Jones Patrick

From: Eick Donald
Sent: Thursday, July 19, 2012 6:28 AM
To: Jones Patrick
Cc: Lawrence David; Lawrence David; Soper Brian
Subject: WPR12FA305 - Richfield, UT, SR22 accident, N86AA
Attachments: WPR12FA305-IR1730Z.GIF; WPR12FA305-VIS1730Z.GIF; KICX 0.5deg base reflectivity at 1727Z.png

Updated Weather Study - best I can give you. Bases 9,000 feet tops 27,000 feet with light rain.

Weather on July 14, 2012 - WPR12FA305

Synoptic conditions – the NWS Surface Analysis Chart for 0900 MDT (1500Z) on July 14, 2012 depicted a low pressure system over central California at 1011-hectopascals with a trough of low pressure running north-south across California. A high pressure system at 1016-hPa was depicted over southern Nevada. Over Utah another low pressure system at 1012-hPa was depicted over the northern portion of the state with a high pressure ridge over the southern portion of the state. The station model over southern Utah closest to the accident site indicated southerly wind at 10 knots, light rain, overcast clouds, temperature 54° Fahrenheit (F), dew point temperature of 53° F.

Observations – no close ASOS/AWOS stations in the vicinity. The closest official weather reporting station was from **Carbon County Regional Airport (KPUC), Price, Utah**, located approximately 56 miles northeast of the accident site at an elevation of 7,590 feet. The airport had an ASOS with a magnetic variation of 14° East. The following conditions were reports:

METAR KPUC 141553Z AUTO 00000KT 10SM -RA FEW036 BKN055 OVC090 17/14 A3026 RMK AO2 RAB33 SLP194 P0000
T01720144=
METAR KPUC 141653Z AUTO 00000KT 10SM -RA OVC085 18/15 A3026 RMK AO2 RAE07B31 SLP189 P0001 T01830150=
Accident 1729Z
METAR KPUC 141753Z AUTO 00000KT 10SM SCT070 BKN110 19/15 A3026 RMK AO2 RAE36 SLP182 P0000 60005 T01940150
10194 20161 50001=

Bryce Canyon Airport (KBCE) located 75 miles south of the accident site in Bryce Canyon, Utah, at an elevation of 7,590 feet and a variation of 14° E reported the following conditions:

METAR KBCE 141453Z AUTO 13009KT 8SM -RA SCT004 OVC075 12/12 A3034 RMK AO2 RAB1359 SLP170 P0013 60014
T01220117 51007 TSNO=
SPECI KBCE 141502Z AUTO 13009KT 6SM -RA BR BKN004 BKN010 OVC070 12/12 A3034 RMK AO2 P0000 TSNO=
SPECI KBCE 141522Z AUTO 15008KT 3/4SM BR OVC004 12/12 A3036 RMK AO2 RAE21 P0000 TSNO=
SPECI KBCE 141530Z AUTO 15007KT 1/4SM FG VV003 12/12 A3036 RMK AO2 RAE21 P0000 TSNO=
SPECI KBCE 141549Z AUTO 17006KT 1 1/4SM BR BKN002 OVC006 12/12 A3036 RMK AO2 RAE21 P0000 TSNO=
SPECI KBCE 141551Z AUTO 15006KT 4SM BR OVC002 12/12 A3036 RMK AO2 RAE21 P0000 TSNO=
METAR KBCE 141553Z AUTO 16007KT 9SM OVC002 13/12 A3036 RMK AO2 RAE21 SLP178 P0000 T01280122 TSNO=
SPECI KBCE 141643Z AUTO 14008KT 2SM BR OVC002 13/13 A3036 RMK AO2 TSNO=
METAR KBCE 141653Z AUTO 14009KT 6SM BR BKN002 OVC008 13/13 A3036 RMK AO2 SLP178 T01330128 TSNO=
SPECI KBCE 141707Z AUTO 15010KT 4SM BR BKN002 OVC008 14/13 A3036 RMK AO2 TSNO=

Accident 1729Z
SPECI KBCE 141742Z AUTO 15008KT 10SM -RA SCT004 SCT070 OVC080 14/13 A3035 RMK AO2 RAB36 P0000 TSNO=
SPECI KBCE 141821Z AUTO 13011KT 10SM BKN004 OVC010 14/13 A3036 RMK AO2 RAE00 P0000 TSNO=
SPECI KBCE 141839Z AUTO 14010KT 1 3/4SM +RA BR BKN004 OVC008 13/13 A3036 RMK AO2 VIS 1V3 RAE00B25 P0005
TSNO=

