



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Washington, D.C. 20594

April 17, 2017

Weather Study

METEOROLOGY

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A. AIRCRAFT ACCIDENT

Location: Cedar key, Florida
Date: February 12, 2017
Time: Approximately 1106 eastern standard time
1606 coordinated universal time (UTC)
Airplane: Piper PA-28R-200; Registration: N4504X

B. METEOROLOGIST

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C. SUMMARY

On February 12, 2017, about 1106 eastern standard time, a Piper PA-28R, N4504X, was destroyed when it impacted the Gulf of Mexico about 7 miles southeast of Cedar Key, Florida. The private pilot and two passengers were fatally injured. The flight departed Brooksville-Tampa Bay Regional Airport (BKV), Brooksville, Florida, at 1037, destined for George T. Lewis Airport (CDK), Cedar Key, Florida. Instrument meteorological conditions prevailed in the area of the accident site, and no flight plan was filed for the personal flight, which was conducted under the provisions of 14 *Code of Federal Regulations* Part 91.

D. DETAILS OF THE INVESTIGATION

The National Transportation Safety Board's (NTSB) Senior Meteorologist was not on scene for this investigation and conducted the meteorology phase of the investigation from the Washington D.C. office, collecting data from official National Weather Service (NWS) sources including the Weather Prediction Center (WPC) and the National Center for Environmental Information (NCEI). All times are eastern standard time (EST) based upon the 24 hour clock, local time is +5 hours to UTC₁, and UTC=Z. Directions are referenced to true north and distances in nautical miles. Heights are above mean sea level (msl) unless otherwise noted. Visibility is in statute miles and fractions of statute miles.

The accident site was estimated at latitude 29.0188° N and longitude 82.9754° W, which was the location where the main wreckage was found.

¹ UTC – is an abbreviation for Coordinated Universal Time

E. FACTUAL INFORMATION

1.0 Synoptic Conditions

The synoptic or large-scale migratory weather systems influencing the area were documented using standard NWS charts issued by the National Center for Environmental Prediction located in Camp Springs, Maryland. These are the base products used in describing weather features and in the creation of forecasts and warnings. Reference to these charts can be found in the joint NWS and Federal Aviation Administration (FAA) Advisory Circular “Aviation Weather Services”, AC 00-45H.

1.1 Surface Analysis

The southeast section of the NWS WPC Surface Analysis Chart for 1000 EST (1500Z) on February 12, 2017 is included as figure 1 with a red star marking the approximate accident site. The chart depicted a low pressure system over Arkansas at 1018-hectopascals (hPa) associated with a frontal wave, with a cold front extending southwestward across Texas and a stationary front to the east-northeast across Arkansas and then back to a cold front across Tennessee, Kentucky to another low pressure system over Pennsylvania. A ridge of high pressure extended across central Florida and was the dominating pressure system over the region. A weak trough of low pressure or easterly wave also indicated off the east coast of Florida and influenced southeast Florida, but had little weather associated with the system. The accident site was located in the warm air sector ahead of the cold front and under the northern edge of the high pressure ridge with general light west to southwesterly wind flow.

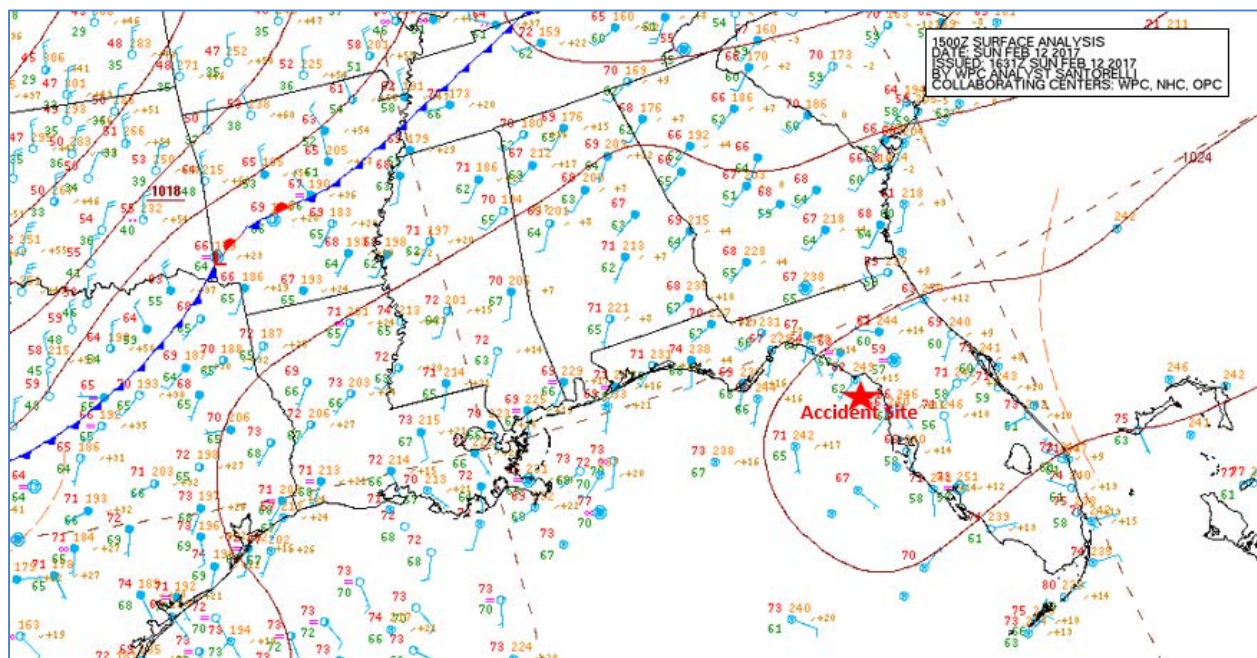


Figure 1 - Southeast section of the NWS Surface Analysis Chart for 1000 EST on February 12, 2017

A station model on the chart for Cedar Key indicated a wind from the west-southwest at 5 knots or less, a temperature and dew point temperature of 62° Fahrenheit (F), no weather or sky conditions were reported. The other surrounding station models around the accident site reported light southwest or calm winds, fog, overcast sky conditions with temperatures in the low 60's with little or no temperature - dew point temperature spreads.

1.2 Weather Depiction Charts

The southeast section of the NWS Weather Depiction Charts for 0800 and 1100 EST are included in figure 2, depicting the general flight categories and primary surface features during the period. The accident site is indicated by a red star. The chart for 0800 EST (1300Z) on the left depicted an extensive area of instrument flight rule (IFR) conditions² by a shaded contour line over northern Florida into Georgia, southern Alabama, Mississippi, and Louisiana. Surrounding that area was an area of marginal visual flight rule (MVFR) conditions³ indicated by an unshaded contour. Two station model near the accident site indicated visibility of 1/4 mile in fog, with obscured skies with ceiling height of 200 feet agl. The chart on the right depicted the general conditions at 1100 EST (1600Z) or at the approximate time of the accident. The general extent of the IFR conditions by 1100 EST was significantly reduced and only extended over a small portion of northwest Florida with several small clusters of IFR conditions over Georgia. The charts indicated that IFR conditions prevailed over the northwest Florida area and was improving or burning off with time during the heat of the day. Visual flight rule (VFR) conditions⁴ were reported near the departure airport of Brooksville during the period.

