

Science Flight Report

Operation IceBridge Arctic 2010



Flight: 10
Mission: Sea Ice 04

Flight Report Summary

Aircraft	DC-8 (N817NA)
Flight Number	100211
Flight Request	108013
Date	Monday, April 12, 2010 (Z), Day of Year 102
Purpose of Flight	Operation IceBridge Mission Sea Ice 04
Take off time	11:27:22 Zulu from Thule Air Base (BGTL)
Landing time	19:27:25 Zulu at Thule Air Base (BGTL)
Flight Hours	8.1
Aircraft Status	Airworthy. Maximum flight elevation for today's flight is limited to 25,000 ft because of a leaking cabin oxygen regulator. The ATM T3 laser beam is blurred because of an oily fluid film, originating from the nose landing gear, that has formed on the outside of the optical window approximately one hour before landing.
Sensor Status	All installed sensors operational.
Significant Issues	None
Accomplishments	<ul style="list-style-type: none"> • Low-altitude (1,500 ft AGL) survey of sea ice in the Arctic Ocean north of Greenland along ICESat ground track 414 and various other lines. • ATM, snow-radar, Ku-band radar, POS/AV, and DMS were operated on the survey lines. • Gravimeter was in operation throughout the entire flight. • LVIS was operated on the high-altitude transits. • MCoRDS was operated over the land ice portion. • Completed all of the planned survey lines. • Added overflight of the Greenland Inland Traverse (GrIT) route between waypoints B12A and B11 for comparison of radar systems. • Conducted low-elevation pass over the runway at Thule Air Base at 2,000 ft AGL for ATM instrument calibration.
Geographic Keywords	Lincoln Sea, Arctic Ocean, Greenland, Thule, GrIT traverse route.
ICESat Tracks	414
Repeat Mission	Yes. Flown in 2009 at high altitude with LVIS.

Science Data Report Summary

Instrument	Instrument Operational			Data Volume	Instrument Issues
	Survey Area	Entire Flight	High-alt. Transit		
ATM + Cambot	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	88 GB	None
MCoRDS	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	272 GB	None
Snow Radar	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	414 GB	None
Ku-band Radar	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	410 GB	None
LVIS	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	10 GB	None
DMS	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	129 GB	None
POS/AV (510 + 610)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2 GB	None
Gravimeter	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	80 MB	None
DC-8 Onboard Data	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	20 MB	None

Mission Report (Michael Studinger, Mission Scientist)

Today's mission is very similar to the 2009 high-altitude LVIS sea ice flight, but this time we flew at low altitude and utilized the ATM lasers, and the snow and Ku-band radars. The goal is to sample the thick multiyear ice near the Greenland coast as well as the gradient to thinner ice towards the North Pole. The first segment of the flight is along ICESat track #0414.

We experienced significant clouds and fogs in parts of the survey area, more than we had expected from the forecast and satellite imagery. Occasional changes in flight elevation were necessary to maintain a surface reflection for the ATM lasers. The pilots did a great job in making the necessary adjustments to the flight elevation to avoid patches of dense fog and communicating the upcoming changes in atmospheric conditions to the science teams. We were able to get 100% of laser data in the survey area.

We also did a requested survey along a segment of the Greenland Inland Traverse route (GrIT) that supplies Summit Station. We flew the segment between waypoints B12A and B11 in order to compare the ground penetrating radar that is used on the traverse with the radar systems used on the DC-8.

Individual instrument reports from experimenters on board the aircraft:

ATM: The ATM systems worked well. Occasional changes in flight elevation made it possible to obtain 100% of ATM data in the sometimes difficult conditions.

MCoRDS: The system worked well and collected 272 GB of data over the traverse route.

Snow and Ku-band radar: The systems worked well and collected data almost the entire flight.

Gravimeter: System worked normally. No problems.

DMS: DMS worked well. Occasional failures presumably caused by very low temperatures in the pit.

LVIS: LVIS worked well over the high-altitude transits.

POS/AV: Systems worked well. No issues.

DC-8 on board data: System worked well.

