

Factual Report – Attachment 7

Summaries of the accident day weather provided by LOX and of
an interview with LOX employees

METEOROLOGY

DCA20MA059

*Submitted by: Mike Richards
NTSB, AS-30*



Los Angeles-Area Weather Overview for January 26, 2020

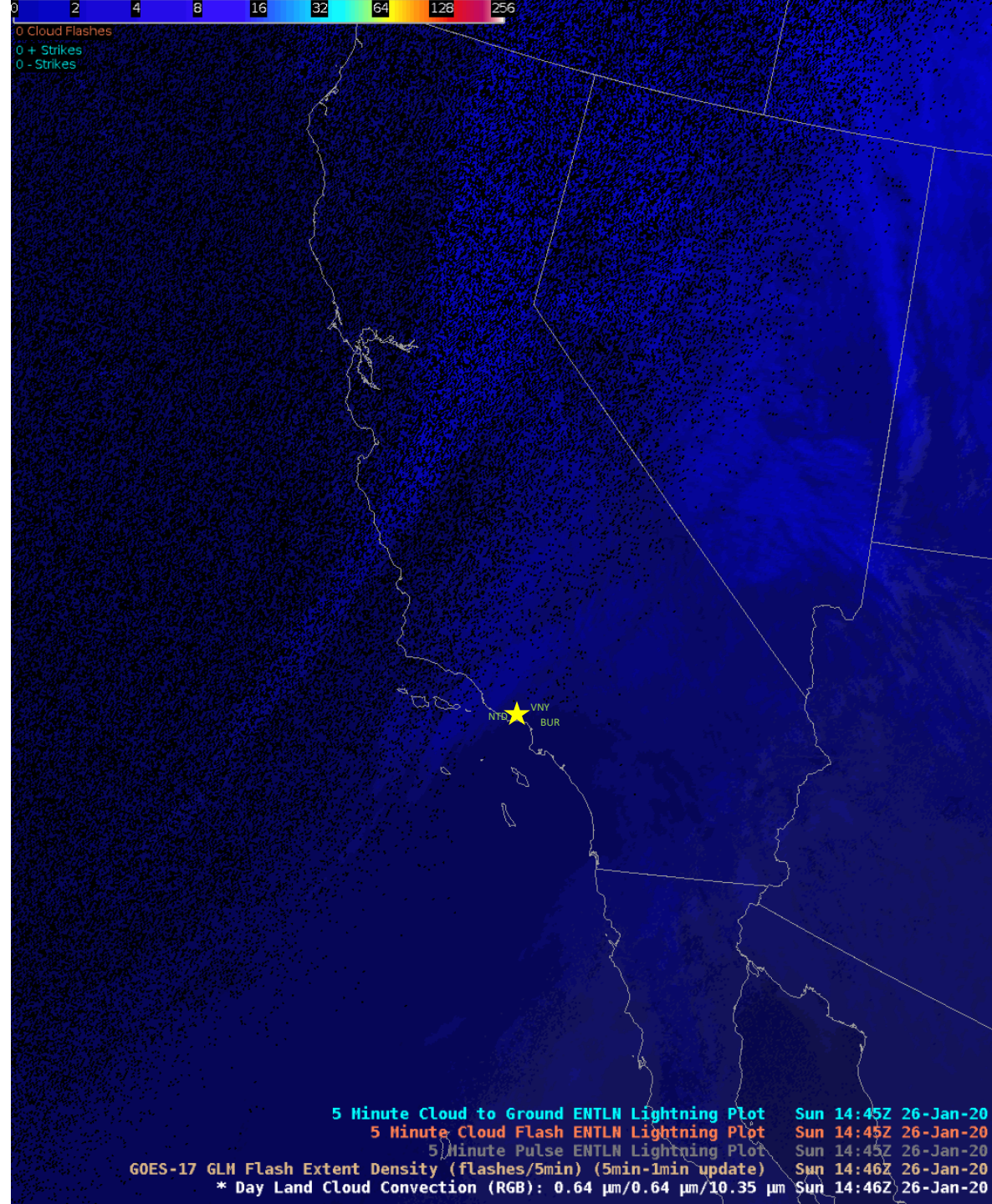
Mark Jackson

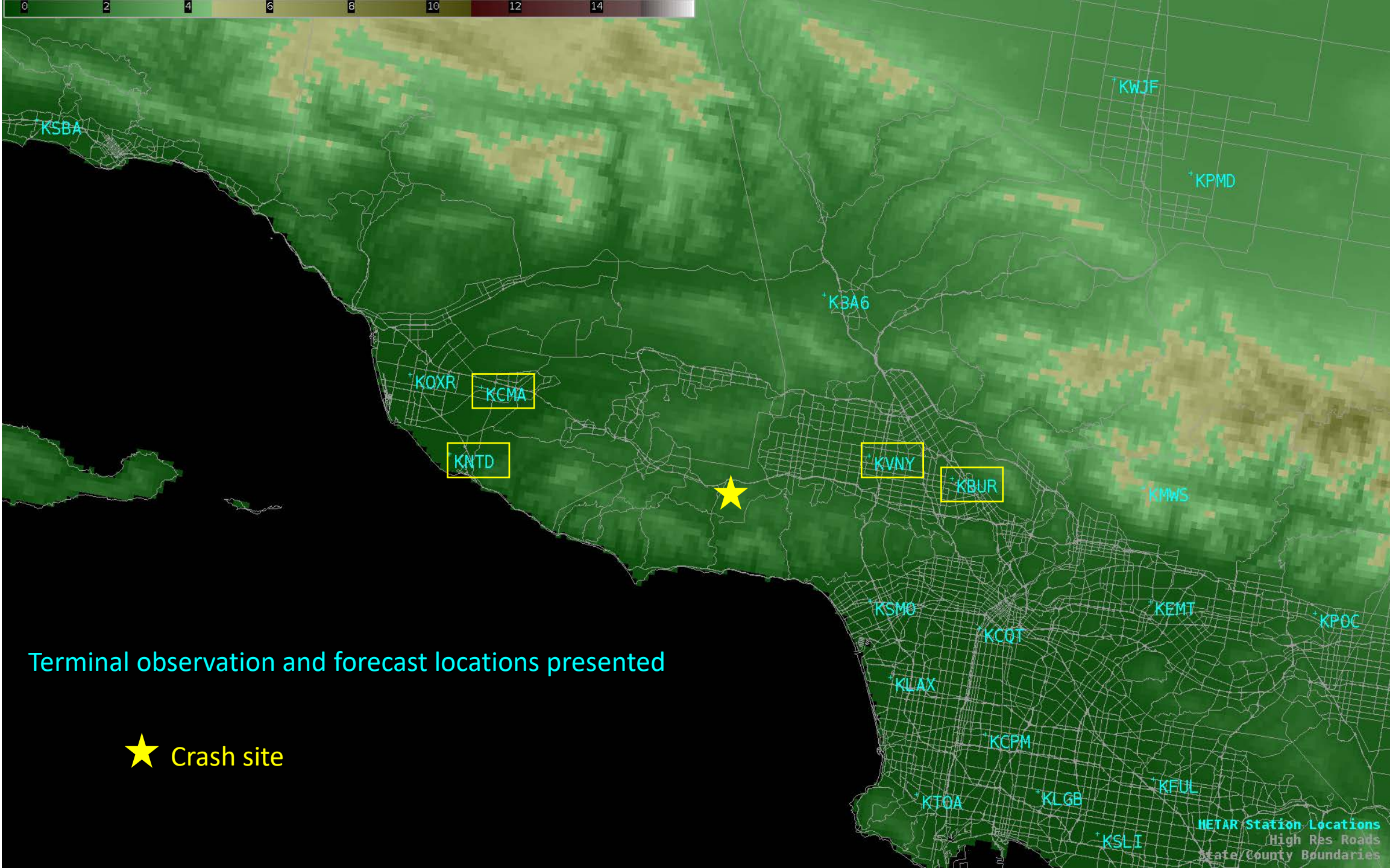
Meteorologist in Charge
NOAA/National Weather Service
Los Angeles/Oxnard, CA

