



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Washington, D.C. 20594

January 13, 2021

Specialist's Report

METEOROLOGY

ERA21LA028

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A. ACCIDENT

Location: Point Lookout, New York
Date: October 21, 2020
Time: 1611 eastern daylight time (2011 UTC)¹
Aircraft: Type – Bell 206; Registration – N716VL

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 daylight time (EDT) for October 21, 2020 (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: 40.598289° north latitude; 73.56209° west longitude at sea level.

This report provides information on the weather conditions and forecasts applicable to the accident location around the accident time. It also includes information applicable to Republic Airport (FRG²) in Farmingdale, New York, (the departure airport) at 1546 EDT (the departure time).

D. WEATHER INFORMATION

1.0 Surface Observations

An Automated Surface Observing System (ASOS) was located at FRG, which was located about 10 miles northeast of the accident location at an elevation of about 80 feet and had a magnetic variation of about 13° west. Automated longline³ reports from the FRG ASOS during the times surrounding the departure time are presented here.

¹ UTC – abbreviation for Coordinated Universal Time

² The National Weather Service uses the 4-digit International Civil Aviation Organization (ICAO) format for station identifiers (as seen in the body of some formatted weather observations). This report uses the 3-digit International Air Transport Association format for station identification, which does not use the geographic designating digit (“K” for stations in the continental U.S. and “P” for U.S. stations in Alaska and the Pacific region) as found in the ICAO format.

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

[1353 EDT] METAR KFRG 211753Z 19010KT 10SM OVC010 21/17 A3025 RMK AO2
SLP243 T02060172 10211 20167 58022=

[1411 EDT] SPECI KFRG 211811Z 18008KT 10SM OVC009 21/17 A3024 RMK AO2
CIG 007V012 T02060172=

**[1453 EDT] METAR KFRG 211853Z 17008KT 10SM OVC006 20/17 A3023 RMK
AO2 SLP237 T02000172=**

**[1553 EDT] METAR KFRG 211953Z 18008KT 10SM OVC005 19/18 A3022 RMK
AO2 SLP234 T01940178=**

[1653 EDT] METAR KFRG 212053Z AUTO 19009KT 10SM OVC006 19/17 A3023
RMK AO2 SLP234 T01940172 55009=

At 1453 EDT, the FRG ASOS reported a wind from 170° at 8 knots, visibility of 10 statute miles or greater, ceiling overcast at 600 feet above ground level (agl), temperature of 20° Celsius (C) and a dew point temperature of 17°C, altimeter setting of 30.23 inches of mercury; remarks: automated station with a precipitation discriminator, sea level pressure of 1023.7 hectopascals (hPa), temperature of 20.0°C and a dew point temperature of 17.2°C.

At 1553 EDT, the FRG ASOS reported a wind from 180° at 8 knots, visibility of 10 statute miles or greater, ceiling overcast at 500 feet agl, temperature of 19°C and a dew point temperature of 18°C, altimeter setting of 30.22 inches of mercury; remarks: automated station with a precipitation discriminator, sea level pressure of 1023.4 hPa, temperature of 19.4°C and a dew point temperature of 17.8°C.

Five-minute data from the FRG ASOS for times surrounding the departure time are presented here. At 1545 EDT, the FRG ASOS five-minute observation indicated a visibility of 10 statute miles or greater and a ceiling of 500 feet agl.

[1535 EDT] 5-MIN KFRG 211935Z 19005KT 10SM OVC005 19/18 A3023 -200 90 300
200/05 RMK AO2 T01940178

[1540 EDT] 5-MIN KFRG 211940Z 18007KT 10SM OVC005 19/18 A3023 -200 90 300
190/07 RMK AO2 T01940178

**[1545 EDT] 5-MIN KFRG 211945Z 18008KT 10SM OVC005 19/18 A3023 -200 90
300 200/08 RMK AO2 T01940178**

[1550 EDT] 5-MIN KFRG 211950Z 18008KT 10SM OVC005 19/17 A3023 -190 87 300
190/08 RMK AO2 SLP234 T01940172

[1555 EDT] 5-MIN KFRG 211955Z 18008KT 10SM OVC005 19/18 A3022 -190 90 300
190/08 RMK AO2 T01940178

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

An ASOS was located at John F Kennedy International Airport (JFK) in New York, New York, which was located about 10 miles west-northwest of the accident location at an elevation of about 10 feet and had a magnetic variation of about 13° west. Augmented longline reports from the JFK ASOS during the times surrounding the accident time are presented here.