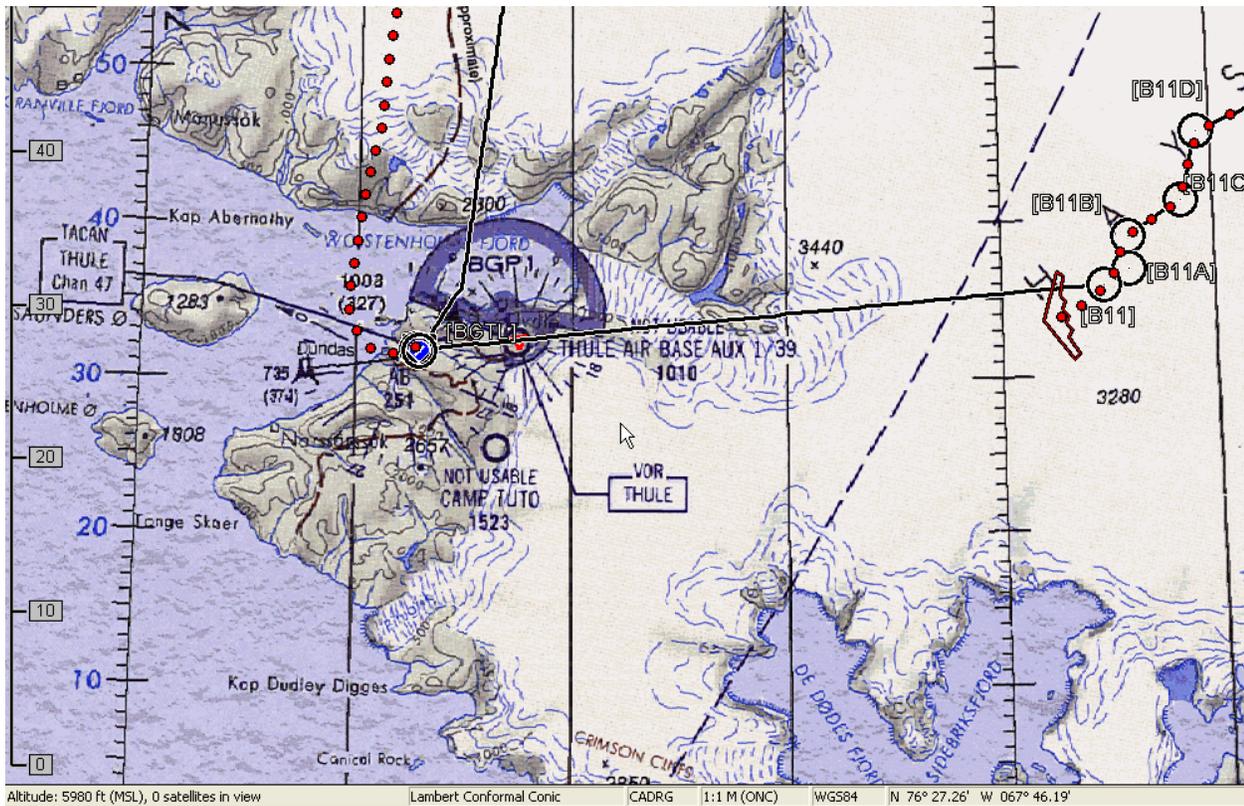
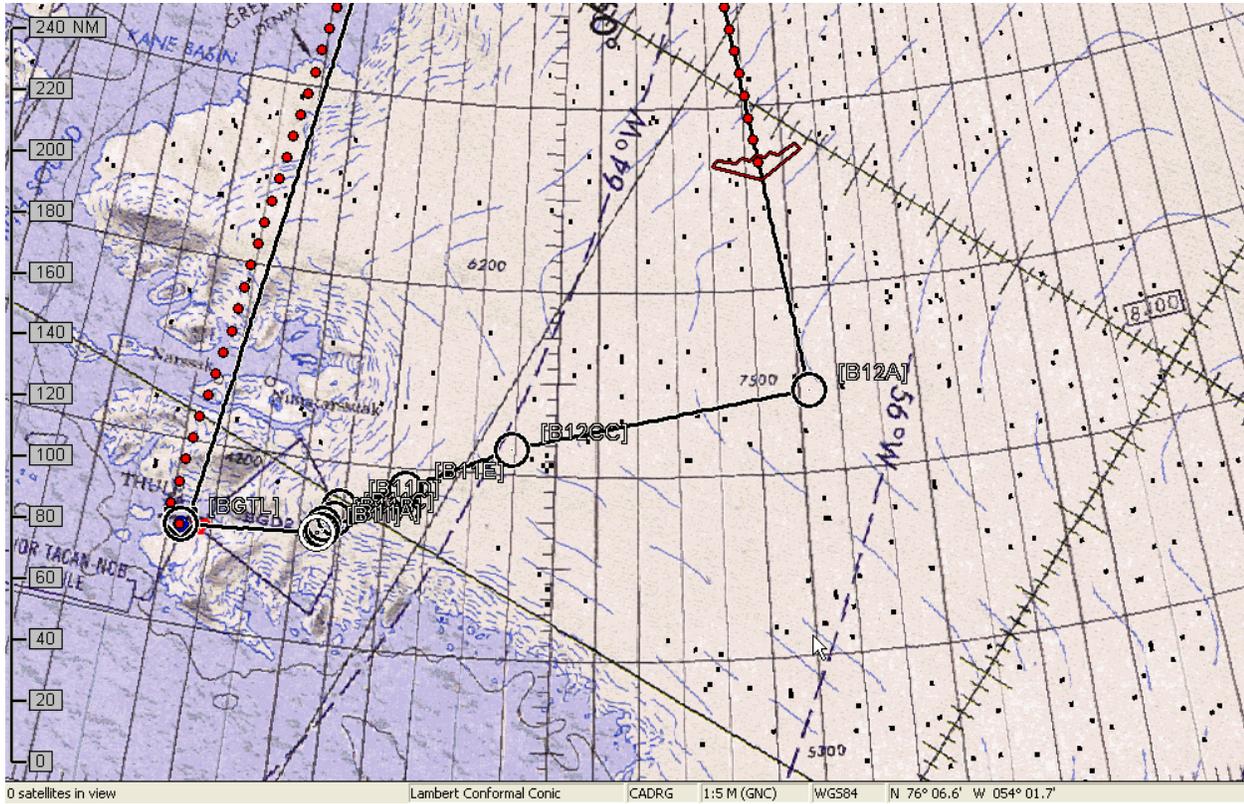