Provided for NTSB Investigation of 26 Jan 2020 Helicopter Crash Near Calabasas, CA

Synopsis for Jan 26

- Approaching cold front from north
- Deepening marine layer (i.e., low cloud layer)
 - Top ~2100-2400 ft
 - Ceiling ~ 1100-1700 ft
 - Reports of light rain in morning
 - High confidence forecast as early as 1/24

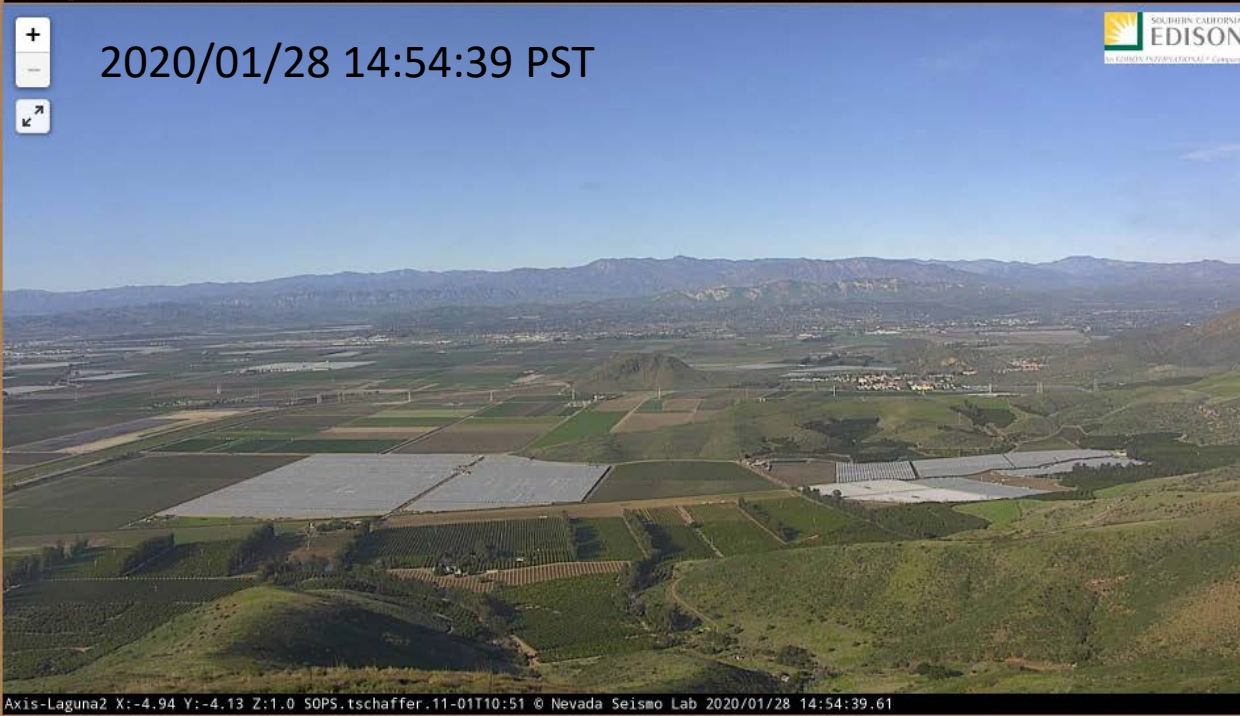
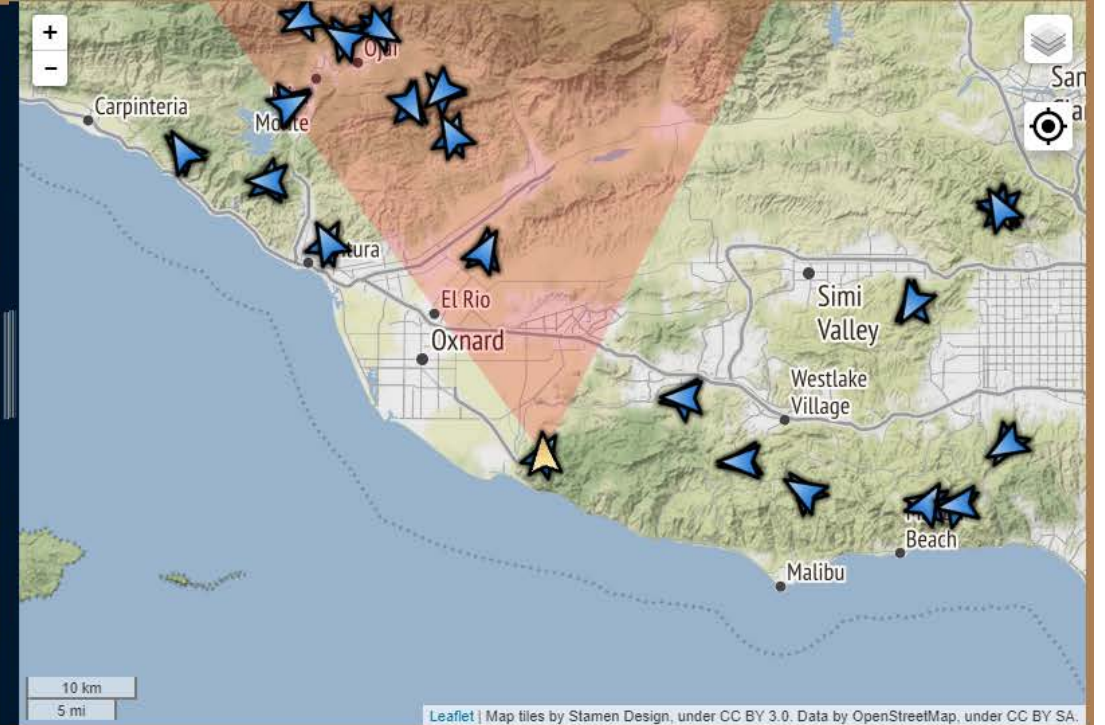
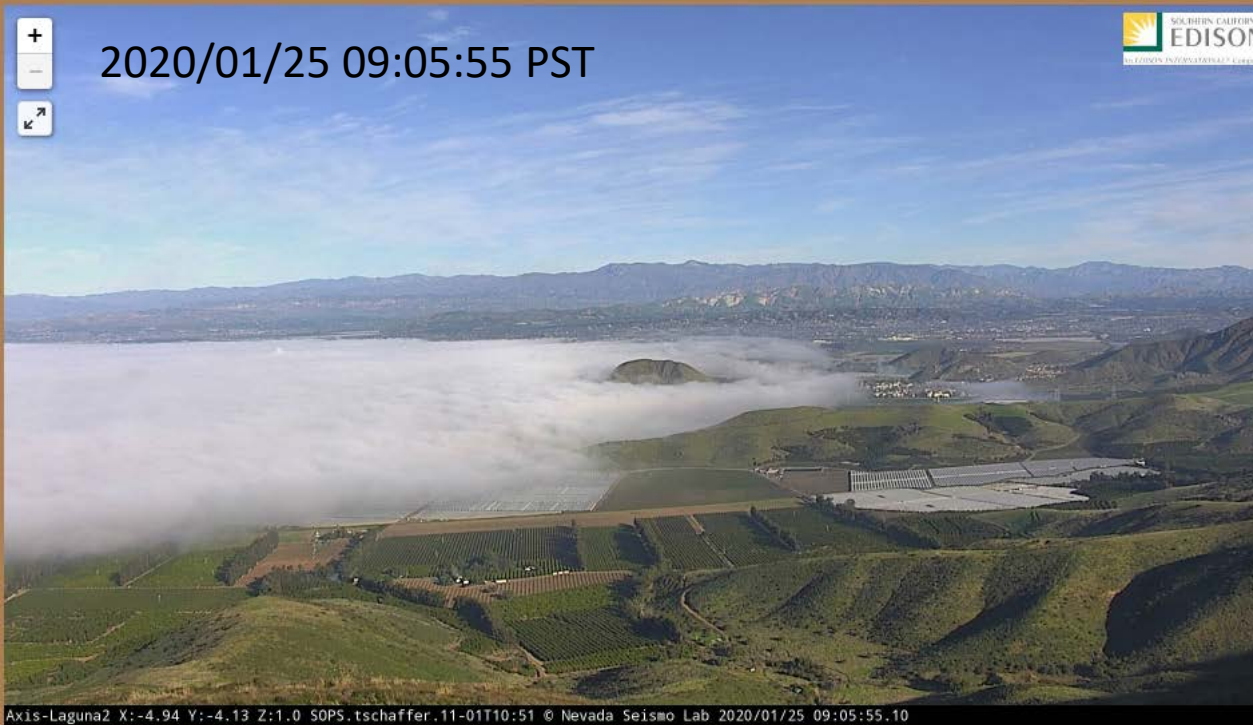




