

# Science Flight Report

## Operation IceBridge Arctic 2010



**Flight:** 02  
**Mission:** Helheim and Kangerdlugssuaq Glaciers 01

### Flight Report Summary

|                            |   |
|----------------------------|---|
| <b>Aircraft</b>            | <b>P-3B (N426NA)</b>  |
| <b>Flight Number</b>       | 890   |
| <b>Flight Request</b>      | 10P002,10P007   |
| <b>Date</b>                | Saturday, May 08, 2010 (Z)  |
| <b>Purpose of Flight</b>   | Operation IceBridge Mission Helheim and Kangerdlugssuaq Glaciers  |
| <b>Take off time</b>       | 10:20 Zulu from Kangerlussuaq/Søndre Strømfjord Airport (BGSF)  |
| <b>Landing time</b>        | 15:59 Zulu at Kangerlussuaq/Søndre Strømfjord Airport (BGSF)  |
| <b>Flight Hours</b>        | 5.8   |
| <b>Aircraft Status</b>     | Airworthy.  |
| <b>Sensor Status</b>       | All installed sensors operational.  |
| <b>Significant Issues</b>  | None.   |
| <b>Accomplishments</b>     | <ul style="list-style-type: none"> <li>• Low-altitude survey (1,500 ft AGL) of several outlet glaciers in southeast Greenland and ICESat tracks. ATM, DMS, accumulation and Ku-band and snow radar were operated on the survey lines. Gravimeter was in operation throughout the entire flight.</li> <li>• Completed all of the planned survey lines.</li> <li>• Collected data over GPS sites on Russell and Leverett Glaciers.</li> <li>• Collected data along traverse route and over ice core sites.</li> <li>• Collected MCoRDS radar data for testing and system fine tuning with the new 16 antenna array. Today's MCoRDS data set is a test data set and not intended for science use.</li> <li>• Conducted several EMI tests for MCoRDS system. Switched off all lasers and radar systems on the aircraft to locate the source of EMI on the inboard antenna array.</li> <li>• Conducted one pass over the runway at Kangerdlugssuaq/Søndre Strømfjord ramp for ATM instrument calibration.</li> </ul> |
| <b>Geographic Keywords</b> | Helheim, Midgard and Kangerdlugssuaq Glaciers, Dye-3, Raven, Ikerssuaq Glacier  |
| <b>ICESat Tracks</b>       | 263   |
| <b>Repeat Mission</b>      | Helheim, Midgard and Kangerdlugssuaq Glaciers, Ikerssuaq Glacier  |

## Science Data Report Summary

| Instrument                | Instrument Operational              |                                     |                                     | Data Volume | Instrument Issues |
|---------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------|-------------------|
|                           | Survey Area                         | Entire Flight                       | High-alt. Transit                   |             |                   |
| <b>ATM</b>                | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | 69 GB       | None              |
| <b>MCoRDS</b>             | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | 1 TB        | Test data set.    |
| <b>Snow Radar</b>         | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | 270 GB      | None              |
| <b>Ku-band Radar</b>      | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | 270 GB      | None              |
| <b>Accumulation Radar</b> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | 225 GB      | None              |
| <b>DMS</b>                | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 81 GB       | None              |
| <b>Gravimeter</b>         | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 80 MB       | None              |

### Mission Report (Michael Studinger, Mission Scientist)

Today's mission includes reflights of historical ATM/CRISIS survey lines over Helheim, Midgard and Kangerdlugssuaq Glaciers for dh/dt monitoring. We also flew over Ikerssuaq Glacier. We started the flight by collecting data along the GPS/traverse line near Kangerlussuaq established by Ian Bartholomew of the University of Edinburgh. After completing the overflight of these points we conducted several EMI tests for the MCoRDS system by sequentially switching off all lasers and radar systems on board the P-3 and turning them back on in a controlled fashion between waypoints BART7 and SEG1. At 11:14 Z we flew over a camp structure on the traverse route. The traverse team had been informed this morning that we will be flying over them in order to enable data collection on the ground.

