker Wave	Z	Winter Storm	Z
Storm Surge/Tide	Z	Winter Weather	Z
Strong Wind	Z		

Legend: There are three designators: C – County/Parish; Z – Zone; and M – Marine Zone.

Table 1. *Storm Data* Event Table.

2.2 Aircraft/Marine Incidents. It is the responsibility of the National Transportation Safety Board (NTSB) to investigate and file reports on the probable causes of aviation and marine-related incidents. A *Storm Data* preparer, however, can include events that may have resulted in an incident in *Storm Data* as long as associated NWS operational performance is not discussed. See Funnel Cloud, Marine Thunderstorm Wind, and Seiche examples in Appendix A.

2.3 Time. The beginning and ending time for each event will be entered as accurately as possible. Use local standard time in 24-hour clock throughout the year, such as 0600 Eastern Standard Time (EST), 0925 Central Standard Time (CST), 1800 Mountain Standard Time (MST), etc. Forecast offices having a CWA responsibility in multiple time zones should enter data in the appropriate time zone for the event's location.

Establishing the time of an event to the nearest minute will be difficult in certain situations. To minimize this problem, the *Storm Data* preparer should carefully compare all storm reports to available radar data, using unique radar signatures to make adjustments in the event time.

The *Storm Data* preparer ensures that event times in the event header-strip are consistent with event times mentioned in the event narrative. Extra quality control is needed in order to minimize user confusion and ensure that the national severe weather database is as accurate as possible.

In general, the time of an event, as it appears in the header-strip, is the time when the event reached locally, regionally, or nationally established advisory or warning criteria (exceptions defined in section 2.3.1). The event time could be the single time that a peak wind gust of 65 knots (75 miles per hour (mph)) occurred, or it could be beginning and ending times of a 10-minute shower of large, damaging hailstones. If the time of the event is a broad estimate, then it should be indicated as such in the event narrative.

2.3.1 Winter Weather Event Times. For the winter-related events of Blizzard, Heavy Snow, Ice Storm, Lake-Effect Snow, Sleet, and Winter Storm, there will be three times that will be logged in the *Storm Data* software:

- Beginning Time - In most cases, the beginning time will be when accumulations began, since this is usually the approximate time that the event started to have an impact or became a nuisance. For Blizzard events, the beginning time will be when blizzard conditions were first experienced (meeting visibility and wind criteria). The *Storm Data* preparer employs good judgment, but are also be consistent from one event to the next;

- Criteria Time - This is the time when the event reached locally, regionally, or nationally-established warning criteria. The criteria time will not appear in the event's header-strip in the *Storm Data* publication; only the beginning and ending times of the event will appear. The criteria time occurs between the date/time the event began and the date/time the event ended;

- Ending Time - This is the ending time of an event. In most cases the ending time will be when precipitation ended. In Blizzard events, it will be when visibilities or winds no longer met blizzard criteria.

2.3.2 Events That Span More Than One Month. Events that span more than one month will be entered for each month they occur, and the fact that the event spanned two or more consecutive months should be documented in the appropriate narrative. Directly-related fatalities, injuries, and damages will be given in the appropriate column for the month currently being prepared. Additional summary information on cumulative fatalities, injuries, or damages from previous months can be explained in the episode narrative of the *Storm Data* entry for the final month of the event.

2.4 Location. A hydrometeorological event will be referenced, minimally, to the nearest hundredth of a mile, to the geographical center (not from the village/city boundaries or limits) of a particular village/city, airport, inland lake, or location providing that the reference point is documented in the S*torm Data* software location database.

The *Storm Data* preparer is strongly encouraged to enter latitude/longitude pairs of numbers to describe an event's location, since latitude/longitude values can be entered with a precision out to the 4th decimal place. In contrast, if the preparer utilized the range/azimuth feature of reference cities, the accuracy would only be reflected to the 2nd decimal place.

The geographical centers of large, irregular-shaped cities may not correspond to their cultural/economic/political centers. In some cases, the reference point of these large, irregularly-shaped cities may have been redefined to co-exist with the cultural/economic/political center of that city, commonly referred to as the "downtown" location.

Ensure the referenced location used in the *Storm Data* software is in the same county in which the event took place. Additional, detailed information on the exact location of an event can be

included in the event narrative. This additional, detailed information, such as highway names or numbers, intersections of major roads, city parks, and small lakes or other landmarks, would be useful when the event occurs within the boundaries of a large city. In some cases, if the event is relatively widespread, the *Storm Data* preparer may reference two locations on either side of the impacted area and describe the impacted area in the event narrative.

The *Storm Data* preparer can enter the azimuth/range of an event with respect to a reference city or the latitude/longitude coordinates of the severe weather event within the *Storm Data* software. Given one set of numbers, the software is able to calculate the same data in the other format.

For all Flood, Flash Flood, and Debris Flow events, ensure the referenced location used in the *Storm Data* software is between four (4) and eight (8) points to outline the flooded area within the *Storm Data* software. However, in the final *Storm Data* publication, only two locations will describe the impacted area. Because of this limitation, for large or high impact Flood, Flash Flood, and Debris Flow events, the *Storm Data* preparer is encouraged to describe the bounds of the impacted area in the event narrative.

For marine zones, a hydrometeorological event will be referenced (azimuth and range) to the reference points documented in the *Storm Data* software location database. In general, these would be coastal harbors, buoys, lighthouses or other prominent coastal shoreline features.

2.5 Event Source. The source of each *Storm Data* event will be entered in the software program. Possible sources of reports include "trained spotter," "law enforcement," and "emergency management." Refer to Table 2 in section 2.5.1 for a complete listing of event sources.

In those cases where the source of the event report is not obvious or there are multiple sources, the preparer should use professional judgment as to what single source is appropriate. Even though the event source does not appear in the final *Storm Data* publication, this information is used in related NWS statistical studies.

2.5.1 *Storm Data* Event Source Table.

911 Call Center
Airplane Pilot
Amateur Radio
Automated Surface Observing System (ASOS)
Automated Weather Observing System (AWOS)
Automated Weather Sensor System (AWSS)
Broadcast Media
Buoy
Coastal-Marine Automated Network (C-MAN) Station
Coast Guard
Community Collaborative Rain, Hail and Snow Network (CoCoRaHS)
Cooperative Network Observer
County Official
Department of Highways
Drought Monitor
Emergency Manager
Fire Department/Rescue
Insurance Company
Law Enforcement
Lifeguard
Local Official
Mariner
Mesonet
Newspaper

NWS Employee	Snow Telemetry (SNOTEL)
NWS Storm Survey	Social Media
Official NWS Observations	State Official
Other Federal Agency	Storm Chaser
Park/Forest Service	Trained Spotter
Post Office	Tribal Official
Public	Unknown
Remote Automatic Weather Station (RAWS)	Utility Company
River/Stream Gage	National Water Level Observation Network (WLON)
Severe Hazards Analysis & Verification Experiment (SHAVE) Project	

Table 2. *Storm Data* Event Source Table.

2.6 Fatalities/Injuries. The determination of direct versus indirect causes of weather-related fatalities or injuries is one of the most difficult aspects of *Storm Data* preparation. Determining whether a fatality or injury was direct or indirect has to be examined on a case-by-case basis. It is impossible to include all possible cases in this Directive. The preparer should include the word "indirect" in all references to indirect fatalities or injuries in the event narrative. This will minimize any potential confusion as to what fatalities and injuries referenced in the event narrative were direct or indirect. An event narrative example follows.

> "Powerful thunderstorm winds leveled trees and power lines in and around Morristown, TN. One of the toppled trees struck and killed two men running for shelter. During the clean-up operations after the storm, a person on an all-terrain vehicle (ATV) was injured (indirect) when the vehicle struck a tree that blocked a road."

Exercise special care when dealing with situations in which vehicles leave a road surface (due to a non-weather reason) not covered with flood waters and go into non-flooded rivers or canals. Any fatalities, injuries, or damage in these cases will not be entered using the *Storm Data* software, since they are not weather-related. However, if a vehicle drives into flood waters crossing a roadway, or a vehicle is driven into a river that is above flood stage and the driver drowns or dies after being struck by debris in the water, then such fatalities would be entered as direct deaths in the *Storm Data* software.

In some cases, such as with Hurricane Katrina, it may be nearly impossible to determine what event (i.e., Storm Surge/Tide, Hurricane, Flash Flood, or High Surf) resulted in a directly-related death. To simplify the *Storm Data* preparation process, for these situations, it is appropriate to assign the death to the Hurricane (Typhoon) event. However, state this fact in the episode narrative.

2.6.1 Direct Fatalities/Injuries. A direct fatality or injury is defined as a fatality or injury directly attributable to the hydrometeorological event itself, or impact by airborne/falling/moving debris (e.g., missiles generated by wind, water, ice, lightning, tornado, dust storms). In these

cases, the "active" agent was the weather event itself or the debris/missiles. Generalized examples of direct fatalities/injuries would include:

a. Thunderstorm wind gust causes a moving vehicle to roll over;

b. Blizzard winds topple a tree onto a person; and

c. Vehicle is parked on a road, adjacent to a dry arroyo. A flash flood comes down the arroyo and flips over the car. The driver drowns.

Fatalities and injuries directly caused by the weather event will be entered in the *Storm Data* software "fatality" and "injury" entry fields, respectively. For direct fatalities, enter the specific data as queried by the software (e.g., number of individuals, age, gender, location). Obtain information from reliable sources. The alphanumeric fatality code trailing the narrative is automatically inserted by the software. See Appendix A for detailed examples for each event type.

A directly-related weather injury is one that requires treatment by a first-responder or subsequent treatment at a medical facility. Injured persons who deny medical treatment also may be included. Persons who are not considered injured, but who are affected by the phenomenon, may be discussed in the event narrative.

In very rare cases, a pregnant woman may die from the direct effects of an event. In these situations, only one death (the pregnant woman) will be documented in *Storm Data.*

If a child less than 1 year of age (e.g., 2-months old) dies directly in a weather event, the child's age is to be rounded up to 1 year of age.

Should a person be directly injured in a weather event, but subsequently die several days/weeks later due to unrelated causes such as pneumonia, the death would be indirectly related to the original weather event, or the *Storm Data* preparer may elect to make no entry.

In some cases, such as with Hurricane Katrina, a person in New Orleans, LA, may have been directly injured by the event, but was subsequently evacuated to another city, such as Houston, TX. If this person eventually died from his/her initial injuries while in Houston, TX, and if this information was made available in a timely fashion to the *Storm Data* preparer at the New Orleans/Slidell office, this death should be documented as if it occurred in New Orleans. If this person died from other causes (e.g., vehicle accident, homicide) while in Houston, then his/her death was not related to Hurricane Katrina, and there will be no *Storm Data* entry.

2.6.1.1 Specifying Direct Fatality Locations. When specifying the location of the direct fatality, only the choices found in Table 3 of section 2.6.1.2 are to be used. In some cases, it will be easy to establish the fatality location, and in others it will be difficult, especially with water situations. For example, a person drives a vehicle into a flash flood; the vehicle is overturned, and the person drowns. In this situation, you should choose the "Vehicle and/or Towed Trailer" location (VE), since the person died as a result of being in the vehicle in floodwaters. Also, VE

should be used for instances where a victim drove into flood waters, made a conscious effort to leave the vehicle, and drowned. The flash flood was still the cause of the death, but the VE designation indicates the vehicle's role in the fatality. Boating fatalities should be coded as BO instead of IW.

With respect to the example described in the last paragraph of section 2.6.1, the preparer should use the "Other/Unknown" location (OT) for situations where a person was evacuated to another site and died from direct injuries suffered at an unknown initial location. However, if available information is sufficient to determine the location where the direct injuries were initially sustained, then the *Storm Data* preparer should choose the appropriate fatality location.

2.6.1.2 Direct Fatality Location Table.

BF	Ball Field	MH	Mobile/Trailer Home
BO	Boating	OT	Other/Unknown
BU	Business	OU	Outside/Open Areas
CA	Camping	PH	Permanent Home
CH	Church	PS	Permanent Structure
EQ	Heavy Equipment/Construction	SC	School
GF	Golfing	TE	Telephone
IW	In Water	UT	Under Tree
LS	Long Span Roof	VE	Vehicle and/or Towed Trailer

Table 3. Direct Fatality Location Table.

2.6.2 Indirect Fatalities/Injuries. Fatalities and injuries, occurring in the vicinity of a hydrometeorological event, or after it has ended, but not directly caused by impact or debris from the event (weather event was a passive entity), are classified as indirect. The *Storm Data* preparer can enter the number of indirect fatalities into a field in the *Storm Data* software, along with the age, gender, and location of the fatality. Consequently, this data lends itself to internal NWS statistical review. However, indirect fatality information will not appear in the header-strip of the *Storm Data* publication.

Any available indirect fatalities and injuries should be discussed in the event narrative. Indirect injuries may be entered into a field within the *Storm Data* software, but they will not be tallied in official *Storm Data* statistics.

Fatalities and injuries due to motor vehicle accidents on slippery, water, or ice-covered roads are indirect. Ice, snow, and water on road surfaces are "passive" agents that do not directly impact a person or property, even though they induce conditions that trigger another event causing a fatality or injury.

If the hydrometeorological event induced conditions that triggered another event resulting in the fatality/injury, then it is indirect. For example, heart attacks, resulting from overexertion during or following winter storms, electrocution caused by contact with a downed power line after a

storm has ended, a death occurring during post-storm cleanup operations, or a death in a fire triggered by lightning are indirect.

Fatalities and injuries resulting from driving in dense fog, a blinding blizzard, a winter storm, a winter weather event, a dust/sandstorm, or other visibility reducing hazards are indirect.

Generalized examples of indirect fatalities/injuries (see Appendix A for detailed examples) include:

a. Dense fog reduces visibilities from zero to 1/8 mile. A 20-vehicle pile-up occurs;

b. Thunderstorm winds topple trees onto a road. A motorist runs into a tree 30 minutes after the storm occurred;

c. Heavy snow is in progress and roads become icy/snow-covered. A vehicle slides across the road into another vehicle;

d. Lightning starts a fire that destroys a home, killing its occupants;

e. People suffer carbon monoxide poisoning due to improper or inadequate venting of heating systems, portable heaters, generators, etc.; and

f. Vehicle accident occurs on a non-flooded roadway and the vehicle and its occupants end up in a ditch, creek, ravine, river, or lake and the vehicle's occupants drowns.

2.6.3 Delayed Fatalities. On occasion, a fatality will occur a few days after the end of a meteorological event, due to weather-related injuries or the effects of the event. This is most common with long-duration, excessive heat episodes in which individuals never recover from the initial effects of the heat wave. The *Storm Data* preparer enters the post-event fatality information as part of the meteorological event that just ended, but enter the actual date of delayed fatality in the fatality entry field. An explanation can be given in the episode narrative for zone-based events, or in the event narrative for county-based or marine zone-based events.

2.7 Damage. Property damage estimates should be entered as actual dollar amounts, if a reasonably accurate estimate from an insurance company or other qualified individual is available. If this estimate is not available, then the preparer has two choices: either check the "no information available" box, or make an estimate. The lone exception is for flood events. The *Storm Data* preparer enters monetary damage amounts for flood events, even if it is an estimate. The U.S. Army Corps of Engineers requires the NWS to provide monetary damage amounts (property and/or crop) resulting from any flood event.

Typically, damage refers to damage inflicted to private property (e.g., structures, objects, vegetation) as well as public infrastructure and facilities. The *Storm Data* preparer is encouraged to make a good faith attempt to obtain or estimate the damage. Damage estimates are very important for many users and should be obtained if at all possible.

Estimates can be obtained from emergency managers, U.S. Geological Survey, U.S. Army Corps of Engineers, utility companies, and newspaper articles. If the values provided are rough estimates, then this should be stated as such in the narrative.

Estimates should be in the form of US Dollar values and rounded to three significant digits, followed by the magnitude of the value (i.e., 1.55 Billion $USD for $1,550,000,000). Values used to signify magnitude include: Thousand $USD, Million $USD, and Billion $USD. If additional precision is available, it may be provided in the narrative part of the entry. When damage is due to more than one element of the storm, indicate, when possible, the amount of damage caused by each element. If the dollar amount of damage is unknown, or not available, check the "no information available" box.

When deciding whether vegetation should be considered as property or crop damage, keep in mind the intended purpose of the vegetation. If the purpose of the damaged vegetation was to enhance a property's appearance (e.g., shade trees, hedges, lawn grass), the loss estimate should be listed in the property damage category. If the purpose of the damaged vegetation was for harvest (e.g., fruit trees, lumber, grasslands used for feed, sod farms), the estimate should be classified as crop damage regardless of whether the intended use was for personal or commercial resale.

Specific breakdowns should be stated in the event narrative (refer to section 2.9), if possible. The number of structures with minor or moderate damage should be indicated, as well as the number of buildings destroyed.

To determine whether the damage is directly related or indirectly related to the hydrometeorological event, the *Storm Data* preparer will use the same guidelines for fatalities and injuries provided in section 2.6.

2.7.1 Flood-Related Damage. Each Weather Forecast Office (WFO) will report flood damage in their CWA. The Service Hydrologist should assist in the collection and assessment of flood/flash flood information that pertains to *Storm Data*.

2.7.2 Crop Damage Data. Crop damage information may be obtained from reliable sources, such as the U.S. Department of Agriculture (USDA), the county/parish agricultural extension agent, the state department of agriculture, crop insurance agencies, or any other reliable authority.

The *Storm Data* preparer should be very careful when using crop damage to infer that a Thunderstorm Wind event occurred with wind gusts equal to or greater than 50 knots (58 mph), or to infer that a Hail event occurred with hail stones one inch or larger. Lesser wind speeds and smaller hail stones can result in crop damage. Additional investigation will be needed in these situations, such as contacting a person who lives in the affected area, and/or comparing what happened to other severe weather reports in the vicinity.

2.7.3 Other Related Costs. The cost of such items as snow removal, debris clearing/moving, firefighting, personnel overtime charges, public housing assistance, etc., will not be tallied as directly-related parts of the property/crop damage. If "other related" cost estimates are available, they may be included in the narrative as a separate item ("for information only"), and stated as such.

2.7.4 Delayed Damage. On occasion, vegetative or structural damage will occur within a few days, or even a couple of weeks, after a meteorological event. This is most common after a very heavy snowfall, or very heavy rain due to weight loading on roofs or buildings, tree branches, or power lines. Windy conditions after a heavy snow or heavy rain event may amplify the damage. In these cases, the *Storm Data* preparer **enters** the post-event damage information as part of the hydrometeorological event that just ended and explains the situation in the event narrative.

2.8 Magnitude of Storm. Select the type of storm or phenomenon from the available options provided in the software. If known, maximum gusts will be encoded as "measured"; otherwise, they will be an estimate (gusts are given in knots).

Doppler-derived wind speeds will not be used to determine the character of the storm or the Enhanced Fujita (EF)-scale of a tornado since these values are representative of conditions aloft rather than ground-based. However, this information can be included in the event narrative for enhancement.

Hail size will be given in hundredths of an inch (0.50, 0.75, 0.88, 1.00, 1.50, etc.), are the most common). Data regarding multiple severe phenomena (events) within a single episode will be provided as separate entries.

2.9 Textual Description of Storm. There are two kinds of textual descriptions: episode narrative and event narrative. Minimally, a brief episode narrative is needed for any weather event entry within the *Storm Data* software. The event narrative may or may not be needed. If the event does not cause injury, fatality or property/crop damage, the event does not require an event narrative, unless otherwise significant. For example, Hail events, as a single phenomenon, should not necessitate narratives unless they are part of a more complex weather event or cause fatality/injury or property/crop damage.

2.9.1 Episode Narrative. Generate an episode with a narrative; otherwise individual events cannot be entered into the *Storm Data* software. An episode narrative describes the entire episode in a general fashion, and briefly describes the synoptic meteorology associated with the episode. Information in the episode narrative can be very useful for researchers and other users of *Storm Data*. This narrative does not need to be long or elaborate, rather make it brief and informative. An example would be "A strong cold front passed through the Washington, D.C. area, triggering several instances of damaging thunderstorm winds and large, baseball-sized hail."

To ensure events being logged in a single episode are part of the same synoptic meteorological system, events within the same episode may begin no more than five (5) calendar days apart. This will enable the *Storm Data* preparer to properly document events that double back into a

specific region or events that are very slow moving. Examples include Hurricane and Winter Storm events.

The episode narrative will appear in the *Storm Data* publication after all events contained within the episode. The episode narrative does not appear in the examples shown in Appendix A, which is reserved for only event narratives. Additionally, a brief summary of fatalities and injuries should be part of the episode narrative for zone-based events.

Should a reference time be used in the episode narrative, it is recommended that a blank space not be inserted between the numerical time and the time zone (e.g., 1200EST is the preferred method). This practice helps save space in the printed *Storm Data* publication.

For episodes containing Flood, Flash Flood, and Debris Flow events which cause injury, fatality, or property/crop damage, the following information will be included in the episode narrative:

a. A statement as to the rivers, areas, and states in which the floods occurred; the period of flooding, its magnitude, and interesting or unusual features; and if floods were of unusual severity.

b. A summary relative to the rainfall or other conditions causing the floods indicating the approximate average precipitation over the basins. In the case of post-fire debris flows and flash floods, the summary should include rainfall rates or any available sub-hourly or hourly rainfall gage data and/or Quantitative Precipitation Estimates (QPE).

2.9.2 Event Narrative. Detailed information pertaining specifically to the event and not the overall episode will appear in an event narrative. The event narrative describes the significance or impact of an event within an episode. An event narrative is required for all Tornado events, all Thunderstorm Wind events, and all Lightning events, whether over land or marine zones. This narrative will appear immediately below the header-strip in the publication and should contain descriptive information about the times, locations, and severity of destruction of property, trees, crops, power lines, roads, bridges, etc. Additionally, a brief summary of fatalities and injuries should be part of the event narrative for county-based and marine zone-based events. For Thunderstorm Wind events with estimated gusts, use sentences such as “Several trees were toppled by powerful downburst gusts.”

The event narrative should be concise and not repeat information provided in the quantitative data found in the header-strip. When used properly, the event narrative integrates the numerical data into a cohesive meteorological event.

The event narrative always appears as a complete description of the event. The event narrative will never consist of a single, stand-alone phrase such as “See the 07/18/09 Thunderstorm Wind event at 1800CST for details.” However, it is permissible to include a similar reference phrase at the end of an event narrative when that event spans two CWAs or different months.

Should a reference time be used in the event narrative, it is recommended that a blank space not be inserted between the numerical time and the time zone (e.g., 1200EST is the preferred method). This practice helps save space in the printed *Storm Data* publication.

When writing the event narrative, always indicate when and where tornadoes and thunderstorm wind events cross county, parish, and state lines, and boundaries of WFO CWAs. *Storm Data* preparers will coordinate with other affected offices to determine time and location of border-crossing tornadoes or other events. Storm characteristics, such as the intermittence of tornado paths, may be included.

The *Storm Data* software program will automatically encode a wind speed conversion line at the end of each event that is characterized with measured or estimated wind speed values. Therefore, it is not necessary for the preparer to provide the miles-per-hour equivalent for wind speed values that are required to be expressed in knots. The encoded line will have this appearance:

Note: The (Measured/Estimated) Wind (Speed/Gust) of xxx knots is equivalent to xxx mph.

For lightning injuries, it is highly desirable to include in the event narrative, the age, gender, location, and weather conditions at the time of occurrence, if known or determinable. The age, gender, and location information is used in compiling lightning statistics used in the national report entitled *Summary of Natural Hazard Statistics in the United States*.

Additional event narrative remarks (or an electronically inserted picture or graphic) may serve to locate storms more precisely and may give the areal extent and the directional movement or speed.

To maintain a consistent look and feel to the *Storm Data* publication, use the following guidelines for writing narratives:

a. Type all narratives in sentence format. All sentences begin with a capital letter. All sentences end with a period;

b. Do not begin a sentence with a number; instead, spell out the number: “17 inches of snow fell overnight” *should* read “Seventeen inches of snow fell overnight;”

c. Do not title the narrative with “Event Summary for Month, Day:” The event narrative IS the event summary so there is no need to identify it as such;

d. If an event spans two or more consecutive months, then state this fact in the event narrative;

e. The *Storm Data* preparer should title episode narratives for tropical cyclones with the name of the cyclone. Example: “Hurricane Katrina”;

f. Do not use simple phrases such as “trees down.” Instead, use complete sentences such as “Several trees were downed by powerful thunderstorm wind gusts”;

g. Do not use the hard return key before or after the narrative. This adds an extra blank line that takes up valuable space in the printed publication; and

h. When beginning a new paragraph, use a hard return instead of an indent (tab key). In other words, each paragraph is left-justified.

2.9.3 Cause of Event. The cause or trigger for Flood, Flash Flood, and Debris Flow events will be entered into the *Storm Data* software, so the NWS can generate internal verification and other statistical calculations. Possible causes to choose from are displayed within the *Storm Data* software (e.g., heavy rain).

2.10 Pictures. Inclusion of electronic images (Joint Photographic Group (.jpg), Graphics Interchange Format (.gif), or Portable Network Graphic (.png) format) into the *Storm Data* software is encouraged to enhance the historical record of an event. Images should be limited to unusual or highly significant events in order to minimize the size of the *Storm Data* publication. Minimally, images should have a 1024x768 resolution at 200 dots per inch (dpi). The *Storm Data* preparer should make an effort to scale high resolution images down to a reasonable size, preferably fewer than 2 megabytes.

3 Disposition of *Storm Data*. *Storm Data* is required to be certified by the Warning Coordination Meteorologist (WCM) or Meteorologist-in-Charge (MIC), no later than 60 days after the end of the month for which the data is valid. Certification takes place for all months even if no events occurred in the given month. The WCM and MIC are the only people who are allowed to certify data. If the data are not certified, they will not appear in the *Storm Data* publication; nor will they be used in the verification process.

In the event of corrections and/or additions in the data to a previously certified month, the WCM or MIC recertifies the month in which the modification was made. This can only be accomplished going back 18 months from the current month. Corrections and/or additions that need to be made for events that occurred more than 18 months prior need to be coordinated through the *Storm Data* Program Manager in the Performance and Evaluation Branch. Requests for these changes can be sent to NWS.Verification@noaa.gov.

4 Tornado and Severe Thunderstorm Confirmation Reports. Four alphanumeric text products are produced by the Storm Prediction Center (SPC). These text products, referenced below in Table 4 of Section 4.1, summarize unofficial (preliminary) tornado and severe thunderstorm reports that were processed at SPC and originated from each WFO. Each WFO should compare the appropriate message with its local records. Any change in event information should be noted, but corrections will be made via *Storm Data*. Additional severe weather statistics and graphics can be found on the SPC Webpage: http://www.spc.noaa.gov/.

There will be differences between the STAHRY/STADTS messages and the WFO's Local Storm Reports (LSRs).

4.1 Table of SPC Statistical Messages.

AWIPS ID	WMO Communications Header	Product Description
STADTS	NWUS20 KWNS	Listing of tornado and severe thunderstorm reports from 6 AM CST the previous day to 6 AM CST on the current day
STAHRY	NWUS22 KWNS	Listing of tornado and severe thunderstorm reports from 6 AM CST on the current day, and updated on an hourly accumulative basis
STAMTS	NWUS21 KWNS	Statistics for tornado totals, tornado-related fatalities, and number of killer tornadoes on a monthly and yearly basis (current year and previous 3 years)
STATIJ	NWUS23 KWNS	Listing of killer tornadoes for current year

Table 4. SPC Tornado and Severe Thunderstorm Statistical Report Table.

5 Event Types. *Storm Data* will be entered into the *Storm Data* program using the guidance provided in Appendix A of this directive.

APPENDIX A – Event Types

This section provides guidelines for entering event types in the *Storm Data* software.

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1 Astronomical Low Tide (Z). Abnormal, or extremely low tide levels, that result in deaths, injuries, watercraft damage, or significant economic impact due to low water levels. The low water levels will be a result of, or enhanced by, the gravitational forces of the moon and sun. Astronomical low tides are made more extreme when strong winds produce a considerable seaward transport of water, resulting in previously submerged, non-hazardous objects become hazardous or exposed.