Terminal observation and forecast locations presented

★ Crash site

METAR Station Locations
High Res Roads
State/County Boundaries

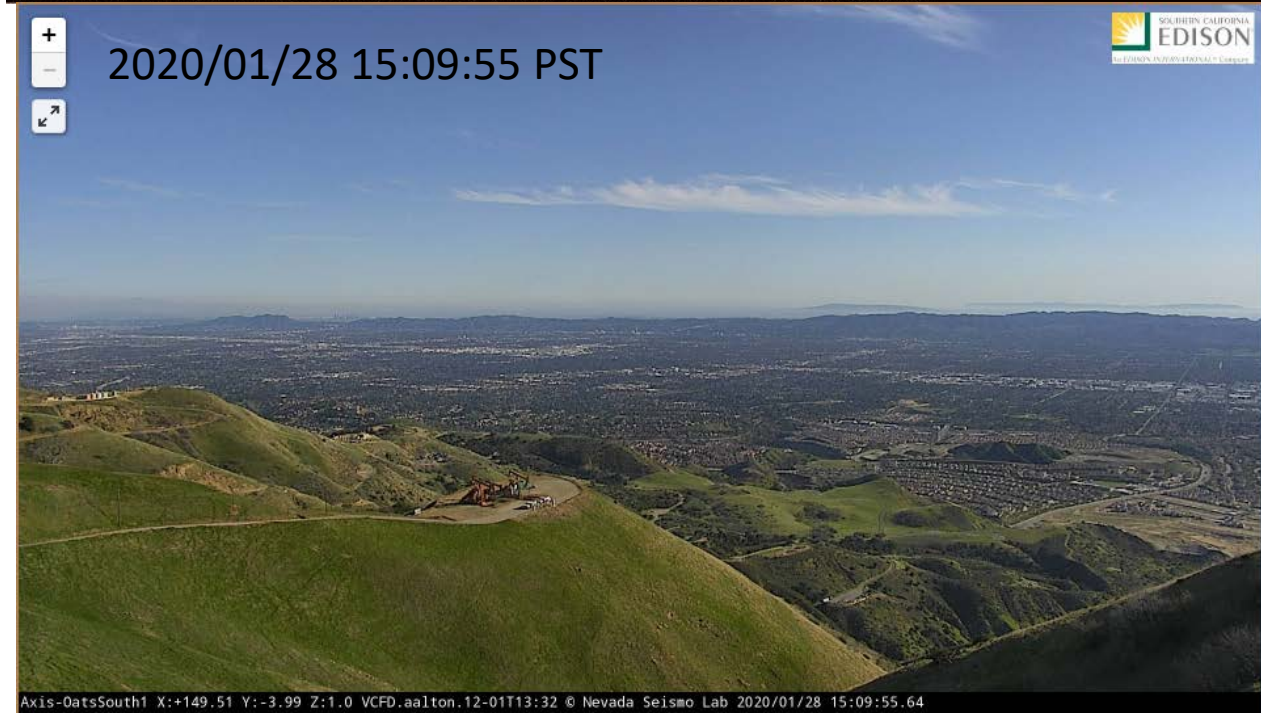
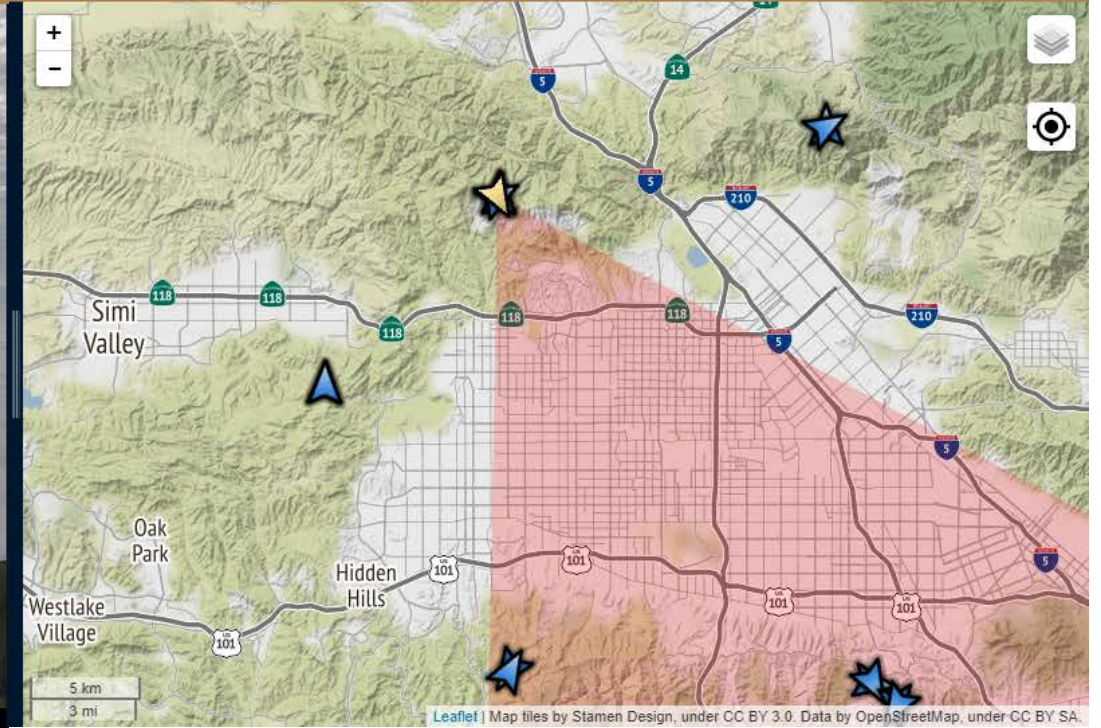
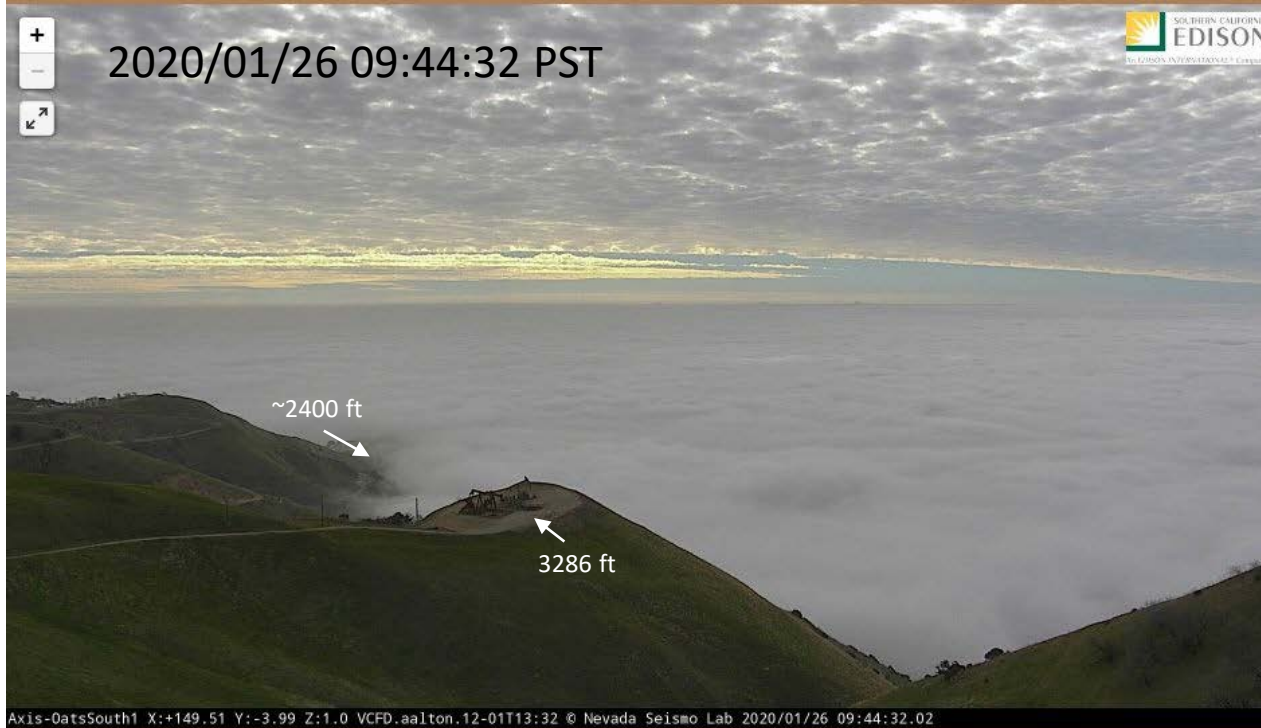


Southern California Edison Camera
(Laguna2)

Top: **Saturday, January 25, 09:55 PST**
Shallow, patchy, dense fog

Bottom: Clear view from Tuesday, January 28

<http://www.alertwildfire.org/orangecoca/index.html>



Southern California Edison Camera
(Oat Mountain South – Elev 3450 ft)

Top: **Sunday, January 26, 09:44 PST**

Top of cloud deck around 2400 ft

Bottom: Clear view from Tuesday, January 28

<http://www.alertwildfire.org/orangecoca/index.html>



NWS Los Angeles
@NWSLosAngeles

2020/01/26 09:48 PST



Interesting webcam from Oat Mtn at 3450 feet this morning. Clouds just below the camera are associated with a deep marine layer and high clouds above the camera are from the passing cold front. #CAwx #LAweather



9:48 AM · Jan 26, 2020 · [TweetDeck](#)