TAF current at the time of departure:

KBCE 141425Z 1414/1512 16005KT P6SM -RA SCT030 BKN060
TEMPO 1414/1416 2SM RA BR BKN030
FM141700 20014G22KT P6SM VCTS SCT060CB BKN090
TEMPO 1420/1424 VRB15G25KT -TSRA SCT040 BKN060CB
FM150200 27009KT P6SM VCSH SCT070 BKN090=

KBCE 141612Z 1416/1512 16005KT P6SM VCSH SCT030 BKN060
TEMPO 1416/1417 BKN002
FM141700 20014G22KT P6SM VCTS SCT060CB BKN090
TEMPO 1420/1424 VRB15G25KT -TSRA SCT040 BKN060CB
FM150200 27009KT P6SM VCSH SCT070 BKN090=

A review of the **Mesowest data** for remote weather observation equipment indicated several sites within 30 miles of the accident site. The closest site at Joes valley at 8,700 feet located 28 miles north of the accident site and under similar conditions based on the satellite image reported a temperature of 53° F, dew point of 51° F, and a relative humidity of 94% and indicated reduced visibility and/or a ceiling less than 1,000 feet supporting mountain obscuration conditions. The wind was from the south-southwest at 5 knots.

Pilot Reports (UA) – the following recorded surrounding the period:

4HV UA /OV HVE270015 /TM 1545 /FL085 /TP PA30 /SK BKN110 /WX FV40SM /TB NEG=
CDC UA /OV CDC-MLF/TM 1555/FL120/TP CRJ2/TA NA/IC LGT RIME 120-130/RM BASE 090 ZLC=
MLF UA /OV CDC360020 /TM 1738 /FL075 /TP BE35 /TB OCNL LGT /RM MTN OBSCD W=
ENV UA /OV BVL 270030/TM 1741/FL410/TP C501/RM TOPS 410 ZLC=
U24 UA /OV CDC-FOM360015 /TM 1825 /FL075 /TP BE35 /TB NEG=
VEL UA /OV MTU 269057-MTU 269047/TM 2245/FL130/TP BL17/TB MOD/RM MOD TO HEAVY PRECIP/ZLC=
PUC UA /OV 69V /TM 2302 /FL083 /TP C210 /SK OVC090 /WX FV99SM /RM SMOOTH ISOLATED SHOWERS ALQDS=

Satellite Imagery – the GOES-15 infrared and visible images at 1130 MDT (1730Z) are attached. The images depicted an enhanced area of clouds associated with cumulus congestus type clouds (TCU) with a radiative cloud top temperature of 251° Kelvin or -22.16° Celsius (C), which corresponded to cloud tops near 27,500 feet.

Radar Imagery – The closest NWS WSR-88D was from Cedar City (KICX), Utah, located approximately 100 miles southwest of the accident site or at an azimuth of 42°. Based on the distance from the KICX WSR-88D with an antenna height of 10,757 feet, the center of the 0.5° beam was at 22,685 feet with the base at 17,648 feet and top of the beam at 27,723 feet, with the width of the beam at 10,075 feet. The 0.5 base reflectivity image for 1127 MDT (1727Z) depicted an area of echoes with a maximum reflectivity of 25 to 30 dBZ or light intensity echoes along the flight track with the accident site on the eastern edge of the echoes. The echoes were noted moving northward with time at approximately 20 knots. The echoes were consistent with rain showers and implied that the accident airplane was operating through an area of rain showers immediately prior to the accident site. (image attached)

Lightning Data – a review of total lightning from 1100 to 1130 MDT (1700Z to 1730Z) indicated no lightning activity in the vicinity of the accident site. Confirming that rain showers and not thunderstorms were in the vicinity.

