

Science Flight Report

Operation IceBridge Arctic 2010



Flight: 13
Mission: Sea Ice 01

Flight Report Summary

Aircraft	DC-8 (N817NA)
Flight Number	100214
Flight Request	108013
Date	Monday, April 19, 2010 (Z), Day of Year 109
Purpose of Flight	Operation IceBridge Mission Sea Ice 01
Take off time	11:40:36 Zulu from Thule Air Base (BGTL)
Landing time	19:27:44 Zulu at Thule Air Base (BGTL)
Flight Hours	7.9
Aircraft Status	Airworthy. Maximum flight elevation is limited to 25,000 ft because of a leak in the cabin oxygen regulator. The limitation only affects the transits on today's flight and not the low-elevation survey.
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 Canada and Alaska along ICESat ground tracks 0329, 0328, and 0334. • 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 and in dense clouds at low elevation. • MCoRDS was not operated due to sea ice mission. • Completed 80% of the planned survey lines. • Conducted several pitch and roll maneuvers over sea ice for LVIS instrument calibration. • Conducted two passes over the runway at Thule Air Base: one at 25,000 ft for LVIS instrument calibration and one at 2,000 ft AGL for ATM instrument calibration.
Geographic Keywords	Lincoln Sea, Arctic Ocean, Greenland, Thule
ICESat Tracks	0329, 0328, 0334
Repeat Mission	090405

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"/>	74 GB	None
MCoRDS	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N/A	None
Snow Radar	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	340 GB	None
Ku-band Radar	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	340 GB	None
LVIS	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	25 GB	None
DMS	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	90 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 a repeat of flight 090405 along ICESat ground tracks 0329, 0328, and 0334. The mission was originally planned from Thule to Fairbanks. Without an overnight in Fairbanks we gain an additional flight day and for this reason we had modified the original plan. We spent one hour this morning at the weather brief to make a very difficult decision. The forecast indicated marginal conditions over almost the entire route and poor conditions near the coast of Alaska, the most important part of the survey line. The forecast was consistent with the satellite imagery. The forecast indicated low clouds, poor visibility and icing conditions along the coast of Alaska. The sea ice community had tasked us to launch the mission if there is a chance to get data along more than 50% of this line. There was a significant chance that we had to abandon the survey line well before reaching the coast of Alaska. This would have caused a problem landing back in Thule with too much fuel on board and we decided to fuel the aircraft only to reach the point of poor weather and be able to turn around and land in Thule within the landing weight limits should we have to abandon the survey line earlier. This decision was based on the forecasts and satellite imagery that we got at the 6:30 am weather brief and in situ reports from weather stations along the Alaskan coast. We were able to complete an amazing 80% of the survey line before we had to turn around because of fuel. The weather conditions at the turning point were better than predicted and would have allowed us to continue a bit further before reaching the area with poor conditions. We only lost 5% of ATM data due to dense fog and clouds. The weather on the transit back to Thule through the Sea Ice 02 survey area was very cloudy near the coast of Alaska as predicted by the forecast and as seen in satellite images.

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 95% of ATM data in often difficult conditions.

MCoRDS: Was not operated on today's mission due to sea ice.

Snow and Ku-band radar: The systems worked well and collected 340 GB data each.

Gravimeter: System worked normally. No problems.

DMS: DMS worked well.

LVIS: LVIS worked well and collected 5 million laser shots.

POS/AV: Systems worked well. No issues.

DC-8 on board data: System worked well.

