Science Flight Report
Operation IceBridge Arctic 2012

Flight: F38
Mission: Northwest Fjords 01

Flight Report Summary

Aircraft	**P-3B (N426NA)**
Flight Number	39
Flight Request	12P006
Date	Wednesday, May 9, 2012 (Z)
Purpose of Flight	Operation IceBridge Mission Northwest Fjords 01
Take off time	11:03 Zulu from Thule Air Base (BGTL)
Landing time	18:49 Zulu at Thule Air Base (BGTL)
Flight Hours	7.9 hours
Aircraft Status	Airworthy.
Sensor Status	All installed sensors operational.
Significant Issues	None.
Accomplishments	• Low-altitude survey (1,500) of glaciers and ice sheet profiles. • ATM, snow, Ku-band, accumulation radar, MCoRDS gravimeter, magnetometer, DMS and KT-19 skin temperature sensor were operated on the survey lines. • Pitch maneuvers for snow and Ku-band radar calibration. • Ramp pass at 1,000 ft AGL at Thule Air Base for ATM calibration.
Geographic Keywords	Northwest Greenland.
Satellite Tracks	None.
Repeat Mission	None.

Science Data Report Summary

Instrument	Instrument Operational			Data Volume	Instrument Issues
	Survey Area	Entire Flight	High-alt. Transit		
ATM	☑	☒	☒	79 GB	None
MCoRDS	☑	☒	☒	2.1 TB	None
Snow Radar	☑	☒	☒	710 GB	None
Ku-band Radar	☑	☒	☒	710 GB	None
Accumulation Radar	☑	☒	☒	200 GB	None
DMS	☑	☒	☒	76.2 GB	None
KT-19 Skin Temp.	☑	☑	☑	10 MB	None
Gravimeter	☑	☑	☑	1.5 GB	None
Magnetometer	☑	☑	☑	560 MB	None

Mission Report (Michael Studinger, Mission Scientist)

This is a new mission which extends the 2010 Northwest Coastal coast-parallel grid to seaward at 5 km increments. The purpose of the mission is to obtain fjord geometry using the gravimeter. Tie line locations were selected to overfly relatively non-dynamic ice in order to provide the best possible sounding radar returns, and to connect with shipborne bathymetry offshore.

IR satellite images showed what looked to be a layer of low stratus over large parts of the survey area. We have encountered these clouds in Baffin Bay many, many times before. Models do not capture these clouds, but we know from experience that they form in certain conditions and sometimes they can be seen in satellite images, as this morning, sometime they can't. The decision making was fairly straight forward this morning, since the main purpose of today's flight was to determine the bathymetry in the fjords using gravity measurements and the bed topography in outlet glaciers from radar. None of these measurements is impacted by clouds below the aircraft. We encountered the conditions that we had expected with the low stratus being in the valleys and most of the ridges in between free, which allowed us to safely fly low and collect good data. The northwest is an important area since we know from GRACE measurements that the area is not only changing, but that the rate of change is accelerating. Today we have continued a comprehensive mapping effort that we have begun in 2010. We collected 7.5 hours of science data today.

Individual instrument reports from experimenters on board the aircraft:

ATM: Both ATM systems worked well and collected good data along the entire line in often cloud free conditions. ATM collected a total of 7.5 hours of science data with 60% coverage.

MCoRDS: The MCoRDS system worked well.

Snow and Ku-band radar: The snow and Ku-band radars worked well.

Accumulation radar: Worked well today.

Gravimeter: Worked well.

Magnetometer: Worked well and used the SGL data logger today without problems.

DMS: DMS worked well.

KT-19 skin temperature sensor: System worked well.

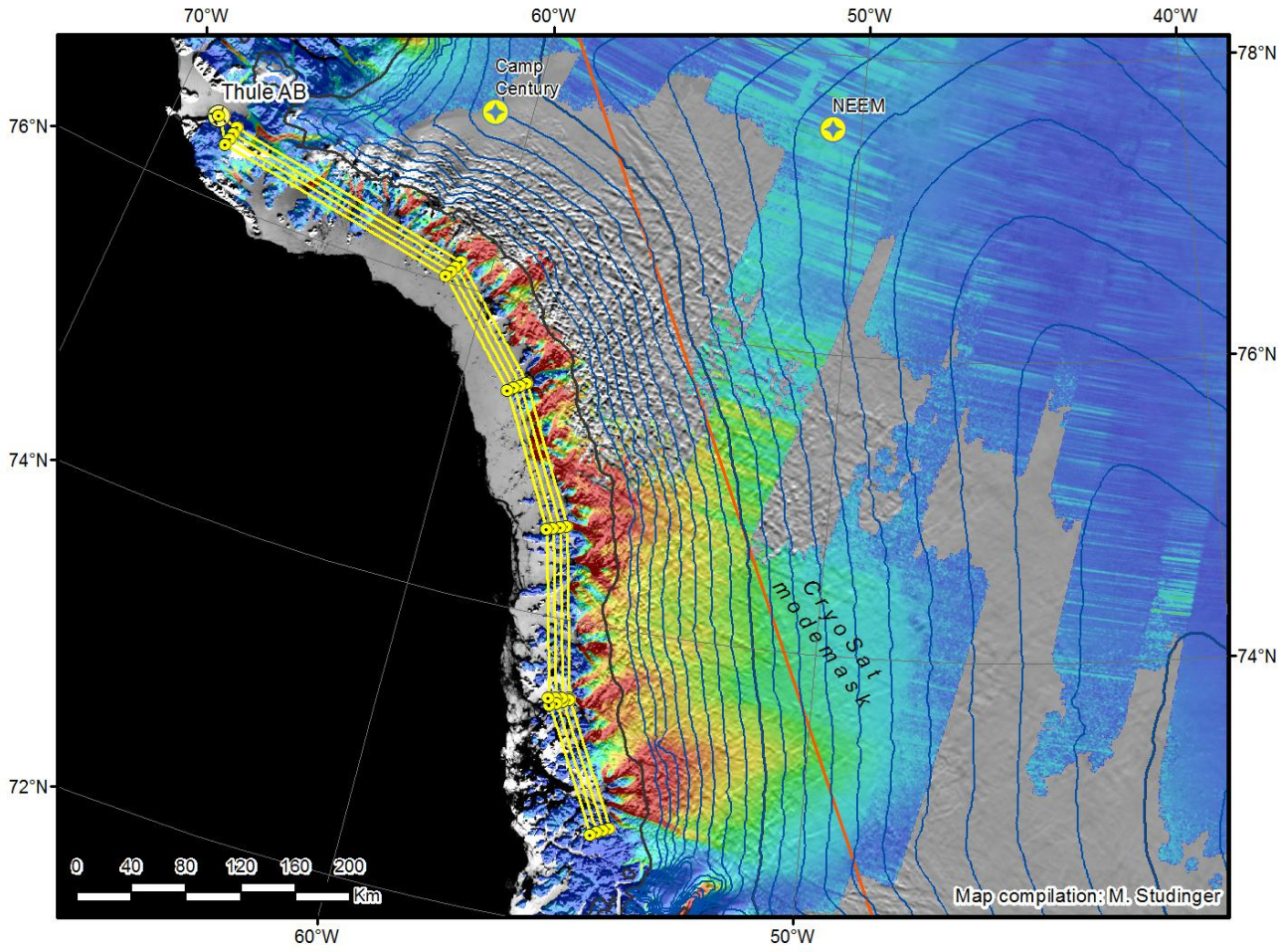

Figure 1: Today's mission plan in yellow.