Area Forecast (FA) – the NWS Area Forecast issued at 05101 MDT (1110Z) for Utah expected scattered clouds at 12,000 feet, broken clouds at 15,000 feet with widely scattered rain showers and isolated thunderstorms with tops to 32,000 feet. The forecast was as follows for the route of flight:

FAUS45 KKCI 141110 CCA 2012196 1108
FA5W
-SLCC FA 141110 COR
SYNOPSIS AND VFR CLDS/WX
SYNOPSIS VALID UNTIL 150500
CLDS/WX VALID UNTIL 142300...OTLK VALID 142300-150500
ID MT WY NV UT CO AZ NM
.
SEE AIRMET SIERRA FOR IFR CONDS AND MTN OBSCN.
TS IMPLY SEV OR GTR TURB SEV ICE LLWS AND IFR CONDS.
NON MSL HGTS DENOTED BY AGL OR CIG.
.
SYNOPSIS...UPR LVL RIDGE AXIS 11Z WRN ND-ERN CO-CNTRL NM FCST DRIFT SLOLY EAST OVR NRN PLAINS THRU 05Z AND RMNDR NR STNR OVR NM THRU 05Z. UPR LOW 11Z NWRN OR WL MOV EWD INTO ERN OR AND BECMG TROF BY 05Z. AT SFC..NR STNR FNT NRN MT-NRN ID WL MOV LTL THRU 05Z. HI PRES RIDGE OVR WRN CO WL CHG LTL THRU 05Z.
.
NV
NWRN...SCT150. OTLK...VFR.
NERN...SCT-BKN 100-120. WDLY SCT -SHRA/ISOL -TSRA. CB TOPS FL400. AFT 19Z WDLY SCT -TSRA. CB TOPS FL450. OTLK...VFR TSRA.
SRN...SCT120 BKN150. TOPS FL280. WDLY SCT -SHRA/ISOL -TSRA. CB TOPS FL350. AFT 20Z WDLY SCT -TSRA. CB TOPS FL450. OTLK...VFR TSRA.
.
UT
SCT120 BKN150. TOPS FL280. WDLY SCT -SHRA/ISOL -TSRA. CB TOPS FL320. 20Z SCT-BKN120-140. TOPS FL300. WDLY SCT -TSRA. CB TOPS FL450. OTLK...VFR TSRA.
.
CO
MTNS AND WEST...SCT150 BKN CI. ISOL -SHRA/-TSRA. CB TOPS FL300. AFT 19Z SCT120 BKN150. TOPS FL300. WDLY SCT -SHRA/-TSRA. CB TOPS FL450. OTLK...VFR.
PLAINS...BKN CI. 21Z SCT150 BKN CI. ISOL TSRA. CB TOPS FL450. OTLK...VFR TSRA.
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In-Flight Weather Advisories – The NWS had the following advisories current over the region: A Convective SIGMET 54W for an area of embedded thunderstorms in the area immediately south of the accident site moving north at 20 knots with tops to 43,000 feet, and an AIRMET for mountain obscuration.

Convective SIGMETs
-MKCW WST 141655
CONVECTIVE SIGMET 52W
VALID UNTIL 1855Z
OR WA
FROM 40S GEG-30WNW BKE-50ENE PDX-30W YKM-40S GEG
AREA TS MOV LTL. TOPS TO FL380.
CONVECTIVE SIGMET 53W
VALID UNTIL 1855Z
UT ID NV

FROM 30E TWF-30N BVL-40W BVL-20WSW TWF-30E TWF
AREA EMBD TS MOV FROM 19020KT. TOPS TO FL430.
CONVECTIVE SIGMET 54W
VALID UNTIL 1855Z
AZ UT
FROM 40SW HVE-60NE TBC-40WSW INW-10SE DRK-20NE BCE-40SW HVE
AREA EMBD TS MOV FROM 19020KT. TOPS TO FL430.
OUTLOOK VALID 141855-142255
FROM 30SE YDC-HVR-DDY-FTI-SJN-SSO-50S TUS-BZA-BAM-BOI-YKM-30SE YDC
WST ISSUANCES POSS. REFER TO MOST RECENT ACUS01 KWNS FROM STORM PREDICTION CENTER FOR SYNOPSIS AND METEOROLOGICAL DETAILS.