Beginning Time - When the low tide began.

Ending Time - When tides returned to normal.

Direct Fatalities/Injuries

- A boat traversing an ocean inlet foundered on the rocks in the unusually low waters and the boaters were injured when equipment on the boat was suddenly thrown about.

Indirect Fatalities/Injuries

- A sightseer was killed when he drove off the road while looking at the absence of water in an adjacent bay.

Example:

AKZ203-204 Eastern Beaufort Sea Coast - Central Beaufort Sea Coast
24 0100AST 0 0 Astronomical Low Tide
25 2300AST

Over the Arctic coast from the evening of the 23rd through the 25th, east winds ranging from 25 to 45 kts (28 to 52 mph) persisted. The sea ice edge was 20 miles offshore and the wind produced a considerable seaward transport of water, causing the water level in Prudhoe Bay to run several feet below normal. Normal tidal variations are only one foot or less along the Beaufort Sea coastline. Extensive marine operations were halted at Prudhoe Bay during this time, including the unloading of barges.

2 Avalanche (Z). A mass of snow, sometimes containing rocks, ice, trees, or other debris, that moves rapidly down a steep slope, resulting in a fatality, injury, or significant damage. If a search team inadvertently starts another avalanche, it will be entered as a new Avalanche event.

Beginning Time - When the snow mass started to descend.

Ending Time - When the snow mass ceased motion.

Example:

COZ012 West Elk and Sawatch Mountains/Taylor Park
06 1900MST 5 1 Avalanche
1915MST

Four college students were caught in an avalanche, triggered when one of the students crossed a slope just below the summit on Cumberland Pass, which is about 25 miles east-northeast of Gunnison in the Sawatch Mountain Range. The entire slope at the 12,000-foot elevation fractured 6-feet deep and 1,500 feet across and ran 400 vertical feet, with the resulting avalanche scouring the slope all the way to the 9,000-foot level. The skier who triggered the avalanche was buried next to a tree which provided an air space that was crucial to his survival. The other three students, including a snowmobiler, a snowboarder, and another skier, perished in the snow. The avalanche also destroyed a cabin, killing the occupant. Boulders

dislodged by the avalanche struck a car, killing the driver. M19OU, M20OU, M22OU, M43PH, F37VE

3 Blizzard (Z). A winter storm which produces the following conditions for three (3) consecutive hours or longer: (1) sustained winds or frequent gusts 30 knots (35 mph) or greater, and (2) falling and/or blowing snow reducing visibility frequently to less than 1/4 mile. If the event that occurred is considered significant, even though it affected a small area, it should be entered into *Storm Data*.

Some Winter Storm and Blizzard events may have had sustained or maximum wind gusts that met or exceeded High Wind criteria. Rather than document an additional High Wind event, the *Storm Data* preparer should just mention the time, location, and wind value in the Winter Storm or Blizzard event narrative.

Beginning Time - When public impact from the blizzard began or was inferred to begin from surrounding reports. Normally, this will be the time of the first observation when blizzard wind/visibility conditions were first observed. The time that snow started to accumulate and/or blowing snow was first observed can be mentioned in the event narrative.

Criteria Time - When the 3rd hour of blizzard conditions was observed to occur or inferred to occur from surrounding reports.

Ending Time - When blizzard wind and visibility conditions are no longer observed or have been inferred to end from surrounding reports.

In *Storm Data*, no blizzard should cover a time period of less than three (3) hours. If blizzard-like conditions occur for less than three (3) hours, the event should be entered as Winter Storm, Heavy Snow, or Winter Weather, perhaps noting in the narrative that near-blizzard or blizzard-like conditions were observed at the height of the storm.

Direct Fatalities/Injuries

- People who became trapped or disoriented in a blizzard and suffered/died from hypothermia.
- People who were struck by objects borne or toppled in blizzard wind.
- People suffered/died from a roof collapse due to the weight of heavy snow that fell during a blizzard.
- A vehicle stalled in a blizzard. The occupant suffered from/died of hypothermia.

Indirect Fatalities/Injuries

- Vehicle accidents caused by poor visibility and/or slippery roads during a blizzard.

Example:

NYZ009-036- Northern Oneida- Madison – Otsego – Southern Oneida

037-046- **02 1800EST** **2** **0** **Blizzard**
03 1300EST

An intense winter storm tracked through western New England the evening of the 2nd to the morning of the 3rd. This storm brought a prolonged period of blizzard conditions to north central New York State. Total snow accumulations ranged from 1 to 2 feet. Frequent wind gusts to 50 mph combined with the heavy snow to create widespread whiteout conditions. Snow drifts 10 to 20 feet high closed numerous roads, including the New York State Thruway, for up to 24 hours. Power outages were widespread as high winds knocked down trees and power lines leaving tens of thousands without power. A state of emergency was declared in Oneida, Madison and Otsego counties. Two people in Oneida County froze to death after they left their snow-covered vehicle and attempted to walk to a nearby farm home. M55OU, F60OU

4 Coastal Flood (Z). Flooding of coastal areas due to the vertical rise above normal water level caused by strong, persistent onshore wind, high astronomical tide, and/or low atmospheric pressure, resulting in damage, erosion, flooding, fatalities, or injuries. Coastal areas are defined as those portions of coastal land zones (coastal county/parish) adjacent to the waters, bays, and estuaries of the oceans. Farther inland, the *Storm Data* preparer determines the boundary between coastal and inland areas, where flood events will be encoded as Flash Flood or Flood rather than Coastal Flood. Terrain (elevation) features will determine how far inland the coastal flooding extends.

Note: Flooding of lakeshore areas of lakes with assigned marine zones should be entered under the Lakeshore Flood event category.

If the astronomical tide height for the flooded area is known, it should be subtracted from the total water level/storm tide (run-up/debris line), and the result specifically labeled in the narrative as "surge." The method of measuring surge height should be mentioned in the narrative, e.g., "NWS survey team calculated a surge height of 4 feet by subtracting the astronomical tide height from the run-up/debris line height." For *Storm Data*, coastal flood events that are associated with a storm of tropical origin (e.g., hurricane, typhoon, or tropical storm) should be reported under the Storm Surge/Tide event category, even if the tropical system is hundreds of miles away. All other coastal flooding events should be reported as a Coastal Flood.

Beginning Time - When the water level began to cause damage or flooding.

Ending Time - When the water level dropped to a point where damage or flooding ended.

Direct Fatalities/Injuries
- A coastal dwelling was washed away injuring/killing the occupants.
- A person drowned when a vehicle was swept away by the storm surge/tide.

Indirect Fatalities/Injuries
- A person suffered a heart attack while evacuating from a storm tide.

- A person died in a vehicle accident caused by the storm tide washing away a traffic signal.
- A person died in a vehicle accident after losing control in standing water on a road.

Example:

ORZ022 Curry County Coast
07 0600PST 0 0 100K Coastal Flood
1000PST
A 4-foot storm tide, as reported by local police, affected a portion of the Oregon coast. The storm tide washed away part of Port Orford's sewage treatment plant.

5 Cold/Wind Chill (Z). Period of low temperatures or wind chill temperatures reaching or exceeding locally/regionally defined advisory (typical value is -18°F or colder) conditions. If the event that occurred is considered significant, even though it affected a small area, it should be entered into *Storm Data*. There can be situations where advisory criteria are not met, but the combination of seasonably cold temperatures and low wind chill values (roughly 15° F below normal) may result in a fatality. In these situations, a cold/wind chill event may be documented if the weather conditions were the primary cause of death as determined by a medical examiner or coroner. Normally, cold/wind chill conditions should cause human and/or economic impact.

Use this event only if a fatality/injury does not occur during a winter precipitation event.

Beginning Time - When cold temperatures or wind chill equivalent temperatures began.

Ending Time - When cold temperatures or wind chill equivalent temperatures ended.

Direct Fatalities/Injuries

- A fatality where hypothermia was ruled as the primary, or major contributing factor as determined by a medical examiner or coroner. If other weather factors, such as freezing/frozen precipitation, disorient the person, trap the person, or cause the person to collapse, but the cause of the fatality was determined to be exposure or hypothermia, the fatality may be entered under the event type Winter Storm, Winter Weather, etc. The *Storm Data* preparer exercises professional judgement and work with the local medical examiner or coroner.
- Elderly person wandered away from a nursing home, became disoriented, and died outdoors. Medical examiner ruled that the major cause of death was hypothermia.
- A person was clearing snow a day or two after a winter storm, fell and could not get back up. Medical examiner ruled that the major cause of death was hypothermia.
- Cases in which people receive medical treatment for frostbite or cold-hypothermia can be considered a direct injury.
- A man dies from hypothermia after falling down a flight of stairs and becoming unconscious in his dark, unheated home.

Indirect Fatalities/Injuries

- Cases where people suffer carbon monoxide poisoning from using an improperly ventilated fuel burning portable heater due to the cold.
- Cases where people are injured or killed in a house fire due to improper use of portable heaters due to the cold.

Example:

WIZ001>004 Ashland – Bayfield – Douglas - Iron
05 0600CST 2 0 400K Cold/Wind Chill
07 1200CST
Wind chill values dropped to -18 to -30 as northwest winds blew at 20 to 30 mph. The fire sprinkler system in several Ashland School District buildings burst from cold temperatures over the weekend, which was not discovered until Monday morning, causing $400K in damage. Additionally, two cross-country skiers died from exposure on a trail west of Hurley in Iron County. The medical examiner classified the fatalities as being due to cold-hypothermia. M32OU, F33OU

INZ001 Lake
11 2000CST 1 0 Cold/Wind Chill
12 1400CST
A homeless man was found dead in Gary, Indiana. The cause of death was hypothermia. It was raining on this cold October day with winds of 17 to 26 knots (20 to 30 mph) and temperatures in the 30s. M42OU

6 Debris Flow (C). A slurry of loose soil, rock, organic matter, and water, similar to wet concrete, which is capable of holding particles larger than gravel in suspension. They can mobilize from landslides on steep, nearly saturated slopes or be triggered by intense rain after wildfires. They can travel several miles from their source, growing in size as they pick up sediment, boulders, trees, cars, and other material. High velocity flows can transport large boulders in suspension and cause catastrophic damage, but even slower debris flows can rapidly infill channels, divert streams, and destroy automobiles, buildings, and infrastructure. Hyperconcentrated flows can also carry significant amounts of sediment and debris and are frequently mistaken for debris flows. However, unlike hyperconcentrated flows that have anywhere from 5-10 percent up to 20-60 percent sediment by volume, debris flows typically exceed 50 percent sediment by volume and the flow behavior is significantly controlled by the entrained sediment instead of the water. Many, but not all, flash floods originating in burn scars also contain debris flows. In most cases, lahars or mudflows from volcanic activity are not considered a debris flow. Details, such as the name of the burn scar a debris flow originated from, or whether it was triggered by a shallow landslide unrelated to a burn scar, should be included in the Event Narrative. Refer to NWSI 10-950, *Definitions and General Terminology*, for additional information.

Beginning Time - When the debris flow started to descend.

Ending Time - When the debris flow ceased motion.

Direct Fatalities/Injuries

- People were struck by the debris flow.
- People killed or injured when a vehicle was struck by moving debris flow.

Indirect Fatalities/Injuries

- Motorists who ran into the mass of debris flow in the road after the mass stopped moving.

Cause of Flash Flood Event – *Storm Data* software requires that an entry be made for the cause of the Debris Flow event (e.g., heavy rain). This cause will not appear in *the Storm Data* publication.

Example:

Flathead County

6 SE West Glacier	**15**	**0700MST** **0710MST**	**1**	**1**	**15K**	**Debris Flow**

A thunderstorm produced very heavy rain early in the morning over the Grizzly Mountain Fire burned area, along Highway 2 in the West Glacier Region. Due to poor radar coverage and no rain gage data in the area, no accurate rainfall depth or intensity is available. A debris flow slide of large rocks and mud cascaded onto Highway 2 between West Glacier and Essex. A large rock hit a moving vehicle and killed one of the occupants instantly. The driver was seriously injured. M36VE

Gila County

8.3 NW Government Hill	**27**	**2107MST** **2122MST**	**0**	**0**	**50K**	**Debris Flow**

Debris flow pushed over State Route 188 and into Roosevelt Lake in Gila County after a radar estimated 1.5 - 3.0 inches of rain in 45 minutes fell over a portion of the 2020 Bush Fire burn scar. The debris flow was near mile post 253 and led to the closing of a 13 mile stretch of SR-188 in order for heavy equipment to remove roughly 20,000 cubic yards of sediment and boulders and to repair guard rails on both sides of the road. It was determined through collaboration between NWS and Arizona Geological Survey (AZGS) that this event was classified as debris flow. For information only, labor costs, fuel costs, and costs to remove the sediment and reopen the road, in addition to the property damage, was estimated around $500,000 for this and the other event location.

Juneau Borough County

0.2 W Douglas	**06**	**0000AKST** **1000AKST**	**0**	**0**	**0.64M**	**Debris Flow**

Saturated soils in the steep terrain combined with heavy rain destabilized slopes and triggered debris flows across the area. Most of the damage from the erosion occurred when culverts were overwhelmed or blocked and debris flows that blocked roadways in Douglas were reported by trained weather spotters or emergency management right after midnight on October 6th. There were multiple calls from the public located on St. Anns Avenue about minor street flooding in Douglas along with a debris flow on David and John Street washing out portions of the street. Police started to evacuate people out of harm's way with the Red Cross helping people displaced from the damage. Just before sunrise more reports came in that Thane Road was blocked by a debris flow just before Mt. Roberts Street. There were also other reports in the morning of the 6th that there was a debris flows in Cope Park in downtown Juneau along with major damage to the Alaska Electric Light and Power's flume system as a debris took out a section of the flume. One report came in that a person's oil tank became dislodged from erosion and was spilling heating fuel into the ground and street.

7 Dense Fog (Z). Water droplets suspended in the air just above the Earth's surface reducing visibility to values equal to or below locally/regionally established values for dense fog (usually 1/4 mile or less) and impacting transportation or commerce. If the event that occurred is considered significant, even though it affected a small area, it should be entered *into Storm Data*. Accidents, which resulted in injuries or fatalities, during a dense fog event, are reported using this event category. These injuries or fatalities should be listed as indirect.

Beginning Time – When dense fog criteria were first met.

Ending Time – When dense fog criteria were no longer met.

Direct Fatalities/Injuries – None.

Indirect Fatalities/Injuries

- Fatalities and injuries resulting from vehicular accidents caused by dense fog.
- During extremely dense fog, a construction worker lifted a metal pipe which touched a power line, resulting in electrocution.

Example:

NCZ053-065 Buncombe - Henderson
30 0400EST 0 0 Dense Fog
1000EST

Dense fog developed in the early morning hours in the French Broad River Valley. The fog impacted the morning commute, and contributed to several accidents in and south of Asheville. At 0900EST, the fog contributed to a 25-car pile-up on Interstate 40 on the south side of Asheville. The accident claimed 4 lives (indirect fatalities) and injured 17 (indirect). Asheville Regional Airport

was closed for most of the morning. The North Carolina State Police shut down Interstate 26 between the airport and the city as a precautionary measure.

8 Dense Smoke (Z). Dense smoke, reducing visibilities to values equal to or below locally/regionally established values (usually ¼ mile or less), that adversely affects people and/or impacts transportation or commerce. If the event that occurred is considered significant, even though it affected a small area, it should be entered into *Storm Data*. Dense smoke in various concentrations suspended in the air at the Earth's surface can cause problems for people with heart or respiratory ailments.

Beginning Time - When dense smoke criteria were first met.

Ending Time - When dense smoke criteria were no longer met.

Direct Fatalities/Injuries
ϒ People who suffered/died from inhalation of dense smoke.

Indirect Fatalities/Injuries
ϒ Fatalities and injuries resulting from vehicular accidents caused by dense smoke.

Example:

MTZ0005 Missoula/Bitterroot Valleys
31 0400MST 2 0 Dense Smoke
1000MST
Dense smoke developed in the early morning hours in the Missoula and Bitterroot Valleys from a combination of surrounding forest fires in the Bitterroot Mountains. The dense smoke played havoc with the morning commute, and contributed to several long delays from minor accidents on Highway 93 near Lolo. Two elderly people died after being hospitalized for smoke inhalation near Florence. Dense smoke also delayed morning flights for several hours at Missoula International Airport. M88OU, F92OU

9 Drought (Z). Drought is a deficiency of moisture that results in adverse impacts on people, animals, or vegetation over a sizeable area. Conceptually, drought is a protracted period of deficient precipitation resulting in extensive damage to crops, resulting in loss of yield. There are different kinds of drought: meteorological, agricultural, hydrological, and social-economic. Each kind of drought starts and ends at different times. Additional information can be obtained at this Web address:

http://drought.unl.edu/DroughtBasics/WhatisDrought.aspx

A drought event should be included in *Storm Data* in relation to the drought classification system which is the foundation of the *Drought Monitor*, a multi-agency effort. Droughts are rated as Abnormally Dry (D0), Moderate (D1), Severe (D2), Extreme (D3), or Exceptional (D4). This

information should be included in the narrative. Details on the *Drought Monitor* can be found at the following Web address: http://droughtmonitor.unl.edu/.

For locations east of the Rocky Mountains, drought events should be included in *Storm Data* for classification of Severe (D2) or higher. For locations including and west of the Rocky Mountains, drought events should be included in *Storm Data* for classification of Extreme (D3) or higher. Drought events of lesser classification should be included if they cause significant impacts to people, animals, or vegetation.

Beginning Time - When an area first reaches Severe (D2) or Extreme (D3) classification or drought begins to cause significant impact to people, animals, or vegetation.

Ending Time - When an area is no longer in at least Severe (D2) or Extreme (D3) classification or drought no longer causes significant impact to people, animals, or vegetation.

Direct Fatalities/Injuries
ϒ None.

Indirect Fatalities/Injuries
ϒ None.

Example:

MTZ003 Flathead/Mission Valleys
01 0000MST 0 0 55K Drought
22 1800MST
A drought, which began in early July ended for much of the Flathead and Mission Valleys on September 22, when 3 to 5 inches of precipitation fell. For many locations this was the first significant rain exceeding a quarter of an inch since July 4. The drought's effect was especially felt during the first 3 weeks of September (Severe - D3) after numerous grass fires prompted many communities to ban any type of outdoor burning. Among the largest fires reported were: 180-200 acres of grassland and timber from Pablo to St. Ignatius. The most costly reported fire was when smoldering leaves ignited dry grass near Ronan, eventually spreading into two homes and causing $55,000 worth of damage. Damage amounts do not include costs to individual fire departments for fire containment.

Note: This example above should have entries in July and August *Storm Data* as well. Damage amounts in the header are for the current month only. Grand totals for the entire drought episode should be mentioned in the narrative. In some cases, the effects and cost of a drought may not be known for some time.

10 Dust Devil (C). A ground-based, rotating column of air, not in contact with a cloud base, usually of short duration, rendered visible by dust, sand, or other debris picked up from the

ground, resulting in a fatality, injury, or damage. Dust devils usually result from intense, localized heating interacting with the micro-scale wind field. Dust devils that do not produce a fatality, injury, or significant damage may be entered as an event if they are unusually large, noteworthy, or create strong public or media interest.

Beginning Time - When the rotating column of air first became visible.

Ending Time - When the rotating column of air was no longer visible.

Direct Fatalities/Injuries

- People who were asphyxiated due to high dust/sand content in the air. (Rare)
- People who were hit by flying debris.
- Fatalities and injuries resulting from a vehicle being tipped over or blown off a road.

Indirect Fatalities/Injuries

- Fatalities and injuries resulting from vehicular accidents caused by reduced visibility during a dust devil, or vehicular accidents caused by debris left on a road after a dust devil passed by.

Example:

Maricopa County

4 W Gila Bend	**12**	**1400MST** **1420MST**	**0**	**2**	**20K**	**Dust Devil**

A fairly strong dust devil developed and moved directly along Interstate 8, according to amateur radio reports. Visibility was severely reduced in the dust devil. One motorist drove into the dust devil, which pushed and flipped the vehicle off the road. The driver and one passenger were injured. Winds were estimated at 56 knots (65 mph).

11 Dust Storm (Z). Strong winds over dry ground, with little or no vegetation, that lift particles of dust or sand, reducing visibility below locally/ regionally established values (usually 1/4 mile or less), which could result in a fatality, injury, damage, or major disruption of transportation. If the event that occurred is considered significant, even though it affected a small area, it should be entered into *Storm Data*.

Some dust storms may be due to winds meeting or exceeding locally/regionally defined high wind warning criteria. The preparer should enter these events as Dust Storm events, as well as enter High Wind events for those events which met or exceeded locally/regionally defined warning criteria. All fatalities, injuries, and/or damage should be entered in association with the Dust Storm.

Dust storms that occur in direct relation to convection should be entered as a Thunderstorm Wind event, including the appropriate wind magnitude, *not* as a Dust Storm entry. For example, severe straight-line winds from a microburst generated a dust storm, which caused a traffic

pileup with indirect fatalities and injuries. When a dust storm has moved away from the parent thunderstorm or convection, and presents as its own hazard or threat, it should be classified as a Dust Storm. This includes: when the parent thunderstorm dissipates and the dust storm continues; or, when the dust storm propagates out far enough ahead of the ongoing parent thunderstorm, such that the leading edge is no longer associated with the storm, and the dust storm continues to be a threat to life or property.

Beginning Time - When an area of blowing dust or sand first reduced visibility to locally/regionally established values or began to cause a major impact.

Ending Time - When an area of blowing dust or sand diminished so that visibility was above locally/regionally established values or no longer had a major impact.

Direct Fatalities/Injuries

- People who were asphyxiated due to high dust/sand content in the air. (Rare)
- People who were hit by flying debris.
- Fatalities and injuries resulting from a vehicle being tipped/pushed over or blown off a road by the strong winds, resulting in an accident and associated fatalities/injuries.

Indirect Fatalities/Injuries

- Fatalities and injuries resulting from vehicular accidents caused by reduced visibility during a dust storm or by debris left on a road after a dust storm passed.

Example:

KSZ061 Hamilton

24 1600MST 0 2 20K Dust Storm
1645MST

A strong cold front caused wind gusts to around 43 knots (50 mph) across far western Kansas. An area of dust and dirt was lifted hundreds of feet into the air, reducing the visibility to near zero across U.S. Highway 50, west of Syracuse. A wind gust overturned and damaged an empty semi-trailer, injuring the two occupants.

12 Excessive Heat (Z). Excessive Heat results from a combination of high temperatures (well above normal) and high humidity. An Excessive Heat event occurs and is reported in *Storm Data* whenever heat index values meet or exceed locally/regionally established excessive heat warning thresholds. Fatalities (directly-related) or major impacts to human health that occur during excessive heat warning conditions are reported using this event category. If the event that occurred is considered significant, even though it affected a small area, it should be entered into *Storm Data*.

Fatalities or impacts to human health occurring when conditions meet locally/regionally defined heat advisory criteria are reported within the Heat event category (Refer to section 20 – Heat, for more details). If deaths are determined to be a result of the heat, but locally/regionally defined

heat warning or heat advisory criteria are not met, then the fatalities can only be mentioned in the narrative of another *Storm Data* event that occurred near the time of death.

In some heat waves, fatalities may occur for several days following the meteorological end of the event. The preparer should include these fatalities in the event, but encode the actual date of the directly-related fatalities in the fatality entry table.

Depending on the part of the country experiencing high temperatures, the heat effects are modulated by relative humidity, cloud cover, wind speeds, the duration of a hot spell, the time of the year, and other factors, including mortality rates and types of housing.

Beginning Time - When local/regional established warning thresholds for excessive heat were first met or when abnormally hot conditions began.

Ending Time - When local/regional established warning thresholds for excessive heat were no longer met or abnormally hot conditions ended.

Direct Fatalities/Injuries

- Fatality where heat-related illness or heat stress was the primary or major contributing factor as determined by a medical examiner or coroner.
- An elderly person suffered heat stroke and died inside a poorly ventilated apartment during a heat wave.
- A toddler was left inside a car while a parent went inside a grocery store on a hot day where ambient conditions met the local/regional definition of excessive heat. The windows were left rolled up, and the toddler died. Likewise, any person or group of persons who die as a result of being trapped inside a vehicle or other enclosure during excessive heat conditions would be labeled as direct fatalities.
- Cases in which people receive medical treatment for heat-hyperthermia (severe dehydration, sunstroke, heatstroke, etc.) and survive are considered injuries, not illnesses, for *Storm Data* purposes.

Indirect Fatalities/Injuries

- Fatality where excessive heat was the secondary or contributing factor.
- Excessive heat triggered widespread power outages, which in turn caused a person's respirator to turn off, and that person died.

Examples:

MIZ068> Monroe - Livingston - Oakland - Macomb - Washtenaw - Wayne - Lenawee - 070-075-076-082-083

02 1300EST 4 24 Excessive Heat
05 2000EST

Very hot and humid weather occurred over southeast Michigan over the Fourth of July weekend. High temperatures were in the mid to upper 90s across metro Detroit all 4 days, with Detroit City Airport reaching 100 degrees on July 4. The high of 97 degrees at Detroit Metropolitan Airport on July 5 set a new record for that date.

Heat indices were in the 105 to 115-degree range all four afternoons. Dozens of people were treated at area hospitals for heat-related illnesses over the weekend, and four elderly people died from heat stroke based on medical reports. Two of the fatalities occurred on July 4, one on July 5, and one person died on July 7 after being hospitalized for heat stroke for 2 days. The heat wave finally broke when a cold front moved through Lower Michigan late in the day on July 5. M89PH, F77PH, M95PH, F72PH

MOZ037 Jackson
10 1800CST 1 0 Excessive Heat
11 2000CST

The high temperature reached 105 degrees with a heat index of 115 on the afternoon of June 11. During the overnight hours of June 10th, the heat indices stayed above 85. The medical examiner reported an elderly woman died from heat stress. She was found dead in her apartment. F84PH

ILZ027>031- Knox – Stark – Peoria – Marshall – Woodford – Fulton – Tazewell –
036>038-040> Mclean – Schuyler – Mason – Logan – DeWitt – Piatt – Champaign -
057-061>063- Vermilion – Cass – Menard – Scott – Morgan – Sangamon – Christian -
066>068-071> Macon – Moultrie – Douglas – Coles – Edgar – Shelby – Cumberland -
073 Clark – Effingham – Jasper – Crawford – Clay – Richland – Lawrence
30 1100CST 0 0 Excessive Heat
31 2359CST

An extended period of excessive heat and humidity occurred across central and southeast Illinois from July 30th to August 2nd. Afternoon high temperatures ranged from 99 to 106 degrees most afternoons, with afternoon heat index values ranging from 110 to 120. Overnight lows only fell into the upper 70s. A 39-year-old male from Mapleton (Peoria County) suffered a heart attack and died in his mobile home. The excessive heat was a contributing factor, since the victim was taking a medication that prevented him from sweating (indirect fatality).

12.1 Heat Index Table.

HEAT INDEX VALUES
DEWPOINTS (F)

T(F)	35	40	45	50	55	60	65	70	75	80	85
75	76	77	77	78	78	79	78	77	75		
80	79	79	79	80	80	81	82	83	85	87	
85	82	82	82	83	84	85	87	90	93	99	107
90	86	86	86	87	88	90	92	96	100	107	117
95	90	91	91	92	93	95	97	101	107	115	126
100	95	95	96	97	98	101	104	108	114	121	132
105	99	100	101	102	104	106	109	114	120	129	140
110	104	104	105	107	109	112	115	120	126	134	145
115	107	108	110	112	114	117	121	126	133	141	152
120	111	112	113	116	118	122	125	132	138	146	156
125	114	115	117	120	123	127	130	136	142	151	163
130	116	117	119	123	125	130	134	141	149	156	168

HEAT INDEX VALUES
RELATIVE HUMIDITY (%)

T(F)	20	30	35	40	45	50	55	60	70	80	90
75	71	72	73	73	74	74	75	75	76	77	78
80	79	79	80	80	80	81	81	82	83	84	86
85	82	83	84	84	85	87	88	89	93	97	102
90	86	88	89	91	93	95	97	100	106	113	122
95	92	94	97	99	102	105	109	113	123	134	147
100	98	102	106	109	114	118	124	130	143	158	
105	104	112	116	122	127	134	141	149	166		
110	112	122	129	136	143	152	161	171			
115	121	135	143	152	162	173	184				
120	130	148	159	170	182	196					
125	140	163	176	190	205						
130	151	179	195	212							

Table A1. Heat Index Values Based on Relative Humidity or Dew Point.

