Science Flight Report
Operation IceBridge Arctic 2012

Flight: **F17**
Mission: **East Glaciers 01**

Flight Report Summary

Aircraft	**P-3B (N426NA)**
Flight Number	18
Flight Request	12P006
Date	Wednesday, April 11, 2012 (Z)
Purpose of Flight	Operation IceBridge Mission East Glaciers 01
Take off time	11:04 Zulu from Kangerlussuaq (BGSF)
Landing time	19:06 Zulu at Kangerlussuaq (BGSF)
Flight Hours	8.2 hours
Aircraft Status	Airworthy.
Sensor Status	All installed sensors operational.
Significant Issues	None
Accomplishments	• Low-altitude survey (1,500) of a glaciers and ice sheet profiles. • ATM, snow, Ku-band, accumulation radar, MCoRDS gravimeter, magnetometer, DMS and KT-19 skin temperature sensor were operated on the survey lines. • Several pitch and roll maneuvers over sea ice for snow and Ku-band radar calibration. • Overflight of ICESat orbit 412 at Summit Camp while ground team collected data along the cal/val profile. • Ramp pass at Kangerlussuaq at 2,000 ft AGL.
Geographic Keywords	DeGeer, Jaette, Nordenskiold, Wahlenberg, Violin and Nord Glaciers
Satellite Tracks	412 at Summit cal/val site
Repeat Mission	Parts of 2009 and 2011 missions

Science Data Report Summary

Instrument	Instrument Operational			Data Volume	Instrument Issues
	Survey Area	Entire Flight	High-alt. Transit		
ATM	☑	☒	☒	84 GB	None
MCoRDS	☒	☒	☒	2.0 TB	N/A
Snow Radar	☑	☒	☒	760 GB	None
Ku-band Radar	☑	☒	☒	760 GB	None
Accumulation Radar	☑	☒	☒	150 GB	lost first line
DMS	☑	☒	☒	112 GB	None
KT-19 Skin Temp.	☑	☑	☑	11 MB	None
Gravimeter	☑	☑	☑	1.5 GB	None
Magnetometer	☑	☑	☑	345 MB	None

Mission Report (Michael Studinger, Mission Scientist)

The weather situation this morning had changed from last night's forecast and we were forced to choose a mission that was not ideal for today – East Glaciers 01. The area north of Scoresby Sund on the east coast was the area that looked most promising. All other areas looked poor (see Fig. 3). Unfortunately, this mission plan included a pass over the ICESat cal/val site at Summit Camp and we had hoped to give the Summit Techs a heads up the evening before this flight in order to help them prepare the ground survey along the cal/val profile. Luckily, the Summit Techs Adam & Christy were able to prepare the measurements on short notice and we observed the team on the ground while flying overhead with the P-3. Thanks for your great efforts to make this happen! The mission plan included also a line connecting the GRIP and DYE-2 ice core drill sites and ideally we should have waited until new radar amplifies from CReSIS arrive in a few weeks and be installed on the P-3. Given the unique weather situation we did not have the choice to post-pone this mission and wait for the new amplifiers.

We first flew along the EGIG traverse route (l'Expedition Glaciologique Internationale au Groenland) in support of ESA's CryoVEx 2011 and 2012 campaigns. The CryoSat-2 Validation and Calibration Experiment (CryoVEx) along the EGIG route is designed to provide ground truth for the ASIRAS and SIRAL radars over ice sheets, extend the accumulation record by 4 years (currently circa 25 years), investigate firn densification over short time scales, and to improve the backscatter model for the percolation zone used for the waveform retracker on CryoSat-2. After we completed this line we surveyed centerlines of six glaciers: DeGeer, Jaette, Nordenskiold, Wahlenberg, Violin and Nord Glaciers. DeGeer and Jaette Glacier have been surveyed during the 2009 IceBridge campaign, so this flight allows the first dh/dt estimate for these glaciers. After we completed this line we made a pass over the Summit Camp ICESat track 0412 experiment site that has been requested by Eric Lutz of Dartmouth (Fig. 2). From there we transited to the area along a line connecting the GRIP and DYE-2 ice core drill sites.

