



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Washington, D.C. 20594

October 23, 2018

Weather Study Report

METEOROLOGY

CEN18FA386

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A. ACCIDENT

Location: Near Rainy Pass, Alaska
Date: September 24, 2018
Time: 1032 Alaska daylight time
1832 Coordinated Universal Time (UTC)
Airplane: Cessna U206G, registration: N1738R

B. METEOROLOGIST

Paul Suffern
Senior Meteorologist
Operational Factors Division (AS-30)
National Transportation Safety Board

C. DETAILS OF THE INVESTIGATION

The National Transportation Safety Board's (NTSB) Meteorologist did not travel for this investigation and gathered the weather data for this investigation from official National Oceanic and Atmospheric Administration (NOAA) National Weather Service (NWS) sources including the National Centers for Environmental Information (NCEI). All times are Alaska daylight time (AKDT) on September 24, 2018, and are based upon the 24-hour clock, where local time is -8 hours from UTC, 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 approximate accident site was located at latitude 62.07217° N, longitude 153.1845° W, at an approximate elevation of 4,640 feet (ft).

D. WEATHER INFORMATION

1.0 Synoptic Situation

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 (NCEP) and the Weather Prediction Center, located in College Park, Maryland. These are the base products used in describing synoptic weather features and in the creation of forecasts and warnings for the NWS. 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

1.1 Surface Analysis Chart

The Alaska section of the NWS Surface Analysis Chart for 1000 and 1300 AKDT, respectively, are provided as figures 1 and 2 with the approximate location of the accident site marked within the red circle. The charts indicated a low pressure system with a pressure of 994- and 996-hectopascals (hPa), respectively, located over western Alaska to the northwest of the accident site with an occluded frontal boundary extending southeastward over the area and moving northeastward with time (figures 1 and 2). The triple point of the front was located north of the Anchorage area, where the front split into a warm and cold front and extended into the Gulf of Alaska. An additional stationary front was located from central to eastern Alaska into northwestern Canada.

The station models around the accident site depicted air temperatures in the mid 40's and decreasing into the upper 30's degrees Fahrenheit (°F), with dew point temperatures a few degrees below the temperature and temperature-dew point spreads of 3° F or less, a south to southwest wind of 10 to 15 knots, overcast sky cover, and light rain.

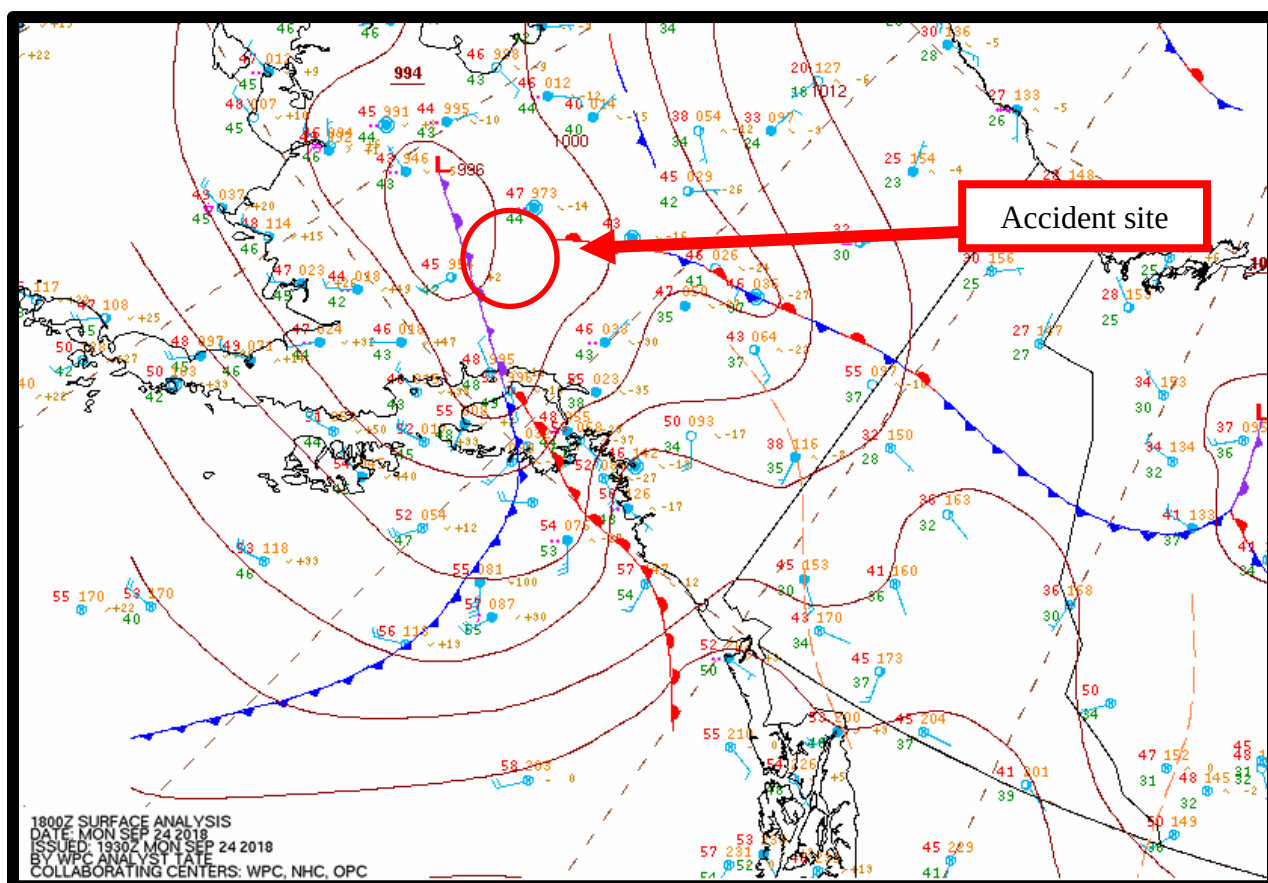


Figure 1 – NWS Surface Analysis Chart for 1000 AKDT

https://www.faa.gov/regulations_policies/advisory_circulars/index.cfm/go/document.information/documentID/1030235

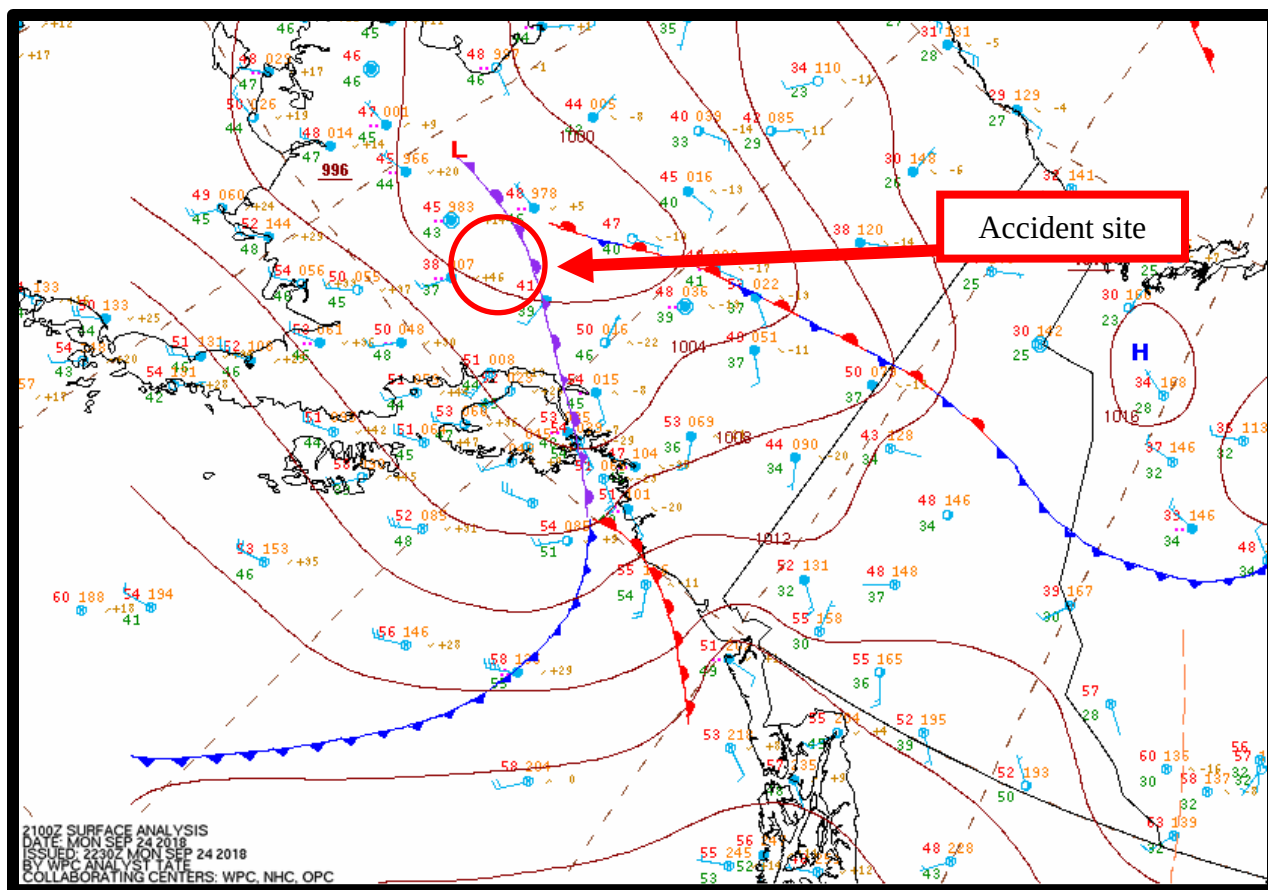


Figure 2 – NWS Surface Analysis Chart for 1300 AKDT

2.0 Surface Observations

The area surrounding the accident site was documented using official Meteorological Aerodrome Reports (METARs) and Specials (SPECIs). Figure 3 is a sectional chart with the accident site and the closest weather reporting locations marked.

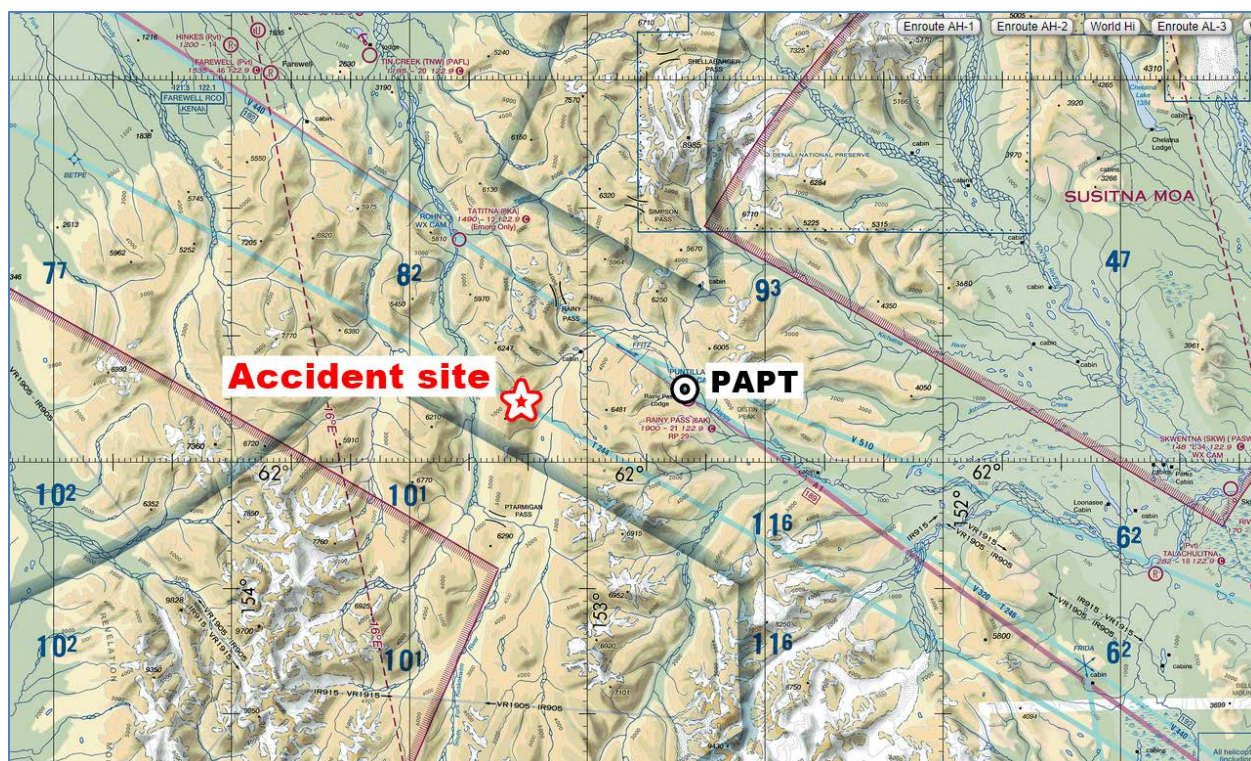


Figure 3 – Sectional chart of accident area with the location of the accident site and surface observation site