13 Extreme Cold/Wind Chill (Z). A period of extremely low temperatures or wind chill temperatures reaching or exceeding locally/regionally defined warning criteria (typical value around -35°F or colder). If the event that occurred is considered significant, even though it affected a small area, it should be entered into *Storm Data*. Normally these conditions should cause significant human and/or economic impact. However, if fatalities occur with cold temperatures/wind chills but extreme cold/wind chill criteria are not met, the event should also be included in *Storm Data* as a Cold/Wind Chill event and the fatalities are direct.

Use this event only if a fatality/injury does not occur during a winter precipitation event.

Beginning Time - When extreme or abnormally cold temperatures or wind chill equivalent temperatures began.

Ending Time - When extreme or abnormally cold temperatures or wind chill equivalent temperatures ended.

Direct Fatalities/Injuries

- A fatality where hypothermia was ruled as the primary, or major contributing factor, as determined by a medical examiner or coroner. If other weather factors, such as freezing/frozen precipitation, disorient the person, trap the person, or cause the person to collapse, but the cause of the fatality was determined to be from exposure or hypothermia, the fatality may be entered under the event type Winter Storm, Winter Weather, etc. The *Storm Data* preparer exercises professional judgment and work with the local medical examiner or coroner.
- Elderly person wandered away from a nursing home, became disoriented, and died outdoors. Medical examiner ruled that the major cause of death was hypothermia.
- Cases in which people receive medical treatment for frostbite or cold-hypothermia can be considered an injury.
- A man dies from hypothermia after falling down a flight of stairs and becoming unconscious in his dark, unheated home.

Indirect Fatalities/Injuries

- After shoveling snow, a man collapsed in the driveway. The medical examiner determined the primary cause of fatality was heart attack.

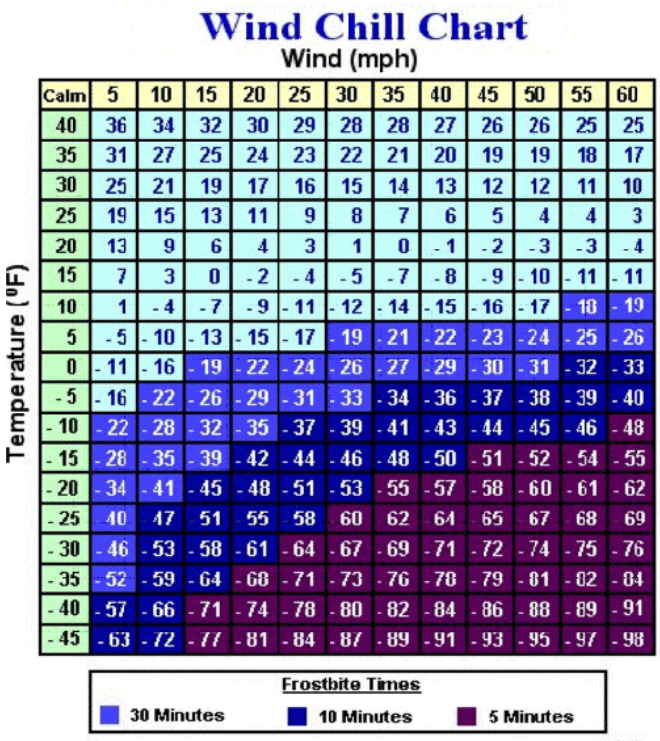
Examples:

WYZ054>058 North Campbell - South Campbell – Western Crook - Wyoming Black Hills - Weston
01 1200MST 4 0 500K 50K Extreme Cold/Wind Chill
03 1000MST
Temperatures fell to 35 below to 45 below zero (-45 in Gillette) on the 2nd. Four fishermen were found frozen at their campsite near Pine Haven at Keyhole State Park in Crook County. The medical examiner classified the fatalities as being due

to cold-hypothermia. The extreme cold caused water mains and pipes to freeze and burst in Gillette and Newcastle, resulting in water damage to homes and businesses. In addition, a couple of ranchers reported losses of livestock. M44OU, F42OU, F57OU, M59OU

NDZ050 McIntosh
15 1000CST 1 0 Extreme Cold/Wind Chill
15 2200CST
An 84-year-old Lehr man died of hypothermia when he went to visit the grave of his wife. The man was found 1 mile from his house. Temperatures that day were around 20 below and wind speeds of 17 to 22 knots (20-25 mph). Wind chills were estimated to be around 50 below. The man was not wearing a coat or gloves when he was found. M84OU

13.1 Wind Chill Table.



Calm	5	10	15	20	25	30	35	40	45	50	55	60
40	36	34	32	30	29	28	28	27	26	26	25	25
35	31	27	25	24	23	22	21	20	19	19	18	17
30	25	21	19	17	16	15	14	13	12	12	11	10
25	19	15	13	11	9	8	7	6	5	4	4	3
20	13	9	6	4	3	1	0	-1	-2	-3	-3	-4
15	7	3	0	-2	-4	-5	-7	-8	-9	-10	-11	-11
10	1	-4	-7	-9	-11	-12	-14	-15	-16	-17	-18	-19
5	-5	-10	-13	-15	-17	-19	-21	-22	-23	-24	-25	-26
0	-11	-16	-19	-22	-24	-26	-27	-29	-30	-31	-32	-33
-5	-16	-22	-26	-29	-31	-33	-34	-36	-37	-38	-39	-40
-10	-22	-28	-32	-35	-37	-39	-41	-43	-44	-45	-46	-48
-15	-28	-35	-39	-42	-44	-46	-48	-50	-51	-52	-54	-55
-20	-34	-41	-45	-48	-51	-53	-55	-57	-58	-60	-61	-62
-25	-40	-47	-51	-55	-58	-60	-62	-64	-65	-67	-68	-69
-30	-46	-53	-58	-61	-64	-67	-69	-71	-72	-74	-75	-76
-35	-52	-59	-64	-68	-71	-73	-76	-78	-79	-81	-82	-84
-40	-57	-66	-71	-74	-78	-80	-82	-84	-86	-88	-89	-91
-45	-63	-72	-77	-81	-84	-87	-89	-91	-93	-95	-97	-98

Table A2. Wind Chill Values Based on Temperature and Wind Speed.

14 Flash Flood (C). A life-threatening, rapid rise of water into a normally dry area beginning within minutes to multiple hours of the causative event (e.g., intense rainfall, dam failure, ice jam). Ongoing flooding can intensify to the shorter term flash flooding in cases where intense rainfall results in a rapid surge of rising flood waters. Flash flooding, such as dangerous small stream or urban flooding and dam or levee failures, requires immediate action to protect life and property. Conversely, flash flooding can transition into flooding as rapidly rising waters abate. The *Storm Data* preparer uses professional judgment in determining when the event is no longer characteristic of a Flash Flood and becomes a Flood.

Every Flash Flood event that occurred and meets the criteria defined in this directive will be logged in *Storm Data*, regardless of whether or not a flash flood warning was issued. The time entered into *Storm Data* for when flash flooding began will be determined by reports and/or observations from the flash flood-affected area and will not be influenced by the time a flash flood warning product was in effect.

14.1 Suggested Specific Guidelines. A Flash Flood event begins within minutes to multiple hours of the causative event such as moderate to heavy rain, dam break, or ice jam release. Criteria for determining if an event was a Flash Flood includes, but is not limited to:

- A river or stream rose rapidly and flowed out of its banks in a matter of a few hours, was a threat to life or property, and urgent response was necessary.
- Person or vehicle was swept away by flowing water from runoff that inundates land adjacent to a channel of any size.
- A maintained county or state road is closed by high water.
- Six inches or more of swiftly moving water flowed over a road or bridge, posing a threat to life or property.
- Dam break or ice jam release caused a dangerous out-of-bank stream flow or inundated normally dry areas, creating a hazard to life or property.
- Any amount of water in contact, flowing into or causing damage of an above ground residence or public building and is runoff from adjacent grounds.
- Three feet or more of ponded water that poses a threat to life or property (A 1988 United States Bureau of Reclamation (USBR) study indicated 3 feet or more as a danger to people and vehicles).
- Flash Floods containing debris (mud, rock, vegetation) should only be classified as Debris Flows if they meet the criteria outlined in Section 2.5 of NWS Manual (NWSM) 10-950.

The following can be used as signals to search further for evidence of a Flash Flood, but do not by themselves indicate a Flash Flood has occurred.

- Damage to any maintained road.
- Flood waters entering a structure (i.e., basement flooding).

Additional information should be gathered (i.e., actual reports of flooding in the area which meet local Flash Flood criteria) to justify the entry of a Flash Flood event.

14.2 Questions to Ask Observers, Emergency Managers, etc. Questions should be posed in such a way as to determine whether or not a flooding episode was truly a Flash Flood event. Example questions are given below.

The following are worded for follow-up verification, but could be re-worded to aid in the determination of a Flash Flood event:

- Was the river/stream flowing out of its banks and a danger to life or property? Was there around 6 inches or more of water flowing over the ground/bridge/road? Do you know about what time this began?
- Were any roads or bridges closed? Do you know about what time they were first closed?
- Was water rapidly flowing over the road or land surface (i.e., yard, field, etc.)?
- Can you estimate the maximum depth of the moving water? (May ask to compare to car tires. Six inches may qualify as an event.)
- Can you estimate the depth of ponded or standing water? (Three feet of ponded water may qualify as an event.)
- Did water enter any house or building? If so, was flooding the result of sewer backup or sump pump failure? (If yes to the second question, this does not qualify as an event.)
- Were there any evacuations due to flood waters?
- Can you estimate the beginning and ending time of the flood that created impacts?
- If you were not present at the time of flooding, can you determine high-water marks on trees, buildings, or other objects?

14.3 Low-impact Flooding vs. Threat to Life or Property. To maintain the most reliable data set it is important to separate low-impact flooding from flash flooding. Low-impact flooding should not be considered a Flash Flood event; rather it should be considered a Flood event. Low-impact flooding does not pose a significant threat to life or property in the same way a Flash Flood does. The following events should be considered as Flood events, not Flash Flood:

- Minor flooding in urban areas and bottom lands of small streams/creeks (conditions that do not pose a threat to life or property).
- Minor ponding of water during or after a heavy rain event or flood (deep ponding of water may pose a threat to life and property).
- High stream levels due to steady or slowly rising/receding creeks/streams that do not pose a threat to life or property.

Beginning Time - When flood waters became an immediate threat to life or property. Flash Flooding occurs in all environments. The distinction between Flash Flood and Flood events is that a Flash Flood event exhibits a rapid onset of adverse impacts to lives and property. The following are examples of potential flash flood onset time.

- A maintained county or state road is first closed by high water.
- Approximate time when 6 inches or more of flowing water is observed over a road or bridge.
- The point at which any amount of water comes in contact, flowing into, or causes damage to an above ground residence or public building and is the runoff from adjacent grounds.
- The time when 3 feet or more of water has ponded and poses a threat to life and property.

Ending Time - When flood waters receded to a point where there was no longer an immediate threat to life or property. The event may then be continued as a Flood event.

Cause of Flash Flood Event - *Storm Data* software requires that an entry be made for the cause of the Flash Flood event (e.g., heavy rain). This cause will not appear in *the Storm Data* publication.

Direct Fatalities/Injuries
When determining whether a fatality is directly related to a Flash Flood event, the *Storm Data* preparer should ask two basic questions.

- Was flash flooding ongoing at the time of death?
- Was the cause of death drowning, or death by impact related to the Flash Flood (i.e., large debris in flood waters) event?

If the answer to both questions is yes, the fatality is directly flash flood related. Figure 1 in section 15.1 can be used to help determine whether a fatality or injury is direct or indirect.

The following are examples of direct flash flood fatalities.

- An individual or individuals, regardless of extenuating circumstances, purposely entered a flooded waterway or inundated area and drowned.
- A person drowned in a flash flood or was struck by an object in flash flood waters.
- A motorist drowned in an overturned car after driving down a hill onto a flooded stretch of highway that had flood waters 4 feet deep. (It doesn't matter how irresponsible the driver was.).
- A recreational boater (kayak, raft, motorboat) drowns in flood waters.
- Several campers drowned when a thunderstorm 10 miles away in an adjacent county/parish sent a flash flood wave down an arroyo where they camped.
- Debris caught in flood waters struck and injured a person walking along a flooding river.
- Drowning or injuries due to flooding caused by a dam break.

Note: Direct fatalities which are vehicle-related will be coded as VE (Vehicle and/or Towed Trailer). In addition, if a person drives into a flooded area, exits his/her vehicle and drowns, the fatality will still be coded as VE.

The *Storm Data* preparer should work with the WFO Hydrology Program Manager to make case-by-case determinations on potential flood related fatalities. These determinations are often subjective, and can only be made by the professional assessment of the WFO team. When additional guidance is needed, WFO staff are encouraged to contact the National Hydrologic Information Coordinator at NWS Headquarters, or their Regional Hydrology Program Manager.

The *Storm Data* preparer cannot be influenced by factors which brought the victim to the flood waters, such as impairment by alcohol or drugs, or poor decision making of any sort. Those factors are extraneous to the hydrometeorological assessment of flooding, which only the local team is certified to make.

In some cases, it is not clear whether the victim died from drowning or another mechanism. For example, a vehicle accident caused impact which may have killed the victim upon contact. Flooding was ongoing at the time, but there is doubt as to whether the victim drowned or died by impact. In these cases, the *Storm Data* preparer will abstain from making a storm data entry, until law enforcement officials verify the official cause of death.

Indirect Fatalities/Indirect Injuries

- Vehicular accidents and incidents that the flash flood contributed to but did not directly cause.
- Children playing in debris or workers cleaning up debris left by a flash flood. Debris shifted and child or worker was struck, pinned, or crushed by debris.
- A flash flood loosened rocks on a mountainside. After the water receded, a rock climber fell to his death after grabbing onto one of the loosened rocks for a handhold.
- A remote mountain pass road was undermined in a flash flood by a nearby creek. After the water receded, a vehicle drove into the hole in the road, killing the passenger and injuring the driver.

Examples:

Milwaukee County
Wauwatosa to 06 1000CST 2 0 2.5M Flash Flood
Milwaukee 07 0000CST

Thunderstorms dumped rainfall amounts of 8 to 12 inches between 0700CST and 1900CST on July 6 in a 7-mile-wide band from the city of Waukesha (Waukesha Co.) east to downtown Milwaukee (Milwaukee Co.). Flash flooding killed two people who drowned when their car was swept away by flood waters at the intersection of I-94 and I-43. Widespread flood damage occurred to 2,000 homes and 500 businesses. The maximum rainfall total in Milwaukee County was 11.25 inches, which was measured at the downtown Public Safety Building. M25VE, F24VE

Jo Daviess County
East Dubuque 27 0300CST 2 0 2.5M Flash Flood
Elizabeth 28 1800 CST

Torrential rains of 7 to 15 inches caused some flash flooding across Jo Daviess County during the evening of July 27 and morning of July 28. Numerous streets were reported flooded in East Dubuque causing sink holes to form as well as buckling of the road rendering them impassable. A 70-year-old woman died in the flood waters after being thrown from a vehicle overcome by flood waters

while traveling along Long Hollow Road near Elizabeth, IL. A 75-year-old man died in his car which was swept away in flood waters near Galena, IL. F70VE, M75VE

Herkimer County
Dolgeville 28 0930EST 0 0 4K Flash Flood
1S Dolgeville 1500EST
An ice jam developed during the morning of February 28 along East Canada Creek at the State Highway 29 bridge in the village of Dolgeville. The water rapidly backed up, flooding the cellars of nearby buildings. The ice jam broke up in the late afternoon without any further flooding downstream.

Cannon County
Woodbury 07 0830CST 0 0 100K Flash Flood
2E Woodbury 1300CST
A dam broke and the resultant flash flood damaged a dozen homes downstream.

Note: This example would apply to levees, retaining walls, and other structures.

14.4 Examples of a Flash Flood that Evolved into a Flood.

Kern County
3E Frazier Pk 10 1900PST 0 0 1.0M Flash Flood
4W Frazier Pk11 0100PST
A powerful storm dropped 3 to 4 inches of rain over portions of Kern County during the afternoon of the 10th. The heavy rains caused flash flooding on several creeks. Frazier Mountain Road, between I-5 and Lockwood Valley Road, was washed out in several spots by overflowing creeks.

Kern County
3E Frazier Pk 11 0100PST 0 0 Flood
4W Frazier Pk11 1000PST
A powerful storm dropped 3 to 4 inches of rain over portions of Kern County during the afternoon of the 10th. The heavy rains caused flash flooding of several creeks. Frazier Mountain Road, between I-5 and Lockwood Valley Road, was washed out in several locations. Additional 1 to 2 inches of rain caused creeks to remain flooded and roads remained closed through the night. Flood waters subsided by late morning on the 11th.

15 Flood (C). Any high flow, overflow, or inundation by water which causes damage. In general, this would mean the inundation of a normally dry area caused by an increased water level in an established watercourse, or ponding of water, that poses a threat to life or property. If the event is considered significant, it should be entered into *Storm Data,* even if it only affected a small area. Refer to the Flash Flood event (section 14) for guidelines for differentiating between Flood and Flash Flood events.

Urban and small stream flooding commonly occurs in poorly drained or low lying areas. These are types of areal flooding and are to be recorded as Flood events, not Heavy Rain.

River flooding may be included as a Flood event. However, such entries should be confined to the effects of the river flooding, such as roads and bridges washed out, homes and businesses damaged, and the dollar estimates of such damage. The Water Resources Services Branch at National Weather Service Headquarters will maintain the official records of river stages, flood stages, and crests. Therefore, river stages need not be included in *Storm Data*.

Note: Direct fatalities which are vehicle-related will be coded as VE. In addition, if a person drives into a flooded area, exits his/her vehicle and drowns, the fatality will be coded as VE (Vehicle and/or Towed Trailer), not IW (In Water).

15.1 Distinguishing Between Types of Flooding. There are times when fatalities or large scale damages occur during flood events that do not meet the Flash Flood event criteria outlined in section 14, and are not larger scale areal floods. These events will be entered in *Storm Data* as Flood events. Heavy Rain, will no longer be acceptable as a means to enter a low-impact or isolated flood event.

When deciding how to categorize an event, the *Storm Data* preparer will only consider flood impacts, not the type of watch, warning or advisory product used before the event, nor infrastructural components which compounded the flood (e.g., urban effects or poor drainage).

Beginning Time - When flood waters began to threaten life or property. In some cases, this might have been when water leaves the banks of a river, and in others it might have been after the water level was 2 to 3 feet above the river banks. Professional judgment should be used by the *Storm Data* preparer.

Ending Time - When flood waters receded to a point where there was no longer any threat to life or property. Keep in mind that flooding may continue to threaten life or property many days after the rain ends.

Cause of Flood Event - *Storm Data* software requires that an entry be made for the cause of the Flood event (e.g., heavy rain). This cause will not appear in *the Storm Data* publication.

Direct Fatalities/Injuries
When determining whether a fatality is directly related to a Flood event, the *Storm Data* preparer should ask two basic questions.

- Was flooding ongoing at the time of death?
- Was the cause of death drowning, or death by impact related to the Flood (i.e., large debris in flood waters)?

If the answer to both questions is yes, the fatality is directly flood-related. Figure A1 can be used to help determine whether a fatality or injury is direct or indirect.

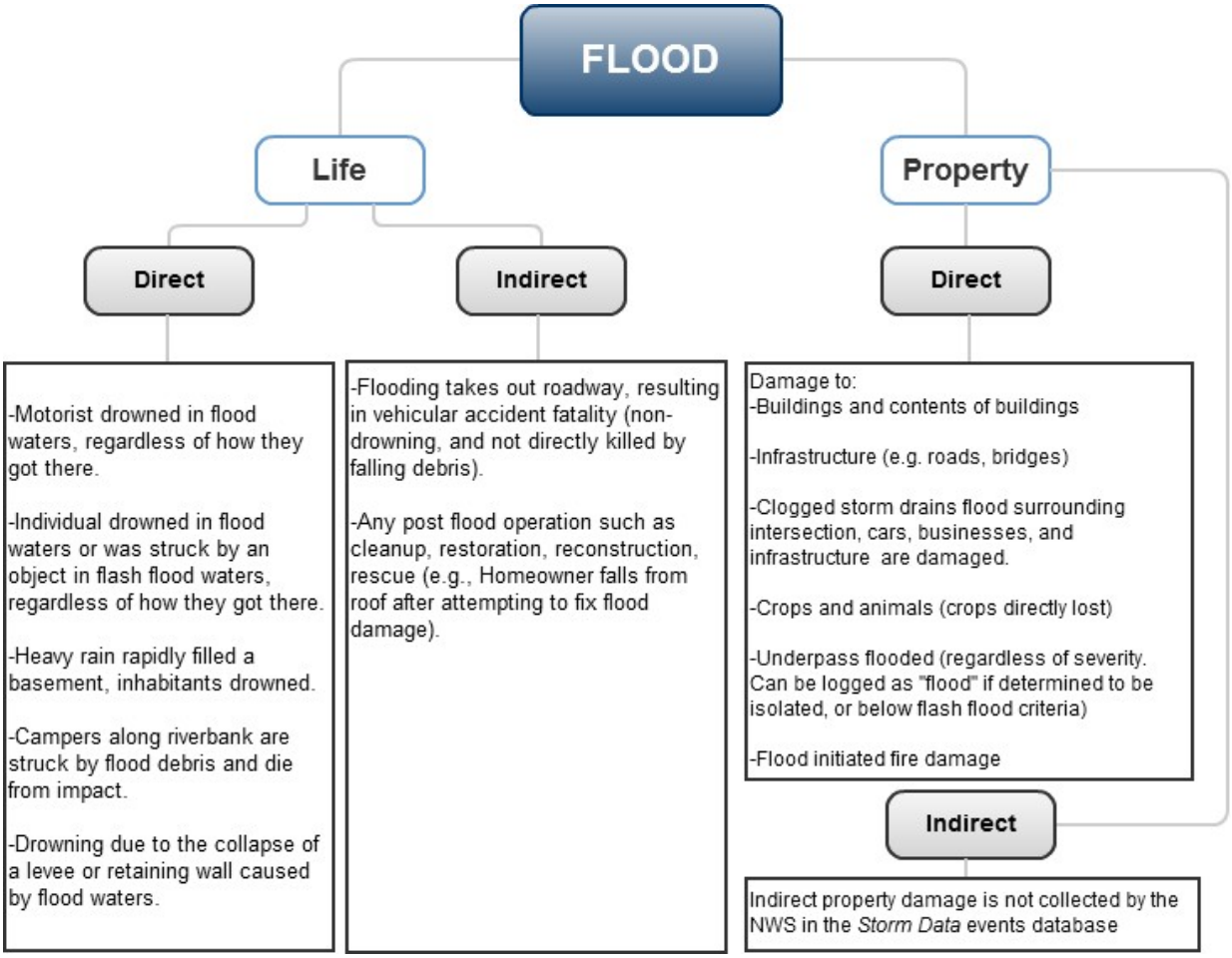


Figure A1. A decision tree to use when figuring out whether loss of life or property damage is direct or indirect.

The following are examples of direct flood fatalities.

- An individual or individuals, regardless of extenuating circumstances, purposely entered a flooded waterway or inundated area and drowned.
- A person drowned in a flood or was struck by an object in flood waters.
- A motorist drowned in an overturned car after driving down a hill onto a flooded stretch of highway that had flood waters 4 feet deep. (It doesn't matter how irresponsible the driver was.).
- Two people were rafting down a flooded street hanging onto inner tubes. Water turbulence flipped them over, causing them to hit their heads on a curb, and both drowned.
- A recreational boater (kayak, raft, motorboat) drowns in flood waters.
- Debris caught in flood waters struck and injured a person walking along a flooding river.
- Drowning or injuries due to flooding caused by a dam break.

Note: Direct fatalities, which are vehicle-related, will be coded as VE (Vehicle and/or Towed Trailer). In addition, if a person drives into a flooded area, exits his/her vehicle and drowns, the fatality will still be coded as VE.

The *Storm Data* preparer should work with the WFO Hydrology Program Manager to make case-by-case determinations of potential flood-related fatalities. These determinations are often subjective and can only be made by the professional assessment of the WFO team. When additional guidance is needed, WFO staff are encouraged to contact the National Hydrologic Information Coordinator at NWS Headquarters, or the Regional Hydrology Program Manager.

The *Storm Data* preparer should not be influenced by factors that brought the victim to the flood waters, such as impairment by alcohol or drugs, or poor decision making of any sort. Those factors are extraneous to the hydrometeorological assessment of flooding, which only the local team is certified to make.

In some cases, it is not clear whether the victim died from drowning or another mechanism. For example, a vehicle accident caused the impact, which may have killed the victim upon contact. Flooding was ongoing at the time, but there is doubt as to whether the victim drowned or died by impact. In these cases, the *Storm Data* preparer will abstain from making a storm data entry until law enforcement officials verify the official cause of death.

Indirect Fatalities/Injuries

- Vehicular accidents to which the flood contributed but did not directly cause.
- A person suffered a heart attack participating in sandbagging operations.

Example:

Providence County

2N S. Foster	**17**	**0200EST**	**0**	**2**	**3.5M**	**5.7M**	**Flood**
2SE S. Foster	**18**	**1500EST**					

Widespread low-land flooding occurred in northwest Providence County, resulting in considerable flood damage to 1,500 homes, 400 businesses, and 200 agricultural farms. Two men near South Foster were injured by floating debris in the Ponaganset River when they rescued a dog. The flood was initiated by rainfall amounts of 4 to 5 inches (on top of wet ground) that fell between 1800EST on the 16th and 1800EST on the 17th.

16 Freezing Fog (Z). Fog which freezes on contact with exposed objects and forms a coating of rime and/or glaze, resulting in an impact on transportation, commerce, or individuals. Even small accumulations of ice can have an impact. Freezing fog can occur with any visibility of six (6) miles or less. If the event that occurred is considered significant, even though it affected a small area, it should be entered into *Storm Data*.

Beginning Time - When freezing fog began.

Ending Time – When freezing fog ended.

Direct Fatalities/Injuries – None.

Indirect Fatalities/Injuries
- Fatalities and injuries resulting from vehicle accidents caused by freezing fog.
- Fatalities and injuries resulting from slippery surfaces (e.g., sidewalks, porch steps) caused by freezing fog.

Example:

ARZ044 Pulaski
14 0400CST 0 0 Freezing Fog
1100CST
Freezing fog occurred in areas near the Arkansas River, reducing visibility to below ½ mile. The fog resulted in a number of multiple-vehicle accidents during the morning rush hour. The majority of these accidents occurred on elevated sections of Interstate 440, on the river bridges of Interstates 30 and 430, and on the Levy Bridge on Interstate 40. Altogether, the accidents caused five injuries (indirect injuries).

17 Frost/Freeze (Z). A surface air temperature of 32 degrees Fahrenheit (°F) or lower, or the formation of ice crystals on the ground or other surfaces, for a period of time long enough to cause human or economic impact, during the locally defined growing season. If the event that occurred is considered significant, even though it affected a small area, it should be entered into *Storm Data*.

Beginning Time - When the temperature first fell below freezing or frost began to form.

Ending Time - When the temperature rose above freezing or frost melted.

Direct Fatalities/Injuries
- None. This *Storm Data* event type applies to agricultural losses. Any fatality in which the medical examiner or coroner determined that the primary cause was hypothermia should be entered under the event type Extreme Cold/Wind Chill, or the Cold/Wind Chill event.

Indirect Fatalities/Injuries
- Any traffic fatalities/injuries due to ice formation on roads or bridges.
- Any pedestrian –fatalities/injuries due to icy walkways.

Examples:

FLZ039-042 Levy - Citrus – Hernando
-048 18 0500EST 0 0 50K Frost/Freeze

18 0800EST
Freezing temperatures between 30 and 32 degrees occurred. The average duration was around 1 hour, with up to 3 hours in isolated locations. Some crop damage was noted in Levy County.