Individual instrument reports from experimenters on board the aircraft:

ATM: Both ATM systems worked well and collected good data along the entire line in cloud free conditions. ATM collected a total of 8.0 hours of science data with 100% coverage.

MCoRDS: The MCoRDS system worked well.

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

Accumulation radar: Did not work on the first ¾ of the EGIG line, but worked well after that.

Gravimeter: Worked well.

Magnetometer: Worked well and used the LDEO data logger today without problems

DMS: DMS worked well and collected data on the primary system only today.

KT-19 skin temperature sensor: System worked well.

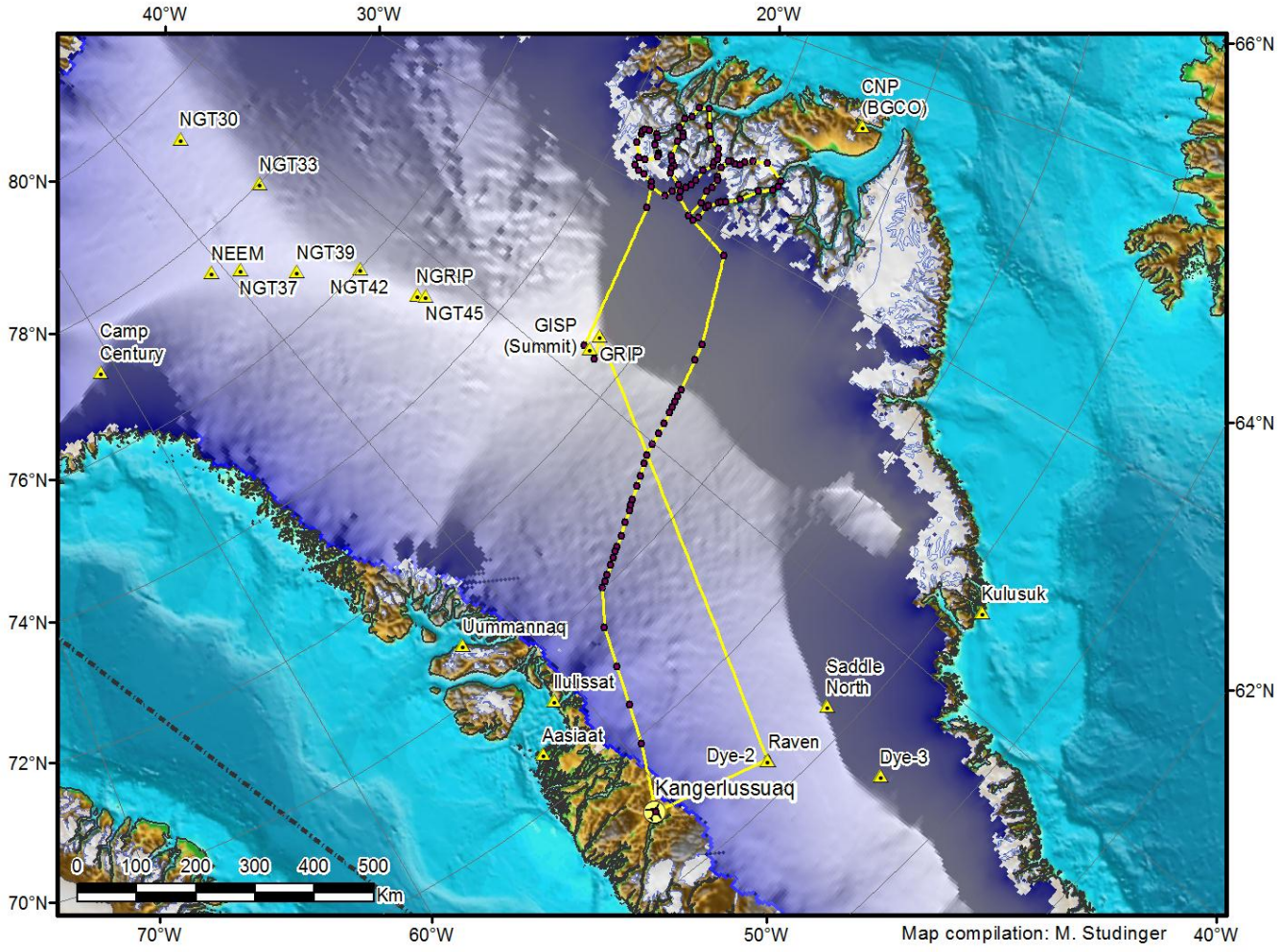

Figure 1: Today's mission plan (yellow).

