Preliminary Science Flight Report
Operation IceBridge Antarctica 2011

Flight: **F08**
Mission: **Bellingshausen and Amundsen Seas 1**

Flight Report Summary

Aircraft	**DC-8 (N817NA)**
Flight Number	120111
Flight Request	128005
Date	Sunday, October 23, 2011 (Z), Day of Year 26
Purpose of Flight	Operation IceBridge Mission Bell 1
Take off time	11:59:59 Zulu from Punta Arenas (SCCI)
Landing time	23:42:13 Zulu at Punta Arenas (SCCI)
Flight Hours	11.8 hours
Aircraft Status	Airworthy.
Sensor Status	All installed sensors operational.
Significant Issues	None
Accomplishments	• Low-altitude survey (1,500 ft AGL) of sea ice transects in the Bellingshausen and Amundsen Seas. Completed entire mission as planned. • ATM, snow and Ku-band radars, gravimeter, and DMS were operated on the survey lines. • MCoRDS was not in operation on this flight due to the sea ice mission • Conducted two ramp passes (1000 ft AGL) at Punta Arenas airport for DMS, ATM, and snow and Ku-band radar instrument calibration after takeoff.
Geographic Keywords	Bellingshausen Sea, Amundsen Sea, Antarctica
ICESat Tracks	None.
Repeat Mission	2009: 10/21 and 2010: 10/30 Sea Ice 01

Science Data Report Summary

Instrument	Instrument Operational			Data Volume	Instrument Issues
	Survey Area	Entire Flight	High-alt. Transit		
ATM	☑	☒	☒	66 GB	None
MCoRDS	☒	☒	☒	N/A	None
Snow Radar	☒	☒	☒	400 GB	None
Ku-band Radar	☑	☒	☒	400 GB	None
DMS	☑	☒	☑	171 GB	None
Gravimeter	☑	☑	☑	640 GB	None
DC-8 Onboard Data	☑	☑	☑	40 MB	None

Mission Report (Michael Studinger, Mission Scientist)

Today's mission repeat of two missions in 2009 (10/21) and 2010 (10/30) then called Sea Ice 01.

The Amundsen and Bellingshausen Seas are both challenging areas. The large survey area is rarely cloud free entirely. Furthermore, the weather is typically poor over the area. Today, we have seen the best conditions since we've been here, which are far from ideal. The biggest challenge, however, is that we know that all available forecast models are struggling to predict the relative humidity, particularly at low elevations, which is critical for us. We know that the GFS, WRF, and AMPS models frequently fail in this area. We typically can't depend on MODIS imagery from this area. In other words have very little information for decision making. The AMPS model showed the entire area cloud free (Fig.2), which indicated to us that the forecast is unreliable. We expected clouds on the eastern and western end of the survey area and were hoping for clear conditions in between. All in all we collected good data along 75% of the line. It doesn't get much better than that in the Bellingshausen and Amundsen Seas.

The G-V with LVIS crossed our line today en route to Antarctica in an area that was entirely cloud free.

Individual instrument reports from experimenters on board the aircraft:

ATM: The ATM systems worked well and collected good data. About 25% 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.

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.

DC-8 on board data: System worked well.