GAZ028-029 Hart – Elbert
06 0500EST 0 0 Frost/Freeze
06 0800EST
Near-record low temperatures in the lower to mid-30s with clear skies and light winds resulted in widespread frost. No crop damage was reported, but frost formation on roads and bridges resulted in several traffic accidents, including one indirect fatality on Highway 72, at the Broad River Bridge.

18 Funnel Cloud (C). A rotating, visible extension of a cloud pendant from a convective cloud with circulation not reaching the ground. The funnel cloud should be large, noteworthy, or create strong public or media interest to be entered.

Beginning Time - When the funnel cloud was first observed.

Ending Time - When the funnel cloud was no longer visible.

Direct Fatalities/Injuries
- A fatality or injury directly caused by the circulating winds of a funnel cloud. Note that by definition, a funnel cloud fatality cannot occur on the ground, so fatalities or injuries can only be associated with aviation mishaps. (Rare)

Indirect Fatalities/Injuries
- All fatalities/injuries that resulted from distress brought on by the sight of the funnel cloud or by any telecommunication to those individuals of the possibility of funnel clouds.

Examples:

Tolland County
Gilead 10 1800EST 0 0 Funnel Cloud
1805EST
A funnel cloud was observed by local law enforcement officials, and Amateur Radio operators. It extended about halfway from the cloud base to the ground as it passed over town.

Power County
13 E American Falls 30 1300MST 0 1 150K Funnel Cloud
1302MST
A small airplane flew into a funnel cloud west of Pocatello; and based on reports from highway motorists, the pilot lost control. The pilot crash-landed at

the Pocatello Municipal Airport, and was injured. The plane was a total loss, based on the insurance claim.

Deuel County

3 S Chappell	**21**	**1612MST** **1620MST**	**0**	**0**			**Funnel Cloud**

A funnel cloud was observed overhead at a location about 3 miles south of Chappell, and persisted for 8 minutes. The funnel was observed by numerous citizens in Chappell and motorists, who stopped along Interstate 80.

19 Hail (C). Frozen precipitation in the form of balls or irregular lumps of ice. Although the minimum size of hail qualifying as "severe" is 1 inch diameter, all reports of hail that is 3/4 of an inch or larger in diameter will be entered. Observed hail accumulations of smaller sizes, or instances where hail accumulates to a measurable depth (e.g., "around 3 inches deep") that cause property and/or crop damage, should be entered. Injuries or fatalities that result from hail of any size should be entered. Maximum hail size will be encoded for all hail reports entered.

The *Storm Data* software permits only one event name for encoding severe and non-severe hail events, and allows the preparer to enter any hail size in hundredths of an inch. Therefore, the preparer is not restricted to only those sizes that appear in Table A3 of section 19.1. Encoded values of estimated or measured hail diameters below one inch (non-severe), regardless of extent and/or severity of fatalities, injuries, and damage, will not be used in the verification process.

Beginning Time - When hail first occurred.

Ending Time - When hail ended.

Direct Fatalities/Injuries

- Baseball-size hail struck a person on the head, causing a fatality/injury.
- A fatality/injury directly caused by wind-driven hail, where both the hail size and winds were below severe criteria. This would be an extremely rare event.

Indirect Fatalities/Injuries

- Hail covered the road. A vehicle lost control on the slippery road and crashed into a tree, killing or injuring the driver.
- Hail falls with sufficient intensity to restrict visibility, causing a driver to lose control of a vehicle. The vehicle rolls over or hits an object, resulting in a fatality/injury.

Examples:

Medina County

Brunswick	**20**	**1730EST** **1735EST**	**1**	**3**	**1.3M**	**50K**	**Hail (4.00)**

A prolific hailstorm sat over Brunswick, Ohio, for 5 minutes, resulting in a fatality, injuries, and considerable property damage. A 10-year old boy died on

a ball field due to head injuries sustained in a barrage of 4-inch diameter hail. Three other boys suffered head injuries. The large hail damaged at least 500 vehicles, and 700 homes reported broken windows or awnings. M10BF

King County
Guthrie 02 2240CST 0 0 500K Hail (0.50)
2245CST

Hail up to ½ inch in diameter accumulated to several inches. The hail completely flattened and shredded young corn crops at several farms near Guthrie. Insurance company officials declared the corn crop a total loss.

19.1 Hail Conversion Table. Spotters should be encouraged to measure instead of estimate hail size whenever it is safe to do so. To assist in the task of converting spotter hail reports to actual hail diameter, a recommended guideline follows in Table A3. The comparisons may not be accurate, but may be used for estimates. Exercise care since apples, softballs, and grapefruit come in different sizes. For example, softballs range in size from 3.50 inches to 5.09 inches. Additionally, dime-size hail was the coin type associated with 0.75-inch diameter hailstones for many years. However, the diameter of a dime is 11/16 inch, slightly smaller than a penny, which is 12/16 inch (0.75 inch). Also, for many years, marble-size hail was associated with hailstones ½ inch in diameter. However, marbles come in different sizes. Therefore, use of the term "marble-size" or "dime-size" hail is not recommended.

Pea	0.25 - .375 inch	Lime	2.00 inches
Small marble	0.50 inch	Tennis Ball	2.50 inches
Penny	0.75 inch	Baseball	2.75 inches
Nickel	0.88 inch	Large Apple	3.00 inches
Quarter	1.00 inch (15/16")	Softball	4.00 inches
Half dollar	1.25 inch	Grapefruit	4.50 inches
Walnut/Ping Pong	1.50 inch	Computer CD/DVD	4.75 - 5.00 inches
Golf ball	1.75 inch		

Table A3. Hail Conversion Table.

20 Heat (Z). A period of heat resulting from the combination of high temperatures (above normal) and relative humidity. A Heat event occurs and is reported in *Storm Data* whenever heat index values meet or exceed locally/regionally established advisory thresholds. Fatalities or major impacts on human health occurring when ambient weather conditions meet heat advisory criteria are reported using the Heat event. If the ambient weather conditions are below heat advisory criteria, a Heat event entry is permissible only if a directly-related fatality occurred due to unseasonably warm weather, and not man-made environments.

Depending on the part of the country experiencing high temperatures, the heat effects are modulated by relative humidity, cloud cover, wind speeds, the duration of a hot spell, the time of the year, and other factors, including mortality rates and types of housing.

In some heat waves, fatalities occur in the few days following the meteorological end of the event. The preparer should include these fatalities in the Heat event, but encode the actual date of the directly-related fatalities in the fatality entry table.

Beginning Time - When local/regional established advisory thresholds for heat were first met or when unseasonably or abnormally hot conditions began.

Ending Time - When local/regional established advisory thresholds for heat were no longer met or unseasonably or abnormally hot conditions ended.

Direct Fatalities/Injuries

- Fatality where heat-related illness or heat stress was the primary or major contributing factor as determined by a medical examiner or coroner.
- An elderly person suffered heat stroke and died inside a stuffy apartment during a heat wave.
- Cases in which people receive medical treatment for heat-hyperthermia (severe dehydration, sunstroke, heatstroke, etc.) are considered injuries, not illnesses, for *Storm Data* purposes.
- Situations in which a person dies (primary cause was heat) in an unseasonably warm period in April in the Great Lakes region with maximum temperatures around 90 and surface dew-points in the upper 60s.

Indirect Fatalities/Injuries

- Fatality where heat was the secondary or contributing factor.
- Heat triggered a power outage, which in turn caused a person's respirator to turn off, and that person died.

Example:

MOZ064 St. Louis
02 1300CST 1 0 Heat
05 2000CST
Unseasonably hot and humid weather settled over Missouri during the first five days of June. On June 3rd, record-setting maximum air temperatures of 95 to 100 degrees combined with dew points of 70-75 resulted in heat index values of 105 to 110. As a result, 1 person in St. Louis died from the effects of this heat. F90PH

21 Heavy Rain (C). Unusually large amount of rain which does not cause a Flash Flood or Flood event, but causes damage, e.g., roof collapse or other human/economic impact. Heavy Rain will no longer be acceptable as a means to record low-impact or isolated flood events.

Urban and small stream flooding commonly occurs in poorly drained or low lying areas. These are types of areal flooding and are to be recorded as Flood events, not Heavy Rain.

Beginning Time - When the heavy rain that led to damage began.

Ending Time - When the heavy rain diminished to the degree that it no longer posed a threat to life or property.

Direct Fatalities/Injuries

- A fatality or injury caused by debris from a structural collapse resulting from water loading.
- A fatality or injury caused by the collapse of a wooden deck due to the additional weight of heavy rain on a deep snow-cover on the deck.

Indirect Fatalities/Injuries

- All fatalities/injuries that resulted from vehicle accidents due to hydroplaning, or from sliding on slippery road surfaces, or from poor visibility.

Example:

Minnehaha County

Sioux Falls	**03**	**1100CST** **1200CST**	**2**	**7**	**300K**	**Heavy Rain**

A short-lived but intense thunderstorm dumped 2 inches of rain between 0930CST and 1130CST, resulting in the collapse of a roof of an old school building at noon. Two students were crushed by roof debris, and 7 others were injured. Apparently, the rain came down so hard that water loading on the roof led to the roof collapse. Minor street flooding occurred elsewhere in Sioux Falls, but in general the city's drainage system was up to the task. M8SC, M9SC

22 Heavy Snow (Z). Snow accumulation meeting or exceeding locally/regionally defined 12 and/or 24 hour warning criteria. This could mean values such as 4, 6, or 8 inches or more in 12 hours or less; or 6, 8, or 10 inches in 24 hours or less. If the event that occurred is considered significant, even if it affected a small area, it should be entered into *Storm Data*. In some heavy snow events, structural damage, due to the excessive weight of snow accumulations, may occur in the few days following the meteorological end of the event. The preparer should include this damage as part of the original event and give details in the narrative. Normally, strong winds or other precipitation types are not present in a Heavy Snow event. If they were, then the Winter Storm event should be used.

The *Storm Data* preparer should include in the narrative the times that heavy snow began to accumulate, met criteria, and accumulation ended.

Beginning Time - When snow was first observed to accumulate or inferred to accumulate from surrounding reports.

Criteria Time - When snow accumulations reach locally/regionally established warning threshold values, or as inferred by damage reports.

Ending Time - When snow was observed to stop accumulating or inferred to stop accumulating from surrounding reports.

Direct Fatalities/Injuries
- A fatality/injury from a mass of snow sliding off a roof or falling through a structure.
- A tree toppled from heavy snow and landed on someone, killing him/her.
- A person walking through deep snow, fell down, and died of exposure.

Indirect Fatalities/Injuries
- Any fatality from a vehicle accident related to deep snow on the roads or slippery roads.
- Any fatality related to shoveling or moving snow.

Examples:

IA013-014 Fayette – Clayton
25 0800CST 0 0 Heavy Snow
25 1800CST
Snow began to accumulate at 0800CST, and tapered off to flurries by 1800CST. A total of 6 to 8 inches of snow fell from Oelwein to Strawberry Point.

VTZ013-014 Bennington - Windham
11 1500EST 1 0 500K Heavy Snow
12 1800EST
Record-breaking heavy snow pounded the southern part of Vermont. Accumulations of 30 to 40 inches paralyzed the region. Travel and commerce came to a halt, and there were numerous reports of downed power lines and structural damage due to the weight of snow on roofs. Some roofs of businesses collapsed during the two days following the end of the heavy snow, since clean-up crews were unable to reach those buildings. One person died from exposure after he left his snow-covered vehicle and attempted to walk to a nearby residence during the height of the storm. Accumulating snow and lower visibilities began at 1500EST on the 11th, and accumulation rates increased to 2 to 3 inches per hour through the overnight and morning hours. M70OU

23 High Surf (Z). Large waves breaking on or near shore, resulting from swell spawned by a distant storm or from strong onshore winds, causing a fatality, injury or damage. In addition, if accompanied by anomalous astronomical high tides, high surf may produce beach erosion and possible damage to beachfront structures. High surf conditions are often accompanied by rip currents and near-shore breaks. Occasionally, high surf conditions can sweep people off rocks along the shore causing them to drown. If this occurs, include the fatality in the High Surf event

type category. The *Storm Data* preparer exercises professional judgment to determine whether the fatality or injury is a result of a High Surf event.

Dry or secondary drowning occurs when a victim is rescued from a surf zone hazard such as a High Surf event and their respiratory system retains water. The victim passes away later from problems caused by the water retained in the respiratory system. A fatality associated with dry drowning should be included in a High Surf event, as this was the initial cause of the rescue.

Beginning Time - When near-shore wave heights met locally developed criteria (usually 7 to 10 feet).

Ending Time - When near-shore waves subsided below locally developed criteria.

Direct Fatalities/Injuries

- A surfer ventured out into severe wave conditions and was injured or drowned.
- A man fishing off a pier was swept into the sea.
- A boat traversing an ocean inlet foundered on the rocks and the boaters drowned.

Indirect Fatalities/Injuries

- A swimmer, struggling to get out of the high surf, suffered a heart attack.

Examples:

CAZ042-043 Orange County Coast - San Diego County Coast
09 2000PST 0 2 2M High Surf
10 0600PST
High surf and swells battered beachfront buildings. Waves, which occasionally reached 15 to 20 feet, damaged 32 homes in San Clemente. A Solana Beach lifeguard was injured while rescuing a drowning teen who also suffered minor injuries.

VAZ098>100 Virginia Beach - Northampton - Accomack
15 1500EST 0 0 10M High Surf
16 1200EST
A strong northeast wind caused significant beach and property damage along the Atlantic coast from Virginia Beach, VA, to Accomack, VA. At least 100 vacation homes reported damage.

24 High Wind (Z). Sustained non-convective winds of 35 knots (40 mph) or greater lasting for 1 hour or longer, or gusts of 50 knots (58 mph) or greater for any duration (or otherwise locally/regionally defined). In some mountainous areas, the above numerical values are 43 knots (50 mph) and 65 knots (75 mph), respectively. If the event that occurred is considered significant, even though it affected a small area, it should be entered into *Storm Data*.

When high wind conditions are satisfied, a *Storm Data* event entry is required, and the preparer will indicate in the entry field whether the wind value represents a maximum sustained wind or

maximum wind gust. Depending on the choice, the software will place an S or G in front of the wind value that appears in the *Storm Data* publication. Additionally, the on-line *Storm Data* software program requires the preparer to indicate whether the wind gust value or sustained wind value is measured or estimated.

Note that damage alone does not automatically imply wind speeds of 35 knots (40 mph) or greater lasting for 1 hour or longer or gusts of 50 knots (58 mph) or greater. When estimating a wind speed value, the preparer should take into account the amount and degree of severity and condition of the damaged property (i.e., age, type of construction technique used, exposure, topography, soil moisture/ composition, and local wind funneling effects due to orientation/closeness of other objects). The resultant damage supports such a value. Refer to Table A7 in section 46.4 for guidelines on estimating wind speeds as well as the EF-Scale information available at http://www.spc.noaa.gov/efscale/.

The *Storm Data* preparer exercises professional judgment to determine the estimated maximum wind value based on observed structural or tree damage. For example, a single rotted tree that is blown over would not support an estimated wind gust of 50 knots (58 mph). On the other hand, numerous large trees, power lines, and road signs toppled by high wind gusts would support an estimated gust value of 50 knots (58 mph) or greater.

Events with winds less than High Wind criteria, resulting in fatalities, injuries, or significant property damage will be encoded as a Strong Wind event (refer to section 45).

The High Wind event name will not be used for severe local storms or winter storm events. These events should be included in the Thunderstorm Wind and Winter Storm categories, respectively.

On occasion, a convective line with no lightning, embedded within an area with a tight surface pressure gradient, will result in widespread wind gusts of 50 knots (58 mph) or higher. In these cases, the Thunderstorm Wind event will be used, rather than a High Wind event. However, widespread “wake-low,” gusty winds will be documented with the High Wind event or Strong Wind event.

Events over large inland lakes with no specific, assigned Marine Forecast Zone number that meet High Wind criteria will be entered as High Wind events, rather than Marine High Wind events.

Tropical cyclones can move well inland and create damaging high winds. In these situations, it may be difficult to determine the event type to use. Inland offices should use either tropical or wind event type based on the products issued during the event. The *Storm Data* event type would be Hurricane, Tropical Storm, or Tropical Depression if Hurricane Local Statements were issued during the event (or, in the case of a Tropical Depression, would have been issued). The event type would be Strong Wind or High Wind if a wind advisory or high wind warning were issued for a tropical cyclone or the remnants of a cyclone that moved into the area.

The preparer should note in the *Storm Data* software program whether the High Wind was a measured gust (MG), estimated gust (EG), measured sustained (MS), or estimated sustained

(ES). This software program automatically inserts a wind speed conversion line at the end of the event narrative that equates knots with miles per hour.

Beginning Time - When damage first occurred, or when sustained winds or gusts first equaled or exceeded locally/regionally established criteria for high wind.

Ending Time - When damage ended or sustained winds or gusts dropped below high wind criteria.

Direct Fatalities/Injuries

- Fatalities or injuries caused by being struck by falling debris associated with structural failure (including falling trees, utility poles, and power lines).
- Fatalities or injuries associated with vehicles that were blown over, or vehicles that were blown into a structure or other vehicle.
- Fatalities or injuries caused by people or vehicles that were struck by airborne objects.
- Drowning due to a boat being capsized by wind.

Indirect Fatalities/Injuries

- Fatalities or injuries when vehicles collided with stationary obstructions/debris placed in roadways by high wind.
- Any fatalities or injuries incurred during the clean-up process.
- Fatalities or injuries associated with contact with power lines after they fell.
- Any fatalities or injuries that loss of electrical power contributed to, including lack of heat, cooling, or light, or failure of medical equipment.

Examples:

MNZ088-095 Fillmore - Winona
30 0100CST 0 0 2.5K High Wind (EG56)
0900CST
Southwest winds gusting to an estimated 56 knots (65 mph) for about 8 hours blew down numerous trees and toppled dozens of signs in Spring Valley and Lewiston. A young girl in Spring Valley was killed when she touched a downed power-line (indirect fatality).
Note: The estimated wind gust of 56 knots is equivalent to 65 mph.

SDZ001-002- Butte - Harding – Nrn Meade Co Plains - Perkins
012-013 06 0900MST 0 0 High Wind (ES39)
1300MST
Sustained west winds reached 39 knots (45 mph) for several hours across northwest South Dakota behind a fast-moving cold front. No gusts of 50 knots (58 mph) or higher were reported.
Note: The estimated wind gust of 39 knots is equivalent to 45 mph.

25 Hurricane/Typhoon (Z). A tropical cyclone in which the maximum 1-minute sustained surface wind is 64 knots (74 mph) or greater. In the Atlantic Ocean or the North Pacific Ocean east of the International Date Line, this event would be labeled a Hurricane, and in the North Pacific Ocean west of the International Dateline, this event would be classified as a Typhoon.

Use the Tropical Storm event type if a hurricane produced sustained 34 knot to 63 knot winds in part of the CWA. This means you may need a Hurricane/Typhoon event type for some zones and a Tropical Storm event type for other zones, even though all of the events are from one tropical cyclone. Other times, you may need a Hurricane/Typhoon event type for your land zones and a Marine Hurricane/Typhoon event for your marine zones. A Tropical Storm event related to a hurricane will include a reference to the hurricane in the Tropical Storm narrative section, (e.g., "Hurricane Dennis produced tropical storm force winds in ...").

Storm Data preparers may reference the National Hurricane Center's (NHC's) Tropical Cyclone Reports (TCR) for information on the storm history, track and intensity of a storm. The landfall intensity/location may change from what was indicated in real-time during the event. They may coordinate with the NHC staff if there are additional questions.

Tropical cyclones can move well inland and create damaging winds. In these situations, it can be difficult to determine the event type to use. Inland offices should use either tropical or wind event type, based on the products issued during the event. The event type would be Hurricane, Tropical Storm, or Tropical Depression if Hurricane Local Statements were issued (or would have been issued in the case of a Tropical Depression). The event type would be strong/high wind if a wind advisory or warning were issued for a tropical cyclone or the remnants of a cyclone that moved into the area.

25.1 Separating the Various Hurricane/Typhoon Hazards. After a tropical cyclone event, offices will:

- Add an event for either Hurricane or Typhoon, summarizing the total impact in the narrative, but include only the wind related fatalities, injuries and damage in the header.
  - Wind damage is the only individual hazard to be encoded in Hurricane/Typhoon, Tropical Storm, and Tropical Depression. This restriction prevents a "double-count" from occurring in the national report entitled "*A Summary of Natural Hazard Statistics for [Year] in the United States*," which is based upon the header strips of *Storm Data* events.
  - Use tropical cyclone advisories as a guide when determining if wind was a result of the tropical cyclone or if it was caused by the pressure gradient between the storm and a high pressure system. This case is expected more in the Tropical Storm event type but could occur in the Hurricane/Typhoon event type.

- Include all other impacts as separate events (e.g., storm surge/tide, freshwater flooding, tornadoes, debris flow, rip currents, etc.).

- These separate event entries and their associated fatalities, injuries, and damage amounts are not included in the hurricane/typhoon header-strip. However, do include this information in the hurricane/typhoon narrative to ensure a complete synopsis.
- Flooding along the coast, even if it is from distant swells, will be entered as Storm Surge/Tide, not Coastal Flood. Rip Currents and High Surf can be entered in addition to Storm Surge/Tide, if applicable.
- The name of the tropical cyclone will be included in the narrative of all associated individual hazards/events.

25.2 Writing the Narrative for a Hurricane/Typhoon Event. In order to provide complete documentation of the tropical cyclone effects, the *Storm Data* preparer exercises professional judgement to do the following:

ϒ Summarize all tropical cyclone hazards for affected coastal and inland counties/parishes within a CWA (e.g., "The collective effects of Hurricane Alpha during the period of August 1-3 resulted in 10 fatalities, 50 injuries, $800M in property damage, and $200M in crop damage in the counties of X, Y, and Z"). This will ensure that all tropical cyclone effects are summarized in one sentence.

ϒ Break down the individual tropical cyclone hazards for affected coastal and inland counties/parishes within a CWA, each with a listing of fatalities, injuries, and damage amounts (e.g., "During the passage of Hurricane Alpha in X County; five tornadoes killed 3 people and resulted in $1.0M in property damage, flash floods injured 20 people and resulted in $175M in crop damage, rip currents resulted in 5 fatalities," etc.).

ϒ In addition, the following information will be included in the narrative for tropical cyclones at coastal locations:
- Tropical cyclone name;
- The point of landfall, even if not in the WFO's CWA;
- Storm surge/tide;
- Minimum surface pressure; and
- Saffir-Simpson Hurricane Wind Scale or Modified Saffir-Simpson Hurricane Wind Scale, upon landfall, as appropriate. (See NWSI 10-604, *Tropical Cyclone Definitions*, for definitions of the Saffir-Simpson Hurricane Wind Scale for the North Atlantic and North East Pacific basin; Saffir-Simpson Hurricane Wind Scale for the North Central Pacific basin; and Modified Saffir-Simpson Hurricane Wind Scale for the Western North Pacific basin).

ϒ The following information will be included for both coastal and inland locations when known:
- Maximum sustained wind speed and peak gusts;
- Rainfall totals; and
- Record-breaking data.

- In some situations (i.e., delayed fatalities and delayed damage), there may be tropical cyclone-related hazards, as mentioned above, occurring prior to or after the beginning/ending time of the tropical cyclone event. Professional judgment is exercised in determining if these related hazards are part of the tropical cyclone. Refer to sections 2.6.3 and 2.7.4 for the decision process.

Beginning Time - When the direct effects of the Hurricane/Typhoon event were first experienced. Use surface observations and storm information from the Tropical Cyclone Public Advisories (TCP products) as a guide.

Ending Time - When the direct effects of the Hurricane/Typhoon event were no longer experienced. Use storm information from the Tropical Cyclone Public Advisories (TCP products) as a guide.

Direct Fatalities/Injuries

- Fatalities/injuries caused by wind-driven debris or structural failure due to winds.
- The wind caused a house to collapse or blew a tree onto someone.

Indirect Fatalities/Injuries

- Fatalities or injuries when vehicles collided with stationary obstructions/debris placed in roadways by high wind.
- Any fatalities or injuries incurred during the clean-up process.
- Fatalities or injuries associated with contact with power lines after they fell.
- Any fatalities or injuries that loss of electrical power contributed to, including lack of heat, cooling, or light, or failure of medical equipment.
- Someone was killed in a vehicle accident caused by a hurricane-related missing traffic signal.

Examples:

FLZ018-021 Broward - Collier - Dade - Monroe
>023 24 0325EST 4 50 13B 750M Hurricane/Typhoon
0900EST

The eye of Hurricane Andrew moved ashore in south Dade County near Homestead with a minimum central pressure of 922 mb and maximum storm surge of 16.9 feet. Maximum sustained winds were estimated at 145 knots (165 mph) with gusts to at least 152 knots (175 mph). Andrew was a Category 5 storm on landfall and was the third strongest in U.S. history. In southeast Florida, the maximum rainfall was 7.79 inches in Broward County. The height of the storm tide (the sum of the storm surge and astronomical tide, referenced to mean sea level) ranged from 4 to 6 ft in northern Biscayne Bay increasing to a maximum value of 16.9 ft at the Burger King International Headquarters, located on the western shoreline in the center of the bay, and decreasing to 4 to 5 ft in southern Biscayne Bay. The observed storm tide values on the Florida southwest coast ranged from 4 to 5 ft near Flamingo to 6 to 7 ft near Goodland. In Broward,

Collier, Dade, and Monroe Counties, the winds killed 4 people (trees falling on moving vehicles). All of the associated effects of Andrew in southeast Florida resulted in 15 fatalities, 250 injuries, $25.0B in property damage, and around $1.0B in crop damage. Specifically in southeast Florida, Andrew's inland flood waters resulted in 5 fatalities, 100 injuries, $5B in property damage, and $250M in crop damage. The eight associated tornadoes resulted in 2 fatalities, 25 injuries, and $1B in property damage. The powerful winds resulted in 4 fatalities, 50 injuries, $13B in property damage, and $750M in crop damage. The storm tide along the coast resulted in 4 fatalities, 75 injuries, and $6M in property damage. Besides the 15 direct fatalities, at least 26 indirect fatalities occurred, during clean-up activities. M67VE, F12VE, M45VE, F46VE

GUZ001 Guam

15 1700ChST 0 1 254M Hurricane/Typhoon
16 1200ChST

Typhoon Paka entered the Marshall Islands as a tropical storm on December 10 became a typhoon on December 11 and crossed through the Marshall Islands until December 14, damaging structures and crops. Paka became a super typhoon on December 15 and passed 5 miles north of Guam. The lowest pressure observed on Guam was 948 mb and the highest sustained wind was measured at 100 knots (115 mph) with a gust to 152 knots (175 mph). On the Modified Saffir-Simpson Hurricane Wind Scale, this corresponds to a Category 3 typhoon based on the sustained-wind value but more accurately to a Category 4 typhoon based on the gust value. Maximum storm tide on Guam was about 30 feet (run-up/debris line) at Arunao Beach on the northwest coast, 16 feet (run-up/debris line) at the Commercial Port, 13 feet (run-up/debris line) on the north side of Tumon Bay (standing water measurement), and 8 feet (run-up/debris line) on Agana Bay. Maximum rainfall at WFO Guam was 20.75 inches from 16 December at 1600ChST to 17 December at 1600ChST. While Paka was on Guam, the typhoon winds resulted in 1 injury (debris hit a person on the head), and damaged numerous businesses and homes. Collectively, all of the effects of Typhoon Paka resulted in no fatalities, 2 people injured, and over $504M in property damage. Specifically, Paka's flood waters resulted in 1 injury, and $200M in property damage; associated winds resulted in 1 injury and over $254M in property damage. The storm tide resulted in $50M in property damage.

