



National Transportation Safety Board

**Office of Aviation Safety
Washington, D.C. 20594-2000**

January 1, 2016

**WEATHER STUDY
ERA16LA003**

A. Accident

Location: Knoxville, Tennessee

Date: October 7, 2015

Time: about 0530 Eastern daylight time (0930 UTC¹)

Aircraft: Beech S35; N449CT

B. Meteorological Specialist

Mike Richards

Senior Meteorologist

National Transportation Safety Board

Operational Factors Division, AS-30

Washington, DC 20594-2000

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 7, 2015 (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).

Coordinates used for approximate accident location: 35.963° North latitude, 83.873° West longitude, elevation of approximately 830 feet.

¹ UTC – abbreviation for Coordinated Universal Time

Synoptic Conditions

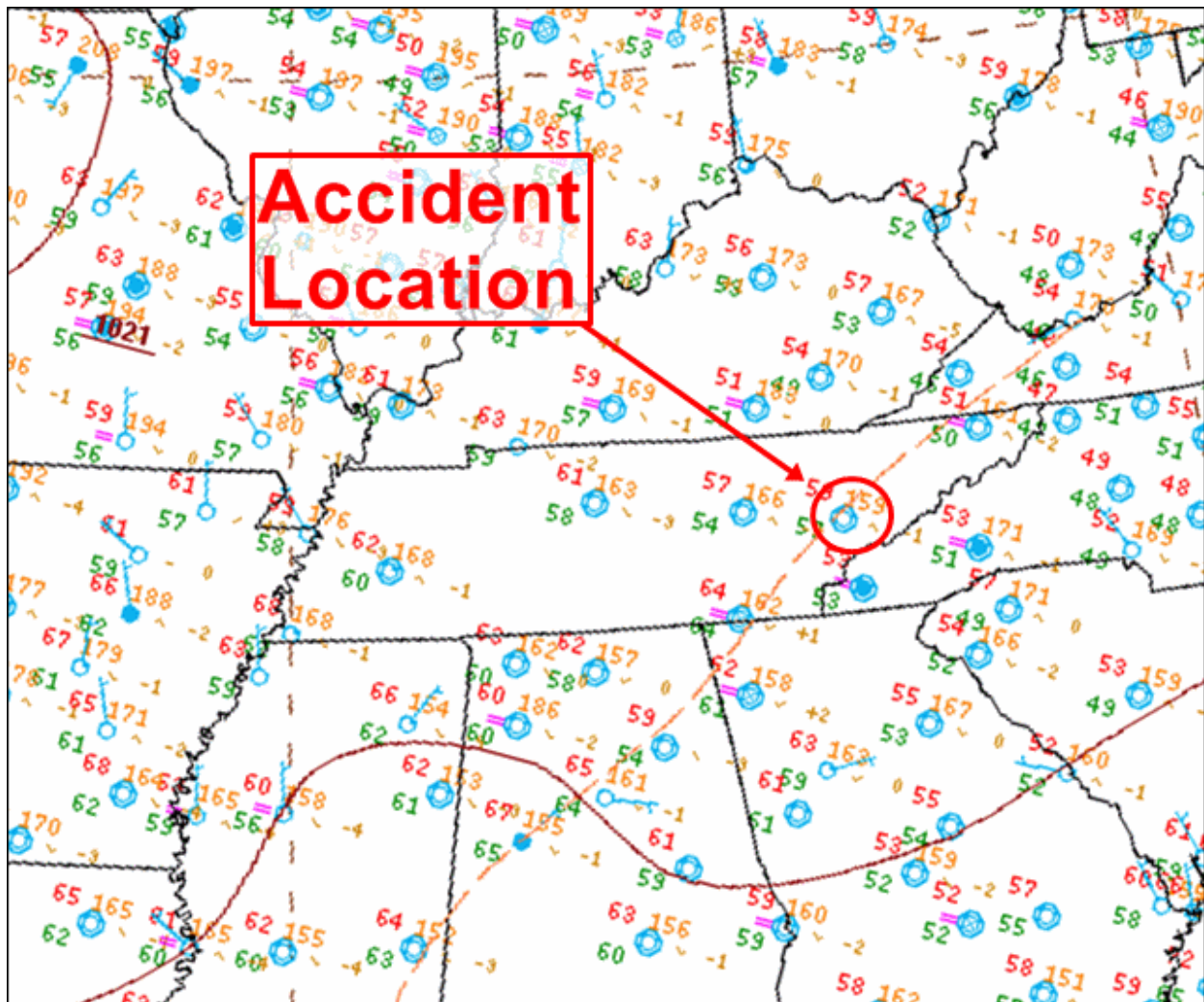


Figure 1 – NWS Surface Analysis Chart for 0500 EDT.