[1451 EDT] METAR KJFK 211851Z 15006KT 8SM BKN006 BKN012 BKN035 19/17 A3023 RMK AO2 SLP237 T01940172 \$=
[1524 EDT] SPECI KJFK 211924Z 15009KT 2SM BR BKN003 OVC012 19/17 A3023 RMK AO2 T01890172 \$=
[1551 EDT] **METAR KJFK 211951Z 16009KT 1/2SM R04R/P6000FT BR BKN003 OVC012 19/17 A3023 RMK AO2 SFC VIS 1 ½ SLP236 T01890172 \$=**
[1630 EDT] **SPECI KJFK 212030Z 15008KT 1/2SM R04R/P6000FT BR OVC003 18/17 A3023 RMK AO2 SFC VIS 1 1/2 T01830172 \$=**
[1651 EDT] METAR KJFK 212051Z 14009KT 1/2SM R04R/2400VP6000FT FG OVC002 18/17 A3022 RMK AO2 SLP234 T01830172 56011 \$=

At 1551 EDT, the JFK ASOS reported a wind from 160° at 9 knots, visibility of one-half statute mile, runway visual range (RVR) for Runway 04R greater than 6,000 feet, mist, ceiling broken at 300 feet agl, overcast clouds of 1,200 feet agl, temperature of 19°C and a dew point temperature of 17°C, altimeter setting of 30.23 inches of mercury; remarks: automated station with a precipitation discriminator, surface visibility of one and one-half statute miles, sea level pressure of 1023.6 hPa, temperature of 18.9°C and a dew point temperature of 17.2°C, maintenance is needed on the system.

At 1630 EDT, the JFK ASOS reported a wind from 150° at 8 knots, visibility of one-half statute mile, RVR for Runway 04R greater than 6,000 feet, mist, ceiling overcast at 300 feet agl, temperature of 18°C and a dew point temperature of 17°C, altimeter setting of 30.23 inches of mercury; remarks: automated station with a precipitation discriminator, surface visibility of one and one-half statute miles, temperature of 18.3°C and a dew point temperature of 17.2°C, maintenance ins needed on the system.

Five-minute data from the JFK ASOS for times surrounding the accident time are presented here. At 1610 EDT, the JFK ASOS five-minute observation indicated a visibility of one-half statute miles, mist, ceiling broken at 300 feet agl and a surface visibility of one and one-half statute miles.

[1600 EDT] 5-MIN KJFK 212000Z 14010KT 1/2SM BR BKN003 19/17 A3023 -260 90 200 160/10 RMK AO2 SFC VIS 1 1/2 T01890172 \$
[1605 EDT] 5-MIN KJFK 212005Z 14009KT 1/2SM BR BKN003 19/17 A3023 -260 90 200 160/09 RMK AO2 SFC VIS 1 1/2 T01890172 \$
[1610 EDT] **5-MIN KJFK 212010Z 15009KT 1/2SM BR BKN003 19/17 A3023 -260 90 200 160/09 RMK AO2 SFC VIS 1 1/2 T01890172 \$**

[1615 EDT] 5-MIN KJFK 212015Z 15009KT 1/2SM BR BKN003 19/17 A3023 -260 90
200 160/09 RMK AO2 SFC VIS 1 1/2 T01890172 \$

[1620 EDT] 5-MIN KJFK 212020Z 15009KT 1/2SM BR BKN003 18/17 A3023 -260 93
100 160/09 RMK AO2 SFC

2.0 Pilot Reports

There was one publicly longline-disseminated pilot report⁴ (PIREP) made within one hour of the accident time and 20 miles of the accident location. At 1646 EDT, an A321 type aircraft during climb over JFK reported cloud bases at 200 feet and cloud tops at 500 feet.

JFK UA /OV JFK/TM 2046/FLDURC/TP A321/SK BASE 002 TOPS 005

3.0 Weather Radar

A review of weather radar imagery from the TJFK Terminal Doppler Weather Radar (TDWR), which was located about 15 miles west of the accident site, did not identify any pertinent reflectivity in the accident region around the accident time.