25.3 Tables for Determining Saffir-Simpson Hurricane Wind Scale and Modernized Saffir-Simpson Hurricane Wind Scale.

Category	Sustained Wind Speed	Types of Damage Due to Hurricane/Typhoon Winds

1	64-82 kts 74-95 mph 119-153 km/hr	Very dangerous winds will produce some damage: Well-constructed frame homes could have damage to roof, shingles, vinyl siding and gutters. Large branches of trees will snap, and shallowly rooted trees may be toppled. Extensive damage to power lines and poles will likely result in power outages that could last a few to several days.
2	83-95 kts 96-110 mph 154-177 km/hr	Extremely dangerous winds will cause extensive damage: Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.
3	96-112 kts 111-129 mph 178-208 km/hr	Devastating damage will occur: Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.
4	113-136 kts 130-156 mph 209-251 km/hr	Catastrophic damage will occur: Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
5	137 kts or higher 157 mph or higher 252 km/hr or higher	Catastrophic damage will occur: A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.

Table A4. Saffir-Simpson Hurricane Wind Scale for the North Atlantic and North East Pacific basins.

Tropical Storm Categories	Sustained Winds	Wind Gusts	Damage Level	Description of Damages
A Weak	26-43 kts 30-49 mph 48-79 km/hr	33-56 kts 40-64 mph 64-103 km/hr	Tiny	Damage done to only the flimsiest lean-to type structures. Unsecured light signs blown down. Minor damage to banana trees and near-coastal agriculture, primarily from salt spray. Some small dead limbs, ripe coconuts, and dead palm fronds blown down from trees. Some fragile and tender green leaves blown from trees such as papaya and fleshy broad leaf plants.
B Severe	44-63 kts 50-73 mph 80-118 km/hr	57-81 kts 65-94 mph 104-151 km/hr	Small	Minor damage to buildings of light material; major damage to huts made of thatch or loosely attached corrugated sheet metal or plywood. Unattached corrugated sheet metal and plywood may become airborne. Wooden signs not supported with guy wires are blown down. Moderate damage to banana trees, papaya trees, and most fleshy crops. Large dead limbs, ripe coconuts, many dead palm fronds, some green leaves, and small branches are blown from trees.
Typhoon Categories	**Sustained Winds**	**Wind Gusts**	**Damage Level**	**Description of Damages**
1 Minimal	64-82 kts 74-95 mph 119-153 km/hr	82-105 kts 95-120 mph 152-193 km/hr	Minimal	Corrugated metal and plywood stripped from poorly constructed or termite-infested structures and may become airborne. A few wooden, non-reinforced power poles tilted, and some rotten power poles broken and their attached lines down. Some damage to poorly constructed, loosely attached signs. Major damage to banana trees, papaya trees, and fleshy crops. Some young trees downed when the ground is saturated. Some palm fronds crimped and bent back through the crown of coconut palms; a few palm fronds torn from the crowns of most types of palm trees; many ripe coconuts blown from coconut palms. Less than 10 percent defoliation of shrubbery and trees; up to 10 percent defoliation of tangantangan. Some small tree limbs downed, especially from large bushy and frail trees such as mango, African tulip, poinciana, etc.
2 Moderate	83-95 kts 96-110 mph 154-177 km/hr	106-121 kts 121-139 mph 194-224 km/hr	Moderate	Several rotten wooden power poles snapped and many non-reinforced wooden power poles tilted. Some secondary power lines downed. Damage to wooden and tin roofs, and doors and windows of termite-infested or rotted wooden structures, but no major damage to well-constructed wooden, sheet metal, or concrete buildings. Considerable

				damage to structures made of light materials. Major damage to poorly constructed, attached signs. Exposed banana trees and papaya trees totally destroyed; 10-20 percent defoliation of trees and shrubbery; up to 30 percent defoliation of tangantangan. Light damage to sugar cane and bamboo. Many palm fronds crimped and bent through the crown of coconut palms and several green fronds ripped from palm trees. Some green coconuts blown from trees. Some trees blown down, especially shallow rooted ones such as small acacia, mango and breadfruit when the ground becomes saturated.
Typhoon Categories	**Sustained Winds**	**Wind Gusts**	**Damage Level**	**Description of Damages**
3 Strong	96-112 kts 111-129 mph 178-208 km/hr	122-142 kts 140-164 mph 225-264 km/hr	Extensive	A few non-reinforced hollow-spun concrete power poles broken or tilted and many non-reinforced wooden power poles broken or blown down; many secondary power lines downed. Practically all poorly constructed signs blown down and some stand-alone steel-framed signs bent over. Some roof, window, and door damage to well-built, wooden and metal residences and utility buildings. Extensive damage to wooden structures weakened by termite infestation, wet-and-dry wood rot, and corroded roof straps (hurricane clips). Non-reinforced cinder block walls blown down. Many mobile homes and buildings made of light materials destroyed. Some glass failure due to flying debris, but only minimal glass failure due to pressure forces associated with extreme gusts. Some unsecured construction cranes blown down. Air is full of light projectiles and debris. Major damage to shrubbery and trees; up to 50 percent of palm fronds bent or blown off; numerous ripe and many green coconuts blown off coconut palms; crowns blown off of a few palm trees. Moderate damage to sugar cane and bamboo. Some large trees (palm trees), blown down when the ground becomes saturated; 30-50 percent defoliation of most trees and shrubs; up to 70 percent defoliation of tangantangan. Some very exposed panax, tangantangan, and oleander bent over.
4 Very Strong	113-136 kts 130-156 mph 209-251 km/hr	143-173 kts 165-198 mph 265-319 km/hr	Extreme	Some reinforced hollow-spun concrete and many reinforced wooden power poles blown down; numerous secondary and a few primary power lines downed. Extensive damage to non-concrete roofs; complete failure of many roof structures, window frames and doors, especially

				unprotected, non-reinforced ones; many well-built wooden and metal structures severely damaged or destroyed. Considerable glass failures due to flying debris and explosive pressure forces created by extreme wind gusts. Weakly reinforced cinder block walls blown down. Complete disintegration of mobile homes and other structures of lighter materials. Most small and medium-sized steel-framed signs bent over or blown down. Some secured construction cranes and gantry cranes blown down. Some fuel storage tanks may rupture. Air is full of large projectiles and debris. Shrubs and trees 50-90 percent defoliated; up to 100 percent of tangantangan defoliated. Up to 75 percent of palm fronds bent, twisted, or blown off; many crowns stripped from palm trees. Numerous green and virtually all ripe coconuts blown from trees. Severe damage to sugar cane and bamboo. Many large trees blown down (palms, breadfruit, monkeypod, mango, acacia, and Australian pine.) Considerable bark and some pulp removed from trees; most standing trees are void of all but the largest branches (severely pruned), with remaining branches stubby in appearance; numerous trunks and branches are sandblasted. Patches of panax, tangantangan, and oleander bent over or flattened.

Typhoon Categories	Sustained Winds	Wind Gusts	Damage Level	Description of Damages
5 Devastating	137-170 kts 157-194 mph 252-312 km/hr	174-216 kts 199-246 mph 320-396 km/hr	Catastrophic	Severe damage to some solid concrete power poles, to numerous reinforced hollow-spun concrete power poles, to many steel towers, and to virtually all wooden poles; all secondary power lines and most primary power lines downed. Total failure of non-concrete reinforced roofs. Extensive or total destruction to non-concrete residences and industrial buildings. Some structural damage to concrete structures, especially from large debris, such as cars, large appliances, etc. Extensive glass failure due to impact of flying debris and explosive pressure forces during extreme gusts. Many well-constructed storm shutters ripped from structures. Some fuel storage tanks rupture. Nearly all construction cranes blown down. Air full of very large and heavy projectiles and debris. Shrubs and trees up to 100 percent defoliated; numerous large trees blown down. Up to 100 percent of palm fronds bent, twisted, or blown off; numerous crowns blown from palm trees; virtually all coconuts blown from trees. Most bark and considerable pulp removed from trees. Most standing trees are void of all but the largest branches, which are very stubby in appearance and severely sandblasted.

Table A5. Modified Saffir-Simpson Hurricane Wind Scale Table for the Western North Pacific Ocean.

26 Ice Storm (Z). Ice accretion meeting or exceeding locally/regionally defined warning criteria (typical value is 1/4 or 1/2 inch or more). If the event that occurred is considered significant, even though it affected a small area, it should be entered into *Storm Data*. The *Storm Data* preparer should include the times that ice accretion began, met criteria, and accretion ended. If the freezing rain was mixed with other precipitation types, then a Winter Storm event should be used.

The Ice Storm event is used for a fatality/injury resulting from hypothermia, due to power loss caused by an ice storm. Refer to section 2 for related details.

Beginning Time - When ice accretion first begins, or was inferred to begin, based on surrounding reports.

Criteria Time - When ice accretion equals locally/regionally established warning threshold values, or as inferred from damage reports.

Ending Time - When accretion ends, or was inferred to have ended, based on surrounding reports.

Direct Fatalities/Injuries

- A large chunk of ice falls off a structure resulting in death
- A large tree or other structure falls or collapses, due to ice load, resulting in death.
- Power is lost resulting in death caused from extreme cold.

Indirect Fatalities/Injuries

- All vehicle-related fatalities due to ice-covered roads and hazardous driving conditions.
- Someone suffers a heart attack and dies while removing or cleaning up downed trees or other structural debris.
- Any fatality/injury suffered by workers involved in post-storm recovery.

Example:

MEZ007>009-012 Northern Oxford - Northern Franklin - Central Somerset - Southern Oxford
06 0300EST 1 0 304M Ice Storm
08 1100EST
A severe ice storm hit sections of central and southern Maine where 1 to 3 inches of ice accreted on trees, power lines, and other exposed surfaces. Nearly everyone in the region experienced power loss. Due to the added weight of ice, an ice-covered tree limb broke and fell on a man who was walking underneath a tree. The man died from head injuries. M36OU

27 Lakeshore Flood (Z). Flooding of lakeshore areas due to the vertical rise of water above normal level caused by strong, persistent onshore wind and/or low atmospheric pressure, resulting in damage, erosion, flooding, fatalities, or injuries. Lakeshore areas are defined as those portions of land zones (coastal county/parish) adjacent to the waters of the Great Lakes and other lakes with specific assigned Marine Zones. Farther inland, the *Storm Data* preparer determines when and where to encode a flood event as Flash Flood or Flood. Terrain (elevation) features will determine how far inland the lakeshore flooding extends.

Note: Direct fatalities which are vehicle-related will be coded as VE. Thus, if a person drives into a flooded area, exits his/her vehicle and drowns, the fatality will be coded as VE (Vehicle and/or Towed Trailer), not IW (In Water).

Beginning Time - When the water level began to cause damage or flooding.

Ending Time - When the water level dropped to a point where damage or flooding ended.

Direct Fatalities/Injuries

- A lakeshore dwelling was washed away injuring/killing the occupants.
- A person drowned when a vehicle was swept away by the lakeshore flooding.

Indirect Fatalities/Injuries

- A person suffered a heart attack while evacuating from the lakeshore flooding.
- A person died in a vehicle accident caused by the lakeshore flooding, washing away a traffic signal.
- A person died in a vehicle accident after losing control in standing water on a road.

Example:

ILZ014 Cook
27 0600CST 0 0 250K Lakeshore Flood
1200CST
North to northeast winds of 26 to 39 knots (30 to 45 mph) affected southern Lake Michigan. The Department of Transportation estimated a storm tide of 2 feet and 10 to 15 foot waves along the Chicago lakefront. Lake Shore Drive was closed due to water and sand on the pavement. Damage occurred to a dozen piers.

28 Lake-Effect Snow (Z). Convective snow bands that occur in the lee of large bodies of water (e.g., the Great Lakes or the Great Salt Lake), when relatively cold air flows over warm water. In extreme cases, snowfall rates of several inches per hour and thunder and lightning may occur. Lake-effect snow accumulations meet or exceed locally defined 12 and/or 24 hour warning criteria (typical values of 6 to 8 inches within 12 hours or 8 to 10 inches within 24 hours). If the event is considered significant, even though it affected a small area, it should be entered into *Storm Data*.

In some lake-effect snow events, structural damage, due to the excessive weight of snow accumulations, may occur in the few days following the meteorological end of the event. The preparer should include this damage as part of the original event and give details in the narrative.

The *Storm Data* preparer should include in the narrative the times that snow began to accumulate, met criteria, and stopped accumulating.

Beginning Time - When snow was first observed to begin to accumulate or inferred to begin to accumulate from surrounding reports.

Criteria Time - When lake-effect snow accumulation reached locally/regionally established warning threshold values, or as inferred from damage reports.

Ending Time - When snow accumulations ended.

Direct Fatalities/Injuries

- A fatality/injury from a mass of snow sliding off a roof or falling through a structure.
- A tree toppled from heavy snow and landed on someone, killing him.
- A person walking through deep snow, fell down, and died of exposure.

Indirect Fatalities/Injuries

- Any fatality from a vehicle accident related to deep snow on the roads or slippery roads.
- Any fatality related to shoveling or moving snow.

Examples:

OHZ003- **Cuyahoga – Geauga – Ashtabula**
013-014 **16 0600EST** **0** **0** **Lake-Effect Snow**
17 1500EST

Lake-effect snow showers affected Northeast Ohio. This activity began during the predawn hours of the 16th with accumulations starting around 0600EST, and continued through midday on the 17th. The heaviest snow fell during the late afternoon and evening hours of the 16th when visibilities at times were near zero. Accumulations ranged from 6 to 8 inches in Geauga, southern Ashtabula and eastern Cuyahoga Counties. Dozens of accidents were reported.

PAZ002-003 **Southern Erie – Crawford**
19 0100EST **0** **0** **Lake-Effect Snow**
20 2000EST

Lake-effect snow showers developed early on the 19th. This activity persisted into the evening hours and then dissipated. Accumulations through late evening on the 19th ranged from 6 to 10 inches. Just after midnight on the 20th, an intense band of snow redeveloped over southern Erie and northern Crawford Counties. Thunder and lightning were observed with this band and snowfall rates exceeded three inches per hour at times. The band moved slowly west during the predawn hours. Accumulations from shortly after midnight to daybreak on the 20th ranged from 8 to 14 inches over much of southern Erie and northern Crawford Counties. The snow finally tapered off during the afternoon hours after several more inches of accumulation. Some locations saw over two feet of snow during this two day event. Travel was severely hampered by this storm and hundreds of accidents were reported.

29 Lightning (C). A sudden electrical discharge from a thunderstorm, resulting in a fatality, injury, and/or damage.

Fatalities and injuries directly related to lightning strikes will be included in *Storm Data*. Report the specific location (see Table 3 in section 2.6.1.2), gender and age of fatalities. If reliable estimates of lightning-related damages (such as costs associated with structural fires, equipment loss, and electrical power and/or communications outages) are available or can be made, they should be entered into *Storm Data* as well. Because of the difficulty in obtaining lightning-

related information, extra effort, such as fostering contacts with the media, fire departments or other first responders, hospitals and medical examiner offices, is recommended to help obtain such information.

The extent of lightning-related injuries is often difficult to determine. In many cases, the extent of an injury may not be known until days or weeks after the incident. As a general guideline, as with other injuries for *Storm Data*, anyone seeking or receiving medical attention following a lightning incident should be counted as a lightning injury. Anyone reporting numbness, a tingling sensation, a headache, or other pain following a lightning incident, whether or not they receive treatment, should be counted as an injury as well.

For lightning injuries, it is highly desirable to include in the event narrative, the age, gender, location, and weather conditions at the time of occurrence, if known or determinable. The age, gender, and location information is used in compiling lightning statistics used in the national report entitled *Summary of Natural Hazard Statistics for [Year] in the United States*.

Over the western states, lightning may start hundreds of wildfires in a single CWA. In these cases, the preparer may have to limit the number of incidents appearing in *Storm Data* by setting a threshold value based on minimum burned acreage, or some other parameter. In other situations, lightning may cause a fire that ultimately leads to fatalities and/or injuries. In these cases, the fatalities and/or injuries will be classified as indirectly-related. Refer to section 2.6 for additional information.

Beginning Time - Exact time of lightning strike(s).

Ending Time - Same as beginning time.

Direct Fatalities/Injuries

- A person was killed/injured by the electrical current that was generated when lightning struck the person directly.
- A person was killed/injured by an electrical current that was generated when lightning struck nearby.
- A person was killed/injured when lightning struck a tree and knocked it over onto the person.

Indirect Fatalities/Injuries

- A person was killed/injured in a traffic accident when lightning caused traffic signals to malfunction.
- A person was killed/injured while removing or cleaning up debris caused by a lightning strike.
- A person was killed/injured in a fire that was initiated by lightning.
- Lightning strikes a steeple which in turn falls into some scaffolding. The scaffolding strikes a pedestrian and kills him.

Example:

Tioga County
3 SW Tioga 06 1900EST 1 5 Lightning
A 26 year old male died when he was struck by lightning while boating on the Hammond Reservoir during a fishing contest. In addition, 5 other people received medical treatment for lightning-related injuries. M26BO

30 Marine Dense Fog (M). Water droplets suspended in the air just above the Earth's surface, resulting in a fatality, injury, or damage, over the waters and bays of the ocean, Great Lakes, and other lakes with assigned specific Marine Forecast Zones. This fog reduces visibility to values equal to or below locally/regionally established values for dense fog (usually less than one mile). This fog may impact transportation or commerce within a marine environment. Accidents which resulted in injuries, fatalities, or significant damage during a dense fog event over marine waters are reported using this event category.

Beginning Time - When marine dense fog criteria were first met.

Ending Time - When marine dense fog criteria were no longer met.

Direct Fatalities/Injuries - None.

Indirect Fatalities/Injuries
- Two ships collide during a dense marine fog event, resulting in multiple fatalities and injuries.
- During extremely dense marine fog, a ship worker fell into the ocean, resulting in a drowning.

Example:

LMZ643>646 Sheboygan to Port Washington WI – Port Washington to North Point Light WI – North Point Light to Wind Point WI – Wind Point WI to Winthrop Harbor IL
14 0400CST 0 0 100K Marine Dense Fog
1100CST
Dense fog developed overnight over the near-shore waters of Lake Michigan from Sheboygan to Kenosha and lowered visibilities to 100 yards to 1/2 mile. The lowest visibilities were in the area from 1 to 3 miles off the shoreline based on boat reports. Around sunrise, two boats collided about 2 miles east of the Port Washington harbor, resulting in 1 indirectly-related death, injuries to 3 people, and considerable boat damage. Synoptically, offshore southwest winds generated upwelling of colder water, which allowed for saturation of moist air once it moved over the colder Lake Michigan waters.

31 Marine Hail (M). Hail 3/4 of an inch in diameter or larger, occurring over the waters and bays of the ocean, Great Lakes, and other lakes with assigned specific Marine Forecast Zones, will be entered. Hail 3/4 of an inch in diameter or larger, occurring immediately along the shorelines of the waters and bays should be entered as a Marine Hail event, especially if the

storm moved over the near-shore waters (it is reasonable to assume it maintained its strength). Hail of smaller size, causing damage to watercraft or fixed platforms, should be entered. A maximum hail size will be entered.

The use of WSR-88D Doppler radar intensities (dBZ values) cannot be used to infer that a thunderstorm was sufficiently strong enough to produce hailstones meeting or exceeding the criteria listed in the previous paragraph.

The *Storm Data* software permits only one event name for encoding severe and non-severe Marine Hail events. If hail diameters over water surfaces with an assigned marine zone number are equal to, or greater than, 3/4 of an inch, a Marine Hail event always will be encoded. It is recognized that a number of Marine Hail events will never be documented. Hail sizes equal to or greater than 3/4 of an inch initiate the verification process for Marine Hail events.

If hailstones with diameters less than 3/4 of an inch result in fatalities, injuries, or damage, encoding a Marine Hail event is recommended. Encoded values of estimated or measured marine hail diameters below 3/4 of an inch (non-severe), regardless of extent and/or severity of fatalities, injuries, and property damage, are not used in the verification process.

Refer to Table A3 in section 19.1 in order to convert estimated hail sizes to measured values.

Beginning Time - When hail began.

Ending Time - When hail ended.

Direct Fatalities/Injuries

- Hail injured a boater.
- Wind-driven hail shredded the sail of a sailboat, causing the boat to overturn, drowning the boater.

Indirect Fatalities/Injuries

- A boater panicked in a hailstorm and ran into a breakwater.

Examples:

ANZ230 Boston Harbor MA
10 1530EST 0 0 Marine Hail (1.00)
1532EST
A boater reported quarter-size hail.

LEZ149 Conneaut OH to Ripley NY
18 1604EST 0 0 5K Marine Hail (0.50)
1608EST
One-half-inch diameter hail driven by 30 knot (35 mph) winds damaged two sailboats near Erie, PA.

32 Marine Heavy Freezing Spray (M). Ice accretions on exposed surfaces of fixed platforms or marine vessels on the waters and bays of the ocean, Great Lakes, and other lakes with assigned specific Marine Forecast Zones, which lead to the loss of life or property damage, should be entered. Normally, an ice accretion at the rate of 3 millimeters (mm) per hour is considered to be heavy freezing spray. Ice accretions occurring immediately along the shorelines of the waters and bays should be entered as a Marine Heavy Freezing Spray event as well.

Normally, freezing spray will occur when the air and water temperatures are sufficiently cold while winds and waves over water surfaces are strong enough and high enough to allow water spray to be projected up and onto exposed surfaces for a sufficient time period. This results in a build-up of ice accretions.

32.1 Table of Conditions Generating Heavy Freezing Spray.

Typically, a combination of the conditions listed in Table A6 will generate heavy freezing spray.

Water Temperature	Air Temperature	Winds	Waves
+4 C or colder	20 to 30 F	34 knots or higher	4 feet or higher
+4 C or colder	10 to 19 F	25 knots or higher	4 feet or higher
+4 C or colder	Less than 10 F	22 knots or higher	4 feet or higher

Table A6. Conditions that lead to the generation of heavy freezing spray.

Note: Direct fatalities, which are related to a marine vessel, will be coded as BO (Boating), not IW (In Water)

Beginning Time - When ice accretions reach or exceed 3 mm per hour on exposed surfaces.

Ending Time - When ice accretions end.

Direct Fatalities/Injuries
- Ɣ Ice accretions fall off wires and onto a crew member that dies from injuries.
- Ɣ Wind-driven ice accretions impact a passenger and result in head injuries.
- Ɣ The weight of ice accretions results in the collapse of a roof over a boat's cabin.

Indirect Fatalities/Injuries
- Ɣ While dislodging ice accretions, a crew member slips, and falls and breaks his leg.

Examples:

LMZ643 Sheboygan to Port Washington WI
10 0600CST 1 1 Marine Heavy Freezing Spray
1800CST
During a blizzard, heavy freezing spray on the west side of Lake Michigan resulted in a fatality, injury, and damage to a boat in the Sheboygan harbor. Ice accretions

of one foot tumbled onto a crew member who died from head injuries. Another crew member was injured. Frequent wind gusts to 40 to 50 knots were measured at the Sheboygan Coast Guard Station while air temperatures were in the teens. M33BO

33 Marine High Wind (M). Non-convective, sustained winds or frequent gusts of 48 knots (55 mph) or more, resulting in a fatality, injury, or damage, over the waters and bays of the ocean, Great Lakes, and other lakes with assigned specific Marine Forecast Zones. These conditions would correspond to a "storm" situation (48 to 63 knots/55 to 73 mph), or a "hurricane-force" wind situation (64 knots or higher/74 mph or higher). A peak wind gust (estimated or measured) or maximum sustained wind value will be entered.

When these conditions are satisfied, a *Storm Data* event entry is required. The preparer will note in the *Storm Data* software program whether the Marine High Wind was a measured gust (MG), estimated gust (EG), measured sustained (MS), or estimated sustained (ES). The software will automatically insert a wind speed conversion line at the end of the event narrative that equates knots with miles per hour. Refer to sections 5.24 and 5.45 for related information.

Events with winds less than the above threshold numbers, resulting in fatalities, injuries, or property damage, will be encoded as a "Marine Strong Wind" event. Refer to section 36, Marine Strong Wind, for more details.

The preparer can use high wind events occurring along the shorelines (to a maximum distance of 1 mile inland) of the waters and bays of the ocean, Great Lakes, and other lakes with assigned specific Marine Forecast Zones, to infer that a Marine High Wind event occurred over the near-shore waters (it is reasonable to assume its strength was maintained over water).

Note: Direct fatalities which are related to a marine vessel will be coded as BO (Boating), not IW (In Water).

Beginning Time - When Marine High Wind conditions, which resulted in a fatality, injury, or damage, were first met.

Ending Time - When Marine High Wind conditions, which resulted in a fatality, injury, or damage, were no longer met.

Direct Fatalities/Injuries

- Fatalities or injuries caused by falling or airborne debris associated with structural failure of a marine vessel due to wind.
- Fatalities resulting from drowning due to an overturned, damaged, or destroyed marine vessel.
- Any fatalities or injuries from loss of electrical power, including lack of heat or cooling.

Indirect Fatalities/Injuries

- Fatalities or injuries when a marine vessel collided with debris on the water surface left over from a previous wind or storm event.
- Any fatalities or injuries incurred during the clean-up process.
- Fatalities or injuries associated with making contact with power lines after they fell.

Example:

LMZ643 Sheboygan to Pt Washington
9 E Oostburg 04 1200CST 4 0 300K Marine High Wind (MG61)
2100CST
Powerful southwest winds persisted for about 9 hours over central Lake Michigan. The winds capsized a luxury cruise boat east of Oostburg in the open waters. Four people drowned inside the boat as it flipped over due to estimated waves of 8 to 12 feet. The boat sustained major structural damage. M57BO F50BO M65BO F66BO
Note: The measured wind gust of 61 knots is equivalent to 70 mph.

34 Marine Hurricane/Typhoon (M). A tropical cyclone occurring over the waters and bays of the ocean (those assigned specific Marine Forecast Zones) in which the maximum 1-minute sustained surface wind is 64 knots (74 mph) or greater and results in a fatality, injury, or damage to watercraft or fixed platforms. In the Atlantic Ocean or the North Pacific Ocean east of the International Date Line, this event would be labeled a Hurricane, and in the North Pacific Ocean west of the International Dateline, this event would be classified as a Typhoon.

Use the Marine Tropical Storm event type if a hurricane produced sustained 34 knot to 63 knot winds in a part of the CWA covered by marine zones. This means you may need a Marine Hurricane/Typhoon event type for some zones and a Marine Tropical Storm event type for other zones, even though all of the events are from one tropical cyclone. Other times, you may need a Marine Hurricane/Typhoon event type for your marine zones and a Hurricane/Typhoon event for your land zones. Marine Tropical Storm event related to a hurricane will include a reference to the hurricane in the Marine Tropical Storm narrative section, (e.g., "Hurricane Dennis produced tropical storm force winds in ...)." Coordinate with NHC if you have any questions.

Note: Direct fatalities which are related to a marine vessel will be coded as BO (Boating), not IW (In Water).

Beginning Time - When winds of 64 knots or greater first occurred or when a fatality, injury, or damage began.

Ending Time - When winds diminished to less than 34 knots or when reports of fatalities, injuries, or damage were no longer received.

Direct Fatalities/Injuries
- Hurricane/Typhoon winds overturn a commercial or recreational vessel and the crew drowns.

Indirect Fatalities/Injuries

ϒ Hurricane/Typhoon winds significantly damaged an oil rig. Several hours later, an employee was killed by falling debris during post storm clean-up.

Examples:

ANZ151 Penobscot Bay ME
10 1530EST 1 0 Marine Hurricane/Typhoon
10 1532EST
A fishing vessel sailing in Penobscot Bay capsized on August 10 around 1530 EST when an estimated winds of 64 knots (74 mph), generated by Hurricane Bob, caught it broadside. The sailor drowned after hitting his head on the mast and being thrown into the water. M28BO

PMZ150 Guam
15 1700ChST 4 0 3M Marine Hurricane/Typhoon
15 1705ChST
A 70-foot fishing vessel capsized 20 miles southeast of Guam on December 15 around 1700 ChST. Typhoon Paka battered the boat with estimated winds in excess of 100 knots (115 mph). Four crew members were lost. Property loss was estimated at 3 million dollars. M28BO M31BO M65BO M18BO

35 Marine Lightning (M). A sudden electrical discharge from a thunderstorm, resulting in a fatality, injury, and/or damage, occurring over the waters and bays of the ocean, Great Lakes, and other lakes with assigned specific Marine Forecast Zones.

