

Science Flight Report

Operation IceBridge Arctic 2010



Flight: 12
Mission: LVIS Southeast 01

Flight Report Summary

Aircraft	DC-8 (N817NA)
Flight Number	100213
Flight Request	108013
Date	Wednesday, April 14, 2010 (Z), Day of Year 104
Purpose of Flight	Operation IceBridge Mission LVIS Southeast 01
Take off time	11:02:37 Zulu from Thule Air Base (BGTL)
Landing time	22:09:09 Zulu at Thule Air Base (BGTL)
Flight Hours	11.2
Aircraft Status	Airworthy. Max. flight elevation is 25,000 ft b/c of leaking O ₂ regulator
Sensor Status	All installed sensors operational.
Significant Issues	None
Accomplishments	<ul style="list-style-type: none"> • High-altitude survey (25,000 ft AGL) of southeast Greenland and pass over the ICESat GPS ground truth line at Summit Camp. We also flew along ICESat tracks 091,412,359 in the interior of Greenland. • LVIS, POS/AV, DMS, and MCoRDS were operated on the survey lines. • Gravimeter was in operation throughout the entire flight. ATM, Ku-band and snow radar were not operated on this flight due to the high-altitude mission. • Completed all of the survey lines as planned, but at 25,000 ft instead of 35,000 ft. • Conducted one pass over the ramp at Thule Air Base at 16,000 ft AGL in cloudy conditions for LVIS instrument calibration. • Conducted calibration maneuvers over sea ice and land ice for LVIS.
Geographic Keywords	Summit Camp, Kangerdlugssuaqs Gletscher, Hutchinson Gletscher, Kaelvegletscher, Søndre Syenitgletscher, Laubes Glacier, K.I.V. Steenstrups Nordre Bræ, Kristian Gletscher, Champs Elysees Gletscher, Pourquoi Pas Gletscher, Glacier de France, Femstjernen, Franche Comte Gletscher, Sekstende September Gletscher, Habet Gletscher, Knud Rasmussen Glacier, Paris Gletscher, Juragletscheren, Midgaardgletscher
ICESat Tracks	091,412,359
Repeat Mission	No

Science Data Report Summary

Instrument	Instrument Operational			Data Volume	Instrument Issues
	Survey Area	Entire Flight	High-alt. Transit		
ATM	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N/A	None
MCoRDS	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	3.3 TB	None
Snow Radar	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N/A	None
Ku-band Radar	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N/A	None
LVIS	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	75 GB	None
DMS	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	33 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"/>	25 MB	None

Mission Report (Michael Studinger, Mission Scientist)

Today's flight is a high-altitude mission at 25,000 ft. This mission was planned for 35,000 ft or higher but the cabin oxygen regulator has a leak limiting max flight altitude to 25,000 ft. We first surveyed along several ICESat ground tracks on the way to Summit Camp where we flew over the ICESat GPS ground validation profile. We reached the northeast point of the 5.8-km-long GPS ground truth profile at 12:44:17 Zulu and left the southwest end of the line at 12:44:56 Zulu flying at 7236 m elevation. Science teams from Summit Camp were out surveying the profile during our pass to collect independent ice surface elevation measurements from GPS. We continued on to the Southeast to our survey area roughly located between Helheim Glacier and Kangerdlugssuaqs Gletscher.

The weather in the survey area was good. We experienced some cloud cover at the northeastern end of the survey area as expected from the forecast and satellite images. It was cloud free over Summit Camp.

Individual instrument reports from experimenters on board the aircraft:

ATM: The ATM systems were not operated on this flight due to the high-altitude mission, but were in stand-by mode during the flight.

MCoRDS: The MCoRDS system worked well and collected 3.3 TB of data on all the survey lines.

Snow and Ku-band radar: The Ku-band radar was not operated on this flight due to the high-altitude mission. The operator was testing some settings on the snow radar in preparation for the high-altitude mission to the North Pole and collected about 20 GB of test data.

Gravimeter: System worked normally. No problems.

DMS: DMS worked well.

LVIS: LVIS system worked very well on all lines. The laser fired about 20 million shots and lost only 1-2% over the survey lines due to cloud cover.

POS/AV: Systems worked well. No issues.

DC-8 on board data: System worked well.

