



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Washington, D.C. 20594

January 25, 2022

Specialist's Factual Report

METEOROLOGY

ERA22FA098

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A. ACCIDENT

Location: Bronson, Florida
Date: December 30, 2021
Time: 2025 eastern standard time (0125 UTC on December 31, 2021)¹
Aircraft: Type – R44 II; Registration – N442VB

B. METEOROLOGIST

Mike Richards
Senior Meteorologist
Operational Factors Division (AS-30)
National Transportation Safety Board

C. DETAILS OF THE INVESTIGATION

The National Transportation Safety Board’s meteorological specialist did not travel in support of this accident investigation and gathered all weather data remotely. Unless otherwise noted, all times are in eastern standard time (EST) for December 30, 2021 (based upon the 24-hour clock), directions are referenced to true north, distances are in nautical miles and heights are above mean sea level (msl). The accident site was located at about: 29.419204° north latitude; 82.646579° west longitude at an elevation of about 70 feet.

This report provides information on the weather and relevant forecasts applicable to the accident location at the accident time.

D. WEATHER INFORMATION

1.0 Surface Observations

An Automated Weather Observing System (AWOS) was located at Williston Municipal Airport (X60²) in Williston, Florida, which was located about 10 miles east-southeast of the accident location an elevation of about 75 feet and had a magnetic variation of about 6° west. Automated longline³ reports from the X60 AWOS during the times surrounding the accident time are presented here.

¹ UTC – abbreviation for Coordinated Universal Time

² This report uses the 3-digit International Air Transport Association format for airport identification, which does not use the geographic designating digit (e.g., “K” for stations in the continental U.S. and “P” for U.S. stations in Alaska and the Pacific region) as found in the 4-digit International Civil Aviation Organization (ICAO) identifier format. Weather observations from airports in this report are referenced by their reporting station’s identifier (using ICAO format that includes the geographic designating digit), not by the airport at which the reporting station is located.

³ “Longline” refers to the dissemination of weather observations with the intent that they are available in near-real time to national databases (effectively, the whole world) and accessible to the general global public from a large number of vendors. This does not include public accessibility to observations from a reporting station’s Very High Frequency (VHF; line-of-site) or telephone broadcast, where applicable. Longline-dissemination of weather

[1935 EST] METAR KX60 310035Z AUTO 21005KT 10SM SCT011 SCT065 21/20 A3007 RMK AO2 T02120203=

[1955 EST] METAR KX60 310055Z AUTO 22005KT 10SM SCT007 SCT065 21/20 A3007 RMK AO2 T02090204=

[2015 EST] METAR KX60 310115Z AUTO 22003KT 7SM SCT007 21/20 A3008 RMK AO2 T02070204=

[2035 EST] METAR KX60 310135Z AUTO 00000KT 7SM BR SCT005 21/20 A3008 RMK AO2 T02050203=

[2055 EST] METAR KX60 310155Z AUTO 00000KT 4SM BR OVC005 20/20 A3008 RMK AO2 LTG DSNT NE T02000199=

[2115 EST] METAR KX60 310215Z AUTO 23003KT 5SM BR OVC005 21/21 A3008 RMK AO2 T02060205=

At 2015 EST, the X60 AWOS reported a wind from 220° at 3 knots, visibility of 7 statute miles, scattered clouds at 700 feet above ground level (agl), temperature of 21° Celsius (C) and dew point temperature of 20°C, altimeter setting of 30.08 inches of mercury; Remarks: automated station with a precipitation discriminator, temperature of 20.7°C and dew point temperature of 20.4°C.

At 2035 EST, the X60 AWOS reported a calm wind, visibility of 7 statute miles, mist, scattered clouds at 500 feet agl, temperature of 21°C and dew point temperature of 20°C, altimeter setting of 30.08 inches of mercury; Remarks: automated station with a precipitation discriminator, temperature of 20.5°C and dew point temperature of 20.3°C.

2.0 Pilot Reports

There were no pertinent publicly longline-disseminated pilot report⁴ (PIREP) made within 2 hours and 40 miles of the accident time and location, respectively.

3.0 Weather Radar

A review of weather radar imagery did not identify any pertinent areas of reflectivity near the accident location at the accident time.

observations is the primary vehicle through which the general global public has access to surface weather observations, particularly outside of the aviation community.