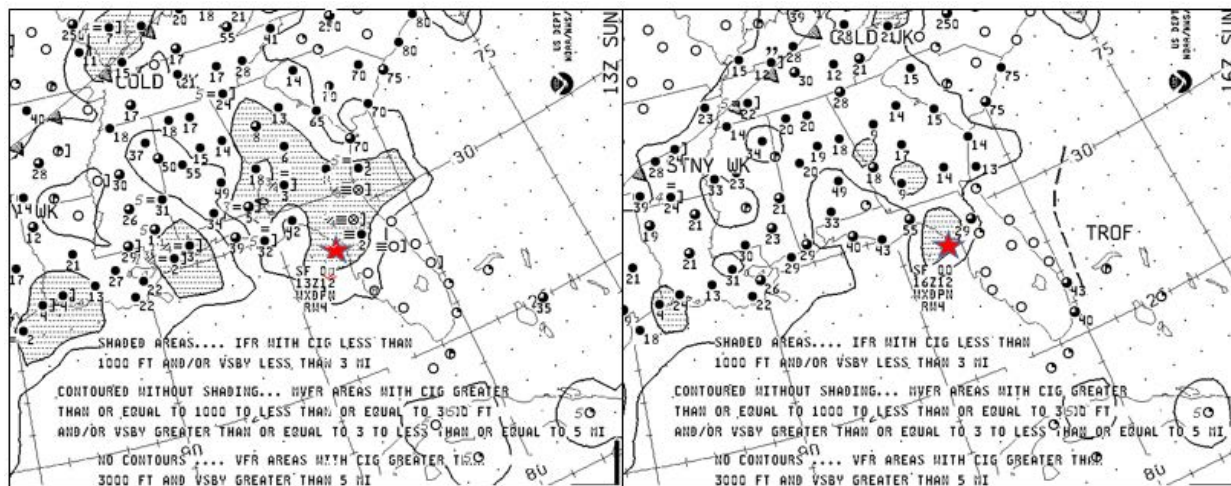


Figure 2 - Southeast section of the NWS Weather Depiction Charts for 0800 EST (1300Z) on the left and 1100 EST (1600Z) on the right on February 12, 2017

² IFR Conditions – are defined as a ceiling or the lowest layer of clouds reported as broken, overcast, or the vertical visibility into a surface based obscuration of less than 1,000 feet above ground level (agl), and/or visibility less than 3 statute miles.

³ MVFR Conditions – is a subset of visual flight rule (VFR) conditions and are defined as a ceiling between 1,000 feet to 3,000 feet agl and/or visibility 3 to 5 miles.

⁴ VFR Conditions – are defined as no ceiling or a ceiling greater than 3,000 feet agl, and visibility greater than 5 miles.

1.3 National Composite radar

The NWS National Composite Radar image for 1105 EST (1605Z) is included as figure 3 and depicted no weather echoes over Florida or the coastal waters.

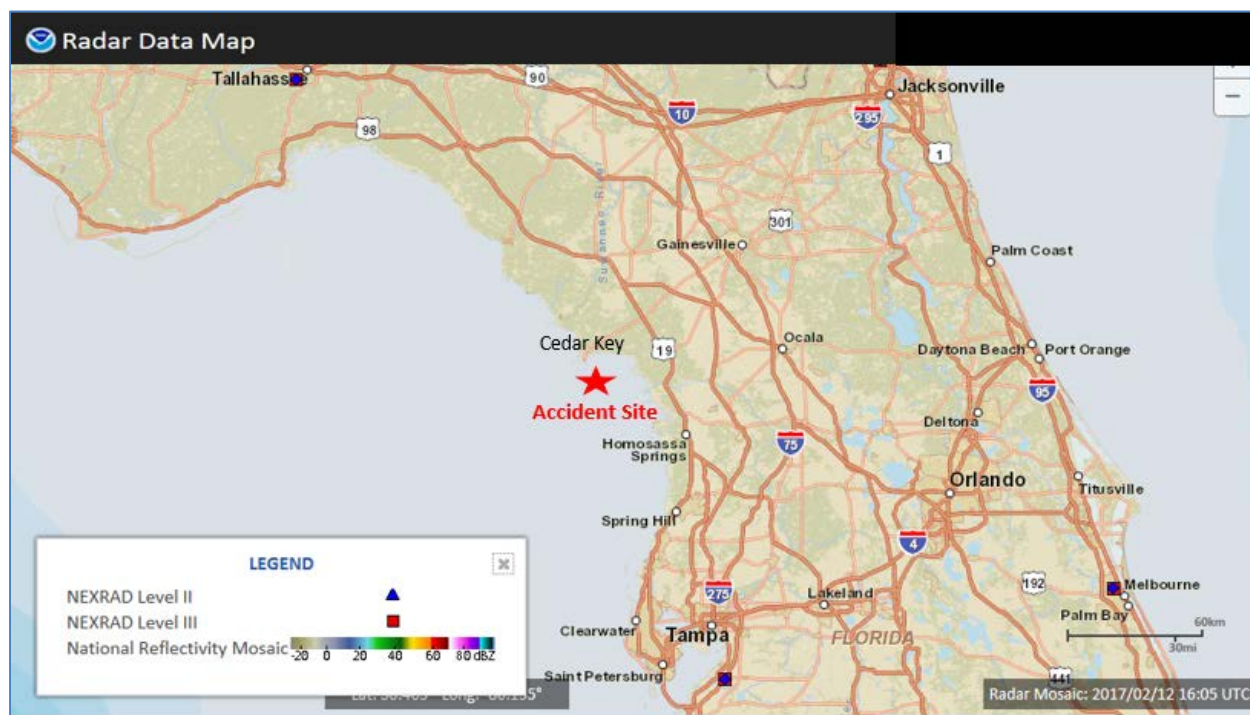


Figure 3 - National Composite Radar image at 1105 EST

1.4 12-Hour Significant Weather Prognostic

The NWS WPC 12-hour Surface Prognostic Chart current during the period showing the expected conditions at 1900 EST is included as figure 4. The chart depicted the approaching cold front across the southeast with a large area of precipitation expected along and ahead of the front. The front was located over central Alabama and Georgia with the edge of the precipitation was just reaching the extreme northwest Florida panhandle. Two high pressure systems were located off the east and west coast of Florida, with no significant weather expected over Florida.

Figure 5 is the 12-hour Low Level Significant Weather Prognostic Chart valid for 1300 EST depicting the general flight categories, turbulence, and freezing level. The chart depicted MVFR conditions over northern Florida northward into the Tennessee Valley. VFR conditions were expected for the route of flight and for central and southern Florida. No significant turbulence was forecast below 24,000 feet and the freezing level was above 12,000 feet.

