

Preliminary Science Flight Report

Operation IceBridge Arctic 2011



Flight: F13
Mission: Umanaq 01

Flight Report Summary

Aircraft	P-3B (N426NA)
Flight Number	013
Flight Request	11P006
Date	Thursday, April 7, 2011 (Z)
Purpose of Flight	Mission Umanaq 01
Take off time	10:23 Zulu from Kangerlussuaq (BGSF)
Landing time	17:50 Zulu at Kangerlussuaq (BGSF)
Flight Hours	7.6 hours
Aircraft Status	Airworthy.
Sensor Status	All installed sensors operational.
Significant Issues	None.
Accomplishments	<ul style="list-style-type: none"> • Low-altitude survey (1,500 ft AGL) of several lines along the coast in the Umanaq/Upernavik area. • ATM, MCoRDS, snow and Ku-band radars, accumulation radar, gravimeter, magnetometer, POS/AV, and DMS were operated on the survey lines. • Flew radar line over Russell Glacier for MCoRDS fine tuning before landing. • Ramp pass at 1,200 ft AGL at Kangerlussuaq airport for ATM and snow radar instrument calibration. • Pitch manoeuvres over frozen fjord for snow radar instrument calibration.
Geographic Keywords	Jakobshavn Isbræ, Stove Isbræ, Avangnardleq Glacier, Kujatdleg Glacier, Eqip Glacier, Rink Glacier.
ICESat/CryoSat Track	ICESat track 0419.
Repeat Mission	ICESat track 0419.

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"/>	62 GB	None
MCoRDS	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2 TB	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"/>	350 GB	None
Accumulation Radar	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	290 GB	None
DMS	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	124 GB	None
POS/AV	<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
Magnetometer	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	TBD	None

Mission Report (Michael Studinger, Mission Scientist)

Umanaq 01 is a new mission design whose main purpose, along with Umanaq 02, is to extend the grid formed by the suite of Northwest Coastal missions from 2010 and this year to the south, and to connect to the Jakobshavn grid flights flown by CreSIS since 2008. We transit to and from the grid along the same ICESat track 0419 to facilitate instrument to estimate the internal consistency of the IceBridge instruments.

The temperature during the night was cold again with a minimum of $-27^{\circ}\text{C}/-17^{\circ}\text{F}$ when we started to heat the aircraft at 5:15 am LT. Warming the aircraft up in the morning to operating temperature took again quite some time, including warming up the science instruments before they can be powered up. After the door closed we ran the engines for 20 minutes to warm them up before taxiing in order to avoid leaks in the hydraulic system of the propellers.

The weather was mostly clear as expected. The forecast predicted a slight change in airflow over Disko Bay that could cause some clouds in the afternoon. The clouds formed as predicted but did not pose any significant problem for use.

We finished all survey lines as planned and were able to fly a radar line along Russell Glacier for MCoRDS fine tuning.

We also flew some pitch manoeuvres over the fjord for snow and Ku-band radar before we did a 1,200 ft ramp pass.

Individual instrument reports from experimenters on board the aircraft:

ATM: ATM system worked well and lost only an insignificant amount of data in the south west due to clouds.

MCoRDS: Hardware failure at beginning of the flight, which was quickly overcome. The root cause for the failure has not yet been determined. The radar was functional before we reached the ice.

Snow and Ku-band radar: The RAID system failed and data had to be recorded onto the laptop disk. There were about 45 file system stalls that corrupted the header which can be fixed. No data was lost.

Accumulation radar: Worked well.

Gravimeter: Worked well.

Magnetometer: Worked well.

DMS: Worked well.