⁴ This does not consider pilot reports only broadcast via radio.

4.0 HRRR Model Sounding

A High-Resolution Rapid Refresh (HRRR) model⁵ sounding (figure 1) for the accident site at 2000 EST using an elevation of 56 feet was retrieved from the National Oceanic and Atmospheric Administration's Air Resources Laboratory. Analysis by the Rawinsonde Observation Program (RAOB) did not identify cloudy conditions below 1,000 feet. Wind near the surface was from the southwest at 5 knots and increased in magnitude to a southwest wind at 18 knots at about 1,000 feet. RAOB identified "moderate" low-level wind shear near the surface.

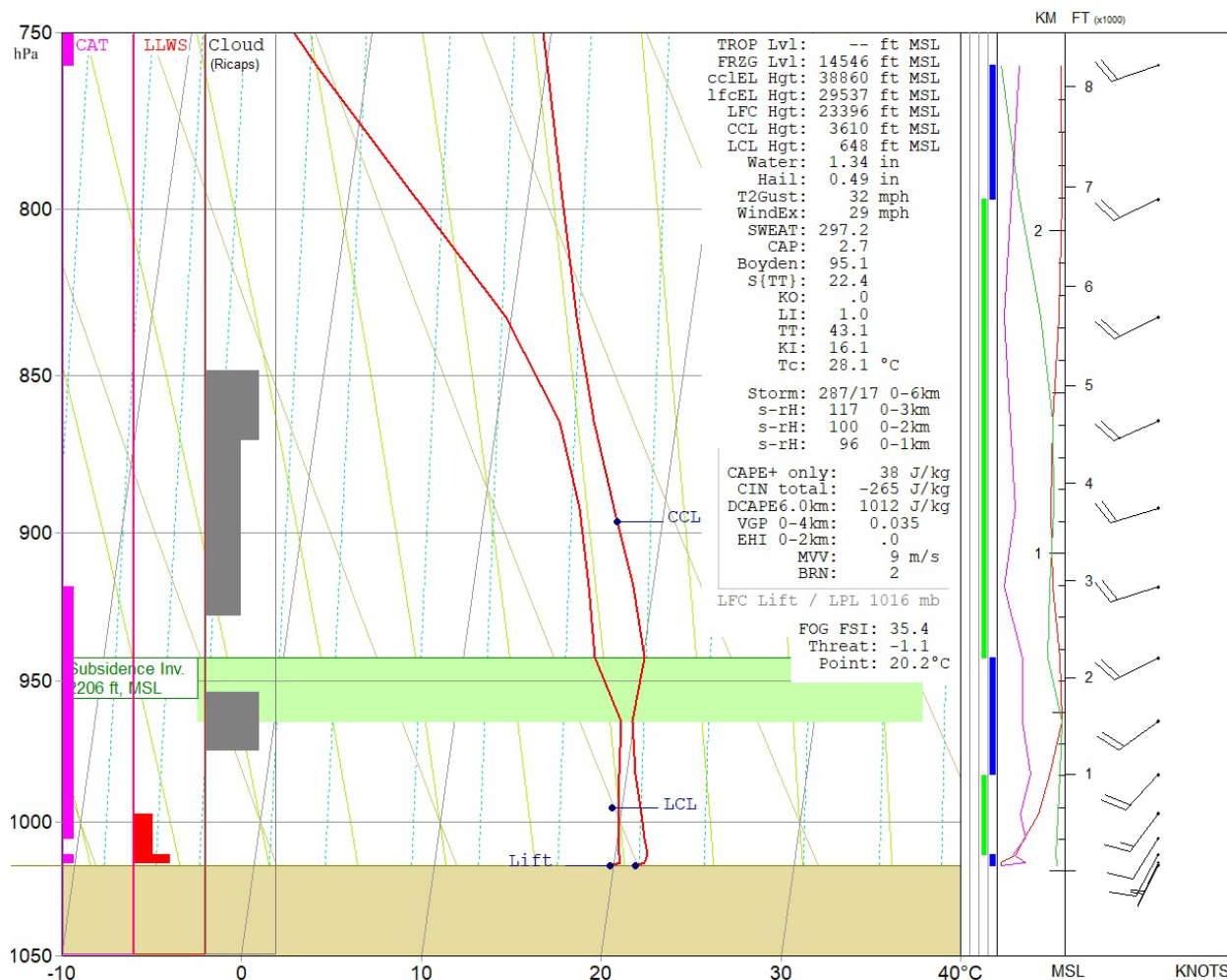


Figure 1 – HRRR model sounding data in SkewT/LogP format for 2000 EST at the accident site, surface to 750 hectopascals.