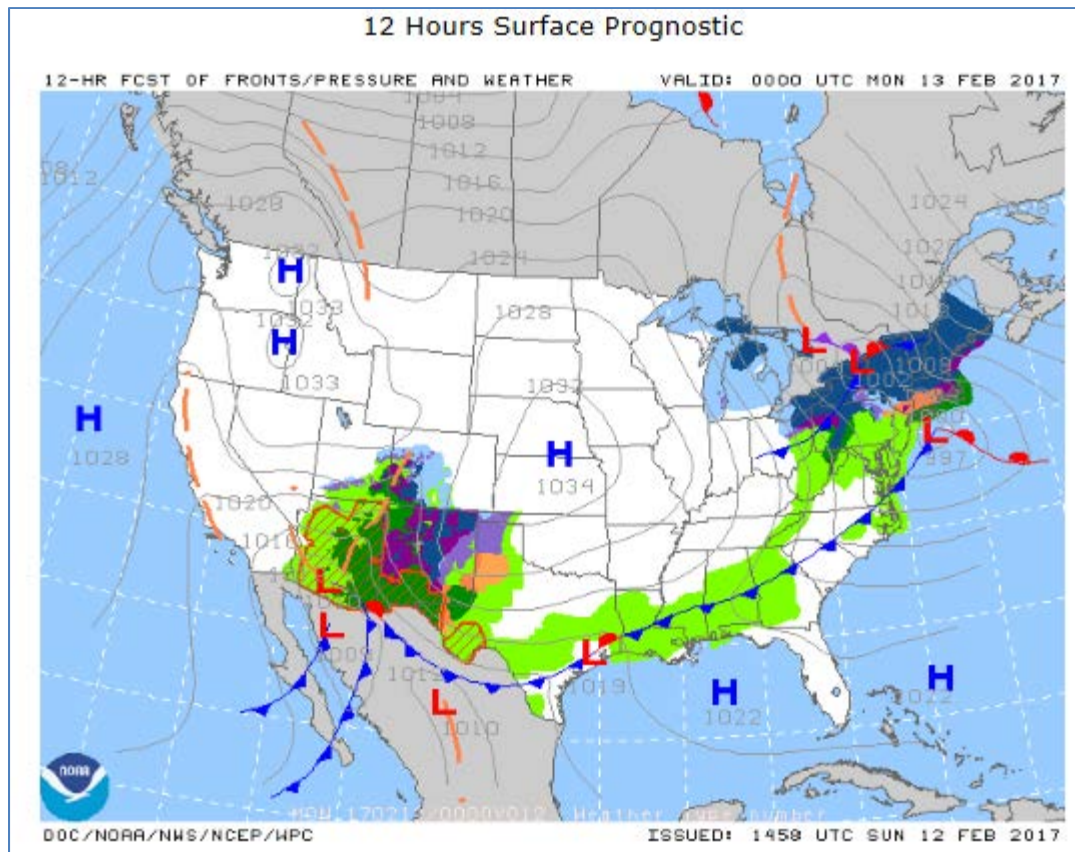


Figure 4 – 12-Hr Surface Prognostic Chart valid for 1900 EST

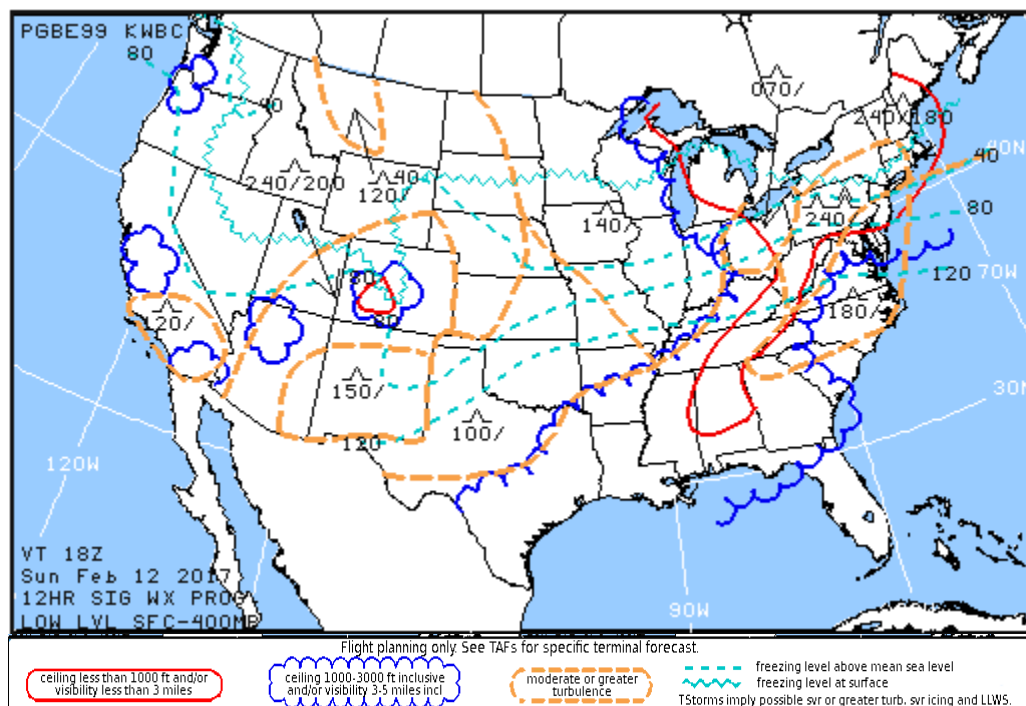


Figure 5 - 12-Hr Low Level Significant Weather Prognostic Chart valid for 1300 EST

2.0 Surface Observations

The official NWS Meteorological Aerodrome Reports (METARs) and special reports (SPECIs) and Remote Automated Weather Stations (RAWS) sites surrounding the period were documented for the area. The cloud heights are reported above ground level (agl) in the following observations. The magnetic variation over the area was estimated at 5° West based on the sectional chart for the area.

Figure 6 is a plotted display of the METARs for northwest section of Florida for 1100 EST obtained from the NWS Aviation Weather Center (AWC).

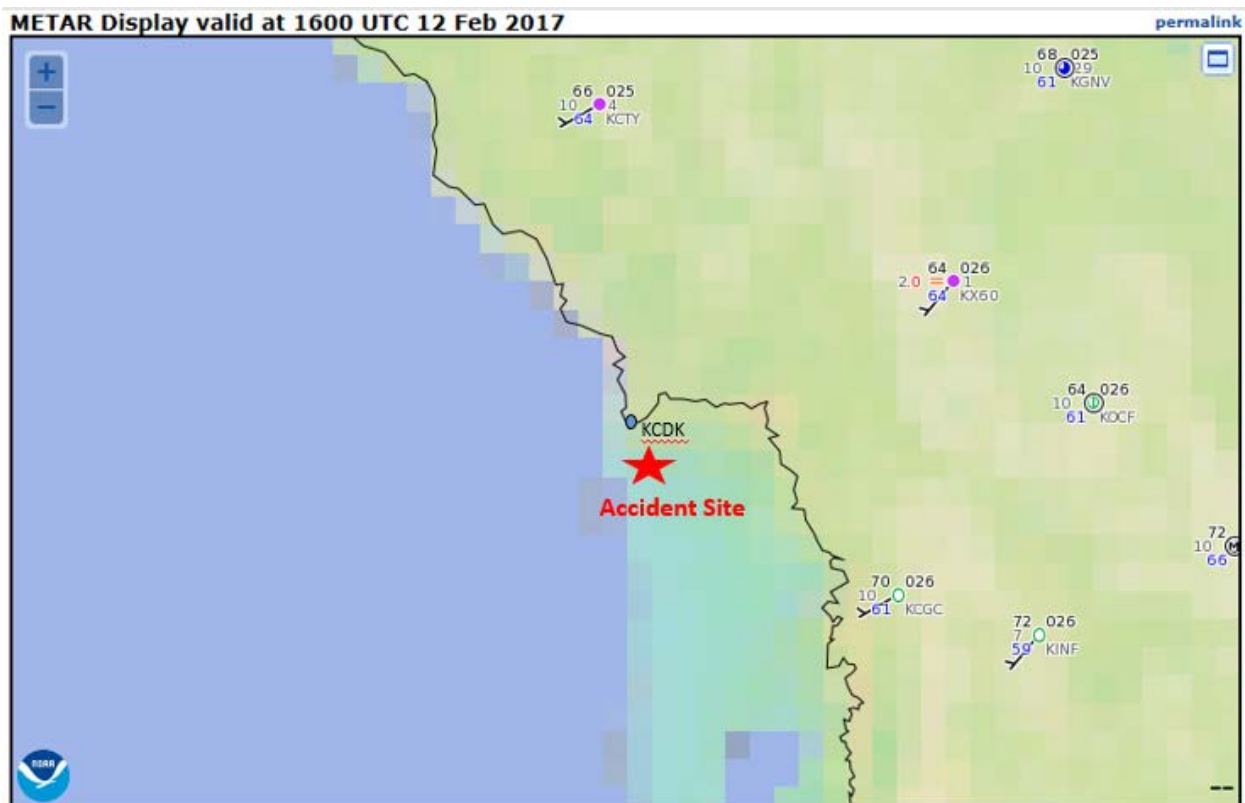


Figure 6 - Plot of the observations at 1100 EST

2.1 George T. Lewis Airport (KCDK), Cedar Key, FL

The planned destination was George T. Lewis Airport (KCDK), Cedar Key, Florida, located approximately 7 miles north of the accident site at an elevation of 11 feet. The airport did not have any weather reporting capability other than a lighted windsock.

2.2 Cross City Airport (KCTY), Cross City, FL

The closest weather reporting facility to the accident site was from Cross City Airport (KCTY), Cross City, FL, located approximately 25 miles north of KCDK at an elevation of 42 feet. The airport had an Automated Weather Observation Station (AWOS) and issued observations every 20-minutes. The following conditions were reported at the time of the accident:

Cross City Airport weather at 1055 EST (1555Z), automated⁵, wind from 240° at 5 knots, visibility 10 miles, ceiling overcast at 400 feet agl, temperature 19° Celsius (C), dew point temperature 18° C, altimeter 30.25 inches of mercury (Hg). Remarks: automated weather observation system with a precipitation discriminator.