Fatalities and injuries directly related to lightning strikes will be included in *Storm Data*. Report the specific location (see Table 3 in section 2.6.1.2), gender and age of fatalities. If reliable estimates of lightning-related damages (such as costs associated with structural fires, equipment loss, and electrical power and/or communications outages) are available or can be made, they should be entered into *Storm Data* as well. Because of the difficulty in obtaining lightning-related information, extra effort, such as fostering contacts with the media, marina entities, fire departments or other first responders, hospitals and medical examiner offices, is recommended to help obtain such information.

The extent of lightning-related injuries is often difficult to determine. In many cases, the extent of an injury may not be known until days or weeks after the incident. As a general guideline, as with other injuries for *Storm Data*, anyone seeking or receiving medical attention following a lightning incident should be counted as a lightning injury. Anyone reporting numbness, a tingling sensation, a headache, or other pain following a lightning incident, whether or not they receive treatment, should be counted as an injury as well.

For lightning injuries, it is recommended to include in the event narrative, the age, gender, location, and weather conditions at the time of occurrence, if known or determinable. The age,

gender, and location information is used in compiling lightning statistics used in the national report entitled *Summary of Natural Hazard Statistics for [Year] in the United States*.

In some situations, lightning may cause a fire that ultimately leads to fatalities and/or injuries. In these cases, the fatalities and/or injuries will be classified as indirectly-related. Refer to section 2.6 for additional information.

Beginning Time - Exact time of lightning strike(s).

Ending Time - Same as beginning time.

Direct Fatalities/Injuries

- A person was killed/injured by the electrical current that was generated when lightning struck the person directly.
- A person was killed/injured by an electrical current that was generated when lightning struck nearby.
- A person was killed/injured when lightning struck a tree and knocked it over onto a person in a parked boat along the near-shore.

Indirect Fatalities/Injuries

- A person was killed/injured while removing or cleaning up debris caused by a lightning strike.
- A person was killed/injured in a fire that was initiated by lightning.

Example:

Monterey Bay
3 N Monterey 16 1500PST 1 3 Marine Lightning
A 46 year-old male died when he was struck by lightning while boating in Monterey Bay. In addition, 3 other people received medical treatment for lightning-related injuries. M46BO

36 Marine Strong Wind (M). Non-convective, sustained winds or frequent gusts up to 47 knots (54 mph), resulting in a fatality, injury, or damage, occurring over the waters and bays of the ocean, Great Lakes, and other lakes with assigned specific Marine Forecast Zones. Wind speed values of 34 to 47 knots (39 to 54 mph) would correspond to a "gale" situation. A peak wind gust (estimated or measured) or maximum sustained wind value will be entered, in knots. Refer to sections 5.45 and 5.46 for related information.

The preparer can use strong wind events occurring immediately along the shorelines (to a maximum distance of 1 mile inland) of the waters and bays of the ocean, Great Lakes, and other lakes with assigned specific Marine Forecast Zones, to infer that a Marine Strong Wind event occurred over the near-shore waters (it is reasonable to assume its strength was maintained over water).

The preparer should note in the *Storm Data* software program whether the Marine Strong Wind was a measured gust (MG), estimated gust (EG), measured sustained (MS), or estimated sustained (ES). This software program automatically inserts a wind speed conversion line at the end of the event narrative that equates knots with miles per hour.

Note: Direct fatalities, which are related to a marine vessel will be coded as BO (Boating), not IW (In Water).

Beginning Time - When Marine Strong Wind conditions were first met, which resulted in a fatality, injury, or damage.

Ending Time - When Marine Strong Wind conditions were no longer met, which resulted in a fatality, injury, or damage.

Direct Fatalities/Injuries

- Fatalities or injuries caused by falling or airborne debris associated with structural failure of a marine vessel due to wind.
- Fatalities resulting from drowning due to an overturned, damaged, or destroyed marine vessel.
- Any fatalities or injuries from loss of electrical power, including lack of heat or cooling.

Indirect Fatalities/Injuries

- Fatalities or injuries when a marine vessel collided with debris on the water surface left over from a previous wind or storm event.
- Any fatalities or injuries incurred during the clean-up process.
- Fatalities or injuries associated with making contact with power lines after they fell.

Example:

LMZ665 Sheboygan to Pt Washington

3 E Oostburg 31 0600CST 1 1 10K Marine Strong Wind (EG40)
1800CST

Strong, gusty southwest winds persisted for about 12 hours over central Lake Michigan. The winds capsized a small boat east of Oostburg in the near-shore waters. One person drowned after he was thrown into the water, and one person was injured as the boat flipped over due to estimated waves of 5 to 8 feet. The boat sustained minor structural damage. M27BO
Note: The estimated wind gust of 40 knots is equivalent to 46 mph.

37 Marine Thunderstorm Wind (M). Winds, associated with thunderstorms, occurring over the waters and bays of the ocean, Great Lakes, and other lakes with assigned specific Marine Forecast Zones with speeds of at least 34 knots (39 mph) for 2 hours or less, or winds of any speed that result in a fatality, injury, or damage to watercraft or fixed platforms. Similar thunderstorm winds occurring immediately along the shorelines (to a maximum distance of 1

mile inland) of the waters and bays should be entered as a Marine Thunderstorm Wind, especially if the storm then moved out over the near-shore waters (it is reasonable to assume it maintained its strength). Marine thunderstorm winds occur within 45 minutes before or after lightning is observed or detected.

The use of WSR-88D Doppler radar intensities (dBZ values) cannot be used to infer that a thunderstorm was sufficiently strong enough to produce wind gusts meeting, or exceeding, the criteria listed in the previous paragraph.

The *Storm Data* software permits only one event name for encoding severe and non-severe "Marine Thunderstorm Winds." Maximum wind gusts (measured or estimated) equal to or greater than 34 knots (39 mph) will always be entered. Values less than 34 knots (39 mph) should be entered only if they result in fatalities, injuries, or property damage.

Damage alone does not automatically imply wind speeds of 34 knots (39 mph) or greater. When estimating a wind speed value, the preparer should take into account the amount and degree of severity, and condition of the damaged property. The resultant damage is required to support such a value. Refer to Table A7 in section 46.4 for guidelines on estimating wind speeds. Estimated or measured wind gusts below 34 knots (39 mph), regardless of extent and/or severity of fatalities, injuries, and property damage, will not be used in the verification process. Wind values of 34 knots (39 mph) or more will initiate the verification process for Marine Thunderstorm Wind events.

The preparer should note in the *Storm Data* software program whether the Marine Thunderstorm Wind was a measured gust (MG), estimated gust (EG), measured sustained (MS), or estimated sustained (ES). This software program automatically inserts a wind speed conversion line at the end of the event narrative that equates knots with miles per hour.

Note: Direct fatalities related to a marine vessel are coded as BO (Boating), not IW (In Water).

Beginning Time - When winds of 34 knots or greater first occurred or when a fatality, injury, or damage began.

Ending Time - When winds diminished to less than 34 knots or when reports of fatalities, injuries, or damage were no longer received.

Direct Fatalities/Injuries

- A wind gust, associated with a thunderstorm, overturned a canoe and the canoeist drowned.
- A jet-skier, jumping large waves created by thunderstorm winds, was killed when the craft flipped over.
- A thunderstorm-generated wave hit a boat broadside, and a boater lost his balance, fell overboard and drowned.

Indirect Fatalities/Injuries

ϒ Thunderstorm winds uprooted a tree that fell in the water. An hour later, a water skier ran into the tree and was killed.

Examples:

ANZ531 Chesapeake Bay from Pooles Island to Sandy Point MD
10 1530EST 1 0 Marine Tstm Wind (EG25)
1532EST
A one-person catamaran sailing in Chesapeake Bay just offshore Sandy Point State Park capsized when an estimated wind gust of 25 knots generated by a thunderstorm, caught it broadside. The sailor drowned after hitting his head on the mast and being thrown into the water. M20BO
Note: The estimated wind gust of 25 knots is equivalent to 29 mph.

LMZ741 Wilmette Harbor to Meigs Field IL
18 1604CST 0 0 Marine Tstm Wind (MG42)
1606CST
A squall line moved through the Chicago area and off the lakefront. A peak gust to 42 knots was recorded at the Harrison Street Crib.
Note: The measured wind gust of 42 knots is equivalent to 48 mph.

38 Marine Tropical Depression (M). Damaging tropical depression force winds occurring over the waters and bays of the ocean (those assigned specific Marine Forecast Zones), in which the 1-minute sustained (not gust) surface wind is less than 33 knots (39 mph) for 2 hours or more, that result in a fatality, injury, or damage to watercraft or fixed platforms. Similar tropical depression force winds occurring immediately along the shorelines (to a maximum distance of 1 mile inland) of the waters and bays of the ocean should be entered as a "Marine Tropical Depression."

Note: Direct fatalities which are related to a marine vessel will be coded as BO (Boating), not IW (In Water).

Beginning Time - When winds less than 33 knots result in fatalities, injuries, or damage.

Ending Time - When winds have abated or reports of fatalities, injuries, or damage are no longer received.

Direct Fatalities/Injuries

ϒ Tropical depression force winds overturned a small fishing vessel and the crew drowned.

Indirect Fatalities/Injuries

ϒ Tropical depression force winds cause minor damage to an oil rig. Several hours later, an employee was killed by falling debris during post storm clean-up.

Examples:

GMZ073 Craig Key to the West End of 7 mile Bridge
15 0130EST 0 0 Marine Tropical Depression
0135EST
A sailboat regatta 30 miles south of 7 mile Bridge encountered tropical depression force winds while enroute to Key West, FL on November 15 around 0130EST. Winds were estimated at 30 knots. The winds were attributed to departing Tropical Depression Twenty-Two, situated 20 miles southeast of the Dry Tortugas at the time. Several boats in the group had their sails partially torn. A few masts were damaged. The boats reached safe haven and their destination by 1000EST.

GMZ078 Middle Gulf between 85W and 90W
11 0300CST 0 0 2M Marine Tropical Depression
11 1005CST
An oil rig platform 100 miles south of Mobile Bay, AL sustained damage on June 11 between 0300 and 1005CST as Tropical Depression Thirteen passed by. Two indirect injuries were reported and occurred due to falling debris during the clean-up phase. Measured winds at the platform peaked at 32 knots. Property loss was estimated at 2 million dollars.

39 Marine Tropical Storm (M). A tropical cyclone occurring over the waters and bays of the ocean (those assigned specific Marine Forecast Zones) in which the maximum 1-minute sustained surface wind is equal to or greater than 34 knots (39 mph) but less than 64 knots (74 mph) for 2 hours or more and results in a fatality, injury, or damage to watercraft or fixed platforms.

Use the Marine Hurricane/Typhoon event type if a hurricane produced sustained surface winds of 64 knot or greater in a part of the CWA covered by marine zones. This means you may need a Marine Hurricane/Typhoon event type for some zones and a Marine Tropical Storm event type for other zones even though all of the events are from one tropical cyclone. Other times, you may need a Marine Tropical Storm event type for your marine zones and a Tropical Storm event for your land zones. A Marine Tropical Storm event related to a hurricane will include a reference to the hurricane in the Marine Tropical Storm narrative section, (e.g., "Hurricane Dennis produced tropical storm force winds in ...)." Coordinate with NHC if you have any questions.

Note: Direct fatalities which are related to a marine vessel will be coded as BO (Boating), not IW (In Water).

Beginning Time - When winds equal to or greater than 34 knots (39 mph) but less than 64 knots first occurred or when a fatality, injury, or damage began.

Ending Time - When winds diminished to less than 34 knots or when reports of fatalities, injuries, or damage were no longer received.

Direct Fatalities/Injuries

ϒ Tropical storm force winds overturn a commercial or recreational vessel and the crew drowns.

Indirect Fatalities/Injuries

ϒ Tropical storm force winds cause moderate damage to an oil rig. Several hours later, an employee was killed by falling debris during post storm clean-up.

Examples:

ANZ270 Waters from Surf City NC to South Santee River SC
8 1000EST 1 0 Marine Tropical Storm
2200EST
A freighter 30 miles northeast of Myrtle Beach, SC received substantial damage on September 8 between 1000 and 2200EST, as 50 knot tropical storm force winds associated with far away Hurricane Floyd buffeted the ship for nearly twelve hours. The combination of rough seas and wind gusts knocked one crew member overboard, resulting in a drowning. M55BO

GMZ375 Waters from High Island to Freeport TX
21 0300CST 0 0 1M Marine Tropical Storm
21 1705CST
A 50-foot-high speed power boat capsized 40 miles south of Galveston Bay on July 21 around 1700CST. The outer bands of approaching Hurricane Phillip battered the boat with estimated tropical storm force winds to 45 knots. All three crew members were rescued by USCG helicopter. Property loss was estimated at 1 million dollars.

40 Rip Current (Z). A narrow channel of water that flows away from the beach, through the surf zone and dissipates beyond the breaking waves. Rip currents develop in the waters and bays of the ocean, Great Lakes and other lakes with assigned specific Marine Forecast Zones), or any location that experiences breaking waves. They often form when the gradient wind is strong and directly onshore or when swells from a distant extra-tropical or tropical cyclone impinge on the coast. Rip currents will be listed in *Storm Data* only when they cause a drowning, near-drowning, result in one or more rescues, or damage to watercraft. Events associated with other surf-related currents, such as long-shore or tidal currents, should be included in the appropriate event type category.

Occasionally, rip currents are designated as the cause of a surf zone drowning in media reports when the actual cause is from another current, longshore, tidal, etc., or outside of surf zone events (i.e., heart attack, weak swimmer). As a result, every attempt should be made to confirm the cause of the drowning, or near-drowning. The best way to confirm what caused the event is to contact the local lifeguards, beach services, or the law enforcement agency responsible for interviewing witnesses and filing the report. The *Storm Data* preparer exercises professional judgment to determine whether the fatality or injury is a result of a Rip Current event.

Dry or secondary drowning occurs when a victim is rescued from a surf zone hazard such as a Rip Current event, and their respiratory system retains water. The victim passes away later from problems caused by the water retained in the respiratory system. A fatality associated with dry drowning should be included in a Rip Current event, as this was the initial cause of the rescue.

Beginning Time - The time when a rip current drowning, near-drowning, or rescue incident began, or damage began.

Ending Time - The time that the rip current drowning, near-drowning, or rescue incident ended or damage ended.

Direct Fatalities/Injuries

- A fatality due to a drowning from a rip current that was caused by wind or wave activity.
- A near-drowning due to a rip current that required medical treatment (either on-site or at a hospital) is considered an injury.

Indirect Fatalities/Injuries

- None

Examples:

FLZ072 Coastal Waters from Deerfield Beach to Ocean Reef FL
25 1400EST 1 1 0 0 Rip Current
1630EST
A 78-year old tourist swimming in the Atlantic behind his hotel near Fort Lauderdale drowned in a rip current. The beach patrol rescued four others, one of whom was transported to the hospital for medical treatment. M78IW

CAZ042 Inner Waters from Pt. Mugu to San Mateo Pt CA
05 0900PST 2 2 0 0 Rip Current
1600PST
A 25-year-old male and a 24-year-old female drowned in a rip current near a pier at Huntington Beach. Lifeguards made over two dozen rescues with two near-drownings as 10-foot swells from Hurricane Angelo swept north. M25IW, F24IW

41 Seiche (Z). A standing-wave oscillation in any enclosed lake that continues after a forcing mechanism has ceased and results in shoreline flooding and/or damage. In the Great Lakes and large inland lakes, large pressure differences, high winds, or fast-moving squall lines may act as the forcing mechanism. In addition, earthquakes or debris flows can initiate a seiche. When the forcing mechanism ends, the water sloshes back and forth from one end of the lake to the other, causing water level fluctuations of up to several feet before damping out.

Beginning Time - When water levels rose to initiate shoreline flooding, resulting in a fatality, injury or damage.

Ending Time - When water returned to pre-seiche levels.

Direct Fatalities/Injuries
- Persons near shore were swept away by the large wave and drowned.
- A boat was overturned by the large wave, drowning or injuring those on board.
- A structure was damaged or flooded by the wave, killing or injuring those inside.

Indirect Fatalities/Injuries
- Person died when cleaning up seiche-generated debris after the seiche ended.
- Person died from a building that collapsed from beach erosion after a seiche ended.

Example:

MIZ071 Van Buren
28 0300EST 0 0 500K Seiche
0315EST
An early-morning seiche of 3 feet, caused by a thunderstorm squall line that crossed Lake Michigan, caused damage in western Lower Michigan. The rising water damaged boats and docks at South Haven. At least $500,000 in damage occurred to piers and boats along the shoreline.

42 Sleet (Z). Sleet accumulations meeting or exceeding locally/regionally defined warning criteria (typical value is 1/2 inch or more). The *Storm Data* preparer should include in the narrative the times that sleet accumulation began, met criteria, and ended.

Beginning Time - When sleet was first observed to accumulate, or inferred to start accumulating from surrounding reports.

Criteria Time - When sleet accumulations equaled locally/regionally established warning threshold values, or as inferred from damage reports.

Ending Time - When sleet accumulation was observed to end, or inferred to end from surrounding reports.

Direct Fatalities/Injuries
- The weight of sleet on a roof or other structure causes it to collapse, killing someone. (Rare)

Indirect Fatalities/Injuries
- Any automobile-related accident due to sleet accumulation or poor driving conditions.
- Any fatality or injury related to someone falling or slipping on sleet.

Example:

WYZ015-062 Natrona - North Carbon

03 1200MST 0 0 65K Sleet
04 0200MST

Sleet began to accumulate around 1200MST on the 3rd. Accumulations eventually reached as much as 8 inches in the central foothills of Wyoming, causing extensive ice conditions and drifts of sleet, before ending around 0200MST on the 4th. Driving was hazardous at best with numerous accidents along Highway 54. The slippery road surface resulted in one accident involving two trucks in which four people were injured (indirectly). The roof of a Natrona business collapsed due to the weight of the sleet.

43 Sneaker Wave (Z). A sneaker wave is the first wave of a set of larger waves that follows a period of relatively calm ocean conditions, resulting in a fatality or damage. The period of calm preceding a sneaker wave can last up to thirty minutes. This period of calm causes beach goers to inaccurately assess the hazard, leading to behavior that places them in harm's way, such as getting too close to the surf with attention diverted. The hazard caused by sneaker waves is not correlated to the absolute magnitude of the size, but it instead is derived from the relative size, compared to the size of the waves that preceded the sneaker wave.

Sneaker waves occur when two wave systems coincide that have very similar periods. When these wave systems are out of phase, wave heights temporarily decrease, and therefore, the distance that waves run up the beach also decreases. When people move toward the water's edge, this temporary decrease in wave run-up may catch them unaware and unprepared for when the wave systems come back into phase, resulting in a return to relatively larger waves and higher wave run-ups. The first few waves that result from this constructive interference are the waves that "sneak" up on people and catch them by surprise. Sneaker waves are a complex weather phenomenon. The technology does not exist to support deterministic sneaker wave forecasting.

Dry or secondary drowning occurs when a victim is rescued from a surf zone hazard such as a Sneaker Wave event, and his/her respiratory system retains water. The victim passes away later from problems caused by the water retained in the respiratory system. A fatality associated with dry drowning should be included in a Sneaker Wave event, as this was the initial cause of the rescue.

43.1 Difference between Sneaker Waves and Other Wave Hazards. Sneaker Waves compared to High Surf: High surf can be forecast, and well-defined criteria exist for issuing warnings and advisories. High surf damages and injuries/fatalities occur when average wave run up reaches far beyond the normal surf line and impact areas normally thought to be safe. Most sneaker wave fatalities occur when conditions are well below High Surf criteria. Sneaker waves are dangerous because they wash up much farther than most of the waves during a given period, even if the absolute magnitude of the wave run up is not significant. Sneaker waves do not usually cause coastal erosion or damage. Lowering High Surf criteria to wave heights that correspond to sneaker wave events would result in the almost continuous issuance of High Surf warnings/advisories.

Sneaker Waves compared to Rogue Waves: Sneaker waves do not necessarily meet the commonly held criteria for a wave to be considered a rogue wave – that it is at least twice as high as the significant wave height. A deadly sneaker wave may only be slightly above the significant wave height for a given time period, but it occurs immediately after a period of relative calm. The interspersed periods of calm and periods of enhanced wave heights is the source of the hazard associated with sneaker waves. Rogue wave events are characterized by periods of normal wave heights followed by brief periods of extraordinarily large waves. Rogue waves are statistically very rare compared to sneaker waves. The waves that result in the sneaker wave hazard on the beach would not usually be hazardous for mariners in open water. Conversely, a true rogue wave on the open water could be an especially large sneaker wave on the beach.

43.2 General Guidelines for Determining if a Sneaker Wave Occurred. Sneaker wave fatalities are distinct from High Surf and Rip Current fatalities. Care is be taken to ensure that beach and surf fatalities are attributed to the correct hazard.

- If High Surf criteria are met during the time when an incident occurs, it should be recorded as a High Surf event. The premise here is that if High Surf criteria are met, then the average wave conditions are hazardous and, therefore, the element of surprise associated with Sneaker Waves does not exist.
- If a person drowns who is already fully in the water (surfing, swimming, etc.), then the fatality should not be attributed to a Sneaker Wave event. The Sneaker Wave hazard is specific in that it catches people who are not in the water and pulls them into the surf.
- If there are no witnesses to a drowning, it is very hard to establish with certainty that a Sneaker Wave was involved. For witnessed events, typical statements will describe a very large wave that seems to come out of nowhere and catches the victims by surprise.
- If a site survey can be conducted within hours after a suspected Sneaker Wave event, the debris or "wet sand" line can be used to verify that a Sneaker Wave occurred. The debris or "wet sand" line should extend significantly beyond the normal wave run up for the average wave conditions, factoring in a rising or falling tide.

Beginning Time - The time when a sneaker wave drowning, near-drowning, or rescue incident began.

Ending Time - The time that the sneaker wave drowning, near-drowning, or rescue incident ended.

Direct Fatalities/Injuries

- Two people are walking on the beach during a time when the ocean appears calm, with waves of only about 5 feet. A 15-foot wave catches them by surprise, knocking them both down and pulling them into the ocean where they drown. Average wave conditions, as measured at buoys, did not meet High Surf criteria.

- A mother and her young daughter are having a picnic at the beach, at a distance from the surf that appears to be safe based on the wave conditions. An unusually large wave reaches their picnic site and pulls the young child into the ocean where she drowns. Average wave conditions did not meet High Surf criteria.
- A father and mother are having their picture taken by their teenage daughter at the end of a jetty when an unusually large wave washes both parents into the water. The mother is rescued by the Coast Guard, but the father is never found. Average wave conditions did not meet High Surf criteria.

Indirect Fatalities/Injuries
- None

Example:

CAZ001 Redwood Coast
09 2000PST 1 0 Sneaker Wave
10 0600PST
An 8-year-old girl walking with her family at Orick Beach was swept off the beach by a sneaker wave and drowned. Rangers reported that average wave conditions were about 6-8 feet, but that there were periodic waves that reached 15 feet. A nearby buoy reported wave heights of 6 feet. The maximum extent of wave run up from the sneaker wave was determined to be 100 feet further inland than the run up distance of average wave conditions. F08IW

44 Storm Surge/Tide (Z). For coastal and select lakeshore areas, the vertical rise above normal water level associated with a storm of tropical origin (e.g., hurricane, typhoon, tropical storm, or subtropical storm), caused by any combination of strong, persistent onshore wind, high astronomical tide and low atmospheric pressure, resulting in damage, erosion, flooding, fatalities, or injuries. Note: Coastal flooding not associated with a typhoon, hurricane, tropical storm or subtropical storm should be reported under the Coastal Flood event; flooding adjacent to the Great Lakes and other lakes with specific assigned Marine Zones should be reported under the Lakeshore Flood event.

For coastal areas, normal water level is defined as mean sea level. Basically, storm tide is the sum of storm surge and astronomical tide. If the astronomical tide height for the flooded area is known, it should be subtracted from the total water level/storm tide (run-up/debris line), and the result specifically labeled in the event narrative as "storm surge." The method of measuring surge height should be mentioned in the narrative, (e.g., "NWS survey team calculated a surge height of 4 feet by subtracting the astronomical tide height from the run-up/debris line height.").

In association with Storm Surge/Tide events, coastal and lakeshore areas are defined as those portions of coastal land zones (coastal county/parish) adjacent to the waters and bays of the oceans, and other lakes with assigned specific Marine Forecast Zones, such as Lakes Maurepas, Pontchartrain, Okeechobee; this does not include the Great Lakes. Farther inland, the *Storm Data* preparer determines the boundary between coastal and inland areas, where flood events will

be encoded as Flash Flood or Flood rather than Storm Surge/Tide. Terrain (elevation) features will determine how far inland the coastal/lakeshore flooding extends.

Beginning Time - When the water level began to cause damage or flooding.

Ending Time - When the water level dropped to a point where damage or flooding ended.

Direct Fatalities/Injuries
- A coastal dwelling was washed away injuring/killing the occupants.
- A person drowned when a vehicle was swept away by the storm tide.

Indirect Fatalities/Injuries
- A person suffered a heart attack while evacuating from a storm tide.
- A person suffered a heart attack, collapsed and drowned, while initially standing in two feet of storm tide.
- A person died in a vehicle accident caused by the storm tide washing away a traffic signal.
- A person died in a vehicle accident after losing control in standing water on a road.

Example:

FLZ041-047- Volusia - Brevard - Indian River - St. Lucie - Martin
054-059-064 25 2200EST 0 0 8M Storm Surge/Tide
26 1600EST

The greatest storm tides occurred between Brevard and St. Lucie Counties, to the right of the land-falling eyewall of Hurricane Jeanne. Initial estimates of storm tide ranged from 7 feet in Volusia County to around 11 feet in St. Lucie County. Storm surge heights for those areas ranged respectively from 6 to 10 feet, as determined by NWS survey teams that subtracted a 1 foot astronomical tide height from debris line heights. Damage would have been greater except that Jeanne came ashore during low tide. Hardest hit was the town of New Smyrna Beach where much of the sand east of the town's seawall was removed. About 100 ocean-front homes were damaged, as well as about 75 piers.

45 Strong Wind (Z). Non-convective winds gusting less than 50 knots (58 mph), or sustained winds less than 35 knots (40 mph), resulting in a fatality, injury, or damage. Consistent with regional guidelines, mountain states may have higher criteria. A peak wind gust (estimated or measured) or maximum sustained wind will be entered.

Inland counties/parishes which experience strong winds/damage associated with tropical cyclones will be documented under the Tropical Depression or Tropical Storm category, as appropriate, not as a Strong Wind event.

Events over large inland lakes (with no specific, assigned Marine Forecast Zone number) that meet Strong Wind criteria will be entered as a Strong Wind event, rather than a Marine Strong Wind event.

The preparer should note in the *Storm Data* software program whether the Strong Wind was a measured gust (MG), estimated gust (EG), measured sustained (MS), or estimated sustained (ES). This software program automatically inserts a wind speed conversion line at the end of the event narrative that equates knots with miles per hour.

Beginning Time - When the wind started to cause a fatality, injury, or significant damage.

Ending Time - When the wind no longer caused a fatality, injury, or significant damage.

Direct Fatalities/Injuries

- Fatalities or injuries caused by falling debris associated with structural failure (e.g., falling trees, utility poles, and power lines).
- Fatalities or injuries associated with vehicles that were blown over, or with vehicles that were blown into a structure or other vehicles.
- Fatalities or injuries caused by airborne objects striking people or vehicles.
- Drowning due to boats capsizing from wind on inland lakes without an assigned Marine Forecast Zone.
- Any fatalities or injuries from loss of electrical power, including lack of heat or cooling.

Indirect Fatalities/Injuries

- Fatalities or injuries when a vehicle collided with debris scattered on a roadway.
- Any fatalities or injuries incurred during the clean-up process.
- Fatalities or injuries associated with making contact with power lines after they fell.

