
Preliminary Science Flight Report

Operation IceBridge Arctic 2011



Flight: F33
Mission: Layers NEEM - NGRIP

Flight Report Summary

Aircraft	P-3B (N426NA)
Flight Number	033
Flight Request	11P006
Date	Friday, May 6, 2011 (Z)
Purpose of Flight	Mission Layers NEEM – NGRIP
Take off time	11:06 Zulu from Thule Air Base (BGTL)
Landing time	17:54 Zulu at Thule Air Base (BGTL)
Flight Hours	7.0 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 five lines spaced 2 km apart along the ice divide between NEEM and NGRIP ice core drill sites.• ATM, MCoRDS, accumulation, snow and Ku-band radars, gravimeter, magnetometer, POS/AV, and DMS were operated on the survey lines.• Ramp pass at 2,000 ft for ATM calibration.
Geographic Keywords	Greenland Ice Sheet
ICESat/CryoSat Track	None.
Repeat Mission	None.

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"/>	75 GB	None
MCoRDS	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1.6 TB	None
Snow Radar	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	283 GB	None
Ku-band Radar	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	283 GB	None
Accumulation Radar	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	324 GB	None
DMS	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	80 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"/>	640 MB	None
Magnetometer	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	480 MB	None

Mission Report (Michael Studinger, Mission Scientist)

The weather forecast for today indicated good conditions for northeast Greenland, but we can only go for 6.5 hour flights on Fridays, which makes flying these targets inefficient. Instead, we decided to fly the northern part of the high-priority mission along the transit route from Kangerlussuaq to Thule. The target there was to connect the NGRIP and NEEM ice core sites along the ice divide. The North Greenland Eemian Ice Drilling (NEEM) is a new ice core with the goal to retrieve a high-resolution climate record from the last interglacial between 115,000 to 130,000 years ago, a period called the Eemian, when temperatures in Greenland have been on average 5°C warmer than presently. We flew five lines spaced 2 kilometers apart, resulting in a 10-kilometer-wide swath with continuous bed coverage and internal layers. The age of the internal layers is known from the NEEM and NGRIP sites at the ends of our swath, which will allow us to create a depth-ice age model along the ice divide that together with the 3-D bedrock elevation will be used for improved ice flow models. The lower part of the ice sheet shows some interesting structures that we have seen on preliminary processed data from a previous flight. Mapping the 3-D structure of these features will help understanding their origin and formation. We also acquired snow and accumulation radar data that track the internal layers in the upper part of the ice sheet which will be used for accumulation studies between the two core sites.

The weather over the target site was good as expected.

Individual instrument reports from experimenters on board the aircraft:

ATM: worked very well.

MCoRDS: worked well.

Snow and Ku-band radar: The snow and Ku-band radars worked well.

Accumulation radar: worked well.

Gravimeter: Worked well. No issues.

Magnetometer: worked well.

DMS: worked very well.