The raw observations and the general flight categories from approximately 4 hours prior to 2 hours after the accident were documented to capture the conditions reported prior to departure during the preflight weather planning stage, and to document any trends or significant changes that occurred during the period. The reports were as follows:

LIFR⁶ METAR KCTY 121155Z AUTO 17003KT M1/4SM FG OVC002 13/13 A3021 RMK AO2=

LIFR METAR KCTY 121215Z AUTO 18003KT M1/4SM FG OVC002 13/13 A3022 RMK AO2=

LIFR METAR KCTY 121235Z AUTO 00000KT M1/4SM FG OVC002 13/13 A3022 RMK AO2=

LIFR METAR KCTY 121255Z AUTO 00000KT M1/4SM FG OVC002 13/13 A3023 RMK AO2=

LIFR METAR KCTY 121315Z AUTO 16003KT M1/4SM FG OVC002 14/14 A3023 RMK AO2=

LIFR METAR KCTY 121335Z AUTO 18003KT 1/4SM FG OVC002 15/15 A3024 RMK AO2=

LIFR METAR KCTY 121355Z AUTO 00000KT 1/4SM FG OVC002 15/15 A3025 RMK AO2=

LIFR METAR KCTY 121415Z AUTO 00000KT 1/4SM FG OVC002 16/16 A3025 RMK AO2=

LIFR METAR KCTY 121435Z AUTO 23005KT 3/4SM BR OVC002 17/17 A3025 RMK AO2=

LIFR METAR KCTY 121455Z AUTO 22004KT 2SM BR OVC002 17/17 A3025 RMK AO2=

LIFR METAR KCTY 121515Z AUTO 22005KT 10SM OVC002 18/18 A3025 RMK AO2=

LIFR METAR KCTY 121535Z AUTO 21004KT 10SM OVC002 18/18 A3026 RMK AO2=

LIFR METAR KCTY 121555Z AUTO 24005KT 10SM OVC004 19/18 A3025 RMK AO2=

Accident 1606Z

IFR METAR KCTY 121615Z AUTO 22006KT 10SM OVC006 19/18 A3025 RMK AO2=

IFR METAR KCTY 121635Z AUTO 22007KT 10SM OVC008 20/18 A3024 RMK AO2=

MVFR METAR KCTY 121655Z AUTO 22008KT 10SM BKN011 OVC015 21/18 A3023 RMK AO2=

MVFR METAR KCTY 121715Z AUTO 23008KT 10SM BKN013 BKN018 OVC039 22/18 A3022 RMK AO2=

⁵ Automated – “AUTO” in the header of the observation indicated that there was no human logged onto the system or augmenting the observation, to add any additional information, or to correct for any reporting errors or weather conditions outside the sensors field of view.

⁶ Low Instrument Flight Rule conditions (LIFR) – is a subset of IFR conditions and is defined as a ceiling less than 500 feet agl and/or visibility less than ½ mile.

MVFR METAR KCTY 121735Z AUTO 22011KT 10SM BKN013 BKN020 BKN041 22/18 A3021 RMK AO2=

VFR METAR KCTY 121755Z AUTO 22011KT 10SM SCT013 SCT041 23/18 A3020 RMK AO2=

MVFR METAR KCTY 121815Z AUTO 24011KT 10SM BKN015 23/18 A3019 RMK AO2=

MVFR METAR KCTY 121835Z AUTO 26010KT 10SM BKN015 23/18 A3018 RMK AO2=

MVFR METAR KCTY 121855Z AUTO 22009KT 10SM BKN017 BKN022 BKN032 23/18 A3017 RMK AO2=

2.3 Crystal River Airport-Captain Tom Davis Field (KCGC), Crystal River, FL

The next closest weather reporting location was Crystal River Airport-Captain Tom Davis Field (KCGC) located approximately 30 miles southeast of KCDK in Crystal River, FL. The airport also had an AWOS system and reported the following conditions:

Crystal City Airport weather at 1055 EST (1555Z), automated, wind from 240° at 5 knots, visibility 10 miles, skies clear below 12,000 feet, temperature 21° C, dew point 16° C, altimeter 30.26 inches of Hg. Remarks: automated weather observation system with a precipitation discriminator.

The raw observations and flight categories surrounding the period were as follows:

LIFR METAR KCGC 121155Z AUTO 00000KT M1/4SM FG OVC003 10/10 A3022 RMK AO2=

LIFR METAR KCGC 121215Z AUTO 00000KT M1/4SM FG OVC003 10/10 A3023 RMK AO2=

LIFR METAR KCGC 121235Z AUTO 00000KT M1/4SM FG OVC003 10/10 A3023 RMK AO2=

LIFR METAR KCGC 121255Z AUTO 00000KT 1/4SM FG OVC003 11/11 A3024 RMK AO2=

LIFR METAR KCGC 121315Z AUTO 00000KT 1/4SM FG OVC003 11/11 A3024 RMK AO2=

LIFR METAR KCGC 121335Z AUTO 00000KT 1/4SM FG OVC003 12/12 A3024 RMK AO2=

LIFR METAR KCGC 121355Z AUTO 00000KT 1/4SM FG OVC003 13/13 A3024 RMK AO2=

LIFR METAR KCGC 121415Z AUTO 00000KT 1/2SM FG OVC003 15/15 A3025 RMK AO2=

LIFR METAR KCGC 121435Z AUTO 00000KT 5SM BR OVC003 16/16 A3025 RMK AO2=

VFR METAR KCGC 121455Z AUTO 00000KT 10SM SCT003 17/17 A3026 RMK AO2=

VFR METAR KCGC 121515Z AUTO 00000KT 10SM CLR 18/17 A3026 RMK AO2=

VFR METAR KCGC 121535Z AUTO 26007KT 10SM CLR 19/17 A3026 RMK AO2=

VFR METAR KCGC 121555Z AUTO 24005KT 10SM CLR 21/16 A3026 RMK AO2=

Accident 1606Z

VFR METAR KCGC 121615Z AUTO 28007KT 250V320 10SM SCT019 22/16 A3026 RMK AO2=

VFR METAR KCGC 121635Z AUTO 27004KT 10SM SCT017 SCT022 22/17 A3026 RMK AO2=
VFR METAR KCGC 121655Z AUTO 25007KT 10SM SCT015 SCT020 22/15 A3025 RMK AO2=
MVFR METAR KCGC 121715Z AUTO 28008G14KT 10SM BKN020 21/16 A3024 RMK AO2=
VFR METAR KCGC 121735Z AUTO 27006KT 10SM SCT020 21/16 A3024 RMK AO2=
MVFR METAR KCGC 121755Z AUTO 28007KT 10SM BKN018 22/16 A3022 RMK AO2=
MVFR METAR KCGC 121815Z AUTO 26008KT 10SM BKN018 BKN024 22/16 A3021 RMK AO2=

2.4 Inverness Airport (KINF), Inverness, FL

Inverness Airport (KINF) was located approximately 43 miles southeast from KCDK at an elevation of 65 feet. The airport had an AWOS and reported the following conditions.

Inverness Airport weather at 1115 EST (1615Z), automated, wind from 200° at 7 knots, visibility 7 miles, sky clear below 12,000 feet, temperature 23° C, dew point temperature 14° C, altimeter 30.25 inches of Hg. Remarks: automated weather observation system with a precipitation discriminator.

The raw observations and flight categories surrounding the period were as follows:

LIFR METAR KINF 121155Z AUTO 00000KT 1/2SM FG OVC002 08/08 A3023 RMK AO2=
LIFR METAR KINF 121215Z AUTO 00000KT 2SM BR OVC002 08/08 A3023 RMK AO2=
LIFR METAR KINF 121235Z AUTO 00000KT M1/4SM FG OVC002 09/09 A3024 RMK AO2=
LIFR METAR KINF 121255Z AUTO 00000KT M1/4SM FG OVC002 10/10 A3024 RMK AO2=
LIFR METAR KINF 121315Z AUTO 00000KT 1/4SM FG OVC002 11/11 A3024 RMK AO2=
LIFR METAR KINF 121335Z AUTO 00000KT 1/4SM FG OVC002 12/12 A3025 RMK AO2=
LIFR METAR KINF 121355Z AUTO 00000KT 3/4SM BR OVC002 14/14 A3025 RMK AO2=
VFR METAR KINF 121415Z AUTO 20003KT 10SM SCT002 16/16 A3026 RMK AO2=
VFR METAR KINF 121435Z AUTO 00000KT 10SM CLR 17/17 A3026 RMK AO2=
VFR METAR KINF 121455Z AUTO 24003KT 10SM CLR 19/16 A3026 RMK AO2=
VFR METAR KINF 121515Z AUTO 18004KT 7SM CLR 20/15 A3026 RMK AO2=
MVFR METAR KINF 121535Z AUTO 21004KT 5SM HZ CLR 21/15 A3026 RMK AO2=
VFR METAR KINF 121555Z AUTO 22004KT 7SM CLR 22/15 A3026 RMK AO2=

