Preliminary Science Flight Report
Operation IceBridge Arctic 2011

Flight: **F39**
Mission: **NW Glaciers**

Flight Report Summary

Aircraft	**P-3B (N426NA)**
Flight Number	039
Flight Request	11P006
Date	Friday, May 13, 2011 (Z)
Purpose of Flight	Mission NW Glaciers
Take off time	11:10 Zulu from Thule Air Base (BGTL)
Landing time	17:37 Zulu at Thule Air Base (BGTL)
Flight Hours	6.7 hours.
Aircraft Status	Airworthy.
Sensor Status	All installed sensors operational.
Significant Issues	None
Accomplishments	• Low-altitude survey (1,500 ft AGL) of several lines along the NW coast of Greenland along Baffin Bay. • ATM, MCoRDS, accumulation, snow and Ku-band radars, gravimeter, magnetometer, POS/AV, and DMS were operated on the survey lines. • Ramp pass at Thule at 16,500 ft AGL for ATM calibration. • Pitch maneuvers over North Star Bay for snow and Ku-band radar.
Geographic Keywords	NW Glaciers
ICESat/CryoSat Track	None.
Repeat Mission	2009, 2010.

Science Data Report Summary

Instrument	Instrument Operational			Data Volume	Instrument Issues
	Survey Area	Entire Flight	High-alt. Transit		
ATM	☑	☒	☒	56 GB	None
MCoRDS	☑	☒	☒	1.65 TB	None
Snow Radar	☑	☒	☒	330 GB	None
Ku-band Radar	☑	☒	☒	330 GB	None
Accumulation Radar	☑	☒	☒	252 GB	None
DMS	☑	☒	☒	112 GB	None
POS/AV	☑	☑	☑	2 GB	None
Gravimeter	☑	☑	☑	560 MB	None
Magnetometer	☑	☑	☑	420 MB	None

Mission Report (Michael Studinger, Mission Scientist)

Today, the conditions over the northwest coast along Baffin Bay have been the best since we are here and we decided to launch mission NW Glaciers. The mission was first flown in 2009 and repeated in 2010 after satellite measurements indicated that the area is undergoing thinning.

The coastal areas in the northwest are often covered in low clouds or fog that extend from the Baffin Bay onto the lower parts of the ice sheet. The IR satellite image clearly showed low clouds reaching the lower parts of the ice sheet along the entire Baffin Bay coast. The forecast predicted >10 kts wind from the ice sheet, which should have pushed the clouds further out into the bay. Unfortunately, the winds weren't strong enough and the lower parts of the glacier runs were often covered by dense clouds reaching a few miles upstream of the terminus and following the 2000 ft elevation contour. We got laser altimeter data over the critical parts of the glaciers. If the clouds had moved just a few miles further west it would have been a perfect day. Luckily, the 2000 ft cloud tops allowed us to stay close enough to the surface to collect Ku-band radar altimeter measurements for dh/dt estimates over the lower parts. The conditions above 2000 ft and further inland were perfect and we got a good data set for monitoring the spreading of the thinning towards higher elevations.
.

Individual instrument reports from experimenters on board the aircraft:

ATM: worked very well except for clouds.

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. Clouds obscured targets below 2000 ft.

