Science Flight Report
Operation IceBridge Arctic 2010

Flight: **11**
Mission: **NEIS 02**

Flight Report Summary

Aircraft	**DC-8 (N817NA)**
Flight Number	100212
Flight Request	108013
Date	Tuesday, April 13, 2010 (Z), Day of Year 103
Purpose of Flight	Operation IceBridge Mission NEIS 02
Take off time	11:21:48 Zulu from Thule Air Base (BGTL)
Landing time	18:40:11 Zulu at Thule Air Base (BGTL)
Flight Hours	7.4
Aircraft Status	Airworthy. The cabin oxygen regulator has a leak limiting flight altitude to 25,000 ft. This is not impacting today's mission plan. The ATM T3 laser beam is blurred because an oily fluid film, originating from the nose landing gear, formed on the outside of the optical window a few hours after takeoff. The same behavior has been observed on yesterday's flight with the T3 laser beam getting obscured as well.
Sensor Status	All installed sensors operational.
Significant Issues	None
Accomplishments	• Low-altitude survey (1,500 ft AGL) of several lines of a 10 km grid pattern on the Northeast Greenland Ice Stream and two of the 10 km master grid EW lines. ATM, POS/AV, DMS, and MCoRDS, Ku-band and snow radar were operated on the survey lines. Gravimeter was in operation throughout the entire flight. • LVIS was operated for the ramp pass and at high elevation. • Completed all of the planned survey lines. • Collected radar data at different flight elevations (15,000 ft and 3,000 ft AGL) over Camp Century/Thule corridor for clutter reduction algorithms. • Conducted two passes over the runway at Thule Air Base: one at 15,000 ft AGL for LVIS and one at 1,600 ft for ATM instrument calibration.
Geographic Keywords	Northeast Greenland, Thule, Camp Century, Northeast Greenland Ice Stream, Zachariae Isstrøm, Nioghalvfjerdsbræ, 79°North Glacier
ICESat Tracks	0150, 0031
Repeat Mission	Camp Century transit to Thule

Science Data Report Summary

Instrument	Instrument Operational			Data Volume	Instrument Issues
	Survey Area	Entire Flight	High-alt. Transit		
ATM	☑	☒	☒	108 GB	None
MCoRDS	☑	☒	☑	2.6 TB	None
Snow Radar	☑	☒	☑	340 GB	None
Ku-band Radar	☑	☒	☑	340 GB	None
LVIS	☒	☒	☑	10 GB	None
DMS	☑	☑	☑	135 GB	None
POS/AV (510 + 610)	☑	☑	☑	2 GB	None
Gravimeter	☑	☑	☑	80 MB	None
DC-8 Onboard Data	☑	☑	☑	25 MB	None

Mission Report (Michael Studinger, Mission Scientist)

Today's mission is the second mission in a sequence of 4 low-altitude missions that are designed to map the Zachariae Isstrøm and lower Northeast Greenland Ice Stream on a 10 km grid. We had to wait about 30 minutes for the fuel truck this morning which delayed our departure. We began our flight with a 15,000 ft ramp pass at Thule and then flew the Camp Century corridor at 15,000 ft AGL as requested by CReSIS. We have flown this line previously at 1,500 ft AGL and will fly it on the return from today's mission at 3,000 ft AGL. This will provide radar data along the same line at 4 different flight elevations. CReSIS will use this data for better quantifying surface clutter and optimizing clutter-reduction algorithms for processing data from both, the DC-8 and the P-3 missions.

The transits between Camp Century and the Northeast Greenland Ice Stream and back are along 10 km master grid EW lines. We occupied two short ICESat ground tracks (0150, 0031) between the transits from the master grid line to the 10 km grid over the Northeast Greenland Ice Stream.

The weather in the survey area was very good as we had expected from the forecast. We have expected more cloud cover over the master grid line but the ATM lasers were able to obtain surface reflections.

Individual instrument reports from experimenters on board the aircraft:

ATM: Both ATM systems worked well during the flight. ATM T3 laser beam was blurred because an oil film formed on the outside of the optical window a few hours after takeoff.

MCoRDS: The MCoRDS system worked well and collected 2.3 TB of data, almost the entire flight.

Snow and Ku-band radar: Both systems worked and collected each about 380 GB of data.

Gravimeter: System worked normally. No problems.