Puntilla (PAPT) was the closest site with official weather observations. PAPT had an Aviation Paid Weather Observer (A-Paid)² who provided weather observations on the accident day. PAPT was located 12 miles east of the accident site at an elevation of 1,837 ft (figure 3). The following raw observations were taken and disseminated during the times surrounding the accident:³

[0659 AKDT] METAR PAPT 241459Z 17010KT 7SM -RA OVC040 06/06 A2958 RMK NO SPECI FIRST=

ACCIDENT TIME 1032 AKDT

[1058 AKDT] METAR PAPT 241858Z 14010KT 7SM SCT012 BKN027 06/05 A2953 RMK NO SPECI=

[1310 AKDT] METAR PAPT 242110Z 17008KT 7SM FEW015 OVC027 05/04 A2952 RMK NO SPECI=

[1450 AKDT] METAR PAPT 242250Z 16007KT 3SM RA BKN012 OVC027 05/03 A2952 RMK NO=

² <http://www.nws.noaa.gov/directives/sym/pd01013001curr.pdf>

³ Bolded sections in this report highlight information that directly reference the weather conditions that affected the accident location around the accident time.

The reports decoded as the following:

PAPT weather observation at 0659 AKDT, wind from 170° at 10 knots, 7 miles visibility, light rain, an overcast ceiling⁴ at 4,000 ft above ground level (agl), temperature of 6° Celsius (C), dew point temperature of 6° C, and an altimeter setting of 29.58 inches of mercury. Remarks: no special, first observation of the day.

PAPT weather observation at 1058 AKDT, wind from 140° at 10 knots, 7 miles visibility, scattered clouds at 1,200 ft agl, a broken ceiling at 2,700 ft agl, temperature of 6° C, dew point temperature of 5° C, and an altimeter setting of 29.53 inches of mercury. Remarks: no special.

PAPT weather observation at 1310 AKDT, wind from 170° at 8 knots, 7 miles visibility, few clouds at 1,500 ft agl, an overcast ceiling at 2,700 ft agl, temperature of 5° C, dew point temperature of 4° C, and an altimeter setting of 29.52 inches of mercury. Remarks: no special.

The observations from PAPT surrounding the accident time indicated VFR⁵ to MVFR⁶ conditions with light rain reported before the accident time. Clouds ceilings ranged from around 4,000 ft agl early in the morning down to 2,700 ft agl around the accident time, or from 5,800 to 4,500 ft msl.

3.0 Upper Air Data

The closest upper air sounding site to the accident site was from Anchorage, Alaska, (PANC) located 105 miles southeast of the accident site with an elevation at 131 ft. The 0400 and 1600 AKDT PANC soundings were plotted on a standard Skew-T log P diagram⁷ with the derived stability parameters included in figures 4 and 5 (with data from the surface to 600-hPa, or ~14,000 ft msl.) This sounding data was analyzed utilizing the RAOB⁸ software package. The 0400 AKDT PANC sounding depicted a low-level temperature inversion⁹ at 3,050 ft msl with the lifted condensation level (LCL)¹⁰ at 1,750 ft msl (~1,620 ft agl) and a convective condensation level (CCL)¹¹ of 5,947 ft msl (~5,820 ft agl). The freezing level was located at 6,159 ft msl. The precipitable water value was 0.81 inches.

⁴ Ceiling is defined as the lowest layer of clouds reported as broken or overcast, or the vertical visibility into a surface based obscuration.

⁵ Visual Flight Rules – Refers to the general weather conditions pilots can expect at the surface. VFR criteria means a ceiling greater than 3,000 feet agl and greater than 6 miles visibility.

⁶ Marginal Visual Flight Rules – Refers to the general weather conditions pilots can expect at the surface. MVFR criteria means a ceiling between 1,000 and 3,000 ft agl and/or 3 to 5 miles visibility.

⁷ Skew T log P diagram – is a standard meteorological plot 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 Inversion – A layer in which temperature increases with altitude.

¹⁰ Lifting Condensation Level (LCL) - The height at which a parcel of moist air becomes saturated when it is lifted dry adiabatically.

¹¹ Convective Condensation Level (CCL) – The level in the atmosphere to which an air parcel, if heated from below, will rise dry adiabatically, without becoming colder than its environment just before the parcel becomes saturated.

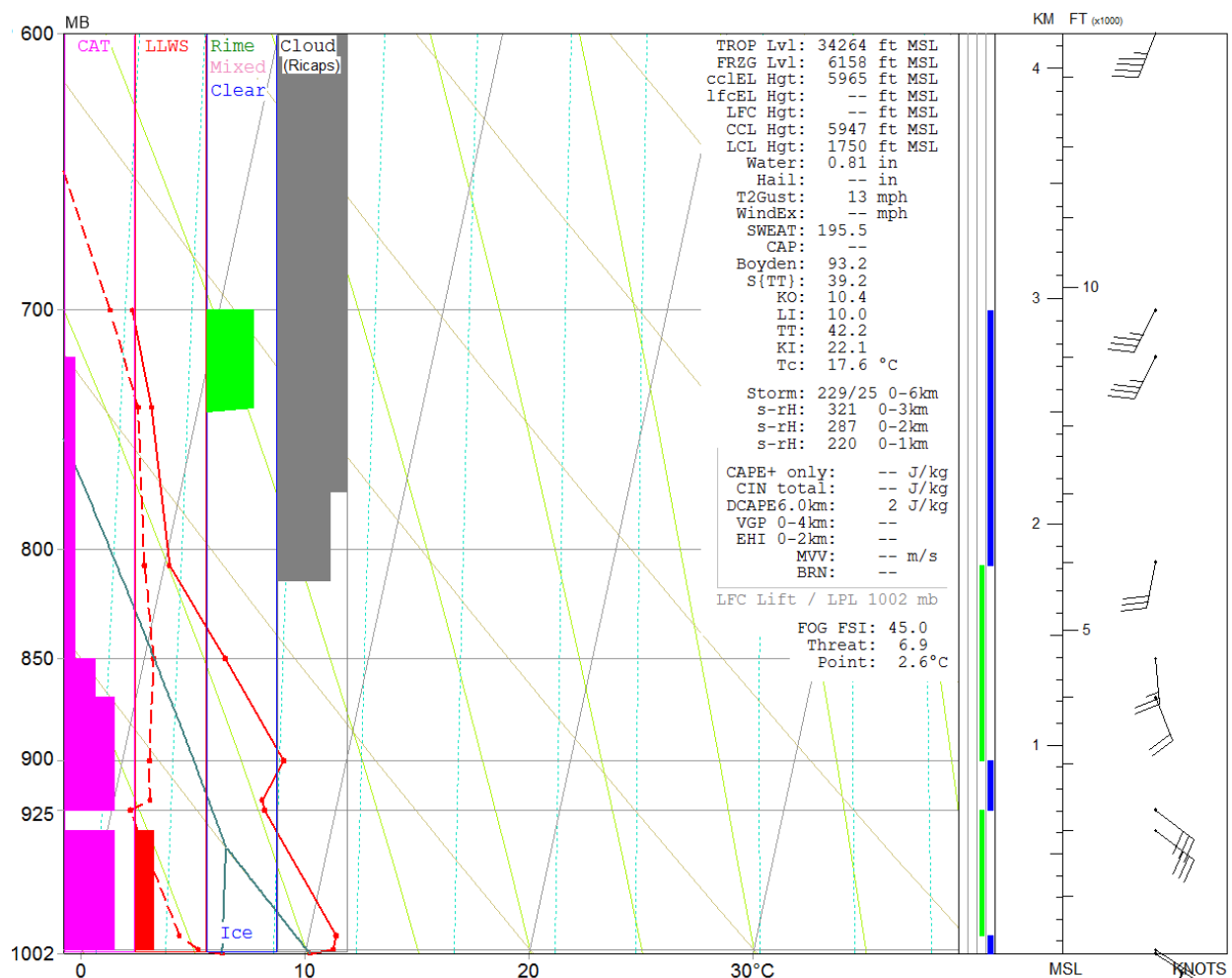


Figure 4 – 0400 AKDT PANC sounding

The 0400 AKDT PANC sounding indicated mostly conditionally unstable layers between the surface and 6,000 ft. Between 6,000 and 14,000 ft the atmosphere was conditionally stable. RAOB indicated that clouds were likely from 5,500 ft through 14,000 ft. Icing conditions were indicated by RAOB between 8,000 and 10,000 ft.

The 0400 AKDT PANC sounding wind profile indicated a surface wind from 125° at 4 knots with the wind remaining southeasterly through 4,000 ft. The wind speed increased with height to 32 knots at 2,000 ft with the wind speed remaining between 25 to 35 knots through 10,000 ft. The wind veered to the southwest by 10,000 ft. RAOB indicated likely light low-level wind shear (LLWS) between the surface and 2,000 ft and moderate or greater clear-air turbulence between the surface and 7,000 ft.

The 1600 AKDT PANC sounding (figure 5) depicted the LCL at 1,828 ft msl (~1,700 ft agl), a CCL of 3,446 ft msl (~3,320 ft agl), and the level of free convection (LFC)¹² at 3,338 ft msl (~3,210 ft agl). The freezing level was located at 4,638 ft msl. The precipitable water value was 0.52 inches.

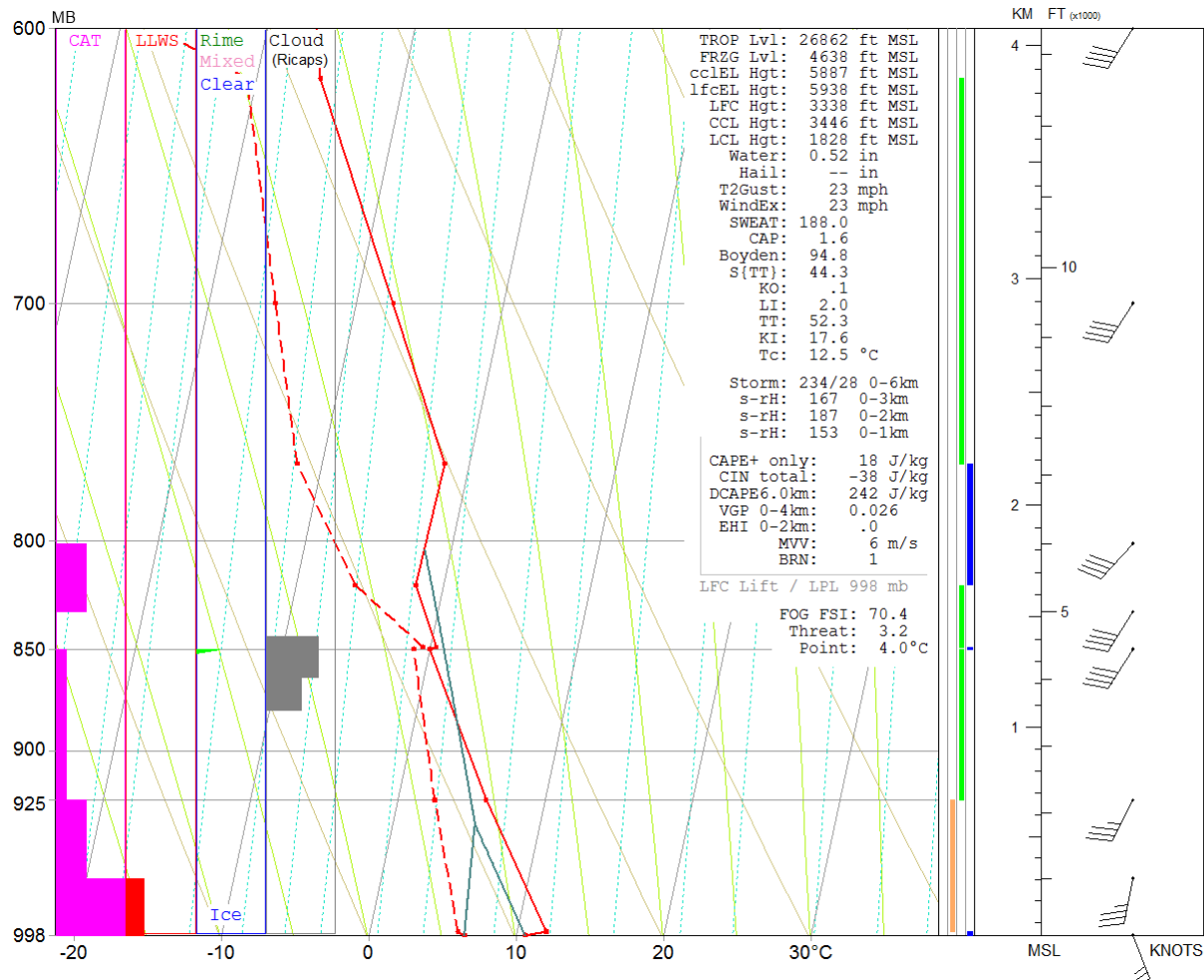


Figure 5 – 1600 AKDT PANC sounding

The 1600 AKDT PANC sounding indicated unstable and conditionally unstable layers between the surface and 5,500 ft. Between 5,500 and 7,000 ft the atmosphere was conditionally stable. RAOB indicated that clouds were likely from 3,500 ft through 5,000 ft. Icing conditions were indicated by RAOB in a small layer around 4,500 ft.