AIRMETs

WAUS45 KKCI 141445 2012196 1431
WA5S
-SLCS WA 141445
AIRMET SIERRA UPDT 2 FOR IFR AND MTN OBSCN VALID UNTIL 142100
.
NO SGFNT IFR EXP OUTSIDE OF CNVTV ACT.
.
AIRMET MTN OBSCN...ID MT
FROM 70SE MLP TO 20NNE DLN TO 40SSE DLN TO 30NNW PIH TO 30SE DNJ TO 60SSW MLP TO 70SE MLP
MTNS OBSC BY CLDS/PCPN/BR. CONDS ENDG 15-18Z.
.
AIRMET MTN OBSCN...ID MT
FROM 50WSW YXC TO 40SSE YQL TO 40WNW GTF TO 70SE MLP TO 60SSW MLP TO 40E GEG TO 50WSW YXC
MTNS OBSC BY CLDS/PCPN/BR. CONDS ENDG 18-21Z.
.
AIRMET MTN OBSCN...UT AZ
FROM 30NE ILC TO 30W HVE TO 40NW TBC TO 40ENE DRK TO 30S DRK TO 20SSW PGS TO 80SSE ILC TO 30NE ILC
MTNS OBSC BY CLDS/PCPN. CONDS ENDG 15-18Z.
.
WAUS45 KKCI 141445 2012196 1433
WA5Z
-SLCZ WA 141445
AIRMET ZULU UPDT 2 FOR ICE AND FRZLVL VALID UNTIL 142100
.
NO SGFNT ICE EXP OUTSIDE OF CNVTV ACT.
.
FRZLVL...RANGING FROM 135-165 ACRS AREA
160 ALG 60SE LAA-TBE-50SSW PUB-60W PUB-20SSW LAR-60NW BFF-50NNW BFF
....
WAUS45 KKCI 141445 2012196 1432
WA5T
-SLCT WA 141445
AIRMET TANGO UPDT 2 FOR TURB VALID UNTIL 142100
.
NO SGFNT TURB EXP OUTSIDE OF CNVTV ACT.
.
OTLK VALID 2100-0300Z...TURB MT
BOUNDED BY 70SSW YYN-40NNW ISN-80SW DIK-20W MLS-70SSW YYN
MOD TURB BLW 080. CONDS DVLPG 21-00Z. CONDS CONTG THRU 03Z.

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Summary - The observations from Price, UT (KPUC) indicated multiple layers of clouds and rain showers with VFR conditions, while conditions at Bryce Canyon (KBCE) south of the accident site and at almost the same elevation of Price reported LIFR conditions due to rain, fog/mist, with ceilings broken to overcast between 200 and 400 feet agl at the time of the accident. Based on conditions at Bryce Canyon ceilings over the accident site may have been at 8,000 feet msl with visibility restricted in rain.

The RAWS site at Joes Valley at 8,700 feet msl did not have a visibility or ceilometer; however, the stattion reported a 94% relative humidity with a 1 degree temperature-dew point spread which supported low ceilings and/or visibility in rain/mist. Other RAWS sites in the higher elevation reported similar conditions.

A pilot report at 1138 MDT (1738Z) from a Beechcraft BE35 at 7,500 feet reported 20 miles north of Cedar City, UT, immediately west of the accident site that the mountains were obscurred. Conditions at Bryce Canyon also reported similar conditions with the 200 to 400 feet ceilings. Another report from a CRJ over the Cedar City area reported cloud bases at 9,000 feet with icing conditions between 12,000 and 13,000 feet. Other aircraft reported isolated rain showers in all quadrents, with some producing moderate to heavy precipitation.

The radar and satellite imagery depicted convective clouds over the route and the accident site with tops to 27,500 feet, with conditions very similar to what was observed over Bryce Canyon. The radar imagery from Cedar City (KICX), UY, 0.5 degree base reflectivity image was centered at 22,600 feet and depicted very light intensity echoes over the accident site and implied cumulus congestus clouds capable of producing rain showers and reducred visibility.

The NWS Aviation Weather Center's (AWC) Area Forecast expected scattered clouds at 12,000 feet msl and broken at 15,000 feet with tops to 28,000 feet. The forecast was amended by an AIRMET for mountain obscuration that extended over the route and the accident site.

The TAF for Bryce Canyon available to the pilot at the time of departure indicated a temporary period of IFR conditions in rain showers near the time of the accident. The TAF was amended at 1012 MDT (1612Z) to reflect actual conditions which was IFR with ceilings broken at 200 feet unil 1100 MDT with thunderstorms in the vicinity afterwards. The TAF did not verify to actual conditions during the period as IFR conditions prevailed during the entire period. The original forecasts implied VFR conditions would prevail, which did not verify based on observations.