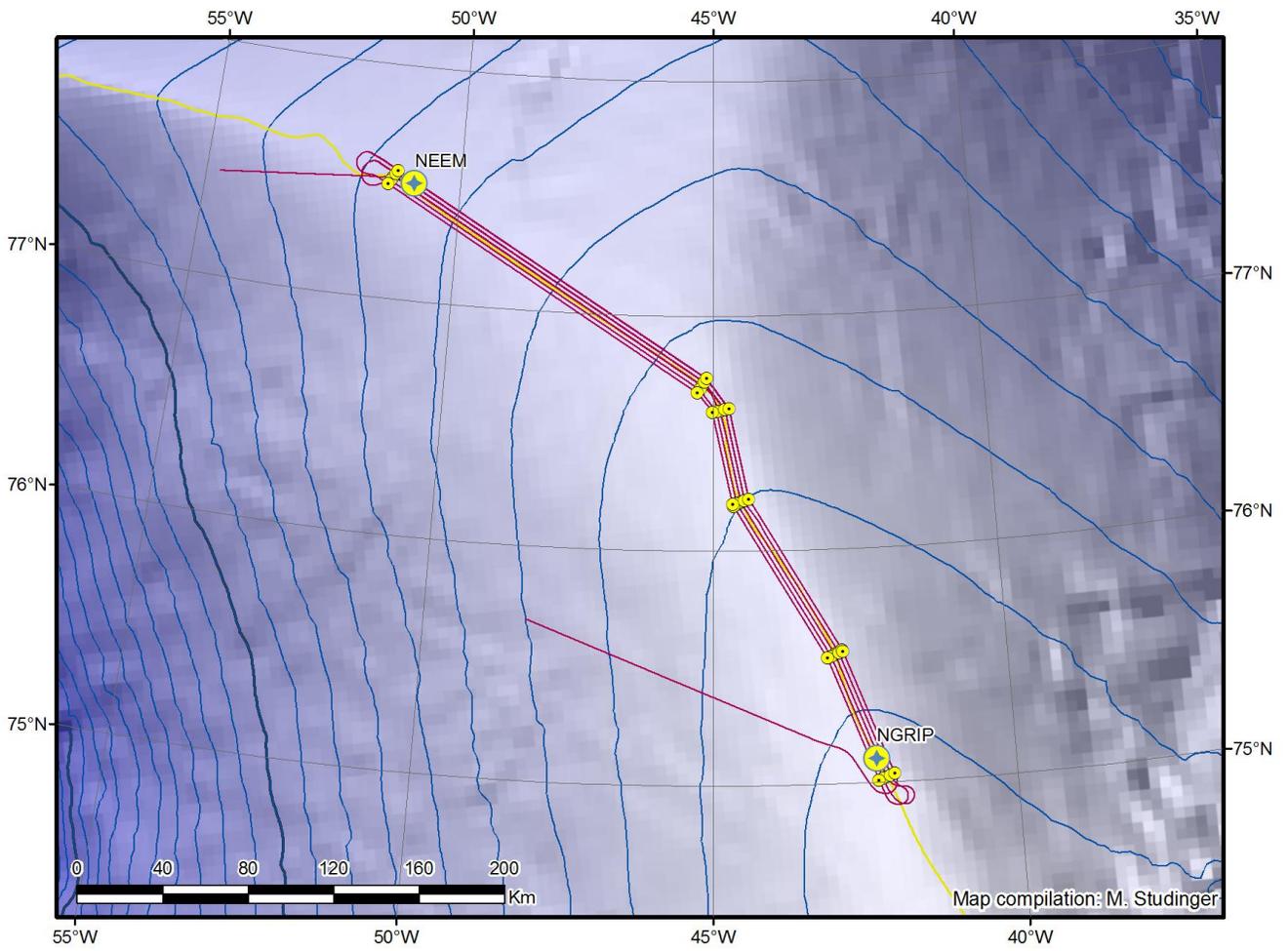


Figure 1: P-3 trajectory of today's flight along the ice divide between NEEM and NGRIP.



Figure 2: Photo of NEEM Camp.

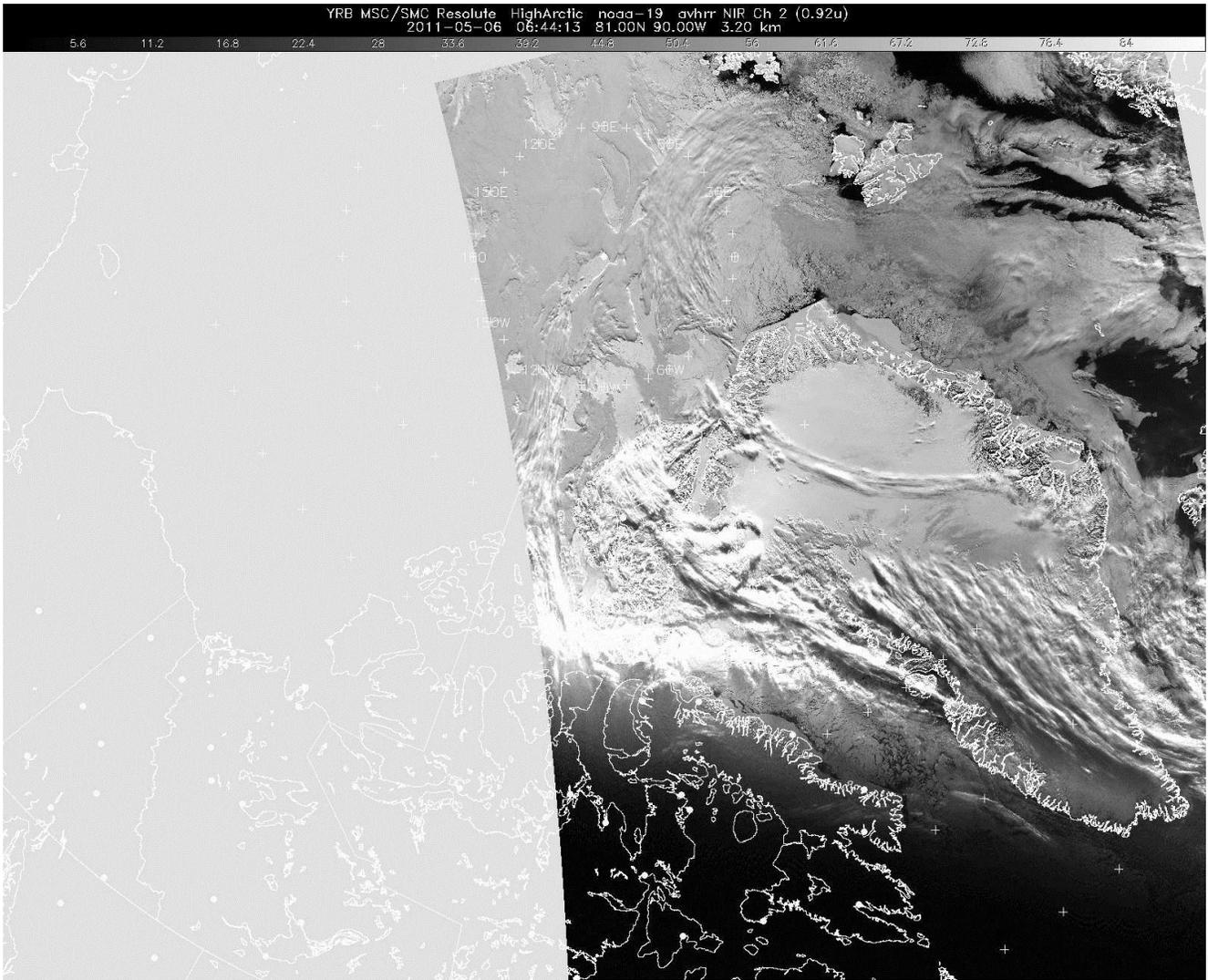


Figure 3: IR satellite image downloaded shortly before takeoff showing very few clouds over the survey area.