Figure 1 presents the National Weather Service (NWS) Surface Analysis Chart for 0500 EDT. A northeast/southwest-oriented trough extended from southwestern Virginia to southeastern Mississippi through the accident site. WSR-88D regional radar composite reflectivity mosaic imagery from 0530 EDT were obtained from the National Mosaic and Multi-Sensor (NMQ) Project² (figures 2 and 3). Figure 2 presents non-“quality controlled” radar data, while Figure 3 presents “quality controlled” data. The quality control is aimed at removing non-meteorological echoes from the imagery. As seen in Figure 3, the region was void of meteorological radar returns.

²The NMQ project is a joint initiative between the National Severe Storms Laboratory, Federal Aviation Administration, National Weather Service/Office of Hydrologic Development, the Office of Climate, Water and Weather Services and the University of Oklahoma Cooperative Institute in Mesoscale Meteorological Studies.

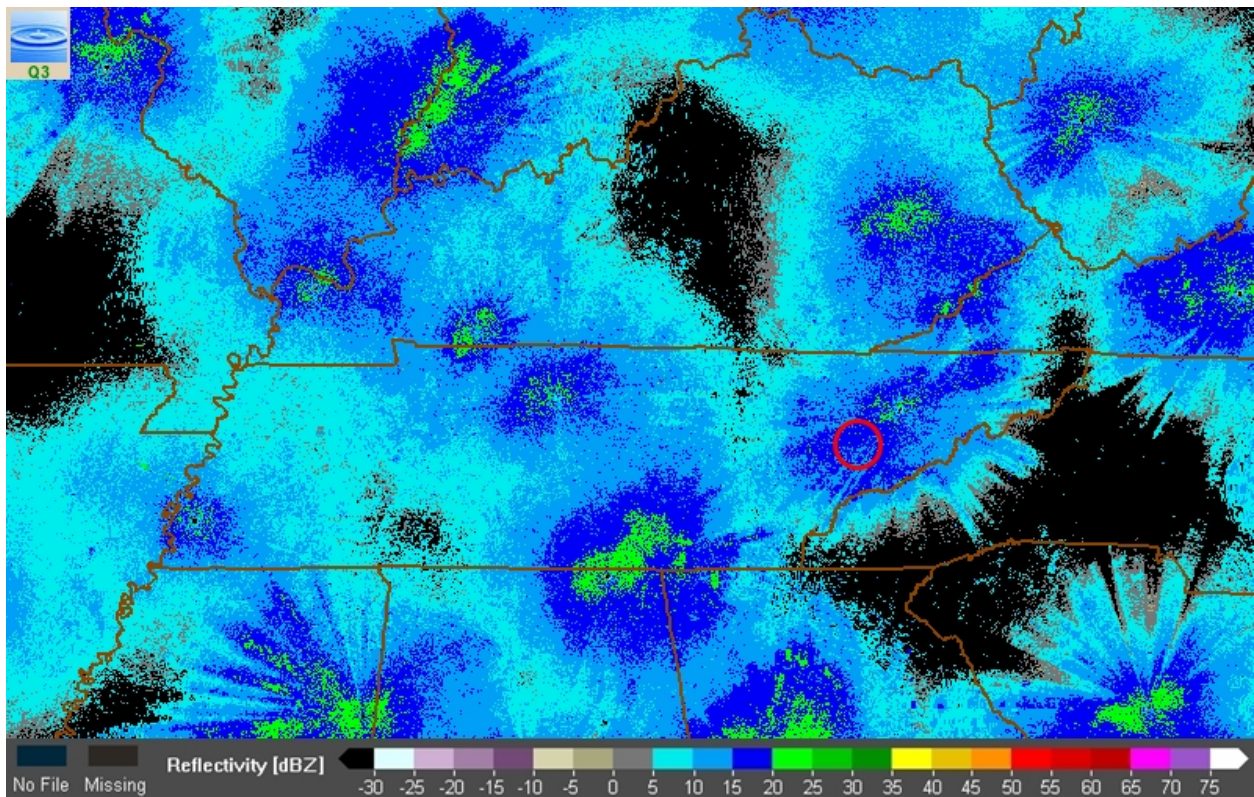


Figure 2 – NMQ NEXRAD composite reflectivity (non-QC'ed) mosaic from 0530 EDT.