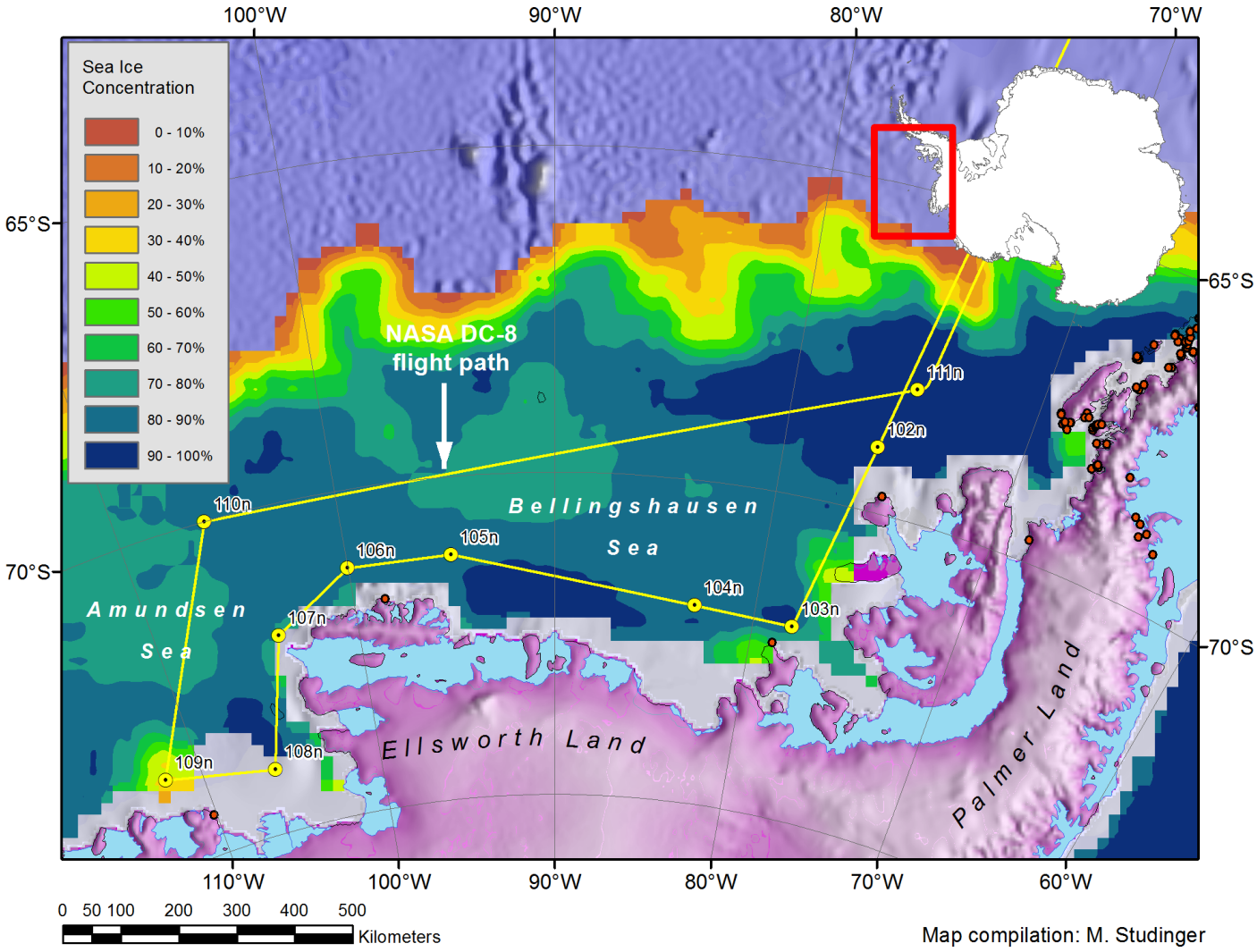

Figure 1: Sea ice mission plotted over sea ice concentration from ISSMI data (Oct 22, 2011)

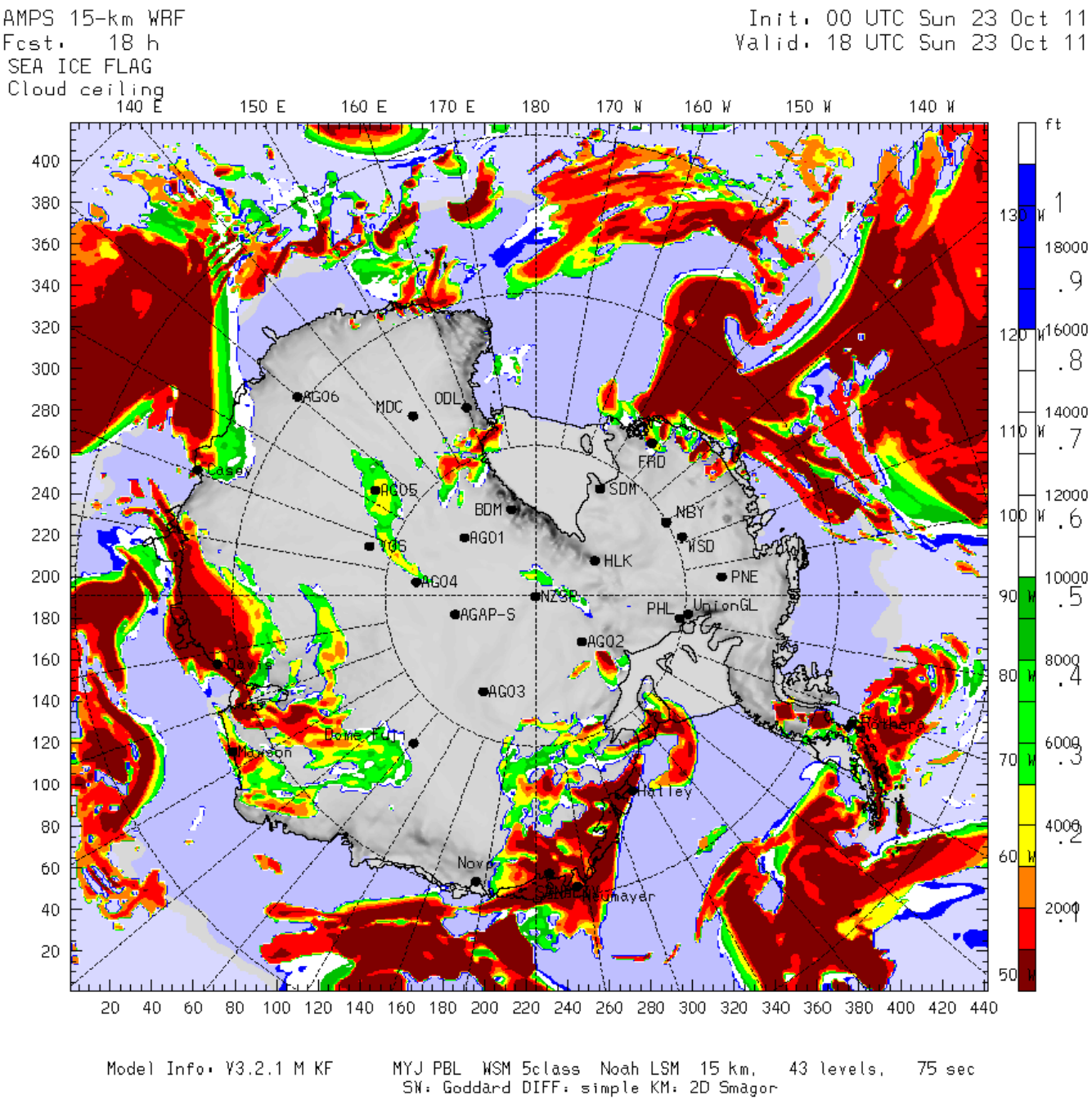

Figure 2: AMPS model showing no clouds over the survey area (Oct 23, 2011).