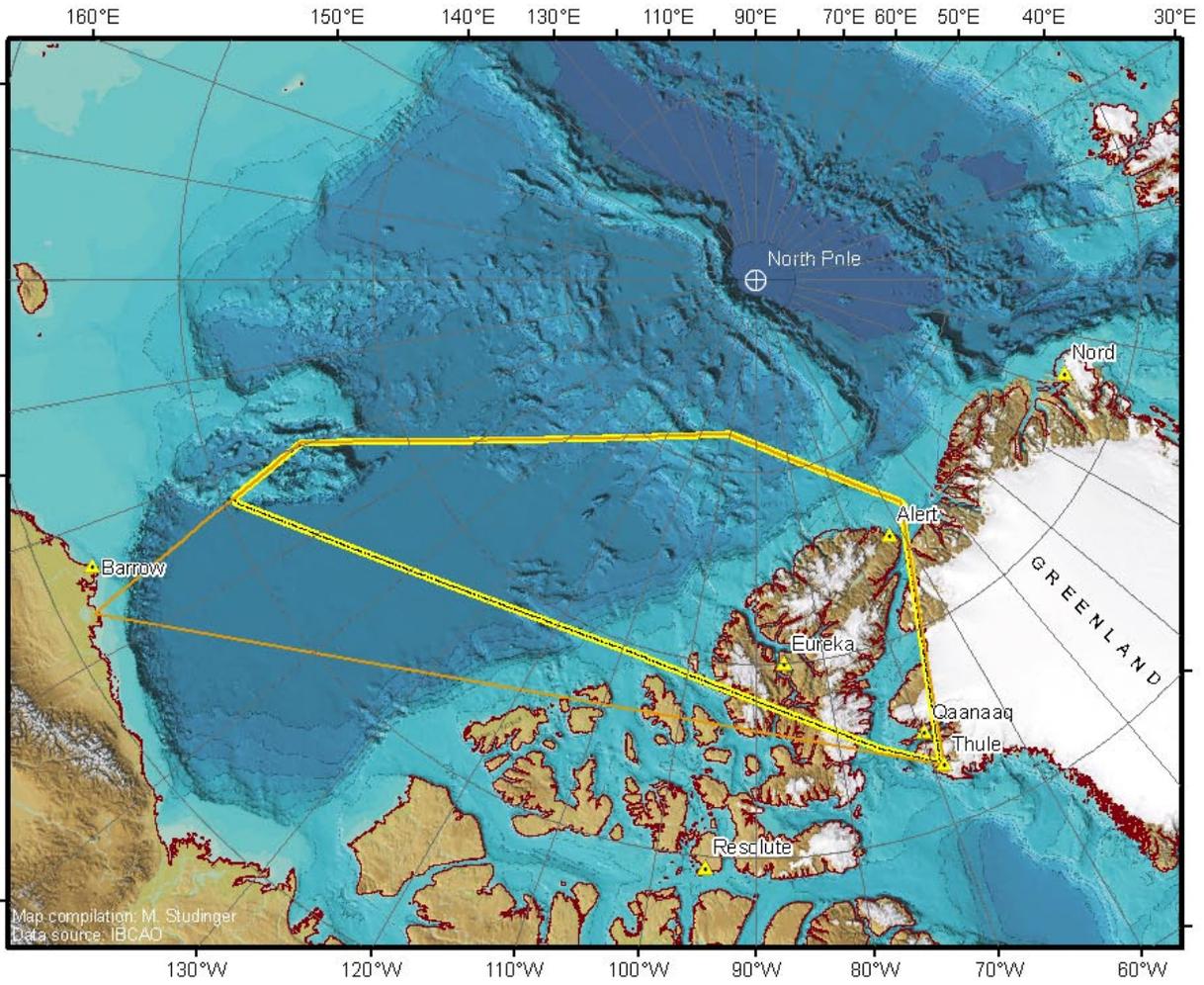


Figure 1: Revised mission Sea Ice 01 (orange) and actual flight trajectory from F13 (yellow).

Sea Ice 01

9.5 hours at 250 knots survey / 440 knots transit

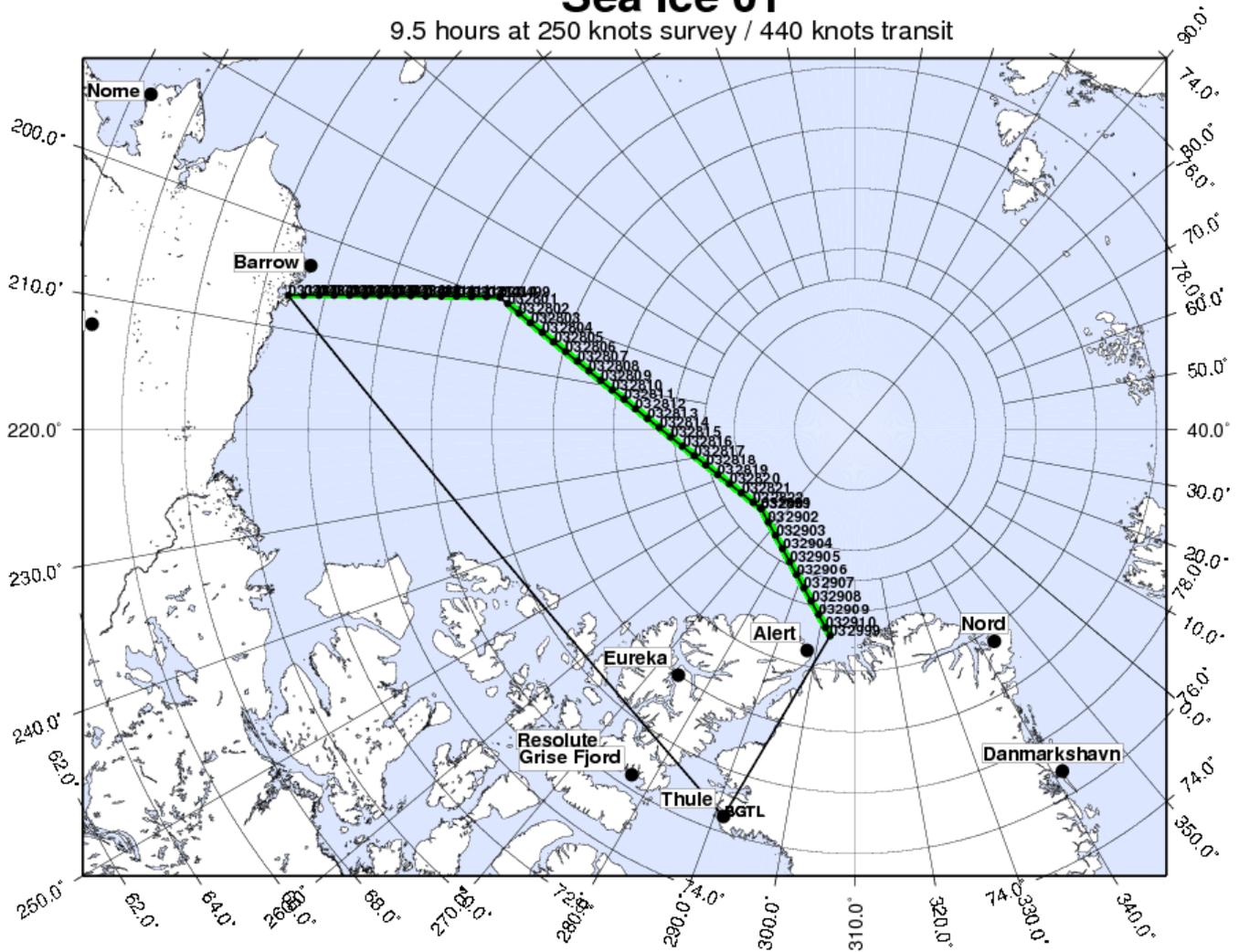


Figure 2: Waypoints and survey area of Flight 13 from John Sonntag.