4.0 HRRR Model Sounding

A High-Resolution Rapid Refresh (HRRR) model⁵ sounding (figure 1) for the accident site at 1600 EDT using a surface elevation at sea level was retrieved from the National Oceanic and Atmospheric Administration's Air Resources Laboratory. Near the surface the wind was from the southeast at 6 knots and veered⁶ to a southwest wind of 15 knots at about 1,500 feet. The relative humidity was 95 percent or greater from the surface to about 1,200 feet, and the Rawinsonde OBservation Program (RAOB) identified broken and overcast stratus between about 500 and 1,000 feet. Fog was identified by RAOB up to 400 feet. Calculations made by the RAOB identified potential light low level wind shear between about 300 and 600 feet. The freezing level was near 14,000 feet. A temperature inversion⁷ was noted between about 600 and 1,000 feet.

⁴ These do not include pilot reports only broadcast via radio.

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.

⁶ A veering wind's wind barbs turn clockwise with increasing height.

⁷ A temperature inversion is a thin layer of the atmosphere where the normal decrease in temperature with height switches to the temperature increasing with height.

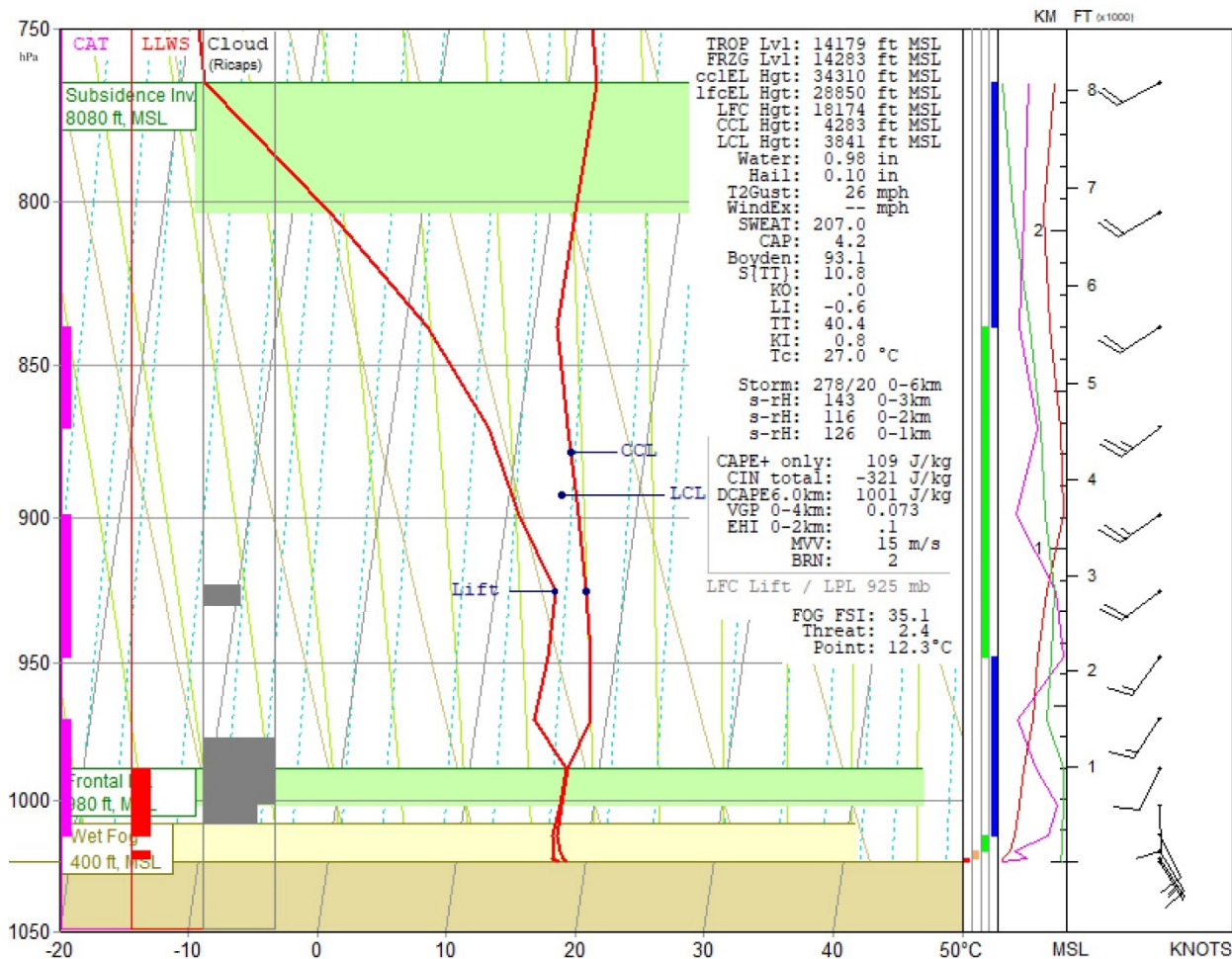


Figure 1 – HRRR model sounding data in SkewT/LogP format for 1600 EDT at the accident site, surface to 750 hPa.

5.0 Satellite Imagery

Geostationary Operational Environmental Satellite (GOES)-16 visible ($0.64\mu\text{m}$) and infrared ($10.3\mu\text{m}$) data were obtained from an archive at the Space Science Engineering Center at the University of Wisconsin-Madison. Images from 1611 EDT are presented in figures 2 and 3. The GOES-16 visible imagery depicted cloudy conditions over the accident region. Infrared brightness temperatures over the accident location were 15°C .

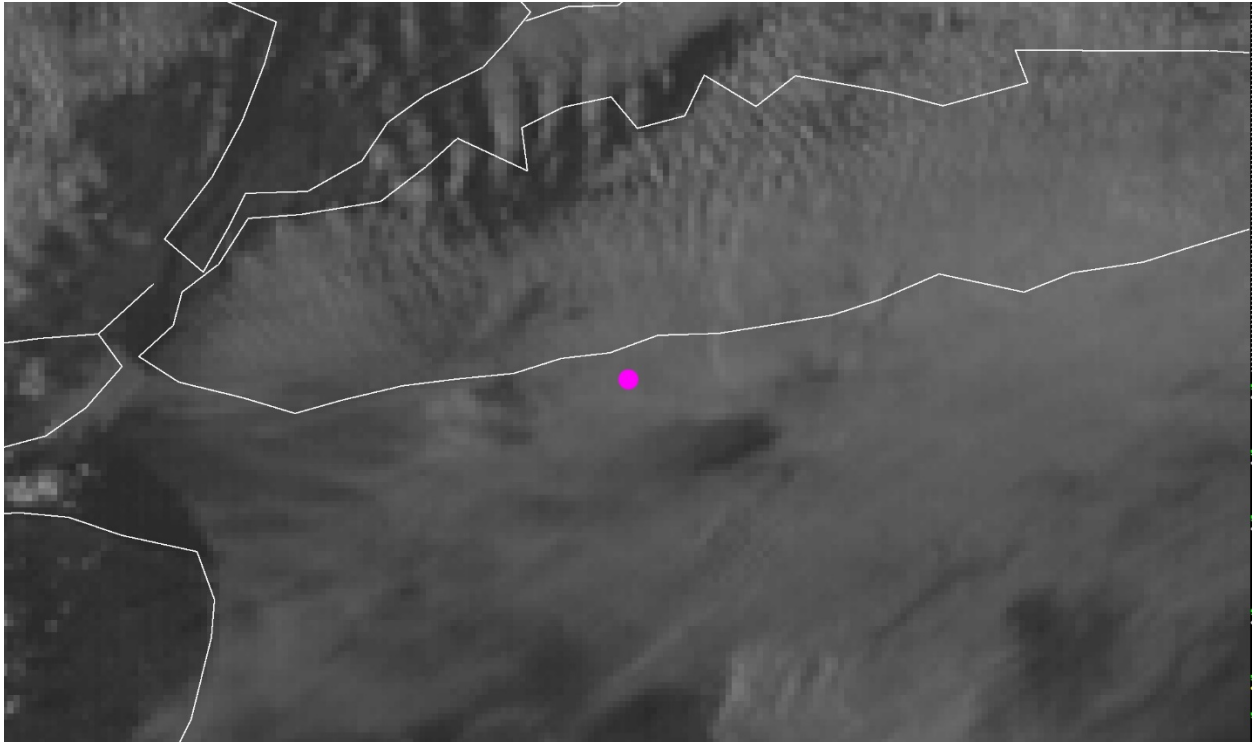


Figure 2 – GOES-16 visible imagery from 1611 EDT. Accident location is denoted by the purple circle. This image has not been corrected for any parallax error.