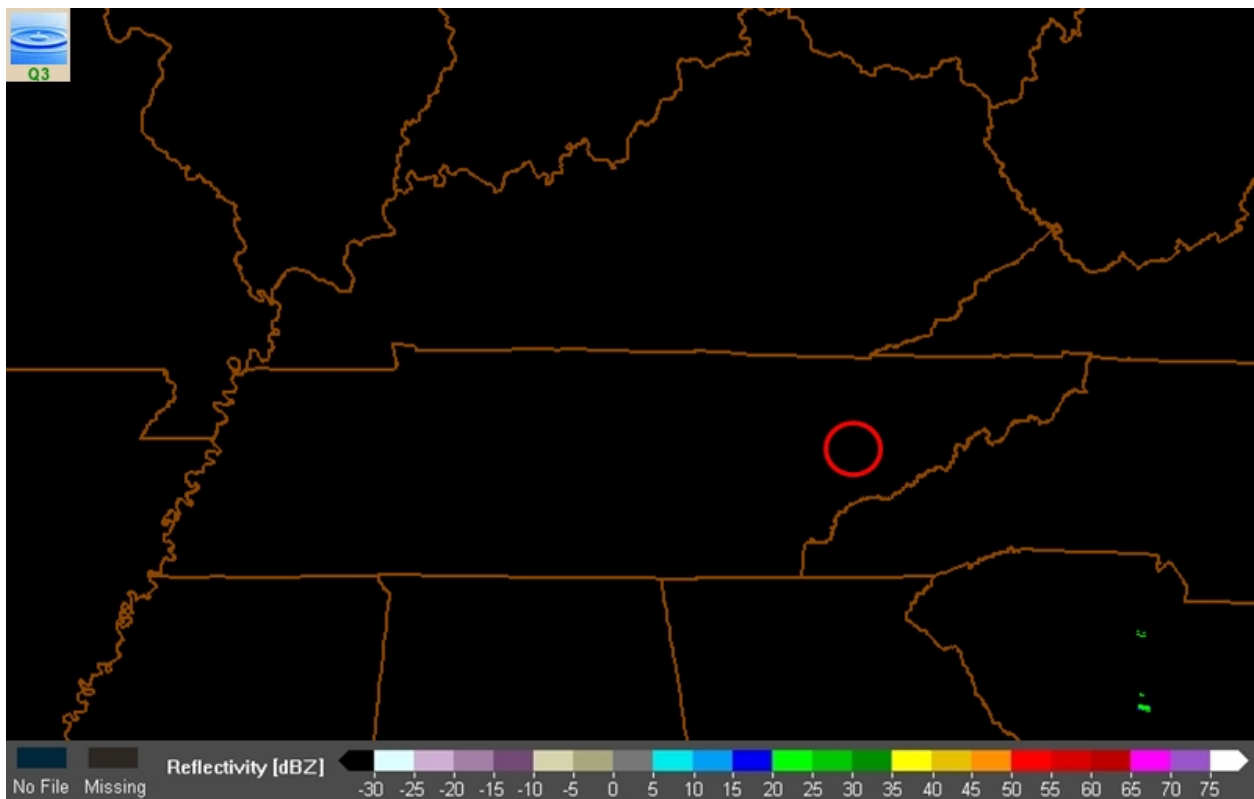


Figure 3 – NMQ NEXRAD composite reflectivity (QC'ed) mosaic from 0530 EDT.

Surface Observations

Screenshots of data retrieved from the Automated Weather Observing System (AWOS) located at Knoxville Downtown Island Airport (DKX) were provided by the DKX airport manager. The screenshot that captured data from the accident time is presented in Figure 4. These data were not augmented by a human.

At 0530 EDT, DKX reported a calm wind, visibility $\frac{1}{4}$ statute mile, ceiling overcast at 200 feet above ground level (agl), temperature of 14°C and a dew point temperature of 13°C, altimeter setting of 30.04 inches of mercury; remarks included: station without a precipitation discriminator, maintenance needed on the system.