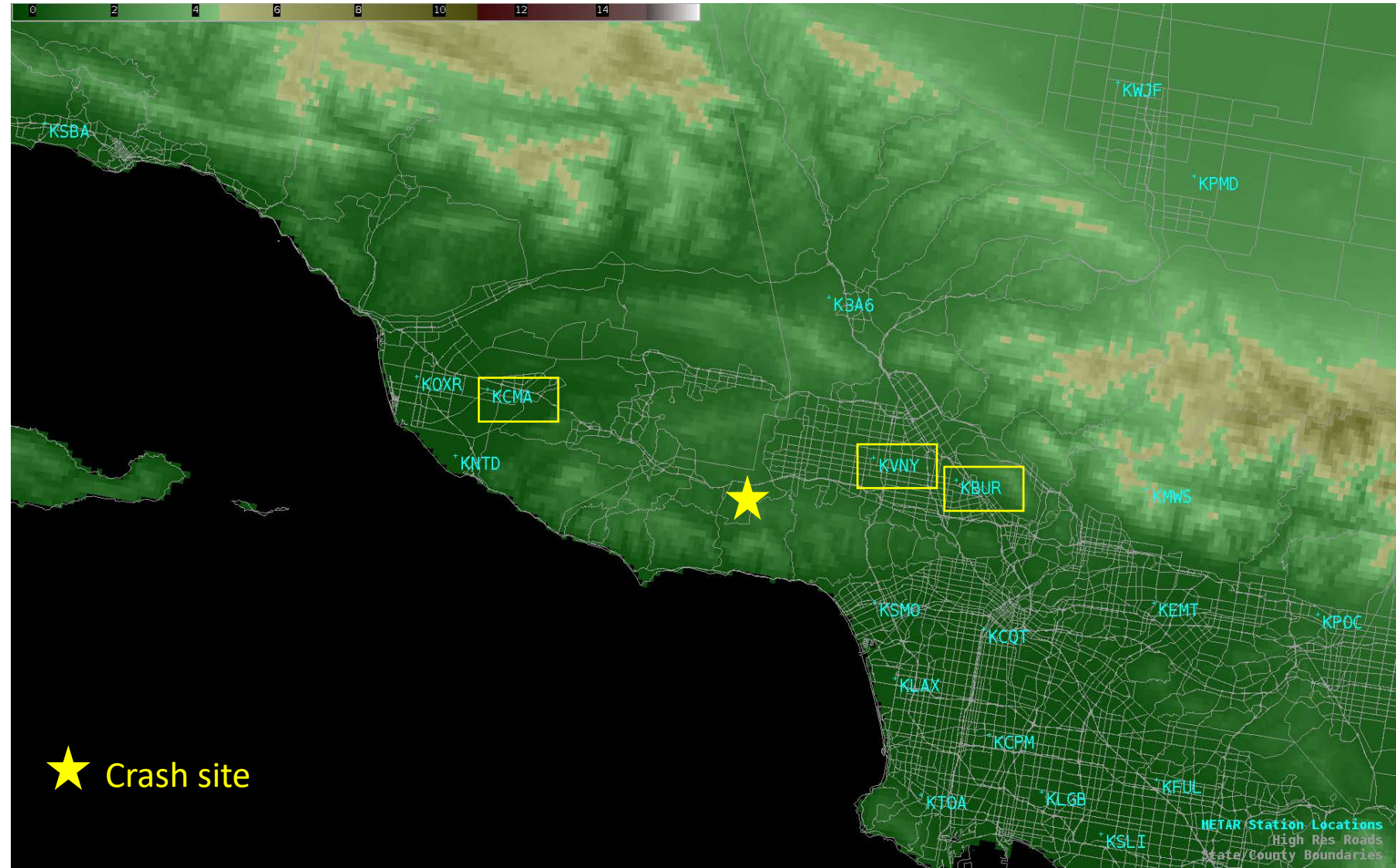
View Tweet activity

47 Retweets 159 Likes



Terminal Area Forecasts (TAF)

- Camarillo (KCMA)
- Burbank (KBUR)
- Van Nuys (KVNY)



KCMA Terminal Aviation Forecast (TAF)

Issued:
04:03 PST

Times in UTC
(261700=26th at 0900 PST)



NATIONAL WEATHER SERVICE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

Terminal Aerodrome Forecast

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FTUS46 KLOX 261203 RRA

TAF CMA

TAF

KCMA 261203Z 2612/2712 VRB03KT 4SM BR SCT008 OVC017

TEMPO 2614/2616 3SM -DZ BR OVC008

FM261800 24008KT P6SM BKN018

FM262100 25010KT P6SM SCT023

FM270300 27005KT P6SM SKC

FM270700 06006KT P6SM SKC=






KCMA Terminal Aviation Forecast (TAF) *Amendment*

Issued:
08:58 PST

Times in UTC
(261700=26th at 0900 PST)



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Terminal Aerodrome Forecast

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TAF CMA
TAF AMD
KCMA 261658Z 2617/2712 VRB05KT 4SM BR SCT008 OVC015
FM261800 24008KT P6SM BKN018
FM262100 25010KT P6SM SCT023
FM270300 27005KT P6SM SKC
FM270700 06006KT P6SM SKC=

KBUR Terminal Aviation Forecast (TAF)

Issued:
03:45 PST

Times in UTC
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TAFBUR

TAF

KBUR 261145Z 2612/2712 13005KT 4SM BR OVC008

FM261700 VRB03KT 5SM HZ BKN013

FM261900 17009KT P6SM FEW018

FM270200 34008KT P6SM SKC

FM270600 VRB03KT P6SM SKC=



KBUR Terminal Aviation Forecast (TAF) *Amendment*

Issued:
08:56 PST

Times in UTC
(261700=26th at 0900 PST)



NATIONAL WEATHER SERVICE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

Terminal Aerodrome Forecast

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TAFBUR

TAF AMD

KBUR 261656Z 2617/2712 VRB05KT 3SM BR OVC011

FM261900 17009KT P6SM FEW018

FM270200 34008KT P6SM SKC

FM270600 VRB03KT P6SM SKC=



KVNY Terminal Aviation Forecast (TAF)

Issued:
04:03 PST

Times in UTC
(261700=26th at 0900 PST)



NATIONAL WEATHER SERVICE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

Terminal Aerodrome Forecast

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TAFVNY

TAF

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FM261700 VRB03KT 4SM HZ BKN012

FM261900 14008KT P6SM FEW017

FM270100 35015G23KT P6SM SKC


FM270800 35012KT P6SM SKC=



KVNY Terminal Aviation Forecast (TAF) *Amendment*

Issued:
08:58 PST

Times in UTC
(261700=26th at 0900 PST)