⁵ The HRRR is a NOAA real-time three-kilometer resolution, hourly-updated, cloud-resolving, convection-allowing atmospheric model, initialized by three-kilometer grids with three-kilometer radar assimilation. Radar data is assimilated in the HRRR every 15 minutes over a one-hour period.

5.0 Satellite Imagery

Geostationary Operational Environmental Satellite (GOES)-16 satellite data were obtained from an archive at the Space Science Engineering Center at the University of Wisconsin-Madison. Figure 2 presents the GOES-16 infrared cloud-top temperatures over the accident site, which were 18°C. Figure 3 presents a red-green-blue (12.3μm-10.3μm – 10.3μm-3.9μm – 10.3μm; RGB) nighttime microphysics GOES-16 band combination product for 2026 EST. This product assists in visually identifying cloud level and type at night. Figure 4 presents a guide on interpreting these types of images.

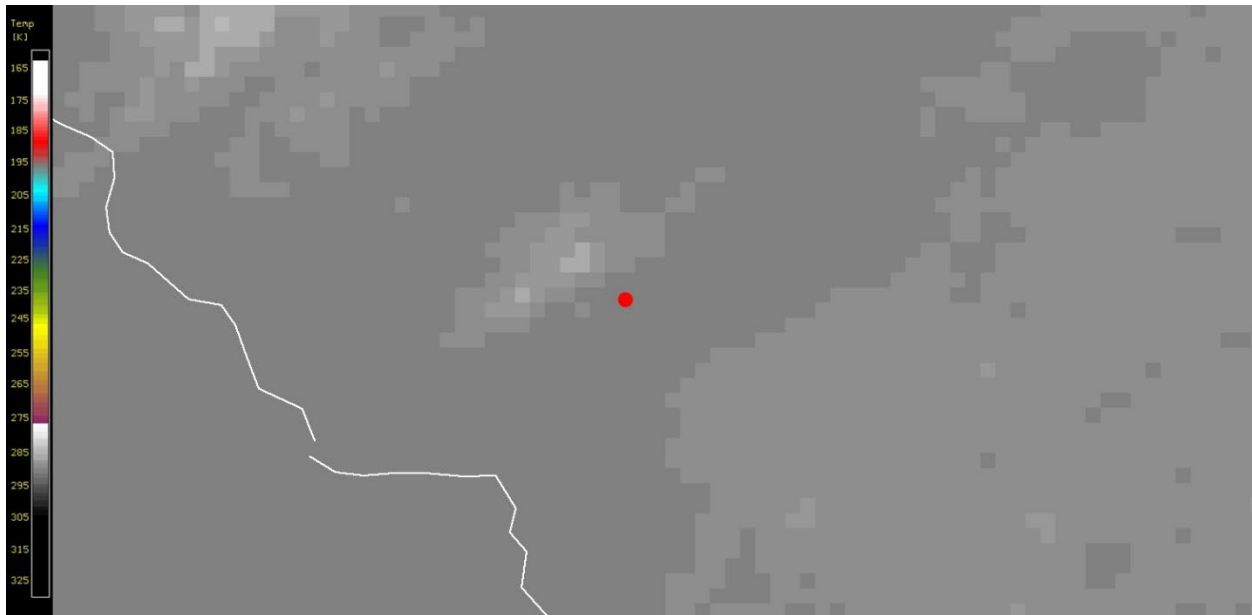


Figure 2 – GOES-16 infrared imagery from 2026 EST. Accident location denoted by the red circle. Image is not corrected for parallax error.