The 1600 AKDT PANC sounding wind profile indicated a surface wind from 160° at 23 knots with the wind becoming southwesterly by 1,000 ft and increasing in magnitude to 33 knots. The wind speed remained between 35 and 40 knots from 1,000 ft through 14,000 ft with a southwest wind direction. RAOB indicated likely light LLWS between the surface and 1,000 ft and RAOB indicated likely moderate or greater clear-air turbulence between the surface and 6,000 ft.

¹² LFC – The level at which a parcel of saturated air becomes warmer than the surrounding air and begins to rise freely. This occurs most readily in a conditionally unstable atmosphere.

The wind and moisture profile indicated by the PANC upper air soundings was likely representative of the weather conditions experienced by the accident flight given that the same frontal boundary moving northward across the accident site between 1000 and 1300 AKDT (figures 1 and 2) moved across southern Alaska and the PANC site between the 0400 and 1600 AKDT PANC soundings.

4.0 Satellite Data

Geostationary Operational Environmental Satellite number 15 (GOES-15) imagery data was obtained from an archive at the Space Science Engineering Center at the University of Wisconsin-Madison in Madison, Wisconsin, and processed using the Man-computer Interactive Data Access System software. Visible and infrared imagery (GOES-15 bands 1 and 4) at wavelengths of 0.65 microns (μm) and 10.7 μm , respectively, were retrieved. Satellite imagery surrounding the time of the accident from 0900 AKDT through 1300 AKDT, at approximately 15-minute intervals were reviewed, and the closest images to the time of the accident were documented.

Figures 6 and 7 present the GOES-15 visible imagery from 1030 and 1045 AKDT at 2X magnification with the accident site highlighted with a red square. Inspection of the visible imagery indicated an overcast layer moving northward over the accident site at the time of the accident.

Figure 8 presents the GOES-15 infrared imagery from 1030 AKDT at 5X magnification with the accident site highlighted with a red square. Inspection of the infrared imagery indicated cloud cover over the accident site at the accident time. The lower brightness temperatures (green and blue colors, higher cloud tops) were located to the northeast, northwest, and southwest of the accident site. The brightness temperature above the accident site at the accident time was -22°C and with the vertical temperature profile provided by the 0400 AKDT PANC sounding, the approximate cloud-top heights over the accident site would have been 19,000 ft at 1030 AKDT. It should be noted these figures have not been corrected for any parallax error.

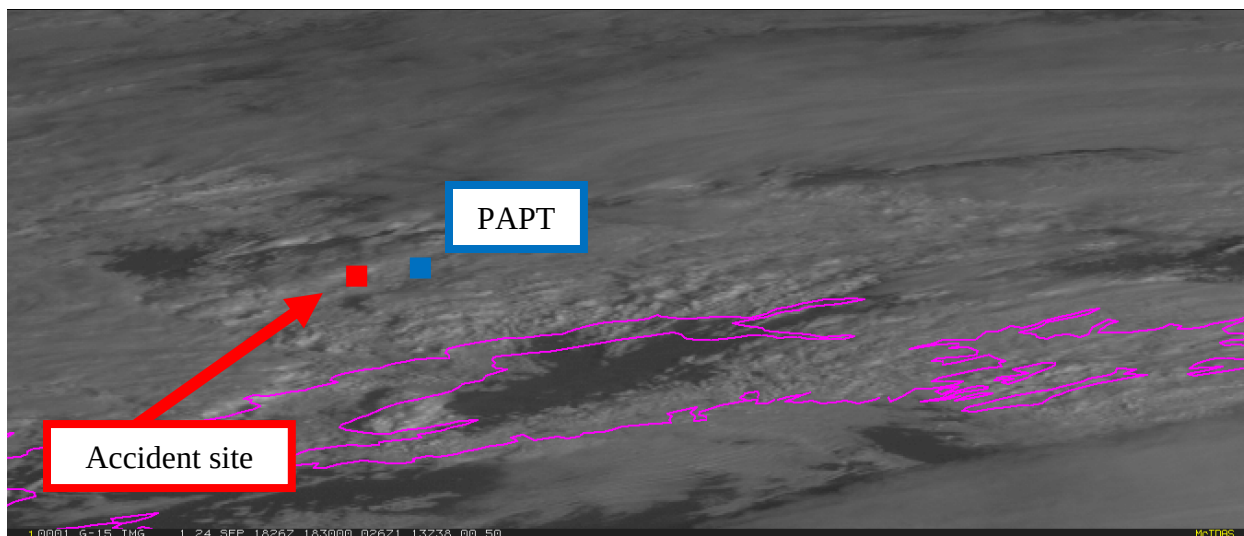


Figure 6 – GOES-15 visible image at 1030 AKDT

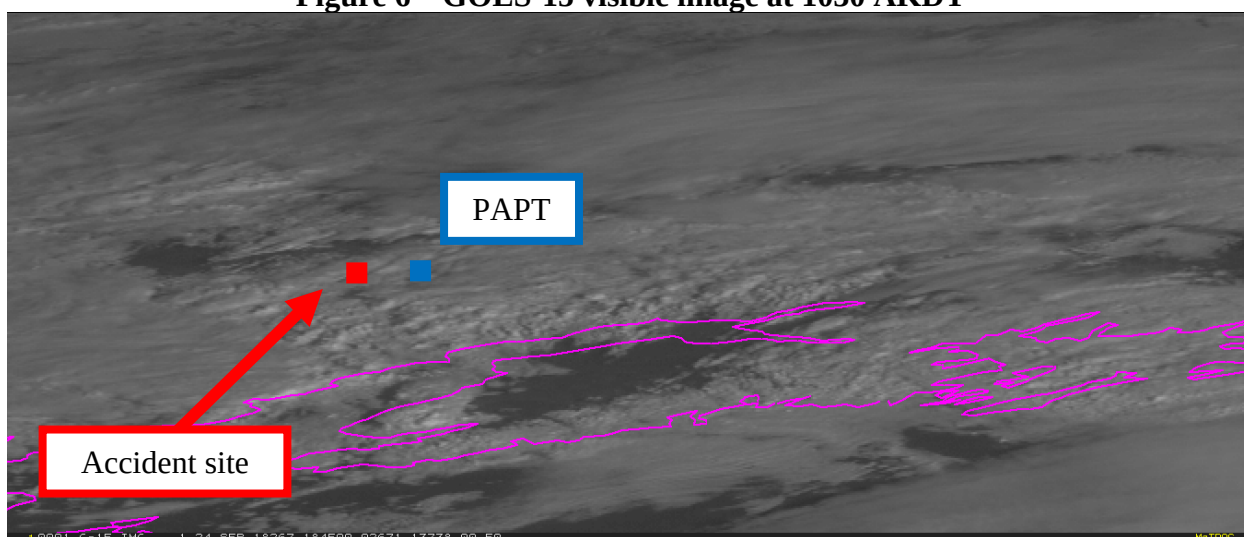


Figure 7 – GOES-15 visible image at 1045 AKDT

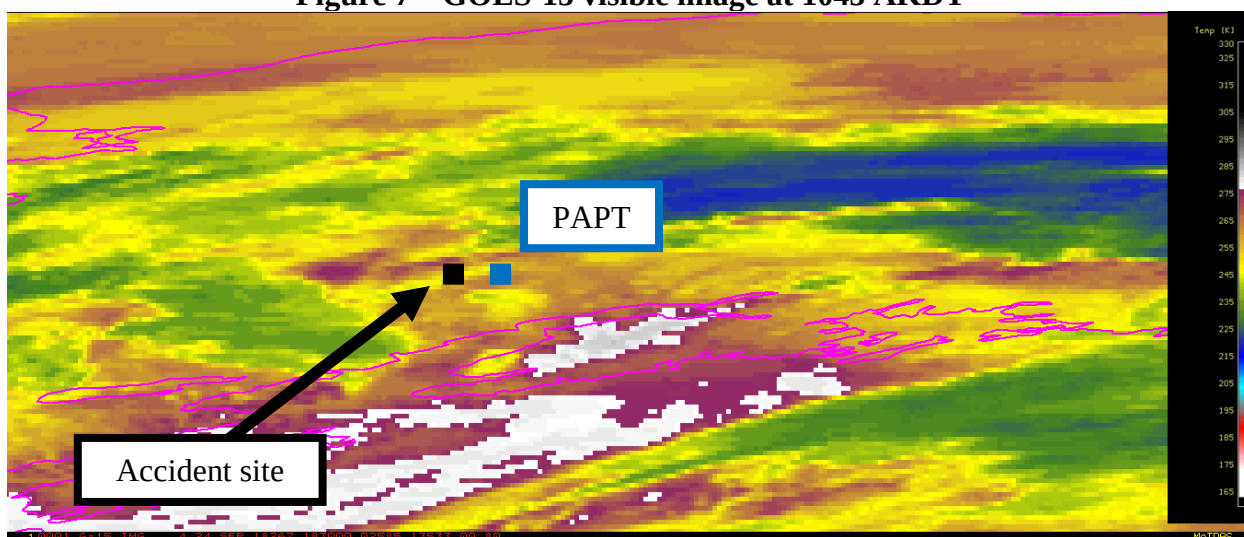


Figure 8 – GOES-15 infrared image at 1030 AKDT

5.0 Radar Imagery Information

The closest NWS Weather Surveillance Radar-1988, Doppler (WSR-88D)¹³ was from near Kenai, Alaska (PAHG), located 96 miles southeast of the accident site with an antenna elevation of 356 ft. Level II archive radar data was obtained from the NCDC using the NEXRAD Data Inventory Search and displayed using the NOAA's Weather and Climate Toolkit software. No precipitation targets were located above the accident site at the accident time. Precipitation targets were located southeast of PAPT stretching eastward into the Susitna Valley region.

6.0 Pilot Reports¹⁴

All pilot reports (PIREPs) for the state of Alaska from about three hours prior to the accident time to about three hours after the accident time were reviewed. The only PIREPs for below FL180¹⁵ and within 100 miles of the accident site are provided below in raw code:

TKA UA /OV ANC-TKA/TM 1705/FL035/TP HXA/SK OVC040/WX -RA/TB LGT

PAQ UA /OV PAQ-PAQ291035-PAQ271074-PAQ /TM 1825 /FL015 /TP PA18 /TB CONS MOD /RM STRONG HEADWIND SOUTHBND OVER MATSU VALLEY 25KTS UP THE KNIK HAD TO TURN AROUND MOD TB AK RANGE

TKA UA /OV MRI-TKA/TM 1905/FL025/TP C172/SK OVC040/WX FV10SM -RA/WV 36015KT/TB CONS LGT/IC NEG

TKA UA /OV UUU0180005-UUU0360005 /TM 1910 /FLUNKN /TP C172 /SK OVC003

The reports are decoded as follows:

Routine pilot report (UA), Talkeetna, Alaska (TKA); Over – Anchorage (ANC) to TKA; Time – 0905 AKDT (1705Z); Altitude – 3,500 ft; Type aircraft – HXA; Sky – Overcast clouds at 4,000 ft; Weather – Light rain; Turbulence – Light.

