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# Science Flight Report

## Operation IceBridge Arctic 2012



**Flight:** F30  
**Mission:** Southeast Glaciers 01

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### Flight Report Summary

<b>Aircraft</b>	<b>P-3B (N426NA)</b>
<b>Flight Number</b>	31
<b>Flight Request</b>	12P006
<b>Date</b>	Saturday, April 28, 2012 (Z)
<b>Purpose of Flight</b>	Operation IceBridge Mission Southeast Glaciers 01
<b>Take off time</b>	10:58 Zulu from Kangerlussuaq (BGSF)
<b>Landing time</b>	18:22 Zulu at Kangerlussuaq (BGSF)
<b>Flight Hours</b>	7.6 hours
<b>Aircraft Status</b>	Airworthy.
<b>Sensor Status</b>	All installed sensors operational.
<b>Significant Issues</b>	None.
<b>Accomplishments</b>	<ul style="list-style-type: none"><li>• Low-altitude survey (1,500) of glaciers and ice sheet profiles.</li><li>• Completed entire mission as planned.</li><li>• ATM, snow, Ku-band, accumulation radar, MCoRDS gravimeter, magnetometer, DMS and KT-19 skin temperature sensor were operated on the survey lines.</li><li>• Pitch and roll maneuvers for snow and Ku-band radar.</li><li>• Ramp pass at 1,000 ft AGL at Kangerlussuaq.</li></ul>
<b>Geographic Keywords</b>	Southeast Greenland
<b>Satellite Tracks</b>	ICESat tracks 0040,0159; CryoSat-2 orbit 10685
<b>Repeat Mission</b>	2011 partial and every year since 2008.

## 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"/>	70 GB	None
MCoRDS	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1.8 TB	None
Snow Radar	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	730 GB	None
Ku-band Radar	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	730 GB	None
Accumulation Radar	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	180 GB	None
DMS	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	75.5 GB	None
KT-19 Skin Temp.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	8 MB	None
Gravimeter	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1.5 GB	None
Magnetometer	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	500 MB	None

### Mission Report (Michael Studinger, Mission Scientist)

This mission is in part a repeat of the 2011 Southeast Glaciers mission. Its primary purpose is to continue dh/dt monitoring of 8 glaciers in the southeast which have been flown each year since 2008, two more not flown since 2010, and two additional glaciers in the south near the Pursortoq peninsula which have not been previously flown. We extend the centerline runs of most of the glaciers past the seaward ends of their fjords, to enable the gravimeter to detect possible sills in the fjords. We also intend to occupy a CryoSat-2 ascending ground track 10685 to transit between southeastern Greenland and Kangerlussuaq.

The weather was clear today, because of a strong katabatic wind. This is a typical situation in the southeast of Greenland. We expected to encounter strong turbulence during today's flight and had to abort a few glacier missions because of that. We experienced a maximum of 3.2 g upward acceleration. All in all the flight was much smoother than the one we did last year.

### Individual instrument reports from experimenters on board the aircraft:

**ATM:** Both ATM systems worked well and collected good data along the entire line in mostly cloud free conditions. ATM collected a total of 6.7 hours of science data with 95% coverage. The build in safety switch did shut down the laser occasionally due to the large vertical accelerations caused by turbulence.

**MCoRDS:** The MCoRDS system worked well.

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

**Accumulation radar:** Worked well today.

**Gravimeter:** Worked well.

**Magnetometer:** Worked well and used the SGL data logger today without problems.

**DMS:** DMS worked well and collected 17100 frames. Half way through the mission remnants from the de-icing fluid obscured the DMS window.