Accident 1606Z

VFR METAR KINF 121615Z AUTO 20004KT 7SM CLR 23/14 A3025 RMK AO2=
VFR METAR KINF 121635Z AUTO 31003KT 10SM CLR 24/13 A3025 RMK AO2=
VFR METAR KINF 121655Z AUTO 27003KT 7SM CLR 24/13 A3024 RMK AO2=
VFR METAR KINF 121735Z AUTO 23007KT 220V280 10SM CLR 25/14 A3022 RMK AO2=
VFR METAR KINF 121755Z AUTO 25005KT 10SM CLR 25/13 A3021 RMK AO2=
VFR METAR KINF 121815Z AUTO 24005KT 10SM CLR 26/12 A3019 RMK AO2=

2.5 Ocala International Airport-Jim Taylor Field (KOCF), Ocala, FL

Ocala International Airport - Jim Taylor Field (KOCF) was located 44 miles east of KCDK at an elevation of 90 feet. The airport also had an AWOS but also had a contract tower which augmented the observations. The following conditions were reported at the time of the accident:

Ocala International Airport weather at 1050 EST (1550Z), wind calm, visibility unrestricted at 10 miles, a few clouds at 600 feet agl, temperature 18° C, dew point temperature 16° C, altimeter 30.26 inches of Hg.

The raw observations and flight categories surrounding the period were as follows:

LIFR METAR KOCF 121150Z 00000KT 1/4 SM FG OVC002 10/08 A3022=
LIFR METAR KOCF 121250Z 00000KT <1/4 SM FG OVC002 11/09 A3023=
LIFR METAR KOCF 121350Z 00000KT M1/4 SM FG OVC002 13/11 A3025=
LIFR METAR KOCF 121450Z 00000KT M1/4SM FG OVC002 15/14 A3026=
LIFR SPECI KOCF 121520Z 00000KT 5SM BR BKN003 17/15 A3026=
VFR SPECI KOCF 121535Z 00000KT 10SM FEW003 17/16 A3026=
VFR METAR KOCF 121550Z 00000KT 10SM FEW006 18/16 A3026=
Accident 1606Z
VFR METAR KOCF 121650Z 24008KT 10SM CLR 23/14 A3024=
VFR METAR KOCF 121750Z 25007KT 10SM CLR 23/14 A3022=

3.0 Sounding

A High Resolution Rapid Refresh (HRRR) numerical model from the initial time of 0700 EST and valid for 1100 EST to approximate the conditions at and for the accident site. The HRRR model data was obtained from the NOAA Air Resource Laboratory (ARL) archive data and was

plotted on a standard Skew-T log P diagram⁷ from the surface to 500-hPa or 18,000 feet utilizing RAOB software⁸, and is included as figure 7.

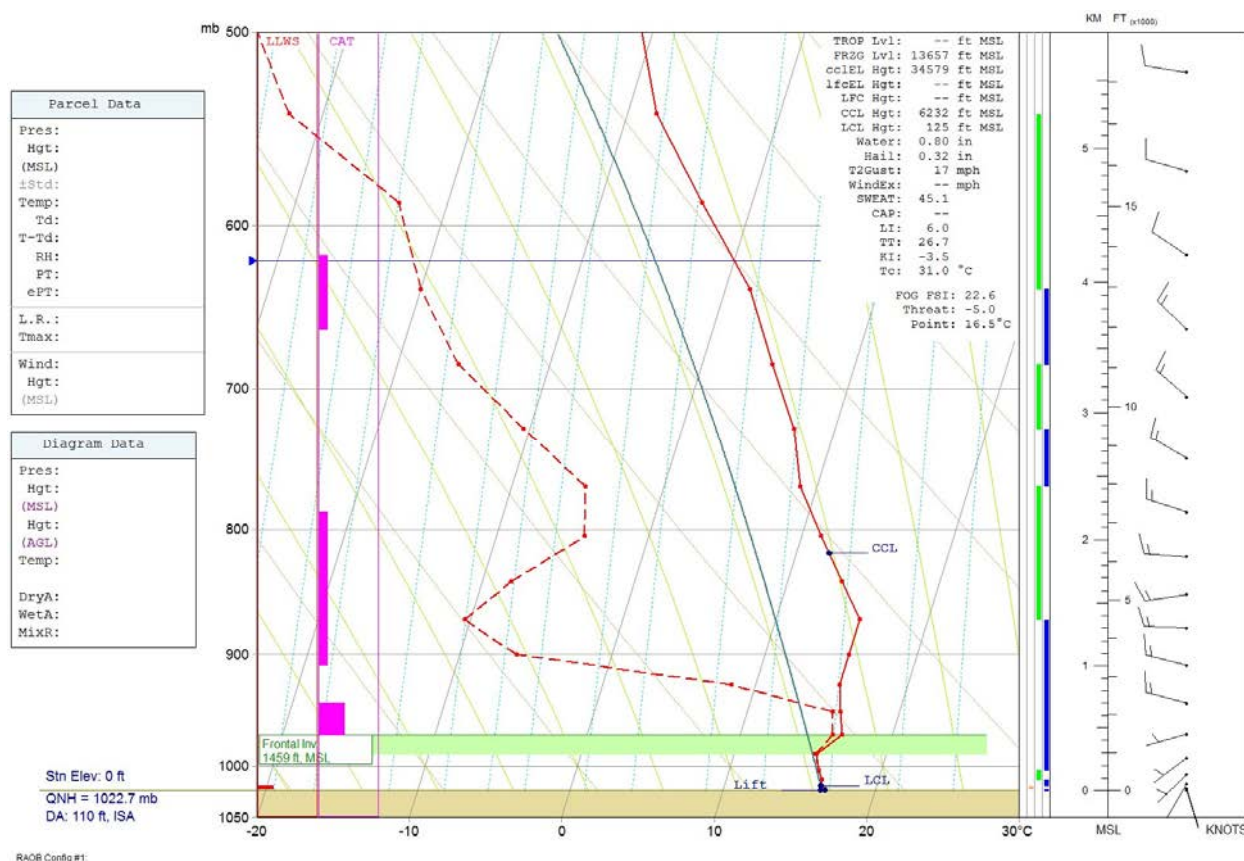


Figure 7 - HRRR numerical model sounding for the accident site for 1100 EST

The sounding depicted a low-level temperature inversion between surface and 1,500 feet where temperature increased with height. This layer had a relative humidity greater than 98% or a saturated layer support low stratiform type clouds and fog. The lifted condensation level (LCL)⁹ was identified at 125 feet agl, and the convective condensation level (CCL)¹⁰ at 6,232 feet agl. The expected cloud tops was at 2,250 feet. The freezing level was identified at 13,657 feet with no significant structural icing identified. With regards to carburetor or induction system type icing

⁷ Skew T log P diagram – is a standard meteorological plot or thermodynamic diagram using temperature and the logarithmic of pressure as coordinates, used to display winds, temperature, dew point, and various indices used to define the vertical structure of the atmosphere.

⁸ RAOB – (The complete Rawinsonde Observation program) is an interactive sounding analysis program developed by Environmental Research Services, Matamoras, Pennsylvania.

⁹ Lifting Condensation Level (LCL) - The height at which a parcel of moist air becomes saturated when it is lifted dry adiabatically.

¹⁰ Convective Condensation Level (CCL) - The height to which a parcel of air, if heated sufficiently from below, will rise adiabatically until condensation starts. This is typically used to identify the base of cumuliform clouds, which are normally produced from surface heating and thermal convection.

the temperature and moisture profile did support a severe risk of icing below 3,000 feet. The precipitable water content was 0.80 inches. The atmosphere was characterized as stable with a Lifted Index (LI)¹¹ of +6.0.

