Science Flight Report
Operation IceBridge Arctic 2012

Flight: **F03**
Mission: **Beaufort-Chukchi Diamond**

Flight Report Summary

Aircraft	**P-3B (N426NA)**
Flight Number	4
Flight Request	12P006
Date	Friday, March 16, 2012 (Z)
Purpose of Flight	Operation IceBridge Mission Beaufort-Chukchi Diamond
Take off time	16:58 Zulu from Fairbanks, AK (PAFA)
Landing time	01:00 Zulu at Fairbanks, AK (PAFA) on March 17, 2012
Flight Hours	8.3 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 over the Beaufort and Chukchi Seas. • Completed entire mission as planned, without having to change altitude a single time. • ATM, snow and Ku-band radars, gravimeter, magnetometer, DMS and KT-19 skin temperature sensor were operated on the survey lines. • MCoRDS and accumulation radars were not in operation on this flight due to the sea ice mission. • Several pitch maneuvers over sea ice for snow and Ku-band radar calibration. • Pass at 1,500 ft AGL over the parking lot outside the main terminal building that Fairbanks Airport for DMS calibration.
Geographic Keywords	Beaufort Sea, Chukchi Sea
Satellite Tracks	None
Repeat Mission	None

Science Data Report Summary

Instrument	Instrument Operational			Data Volume	Instrument Issues
	Survey Area	Entire Flight	High-alt. Transit		
ATM	☑	☒	☒	48 GB	CAMBOT not available
MCoRDS	☒	☒	☒	N/A	N/A
Snow Radar	☑	☒	☒	560 GB	None
Ku-band Radar	☑	☒	☒	560 GB	None
Accumulation Radar	☒	☒	☒	N/A	N/A
DMS	☑	☒	☒	132 GB	None
KT-19 Skin Temp.	☑	☑	☑	8.1 MB	None
Gravimeter	☑	☑	☑	1.5 GB	None
Magnetometer	☑	☑	☑	120 MB	None

Mission Report (Michael Studinger, Mission Scientist)

This is a new mission, designed to sample sea ice in the western Arctic Basin along north-south gradients in the Chukchi and Beaufort Seas. The CryoSat-2 orbit geometry was not suitable for underflights today and we therefore followed the original mission plan. The weather was perfect over the entire line as we had expected and we were able to fly the entire line at 1500 ft AGL. The location of the survey line resulted in good sun illumination allowing to us collect very good DMS imagery.

We flew over an area with open water in the Chukchi Sea that was clearly visible in the IR satellite image (see Fig. 2 and Fig. 3).

Individual instrument reports from experimenters on board the aircraft:

ATM: The ATM systems worked well and collected good data along the entire line in cloud free conditions. The CAMBOT system was unavailable following a failure on a previous flight. The ATM T4 wide scanner encountered a cooler failure and lost 2% of data. ATM collected a total of 5.4 hours of science data.

MCoRDS: The MCoRDS system was not operated on this flight due to the sea ice mission.

Snow and Ku-band radar: The snow and Ku-band radars collected 4.5 hours of data along the entire line with the new system. A few minutes of data were lost due to setting changes on the radars.

Accumulation radar: The system was not operated on this flight due to the sea ice mission.

Gravimeter: Worked well. No issues.

Magnetometer: Worked well.

DMS: DMS worked well and collected 15,709 “fraims” (sic!). No issues on the primary camera. The backup camera continued to behave flaky.

KT-19 skin temperature sensor: System worked well.