Based on the information available, the accident airplane likely encountered instrument meteoroligical conditions (IMC) and mountain obscuration conditions. The most recent pilot report prior to the accident indicated cloud bases at 9,000 feet. The Cedar City WSR-88D depicted light intensity echoes over the route and over the accident site further defining some likely reducted visibility in light rain and extensive vertical developed clouds over the accident site.

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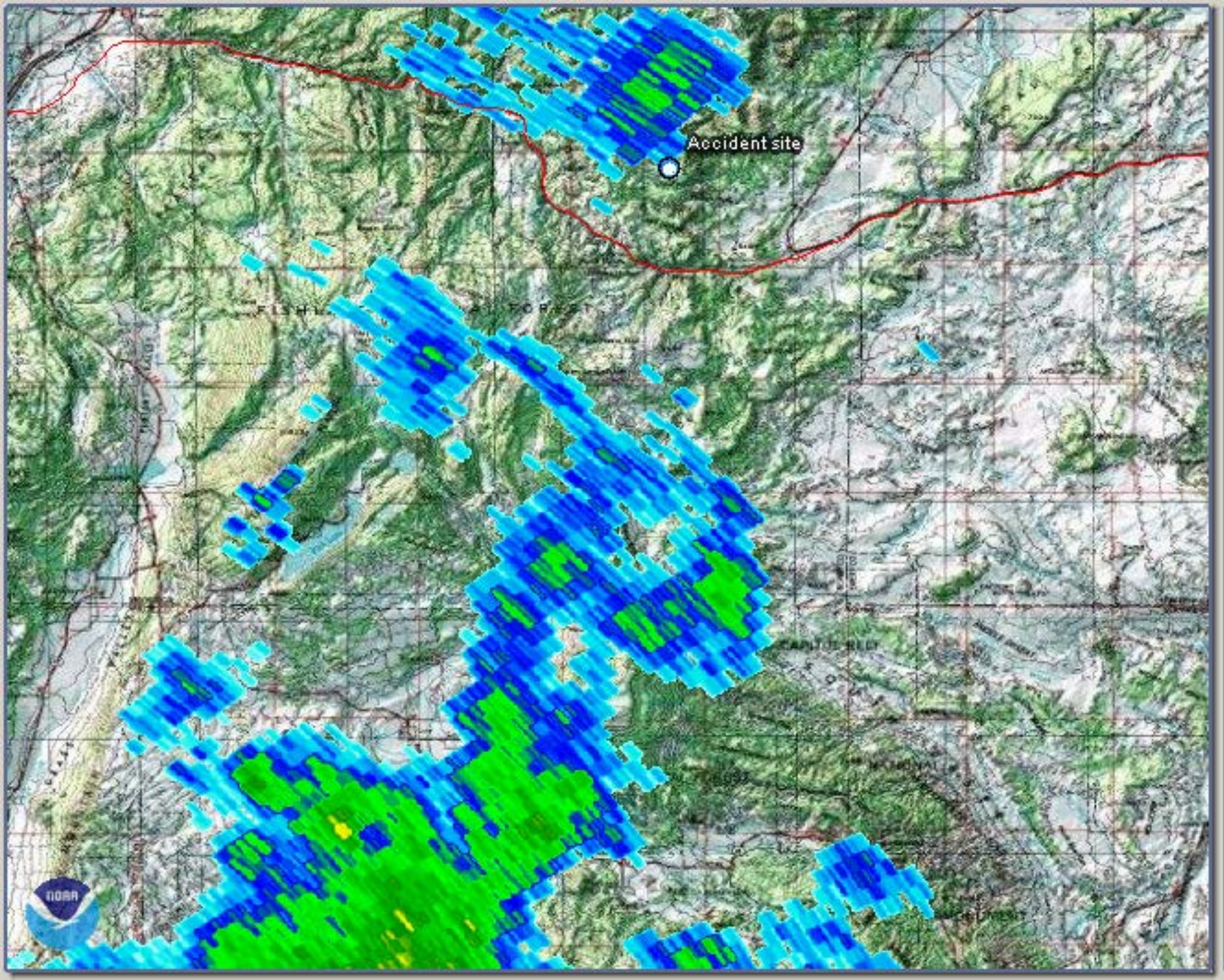