Routine pilot report (UA), Palmer, Alaska (PAQ); Over – over the route from PAQ to 35 miles from PAQ on the 291° radial to 74 miles from PAQ on the 271° radial to PAQ; Time – 1025 AKDT (1825Z); Altitude – 1,500 ft; Type aircraft – Piper PA-18 Super Cub; Turbulence – Continuous moderate; Remarks – Strong headwind southbound over Matsu Valley, 25 knots up the Knik, had to turn around due to moderate turbulence in the Alaska Range.

¹³ The WSR-88D is an S-band 10-centimeter wavelength radar with a power output of 750,000 watts, and with a 28-foot parabolic antenna that concentrates the energy between a 0.87° and 0.96° beam width. The radar produces three basic types of products: base reflectivity, base radial velocity, and base spectral width.

¹⁴ Only pilot reports with the WMO header UBAK** identifier were considered.

¹⁵ Flight Level – A Flight Level (FL) is a standard nominal altitude of an aircraft, in hundreds of ft. This altitude is calculated from the International standard pressure datum of 1013.25 hPa (29.92 inHg), the average sea-level pressure, and therefore is not necessarily the same as the aircraft's true altitude either above mean sea level or above ground level.

Routine pilot report (UA), TKA; Over – Merrill Field Airport, Anchorage, Alaska (MRI) to TKA; Time – 1105 AKDT (1905Z); Altitude – 2,500 ft; Type aircraft – Cessna 172; Sky – Overcast clouds at 4,000 ft; Weather – Flight visibility 10 miles with light rain; Wind – From 360° at 15 knots; Turbulence – Continuous light; Icing – Negative.

Routine pilot report (UA), TKA; Over – from 5 miles from Willow Airport (UUO) on the 180 radial to 5 miles from UUO on the 360 radial; Time – 1110 AKDT (1910Z); Altitude – Unknown; Type aircraft – Cessna 172; Sky – Overcast clouds at 300 ft.

7.0 SIGMET

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

8.0 CWSU Advisories

No Center Weather Service Unit (CWSU) Center Weather Advisory (CWA) or Meteorological Impact Statement (MIS) were valid for the accident site at the accident time.

9.0 AIRMETs

The Alaska Aviation Weather Unit (AAWU) issued Airmen's Meteorological Information (AIRMET) advisories Sierra, Tango, and Zulu at 0724 AKDT for IFR¹⁶ conditions and mountain obscuration in clouds and precipitation for the Cook Inlet to Susitna Valley to Kuskokwim Valley areas, for moderate turbulence below 12,000 ft and isolated severe turbulence within 8,000 ft agl, and moderate icing conditions between 8,000 ft and FL180 with the freezing level between 4,000 and 5,000 ft. The accident site was located on the border of the Cook Inlet/Susitna Valley and Kuskokwim Valley aviation forecast areas:

WAAK48 PAWU 241524 AAB
WA80
ANCS WA 241522 AMD
AIRMET SIERRA FOR IFR AND MT OBSC VALID UNTIL 242015

.
COOK INLET AND SUSITNA VLY AB UPDT
ALG/VCY AK RANGE OCNL CIG BLW 010 VIS BLW 3SM RA BR.
IMPR FROM SW.

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COOK INLET AND SUSITNA VLY AB UPDT
AK RANGE OBSC IN CLDS/PCPN. IMPR FROM SW.

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COOK INLET AND SUSITNA VLY AB UPDT
ERN MTS PANC S SPRDG TO ALL ERN MTS BY 20Z MTS
OCNL OBSC CLDS/PCPN. IMPR FROM SW.

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COPPER RIVER BASIN AC
MTS OCNL OBSC IN CLDS/PCPN. NC.

¹⁶ Instrument Flight Rules (IFR) – Refers to the general weather conditions pilots can expect at the surface. IFR criteria means a ceiling below 1,000 ft agl and/or less than 3 miles visibility.

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 CNTRL GLF CST AD
 MTS OBSC IN CLDS/PCPN. NC.

.
 KODIAK IS AE
 TIL 18Z PAKH NE MTS OCNL OBSC IN CLDS/PCPN. IMPR.

.
 KODIAK IS AE
 TIL 15Z PAKH NE OCNL CIG BLW 010 ISOL VIS BLW 3SM
 RA BR. IMPR FM SW.

.
KUSKOKWIM VLY AF
AFT 15Z OCNL CIG BLW 010/VIS BLW 3SM -RA BR.
DTRT.

.
KUSKOKWIM VLY AF
MTS OCNL OBSC CLDS/PCPN. DTRT.

.
 YKN-KUSKOKWIM DELTA AG
 OCNL CIG BLW 010/VIS BLW 3SM -SHRA BR. DTRT.

.
 YKN-KUSKOKWIM DELTA AG
 MTS OCNL OBSC CLDS/PCPN. DTRT.

.
 BRISTOL BAY AH
 PAJZ-PAPH LN E OCNL CIG BLW 010/
 VIS BLW 3SM -RA BR. NC.

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 BRISTOL BAY AH
 MTS OCNL OBSC CLDS/PCPN. NC.

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 AK PEN AI
 PACD E MTS OCNL OBSC CLD/PCPN. IMPR.

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 =ANCT WA 241522
 AIRMET TANGO FOR TURB/STG SFC WINDS VALID UNTIL 242015

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 COOK INLET AND SUSITNA VLY AB UPDT
 AFT 15Z VCY COOK INLET ANCHOR PT S SPRDG TO
 PAEN S BY 20Z SUSTAINED SFC WND 30KT OR GTR. INTSF.

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 COOK INLET AND SUSITNA VLY AB UPDT
 VCY TURNAGAIN ARM AND HILL SIDE ABOVE PANC
 SUSTAINED SFC WND 30KT OR GTR. WKN.

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 COOK INLET AND SUSITNA VLY AB UPDT
 OCNL MOD TURB FL280-FL380. NC.

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COOK INLET AND SUSITNA VLY AB UPDT
PAEN N MOD TURB BLW 100.
ISOL SEV TURB WI 080 AGL. NC.

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 COOK INLET AND SUSITNA VLY AB UPDT
 ERN MTS OCNL MOD TURB BLW FL180. NC.

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 COOK INLET AND SUSITNA VLY AB UPDT

VCY PANC LLWS CONDITIONS. WKN.

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COPPER RIVER BASIN AC
OCNL MOD TURB FL280-FL380. NC.

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COPPER RIVER BASIN AC
VCY MTS OCNL MOD TURB BLW FL180. NC.

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COPPER RIVER BASIN AC
AFT 15Z VCY PAGK OCNL MOD TURB BLW 100. INTSF.

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COPPER RIVER BASIN AC
AFT 18Z VCY PAGK AREAS LLWS. WKN.

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CNTRL GLF CST AD
OCNL MOD TURB FL280-FL380. NC.

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CNTRL GLF CST AD
ALG KENAI PEN OCNL MOD TURB BLW FL180. NC.

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KODIAK IS AE
SUSTAINED SFC WND 30KT OR GTR. WKN FROM SW.

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KODIAK IS AE
TIL 15Z NE PADQ OCNL MOD TURB FL280-FL380. WKN.

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KUSKOKWIM VLY AF
SE PASV-PAFS LN SUSTAINED SFC WND 30KTS
OR GTR. NC.

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KUSKOKWIM VLY AF
TIL 21Z E PASV-PAMC LN OCNL MOD TURB FL280-FL380.
WKN.

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KUSKOKWIM VLY AF
AK RANGE OCNL MOD TURB BLW 120. NC.

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BRISTOL BAY AH
OFSHR AND ALG ALUTN RANGE SUSTAINED SFC
WND 30KTS OR GTR. NC.

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BRISTOL BAY AH
TIL 21Z NE PAJZ OCNL MOD TURB FL280-FL380. WKN.

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BRISTOL BAY AH
TIL 21Z PALJ NE OCNL MOD TURB BLW 120. WKN.

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AK PEN AI
E PACD SUSTAINED SFC WND 30KTS OR GTR.
NC.

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AIRMET ZULU FOR ICING VALID UNTIL 242015

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COOK INLET AND SUSITNA VLY AB UPDT
AK RANGE PAPT S OCNL MOD ICEIC 080-FL180.

FZLVL 050. NC.

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CNTRL GLF CST AD
TIL 21Z OCNL MOD ICEIC 080-FL180.
FZLVL 070 EXC 050 N. WKN.

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KODIAK IS AE
TIL 15Z N PADQ OCNL MOD ICEIC 080-FL180.
FZLVL 050. WKN.

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KUSKOKWIM VLY AF
VCY MTS OCNL MOD ICEIC 080-FL180.
FZLVL 040. NC.

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BRISTOL BAY AH
TIL 15Z VCY LAKE ILLIAMNA OCNL MOD ICEIC
080-FL180. FZLVL 040. WKN.

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BH SEP 2018 AAWU

10.0 Area Forecast

The Area Forecasts issued at 0724 AKDT for the Cook Inlet and Susitna Valley and 0402 AKDT for the Kuskokwim Valley area are included below. These Area Forecasts indicated along and in the vicinity of the Alaska range that scattered clouds at 1,500 ft msl with overcast clouds at 2,500 ft msl were expected with visibilities between 3 and 5 miles in light rain. Occasional ceilings below 1,000 ft agl and visibilities below 3 miles in moderate rain and mist were forecast. In the Kuskokwim Valley aviation forecast region after 0700 AKDT scattered clouds at 500 ft msl, broken clouds at 1,500 ft msl, and overcast skies at 3,500 ft msl with cloud tops to FL180 were expected with visibilities of 3 miles in light rain and mist. East of Sparrevohn (PASV), Alaska, (including the accident area) isolated broken clouds at 3,500 ft msl were expected, and east of a line from PASV to Nikolai, Alaska, (including the accident area) surface winds from the east to southeast at 30 knots with gusts to 45 knots were forecast. All the AIRMETs (section 9.0) were included in the Area Forecasts text below as well:

FAAK48 PAWU 241524 AAB
FA8H
ANCH FA 241522 AMD
AK SRN HLF EXCP SE AK...

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AIRMETS VALID UNTIL 242015
CB IMPLY POSSIBLE SEV OR GREATER TURB SEV ICE LLWS AND IFR CONDS.
NON MSL HEIGHTS NOTED BY AGL OR CIG.

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SYNOPSIS VALID UNTIL 250600
N-S RIDGE PAYA S INTO ERN GULF AK WILL BUILD INTO AK PANHANDLE EARLY
IN PD. VIGOROUS 997 MB LOW VCY PAJZ WILL WKN TO 1002 MB AS IT MOVES
TO VCY PARY BY 06Z. ASSOCD OCFNT FROM LOW-VCY PADQ THENCE S WILL WKN
AS IT MOVES RAPIDLY NE AND E ACROSS S CNTRL AK DUR PD. N-S RIDGE WILL
BUILD ACROSS WRN ALEUTIANS LATE IN PD.