The wind profile indicated a calm surface wind with winds from the west-southwest and veering clockwise to the west immediately above the temperature inversion, and increasing to 15 knots above 3,000 feet. The mean 0 to 6 kilometer or 18,000 feet wind was from 290° at 12 knots, with the level of maximum wind at 44,760 feet was from 280° at 26 knots. At 2,000 feet a potential for moderate turbulence existed at the top of the inversion and the increase in wind speeds above. The model data through 10,000 feet was as follows:

Height (ft-MSL)	Pres (mb)	T (C)	Td (C)	RH (%)	DD/FF (deg/ kts)	CAT (FAA)	LLWS	Icing - Type (AFGWC method)
0	1023	16.7	16.4	98	164/2			
27	1022	16.7	16.6	99	164/2		LIGHT	
109	1019	16.4	16.4	100	208/2			
274	1013	16.3	16.3	100				
423	1008				223/3			
524	1004	15.9	15.9	100				
945	989	15.4	15.3	99	231/4			
1459	971	16.7	16.1	96	253/6			
2072	950	16.1	15.6	97		MDT		
2300	942				286/13			
2787	926	15.5	8.4	63				
3297	909				285/15			
3579	900	15.5	-6.3	22		LGT		
4265	878				272/15			
4489	871	15.5	-10.4	16		LGT		
5148	851				261/17			
5492	840	13.6	-8.1	21		LGT		
6132	821				274/17			
6662	805	11.3	-4.2	33		LGT		
7283	787				289/17			
7945	768	8.9	-5.2	36				
8668	748				302/16			
9430	727	7.3	-10.4	27				
10243	705				314/17			

4.0 Satellite Imagery

The Geostationary Operational Environmental Satellite number 13 (GOES-13) data was obtained from an archive at the Space Science Engineering Center (SSEC) at the University of Wisconsin-Madison in Madison, Wisconsin, and processed using the Man-computer Interactive Data Access System (McIDAS) software. Both the infrared long wave and visible band imagery were obtained surrounding the time of the accident. The infrared long wave imagery (band 4) at a wavelength of 10.7 microns (µm) provided standard satellite image with radiative cloud top

¹¹ Lifted Index (LI) - A common measure of atmospheric instability. Its value is obtained by computing the temperature that air near the ground would have if it were lifted to 500-hPa or approximately 18,000 feet and comparing that temperature to the actual temperature at that level. Negative values indicate instability - the more negative, the more unstable the air is, and the stronger the updrafts are likely to be with any developing thunderstorms.

temperatures with a resolution of 4 km. The visible imagery (band 1) at a wavelength of 0.65 μm provided a resolution of 1 km.

The GOES-13 infrared image at 4X magnification for 1100 EST is included as figure 8, with the accident site marked by a white square. The image depicted a band of low stratiform type clouds and fog over the Gulf coastal region into northwestern Florida. The radiative cloud top temperature over the accident site was 288° Kelvin or 14.8° C, which corresponded to cloud tops to near 4,800 feet. A mid level band of clouds was also observed from the Gulf to north of KCTY east-northeastward to near Jacksonville (KJAX) associated with stratocumulus type clouds.

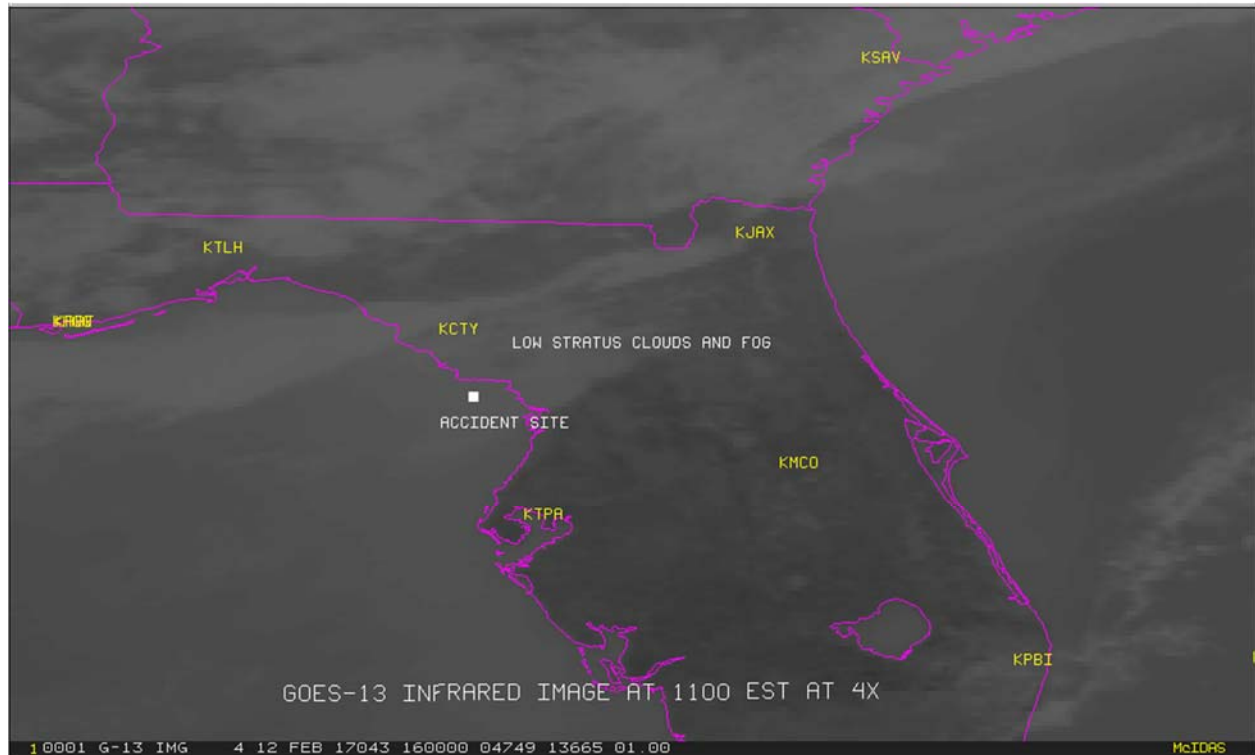
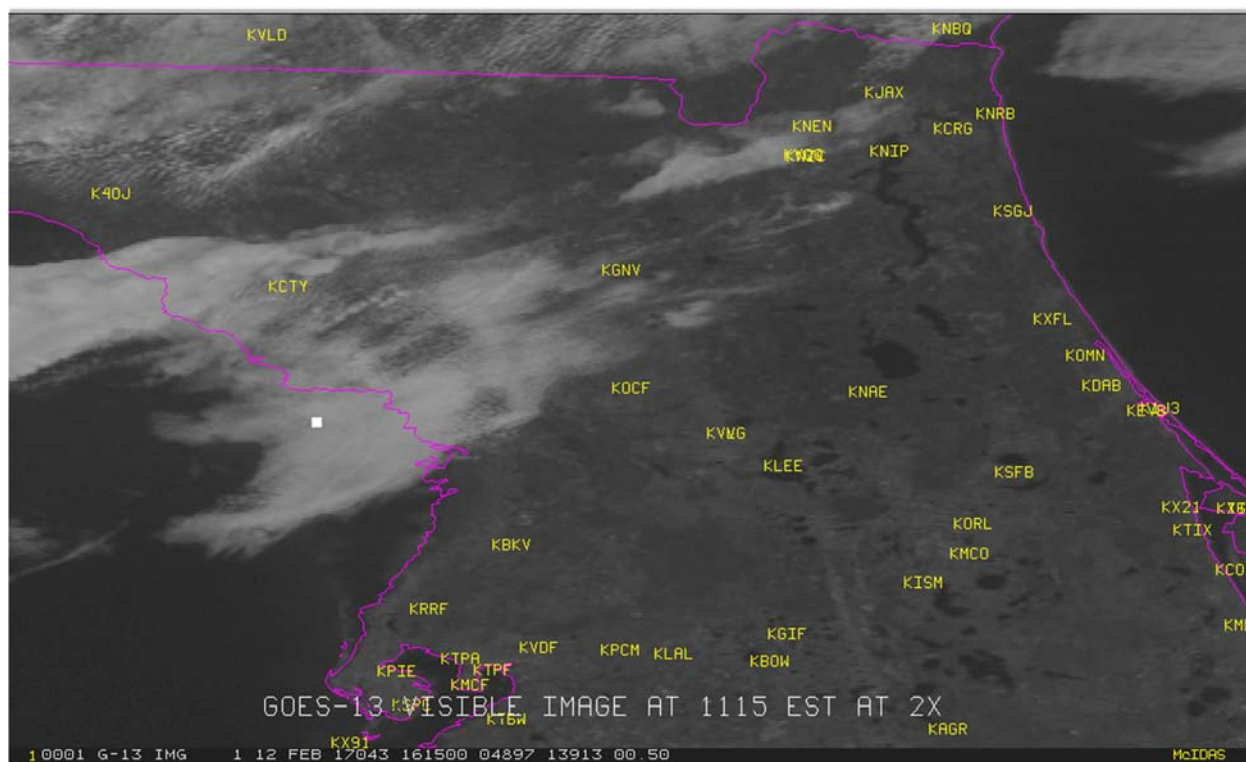
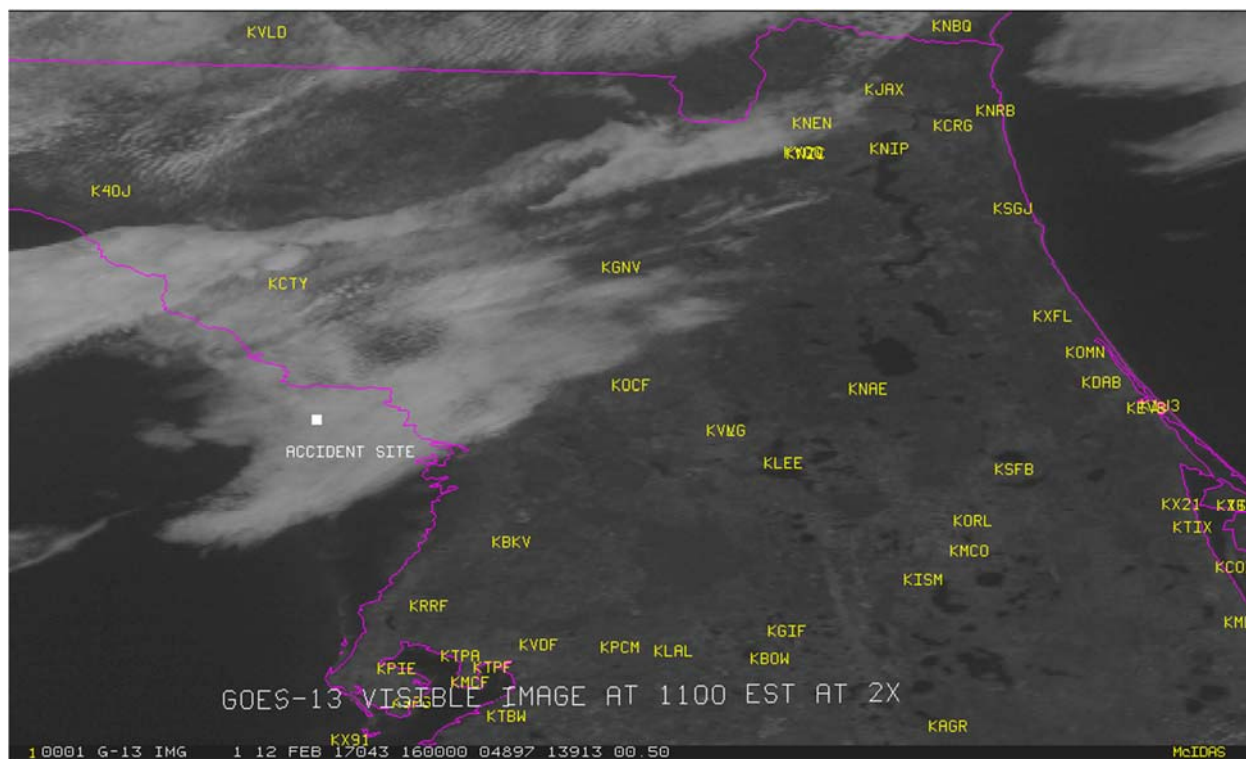