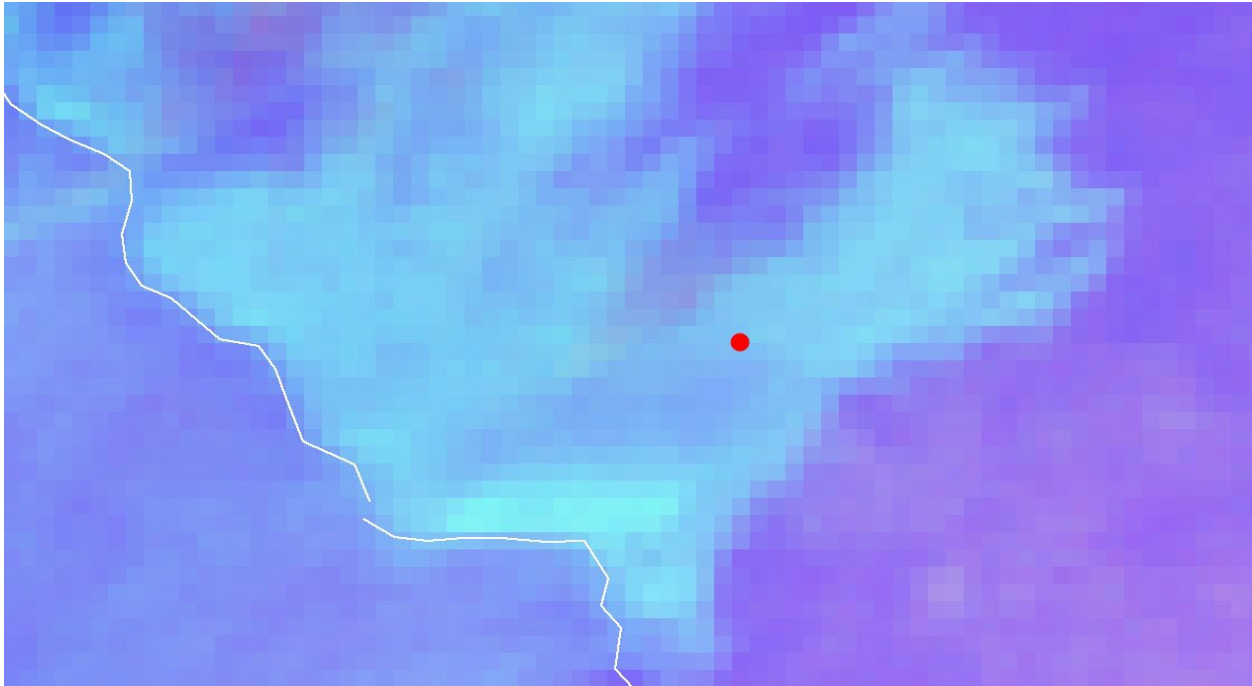


Figure 3 – GOES-16 RGB nighttime microphysics image for 2026 EST. Accident location denoted by the red circle. This image has not been corrected for any parallax error.