NATIONAL WEATHER SERVICE

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Terminal Aerodrome Forecast

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TAF AMD
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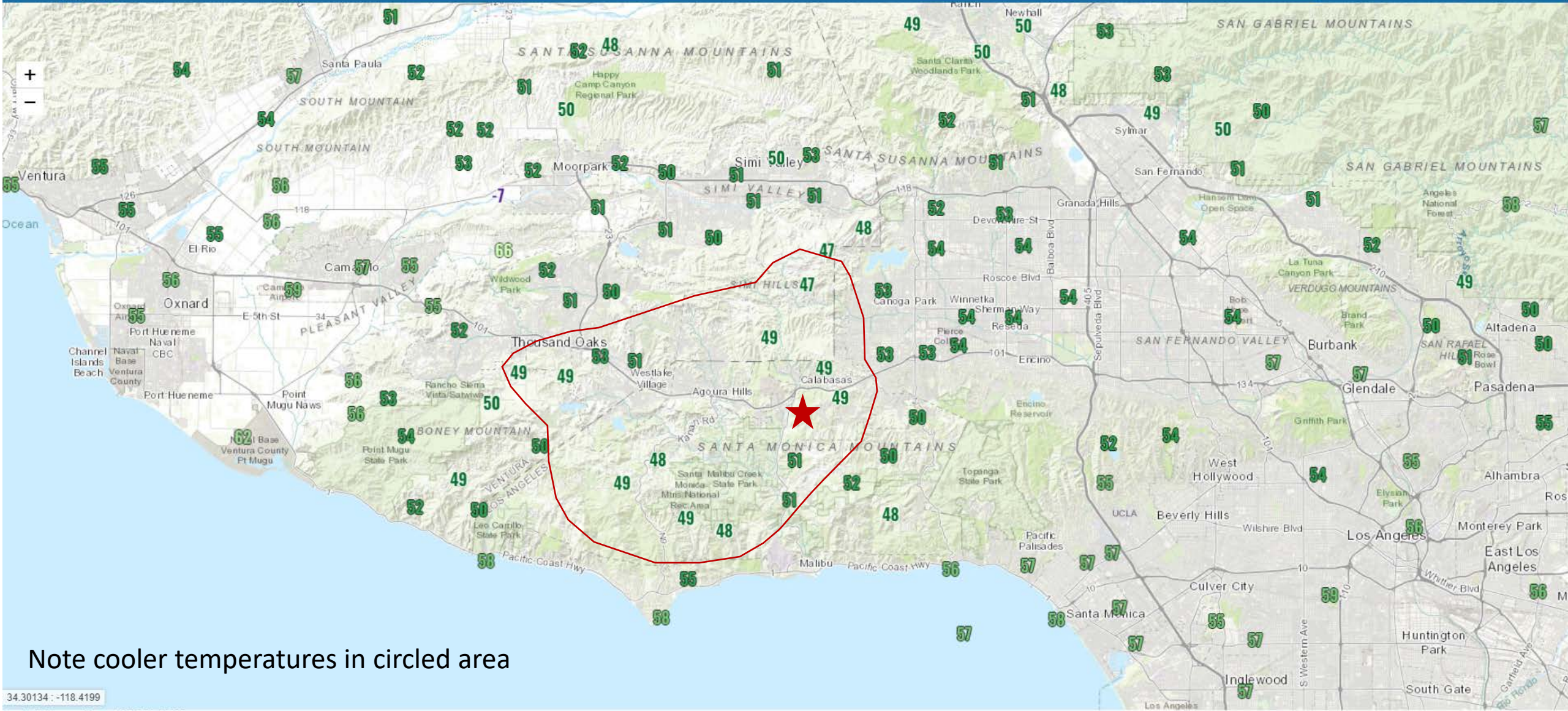


Observations for Morning of 26 Jan 2020

- [Camarillo \(KCMA\)](https://tinyurl.com/wcdf65r)
<https://tinyurl.com/wcdf65r>
- [Point Mugu NAS \(KNTD\)](https://tinyurl.com/shddlc6)
<https://tinyurl.com/shddlc6>
- [Van Nuys \(KVNY\)](https://tinyurl.com/rnvggch)
<https://tinyurl.com/rnvggch>
- [Burbank \(KBUR\)](https://tinyurl.com/rdr94s2)
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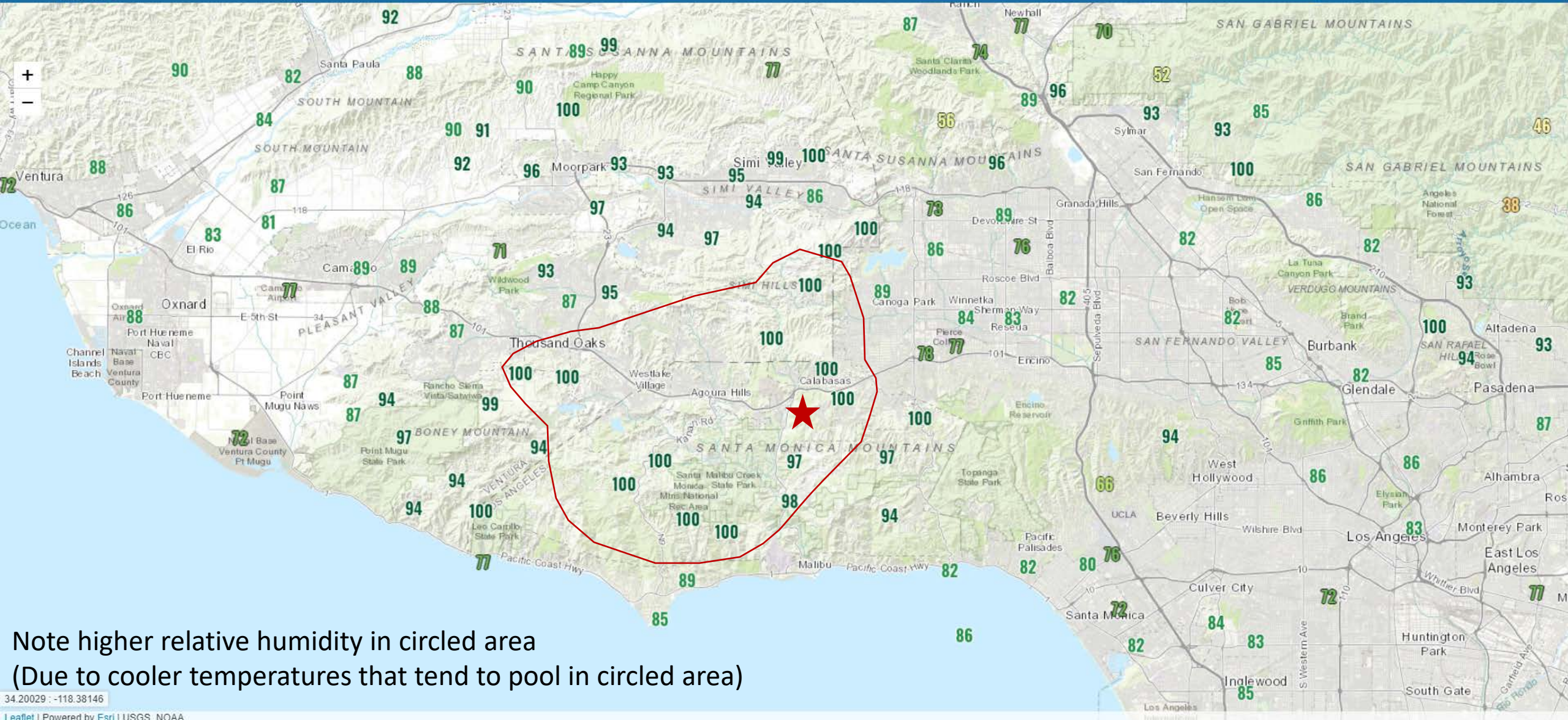


★ Crash site



Note cooler temperatures in circled area

★ Crash site



Note higher relative humidity in circled area
 (Due to cooler temperatures that tend to pool in circled area)

 **Crash site**

Area Forecast Discussion

National Weather Service Los Angeles/Oxnard CA

403 AM PST Sat Jan 25 2020

The **ridge** across the region today will move eastward tonight and Sunday as a weak **trough** moves into the West Coast. The WRF shows an increasingly deep marine layer tonight, with **low clouds** likely pushing into the valleys of L.A. and VTU Counties overnight. There could even be some local **drizzle** late tonight/Sun morning, especially in the foothills of L.A. County. Across SLO and SBA Counties, a combination of low clouds, and increasing mid and high clouds with a dying surface **front** will cause skies to become **mostly cloudy** there tonight. There is a slight chance that a few showers could affect portions of SLO County Sunday as the dying **front** moves into the area, but expect any rainfall to be less than one tenth of an inch.