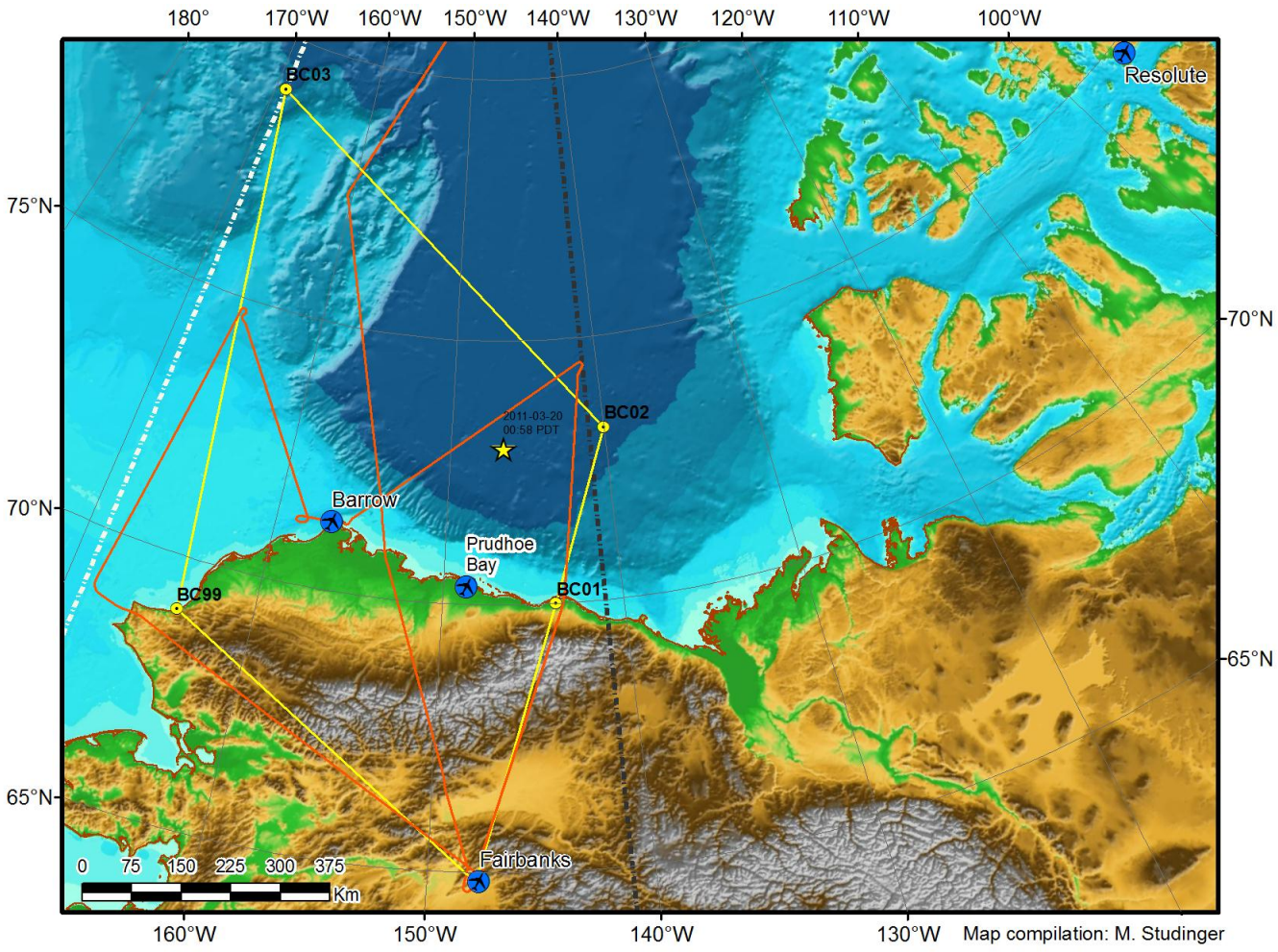

Figure 1: Today's sea ice mission plan (yellow). Star marks location of last year's ICEX2011 camp. Red lines are F01 and F02.

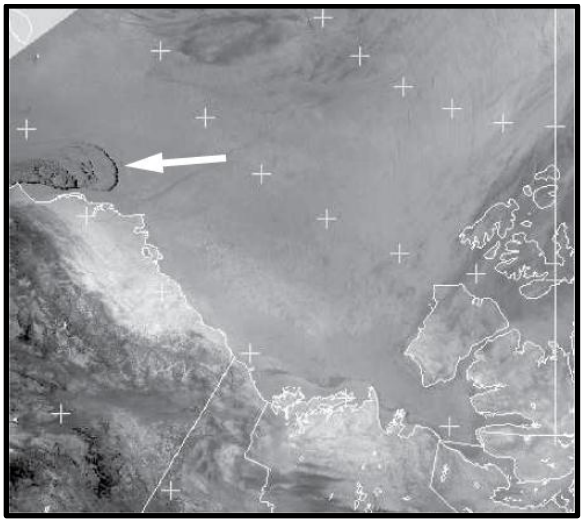

Figure 2: IR satellite image showing the large lead with open water (white arrow).

Figure 3: DMS mosaic from Eric Fraim showing the edge of the large lead that is visible in the IR satellite image in Fig. 2.