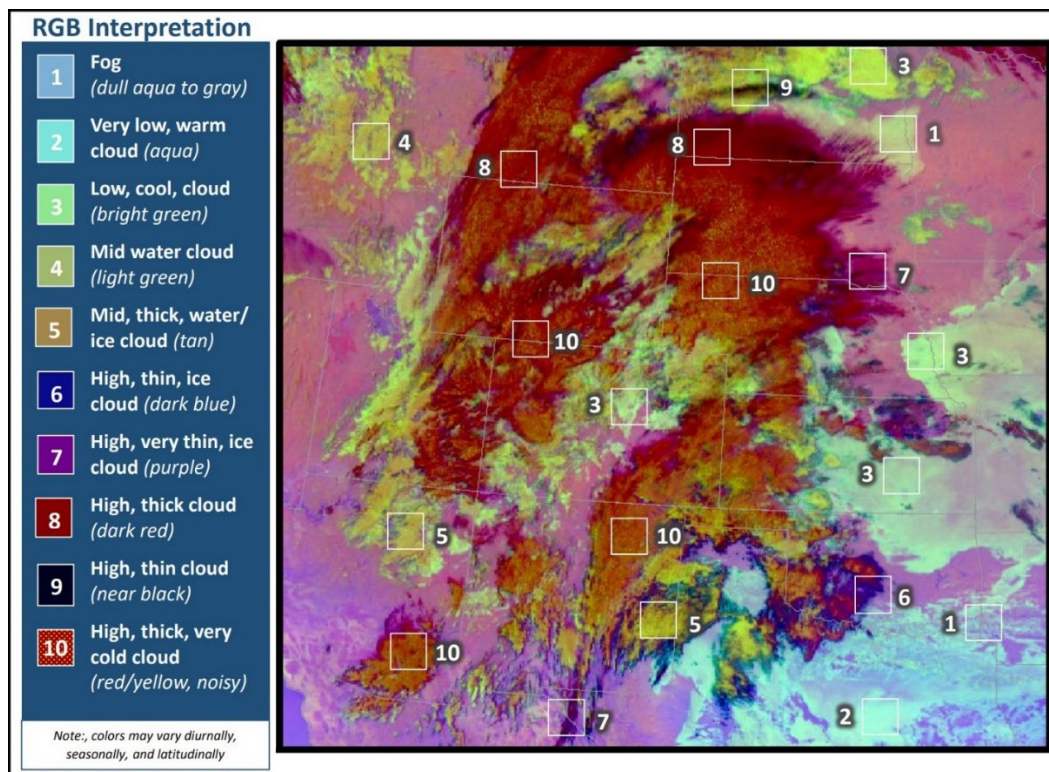


Figure 4 – Interpretation aid for the GOES-16 RGB nighttime microphysics image found in Figure 3. Taken from:

https://www.star.nesdis.noaa.gov/GOES/documents/QuickGuide_GOESR_NtMicroRGB_final.pdf

6.0 Area Forecast Discussion

The NWS Weather Forecast Office (WFO) in Tampa Bay, Florida, issued the following “Update” section of an Area Forecast Discussion (AFD) at 1908 EST. This was the last AFD issued from this WFO prior to the accident.

*FXUS62 KTBW 310008
AFDTBW
Area Forecast Discussion
National Weather Service Tampa Bay Ruskin FL
708 PM EST Thu Dec 30 2021*

.UPDATE...

Atmospheric conditions are very favorable for widespread radiational dense fog over land and advection fog over marine zones this evening, tonight and into Friday morning. An expanding area of low clouds and sea fog has already developed from Sarasota County through Tampa Bay and into portions of the Nature Coast with near zero visibility reported in Venice early this evening. later this evening expected fog development to expand and become widespread and very dense overnight. Expect Dense Fog Advisories to be issued as fog impacts more areas into tonight.

7.0 AIRMETs

An Airmen’s Meteorological Information (AIRMET) SIERRA advisory for instrument flight rule (IFR) conditions, identifying ceilings below 1,000 feet, visibility below 3 statute miles, mist and fog, was issued at 2005 EST and was valid for the accident site at the accident time.

*WAUS42 KKCI 310105 AAA
WA2S
-MIAS WA 310105 AMD
AIRMET SIERRA UPDT 6 FOR IFR AND MTN OBSCN VALID UNTIL 310300

AIRMET IFR...NC SC GA FL AND CSTL WTRS...UPDT
FROM 50ENE CHS TO 50SSW SAV TO 30S CRG TO 40ESE SRQ TO 60WSW RSW TO
100SW SRQ TO 90WSW PIE TO 170SE LEV TO 130ESE LEV TO 40W CEW TO 50WSW
PZD TO 40SSW MCN TO 20ENE MCN TO 50ENE CHS
CIG BLW 010/VIS BLW 3SM BR/FG. CONDS CONTG BYD 03Z THRU 09Z.*

8.0 SIGMETs

There were no convective or non-convective Significant Meteorological Information (SIGMET) advisories active for the accident location at the accident time.

9.0 CWSU Products

There were no Center Weather Advisories or Meteorological Impact Statements issued by the NWS Center Weather Service Unit at the Jacksonville Air Route Traffic Control Center that were active for the accident location at the accident time.

10.0 Astronomical

According to the Federal Aviation Administration⁶, on the accident day, sunset occurred at 1742 EST and civil twilight ended at 1808 EST. According to mooncalc.org⁷, at the time of the accident and relative to the accident location the moon was below the horizon.

Submitted by:

Mike Richards
Senior Meteorologist

⁶ https://avcams.faa.gov/sunrise_sunset.php

⁷ <https://www.mooncalc.org/>