Example:

TXZ252-253- Starr - Hidalgo - Cameron
255 22 1000CST 1 0 25K Strong Wind (MG45)
2100CST
Gusty winds to 45 knots occurred in the Rio Grande Valley of Deep South Texas. Power lines and store signs were downed in Rio Grande City, Mercedes, and Brownsville. The wind pushed a large store sign onto a passing car on US 281 in Brownsville, killing the driver. M27VE
Note: The measured wind gust of 45 knots is equivalent to 52 mph.

46 Thunderstorm Wind (C). Winds, arising from convection (occurring within 30 minutes of lightning being observed or detected), with speeds of at least 50 knots (58 mph), or winds of any speed (non-severe thunderstorm winds below 50 knots) producing a fatality, injury, or damage. Maximum sustained winds or wind gusts (measured or estimated) equal to or greater than 50 knots (58 mph) will always be entered. Events with maximum sustained winds or wind

gusts less than 50 knots (58 mph) should be entered as a *Storm Data* event only if the result in fatalities, injuries, or serious property damage. *Storm Data* software permits only one event name for encoding severe and non-severe thunderstorm winds. The *Storm Data* software program requires the preparer to indicate whether the sustained wind or wind gust value was measured or estimated.

Note that damage alone does not automatically imply wind speeds of 50 knots (58 mph) or greater. When estimating a wind speed value, the preparer should take into account the amount and degree of severity, and condition of the damaged property (age, type of construction technique used, exposure, topography, soil moisture/composition, and local wind funneling effects due to orientation/closeness of other objects). The resultant damage supports such a value. Refer to Table A7 in section 46.4 for guidelines on estimating wind speeds, as well as the EF-Scale information available at https://www.spc.noaa.gov/efscale/.

On occasion, a convective line with no lightning, embedded within an area with a tight surface pressure gradient, will result in widespread wind gusts of 50 knots (58 mph) or higher. In these cases, the Thunderstorm Wind event will be used, rather than a High Wind event. However, widespread "wake-low," gusty winds will be documented with the High Wind or Strong Wind event.

Estimated or measured winds (sustained or gusts) below 50 knots (58 mph), regardless of extent and/or severity of fatalities, injuries, and property damage, will not initiate the verification process. Encoded wind values of 50 knots (58 mph) or more will initiate the verification process for Thunderstorm Wind events.

Note: "Extreme" damage, produced by thunderstorm winds greater than 64 knots (74 mph), is equivalent to estimated winds in the EF0 category of the Enhanced Fujita damage scale. Therefore, partial roofs removed, windows broken, light trailer homes pushed over/overturned, automobiles pushed off the road would be considered extreme wind damage. Refer to Table A7 in section 46.4 for guidance and to the EF-Scale information available at https://www.spc.noaa.gov/efscale/.

46.1 Downbursts. Downbursts, including dry, or wet, microbursts or macrobursts, will be classified as Thunderstorm Wind events. In some cases, the downburst may travel several miles from the parent thunderstorm, or the parent thunderstorm may have dissipated. However, since the initiation of the downburst event was related to a thunderstorm, Thunderstorm Wind is the appropriate event to use. Furthermore, the *Storm Data* preparer has the option of including "wind swath" information by inputting both a starting location latitude/longitude and an ending location latitude/longitude within the county where the wind damage swath exists. For wind swaths crossing county lines, the Thunderstorm Wind event would be continued into the next county as an additional *Storm Data* entry.

46.2 Gustnadoes. A gustnado is a small, usually weak whirlwind, which forms as an eddy in thunderstorm outflows. They do not connect with any cloud-base rotation and are not tornadoes. Since their origin is associated with cumuliform clouds, gustnadoes will be classified as Thunderstorm Wind events.

46.3 Thunderstorm Wind Damage. The *Storm Data* preparer exercises professional judgment to determine the estimated maximum wind value based on observed structural or tree damage. For example, a single rotted tree that is toppled by thunderstorm winds does not support an estimated wind gust of 50 knots (58 mph). Other examples of thunderstorm wind damage that do not support an estimated severe thunderstorm wind gust of 50 knots (58 mph) include: small twigs broken, toppled lawn furniture, poorly constructed/secured signs, billboards and awnings. Although some of these examples can be considered damage, it is likely that this damage can be incurred at wind speeds far below 50 knots (58 mph). On the other hand, numerous large trees, power lines, and road signs toppled by thunderstorm winds would support an estimated gust value at or above 50 knots (58 mph).

The preparer should note in the *Storm Data* software program whether the Thunderstorm Wind was measured gust (MG), estimated (EG), measured sustained (MS), or estimated sustained (ES). This software program will automatically insert a wind speed conversion line at the end of the event narrative that equates knots with miles per hour.

Beginning Time - When damage first occurred or winds 50 knots (58 mph) or greater were first reported.

Ending Time - When damage ended or winds of 50 knots (58 mph) were last reported.

Direct Fatalities/Injuries

- A thunderstorm wind gust snapped a large tree limb. The limb fell on a passing car, killing or injuring the driver.

Indirect Fatalities/Injuries

- A wind gust snapped a large tree limb which fell on the road. A few minutes later, a car drove into the tree limb and the driver was killed or injured.
- A wind gust downed numerous trees and limbs. The next morning, a person cleaning up the debris in his yard died or was injured from a chainsaw accident.
- A thunderstorm gust toppled a tree on a home's gas meter, causing an explosion. The resultant fire subsequently killed two people who were in the home.

Examples:

El Paso County
Colorado Spgs 23 1730MST 0 0 Thunderstorm Wind (MG70)
A dry-microburst struck the 5100 block of North Nevada Avenue in Colorado Springs. The downburst winds tore down power lines (but left the poles standing), ripped 40 square feet of roofing off a building, blew a pontoon boat 30 feet off its trailer, damaged billboards, and brought down tree limbs 6 to 8 inches in diameter. A home weather station recorded the measured gust.
Note: The measured wind gust of 70 knots is equivalent to 81 mph.

DeKalb County

Malta 12 1505MST 0 0 15K 10K Thunderstorm Wind (EG65)

Thunderstorm winds estimated at 65 knots downed numerous large trees, ripped off several barn roofs, and blew over a fuel storage tank. Two people were injured (indirectly related) when their vehicle struck a large tree on a road about 1 hour after the storm ended.

Note: The estimated wind gust of 65 knots is equivalent to 75 mph.

Langlade County

Antigo to Lily 10 1309CST 1320CST 0 0 200K Thunderstorm Wind (EG78)

A powerful downburst leveled thousands of trees, downed power lines, and damaged at least 50 homes as it moved northeast. The downburst swath ranged from 2 to 4 miles in width.

Note: The estimated wind gust of 78 knots is equivalent to 90 mph.

Waukesha County

Genesee 15 1915CST 0 0 50K Thunderstorm Wind (EG61)

A gustnado along the leading edge of a downburst produced wind gusts estimated at nearly 70 mph, damaging a barn and farm house along Highway 59 near Genesee. Interaction between the downburst and outflow from another thunderstorm just south of the city of Waukesha generated the gustnado.

Note: The estimated wind gust of 61 knots is equivalent to 70 mph.

46.4 Table for Estimating Wind Speed from Damage.

Wind Speed	Observations
26-38 kts (30-44 mph)	Trees in motion. Light-weight loose objects (e.g., lawn furniture) tossed or toppled.
39-49 kts (45-57 mph)	Large trees bend; twigs, small limbs break, and a few larger dead or weak branches may break. Old/weak structures (e.g., sheds, barns) may sustain minor damage (roof, doors). Building partially under construction may be damaged. A few loose shingles removed from houses. Carports may be uplifted; minor cosmetic damage to mobile homes and pool lanai cages.
50-64 kts (58-74 mph)	Large limbs break; shallow rooted trees pushed over. Semi-trucks overturned. More significant damage to old/weak structures. Shingles, awnings removed from houses; damage to chimneys and antennas; mobile homes, carports incur minor structural damage; large billboard signs may be toppled.
65-77 kts (75-89 mph)	Widespread damage to trees with trees broken/uprooted. Mobile homes may incur more significant structural damage; be pushed off foundations or overturned. Roof may be partially peeled off industrial/commercial/ warehouse buildings. Some minor roof damage to homes. Weak structures (e.g., farm buildings, airplane hangars) may be severely damaged.
78+ kts (90+ mph)	Many large trees broken and uprooted. Mobile homes severely damaged; moderate roof damage to homes. Roofs partially peeled off homes and buildings. Moving automobiles pushed off dry roads. Barns, sheds demolished.

Table A7. Estimating Wind Speed from Damage.

Note: All references to trees are for trees with foliage. Appreciably higher winds may be required to cause similar damage to trees without foliage. In addition, very wet soil conditions may allow weaker winds of 26 to 49 knots (30 to 57 mph) to uproot trees. For additional information, please refer to Damage Indicators 27 and 28 in the EF-Scale information located at http://www.spc.noaa.gov/efscale/.

46.5 Knot-Miles Per Hour Conversion Tables. Tables A8 and A9 will assist in conversion of wind speed values between knots and miles per hour.

KTS	0	1	2	3	4	5	6	7	8	9
0	0	1	2	3	5	6	7	8	9	10
10	12	13	14	15	16	17	18	20	21	22
20	23	24	25	26	28	29	30	31	32	33
30	35	36	37	38	39	40	41	43	44	45
40	46	47	48	50	51	52	53	54	55	56
50	58	59	60	61	62	63	64	66	67	68
60	69	70	71	73	74	75	76	77	78	79
70	81	82	83	84	85	86	88	89	90	91
80	92	93	94	96	97	98	99	100	101	102
90	104	105	106	107	108	109	111	112	113	114

Table A8. Knots to miles per hour. (Example: 45 knots equals 52 mph)

MPH	0	1	2	3	4	5	6	7	8	9
0	0	1	2	3	3	4	5	6	7	8
10	9	10	10	11	12	13	14	15	16	16
20	17	18	19	20	21	22	23	23	24	25
30	26	27	28	29	30	30	31	32	33	34
40	35	36	36	37	38	39	40	41	42	43
50	43	44	45	46	47	48	49	49	50	51
60	52	53	54	55	56	56	57	58	59	60
70	61	62	63	63	64	65	66	67	68	69
80	70	70	71	72	73	74	75	76	76	77
90	78	79	80	81	82	82	83	84	85	86

Table A9. Miles per hour to knots. (Example...45 mph equals 39 knots)

46.6 Speed-Distance Conversion Table. On occasion, the *Storm Data* preparer may need to calculate beginning and ending times, time of arrival, or validity of storm report times, based on a known thunderstorm speed from radar. To assist in this task, use Table A10.

KTS/MPH	1 Mile in X Minutes	KTS/MPH	1 Mile in X Minutes
52/60	1 mile in 1.0 min	**26/30**	1 mile in 2.0 min
48/55	1 mile in 1.1 min	**22/25**	1 mile in 2.4 min
43/50	1 mile in 1.2 min	**17/20**	1 mile in 3.0 min
39/45	1 mile in 1.3 min	**13/15**	1 mile in 4.0 min
35/40	1 mile in 1.5 min	**9/10**	1 mile in 6.0 min
30/35	1 mile in 1.7 min	**4/5**	1 mile in 12.0 min

Table A10. Speed to Distance Conversion.

47 Tornado (C). A violently rotating column of air, extending to or from a cumuliform cloud or underneath a cumuliform cloud, to the ground, and often (but not always) visible as a condensation funnel. For a vortex to be classified as a tornado, it must be in contact with the ground and extend to/from the cloud base, and there should be some semblance of ground-based visual effects such as dust/dirt rotational markings/swirls, or structural or vegetative damage or disturbance.

The tornado path length will be entered in miles and tenths of a mile. The maximum tornado path width will be entered in yards. See section 47.7 for details in determining path length (including beginning and ending points) and path width. Exercise professional judgment in determining the existence of separate tornadoes. Each and every case is a different situation.

An Enhanced Fujita (EF) Damage Scale value will be entered. Although not required, the inclusion of Damage Indicator (DI) and Degree of Damage (DOD) information in the event narrative that led to the EF Damage Scale value assigned to the tornado is strongly encouraged.

As an option, the type of thunderstorm that produced the tornado can be included in the event narrative. Some examples include high- or low-precipitation supercell, non-supercell, squall line, bookend vortex, tropical cyclone (TC) supercell, etc.

When discernible, wind damage from the rear-flank downdraft should not be considered part of the tornado path but should be entered as a Thunderstorm Wind event.

Gustnadoes will be reported as Thunderstorm Wind events. Refer to section 46.2 for details.

Landspouts and funnels, ultimately meeting the objective tornado criteria listed in section 47.6, will be classified as Tornado events.

47.1 Tornado, Funnel Cloud, and Waterspout Events. The terms Tornado, Funnel Cloud, and Waterspout are defined below:

a. Tornado. A violently rotating column of air extending from a cumuliform cloud or underneath a cumuliform cloud, to the ground, and often (but not always) visible as a condensation funnel. Literally, in order for a vortex to be classified as a tornado, it must be in contact with the ground and extend to/from the cloud base. On a local scale, it is the most destructive of all atmospheric phenomena;

b. Waterspout. A violently rotating column of air usually pendant to a cumulus/cumulonimbus, over a body of water, with its circulation reaching the water; and

c. Funnel Cloud. A rotating visible extension of cloud pendant to a cumulus/cumulonimbus with circulation not reaching the ground or water.

In some situations, many public and spotter reports of funnel clouds are passed on to a WFO. In these cases, the preparer should document only the most significant funnel clouds, especially those that generate public or media attention. Refer to section 18 for additional funnel cloud details.

WFOs are responsible for identifying, investigating, and confirming storms occurring in their warning areas. To accomplish this, the *Storm Data* preparer uses all available severe weather reports, including information from newspapers, letters and photographs, airborne surveys and pilot reports, state/local emergency management, and personal inspections.

When available information includes a reliable report that a tornado vortex was distinctly visible (condensation funnel pendant from a cloud - usually a cumulonimbus), and in contact with the ground, or a rotating dust/dirt/debris column at the ground is overlaid with a condensation funnel pendant above, identification of a tornado is a simple matter. This is particularly true when reports have been investigated by the responsible NWS official and found to be reliable. However, tornadoes, funnel clouds, and waterspouts can be hidden by precipitation, low clouds, or dust. Darkness or lack of observers may also result in a tornado or waterspout not being observed. The WFO staff exercises professional judgment to identify a tornado or waterspout from its effects.

47.2 Criteria for a Waterspout. A vortex in contact with the water surface that develops on, or moves over, the waters and bays of the oceans, Great Lakes, and other lakes with assigned Marine Forecast Zones, will be characterized as a Waterspout for that portion of its path over those water surfaces. The vortex will be classified as a Tornado for that portion of its path over land or inland bodies of water that are not assigned Marine Forecast Zones. Refer to section 52 for additional waterspout details.

47.3 Tornadoes Crossing CWA Boundaries. Tornadoes crossing state lines or boundaries of WFO CWA responsibility will be coordinated between WFOs. The preparer will ensure that the exact location where a tornado crosses a county, parish, or state line, is incorporated into the event narrative. Sharp-turning tornadoes may need to be segmented into individual pieces to

adequately describe the path of that event. However, segmenting a tornado within the same county/parish is not permitted since this practice may lead to confusion and over-counting of tornadoes by the SPC, NCEI, and *Storm Data* users. It is recommended that the preparer encode only one beginning and ending point for the tornado path within each county/parish affected, and provide detailed information in the event narrative about the intermediate locations where the tornado turned sharply. Additional instructional information regarding these "border-crossing" tornadoes can be found in the Tornado event examples in this section.

47.4 Landspouts and Dust Devils. A landspout (slang-term for non-supercell tornado) will be classified as a Tornado event, assuming the preparer has reliable reports meeting the criteria outlined in section 47.6. Similarly, cold-air funnels, meeting the criteria outlined in section 47.6, will be classified as a Tornado event.

On the other hand, dust devils will not be classified as tornadoes since they are ground-based whirlwinds that do not meet the tornado criteria outlined in section 47.6. A dust devil is an allowable *Storm Data* event name as indicated in section 10.

47.5 On-site Inspections (Surveys). WFO tornado/waterspout and extreme downburst damage surveys are desirable in those cases when the MIC or WCM believes additional information is needed for *Storm Data* preparation. A survey should be completed as soon as possible before clean-up operations remove too much damage evidence.

The NWS has developed the Damage Assessment Toolkit (DAT) to assist with the collection of storm damage survey information. The DAT is a Geographic Information System (GIS) application designed for efficient collection, analysis, and delivery of storm damage data. The toolkit is built around a central geospatial database, which is used to store the data. To ensure accurate tornado paths are recorded, WFOs should use the DAT to collect storm damage survey information. More information on the DAT is located at: https://sites.google.com/a/noaa.gov/damage-assessment-toolkit/.

When strong to extreme Tornado events occur (e.g., greater than EF3 tornado damage expected), a Post Storm Damage Assessment (PSDA) report should be compiled. To quickly gather the data necessary for accurate post-event analysis, the deployment of a PSDA Quick Response Team (QRT) may be required. The guidelines and requirements for initiating a PSDA QRT action are contained in NWSI 10-1604, *Post-Storm Data Acquisition*, available at http://www.nws.noaa.gov/directives/sym/pd01016004curr.pdf.

47.6 Objective Criteria for Tornadoes. An event will be characterized as a tornado if the type or intensity of the structural and vegetative damage and/or scarring of the ground could only have been tornadic, or if any two of the following guidelines are satisfied:

a. Well-defined lateral boundaries of the damage path;

b. Evidence of cross-path wind component, e.g., trees lying 30 degrees or more to the left/right of the path axis (suggesting the presence of a circulation);

c. Evidence of suction vortices, ground striations, and extreme missiles; or

d. Evidence of surface wind convergence as suggested by debris-fall pattern and distribution. In fast-moving storms, the convergence pattern may not be present and debris pattern may appear to fall in the same direction.

Additionally, an event will be characterized as a tornado if:

a. Eyewitness reports from credible sources, even with little or no structural or vegetative damage, and/or little or no scarring of the ground, indicate that a violent circulation extended from the convective cloud base to the ground; or

b. Videos or photographs from credible sources, even with little or no structural or vegetative damage, and/or little or no scarring of the ground, indicate that a violent circulation extended from the convective cloud base to the ground.

There may be situations, especially in the central or western parts of the United States, where verification of tornadoes will be difficult. However, if available evidence establishes that it was highly likely a Tornado event occurred, the preparer will enter the event in *Storm Data*.

47.7 Determining Path Length and Width. Path length (in miles and tenths of miles) and maximum path width (in yards) will be indicated for all tornadoes, including each member of families of tornadoes, or for all segments of multi-segmented tornadoes. The length in the header-strip is the length of that particular segment in that particular county/parish. The SPC, NCEI, or a *Storm Data* user can determine the entire length of a multi-segmented tornado by adding the lengths from each segment as well as using the latitude and longitude of that segment. Note that latitude and longitude are not available in the *Storm Data* publication, but are available on the internet in the NCEI and SPC databases.

The tornado path length generally excludes sections without surface damage/disturbance, unless other evidence of the touchdown (e.g., a trained spotter report, video of the tornado over a plowed field) is available. The excluded section will not exceed 2 continuous miles or four (4) consecutive minutes of travel time; otherwise, the path will be categorized as separate Tornado events. The beginning and ending locations of the excluded sections should be described as accurately as possible in the event narrative. In some cases, careful analysis and eyewitness descriptions will determine if separate tornadoes actually occurred within 2 miles or four (4) minutes. Refer to section 47.9 for related information. Use the event narrative to describe whether a tornado was continuous or had small gaps in these types of cases.

The width in the header-strip is the maximum observed through the entire length of a tornado, or of each segment in a multi-segment tornado. In the absence of structural damage, broken small tree branches of at least 3 inches in diameter can be considered as a marker for tornado width (assuming this damage isn't related to the rear flank downdraft). In arid regions where there is a lack of trees, other vegetation or landscape material must be used as a marker. To determine the tornado's maximum width, the SPC or *Storm Data* user checks each segment which is entered as a separate event.

The preparer is encouraged to include in the event narrative the average path width (in yards) of all tornadoes, especially for strong or violent tornadoes (EF2 damage or worse). Availability of average path width information in *Storm Data* benefits the scientific research community and other users.

47.8 Using the Enhanced Fujita (EF) Scale. Use of the EF-Scale is listed at https://www.spc.noaa.gov/efscale/ and https://training.weather.gov/wdtd/courses/EF-scale/index.php. EF-Scale values will be assigned to every documented tornado. The *Storm Data* preparer may refer to the Internet documents (links above) and exercise professional judgment to determine the EF-Scale rating. These documents provide more examples and descriptions through the use of Damage Indicators (DI) and Degrees of Damage (DOD) to evaluate tornado damage.

Eyewitness verbal accounts, newspaper or personal photographs, and videos of the Tornado events may be relied upon when an inspection/survey is not possible. In cases where there is damage to numerous structures, damage to a single structure should not be used as the deciding factor for the appropriate EF-Scale rating. The surveyor should take into account the overall damage, evaluating tornado damage versus debris-caused damage and other extenuating circumstances. Experience has shown that tornado F-Scale ratings could not be determined consistently and reliably solely on the appearance of damage. This is also assumed with the newer EF-Scale. Although there are more documented examples of tornado damage, the assigned EF-Scale value may still vary by +/- 1.

When composing the event narrative of a tornado event, the description should be written remembering that it is a damage scale and the winds listed are estimated. Thus, a tornado does not necessarily "strengthen" as it moves into a city, housing development, subdivision or industrial area. If the tornado increases in speed or widens, then it may be assumed that the tornado physically is strengthening. Because the tornado moves into an area encountering more structures, creating more debris, does not necessarily indicate a strengthening of the tornado.

Doppler-derived wind speeds will not be used to determine the character of the storm or the EF-Scale of a tornado since these values are representative of conditions aloft rather than ground-based. However, this information may be included in the event narrative for enhancement. For example, the *Storm Data* preparer could include the following in the event narrative of a tornado surveyed by a Doppler on Wheels vehicle: "Based on damage evidence in path of the tornado, the tornado was officially rated an EF2. However, the NWS received derived wind speeds from a Doppler on Wheels vehicle located approximately 1 mile north of the tornado. These Doppler-derived observations indicated wind speeds of 170 mph at approximately the 300 foot level of the funnel. This is consistent with wind speeds associated with an EF4 tornado."

47.9 Tornadoes Without Visible Damage Evidence. On rare occasions, it is impossible to rate the strength of a confirmed tornado because there is little to no damage evidence. In these cases, the *Storm Data* preparer can document such a tornado as "EF-Unknown" (EFU). Narratives of tornadoes rated as EFU will include a brief narrative explaining why the tornado was unrated. For example, the *Storm Data* preparer could include the following in the event

narrative of a tornado causing no damage: "Storm chasers captured video of a tornado briefly touching down in a remote section of Cheyenne County. The tornado caused no damage from which the NWS could assign an EF-scale rating."

The following are a few examples of when the Storm Data preparer would rate a tornado an EFU:

1. A tornado traverses through an area that was severely damaged by a previous tornado. There are no damage indicators left that can be used to characterize the new tornado.

2. A tornado traverses through a wilderness or a high mountain area that is difficult to reach to conduct a damage survey, or through land lacking damage indicators such as trees or structures.

3. A tornado spins-up and stays over an inland lake that does not have an assigned marine zone. Unless a boat or an above-water-surface structure on the lake is damaged, or a buoy with an anemometer is within the path, a rating cannot be assigned.

4. A "satellite" tornado (or tornadoes) is (are) observed in association with a primary tornado. The damage survey team finds it is difficult to distinguish the damage caused by the primary tornado from the satellite tornado(es). The primary tornado should be assigned an EF-Scale rating and the satellite tornadoes may be rated as EFU.

47.10 Simultaneously Occurring Tornadoes. On occasions, especially over the Plains States, a single cumulonimbus may have several, separate, tornadoes occurring simultaneously. They may be separated by a distance of as little as 1/2 to 1 mile; and each may have a distinct, separate trajectory. In these cases, the *Storm Data* preparer should classify the tornadoes as separate events, each with a unique start/end location/time combination. The preparer will have to rely on credible evidence such as eyewitness reports, videos, and damage along the path to determine how many tornadoes actually existed. Existing *Storm Data* indicates that "landspout" tornadic situations have resulted in several simultaneously occurring tornadoes.

If evidence suggests that a multiple-vortex tornado occurred, the *Storm Data* preparer will document this situation as a single tornado event, even though each vortex created a distinct damage path. The multiple vortices rotate around a common center – the tornado center. Conversely, separate tornadoes, even if they are closely spaced, will not rotate around a common center.

A brief, detailed explanation of simultaneously occurring tornadoes may be included in the narrative associated with each tornado event.

Beginning Time - When the sub-cloud vortex first contacted the ground.

Ending Time - When the sub-cloud vortex lost contact with the ground.

Direct Fatalities/Injuries

- Structures or trees were blown over and landed on someone, resulting in a fatality/injury.
- People became airborne and struck the ground or objects, resulting in a fatality/injury.
- High voltage power lines were blown onto a car, killing or injuring those inside.
- A high-profile vehicle was blown over, resulting in a fatality/injury.
- A vehicle was blown into a structure or oncoming traffic, resulting in a fatality/injury.
- Objects became airborne (debris, missiles), resulting in a fatality/injury.
- A boat on an inland lake or river was blown over or capsized, resulting in a drowning.

Indirect Fatalities/Injuries

- A person was killed or injured after driving into a tree downed by the tornado.
- Someone was electrocuted by touching downed power lines.
- Someone suffered a heart attack and died as a result of removing debris.

47.11 Single-Segment (Non Border-crossing) Tornado Entries.

47.11.1 Example of a Tornado Within One County/Parish.

Page County
Bingham to 2 NE Norwich 22 1905CST 1917CST 6 75 0 0 5K 5K Tornado (EF0)

A tornado spun up 0.5 mile west of the intersection of SH 33 and SH 55 near Bingham, and moved east to Norwich before dissipating 0.25 mile northeast of the intersection of SH 18 and SH 12 northeast of Norwich. Two homes in Bingham and one in Norwich sustained minor damage (DI 2, DOD 2). The tornado track was not continuous; there were two areas (both about one-half-mile long) east of Bingham where damage was not discernable. Average path width was 30 yards.

47.11.2 Example of a Tornado that Changed Direction Within One County/Parish. A tornado that affects only one county/parish should be entered as only one segment, even if the tornado changed direction within a county/parish. The end points should be entered in the header-strip and the complete description of the tornado's path, including any variation from a straight line, should be described in the event narrative.

Jackson County
5 W Vernon to 5 NNE Vernon 14 2308CST 2326CST 10 150 0 0 150K Tornado (EF1)

A tornado spun up 5 miles west of Vernon just northeast of the intersection of Interstate 80 and SH 29. The tornado moved east through the city of Vernon, and then veered left at the center of the city. It finally dissipated about 5 miles north-northeast of Vernon about 0.25 mile east of the intersection of CTH E and CTH V. Trees and power lines were blown

down and several barns were damaged. A business (DI 12, DOD 3) and a home were partially unroofed in Vernon. Average path width was 75 yards.

47.11.3 Example of a Tornado over an Inland Body of Water (Without an Assigned Marine Forecast Zone).

Davis County

7SW Layton	**01**	**1738MST** **1741MST**	**1**	**30**	**0**	**0**		**Tornado (EF0)**

State Police spotted a tornado over Great Salt Lake. It dissipated before reaching shore.

47.11.4 Examples of a Tornado that Became a Waterspout (Body of Water with Assigned Marine Forecast Zone).

St. Louis County

2E Arnold to French River	**28**	**1651CST** **1655CST**	**4.4**	**60**	**0**	**0**		**Tornado (EF1)**

A tornado spun up 2 miles east of Arnold at the entrance of Arrowhead State Park, and traveled until it reached the shore of Lake Superior at French River where it continued as a waterspout. A barn and an outbuilding were destroyed (DI 1, DOD 8) and trees were damaged. Average path width was 40 yards.

LSZ144

Two Harbors to Duluth MN	**28**	**1655CST** **1657CST**			**0**	**0**		**Waterspout**

The St. Louis County tornado event reached the shores of Lake Superior at French Creek. This waterspout then moved northeast and lasted another 2 minutes before dissipating.