.
 COOK INLET AND SUSITNA VLY AB...VALID UNTIL 250000 UPDT
 ...CLOUDS/WX...
 AIRMET IFRALG/VCY AK RANGE OCNL CIG BLW 010 VIS BLW 3SM RA BR.
 IMPR FROM SW...
 AIRMET STG SFC WNDAFT 15Z VCY COOK INLET ANCHOR PT S SPRDG TO
 PAEN S BY 20Z SUSTAINED SFC WND 30KT OR GTR. INTSF...
 AIRMET STG SFC WNDVCY TURNAGAIN ARM AND HILL SIDE ABOVE PANC
 SUSTAINED SFC WND 30KT OR GTR. WKN...
 AIRMET MT OBSCAK RANGE OBSC IN CLDS/PCPN. IMPR FROM SW...
 AIRMET MT OBSCERN MTS PANC S SPRDG TO ALL ERN MTS BY 20Z MTS
 OCNL OBSC CLDS/PCPN. IMPR FROM SW...
 ALG/VCY AK RANGE SCT015 OVC025 VIS 3-5SM -RA.
 OCNL CIG BLW 010/VIS BLW 3SM RA BR.
 AFT 21Z LAKE CLARK PASS SW LOWER CONDS BCMG ISOL.
 ELSW FEW025 SCT045 OVC060 TOP FL200 -RA.
 OCNL BKN045 VIS 5SM -RA BR.
 AFT 20Z VCY PANC AND ALG ERN MTS ISOL BKN025CB TOP FL250 VIS 3SM-TSRA.
 VCY TURNAGAIN ARM AND HILLSIDE ABOVE PANC SFC WND SE 35G50KT. TIL 21Z ISOL
 G60KT.
 AFT 15Z VCY COOK INLET ANCHOR PT S SPRDG TO S PANC BY 00Z SFC WND SW
 30G45KT.
 OTLK VALID 250000-250600...PATK NE MVFR CIG SHRA. ELSW VFR.
 PASSES...LAKE CLARK...MERRILL...RAINY...WINDY...IFR CIG RA BR. TURB.
 PORTAGE...MVFR CIG RA BR TURB.
 ...TURB...UPDT
 AIRMET TURBOCNL MOD TURB FL280-FL380. NC...
 AIRMET TURBPAEN N MOD TURB BLW 100.
 ISOL SEV TURB WI 080 AGL. NC...
 AIRMET TURBERN MTS OCNL MOD TURB BLW FL180. NC...
 AIRMET LLWSVCY PANC LLWS CONDITIONS. WKN...
 ...ICE AND FZLVL...
 AIRMET ICEAK RANGE PAPT S OCNL MOD ICEIC 080-FL180.
 FZLVL 050. NC...
 ELSW ISOL MOD ICEIC 080-FL180.

.
 COPPER RIVER BASIN AC...VALID UNTIL 250000
 ...CLOUDS/WX...
 AIRMET MT OBSCMTS OCNL OBSC IN CLDS/PCPN. NC...
 SCT050 BKN-OVC090 TOP FL200.
 VCY MTS OCNL BKN050 VIS 3-5SM -SHRA/-SHSN.
 ELSW ISOL BKN050 -SHRA.
 AFT 23Z W PAGK ISOL BKN050CB TOP FL250 VIS 5SM -TSRA.
 VCY HYR/CHNLD TRRN SFC WND SE-S 20G30KT.
 AFT 18Z ISOL G50KT.
 OTLK VALID 250000-250600...VFR. MTS MVFR CIG SHRA. N-S PASSES AND CHNLD
 TRRN ADNLY WND.
 PASS...TAHNETA...MVFR CIG RA BR. TURB.
 ...TURB...

AIRMET TURBOCNL MOD TURB FL280-FL380. NC...
 AIRMET TURBVCY MTS OCNL MOD TURB BLW FL180. NC...
 AIRMET TURBAFT 15Z VCY PAGK OCNL MOD TURB BLW 100. INTSF...
 AIRMET LLWSAFT 18Z VCY PAGK AREAS LLWS. WKN...
 ...ICE AND FZLVL...
 ISOL MOD ICEIC 080-FL180. FZLVL 060.
 .
 CNTRL GLF CST AD...VALID UNTIL 250000
 ...CLOUDS/WX...
 AIRMET MT OBSCMTS OBSC IN CLDS/PCPN. NC...
 FEW015 SCT025 OVC045 TOP FL200 -RA.
 OCNL BKN025 VIS 5SM -RA BR.
 ALG KENAI PEN ISOL CIG BLW 010/VIS BLW 3SM RA BR.
 ELSW TIL 21Z ISOL BKN015 VIS 3-5SM RA BR.
 AFT 23Z ISOL BKN025CB TOP FL250 VIS 3-5SM -TSRA.
 SFC WND SE 20G30KT INCRG AFT 18Z ALG CST TO E-SE 25G35KT.
 WND SHIFTING TO SW FROM SW TO NE.
 OTLK VALID 250000-250600...MVFR CIG SHRA.
 ...TURB...
 AIRMET TURBOCNL MOD TURB FL280-FL380. NC...
 AIRMET TURBALG KENAI PEN OCNL MOD TURB BLW FL180. NC...
 ...ICE AND FZLVL...
 AIRMET ICETIL 21Z OCNL MOD ICEIC 080-FL180.
 FZLVL 070 EXC 050 N. WKN...
 .
 KODIAK IS AE...VALID UNTIL 250000
 ...CLOUDS/WX...
 AIRMET STG SFC WNDSUSTAINED SFC WND 30KT OR GTR. WKN FROM SW...
 AIRMET MT OBSCTIL 18Z PAKH NE MTS OCNL OBSC IN CLDS/PCPN. IMPR...
 AIRMET IFRTIL 15Z PAKH NE OCNL CIG BLW 010 ISOL VIS BLW 3SM
 RA BR. IMPR FM SW...
 TIL 18Z PAKH NE FEW005 SCT015 OVC025 TOP FL180 -RA.
 TIL 15Z OCNL CIG BLW 010/VIS BLW 3SM -RA BR.
 ELSW/OTRW SCT025. ISOL BKN025 TOP 070.
 ALG CST/OFSHR SFC WND SW 30G40KT DMNSHG VERY SLOWLY FROM SW TO NE.
 OTLK VALID 250000-250600...VFR. TIL 03Z OFSHR N PADQ WND.
 ...TURB...
 AIRMET TURBTIL 15Z NE PADQ OCNL MOD TURB FL280-FL380. WKN...
 PAKH NE ISOL MOD TURB BLW 040.
 ...ICE AND FZLVL...
 AIRMET ICETIL 15Z N PADQ OCNL MOD ICEIC 080-FL180.
 FZLVL 050. WKN...
 .
 BH SEP 2018 AAWU

 FAAK58 PAWU 241202
 FA8W
 ANCC FA 241215
 AK SRN HLF EXCP SE AK...

.
AIRMETS VALID UNTIL 242015

CB IMPLY POSSIBLE SEV OR GREATER TURB SEV ICE LLWS AND IFR CONDS.
NON MSL HEIGHTS NOTED BY AGL OR CIG.

.
KUSKOKWIM VLY AF...VALID UNTIL 250000

...CLOUDS/WX...

*****AIRMET STG SFC WIND***SE PASV-PAFS LN SUSTAINED SFC WND 30KTS
OR GTR. NC...**

*****AIRMET IFR***AFT 15Z OCNL CIG BLW 010/VIS BLW 3SM -RA BR.**

DTRT...

*****AIRMET MT OBSC***MTS OCNL OBSC CLDS/PCPN. DTRT...**

SCT035 OVC050 TOP FL180 MEGG LYRS ABV TO FL270.

TIL 15Z OCNL BKN035/VIS 5SM -SHRA.

AFT 15Z SCT005 BKN015 OVC035 TOP FL180/VIS 3SM -RA BR.

E PASV ISOL BKN035.

SE PASV-PAFS LN SFC WND E-SE 30G45 KTS.

OTLK VALID 250000-250600...IFR CIG RA BR. ADNLY AK RANGE WND.

...TURB...

*****AIRMET TURB***TIL 21Z E PASV-PAMC LN OCNL MOD TURB FL280-FL380.**

WKN...

*****AIRMET TURB***AK RANGE OCNL MOD TURB BLW 120. NC...**

...ICE AND FZLVL...

*****AIRMET ICE***VCY MTS OCNL MOD ICEIC 080-FL180.**

FZLVL 040. NC...

E PASL ISOL MOD ICEIC 080-FL180.

.
YKN-KUSKOKWIM DELTA AG...VALID UNTIL 250000

...CLOUDS/WX...

*****AIRMET IFR***OCNL CIG BLW 010/VIS BLW 3SM -SHRA BR. DTRT...**

*****AIRMET MT OBSC***MTS OCNL OBSC CLDS/PCPN. DTRT...**

PAOO-PARS LN NW SCT002 BKN012 OVC030 TOP 160. E PABE MEGG LYRS

ABV TO FL270. VIS 3SM -SHRA BR. CONDS SPRDG ENTIR ZONE AFT 15Z.

ELSW/OTRW FEW009 SCT035 BKN050 TOP 160.

TIL 15Z WDLY SCT BKN035 -SHRA.

AFT 20Z E-SE PABE ISOL BKN050CB MAX TOP FL250/VIS 3SM -TSRAGS.

VCY CB SFC WND VRBL G30 KTS.

OTLK VALID 250000-250600...PABE-PASM LN E IFR CIG RA BR.

ELSW MVFR CIG SHRA.

...TURB...

NIL SIG EXC VCY CB.

...ICE AND FZLVL...

ISOL MOD ICEIC 060-160. FZLVL 040.

.
BRISTOL BAY AH...VALID UNTIL 250000

...CLOUDS/WX...

*****AIRMET STG SFC WIND***OFSHR AND ALG ALUTN RANGE SUSTAINED SFC
WND 30KTS OR GTR. NC...**

*****AIRMET IFR***PAJZ-PAPH LN E OCNL CIG BLW 010/**

VIS BLW 3SM -RA BR. NC...
 AIRMET MT OBSCMTS OCNL OBSC CLDS/PCPN. NC...
 PAJZ-PAPH LN E SCT004 BKN011 OVC025 TOP FL180 MEGG LYRS ABV FL270. VIS 3SM -RA BR.
 ELSW FEW012 SCT025 BKN-OVC050 TOP FL180 -RA.
 OCNL BKN025/VIS 5SM -RA BR.
 AFT 20Z PADL W ISOL BKN050CB MAX TOP FL250/VIS 3SM -TSRAGS.
 VCY CB SFC WND VRBL G30 KTS.
 OFSHR SFC WND W-NW 30G40 KTS.
 ALG ALUTN RANGE SFC WND W 30G40 KTS.
 OTLK VALID 250000-250600...IFR CIG RA BR.
 ...TURB...
 AIRMET TURBTIL 21Z NE PAJZ OCNL MOD TURB FL280-FL380. WKN...
 AIRMET TURBTIL 21Z PALJ NE OCNL MOD TURB BLW 120. WKN...
 OTRW E PADL ISOL MOD TURB BLW 040.
 ...ICE AND FZLVL...
 AIRMET ICETIL 15Z VCY LAKE ILLIAMNA OCNL MOD ICEIC
 080-FL180. FZLVL 040. WKN...
 TIL 18Z PAIG-PANW LN N ISOL MOD ICEIC 080-FL180.
 .
 AK PEN AI...VALID UNTIL 250000
 ...CLOUDS/WX...
 AIRMET STG SFC WINDE PACD SUSTAINED SFC WND 30KTS OR GTR.
 NC...
 AIRMET MT OBSCPACD E MTS OCNL OBSC CLD/PCPN. IMPR...
 FEW005 SCT015 BKN050 TOP 160 DCRG LYRS ABV.
 PACD E OCNL BKN015/-SHRA. ISOL CIG BLW 010/VIS BLW 3SM -SHRA BR.
 AFT 18Z FEW015 SCT050 BKN090 TOP 160. ISOL BKN015.
 ELSW FEW015 SCT050 BKN090 TOP 160.
 E PACD SFC WND SW 30G40 KTS DCRG W G25 KTS BY 17Z.
 OTLK VALID 250000-250600...VFR. OFSHR BERING SIDE MVFR CIG SHRA.
 ...TURB...
 E PASD ISOL MOD TURB BLW 040.
 ...ICE AND FZLVL...
 TIL 18Z AKPEN N ISOL MOD ICEIC 060-160. FZLVL 045.
 .
 UNIMAK PASS TO ADAK AJ...VALID UNTIL 250000
 ...CLOUDS/WX...
 FEW020 SCT040 BKN080 TOP 160 FEW LYRS ABV. ISOL BKN040 -SHRA.
 OTLK VALID 250000-250600...VFR. OFSHR BERING SIDE MVFR CIG SHRA.
 ...TURB...
 NIL SIG.
 ...ICE AND FZLVL...
 E PAAK ISOL MOD ICEIC 060-160. FZLVL 040.
 .
 HOLTZIE SEP 18

11.0 AAWU Graphics

The AAWU icing forecast, flying weather, and low-level turbulence, graphics valid around the accident time are provided in figures 9 through 11. The AAWU graphics depicted isolated moderate icing conditions between 8,000 and 18,000 ft msl (figure 9). The flying weather chart indicated IFR conditions forecast for the accident site with areas of wind greater than 30 knots (figure 10). Occasional to continuous moderate turbulence was forecast for the accident site for between the surface and 12,000 ft msl (figure 11).