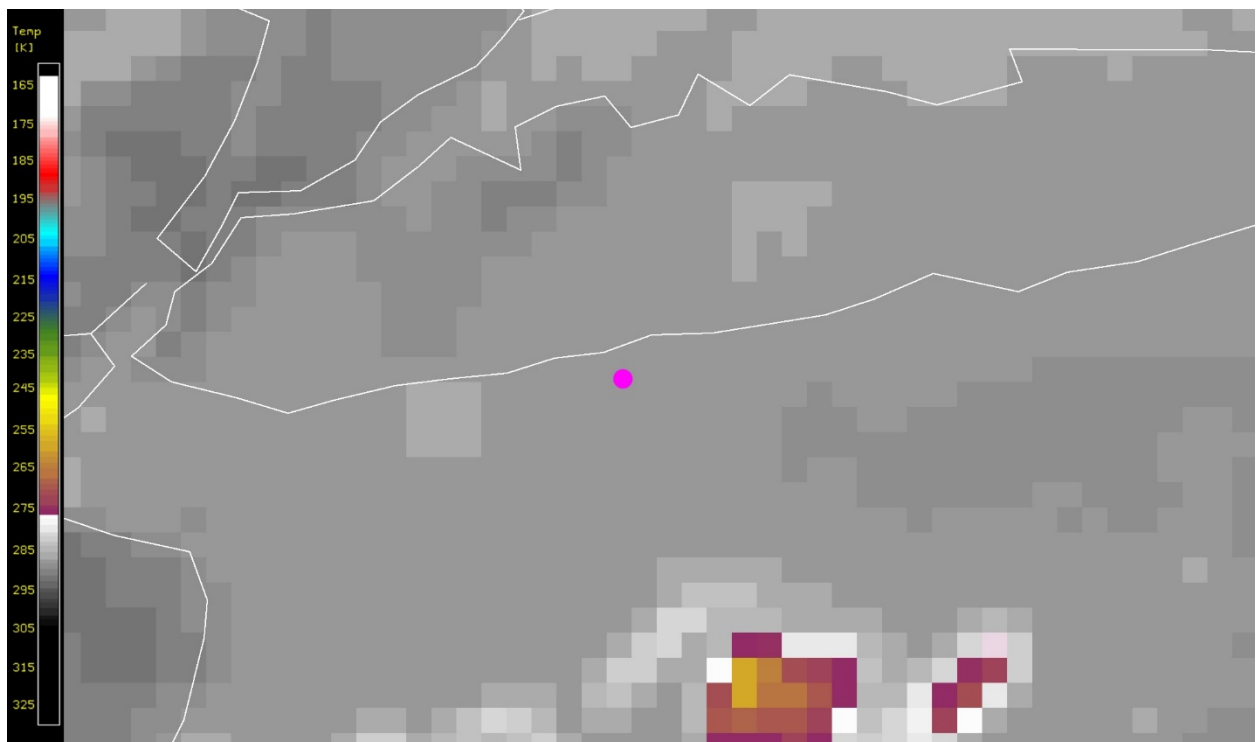


Figure 3 – GOES-16 infrared brightness temperature imagery from 1611 EDT. Accident location is denoted by the purple circle. This image has not been corrected for any parallax error.

6.0 Area Forecast Discussion

Presented here are the "Aviation" and "Marine" sections of the Area Forecast Discussion issued at 1356 EDT by the National Weather Service (NWS) Upton, New York, Weather Forecast Office.

FXUS61 KOKX 211756

AFDOKX

Area Forecast Discussion

National Weather Service New York NY

156 PM EDT Wed Oct 21 2020

.AVIATION /18Z WEDNESDAY THROUGH MONDAY/...

A cold front passes late tngt, then stalls near the region on Thu.

Gradual improvement will continue this aftn. VFR is still expected by 19-20Z for most areas. MVFR and lower is likely to develop again tngt. LIFR is possible especially E of the NYC arpts. Improvement to VFR is expected on Thu, however, if the front stalls too close to the area MVFR or lower will linger thru the day.