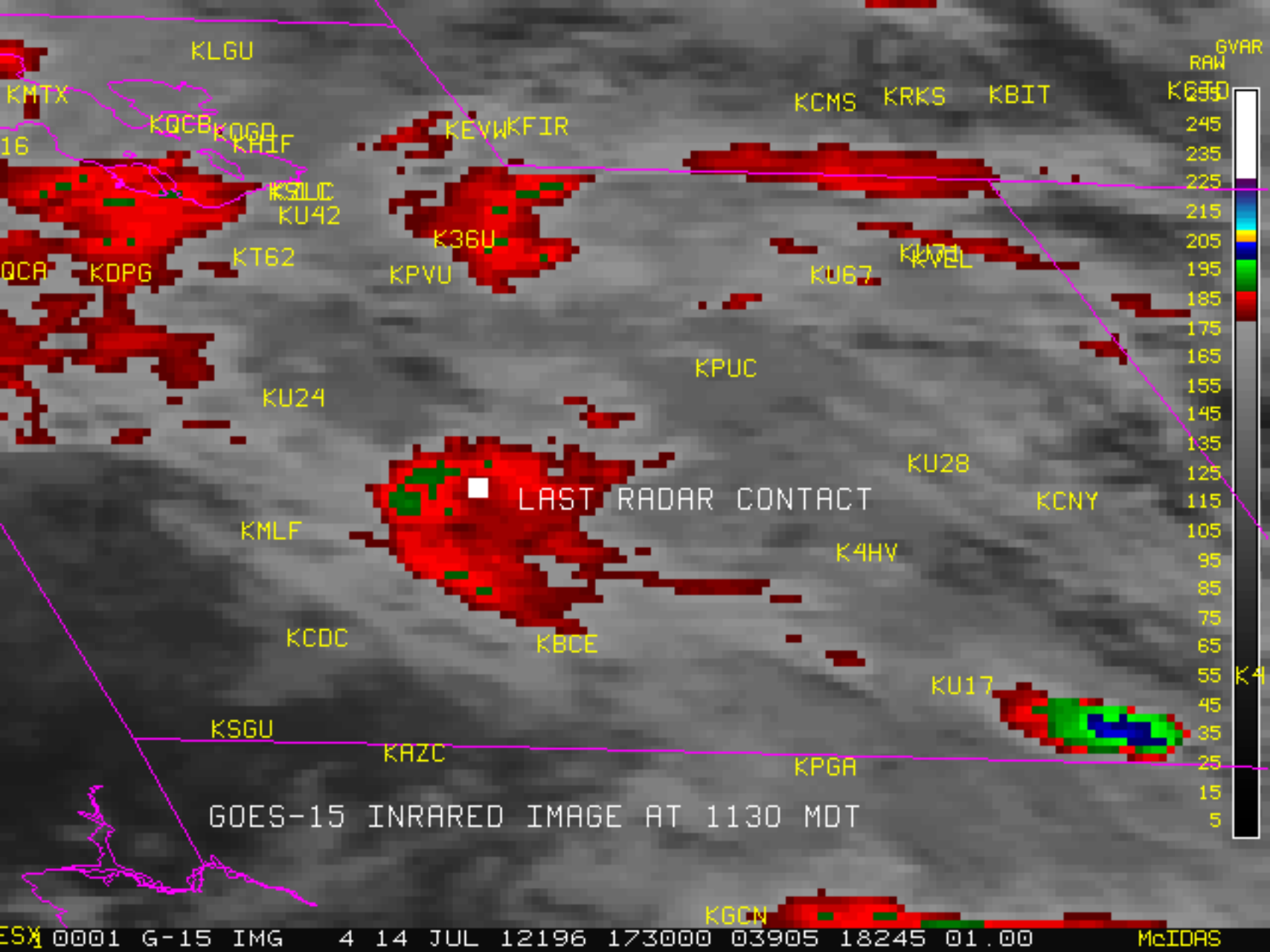
NEXRAD LEVEL-II
KICX - CEDAR CITY, UT
07/14/2012 17:27:20 GMT
LAT: 37/35/27 N
LON: 112/51/43 W
ELEV: 10600 FT
VCP: 212