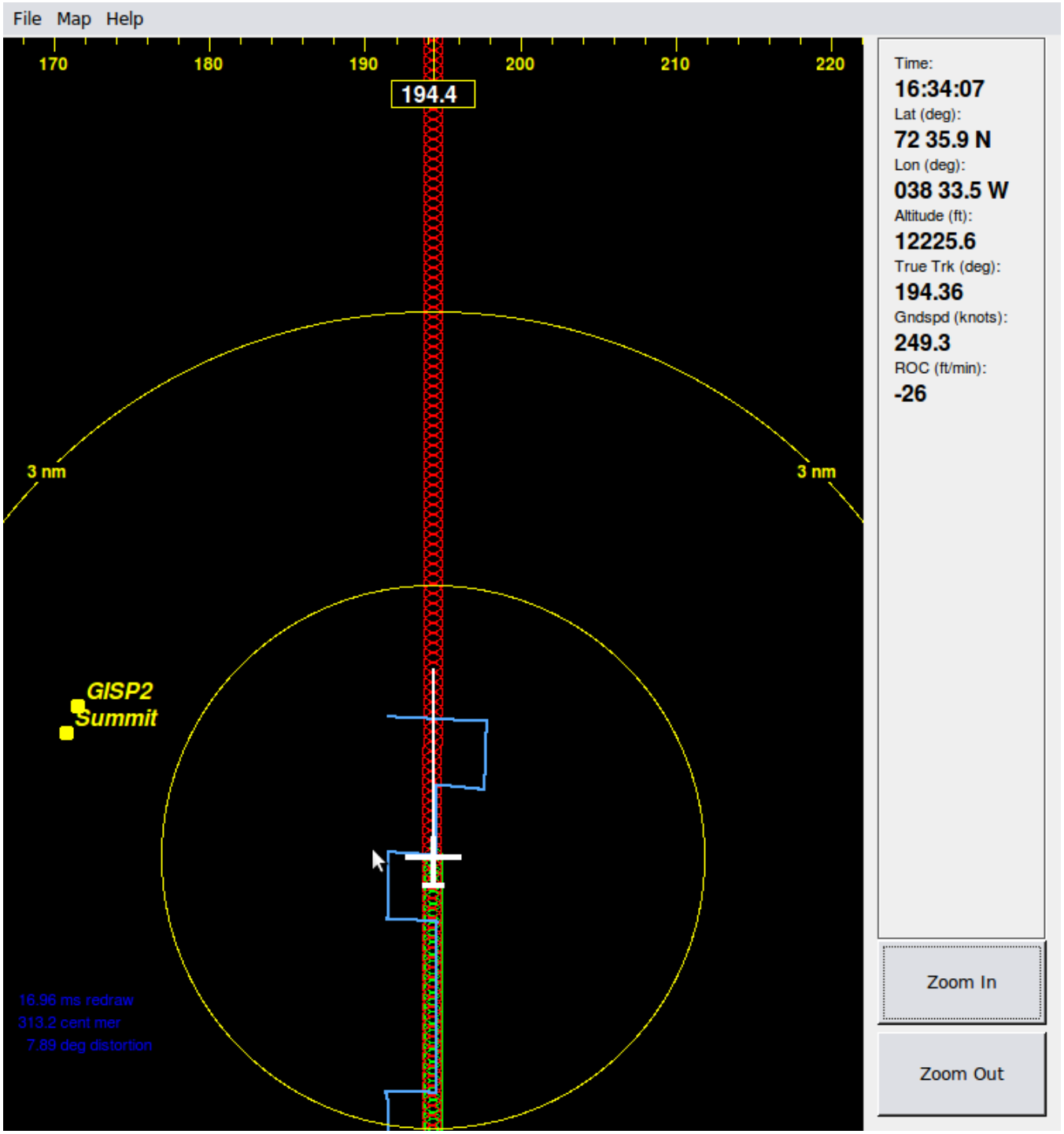

Figure 2: Today's flight over the ICESat cal/val site near Summit Camp on the ATM aircraft navigation display. Image: John Sonntag.

