

NATIONAL TRANSPORTATION SAFETY BOARD

Vehicle Recorder Division

Washington, D.C. 20594

May 2, 2017

Global Positioning System Device

Specialist's Factual Report

By James Cash

1. EVENT SUMMARY

Location: Angoon, Alaska
Date: April 08, 2016
Aircraft: Cessna 206
Registration: N50159
Operator: Sunrise Aviation Inc.
NTSB Number: ANC16FA017

On April 8, 2016, about 0912 Alaska daylight time, an amphibious float-equipped Cessna 206 airplane, N50159, sustained substantial damage after impacting snow-covered, rising terrain about 17 miles southeast of the Angoon Airport, Angoon, Alaska. The airplane was operated by Sunrise Aviation, Inc., Wrangell, Alaska, as a visual flight rules (VFR) commercial on-demand flight under the provisions of 14 Code of Federal Regulations (CFR) Part 135. Of the four people on board, the commercial pilot and two passengers sustained fatal injuries, and one passenger sustained serious injuries. Visual meteorological conditions (VMC) prevailed at the time of departure, and company flight following procedures were in effect. The flight departed from the Wrangell Airport, Wrangell Alaska, about 0810, destined for Angoon.

2. GROUP

A group was not convened.

3. DETAILS OF INVESTIGATION

The National Transportation Safety Board (NTSB) Vehicle Recorder Division received the following global positioning system (GPS) device:

Device Manufacturer/Model: Garmin GPSMAP 396
Serial Number: 28209929

3.1. Device Description

The Garmin GPSMAP 396 is a battery-powered portable 12-channel GPS receiver with a 256-color TFT LCD display screen. The unit includes a built-in Jeppesen database

and is capable of receiving XM satellite radio for flight information including NEXTRAD radar, lightning, METARs, TAFs, and TFRs. The unit stores date, route-of-flight, and flight-time information for up to 50 flights. A flight record is triggered when groundspeed exceeds 30 knots and altitude exceeds 500 feet, and ends when groundspeed drops below 30 knots for 10 minutes or more. A detailed tracklog – including latitude, longitude, date, time, and GPS altitude information for an unspecified number of points is stored within the unit whenever the receiver has a lock on the GPS navigation signal. Position is updated within the tracklog as a function of time or distance moved, depending on how the unit has been configured. Once the current tracklog memory becomes full, new information either overwrites the oldest information or recording stops, depending on how the unit is configured. The current tracklog can be saved to long-term memory and 15 saved tracklogs can be maintained in addition to the current tracklog. Tracklog storage may be activated or de-activated at user discretion. All recorded data is stored in non-volatile memory. The unit contains hardware and software permitting the download of recorded waypoint, route, and tracklog information to a PC via a built-in serial port using the NMEA 0183 version 2.0 protocol. The unit can also communicate with external devices such as a computer using a built in USB port. An internal button-battery is used to back-up power to the internal memory and real-time clock during those periods when main power is removed.

3.2. Data Recovery

The accident unit was undamaged and was downloaded normally using the manufacturers supplied software program.

3.3. Data Description

The data extracted included 20 track logs/sessions from April 4, 2016¹, through April 8, 2016. The accident flight was recorded starting 0808:33 ADT and ending 0913:55 ADT on April 8, 2016.

3.4. Parameters Provided

Table 1 describes data parameters provided by the GPS device. Date, Time, Latitude, Longitude, and GPS Altitude are recorded by the device. Groundspeed and Track are derived from the recorded parameters.

Table 1. GPS Data Parameters

Parameter Name	Parameter Description
Date	Date for recorded data point (MM/DD/YYYY)
Time	Time (UTC) for recorded data point (HH:MM:SS)
Latitude	Recorded Latitude (degrees)

¹ All dates and times are referenced to Alaska Daylight Time (ADT).

Longitude	Recorded Longitude (degrees)
GPS Alt	Recorded GPS Altitude (feet)
Groundspeed	Average derived groundspeed (knots)
Track	Average derived true course (degrees)

3.5. OVERLAYS AND TABULAR DATA

Figure 1 is a graphical overlay generated using Google Earth for the accident flight. The weather and lighting conditions in Google Earth are not necessarily the weather and lighting conditions present at the time of the recording.