DMS: DMS worked well. No problems.

LVIS: LVIS operated on the high-altitude portion of the flight and the first ramp pass (~ 30 mins).

POS/AV: Systems worked well. No issues.

DC-8 on board data: The Falcon View feed to the network server failed and was repaired at 12:05 Z. The system worked well for the remainder of the flight.

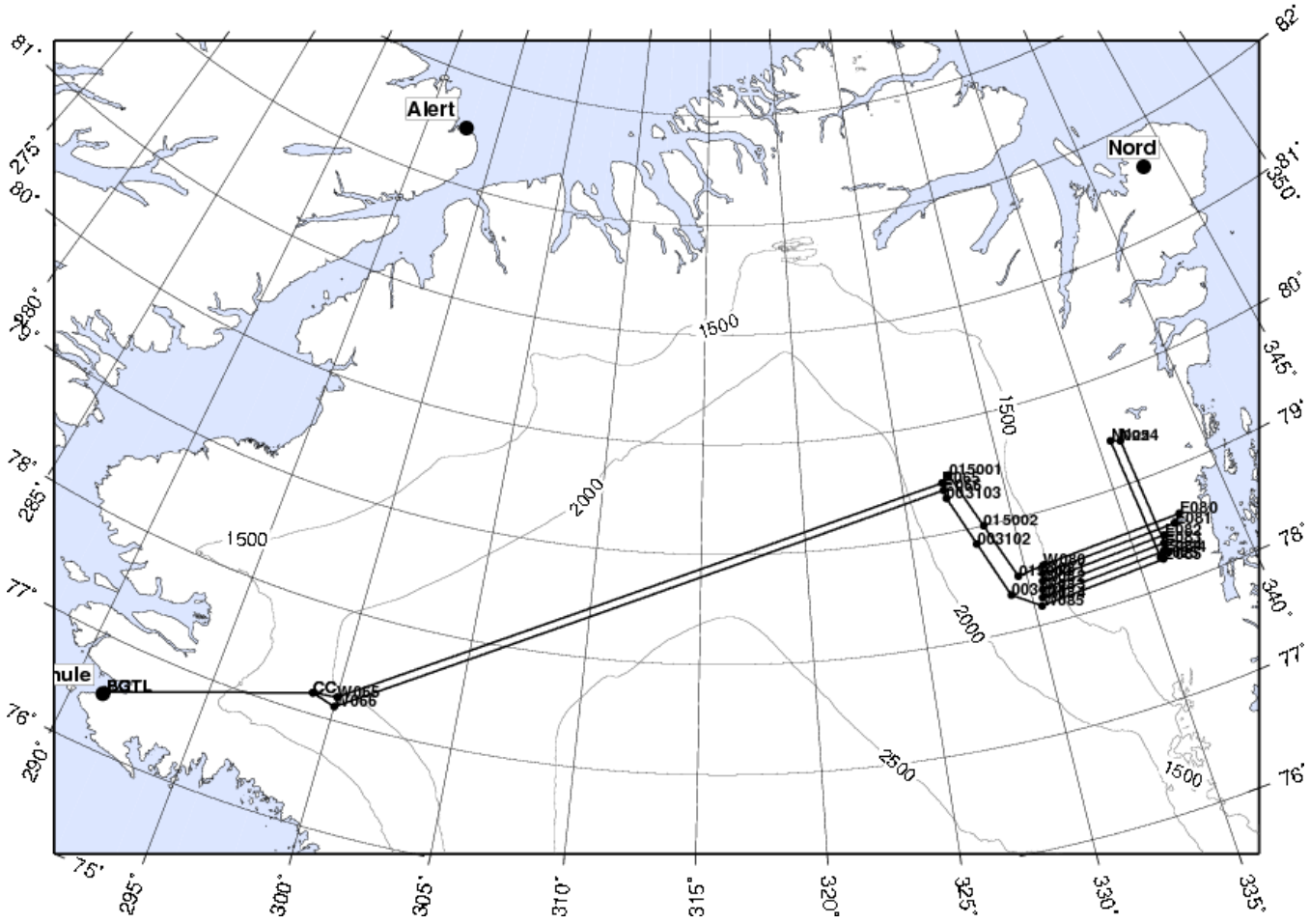

Figure 1: Waypoints and survey area of Flight 11 from John Sonntag.