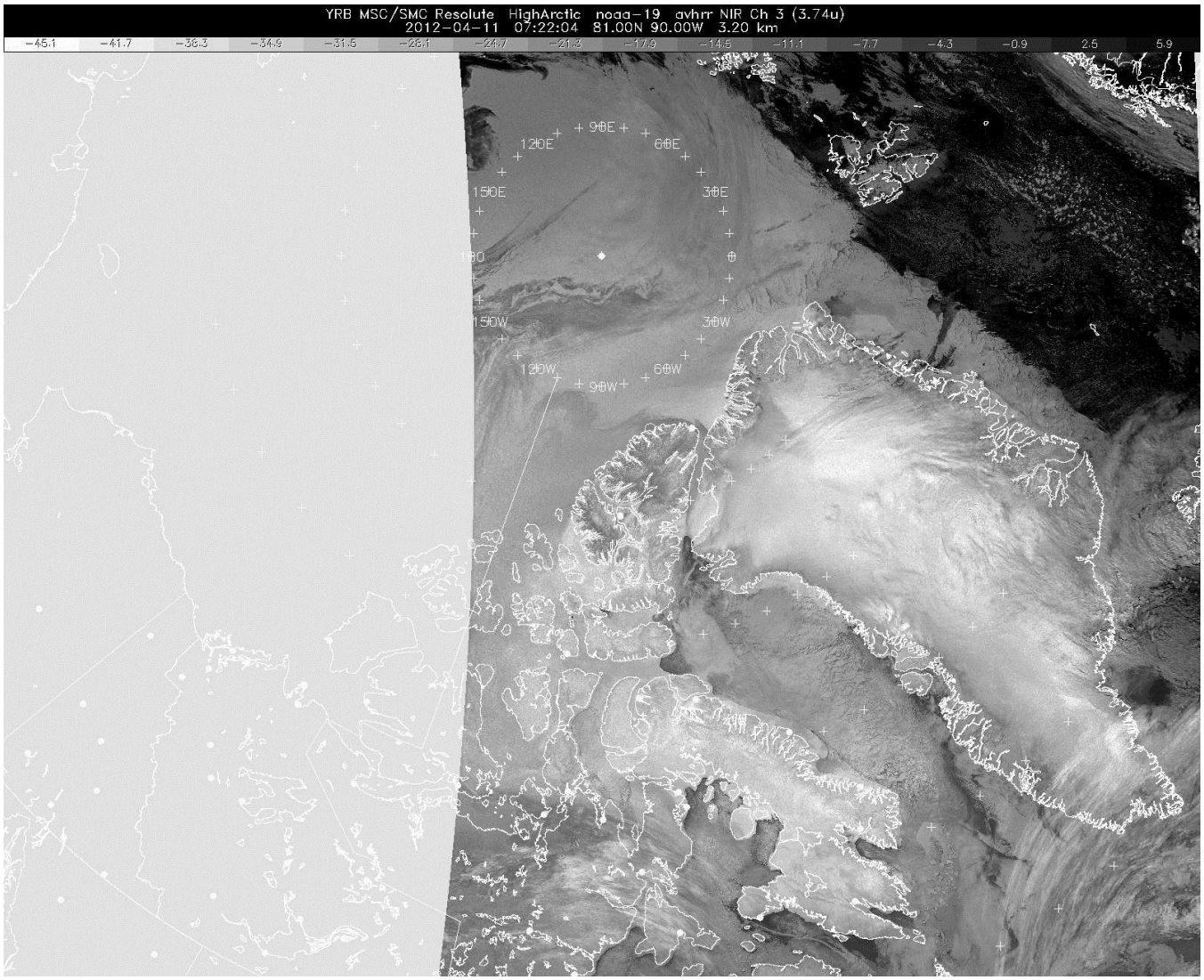

Figure 3: NOAA infrared satellite image showing cloud cover over survey areas in south Greenland.

Figure 4: DMS mosaic of glacier calving front during today's flight from James Jacobson and Eric Fraim/DMS.