Figure 1: Additional waypoints added to today's mission along the Greenland Inland Traverse (GrIT).

Sea Ice 04

7.5 hours at 250 knots survey / 440 knots transit

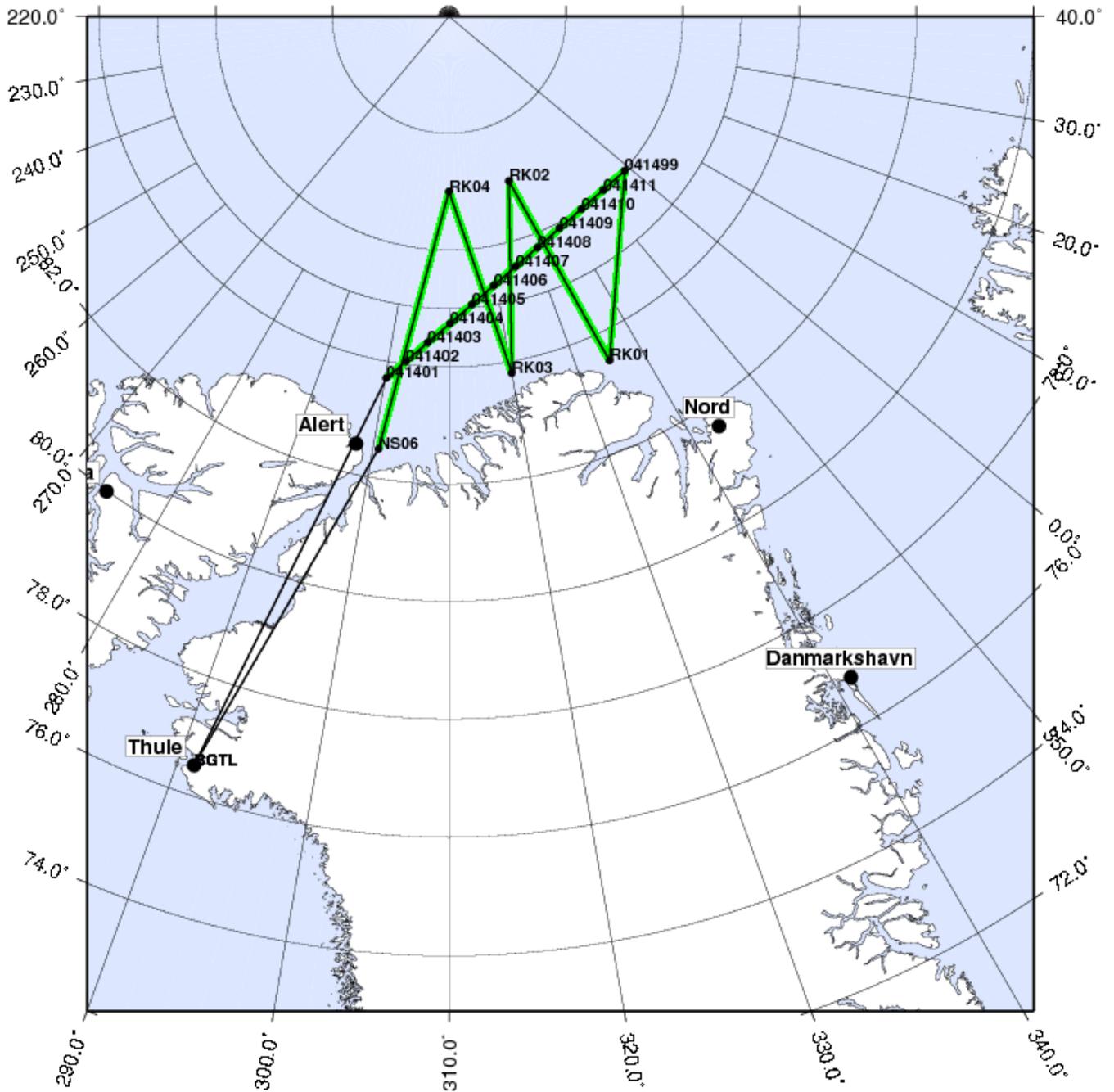


Figure 2: Waypoints and survey area of Flight 10 from John Sonntag.