47.11.5 Examples of a Waterspout (Body of Water with Assigned Marine Forecast Zone) That Became a Tornado.

LMZ645

5NE Wind Pt to Wind Pt WI	**15**	**1700CST** **1705CST**			**0**	**1**	**100K**	**Waterspout**

A waterspout developed 5 miles northeast of Wind Point and moved slowly southwest. Three sailboats about 2 miles offshore were destroyed and one person was injured. The waterspout moved onshore at the Wind Point Lighthouse and continued southwest as a tornado in Racine County.

Racine County

Wind Pt to 3SW Wind Pt	**15**	**1705CST** **1707CST**	**1**	**25**	**0**	**0**	**1M**	**Tornado (EF1)**

The waterspout that spun up 5 miles northeast of Wind Point moved onshore as a tornado at the Wind Point Lighthouse, and dissipated about 3 miles inland at the John H. Batten Airport. The tornado weakened but still managed to cause significant damage to two piers, a yacht club building, two small boats, and a dozen homes (DI 2, DOD 4). Estimated wind speeds of the tornado were about 87 knots (100 mph).

47.12 Segmented and Border-crossing Tornado Entries.

47.12.1 Examples of a County/Parish Line-crossing Tornado Within a CWA. Tornadoes that cross county/parish lines are entered as segments with one segment per county/parish. *Storm Data* preparers coordinate entries for tornadoes that cross state lines or CWAs. Consistency between *Storm Data* entries of border crossing tornadoes is needed to ensure an accurate tornado path. Otherwise, a single tornado may be misinterpreted as two separate tornadoes. This can easily occur when external users, not familiar with *Storm Data* practices, use the NCEI Website query feature. It is critical that all counties/parishes affected by a single tornado, and the exact location that a tornado exits or enters a county/parish, be mentioned in the event narrative that discusses that tornado. Do not segment a tornado within a county/parish (an entry for each portion of a tornado that appreciably changes directions). In the example below, the first line of the event narrative makes it clear that the tornado moved across a county/parish line, and indicates exactly where the tornado exited the first county/parish.

Coal County

4 SE Coalgate	**11**	**0425CST**	**8**	**200**	**1**	**1**	**75K**	**Tornado (EF2)**
2.5 ENE Cairo		**0434CST**						

This tornado formed 4 miles southeast of Coalgate at the intersection of SH 25 and County Road 17 and tracked northeastward for 8 miles before exiting Coal County about 2.5 miles east-northeast of Cairo at about 100 yards southeast of the intersection of SH 15 and Wilson Road. The tornado continued in Atoka County for another 5 miles, before dissipating at 0440CST. In Coal County, 1 fatality and injuries to another person occurred when a mobile home was thrown approximately 200 yards and disintegrated 4 miles east of Coalgate. In addition, a well-constructed frame home suffered severe roof damage and exterior wall damage in extreme eastern Coal County (DI 2, DOD 6). While in Coal County, it was rated as EF2, but in Atoka County, it was rated as EF0. Average path width in Coal County was 100 yards, while the maximum width was 200 yards. F62MH

Atoka County

1.5 NW Wardville	**11**	**0434CST**	**5**	**100**	**0**	**0**	**6K**	**Tornado (EF0)**
to 5.5 SE Wardville		**0440CST**						

This tornado formed 4 miles southeast of Coalgate in Coal County and entered Atoka County about 1.5 miles northwest of Wardville, about 100 yards southeast of the intersection of SH 15 and Wilson Road. The tornado then continued for another 5 miles before dissipating 5.5 miles southeast of Wardville about 0.25 mile northwest of the intersection of Bark Road and Hardscrabble Road. In

Atoka County, minor roof damage was inflicted on a mobile home (DI 3, DOD 2), and numerous trees were damaged. While in Coal County, it was rated as EF2, but in Atoka County, it was rated as EF0. Average path width in Coal County was 50 yards.

47.12.2 Example of a Triple-segmented, Two-County Tornado. In some cases, a tornado may spin up in County A, cut across the corner of County B, and re-enter and dissipate in County A. In these situations, three Tornado events will be entered into the *Storm Data* software: the first event covers the first County A segment, the second event covers the County B segment, and the third event covers the second County A segment.

Columbia County
3 E Wis Dells to 06 1754CST 6.1 200 0 0 400K Tornado (EF1)
2 SE Lewiston 1813CST

The first segment of a multi-segmented tornado spun up near the intersection of Broadway Road and CTH Q east of Wisconsin Dells. It damaged 9 homes (DI 2, DOD 4) before it exited Columbia County on the Wisconsin River at 1813CST. This tornado then clipped the northeast corner of Sauk County (southeast of Lake Delton) and re-entered Columbia County at 1817CST. Average path width was 75 yards.

Sauk County
9 SE Lk Delton to 06 1813CST 1.6 100 0 0 1K Tornado (EF0)
10 SE Lk Delton 1817CST

This tornado segment is a continuation of a tornado that initially started 3 E of Wisconsin Dells at 1754CST on June 6th. In Sauk County, it lightly damaged a home's siding (DI 2, DOD 2), and ripped up some trees. It entered Sauk County at the intersection of N. Hein Road and Levee Road, and exited Sauk County into Columbia County where Levee Road enters Columbia County. Average path width was 50 yards.

Columbia County
7 W Portage to 06 1817CST 9.2 200 0 0 600K Tornado (EF1)
1 SW Dekorra 1840CST

This is the 3rd segment of a single tornado that initially started east of Wisconsin Dells at 1754CST, crossed into Sauk County at 1813CST, and re-entered Columbia County at 1817CST where Levee Road enters Columbia County from the west. In Columbia County, 10 homes (DI 2, DOD 4) and a campground sustained damage. Five vehicles were slightly damaged by tree debris. This tornado dissipated southwest of Dekorra, just after crossing the Wisconsin River for the second time. Average path width was 100 yards.

47.12.3 Example of CWA Boundary-crossing Tornado. WFOs coordinate the beginning and ending locations of tornadoes that move from one CWA into another. This will assure that all affected counties/parishes are mentioned. In the following example, both segments mention that the tornado crossed from one county into another one.

TEXAS, North Cooke County
4 NW Gainesville 11 0255CST 2.6 150 0 0 30K Tornado (EF1)
to 6 N Gainesville 0258CST

A tornado touched down 4 miles northwest of Gainesville at the intersection of Pearl Road and Washington Road. It then moved into Love County, Oklahoma, 6 miles north of Gainesville (see *Storm Data* for Oklahoma, Western, Central and Southeast) where Red River goes under SH 66. In Cooke County, a mobile home (DI 3, DOD 5) and a storage pole barn were heavily damaged northwest of Gainesville. Average path width for the Texas portion was 75 yards.

OKLAHOMA, Western, Central, and Southeast Love County
5 S Thackerville to 11 0258CST 5 100 0 0 100K 100K Tornado (EF1)
3 ESE Thackerville 0304CST

This tornado developed in Cooke County, Texas, about 4 miles northwest of Gainesville, and tracked northeastward before crossing the Red River into Love County in Oklahoma (see *Storm Data* for Texas, North, for more information on the beginning portion of this tornado in Texas) at 0258CST at a point 5 miles south of Thackerville near the intersection of SH 52 and Baker Road. This tornado dissipated about a 0.5 mile northeast of the intersection of CTH 118 and Simple Road. In Oklahoma, the most significant damage, rated EF1, occurred 3 miles southeast of Thackerville where a barn was destroyed (DI 1, DOD 8), and part of a soybean crop was uprooted. Nearby, a mobile home was severely damaged. Average path width for the Oklahoma portion was 50 yards.

47.13 The Enhanced Fujita Tornado Damage Scale Table.

Derived EF-Scale		Operational EF-Scale
EF Classes	**3-Second Gust Speed (mph)**	**3-Second Gust Speed (mph)**
EF0	65 - 85	65 – 85
EF1	86 - 109	86 – 110
EF2	110 - 137	111 – 135
EF3	138 - 167	136 – 165
EF4	168 - 199	166 – 200
EF5	200 - 234	> 200

Table A11. Enhanced Fujita Tornado Damage Scale

48 Tropical Depression (Z). A tropical cyclone in which the 1-minute sustained wind speed is 33 knots (38 mph), or less. A Tropical Depression should be included as an entry when these conditions are experienced in the WFO's CWA. The tropical depression number will be included in the narrative section.

The tropical depression may be associated with many individual hazards, such as storm surge, freshwater flooding, tornadoes, debris flows, rip currents, etc. These individual hazards and their

associated fatalities, injuries, and damage amounts are not to be included as part of the Tropical Depression event type. Rather, these individual hazards are to be entered as separate events. However, do include this information in the Tropical Depression narrative to ensure a complete synopsis. Refer to section 25 for additional information that may be applicable for tropical depressions, as well as their associated individual hazards (section 25.1). Wind damage that occurred inland as well as in coastal counties/parishes and islands affected by tropical depression winds will be entered as a Tropical Depression event.

The following information explains the content of the Tropical Depression entry:

Beginning Time - When the direct effects of the tropical depression were first experienced.

Ending Time - When the direct effects of the tropical depression were no longer experienced.

Direct Fatalities/Injuries:
- Fatalities/injuries caused by wind-driven debris or structural failure due to the winds.
- Wind caused a tree to blow onto someone.

Indirect Fatalities/Injuries:
- Someone suffered a heart attack while removing debris.
- Someone was electrocuted by touching downed power lines.

Example:

TXZ183 Val Verde
23 2200CST 0 0 Tropical Depression
1000CST
The remnants of Tropical Depression Two stalled over the Big Bend area and produced up to 18 inches of rain in Del Rio. Wind gusts of 35 knots (40 mph) and minimum sea-level pressure of 1015 mb were reported at Del Rio. The main effect of T.D. #2, flash flooding on San Felipe Creek, resulted in 9 fatalities (drowning), and 150 injuries. For a complete description of the flash flooding impacts, refer to the Flash Flood event for September 23, 2006.

49 Tropical Storm (Z). A tropical cyclone in which the 1-minute sustained surface wind ranges from 34 to 63 knots (39 to 73 mph). A Tropical Storm should be included as an entry when these conditions are experienced in the WFO's CWA.

The tropical storm may be associated with many individual hazards, such as storm tide, freshwater flooding, tornadoes, debris flows, rip currents, etc. These individual hazards and their associated fatalities, injuries, and damage amounts are not to be included as part of the Tropical Storm event type. Rather, these individual hazards are to be entered as separate events. However, do include this information in the Tropical Storm narrative to ensure a complete

synopsis. Refer to section 25 for additional information that may be applicable for tropical storms, as well as their associated individual hazards (section 25.1).

Tropical cyclones can move well inland and create damaging winds. In these situations, it can be difficult to determine the event type to use. Inland offices should use either Tropical or Wind event type based on the products issued during the event. The *Storm Data* event type would be Tropical Storm if Hurricane Local Statements were issued during the event. The event type would be Strong Wind or High Wind if a wind advisory or high wind warning were issued for a tropical cyclone or the remnants of a cyclone that moved into the area.

Storm Data preparers may reference NHC's Tropical Cyclone Reports (TCR) or the NHC product archive (found on-line at hurricanes.gov/archive) for information on the storm history, track and intensity of a storm. The landfall intensity/location may change from what was indicated in real time during the event. They may coordinate with the NHC staff if there are additional questions.

If a hurricane produces only winds as high as tropical storm-force winds within a particular CWA, the entry should be made under Tropical Storm. If a hurricane produces only winds as high as tropical depression strength within a particular CWA, the entry should be made under Tropical Depression. However, such entries should include a reference to the hurricane in the narrative section, e.g., "Hurricane Dennis produced tropical storm force winds in ...".

The following information explains the content of the Tropical Storm entry:

Beginning Time - When the direct effects of the tropical storm were first experienced.

Ending Time - When the direct effects of the tropical storm were no longer experienced.

Direct Fatalities/Injuries:

- Fatalities/injuries caused by wind-driven debris or structural failure due to the winds.
- Wind caused a tree to blow onto someone.

Indirect Fatalities/Injuries:

- Someone suffered a heart attack while removing debris.
- Someone was electrocuted by touching downed power lines.
- Someone was killed in a vehicle accident caused by a tropical storm-related missing traffic signal.

Example:

FLZ007>019- Inland Walton - Coastal Walton - Holmes - Washington - Jackson - Bay -
026>028 Calhoun - Gulf - Franklin - Gadsden - Leon - Jefferson - Madison - Liberty –
Taylor - Wakulla

21 1800EST	**0**	**0**	**1M**	**100K**	**Tropical Storm**
23 0000EST					

Tropical Storm Helene made landfall near Fort Walton Beach during the late morning hours of September 22. Storm total rainfall ranged from a half inch at Perry to 9.56 inches at Apalachicola. The highest sustained wind of 39 knots (45 mph) with a peak gust of 56 knots (65 mph) was recorded at Cape San Blas. The lowest sea-level pressure was 1011 mb at Panama City. Coastal storm tides of 2 feet or less above astronomical tide levels were common, with only minor beach erosion reported. Near the coast, as well as inland, many properties, homes, and businesses sustained wind damage. No fatalities or injuries were attributed to the winds. All of the associated effects of Helene resulted in 4 fatalities, 13 injuries, $3.0M in property damage, and around $1.0M in crop damage. Specifically, Helene's flood waters in the Florida Panhandle resulted in 2 fatalities, 3 injuries, $1.0M in property damage, and $750K in crop damage. The nine associated tornadoes resulted in 2 fatalities, 10 injuries, $1M in property damage, and $150K in crop damage. The powerful winds caused $1M in property damage and $100K in crop damage. The storm surge along the coast resulted in $500K in property damage.

50 Tsunami (Z). A series of very long waves generated by any rapid, large-scale disturbance of the sea (e.g., an underwater earthquake, landslide, or volcanic eruption) resulting in a fatality, injury or damage. When the wave reaches the coast, a tsunami may appear as a rapidly rising or falling tide, a series of breaking waves, or even a bore. The event narrative should include the source of the Tsunami event (e.g., 8.5 magnitude earthquake near the western coast of Chile), the height and time of the maximum wave, and the inland distance of inundation. Any other characteristics, such as the observation of water draining from bays should be included.

Beginning Time - When the water level first began to change rapidly.

Ending Time - When the water level returned to near normal.

Direct Fatalities/Injuries
- A coastal dwelling was washed away injuring or killing the occupants.
- A person drowned when a vehicle was swept away.

Indirect Fatalities/Injuries
- A person suffered a heart attack while evacuating.
- After the tsunami, a person died when the house he returned to collapsed.

Example:

HIZ008 South Hawaii including Kauna Point
07 0600HST 0 0 5M Tsunami
1000HST
A tsunami wave affected coastal sections of the south and east shores of the Big Island of Hawaii from Hilo Harbor to Kauna Point. The tsunami resulted from an 8.3 earthquake that occurred off the coast of Chile. Tide gauges located on

buoys 150 miles SE of the Big Island of Hawaii reported a 2-inch rise as the tsunami passed. A 20-foot wave at Punaluu Harbor was the highest of three waves that occurred over a 2-hour and 20-minute period. The wave went inland as far as 1/2 mile. The height of the waves ranged from 5 feet at Hilo Harbor on the east coast to 20 feet at Punaluu Harbor on the southeast coast to 3 feet near Kauna Point on the southwest coast. There were no deaths or injuries, but several marinas were heavily damaged and coastal roads were flooded. These damages amounted to $5.0 million.

51 Volcanic Ash (Z). Fine particles of mineral matter from a volcanic eruption which can be dispersed long distances by winds aloft, resulting in fatalities, injuries, damage, or a disruption of transportation and/or commerce.

Beginning Time - When volcanic ash began to cause disruption to transportation, commerce, fatality, injury, or damage.

Ending Time - When volcanic ash stopped falling.

Direct Fatalities/Injuries

- People who were asphyxiated due to high ash content in the air. (Rare)
- People who were involved in aircraft accidents due to ash being ingested into the engines.

Indirect Fatalities/Injuries

- Vehicular accidents caused by reduced visibility and slippery roads due to volcanic ash fall, or due to falls while walking through volcanic ash.

Example:

WAZ040 Southern Cascade Foothills
10 1800PST 0 0 Volcanic Ash
2100PST

A minor eruption of Mt. St. Helens caused ash to rise about 10,000 feet into the atmosphere. The ash drifted to the southwest and fell in the southern Cascade foothills. State Highway 503 became slippery when it was covered with ash, which caused a head-on collision of two vehicles. One person was killed (indirect fatality) and the other seriously injured (indirect injury).

52 Waterspout (M). A rotating column of air, pendant from a convective cloud, with its circulation extending from cloud base to the water surface of bays and waters of the Great Lakes, and other lakes with assigned Marine Forecast Zones. A condensation funnel may or may not be visible in the vortex.

A vortex that moves over both water and land will be characterized as a Waterspout for that portion of its path over the water surface of an assigned Marine Forecast Zone, and a Tornado for

its path over the land. A vortex over any water surface not designated as an official marine zone will be entered as a Tornado.

Note: Direct fatalities related to a marine vessel will be coded as BO (Boating), not IW (In Water).

Beginning Time - When a waterspout was first reported to exist.

Ending Time - When a waterspout was last reported to exist.

Direct Fatalities/Injuries
- A waterspout capsized a small boat, drowning the occupant.
- A waterspout blew a vehicle off a bridge and the driver drowned.

Indirect Fatalities/Injuries
- A boater fleeing a waterspout crashed into a breakwater.
- A boater suffered a heart attack after sighting a waterspout.

Examples:

LMZ654

2 E Port Washington	**18**	**1835CST**			**0**	**0**		**Waterspout**

A brief waterspout was spotted over Lake Michigan a couple miles offshore of Port Washington. The distance was estimated.

GMZ053

Craig Key to West end of 7 Mile Bridge FL	**10**	**1200EST 1206EST**			**0**	**2**	**50K**	**Waterspout**

A large waterspout from the Florida Straits moved across a marina at Marathon damaging three sailboats and injuring two people.

52.1 Example of a Tornado That Became a Waterspout (Body of Water with Assigned Marine Forecast Zone).

St. Louis County

2 E Arnold to 1 S French River	**28**	**1651CST 1655CST**	**4.4**	**60**	**0**	**0**	**100K**	**Tornado (EF1)**

A tornado touched down north of Duluth. A barn and an outbuilding were destroyed (DI 1, DOD 8) and trees were damaged. The tornado reached the shore of Lake Superior just south of French River, and then curved northeast as a waterspout moving toward Two Harbors.

LSZ144

1 S French River to Two Harbors	**28**	**1655CST 1705CST**			**0**	**0**		**Waterspout**

This waterspout initially began as a tornado in St. Louis County near Arnold. It crossed over the Lake Superior shoreline just south of the village of French River, and then curved northeast toward Two Harbors. No marine-related damage was noted.

52.2 Example of a Waterspout (Body of Water with Assigned Marine Forecast Zone) That Became a Tornado.

Lake County
.5 S Two Harbors 28 1705CST 2.5 25 0 0 250K Tornado (EF1)
to 2N Two Harbors 1707CST

A waterspout on Lake Superior moved onshore as a tornado just south of Two Harbors. The tornado continued on the ground for about 2.5 miles before dissipating. A small building was destroyed (DI 1, DOD 8) and a cottage damaged near where the tornado came onshore. The tornado damaged four more homes and downed around three dozen trees before finally dissipating. The damage path was no more than 25 yards in width.

53 Wildfire (Z). Any significant forest fire, grassland fire, rangeland fire, or wildland-urban interface fire that consumes the natural fuels and spreads in response to its environment. "Significant" is defined as a wildfire that causes one or more fatalities, one or more significant injuries, and/or property damage (optional: include significant damages to firefighting equipment if loss estimates are available). Professional judgment should be used in deciding to include a Wildfire in *Storm Data*. In general, forest fires smaller than 100 acres, grassland or rangeland fires smaller than 300 acres, and wildland use fires not actively managed as wildfires should not be included. This is consistent with the definitions for significant and/or large fires utilized by most land use agencies.

Beginning Time - When a forest fire, grassland fire, rangeland fire, or wild land/urban-interface fire became out of control.

Ending Time - When a wildfire became under control.

Direct Fatalities/Injuries

- A wildfire swept through a campground. Two campers died when their RV was consumed by fire.
- A man drove into an evacuated area to try and save belongings from a cabin that was threatened by a wildfire. The man died when fire burned the cabin to the ground.
- People who were asphyxiated due to smoke inhalation.
- Firefighters who suffer heat exhaustion or smoke inhalation will be considered injuries, whether they are treated at the scene or transported to the hospital.

Indirect Fatalities/Injuries

- All vehicular accidents caused by reduced visibility due to smoke.

Example:

MTZ005-006 Missoula/Bitterroot Valleys-Bitterroot

06 1500MST 0 0 8M Wildfire
31 1500MST

Dry lightning and strong winds started fires which spread into urban areas of the southern part of the county. Structural damage from fires occurred from August 6-8, but fires raged to the end of the month with a total of 335,356 acres burned. Sixty-four residences and cabins were destroyed, and five were partially destroyed. A total of 164 outbuildings and 87 vehicles were destroyed.

54 Winter Storm (Z). A winter weather event that has more than one significant hazard (i.e., heavy snow and blowing snow; snow and ice; snow and sleet; sleet and ice; or snow, sleet and ice) and meets or exceeds locally/regionally defined 12 and/or 24 hour warning criteria for at least one of the precipitation elements. If the event that occurred is considered significant, even though it affected a small area, it should be entered into *Storm Data*. Normally, a Winter Storm would pose a threat to life or property.

In cases of winter storms, the preparer should be careful to classify the event properly *in Storm Data*. In general, the event should be classified as a Winter Storm event (rather than an Ice Storm event or a Heavy Snow event) only if more than one winter precipitation type presented a significant hazard.

Some Winter Storm and Blizzard events may have had sustained or maximum wind gusts that met or exceeded High Wind criteria. Rather than document an additional High Wind event, the *Storm Data* preparer should just mention the time, location, and wind value in the Winter Storm or Blizzard event narrative. This is permissible even if only light snow and minor blowing snow (no serious reduction in visibility below 3 miles) occurred with the high winds, as long as the high wind report is deemed reliable, and was generated by the same synoptic storm system that resulted in the Winter Storm or Blizzard event. This scenario would be most likely in the mountains of the western United States.

Beginning Time - The time when accumulating precipitation (measurable) began.

Criteria Time - The time when the winter storm first met or exceeded locally or regionally defined warning criteria.

Ending Time - The time when precipitation stopped accumulating.

Direct Fatalities/Injuries

- The weight of snow and ice caused a machine shed roof to collapse, killing a farmer.

Indirect Fatalities/Injuries

- All vehicle-related fatalities or injuries due to poor visibility and/or slippery roads.

Example:

WVZ033>035-042>044 McDowell - Mercer - Monroe - Raleigh - Summers – Wyoming **Winter Storm**
01 1500EST 0 0
02 1800EST
The New Year started off with a major winter storm. A combination of snow, sleet, and freezing rain began around 1400MST, started to accumulate about 1500MST, and eventually left about 10 inches of frozen precipitation on the ground across the area. Transportation came to a stop for much of the holiday weekend.

55 Winter Weather (Z). A winter precipitation event that causes a death, injury, or a significant impact to commerce or transportation, but does not meet locally/regionally defined warning criteria. A Winter Weather event could result from one or more winter precipitation types (snow, or blowing/drifting snow, or freezing rain/drizzle). The Winter Weather event can also be used to document out-of-season and other unusual or rare occurrences of snow, or blowing/drifting snow, or freezing rain/drizzle. If the event that occurred is considered significant, even though it affected a small area, it should be entered into *Storm Data*.

Note that, in *Storm Data*, Blizzard events should cover a time period of 3 hours or more. Therefore, if blizzard-like conditions occur for less than 3 hours, the event should be entered as a Winter Storm, Heavy Snow, or Winter Weather, noting in the event narrative that near-blizzard or blizzard-like conditions were observed at the height of the event. WFOs will use a Winter Weather event type entry for Snow Squalls as well, until such a time when Snow Squall is designated a separate event type; the Event Narrative will begin with the words "Snow Squall", in similar format to their LSR entry, per guidance shared by the NWS Winter Weather program.

Beginning Time - Time when winter weather precipitation started to accumulate or phenomena, such as blowing snow, began.

Ending Time - Time when the winter weather precipitation stopped accumulating or phenomena ended.

Direct Fatalities/Injuries

- A vehicle gets stuck in a snow drift and the driver attempts to walk to a shelter but is overcome by the weather elements and dies from exposure.

Indirect Fatalities/Injuries

- Almost all vehicle-related fatalities/injuries due to snow or ice covered roads, hazardous driving conditions, and visibility restrictions.
- Any vehicle accident involving a snow plow.

Examples:

MAZ001>004 Berkshire - Western Franklin - Eastern Franklin - Northern Worcester **Winter Weather**

06 0500EST 0 0
1900EST

A period of freezing drizzle and freezing rain led to a thin layer of ice or glaze over northwest Massachusetts. There were numerous car accidents with minor injuries (indirect) due to the icy conditions, especially along Highways 2 and 202.

SCZ047>049 Jasper - Beaufort - Southern Colleton **Winter Weather**

01 1800EST 0 0
2200EST

A mixture of freezing rain, sleet, and snow brought hazardous travel conditions to sections of southern South Carolina. Although the accumulation of ice was small, (less than 1/8 inch), the combination of elements led to accidents, especially along Interstate 95.

NDZ014-015 Benson – Ramsey **Winter Weather**

12 2200CST 0 0
13 0300CST

Strong winds and fresh snow caused blowing snow to lower visibilities to 1/4 to 1/2 mile at times overnight. Several cars were stranded along County Road 5 in Benson County.

KYZ004-005 Ballard - McCracken **Winter Weather**

16 1300CST 0 0
2200CST

Slippery driving conditions caused by an extended period of sleet led to numerous car accidents across extreme western Kentucky. The worst conditions were around Paducah where slick streets led to multi-car accidents and the closing of some highways around town.

PAZ001-002 Northern Erie - Southern Erie

25 1400EST 0 0 **Winter Weather**
2000EST

Slippery roads caused by 4 to 5 inches of snow led to numerous accidents and minor injuries (indirect) across Erie County in northwest Pennsylvania. Two school buses collided on a snow-covered hill just east of Fairfield, but no one was seriously injured.

APPENDIX B - Glossary of Terms

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County Warning Area (CWA) - The geographical area of responsibility assigned to a WFO for providing warnings, forecasts, and other weather information. Sometimes referred to as County Warning and Forecast Area.

Enhanced Fujita-Scale - A 0 to 5 rating of a tornado's observed damage. Since structural design determines damage, probable wind speeds are associated with each EF-Scale number. There are 28 Damage Indicators (DI), each with varying numbers of Degree of Damage (DOD) that are utilized in determining each EF-rating.

Header-strip - Bold-faced lines of text and numbers at the beginning of each *Storm Data* entry, providing specific information on the time and character of the weather event. This includes location, beginning and ending times, deaths, injuries, property and crop damage, and type of event. In some cases, it also includes the Universal Generic Code and the magnitude of the event, i.e., hail size and tornado EF-Scale.

Modified Saffir/Simpson Hurricane Wind Scale - A rating scale of the intensity of a tropical cyclone for the Western North Pacific. The scale has two categories for below typhoon intensity (tropical depression and tropical storm) and 5 typhoon categories. This scale provides examples of the type of damage and impacts associated with winds of the indicated intensity. The scale does not address the potential for other related impacts, such as storm surge, rainfall-induced floods, and tornadoes.

Saffir/Simpson Hurricane Wind Scale - A 1 to 5 rating of a hurricane's intensity. This scale provides examples of the type of damage and impacts associated with winds of the indicated intensity. The scale does not address the potential for other related impacts, such as storm surge, rainfall-induced floods, and tornadoes.

Storm Data - NOAA's official publication which documents the occurrence of storms and other significant natural hazards having sufficient intensity to cause loss of life, injuries, significant property damage, and/or disruption to commerce.

***Storm Data* Software** - The on-line software program that documents specifics and narratives of significant or unusual weather events. Data is transferred from WFOs to the Performance and Evaluation Branch in OCOO for use in the NWS verification program and to the NCEI for publication of *Storm Data*. Also referred to as StormDat.