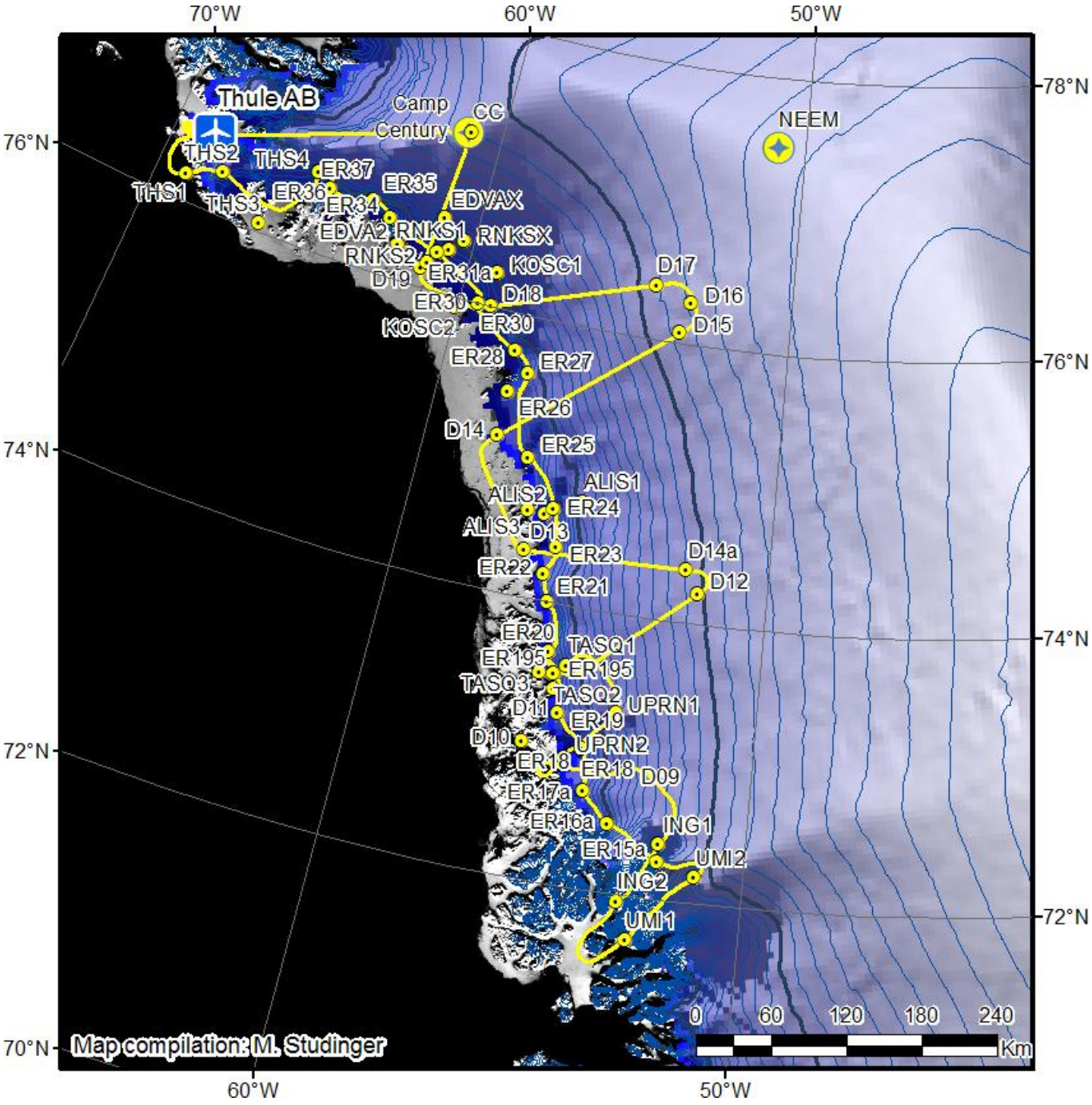

Figure 1: P-3 trajectory of today's flight along NW glaciers.

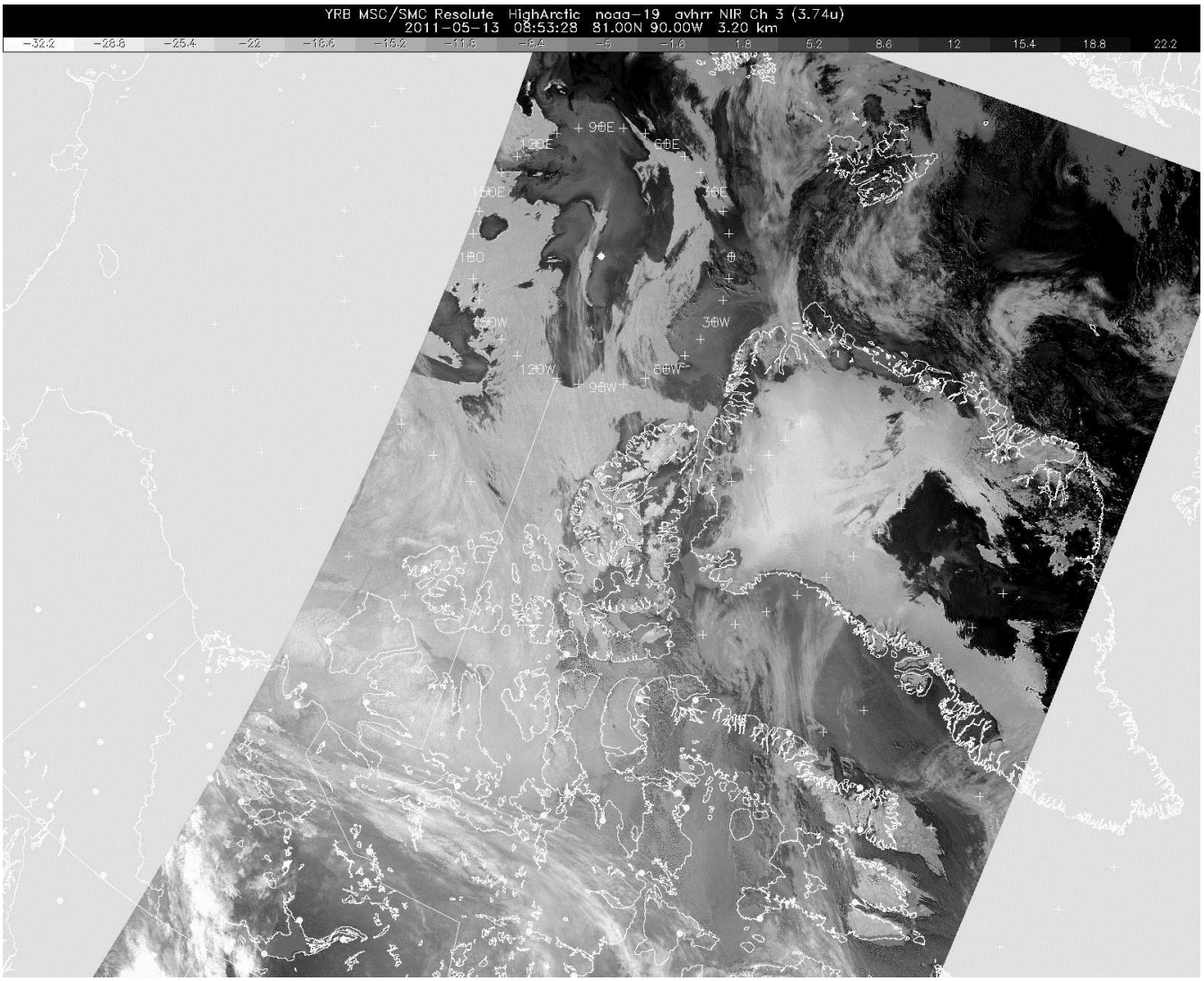

Figure 2: IR satellite image downloaded shortly before takeoff.