Figure 8 - GOES-13 infrared image at 1100 EST

The GOES-13 visible images at 2X magnification for 1100 and 1115 EST are included as figures 9 and 10 respectively. The images show the accident site under a layer of stratiform clouds and fog off the coast.



5.0 Pilot Reports

A search of the NWS recorded pilot reports or PIREPs were reviewed. The following reports over northern Florida were recorded surrounding the period from 0600 through 1200 EST. The reports are in plain language taken from standard code and abbreviations, and converted to local time. The reports were as follows:

Jacksonville International Airport (JAX) routine pilot report; Over – 4 miles northwest of Gators VORTAC¹² (GNV), Gainesville, FL; Time – 0654 EST; Flight level – 2,000 feet; Type aircraft – Bombardier Regional Jet (CRJ7); Sky cover – cloud bases at 200 feet, overcast with tops at 1,000 feet.

Pensacola International Airport (PNS) routine pilot report; Over – 170° azimuth and 7 miles of PNS airport; Time – 0719 EST; Flight level – 3,900 feet; Type aircraft – Embraer regional jet (E145); Sky cover – broken layer of clouds at 400 feet with tops at 3,900 feet.

Jacksonville International Airport (JAX) routine pilot report; Over – Ocala VORTAC (OCF); Time – 0800 EST; Flight level – 1,000 feet; Type aircraft – Pilatus PC-12 single engine turboprop (PC12); Sky cover – bases of vertical visibility at 100 feet with overcast tops at 300 feet.

Pensacola International Airport (PNS) routine pilot report; Over – 240° azimuth and 5 miles of PNS airport; Time – 0807 EST; Flight level – 4,000 feet; Type aircraft – Bombardier Regional Jet (CRJ9); Sky cover – overcast cloud tops at 4,000 feet.

Ocala International Airport (OCF) routine pilot report; Over –Marion County Airport (X35), Dunnellon, FL; Time – 1011 EST; Flight level – 100 feet; Type aircraft – Douglas DC-3 multiengine airplane; Remarks – scattered to broken cloud cover clearing.

Peter O. Knight Airport (TPF), Tampa routine pilot report; Over – 078 azimuth and 13 miles from St. Petersburg VORTAC (PIE); Time – 1132 EST; Flight level – 4,000 feet; Type aircraft – Cirrus SR22 single engine composite airplane; Sky cover – sky clear; Weather – flight visibility 10 miles; Temperature – 16° C; Wind – 313° at 8 knots; Turbulence – negative, smooth conditions.

The raw pilot reports in original format were as follows:

JAX UA /OV 4 NW GNV/TM 1154/FL020/TP CRJ7/SK BASES 002, TOPS 010 OVC=

PNS UA /OV PNS170007/TM 1219/FL039/TP E145/SK BKN004-TOP039=

JAX UA /OV OCF/TM 1300/FL010/TP PC12/SK BASES VV001/ TOPS 003 OVC

PNS UA /OV PNS240005/TM 1307/FL040/TP CRJ9/SK TOPS OVC040=

OCF UA /OV X35/TM 1511/FL001/TP DC3/RM SCT-BKN CLEARING

¹² VORTAC is a navigational aid for aircraft pilots consisting of a co-located VHF omnidirectional range (VOR) beacon and a tactical air navigation system (TACAN) beacon. Unless otherwise noted, the name of the beacon corresponds to the city.

TPF UA /OV PIE078013/TM 1632/FL040/TP SR22/SK SKC/WX FV10SM/TA 16/WV 31308KT/TB NEG/RM
AEROVIE / SMTH

The reports indicated a layer of low stratiform clouds over northern Florida during the morning hours with bases from 100 to 400 feet, overcast with tops near 4,000 feet.

