

# Science Flight Report

## Operation IceBridge Arctic 2010



**Flight:** 15  
**Mission:** Sea Ice 02

### Flight Report Summary

<b>Aircraft</b>	<b>DC-8 (N817NA)</b>
<b>Flight Number</b>	100216
<b>Flight Request</b>	108013
<b>Date</b>	Wednesday, April 21, 2010 (Z), Day of Year 111
<b>Purpose of Flight</b>	Operation IceBridge Mission Sea Ice 02
<b>Take off time</b>	11:13:37 Zulu from Thule Air Base (BGTL)
<b>Landing time</b>	18:43:15 Zulu at Thule Air Base (BGTL)
<b>Flight Hours</b>	7.6
<b>Aircraft Status</b>	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.
<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 (1,500 ft AGL) survey of sea ice in the Arctic Ocean north of Canada along ICESat ground tracks 0282 and 0284 (not flown).</li> <li>• ATM, snow-radar, Ku-band radar, POS/AV, and DMS were operated on the survey lines.</li> <li>• Gravimeter was in operation throughout the entire flight.</li> <li>• LVIS was operated on the high-altitude transits and in dense clouds at low elevation.</li> <li>• MCoRDS was not operated due to sea ice mission.</li> <li>• Completed all of the shortened survey lines.</li> <li>• Conducted pitch and roll maneuvers over sea ice for LVIS instrument calibration.</li> </ul>
<b>Geographic Keywords</b>	Beaufort Sea, Amundsen Gulf, Arctic Ocean, MacKenzie Bay, Thule
<b>ICESat Tracks</b>	0282,0284 (not flown)
<b>Repeat Mission</b>	090402

## Science Data Report Summary

Instrument	Instrument Operational			Data Volume	Instrument Issues
	Survey Area	Entire Flight	High-alt. Transit		
<b>ATM + Cambot</b>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	65 GB	None
<b>MCoRDS</b>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N/A	None
<b>Snow Radar</b>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	250 GB	None
<b>Ku-band Radar</b>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	250 GB	None
<b>LVIS</b>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	20 GB	None
<b>DMS</b>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	100 GB	None
<b>POS/AV (510 + 610)</b>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2 GB	None
<b>Gravimeter</b>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	80 MB	None
<b>DC-8 Onboard Data</b>	<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 090402 along ICESat ground tracks 0282 and 0284 (not flown). 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. Another difficult weather decision followed by another successful flight. We expected marginal to poor weather conditions along the route. To complicate things further, the airfield is back to normal hours of operation which means wheels on the ground before 16:00 LT. We had to shorten the Sea Ice 02 flight plan and skipped the beginning through the Nares Strait and north of Alert along ICESat tack 284 because of poor weather in this area in the forecast and satellite images. We planned to fly as far as possible to the coast, weather and flight hours permitting. We sometimes had very clear conditions and sometimes very poor visibility with ice forming on the wings and engines. We managed to get all the way to the MacKenzie Delta on the Canadian coast. ATM got 73% of laser returns along the survey line. A good day to say the least.

Today was our last dedicated science flight. We plan to collect data along the transit to Kangerlussuaq.

#### 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 73% of returns 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 250 GB data each. Lost 2 minutes of data due to altitude changes in dense fog/icing conditions.