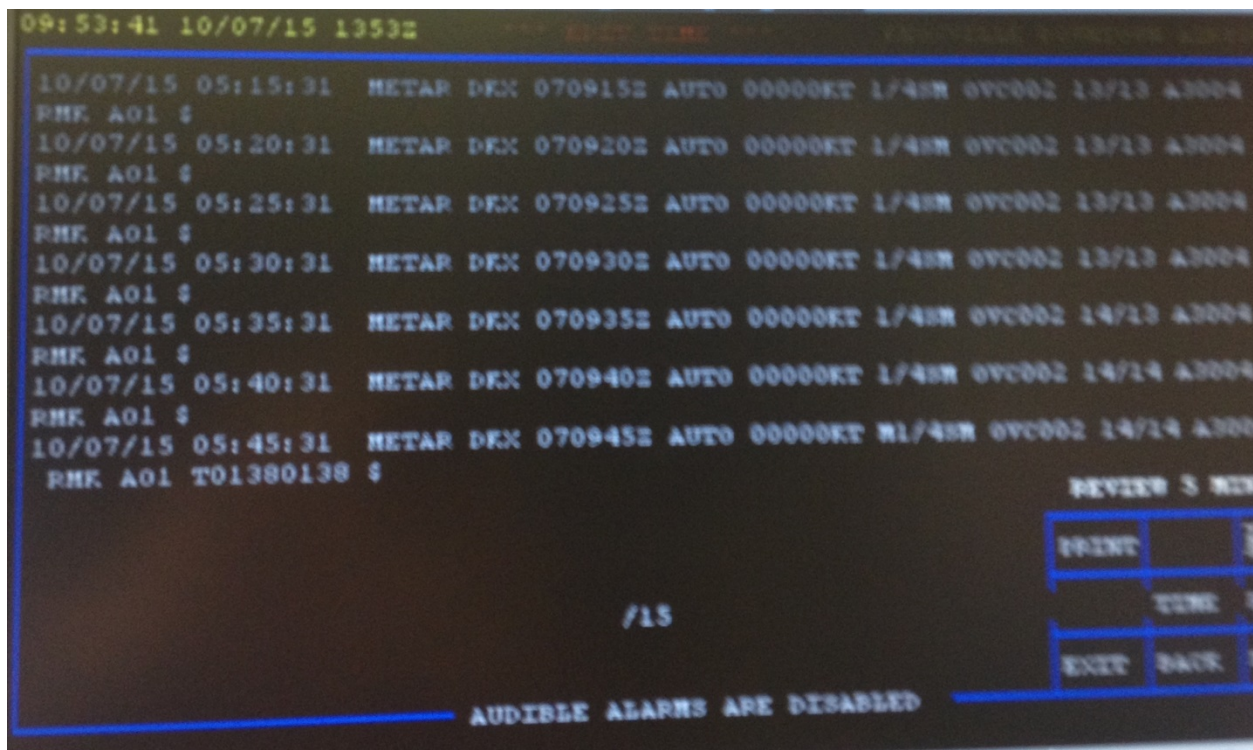


Figure 4 – Screenshot of the DKX AWOS data the morning of the accident.

An Automated Surface Observing System was located at McGhee Tyson Airport (TYS) in Knoxville, Tennessee, which was located about 11 miles southwest of the accident location at an elevation of 979 feet. Human-augmented reports from TYS during the times surrounding the accident time are presented here:

- [0253 EDT] METAR KTYS 070653Z 00000KT 10SM CLR 16/14 A3003 RMK AO2 SLP161 T01610144=
- [0353 EDT] METAR KTYS 070753Z 00000KT 10SM FEW016 16/14 A3003 RMK AO2 SLP160 T01560144=
- [0453 EDT] METAR KTYS 070853Z 00000KT 10SM CLR 15/14 A3003 RMK AO2 SLP159 T01500139 58001=

**[0502 EDT] SPECI KTYS 070902Z 00000KT 10SM BCFG FEW001 15/14 A3003
RMK AO2 T01500139=**

**[0553 EDT] METAR KTYS 070953Z 00000KT 10SM BCFG FEW001 15/14 A3003
RMK AO2 SLP162 T01500139=**

At 0502 EDT, TYS reported a calm wind, visibility of 10 statute miles or greater, patches of fog, few clouds at 100 feet agl, temperature of 15°C and a dew point temperature of 14°C, altimeter setting of 30.03 inches of mercury; remarks included: station with a precipitation discriminator.

