
Preliminary Science Flight Report

Operation IceBridge Antarctica 2011



Flight: F03
Mission: Pine Island Glacier Grounding Line 1

Flight Report Summary

Aircraft	DC-8 (N817NA)
Flight Number	120105
Flight Request	128007
Date	Friday, October 14, 2011 (Z), Day of Year 287
Purpose of Flight	Operation IceBridge Mission Endurance (Weddell Sea/CryoSat-2)
Take off time	12:10:24 Zulu from Punta Arenas (SCCI)
Landing time	23:32:51 Zulu at Punta Arenas (SCCI)
Flight Hours	11.5 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.• ATM, MCoRDS, snow and Ku-band radars, gravimeter, and DMS were operated on the survey lines.• Conducted two ramp passes (2000 ft AGL) at Punta Arenas airport for ATM, DMS and snow and Ku-band radar instrument calibration.
Geographic Keywords	Pine Island Glacier, Antarctica
ICESat Tracks	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"/>	40 GB	None
MCoRDS	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1.5 TB	None
Snow Radar	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	200 GB	None
Ku-band Radar	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	210 GB	None
DMS	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	73.7 GB	None
Gravimeter	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2 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)

Today's mission is a new design, intended to capture two concepts for missions in this area. The first is to extend cross-flow coverage using a series of lines progressing from the grounding line upstream as far as practical, by interspersing the similar BBAS lines and extending upstream with a spacing of 4 km. Since these lines were not evenly spaced nor parallel, these new lines are not either. The second purpose was to collect altimetry, radar, gravity and photo measurements on the floating PIG shelf in concert with the planned Bindenschadler in-situ project, by overflying a number of their field sites and traverse lines. The weather in the area was perfect and we collected 100% data.

The ice shelf in front of Pine Island Glacier showed a large crack that spans the entire shelf (see photos attached). The portion of the ice shelf toward Pine Island Bay seems to be ready to break off from the main ice shelf.

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 crashed twice toward the end of the survey lines and resulting in a 12 and 4 minute data gap respectively. Some of the data was lost in turns, some on the survey line.

Snow and Ku-band radar: The snow and Ku-band radars collected data along the entire line. A short 3 min loss of snow radar data occurred at the beginning of the survey.

Gravimeter: Worked well. No issues.

DMS: DMS worked well. No issues.

DC-8 on board data: System worked well.

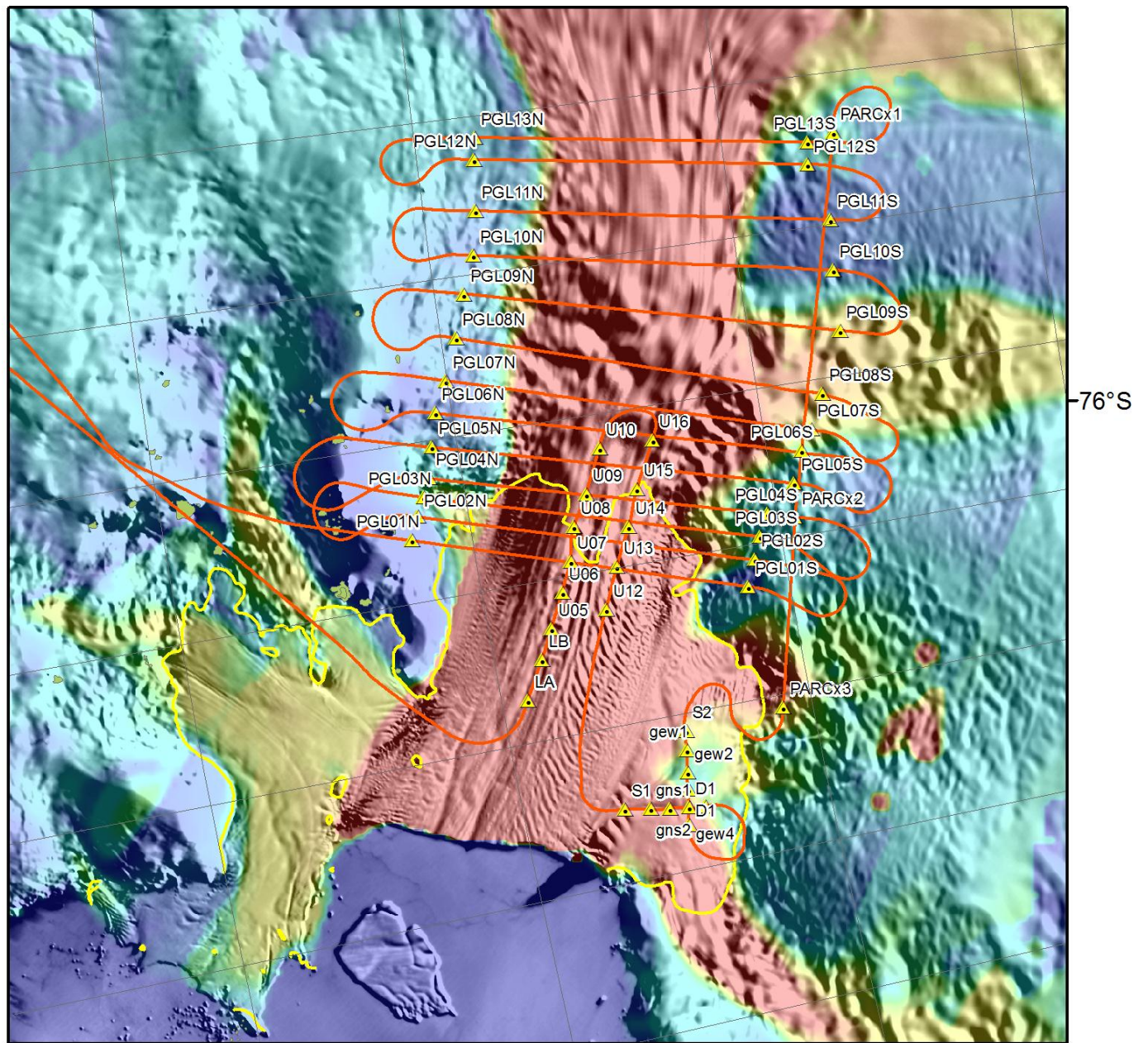


Figure 1: DC-8 trajectory over Pine Island Glacier. Background image is MODIS mosaic and ice surface velocity from InSAR.





Figure 2: Crack in Pine Island ice shelf spanning the entire ice shelf. All photos M. Studinger.