Preliminary Science Flight Report
Operation IceBridge Antarctica 2011

Flight: **F01**
Mission: **Sea Ice Seelye Loop**

Flight Report Summary

Aircraft	**DC-8 (N817NA)**
Flight Number	120105
Flight Request	128005
Date	Wednesday, October 12, 2011 (Z), Day of Year 285
Purpose of Flight	Operation IceBridge Mission Seelye Loop
Take off time	12:20 Zulu from Punta Arenas (SCCI)
Landing time	00:11 Zulu at Punta Arenas on October 13 (SCCI)
Flight Hours	11.9 hours
Aircraft Status	Airworthy.
Sensor Status	All installed sensors operational.
Significant Issues	None
Accomplishments	• Low-altitude survey (1,500 ft AGL) of two sea ice transects in the Weddell Sea. Completed entire mission as planned. • ATM, snow and Ku-band radars, gravimeter, POS/AV, and DMS were operated on the survey lines. • MCoRDS was not in operation on this flight due to the sea ice mission. Instrument team used time on the aircraft during the flight to work on the system. • Conducted pitch maneuvers over open water in front of the Brunt Ice Shelf for snow and Ku-band radar. • Conducted two ramp passes (1500 ft AGL) at Punta Arenas airport for DMS, ATM and snow and Ku-band radar instrument calibration.
Geographic Keywords	Weddell Sea, Antarctica, Cape Norvegia, Brunt Ice Shelf
ICESat Tracks	None.
Repeat Mission	Yes (2009, 2010).

Science Data Report Summary

Instrument	Instrument Operational			Data Volume	Instrument Issues
	Survey Area	Entire Flight	High-alt. Transit		
ATM	☑	☒	☒	68 GB	None
MCoRDS	☒	☒	☒	N/A	None
Snow Radar	☒	☒	☒	408 GB	None
Ku-band Radar	☑	☒	☒	407 GB	None
DMS	☑	☒	☑	151 GB	None
Gravimeter	☑	☑	☑	2 GB	None
DC-8 Onboard Data	☑	☑	☑	40 MB	None

Mission Report (Michael Studinger, Mission Scientist)

Today's mission is an exact repeat of the IceBridge flight from 2009 and 2010. Its main purpose is to measure gradients in sea ice freeboard and thickness along the "gate" connecting the tip of the Peninsula with Cape Norvegia. This gate is the line across which ice export is typically computed, and the export from this area is a major contributor to total ice volume exported into the Antarctic Circumpolar Current. We began our flight with two ramp passes for DMS at Punta Arenas airport in order to make sure we have daylight to illuminate the surveyed targets on the ramp. We lost power to some of the science instruments but an experience flight crew and instrument team routinely located the problem and then switch to a difference generator and inverted and we were able to continue the flight as planned. We encountered a mix of clouds, fog and sunshine as expected which occasionally resulted in brief periods of data loss, not more than 20% of the total length.

Individual instrument reports from experimenters on board the aircraft:

ATM: The ATM systems worked well and collected good data. About 20% of the line was obscured by low-level clouds.

MCoRDS: The MCoRDS system was not operated on this flight due to the high-altitude mission, but the instrument team used the flight for testing, configuring and calibrating the system.

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. Occasional clouds obscured the surface.

POS/AV: Systems worked well. No issues.

DC-8 on board data: System worked well.

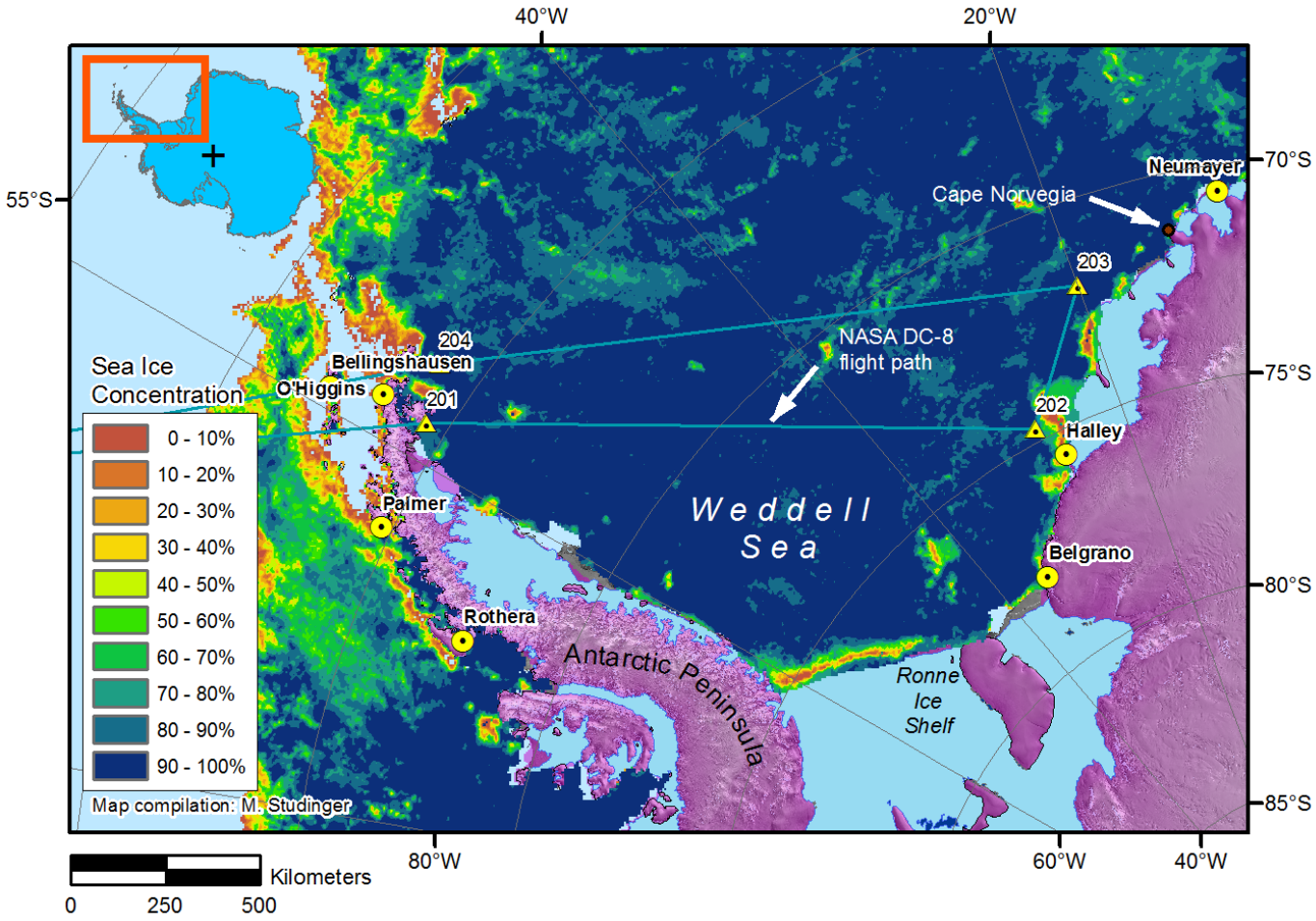

Figure 1: Sea ice mission plotted over sea ice concentration from AMSR-E data (Oct 4, 2011)