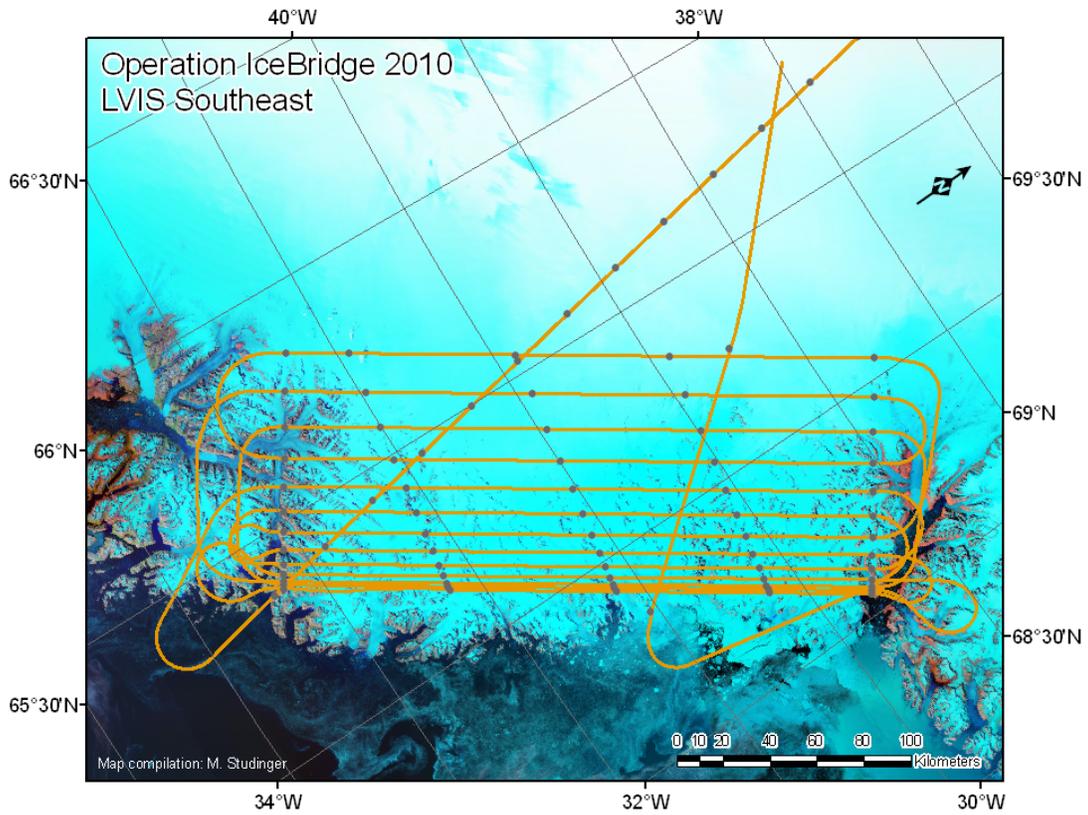
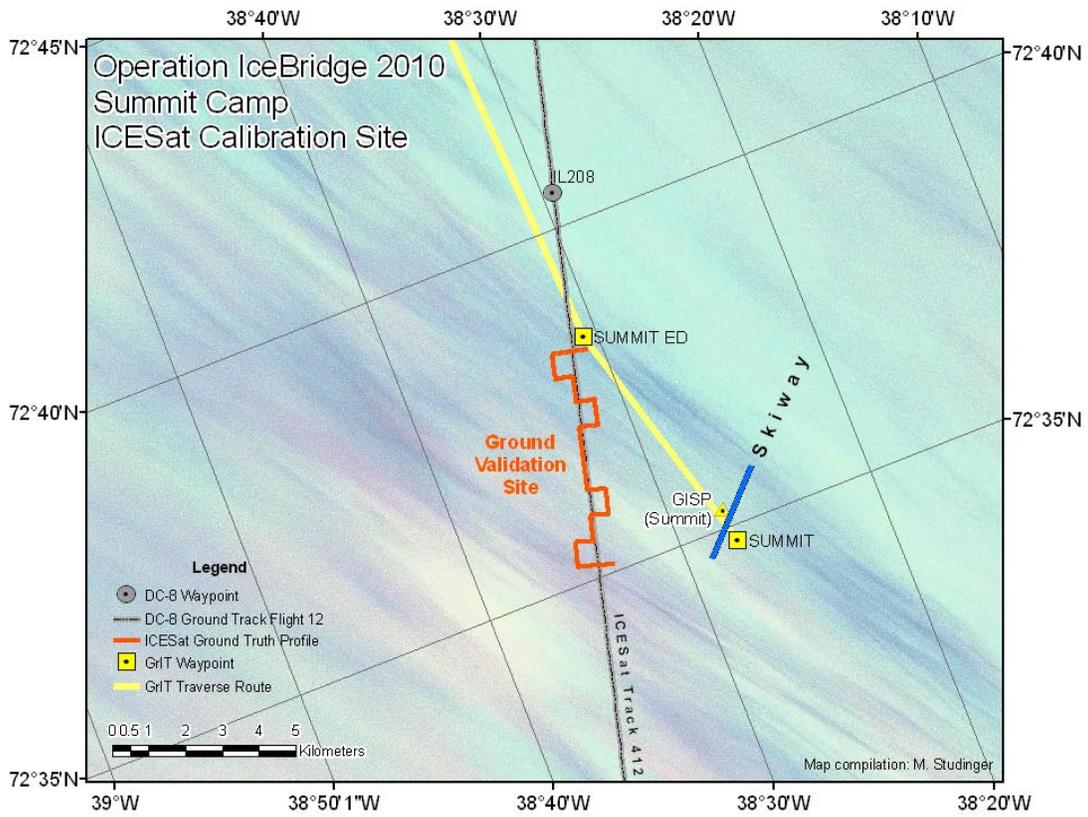