Pilot Reports

There were no publicly disseminated pilot reports³ made within about two hours of the accident time within about 50 miles of the accident site.

Area Forecast Discussion

An Area Forecast Discussion (AFD) directed toward aviation was issued at 0127 EDT by the NWS Weather Forecast Office (WFO) in Morristown, Tennessee (MRX).

FXUS64 KMRX 070527
AFDMRX
AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE MORRISTOWN TN
127 AM EDT WED OCT 7 2015
.AVIATION...MAIN CONCERN IS HOW MUCH FOG/LOW CLOUDS DEVELOP
THIS MORNING. WILL CONTINUE WITH MVFR/IFR FLIGHT CONDITIONS
AT ALL TAF SITES THIS MORNING. AS EVENING SHIFT
STATED...CONFIDENCE IS LOW REGARDING THE POTENTIAL FOR FOG
AND LOW CIGS. BY MID-MORNING... FOG WILL DISSIPATE WITH VFR
CONDITIONS RETURNING. SURFACE RIDGING WILL KEEP WINDS LIGHT
THROUGHOUT THE FORECAST.
&&
.MRX WATCHES/WARNINGS/ADVISORIES...
NC...NONE.
TN...NONE.
VA...NONE.

An AFD that did not include an aviation section was issued at 0255 EDT by the NWS MRX WFO. Only the “Short Term” section of the AFD is presented here.

FXUS64 KMRX 070655

³ Only pilot reports with the WMO header UBTN** and UBNC** were considered.

AFDMRX
AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE MORRISTOWN TN
255 AM EDT WED OCT 7 2015
.SHORT TERM (TODAY AND TONIGHT)...CLEAR SKY...CALM WIND WILL
ALLOW PATCHY DENSE FOG TO DEVELOP THIS MORNING...ESPECIALLY
NEAR AREA LAKES AND STREAMS...DUE TO STEAM FOG. BESIDES THE
FOG...SURFACE RIDGING AND DRY NORTHWEST FLOW WILL PRODUCE
ANOTHER DRY AND WARM DAY.
.MRX WATCHES/WARNINGS/ADVISORIES...
NC...NONE.
TN...NONE.
VA...NONE.

Hazardous Weather Outlook

A Hazardous Weather Outlook that addressed portions of Blount County and that advised of patchy dense fog was issued at 0349 EDT by the NWS MRX WFO. Only the "Day One" section is presented here.

FLUS44 KMRX 070749
HWOMRX
HAZARDOUS WEATHER OUTLOOK
NATIONAL WEATHER SERVICE MORRISTOWN TN
349 AM EDT WED OCT 7 2015
NCZ060-061-TNZ012>018-035>047-067>074-081>087-098>102-VAZ001-002-
005-006-008-080800-
CHEROKEE -CLAY -SCOTT TN -CAMPBELL -CLAIBORNE -HANCOCK -
HAWKINS -SULLIVAN -JOHNSON -MORGAN -ANDERSON -UNION -
GRAINGER -HAMBLIN -NORTHWEST COCKE -COCKE SMOKY
MOUNTAINS -NORTHWEST GREENE -SOUTHEAST GREENE -
WASHINGTON TN -UNICOI -NORTHWEST CARTER -SOUTHEAST CARTER
-ROANE -LOUDON -KNOX -JEFFERSON -NW BLOUNT -BLOUNT SMOKY
MOUNTAINS -NORTH SEVIER -SEVIER SMOKY MOUNTAINS -
SEQUATCHIE -BLEDSOE -RHEA -MEIGS -MCMINN -NORTHWEST
MONROE -SOUTHEAST MONROE -MARION -HAMILTON -BRADLEY -
WEST POLK -EAST POLK -LEE -WISE -SCOTT-RUSSELL -WASHINGTON -
349 AM EDT WED OCT 7 2015 /249 AM CDT WED OCT 7 2015/
THIS HAZARDOUS WEATHER OUTLOOK IS FOR PORTIONS OF
SOUTHWEST NORTH CAROLINA...EAST TENNESSEE AND SOUTHWEST
VIRGINIA.
.DAY ONE...TODAY AND TONIGHT...
**PATCHY DENSE FOG THIS MORNING REDUCING VISIBILITIES TO
ONE-QUARTER MILE OR LESS. DRIVE WITH CAUTION AND SLOW. THE
FOG WILL DISSIPATE BY MID-MORNING GIVING WAY TO SUNNY SKIES.**

AIRMETs

An Airmen's Meteorological Information (AIRMET) advisory SIERRA for instrument flight rules (IFR) conditions was issued at 0445 EDT and was active for the accident location at the accident time.