Area Forecast Discussion

National Weather Service Los Angeles/Oxnard CA

452 AM PST Sun Jan 26 2020

.SYNOPSIS...26/339 AM.

A weak **front** will bring plenty of clouds to the region today. There is a slight chance of showers in northern areas this afternoon, and on northern mountain slopes tonight. Areas of gusty northwest to north winds are expected later today through Monday morning. Skies will be **mostly clear** Monday through Saturday. It will be breezy to windy at times for much of the week. Temperatures will be near normal to slightly above normal Monday through Wednesday, with a warming trend expected thereafter.

&&

.SHORT TERM (TDY-TUE)...26/408 AM.

Marine layer has deepened significantly early this morning, and **low clouds** were widespread in all coastal and valley areas, with the exception of the Santa Clarita Valley and the far interior valleys of SLO and SBA Counties. Clouds will probably push into the Santa Clarita Valley by daybreak. Would not be surprised if there is some local **drizzle** this morning, especially across the foothills of L.A. County. Oddly, despite the deep marine layer, there was still some local dense **fog** early this morning, though too localized to require dense **fog** advisories.



INTERVIEW

Date: February 21, 2020
Time: About 1100 Pacific standard time
Location: Telephone
Person Contacted: Mr. Ryan Kittell, National Weather Service
Persons Present: Mr. Mike Richards, National Transportation Safety Board
Mr. Eric Boldt, National Weather Service
Subject: Accident Investigation DCA20MA059

On February 21, 2020, at approximately 1100 Pacific standard time (PST), Mr. Mike Richards of the National Transportation Safety Board conducted an interview with Mr. Ryan Kittell via telephone. Following the interview, Mr. Kittell was given the opportunity to review this summary to ensure its accuracy and completeness. During the conversation Mr. Kittell reported the following:

He has been a forecaster at the National Weather Service (NWS) Weather Forecast Office (WFO) in Los Angeles/Oxnard, California, since 2006. Prior to this, he was an intern at the NWS WFO in Phoenix, Arizona, since 2005. He was not working on the day of the accident.

The plot of minimum temperatures (see Figure 1) is a good depiction of temperature differences that can occur across the region, specifically the area of the Santa Monica Mountains often realize lower minimum temperatures than the San Fernando Valley to the east. The Santa Monica Mountains are diverse terrain. As you drive the 101 Freeway from the east, you climb a grade approaching Calabasas, then there is a peak and you begin to drop down toward the Las Virgenes freeway exit. This area is a low spot elevation-wise relative to the nearby terrain. Anytime you have a valley in mountainous terrain, with all else staying the same, at night you will experience the coldest temperatures in the low areas. This occurs because cold air along the terrain will sink and will tend to pool in the low areas. It is normal to see temperatures there colder than in Woodland Hills, California, and at least five degrees colder than in the San Fernando Valley where there is a "heat island effect." The heat island is a well-know phenomena that occurs where there is expansion of urban terrain and the natural landscape gets "paved over." Concrete and asphalt retain heat better and night-time temperatures tend to stay warmer than areas without these urban features.

If the air is colder and closer to saturation in the Santa Monica Mountains, his educated guess is that you could expect ceilings and visibilities in that area to be lower than in Camarillo and Van Nuys. During routine work-related review of the CHP traffic camera located along the 101 Freeway near the Las Virgenes exit (see Figure 2), it is common to see lower visibility through that camera relative to what is seen in surrounding regions when Van Nuys is reporting ceilings of 1,000 feet or lower. There were a few times he updated the forecast for dense fog based on what this camera showed in the morning hours.

It is not uncommon to have higher relative humidity values in the Santa Monica Mountains compared to the San Fernando Valley, but he did not know how common it was for the relative humidity to reach 100 percent.

A marine layer depth of 2,400 or 2,500 feet would be common in May or June but would be less common in January. It would be deep for January. Typically, there are only 10 or so days in January where the region experiences a marine layer, which requires high-pressure aloft.¹

Referencing Figure 3, it is remarkable that the relative humidity near Calabasas was still 100 percent at 1000 PST on the accident day. Normally the relative humidity would decrease earlier in the morning.

Interview ended at approximately 1130 PST.

Following the interview, Mr. Kittell's representative, Mr. Eric Boldt, who is the Warning Coordination Meteorologist at the NWS WFO in Los Angeles/Oxnard, California, and who was working at a forecast desk on the day of the accident, provided the following:

On the day before the accident there was a very shallow marine layer present, with very dense fog in Oxnard. The fog was so shallow that he could see the top of a 15-story skyscraper. His office had issued a dense fog advisory.

On the day before the accident there was high-pressure overhead which suppressed moisture closer to the ground. With the low pressure approaching from the west, the high pressure shifted eastward allowing a deeper layer of moisture under the inversion. On the day of the accident there were widespread coastal clouds across California.

He does not recall a day in any January where low clouds persisted as long as they did on the accident day. A general rule of thumb is that the low clouds will leave by 1000 local time, 1100 at the latest.

¹ Following the interview, Mr. Kittell clarified his information regarding the marine layer with the following emailed statement: *"I went back through our records for the marine layer over the last 10 years. A marine layer is present over the Los Angeles area on 7 January days on average...and only 3 days on average with a depth of 1000 feet or more (which would be needed to affect the Calabasas area). In June, the marine layer is present for 27 days on average, with an average depth of 2000 feet."*