**KT-19 skin temperature sensor:** System worked well.

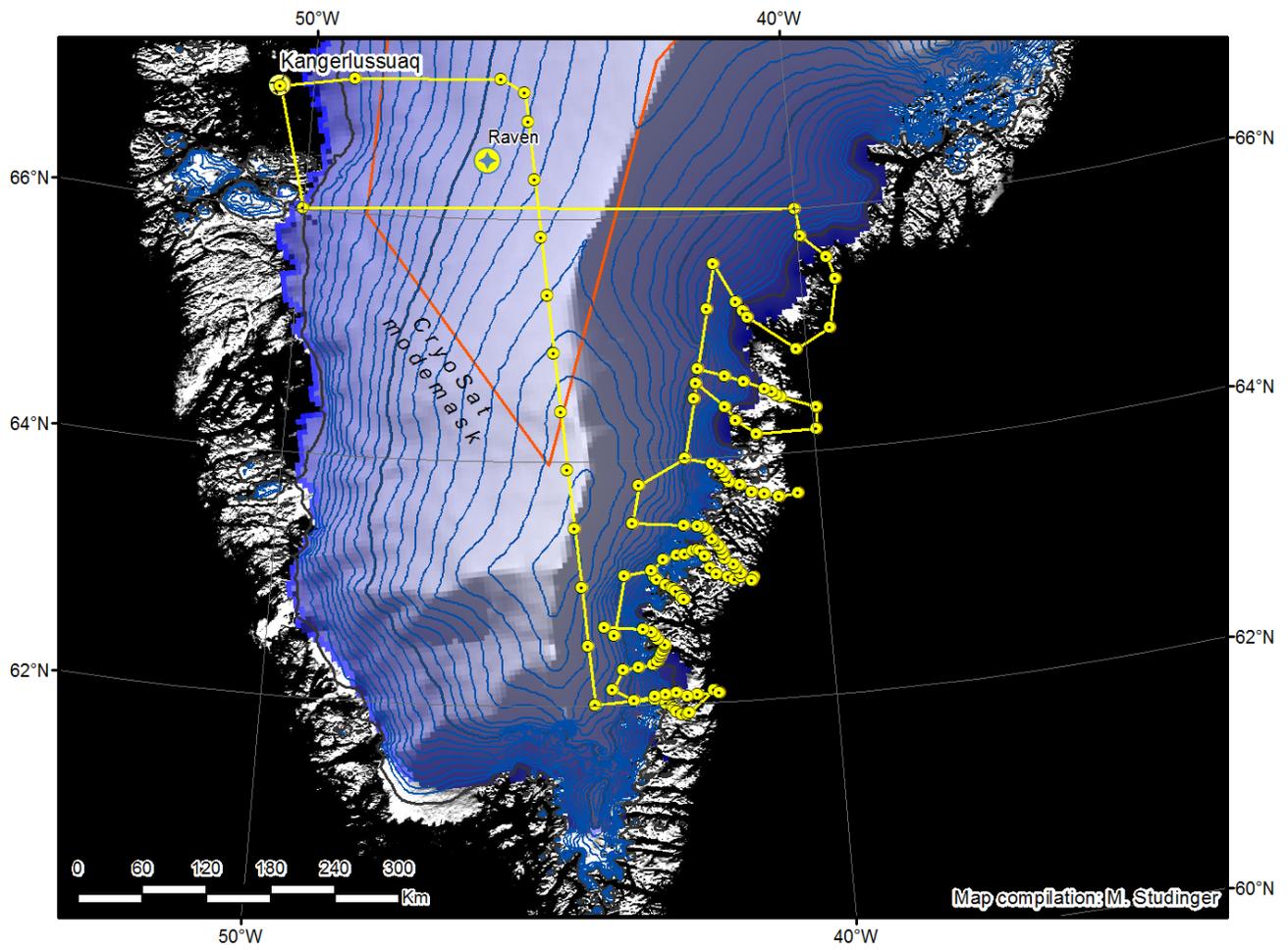


Figure 1: Today's mission plan (yellow).

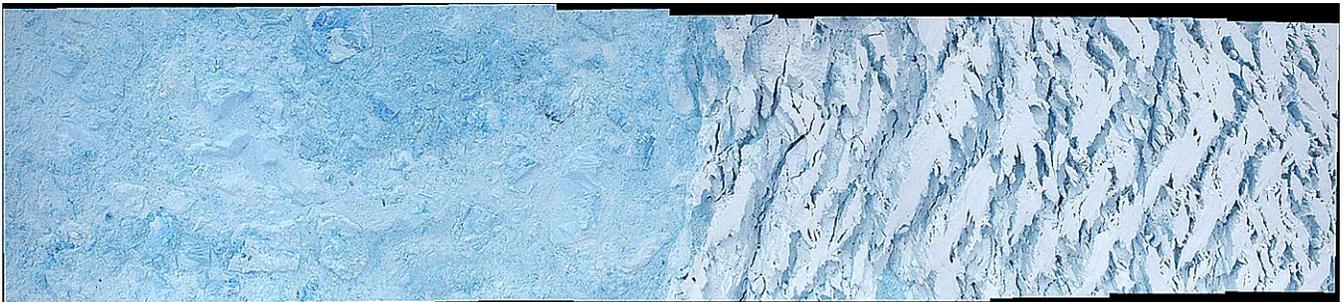


Figure 2: DMS mosaic of a calving front. DMS/James Jacobson.