Figure 1: Top: Today's flight path over GPS site at Summit. Bottom: Flight path over the survey area in the SE.

LVIS Southeast 1

11.7 hrs at 250 knots groundspeed

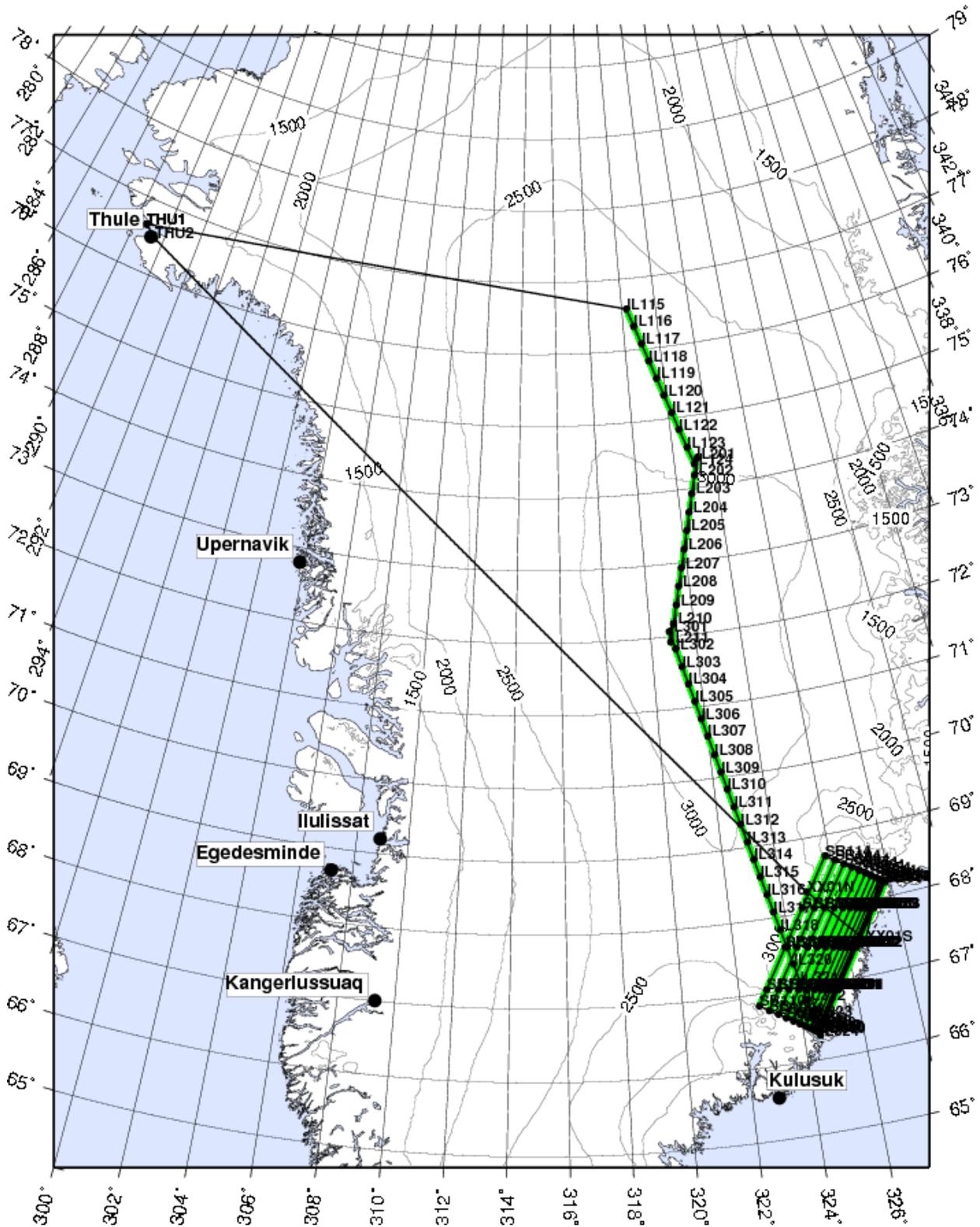


Figure 2: Waypoints and survey area of Flight 12 from John Sonntag.