The flight departed the Wrangell Airport at approximately 0810 ADT. The last recorded data record was as at 0913:55 ADT on April 8, 2016, with a GPS altitude of 2,405 feet above Mean Sea Level (MSL) and a ground speed of 74 miles per hour. Due to data buffering on the GPS unit, the data recording may have ended before the accident event.

Figure 2 is a graphical overlay generated using Google Earth zoomed in on the pilots attempt to fly up Pybus Bay inlet.

Figure 3 is a graphical overlay generated using Google Earth depicting the last 6 minutes of the accident flight.

Figure 4 is a graphical presentation of the recorded GPS altitude, groundspeed and track data. Also included in the figure are terrain data elevation and the resulting aircraft's height above the terrain. The aircraft height above the terrain was calculated by comparing the aircraft's GPS altitude of the flight track above the ground elevation referenced in the Google Earth terrain model.

Tabular data used to generate figures 1 through 4 are included as Attachment 1. This attachment is provided in electronic comma-delimited (.CSV) format].

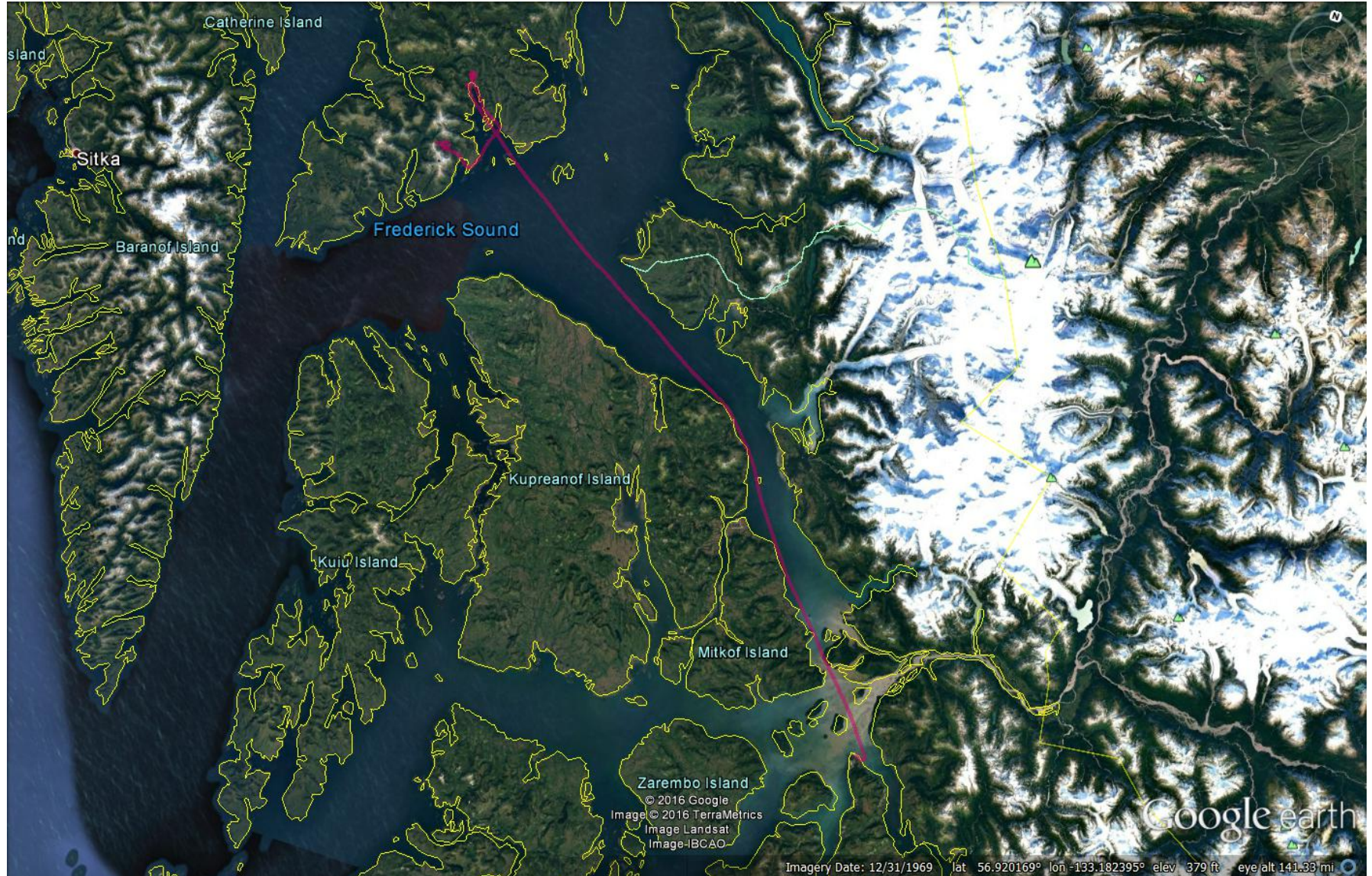


Figure 1. Google Earth overlay showing the accident flight

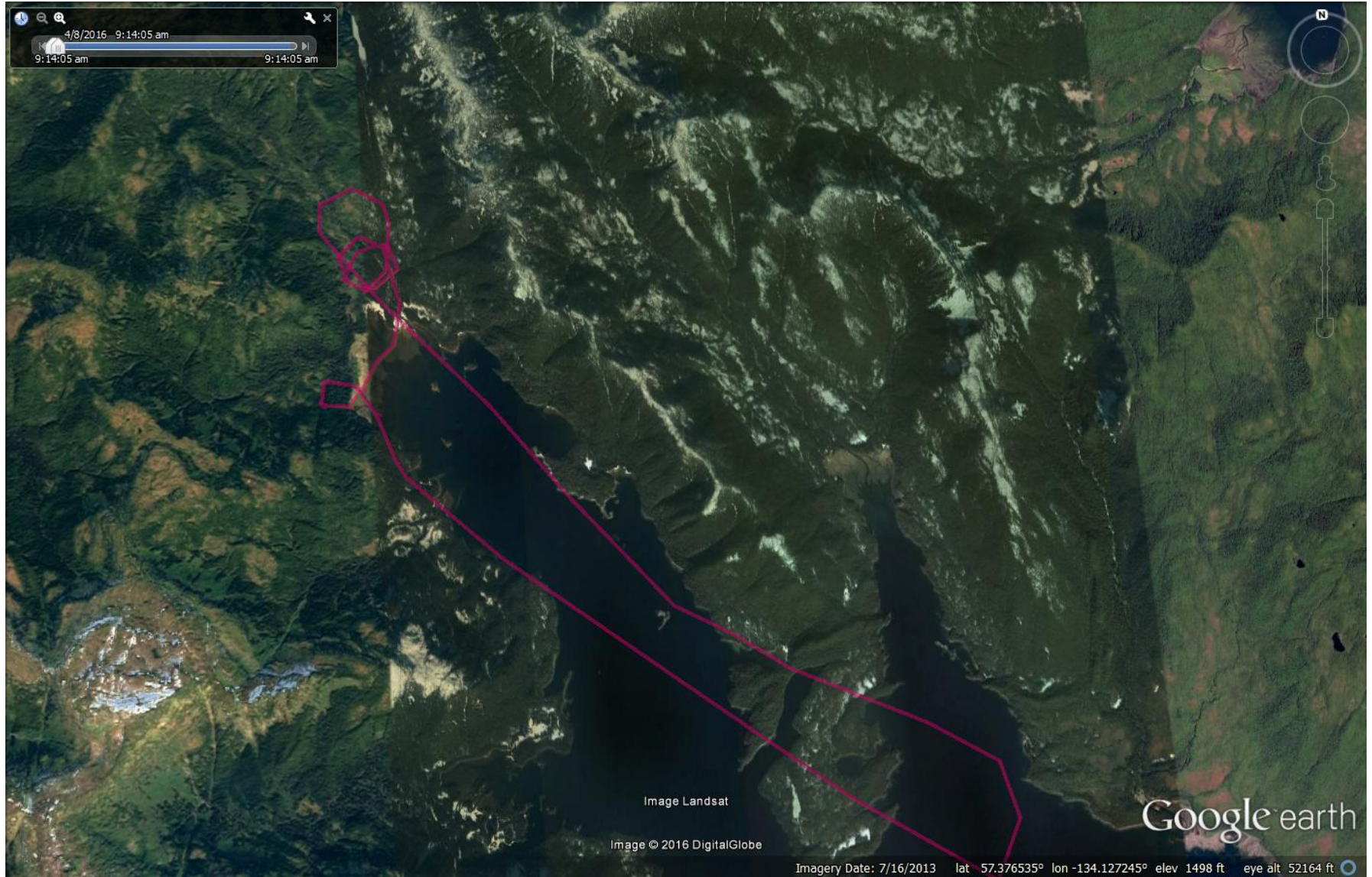


Figure 1. Google Earth overlay the aircraft attempt to fly up Pybus Bay.