...NY Metro (KEWR/KLGA/KJFK/KTEB) TAF Uncertainty...

Exact timing of improvement today uncertain. There is the potential that 1/4sm FG develops at some of the arpts tngt, including JFK. Confidence was too low to included in the TAFs attm. There is the potential for MVFR or lower to linger thru much of Thu if the front does not pass far enough S of the area.

.OUTLOOK FOR 18Z THURSDAY THROUGH MONDAY...

.Rest of Thu...Mainly VFR in the aftn. MVFR or lower possible Thu ngt, especially E of NYC terminals.

.Fri...MVFR or lower possible. Lgt S flow.

.Sat...Becoming VFR. Winds becoming NW less than 25kt.

.Sun...VFR with lgt N flow.

.Mon...MVFR or lower possible. Strong SW flow possible.

Detailed information, including hourly TAF wind component forecasts, can be found at: <http://www.weather.gov/zny/n90>

&&

.MARINE...

Visibilities have improved across the coastal waters and the Dense Fog Advisory that was in effect has been cancelled. Visibilities may become patchy dense at times, through early afternoon.

Otherwise, sub-SCA conditions will continue across all waters through early Thursday morning. Then, long period swell from distant Hurricane Epsilon will build ocean seas to 5 ft Thursday afternoon. Long period energetic ocean swells from Hurricane Epsilon are likely to reach 5-8 ft Thursday night into Friday and likely continue into the weekend. Please refer to National Hurricane Center products for further details on Epsilon.

SCA in effect for the ocean from 11AM Thursday through Friday. SCA seas on the ocean could very well extend into the weekend. Winds will remain below SCA in a weak flow regime.

7.0 Terminal Aerodrome Forecasts

The closest NWS Terminal Aerodrome Forecast (TAF) site was JFK but its TAFs were not applicable to the accident site. According to NWS Instruction 10-813: “A NWS TAF consists 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.”⁸

At 1537 EDT a TAF was issued by the NWS for JFK that forecasted for the accident time: wind from 160° at 9 knots, visibility of 5 statute miles, mist, ceiling broken at 400 feet agl, broken clouds at 1,200 feet agl; temporary conditions⁹ between 1600 and 2000 EDT: visibility greater than 6 statute miles, no significant weather, scattered clouds at 700 feet agl, scattered clouds at 1,500 feet agl, ceiling broken at 3,500 feet agl.

**KJFK 211937Z 2120/2224 16009KT 5SM BR BKN004 BKN012
TEMPO 2120/2124 P6SM NSW SCT007 SCT015 BKN035
FM220000 19008KT P6SM BKN004 BKN250
FM220600 21005KT 4SM BR BKN004
FM220900 VRB03KT 1/2SM FG BKN004
FM221300 VRB03KT P6SM BKN004=**

8.0 AIRMETs SIERRA

The NWS Aviation Weather Center (AWC) issued an Airmen's Meteorological Information (AIRMET) SIERRA advisory at 1304 EDT for instrument flight rule conditions (IFR) that was applicable to the accident location at the accident time.

*WAUS41 KKCI 211704 AAB
WAIS
-BOSS WA 211704 AMD
AIRMET SIERRA UPDT 5 FOR IFR AND MTN OBSCN VALID UNTIL 212100
.
AIRMET IFR...ME NH VT MA RI CT NY NJ PA MD DC DE VA AND CSTL
WTRS...UPDT
FROM 50NW PQI TO 30NE PQI TO 140E ACK TO 20WNW SBY TO 40SSW CSN TO
60SW HNK TO 20N SAX TO 30E ALB TO 30NNE MPV TO 60ENE YSC TO 50NW
PQI*

⁸ www.nws.noaa.gov/directives/sym/pd01008013curr.pdf

⁹ Temporary conditions - fluctuations to forecast conditions which are expected to last less than one hour in each instance and, in the aggregate, to cover less than half of the indicated period.

9.0 SIGMETs

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

10.0 CWSU Products

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

11.0 HEMS Tool

The Helicopter Emergency Medical Services (HEMS) tool (hereafter referred to as the “HEMS tool”) was specifically designed to show weather conditions for short-distance and low-altitude flights that are common for the HEMS community (but the tool is available for use by anyone). HEMS tool images present high-resolution output of critical weather parameters, particularly cloud ceiling and surface visibility. These images can be accessed through the interactive HEMS tool available on the NWS Aviation Weather Center’s website.¹⁰

Figures 4 and 5 provide static images of what the underlying gridded model (the LAMP model), which is the forecast product used for the HEMS tool, produced for 1600 EDT for surface visibility and ceiling. The exact images the public would have seen if using the HEMS tool on the accident day were unavailable.