6.0 Area Forecast

The NWS Area Forecast issued at 0648 EST and valid until 1700 EST was as follows:

FAUS42 KKCI 121148 AAA
FA2W
-MIAC FA 121148 AMD
SYNOPSIS AND VFR CLDS/WX
SYNOPSIS VALID UNTIL 130400
CLDS/WX VALID UNTIL 122200...OTLK VALID 122200-130400
NC SC GA FL AND CSTL WTRS E OF 85W
.
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...HI PRES OVR FL CSTL WTRS RIDGING WWD ACRS GLFMEX. NO
SGFNT FNTS OR BNDRYS. 04Z CDFNT ALG A ORF-IRQ-LGC LN. HI PRES
RMNDR.
.
FL
PNHDL...
W HLF...OVC010 TOP 030. VIS 3SM BR. 16Z BKN015. VIS 4SM BR.
OTLK...MVFR CIG 03Z IFR CIG BR.
E HLF...OVC010 TOP 030. VIS 3SM BR. 18Z BKN020. 21Z SCT030.
OTLK...VFR 02Z MVFR CIG 04Z IFR CIG BR.
NRN-N CNTRL...SCT-BKN010 TOP 015. VIS 3SM BR. 16Z SCT015 SCT050.
OTLK...VFR 02Z MVFR CIG.
CNTRL-S CNTRL...SKC. TIL 15Z OCNL VIS 3-5SM BR. 17Z SCT030. 22Z
SKC. OTLK...VFR.
SRN...
ATLC CSTLN...SCT035. 12Z SCT-BKN035 TOP 060. OTLK...VFR.
RMNDR...SKC. TIL 14Z OCNL VIS 5SM BR. 17Z SCT030. OTLK...VFR.
KEYS...SCT015 SCT-BKN035 TOP 060. OTLK...VFR.
.
CSTL WTRS
ATLC WTRS...
NC/N HLF SC...SCT030 BKN060 LYRD 120. 17Z SCT070 SCT CI. WND SW 20G30KT.
OTLK...VFR.
S HLF SC/GA/NRN FL...SCT030 SCT CI. AFT 18Z WND SW G25KT. OTLK...VFR.
CNTRL FL...SCT030 SCT CI. OTLK...VFR.
SRN FL...SCT-BKN035 LYRD 120. ISOL -SHRA. OTLK...VFR.
GULF WTRS E OF 85W...
N HLF...SCT010 SCT030. VIS 5SM BR. 15Z SCT030 SCT CI. OTLK...VFR.
S HLF...SCT035. OTLK...VFR.
....

The header warned users to see the latest AIRMET Sierra series advisories for IFR conditions, which amended the forecast.

7.0 Inflight Weather Advisories

During the period the NWS had no Significant Meteorological Advisories (SIGMET), Convective SIGMETs, or Severe Weather Watches current. The NWS also had a series of Airmen's Meteorological Advisory (AIRMETs) issued with Sierra applicable to Florida:

WAUS42 KKCI 121445

50SW CEW TO 40W CEW TO 50SW PZD TO GQO TO 20SSE VXV
CIG BLW 010/VIS BLW 3SM BR. CONDS ENDG 15-18Z.

AIRMET MTN OBSCN...NC SC GA ME NH VT MA NY PA WV MD VA
FROM 70NW PQI TO 20S MLT TO CON TO HAR TO 20S LYH TO CLT TO ATL
TO GQO TO HNV TO HNN TO JHW TO SYR TO MSS TO YSC TO 70NW PQI
MTNS OBSC BY CLDS/PCPN/BR. CONDS CONTG BYD 21Z THRU 03Z.

OTLK VALID 2100-0300Z...IFR GA FL AND CSTL WTRS
BOUNDED BY 50SW PZD-80SSW TLH-80SSE SJI-40W CEW-50SW PZD
CIG BLW 010/VIS BLW 3SM BR. CONDS DVLPG 00-03Z. CONDS CONTG THRU
03Z.

....

Two CWAs were issued by the Jacksonville CWSU during the period. CWA 102 was issued at 0835 EST and was valid until 1020 EST, and was followed by CWA 103 at 1045 EST for an area of LIFR conditions. The advisories plotted over the GOES-13 visible image for the period is included as figure 11, followed by the advisories:

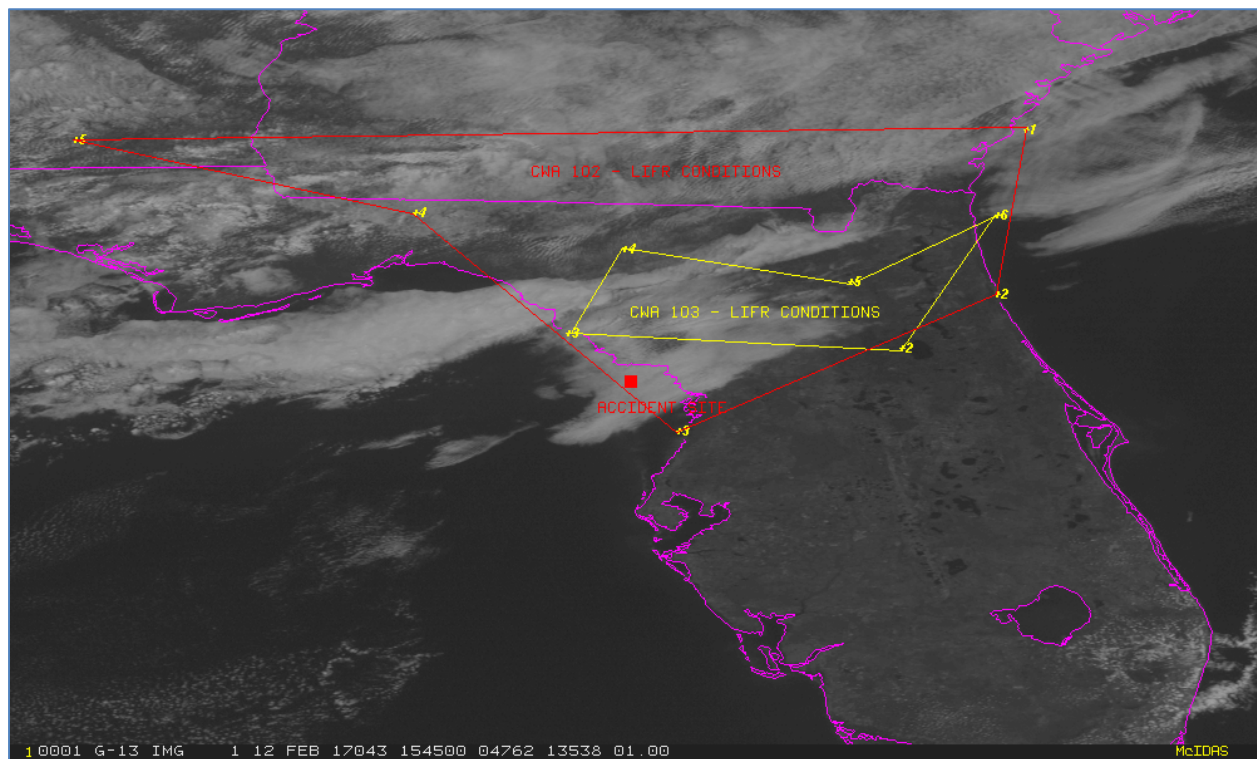


Figure 11 - CWA 102 & 103 issued for LIFR conditions

FAUS21 KZJX 121325
ZJX1 CWA 121320
ZJX CWA 102 VALID UNTIL 121520
FROM 50S SAV-35SE CRG-40N PIE-10E SZW-40NE CEW-50S SAV
AREA OF LIFR CONDS. CIGS BLW 005 AND VSBY BLW 1SM IN BR/FG.
CONDS FCST TO END AFT 1530Z.

FAUS21 KZJX 121546

ZJX1 CWA 121545
ZJX CWA 103 VALID UNTIL 121745
FROM 15NE CRG-25W OMN-15SW CTY-35N CTY-25SW CRG-15NE CRG
AREA OF LIFR CONDS. CIGS BLW 005 AND/OR VSBY BLW 1SM IN BR/FG.

8.0 Winds and Temperature Aloft Forecast

The NWS Winds and Temperature Aloft forecast current at the time was as follows:

WINDS ALOFT FORECASTS
DATA BASED ON 121200Z
VALID 121800Z FOR USE 1400-2100Z. TEMPS NEG ABV 24000

FT	3000	6000	9000	12000	18000	24000	30000	34000	39000
PIE	3008	3110+13	3209+08	3008+03	2818-10	2823-23	292038	292547	303477
MLB	2707	3010+13	3009+07	2811+03	2917-10	2819-22	301738	291947	282653

The forecast for 3,000 feet expected west-northwest winds at 7 to 8 knots, with winds at 6,000 feet from the northwest at 10 knots with a temperature of 13° C. The forecast was similar to the model sounding.

9.0 Preflight Briefing

A search of the FAA contract Automated Flight Service Station provider and the Direct Users Access System provider indicated no record of any weather briefing services provided on February 12, 2017. It is therefore unknown what weather information the pilot reviewed before he departure on the day of the accident. However, the NWS CWA and AIRMET Sierra advisories were current during the period prior to departure and would have warned the pilot that VFR flight was not advisable.

Submitted by:

Don Eick
Senior Meteorologist