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

**DMS:** DMS worked well. No issues.

**LVIS:** LVIS worked well and collected data almost the entire flight.

**POS/AV:** Systems worked well. No issues.

**DC-8 on board data:** System worked well.

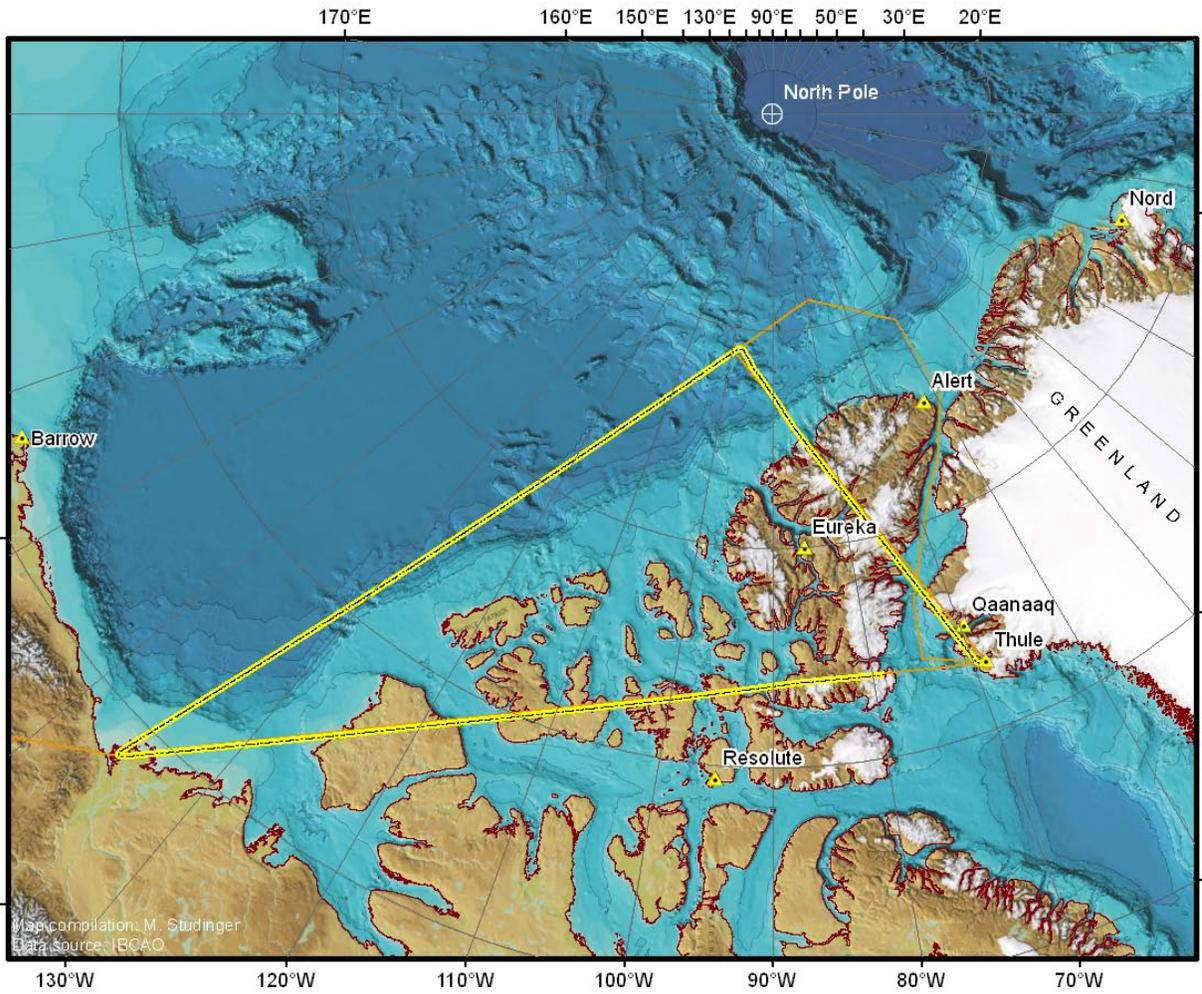


Figure 1: Revised mission Sea Ice 02 (orange) and actual flight trajectory from F15 (yellow).

# Sea Ice 02

8.9 hours at 250 knots survey / 440 knots transit

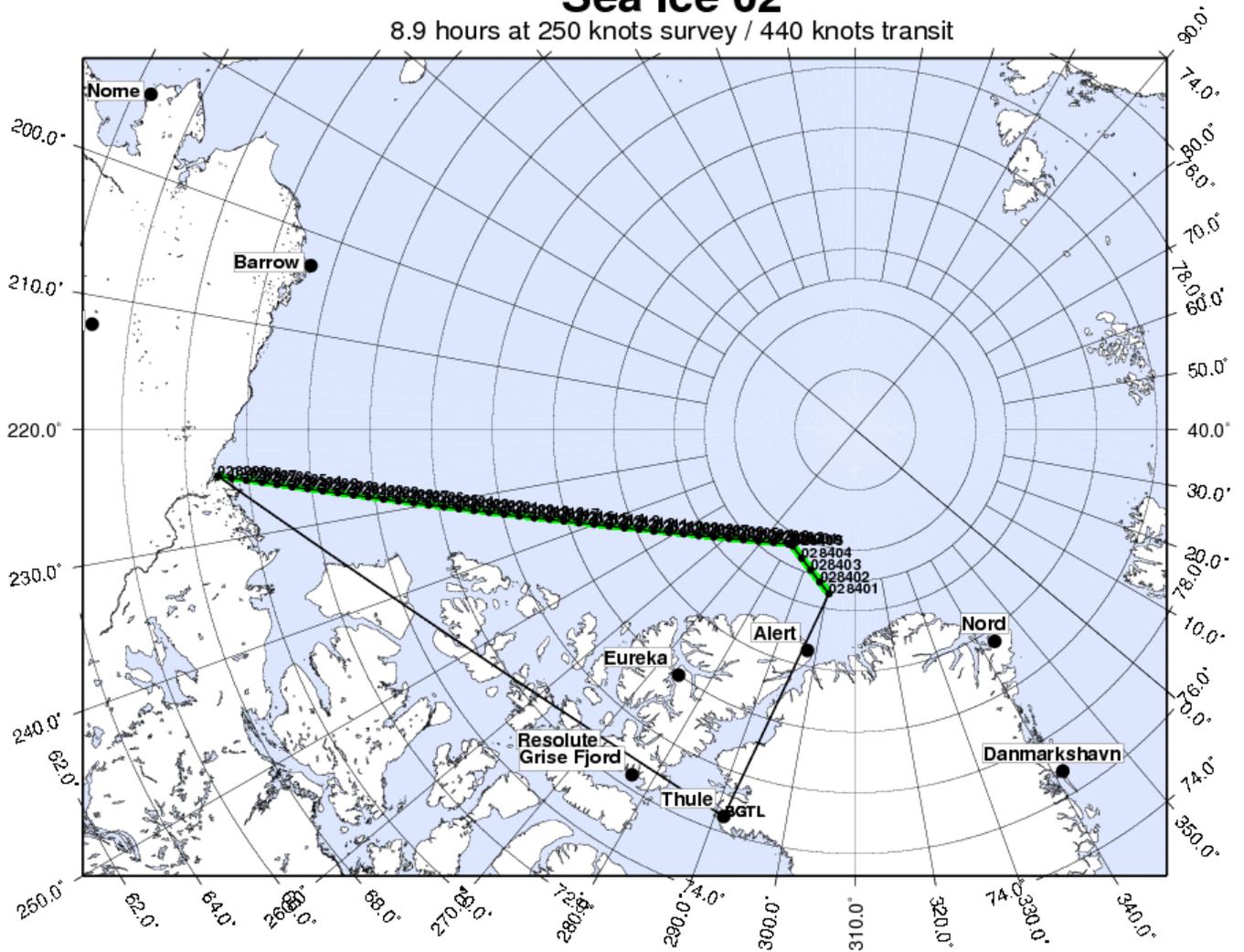


Figure 2: Waypoints and survey area of Flight 15 from John Sonntag.