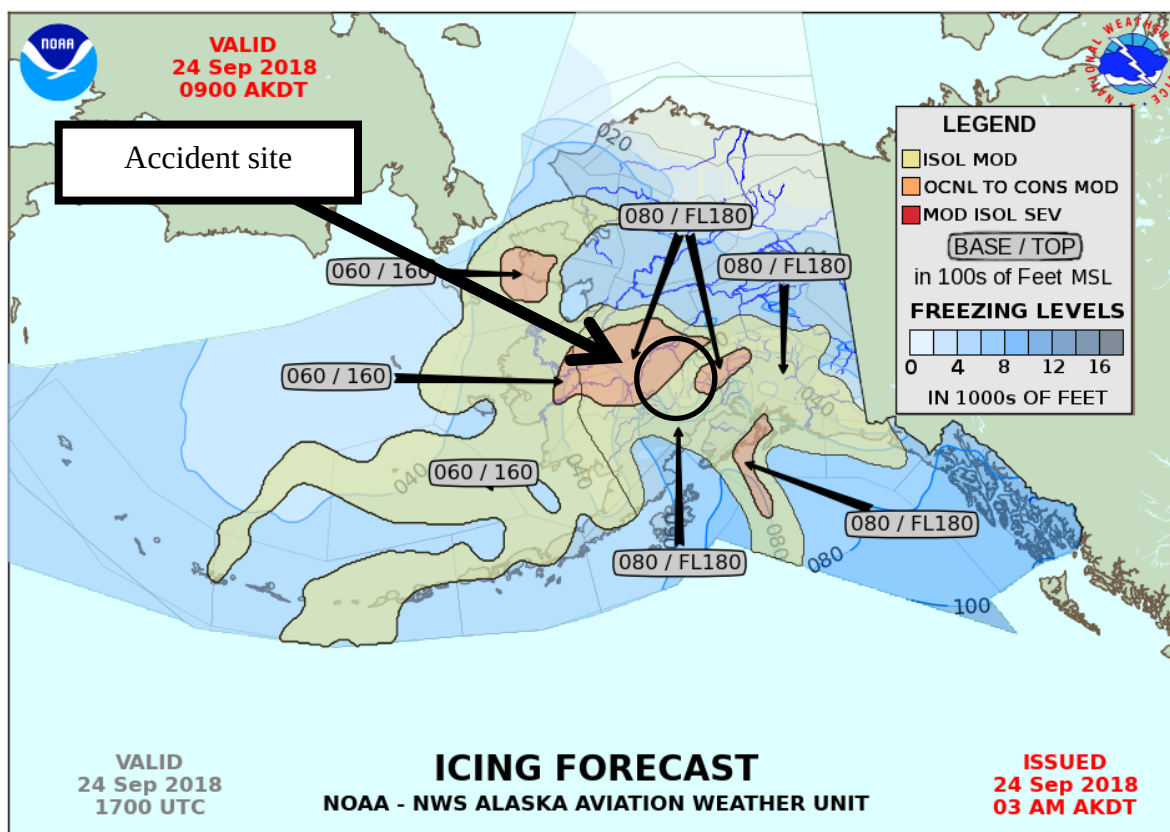


Figure 9 – Icing Forecast graphic from the AAWU valid for 0900 AKDT and graphic was issued at 0300 AKDT

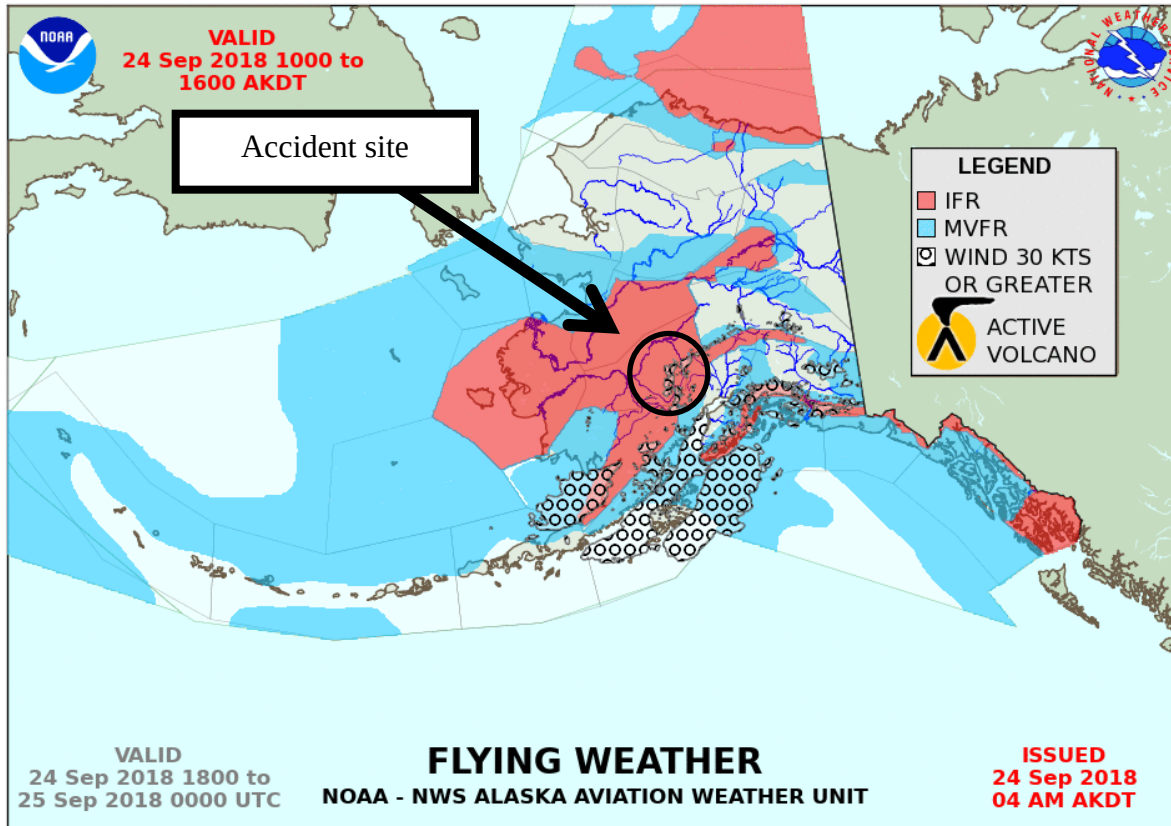


Figure 10 – Flying Weather graphic from the AAWU valid between 1000 and 1600 AKDT and graphic was issued at 0400 AKDT

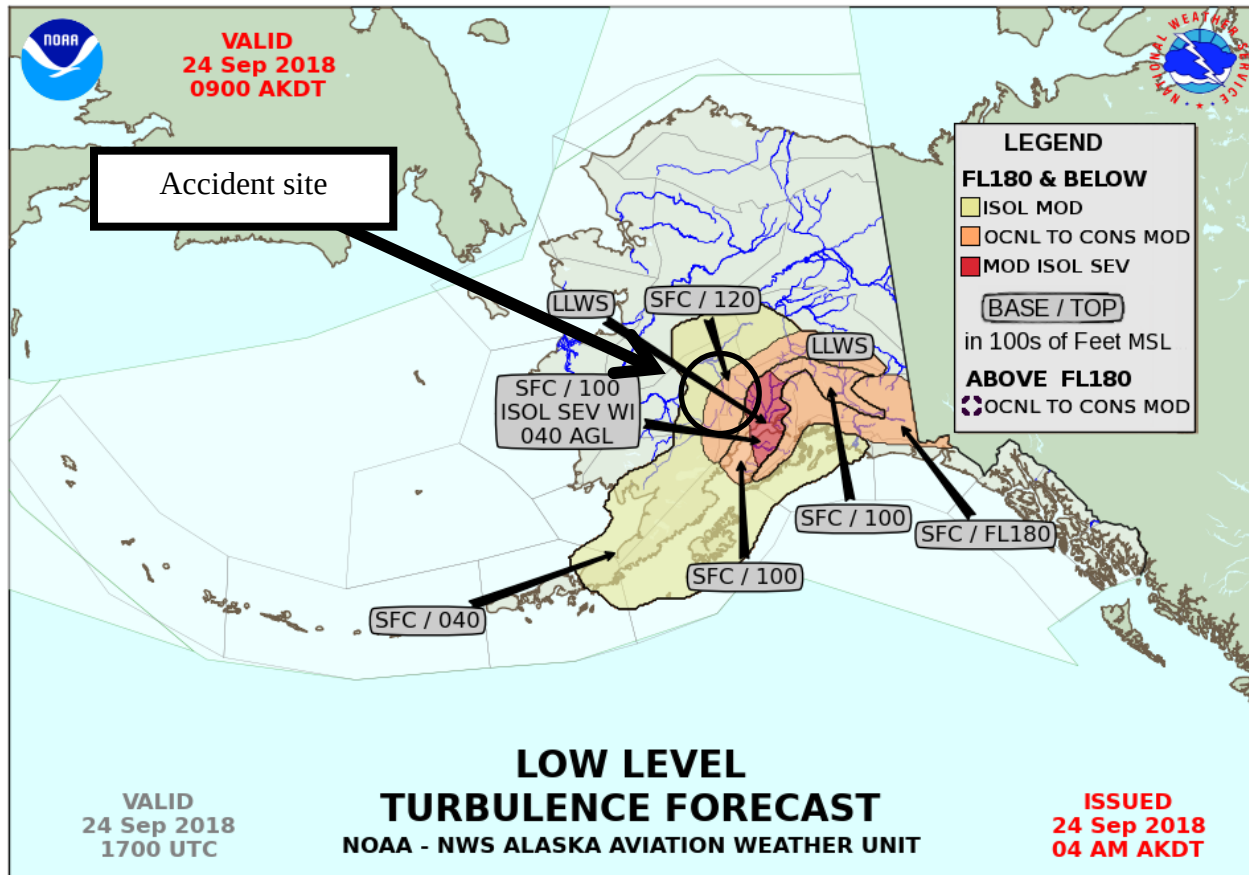


Figure 11 – Low-Level Turbulence Forecast graphic from the AAWU valid at 0900 AKDT and graphic was issued at 0400 AKDT

12.0 Terminal Aerodrome Forecast

No NWS Terminal Aerodrome Forecast (TAF) sites were located within 90 miles of the accident site or Rainy Pass.

13.0 NWS Area Forecast Discussion

The NWS Office in Anchorage, Alaska, issued the following Area Forecast Discussion (AFD) at 0430 AKDT (closest AFD to the accident time). The AFD discussed mainly the weather conditions for the Anchorage region including that LLWS was likely with wind gusts to 35 to 40 knots during the afternoon after the frontal passage:

FXAK68 PAFC 241230
AFDAFC

Southcentral and Southwest Alaska Forecast Discussion
National Weather Service Anchorage AK
430 AM AKDT Mon Sep 24 2018

.ANALYSIS AND UPPER LEVELS...

An upper level low over Bristol Bay is still the driving force for much of the weather throughout mainland Alaska. A surface front stems from the low spreading across the Alaska Peninsula and western Gulf of Alaska. This front, in combination with a jet max skirting the eastern Aleutians, is creating a band of increased vorticity and instability along the Alaska Peninsula. As the low moves north and east, significant rainfall is occurring over Bristol Bay and has arrived in Southcentral. Radar shows significant stratiform rain throughout Southcentral and Bristol Bay with some isolated areas of heavy rain near Dillingham and Stuyahok. Heavy showers have also been popping up across the AKPEN overnight, some of which have produced a few lightning strikes east of King Salmon. Gusty winds have begun to pick back up through Turnagain Arm as the front approaches the southern coastline and the pressure gradient intensifies along the terrain. Satellite imagery shows widespread cloud cover throughout the Bering and Southcentral with a slight dry slot trailing behind the front.

With calmer winds and clearer skies yesterday afternoon, Anchorage was able to set yet another high temperature record. The high temperature of 61 degrees tied the previous record set in 1965.

&&

.MODEL DISCUSSION...

Models are relatively consistent in regards to the placement of the low over Bristol Bay as it moves farther inland through the first 24 hours. Synoptically there is good agreement through the period especially in regards to the front moving into the western Bering and another front moving into the southern Gulf of Alaska on Wednesday. One major discrepancy is in regards to the development of a closed low in the southern Gulf of Alaska. The GFS has the low developing Wednesday morning while the NAM and EC have yet to come to a similar solution.