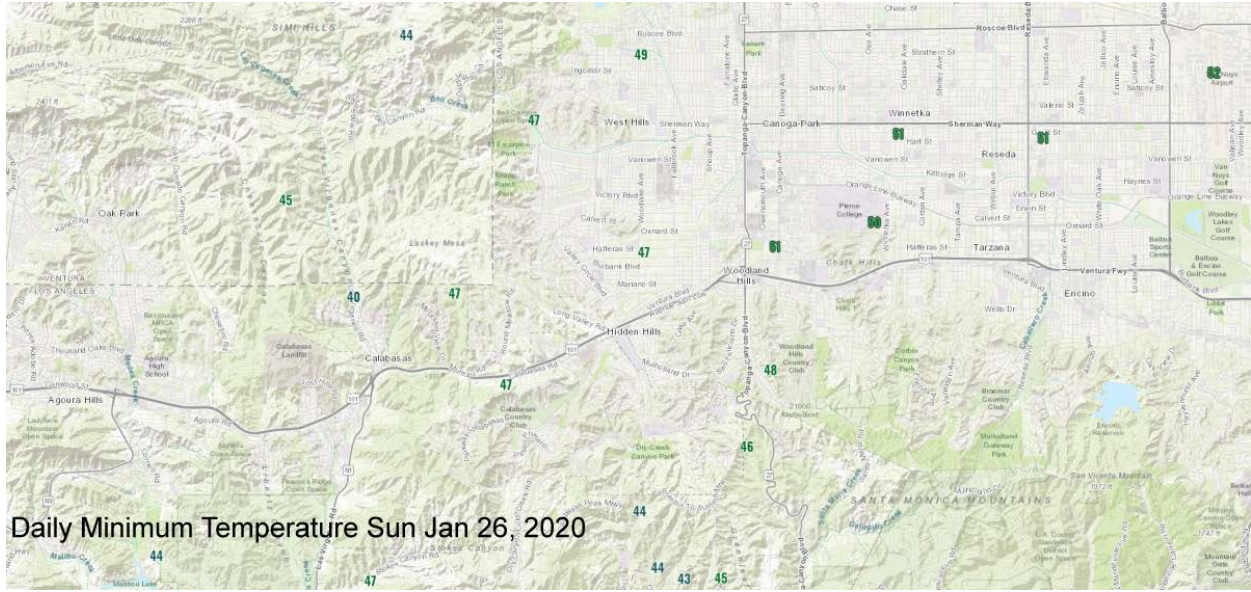


FIGURE 1

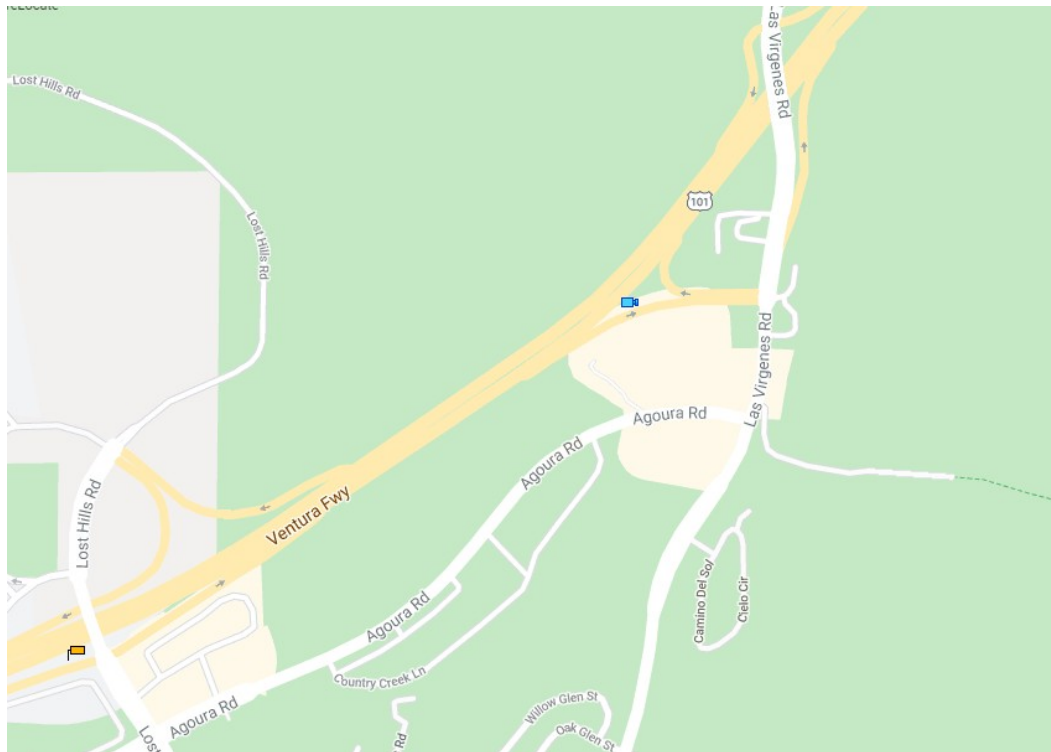


FIGURE 2

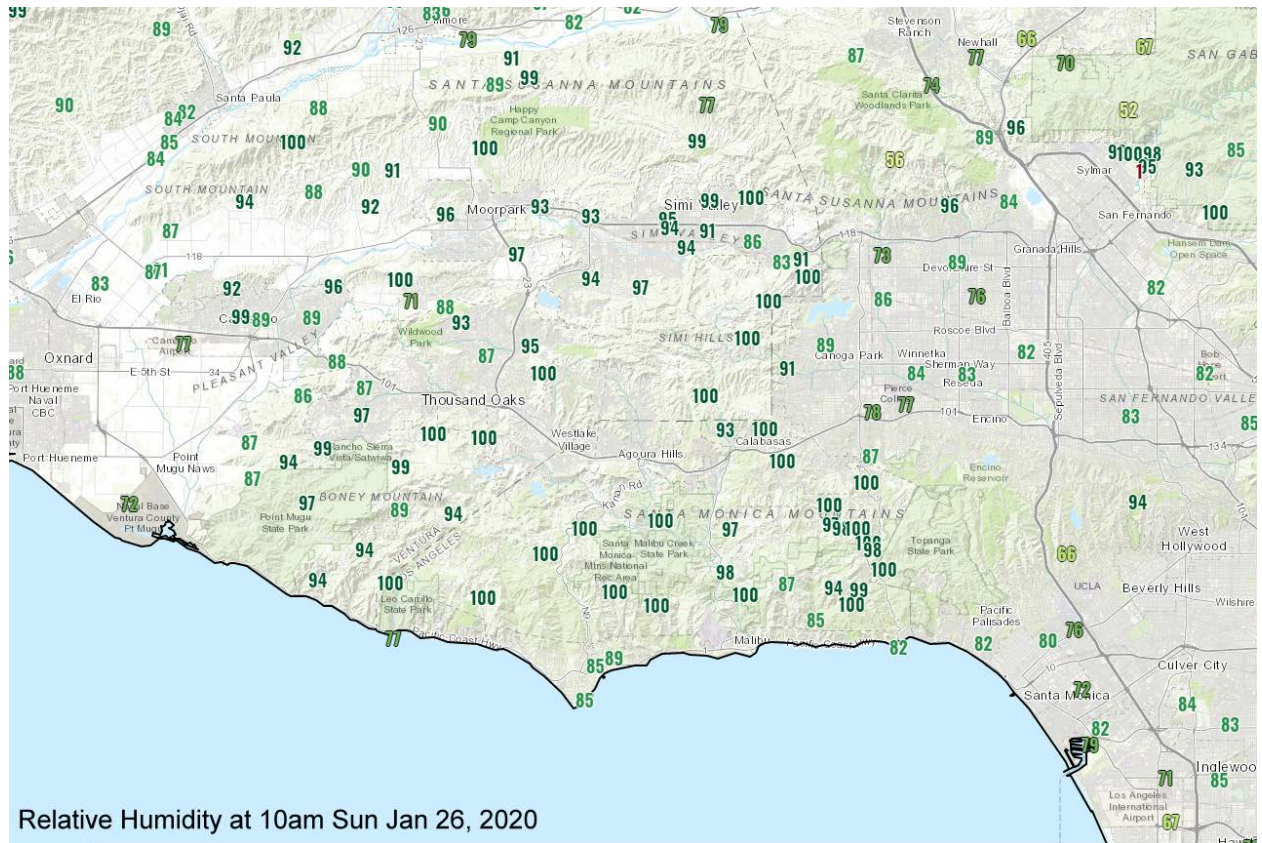


FIGURE 3

Mike Richards
 Aviation Safety Investigator
 Operational Factors Division
 National Transportation Safety Board