WAUS44 KPCI 070845

WA4S

-DFWS WA 070845

AIRMET SIERRA UPDT 2 FOR IFR AND MTN OBSCN VALID UNTIL 071500

.

AIRMET IFR...TN KY

FROM HNN TO HNV TO GQO TO 50W LOZ TO HNN

VIS BLW 3SM BR. CONDS ENDG 09-12Z.

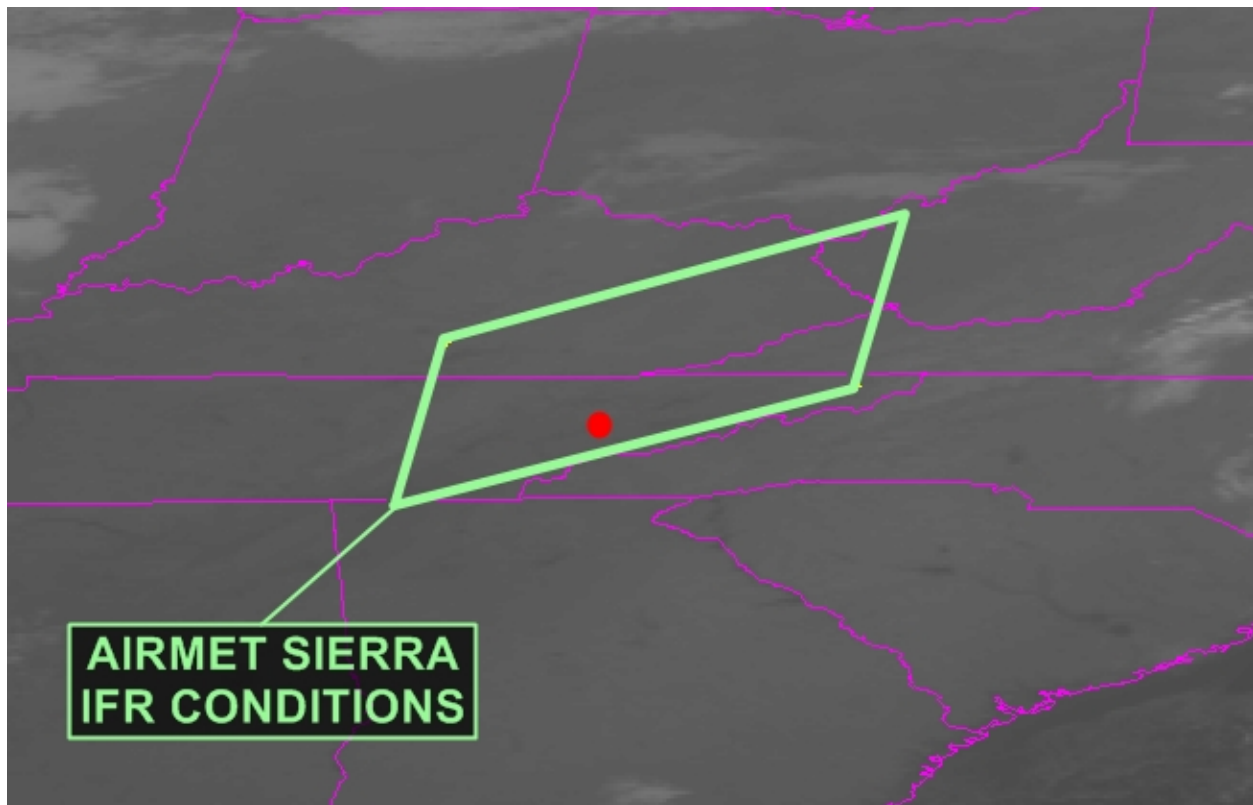


Figure 5 – Graphical depiction of AIRMET SIERRA presented in this section. Red dot denotes accident location.

SIGMETs

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

CWSU Products

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

Astronomical Data

The astronomical data obtained from the United States Naval Observatory for 83° 52' west longitude and 35° 58' north latitude, indicated the following:

SUN

Begin Civil Twilight	0710 EDT
Sunrise	0735 EDT

MOON

Moonrise	0244 EDT
Moonset	1624 EDT

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