Today's mission is used for MCoRDS testing and system fine tuning with the new 16 antenna array. Today's MCoRDS data set is a test data set and not intended for science use or submission to NSIDC.

The weather in the survey area was very good as we had expected from the forecast. The volcanic ash cloud from the eruption in Iceland has reached the coast of southeast Greenland and we stayed just slightly northwest of the area that was cornered off in the NOTAM issued for Søndre Strømfjord.

#### Individual instrument reports from experimenters on board the aircraft:

**ATM:** Both systems worked well. We lost about 10 mins of laser returns on the transit back to Kangerlussuaq due to dense ice fog.

**MCoRDS:** The MCoRDS system worked well and collected 1 TB of test data and data during the EMI tests. Tomorrow will be hard down day that will allow work on the radar system.

**Snow and Ku-band radar:** Both systems worked well and collected each about 270 GB of data. We briefly lost data due to higher than 1500 ft flight elevation.

**Accumulation Radar:** The system worked well and collected 225 GB of data. Brief data loss due to larger than 1500 ft flight elevation.

**DMS:** DMS worked well. No problems.

**Gravimeter:** System worked normally. No problems.

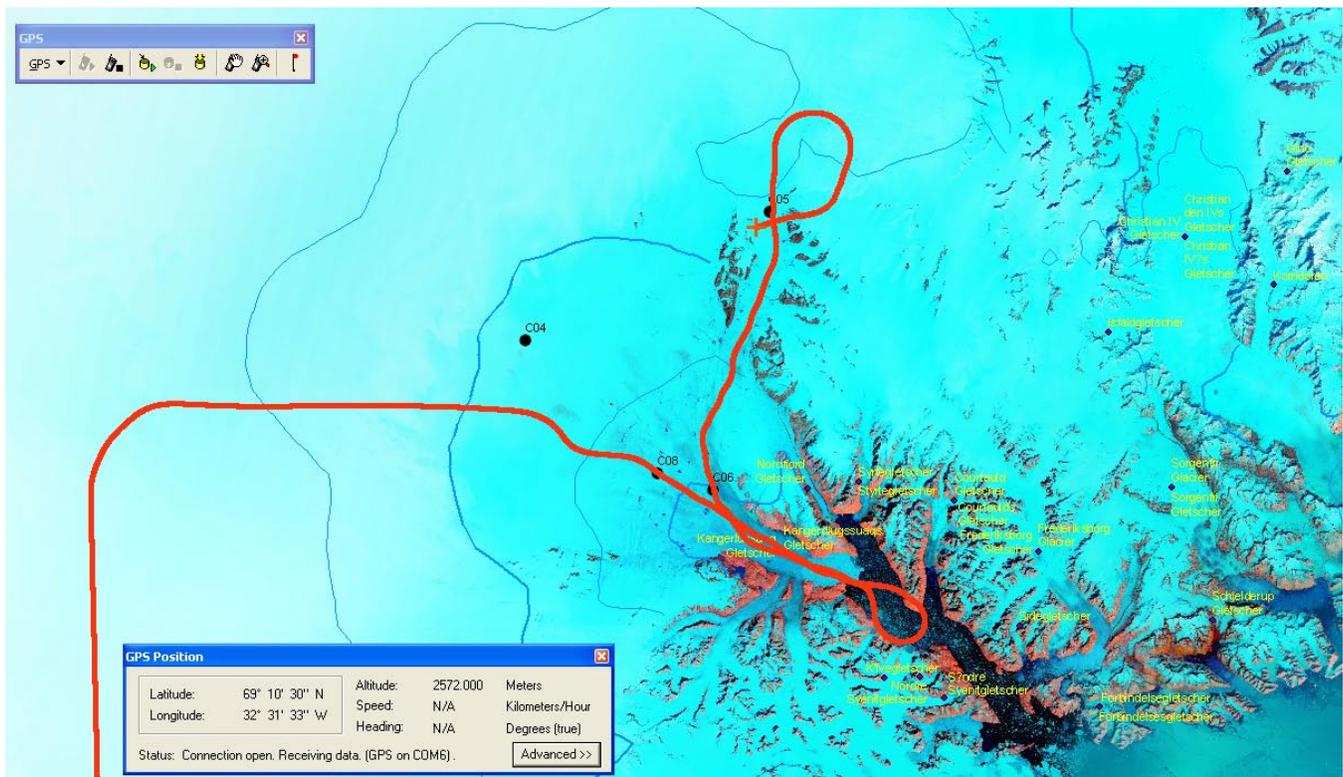
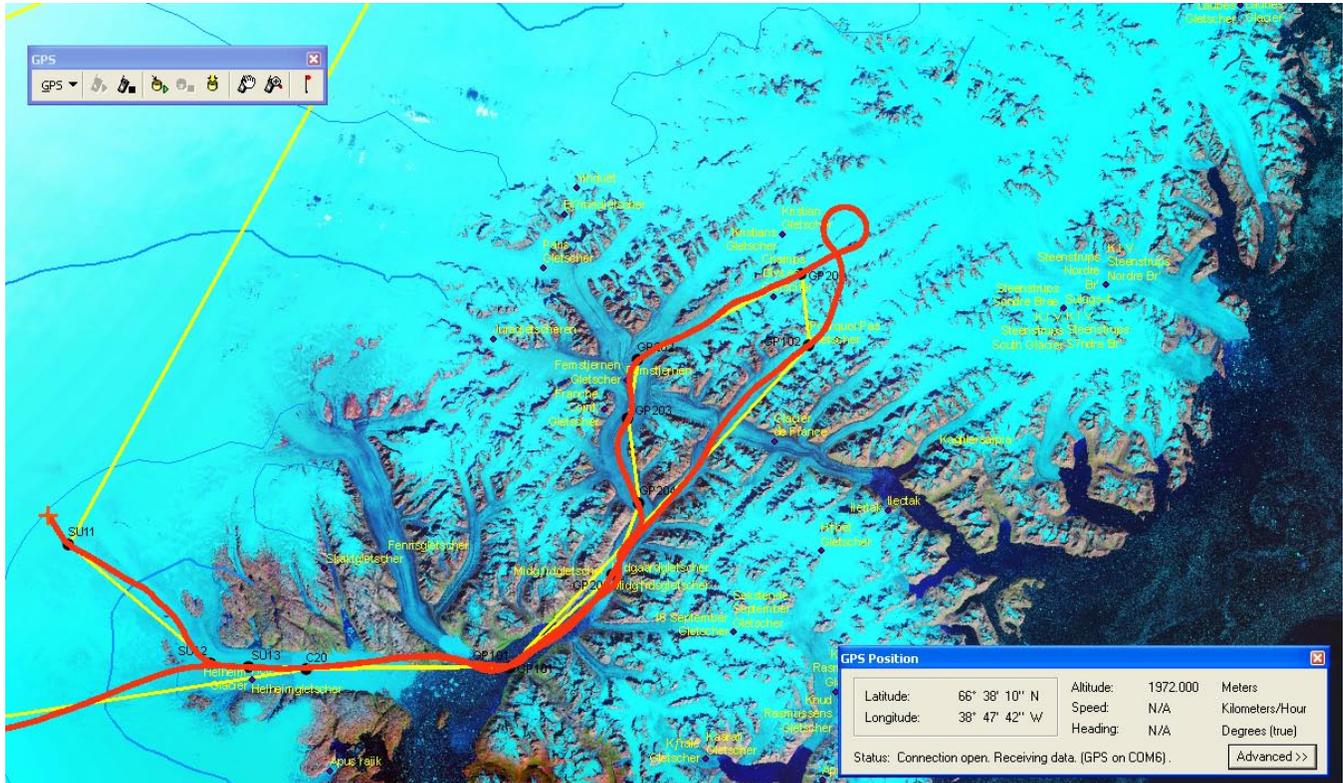


Figure 1: Actual flight path of F02 over Helheim Glacier area (top) and Kangerluqssuaq Glacier (bottom).