¹⁰ For more information see: <https://www.aviationweather.gov/hemst>

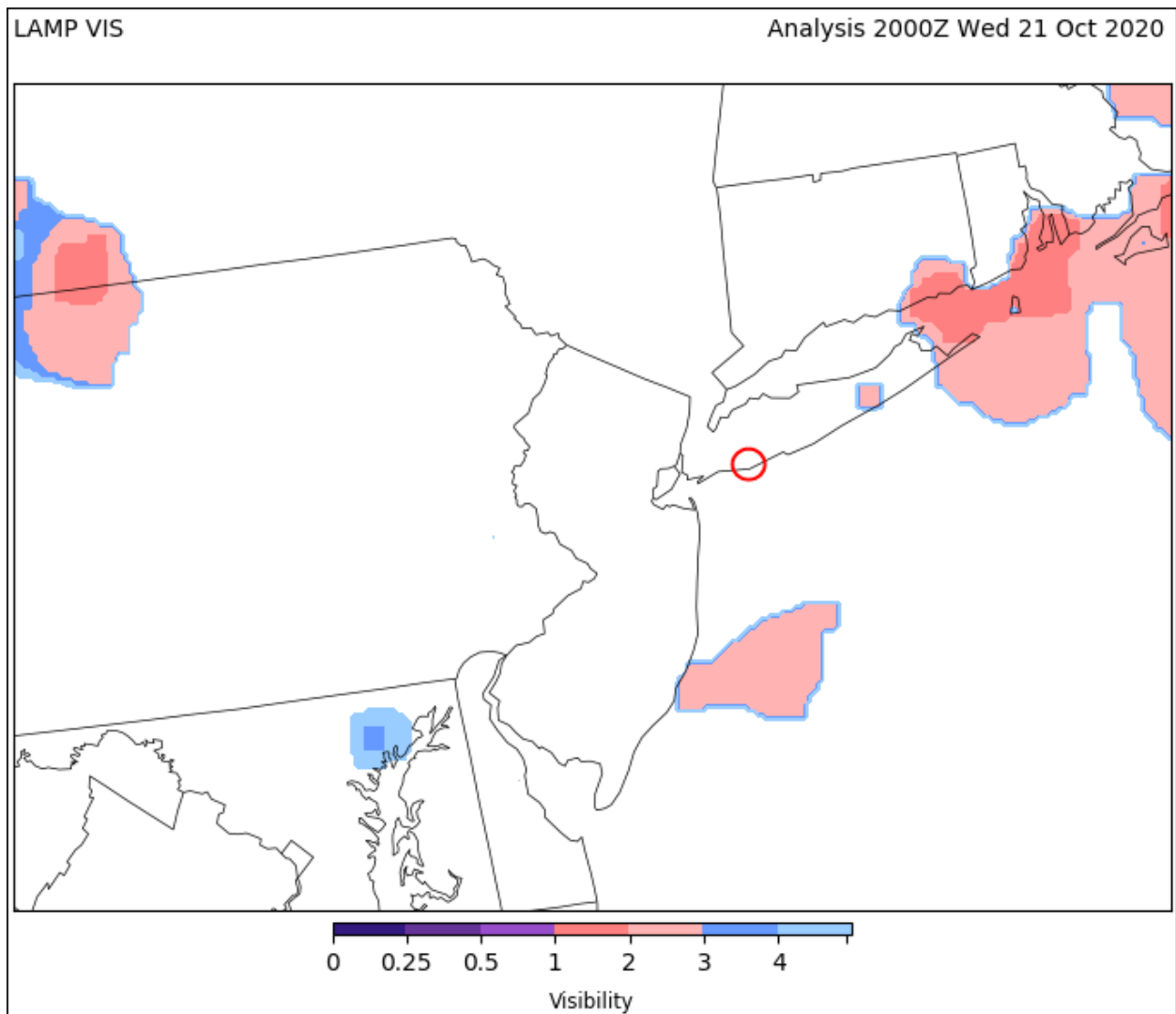


Figure 4 – LAMP surface visibility analysis for the accident region valid at 1600 EDT. Accident location is within the red circle.