&&

.AVIATION...

PANC...LLWS is still likely this morning with a variable surface wind under a strong low-level southeasterly jet aloft. These gusty southeasterly winds may mix down to the surface at times early this morning and impact the airport complex. LLWS is expected to abate by midday as the front passes and surface winds shift to the south. Following the frontal passage, southerly winds will increase with gusts between 35 and 40 knots this afternoon and evening. VFR conditions should also persist through the day; however, there is the possibility of cloud heights dropping below 5,000ft with the frontal passage.

&&

.SHORT TERM FORECAST SOUTHCENTRAL ALASKA (Days 1 and 2)...

The forecast for today's storm, with widespread rain and wind expected across Southcentral, is pretty much on track. Guidance has backed off on the strength of winds behind the occluded front, so have trended just a bit weaker with southerly winds this afternoon and evening. The gusty winds will persist through tonight, so despite the cold air advection, temperatures will remain elevated overnight with a well mixed boundary layer. Precipitation will linger along the mountains tonight, with snow levels likely dropping to 4000 feet or lower. Both winds and precipitation will then gradually come to an end on Tuesday.

Tuesday night still looks on track to be one of the coldest nights of the season. While there may be a few lingering clouds over interior Southcentral, it looks like most areas will be largely cloud free. Thus, have trended downward with minimum temperatures, with nearly all of Southcentral expected to bottom out in the 20s to 30s Wednesday morning.

&&

.SHORT TERM FORECAST SOUTHWEST ALASKA (Days 1 through 3)...

A batch of unsettled weather has pushed into Southwest Alaska in association with an occluded front. This system will continue to steer moist air into the region and into the interior. This is a fast moving system, so expect the precipitation to taper off Tuesday and Wednesday will be relatively dry. In the wake of the frontal passage, colder air will advect into the region.

&&

.SHORT TERM FORECAST BERING SEA/ALEUTIANS (Days 1 through 3)...

Cyclonic flow will continue to influence the Bering and the Aleutians this forecast period. Embedded shortwave energy will propagate around the upper low bringing intermittent showers. The next organized front is anticipated late Tuesday which will push eastward along the chain.

&&

.LONG TERM FORECAST (Days 4 through 7: Wednesday Night through Sunday)...

Wednesday night will start out with a front associated with a North Pacific low moving northwestward, spreading rain across Kodiak and the Alaska Peninsula. The models are trending a bit further northeast with the northern edge of the precipitation shield as compared with yesterday's runs. As such they're now suggesting the rain spreads across much of Bristol Bay, and eventually northwestward across the Kuskokwim Delta, though the EC and GFS are about 18 hours apart as to when that rain makes it into the Kuskokwim Delta. Thus, the differences between the models still leave significant uncertainty as to the specifics of when and how much rain falls in any one place in Southwest Alaska. On Friday through Sunday, the trailing front behind the parent low lingers along or off the coast, gradually drifting westward away

from mainland Alaska by Sunday. The presence of the front should mean a sustained period of gusty southeast winds across Southwest Alaska Friday and Saturday.

For Southcentral, the front and associated precipitation over Kodiak will continue there into Friday, though the heaviest rain should be winding down by Friday morning. During the day Thursday, the rain will overspread the southern half of the Kenai Peninsula and up the coast to about the Seward area before beginning to diminish and retreat southwestward Thursday night. High pressure over the interior will hold strong and keep Anchorage and points north and east dry throughout the entire long-term forecast period, though Thursday now looks to be a cloudier day than it looked like in the models yesterday.

Temperature-wise, the entire long-term forecast will feature a warming trend. Behind the front, much warmer air will move into Southern Alaska Friday through Sunday, which will help support well above average afternoon highs, though the longer nights and mainly clear skies will still support some chilly nights for lower elevation locations as inversions likely set up each night.

&&

.AFC WATCHES/WARNINGS/ADVISORIES...
PUBLIC...None.
MARINE...Gale Warning...119 125 130 131 132 138 139 140 141 160
351 352.

&&

\$\$

14.0 Winds and Temperature Aloft Forecast

The NWS 0557 AKDT Winds and Temperature Aloft forecast valid for the closest points to the accident site are included below:

```

FBAK31 KWN0 241357
FD1AK1
DATA BASED ON 241200Z
VALID 241800Z    FOR USE 1400-2100Z. TEMPS NEG ABV 24000

FT   3000    6000    9000    12000    18000    24000    30000    34000    39000

ANC 1437 1651+03 1847-02 1945-07 1860-19 1960-32 206549 206653 226152
TKA 1119 1746+00 1849-04 1847-08 1949-20 1856-33 185450 205855 225253
```

The accident site was closest to the Anchorage, Alaska (ANC), and Talkeetna, Alaska (TKA), forecast points. The forecast valid for use between 0600 and 1300 AKDT for ANC indicated a wind from 140° at 37 knots at 3,000 ft and a wind from 160° at 51 knots at 6,000 ft with a temperature of 3° C. The forecast for TKA forecast indicated a wind from 110° at 19 knots at 3,000 ft and a wind from 170° at 46 knots at 6,000 ft with a temperature of 0° C.

15.0 Pilot Weather Briefing

The accident pilot did not receive a weather briefing from the Alaska Flight Service Station (FSS). An additional archive search of ForeFlight data revealed that the accident pilot also did not gather weather information from ForeFlight before or during the accident flight.

16.0 Witness Information

A pilot (operating N1748R) flying along the same route as the accident pilot, but travelling 15 minutes behind the accident aircraft through Rainy Pass, stated that on the day of the accident, the accident pilot and the pilot of N1748R had reviewed weather information between 0800 AKDT and departure (~0920 to 0940 AKDT). The weather information reviewed included the Area Forecasts and imagery from FAA's Aviation Weather Cameras. In addition, the pilot of N1748R received 2 PIREPs from the company Duty Officer which relayed information about weather conditions near N1748R's proposed destination. These PIREPs were not relayed or available in the national airspace for all pilots. The accident pilot received an updated wind observation for near his destination around 0915 AKDT, and the accident pilot departed shortly after receiving this phone call. Around 0940 AKDT, the accident pilot while enroute called over company frequency for someone to review the FAA's Aviation Weather Camera information and provide an update on the weather at the weather camera locations. For more information please see attachment 1.

17.0 Web Camera Images

Images from the FAA's Aviation Weather Cameras are shown in figures 14 through 25 along with attachments 2 and 3 providing images of the weather conditions surrounding the accident site at the accident time. Figures 12 and 13 indicated the web camera locations included in attachments 2 and 3, along with the accident site location, and Spidertracks¹⁷ data for the accident flight. The weather camera imagery (figures 15 through 20) from Puntilla Lake (6AK), located 13 miles east of the accident site at an elevation of 1,930 ft (figure 14), showed the weather conditions surrounding the accident time with the northwest facing camera images provided in figures 15 through 20 with times at 1012, 1022, 1032, 1042, and 1052 AKDT. The 6AK northwest facing camera images depicted the lowest layer of stratocumulus type clouds with bases at or near 4,200 ft msl (~2,300 ft agl) between 1012 and 1052 AKDT, visibilities as high as 8.0 miles, but less than 10.5 miles visibility, mountain obscuration conditions, and rain falling from the base of cloud cover. A lower stratocumulus layer of clouds is visible at times below 4,200 ft msl, but it is unknown at what height the base of these clouds were. The weather camera imagery around the accident time from Rohn (QPS) and Skwentna (SKW) are also provided in attachments 2 and 3.

¹⁷ <https://www.spidertracks.com/> - Real-Time aircraft tracking and communication

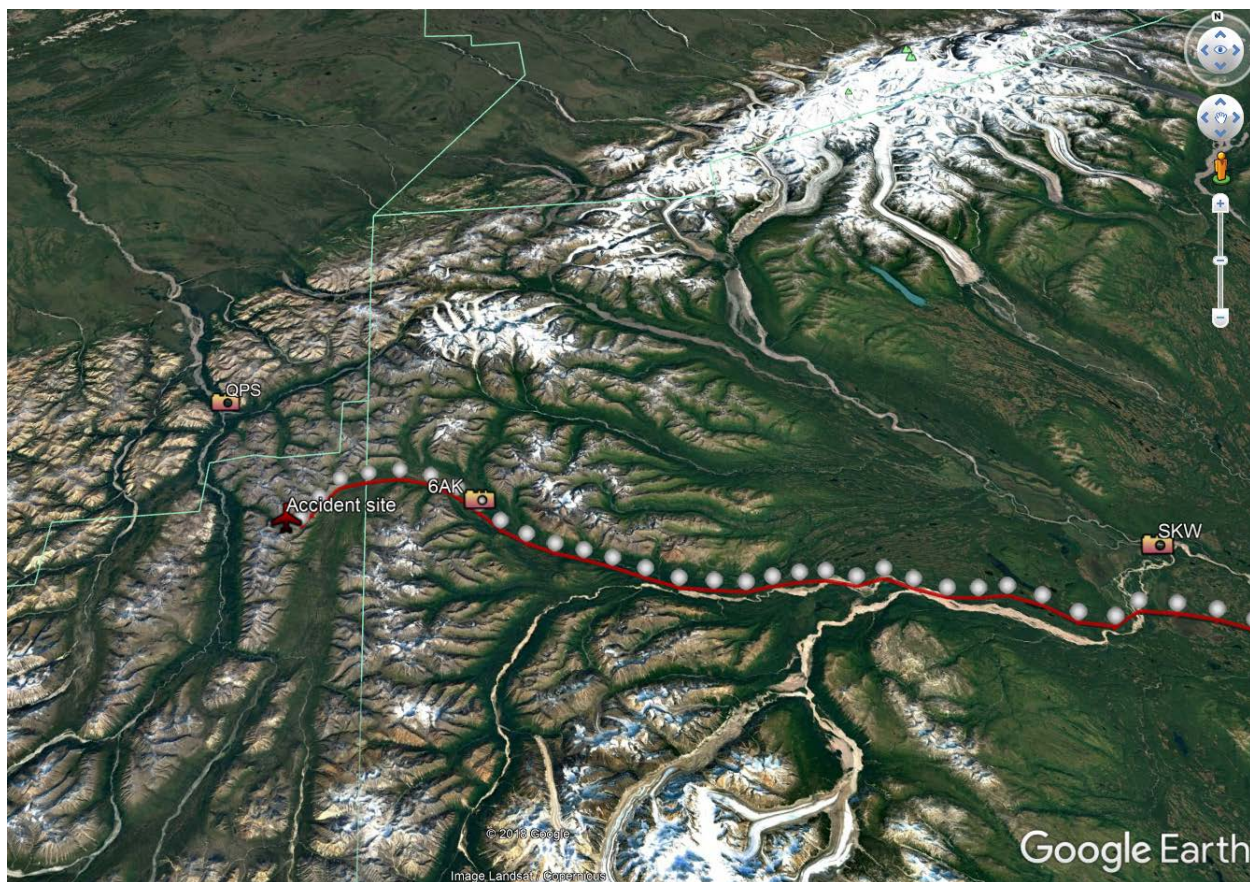


Figure 12 – Google Earth Map of the closest FAA weather camera sites, the accident site, and the Spidertracks data for the accident flight

