
Preliminary Science Flight Report

Operation IceBridge Antarctica 2011



Flight: F11
Mission: Pine Island Glacier 2b

Flight Report Summary

Aircraft	DC-8 (N817NA)
Flight Number	120115
Flight Request	128008
Date	Wednesday, October 26, 2011 (Z), Day of Year 299
Purpose of Flight	Operation IceBridge Mission Pine Island Glacier 2b
Take off time	12:02:01 Zulu from Punta Arenas (SCCI)
Landing time	23:16:24 Zulu at Punta Arenas (SCCI)
Flight Hours	11.3 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) Pine Island Glacier. Completed entire mission as planned.• Flew survey along the axis of the newly developing rift on the Pine Island Ice Shelf and one line across it.• ATM, MCoRDS, snow and Ku-band radars, gravimeter, and DMS were operated on the survey lines.• Conducted one ramp pass (1000 ft AGL) at Punta Arenas airport for ATM, snow and Ku-band radar instrument calibration.
Geographic Keywords	Pine Island Glacier, Antarctica
ICESat Tracks	0026, 0041, 0109, 0124, 0264, 0279, 0347, 0362.
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"/>	34 GB	None
MCoRDS	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1.4 TB	None
Snow Radar	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	230 GB	None
Ku-band Radar	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	230 GB	None
DMS	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	86.6 GB	None
Gravimeter	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1.5 GB	None
DC-8 Onboard Data	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	40 MB	None

Mission Report (Michael Studinger, Mission Scientist)

This flight is a near repeat of the 2009 October 27 IceBridge flight. It is intended to track ongoing changes in the Pine Island Glacier trunk, by comparison along ICESat ground tracks. This version differs slightly from the 2009 flight, in that three lines on the floating shelf of the glacier, intended to target the gravimeter to the findings of the BAS auto-sub, have been removed and replaced with two additional ascending ICESat lines on the upper trunk of the glacier. The original purpose of the “autosub” lines was superseded when we flew a 5 km grid over the shelf in 2009. The weather in the area was perfect and we collected 100% of the planned data.

In addition we extended a turn and flew along the axis of the newly developing rift in the Pine Island Ice shelf (see DMS photo in Fig. 2). We also added one line that crosses the rift. A preliminary analysis of the ATM data shows the elevation of the ice in the rift just barely above the water level offshore. The DMS image suggests a mélange, which indicated together with the ATM data that the rift must be flooded by water.

Individual instrument reports from experimenters on board the aircraft:

ATM: The ATM systems worked well and collected good data. No clouds today.

MCoRDS: The MCoRDS system worked well without any issues.

Snow and Ku-band radar: The snow and Ku-band radars collected data along the entire line.

Gravimeter: Worked well. No issues.

DMS: DMS worked well. No issues. The system collected 10,050 data frames.

DC-8 on board data: System worked well.