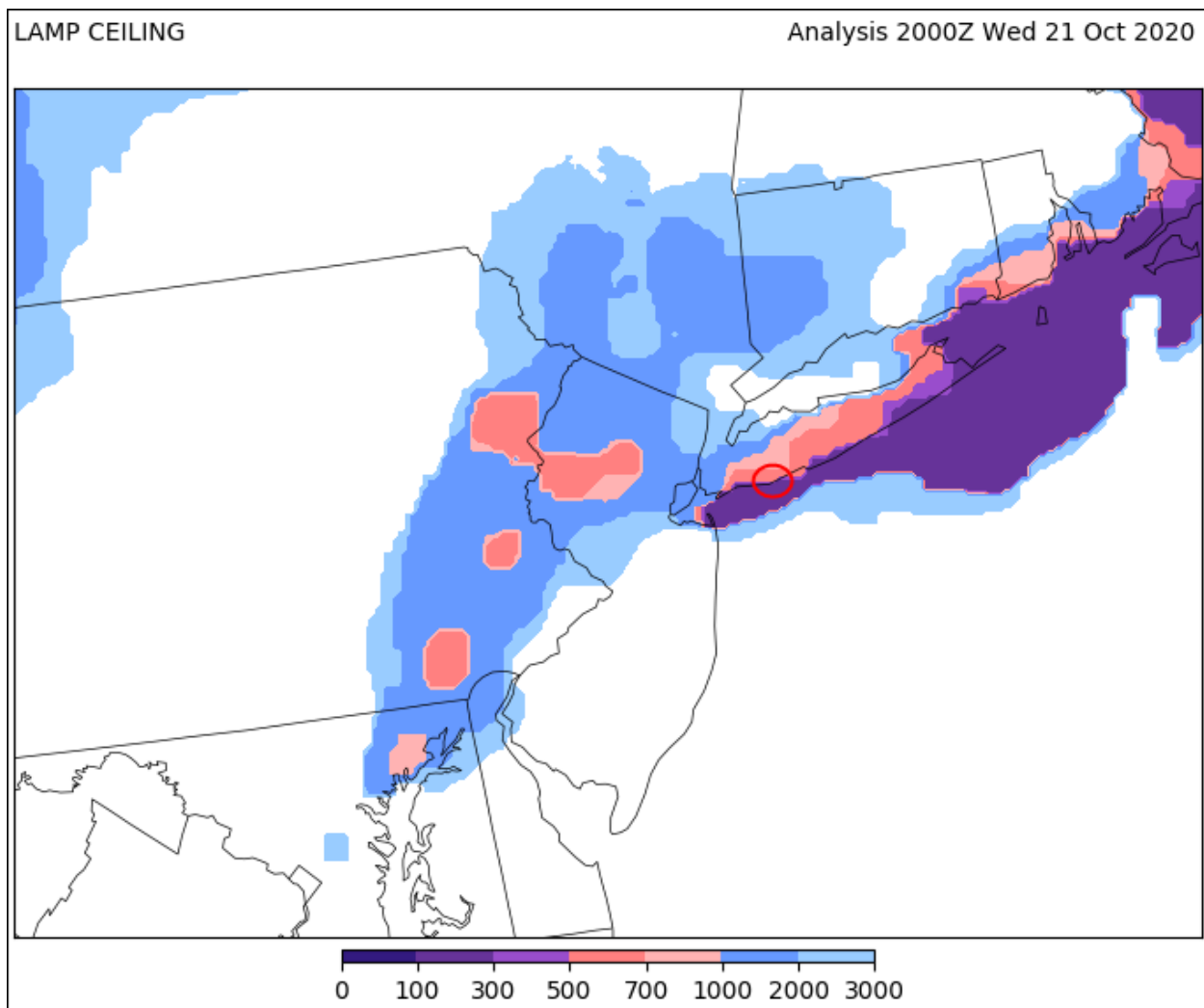


Figure 5 – LAMP Ceiling analysis for the accident region valid at 1600 EDT. Accident location is within the red circle.

Submitted by:

Mike Richards
Senior Meteorologist