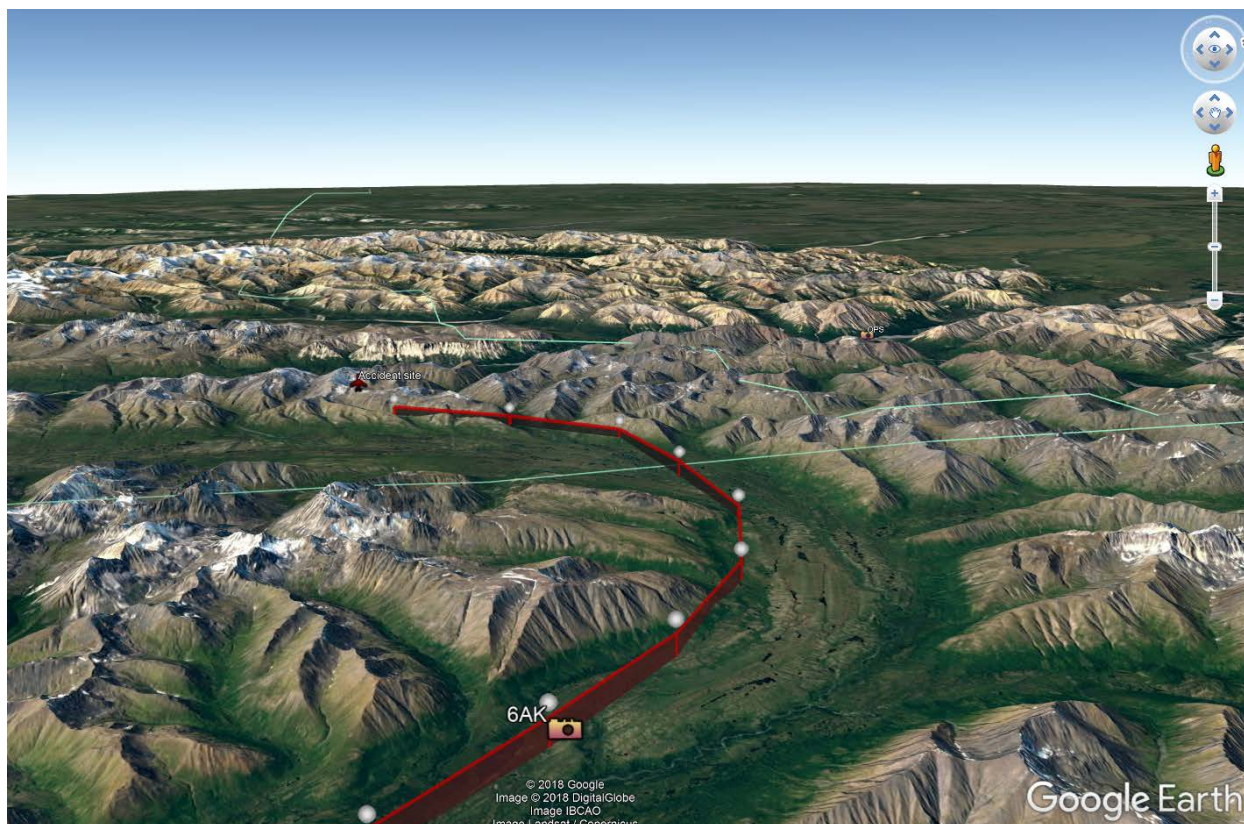


Figure 13 – A more zoomed in (and west facing) view of the closest FAA weather camera sites, the accident site, and the Spidertracks data for the accident flight

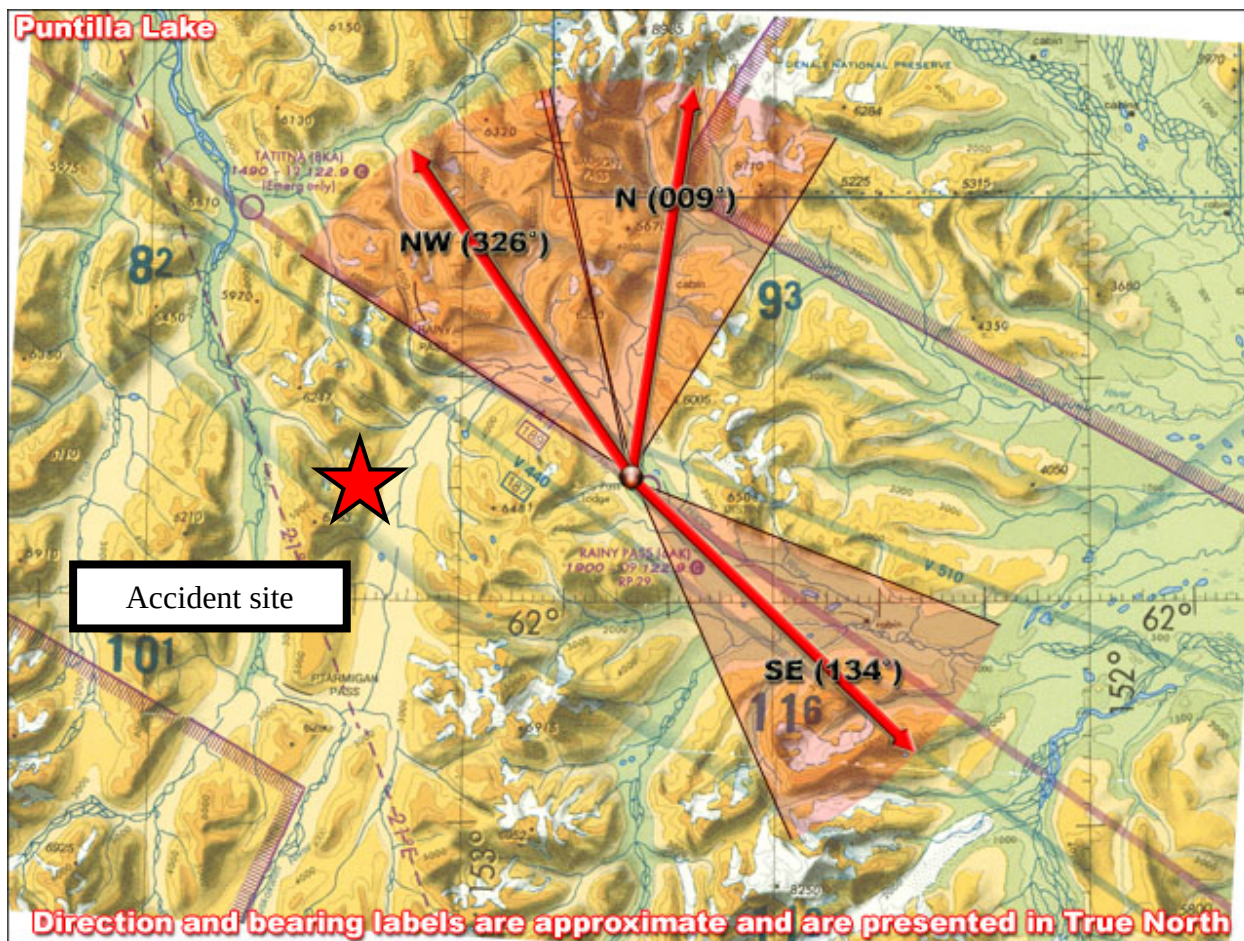


Figure 14 – FAA weather camera Puntilla Lake location on sectional chart with the direction the different camera angles face with the accident site marked

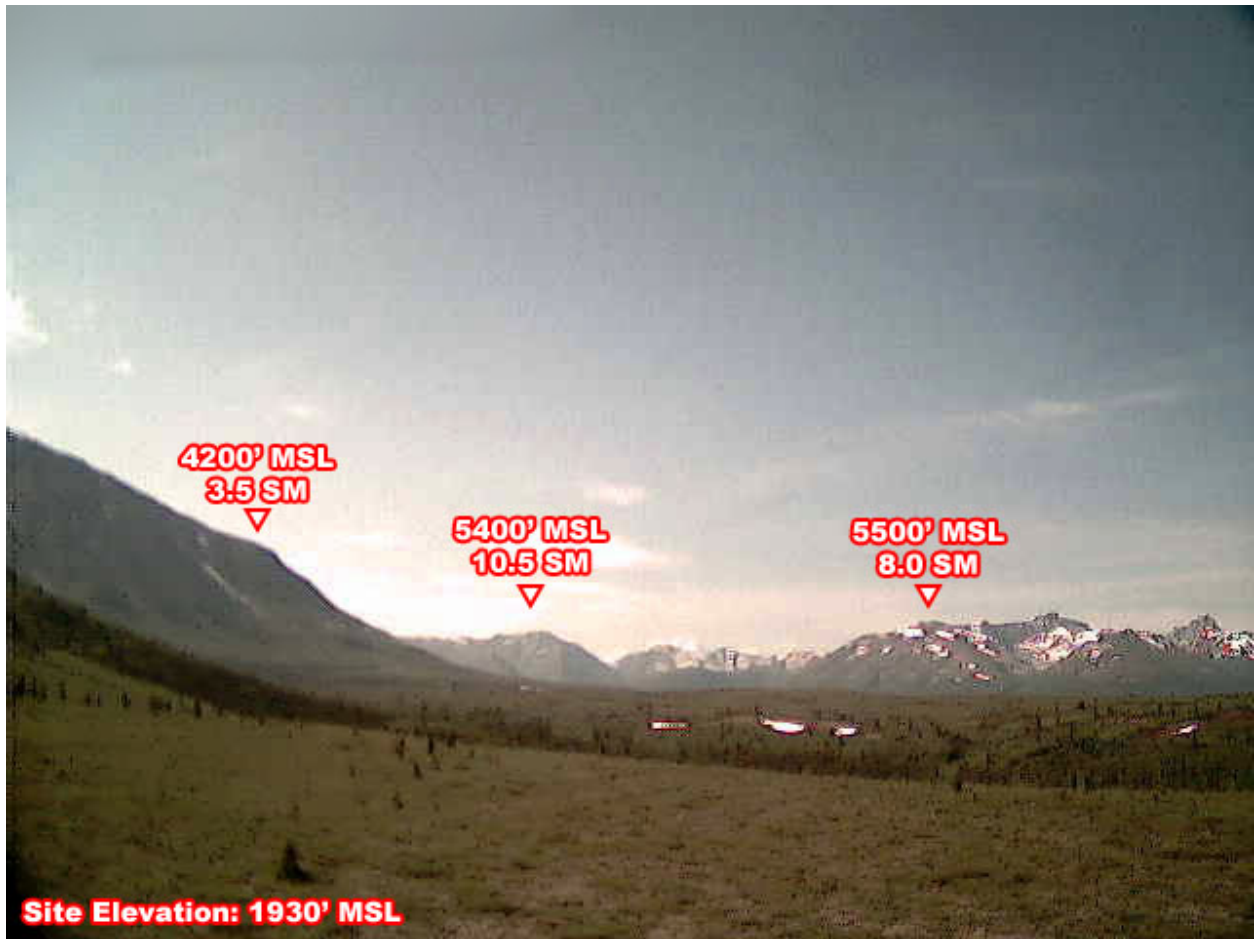


Figure 15 – FAA weather camera from Puntilla Lake northwest facing view from a standard clear sky weather day

Mon 24 Sep 2018 18:12:11 UTC
Mon 24 Sep 2018 10:12:11 AKDT

Puntilla Lake - NorthWest
See <https://avcams.faa.gov> for more information



Figure 16 – FAA weather camera from Puntilla Lake northwest facing view from 1012 AKDT

Mon 24 Sep 2018 18:22:11 UTC
Mon 24 Sep 2018 10:22:11 AKDT

Puntilla Lake - NorthWest
See <https://avcams.faa.gov> for more information



Figure 17 – FAA weather camera from Puntilla Lake northwest facing view from 1022 AKDT

Mon 24 Sep 2018 18:32:15 UTC
Mon 24 Sep 2018 10:32:15 AKDT

Puntilla Lake - NorthWest
See <https://avcams.faa.gov> for more information



Figure 18 – FAA weather camera from Puntilla Lake northwest facing view from 1032 AKDT

Mon 24 Sep 2018 18:42:22 UTC
Mon 24 Sep 2018 10:42:22 AKDT

Puntilla Lake - NorthWest
See <https://avcams.faa.gov> for more information



Figure 19 – FAA weather camera from Puntilla Lake northwest facing view from 1042 AKDT

Mon 24 Sep 2018 18:52:28 UTC
Mon 24 Sep 2018 10:52:28 AKDT

Puntilla Lake - NorthWest
See <https://avcams.faa.gov> for more information



FAA advisory weather product

Figure 20 – FAA weather camera from Puntilla Lake northwest facing view from 1052 AKDT

18.0 Astronomical Data

The astronomical data obtained from the United States Naval Observatory for the accident site on September 24, 2018, indicated the following:

SUN

Begin civil twilight	0718 AKDT
Sunrise	0802 AKDT
Accident time	1032 AKDT¹⁸
Sun transit	1405 AKDT
Sunset	2005 AKDT
End civil twilight	2050 AKDT

¹⁸ Inserted accident time for reference and context.

E. LIST OF ATTACHMENTS

Attachment 1 – N1748R’s Pilot Statement

Attachment 2 – FAA’s Aviation Web Camera images from web cameras (locations seen in figure 12) surrounding the accident site

Attachment 3 – Part 2 of FAA’s Aviation Web Camera images from web cameras (locations seen in figure 12) surrounding the accident site

Submitted by:

Paul Suffern
Senior Meteorologist

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