# Helheim-Kangerd

5.3 hrs at 250 knots groundspeed

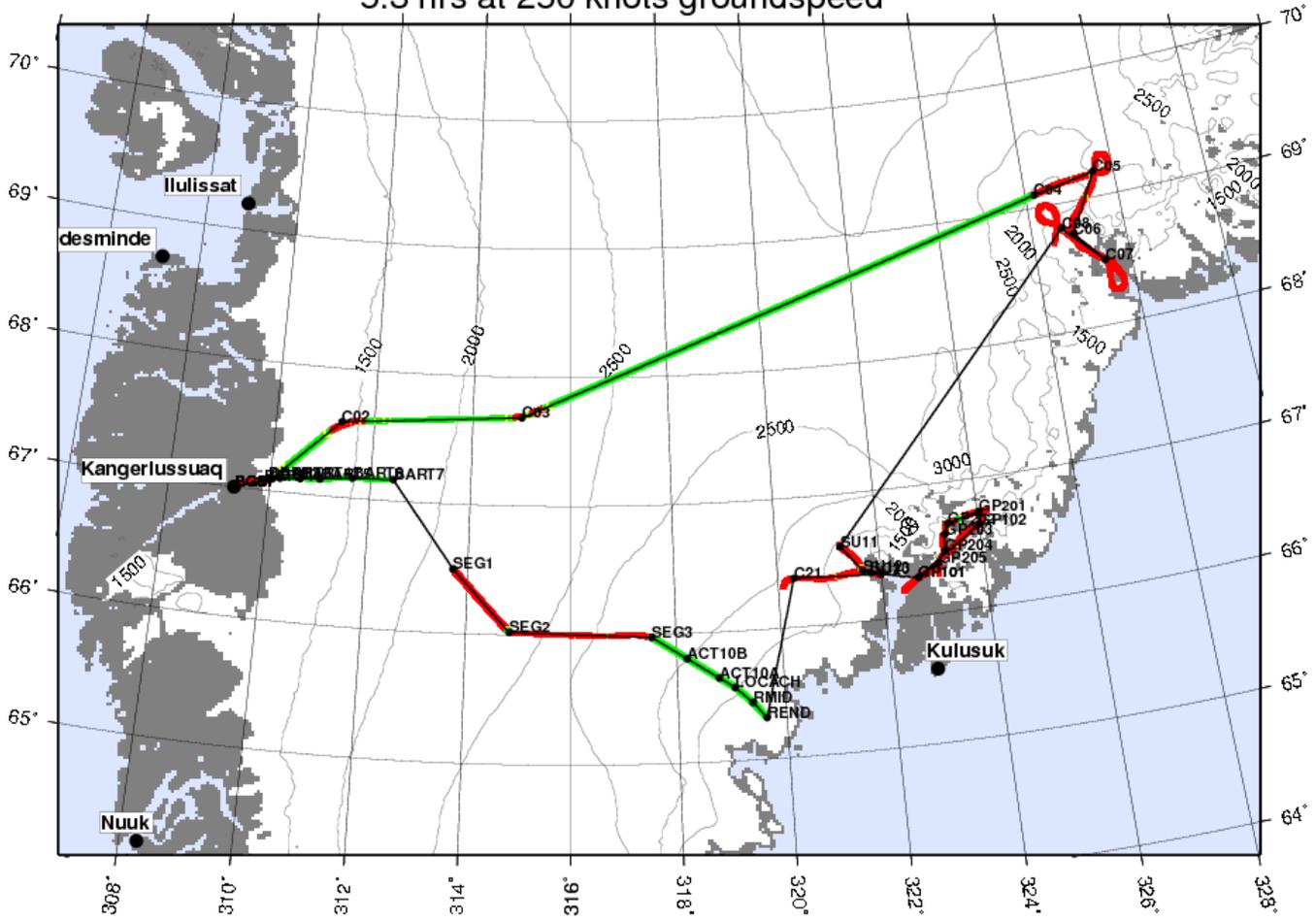


Figure 2: Waypoints and survey area of Flight 02 from John Sonntag.