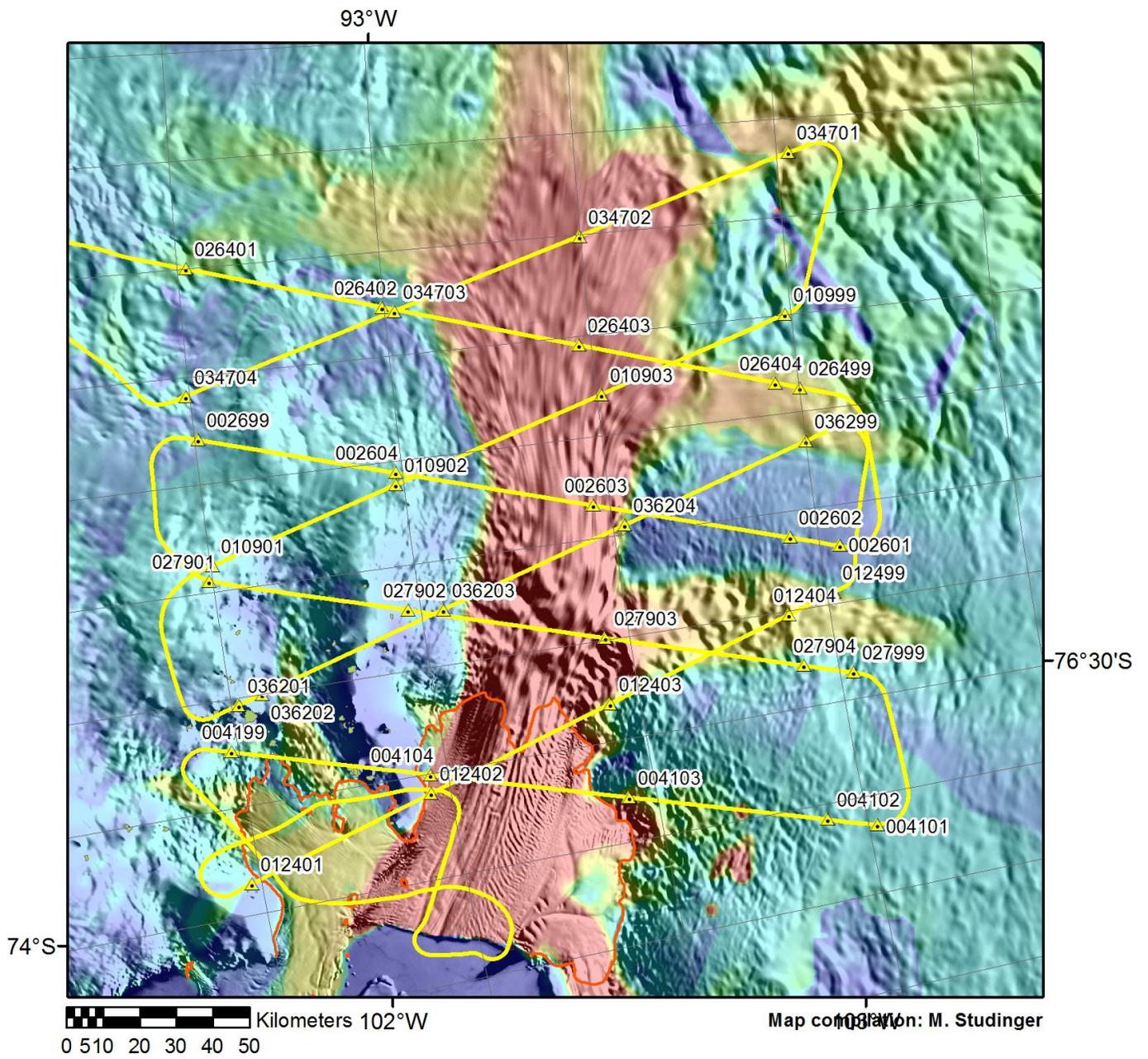


Figure 1: DC-8 trajectory over Pine Island Glacier. Background image is MODIS mosaic and ice surface velocity from InSAR.

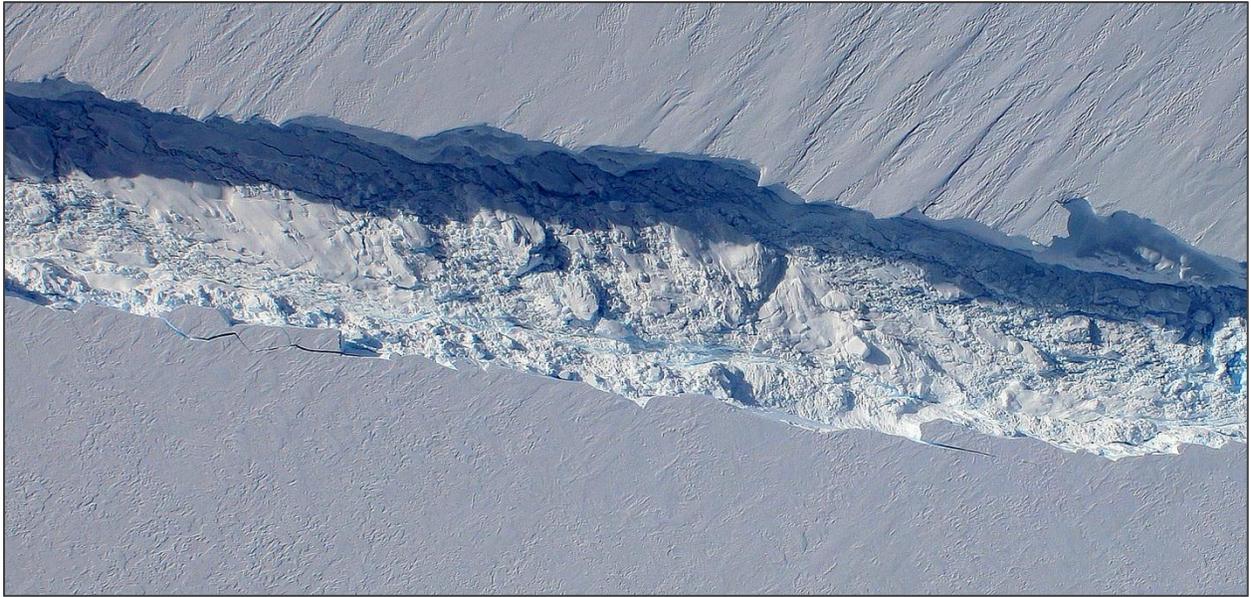


Figure 2: Crack in Pine Island ice shelf spanning almost the entire ice shelf. Photo: DMS/NASA.