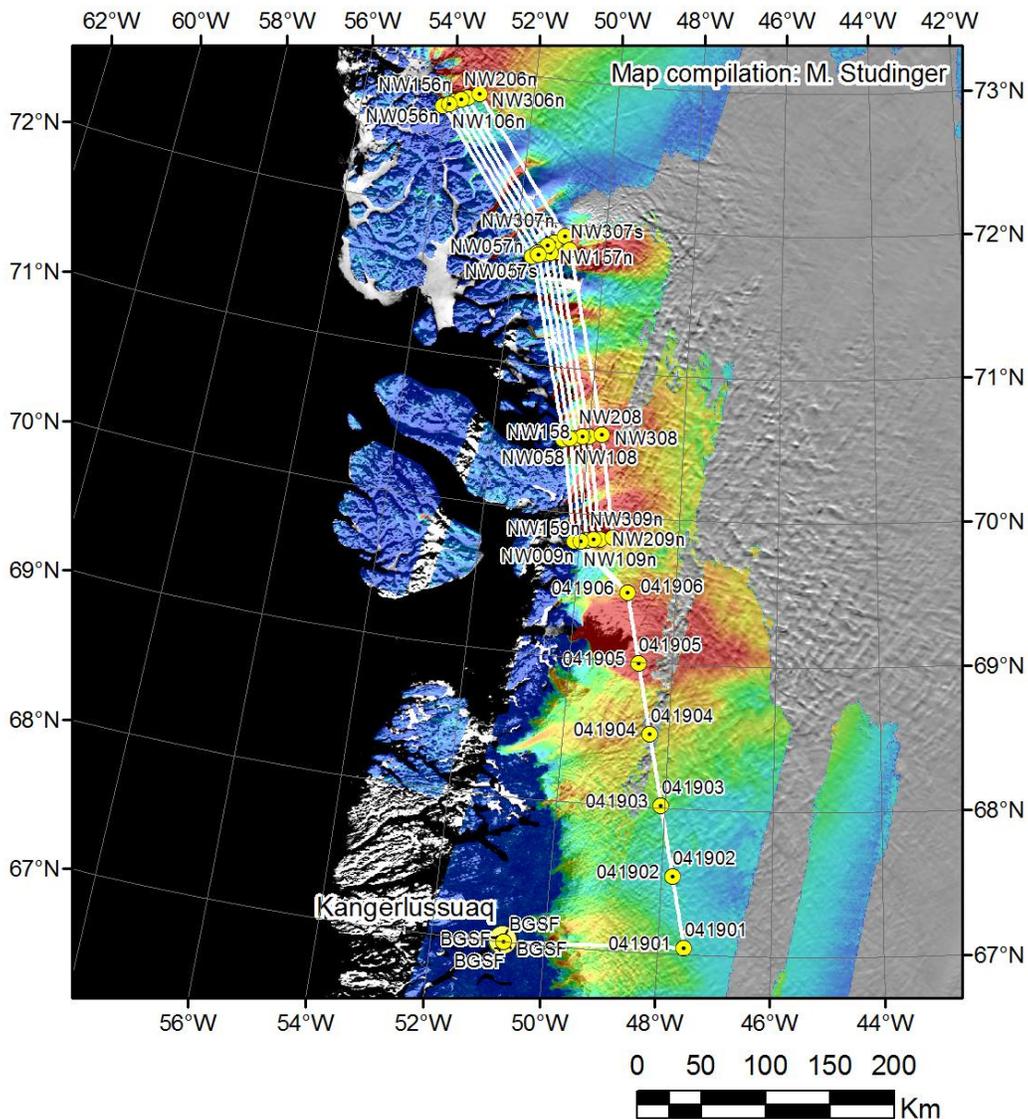


Figure 1: Mission plan for today's mission Umanaq 01.

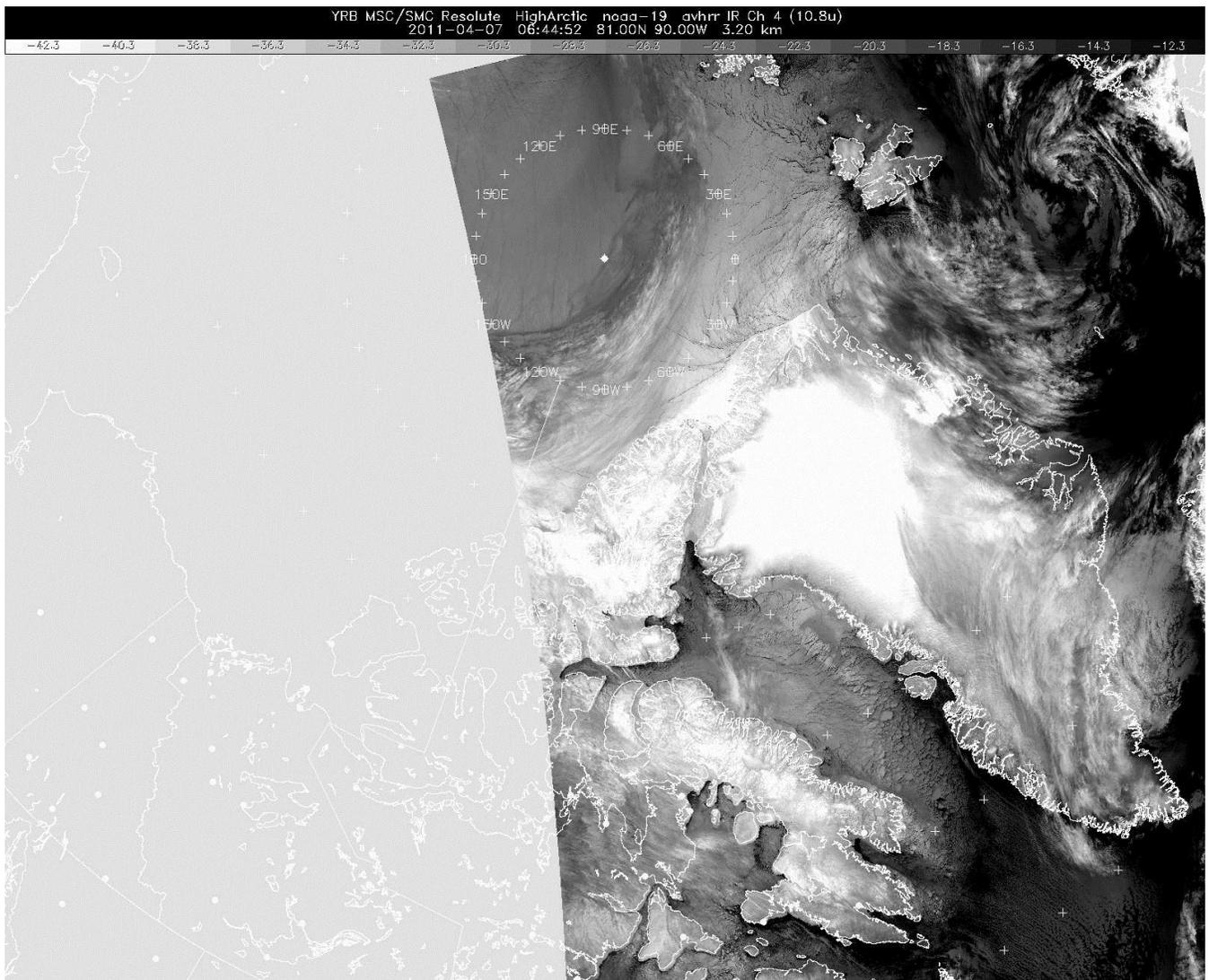


Figure 2: IR Satellite image downloaded shortly before takeoff showing excellent conditions over northwest Greenland coastal areas.