REFLECTIVITY
ELEV ANGLE: 0.47

Legend: dBZ

75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
-10
-15
-20
-25

RF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KSLC
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KT62
KDPG
KPVU
KU67
KVEL
KPUC
KU24
KU28
LAST RADAR CONTACT
KCNY
KMLF
K4HV
KCDC
KBCE
KU17
KSGU
KAZC
KPGA
GOES-15 INRARED IMAGE AT 1130 MDT
KGCN
GVAR
RAW
255
245
235
225
215
205
195
185
175
165
155
145
135
125
115
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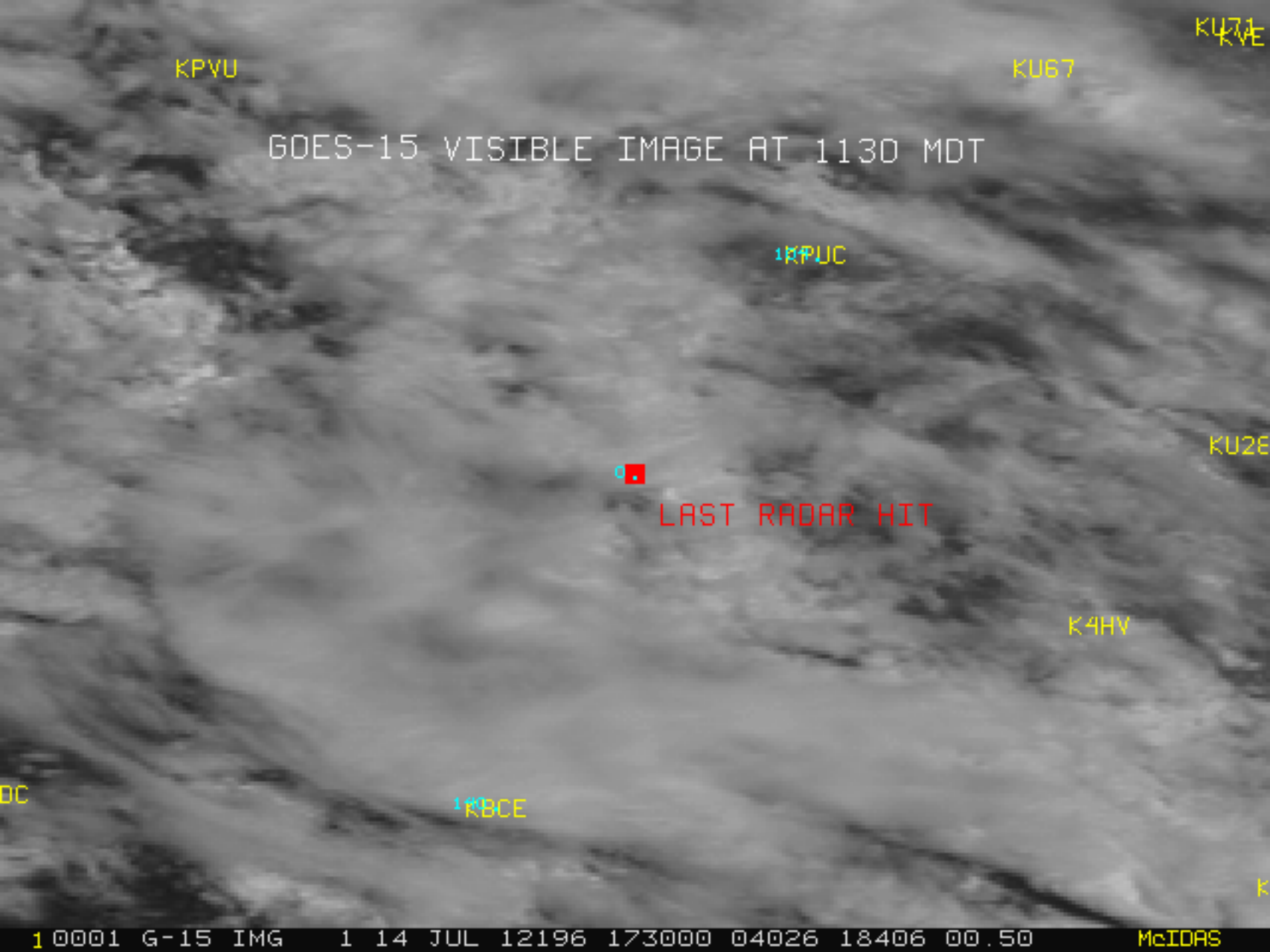
KPVU
KU67
GOES-15 VISIBLE IMAGE AT 1130 MDT
KPUC
LAST RADAR HIT
K4HV
KBCE
1 0001 G-15 IMG 1 14 JUL 12196 173000 04026 18406 00.50 McIDAS