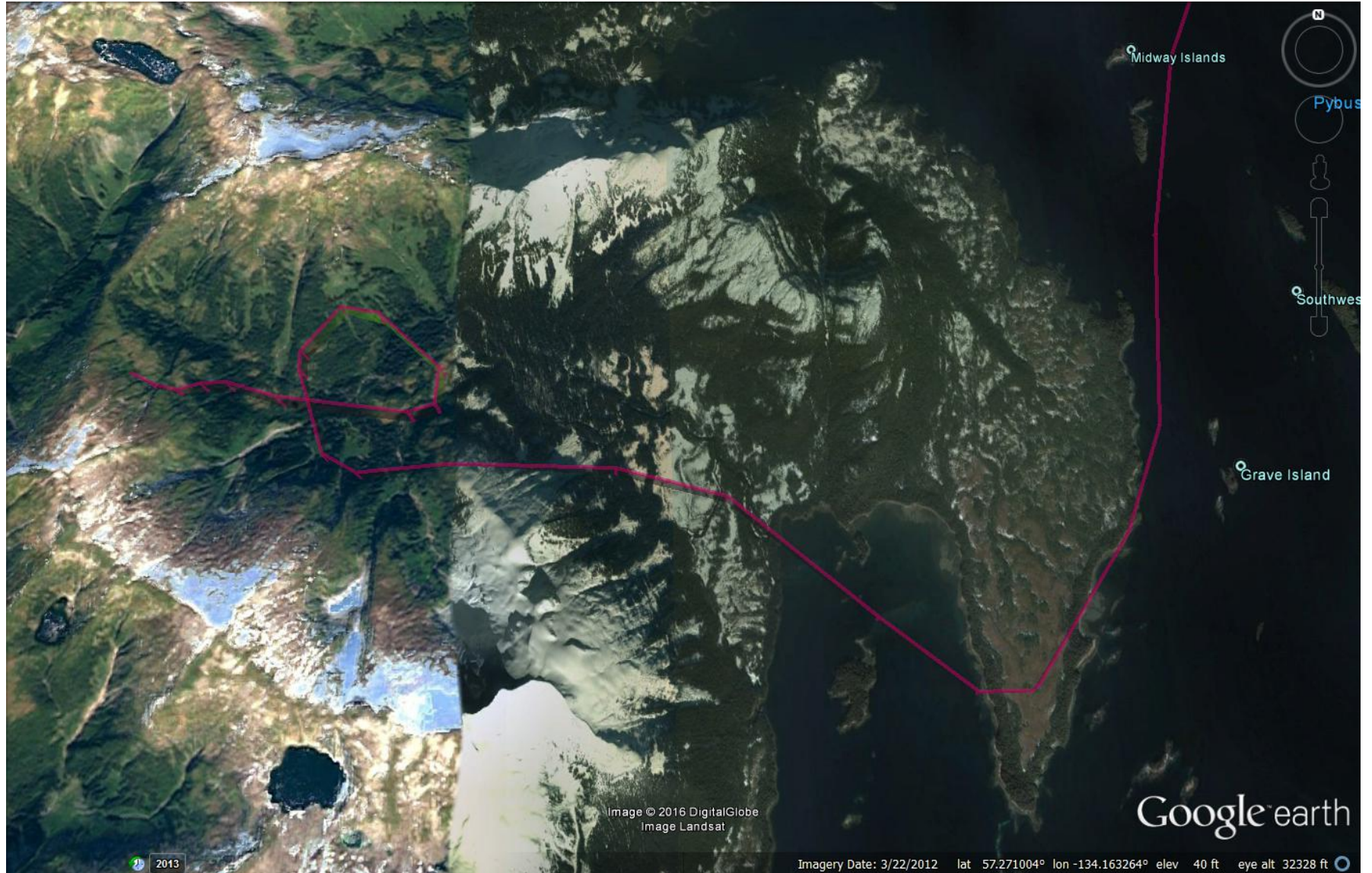
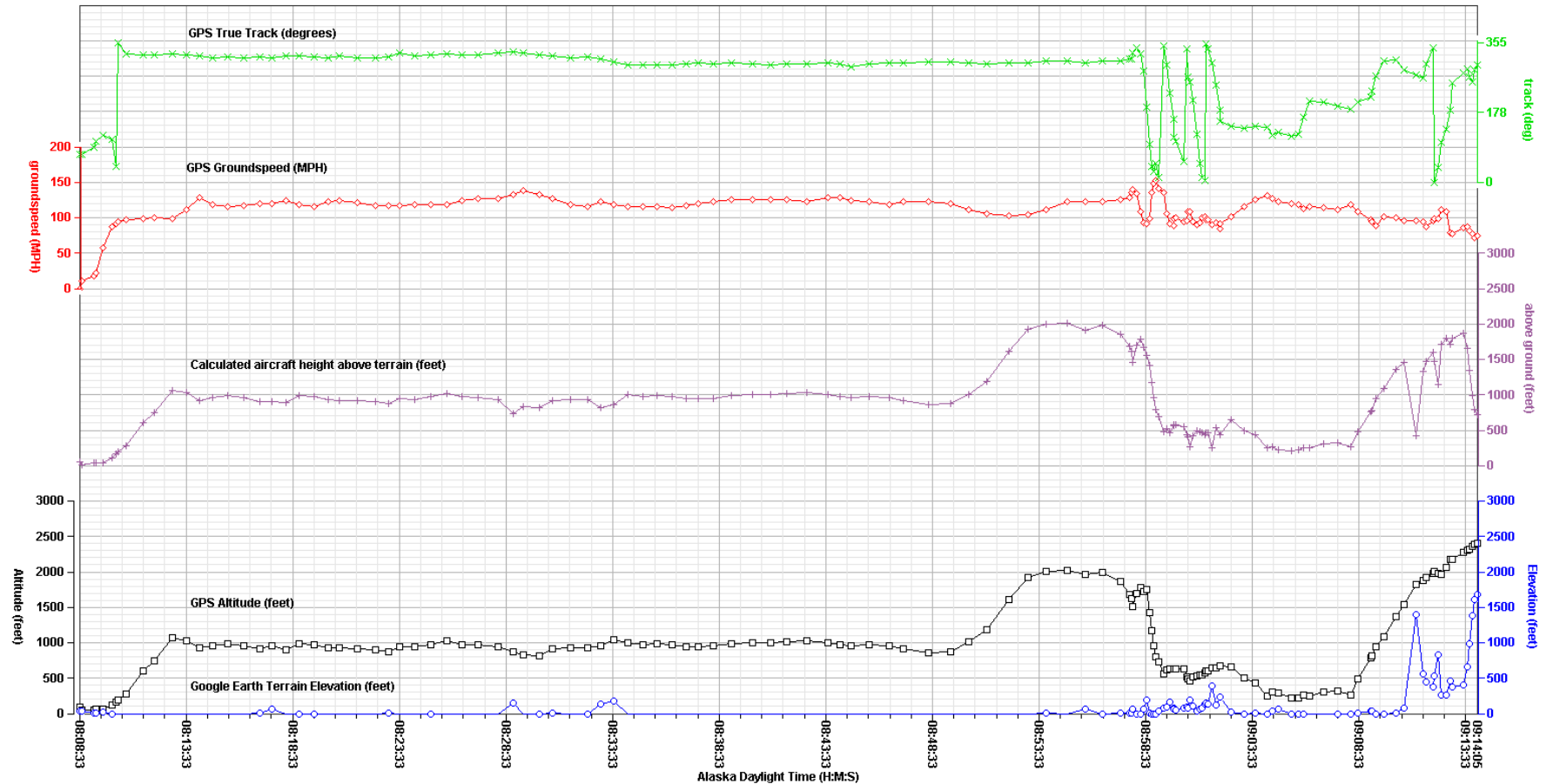


Figure 3. Google Earth overlay the last 6 minutes of the GPS data



Revised: 26 July 2016

National Transportation Safety Board

Figure 4. Graphical presentation of the recorded GPS data with terrain data extracted from Google Earth terrain model.