Science Flight Report
Operation IceBridge Arctic 2012

Flight: **F02**
Mission: **Beaufort-Chukchi Zigzag**

Flight Report Summary

Aircraft	**P-3B (N426NA)**
Flight Number	3
Flight Request	12P006
Date	Thursday, March 15, 2012 (Z)
Purpose of Flight	Operation IceBridge Mission Beaufort-Chukchi Zigzag
Take off time	17:04 Zulu from Fairbanks, AK (PAFA)
Landing time	01:30 Zulu at Fairbanks, AK (PAFA) on March 16, 2012
Flight Hours	8.7 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. • Completed two CryoSat-2 lines that have been overflown by CryoSat-2 within hours of the P-3B survey. • Completed a flight along the BRomine, Ozone, and Mercury EXperiment (BROMEX) field site at Barrow, AK. • 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.
Geographic Keywords	Beaufort Sea, Chukchi Sea, Barrow
Satellite Tracks	CryoSat-2 orbits 10262 and 10263
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	☑	☒	☒	300 GB	Running backup system
Ku-band Radar	☑	☒	☒	300 GB	Running backup system
Accumulation Radar	☒	☒	☒	N/A	N/A
DMS	☑	☒	☒	143 GB	None
KT-19 Skin Temp.	☑	☑	☑	8 MB	None
Gravimeter	☑	☑	☑	1.5 GB	None
Magnetometer	☑	☑	☑	120 MB	None

Mission Report (Michael Studinger, Mission Scientist)

This is a new mission designed to measure north-south and east-west gradients in sea ice in the Beaufort and Chukchi Seas. At 19:00 Z we start the survey on CryoSat-2 orbit 10262 in the Chukchi Sea. CryoSat-2 had passed this line at 18:31 Z, just 29 minutes before us. We also flew two lines to sample gradients in the sea ice and the BROMEX lines at Barrow. We finished the survey with the second CryoSat-2 line starting at 23:21 Z. CryoSat-2 had passed this line at 16:52 Z.

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 more southern location of the survey line resulted in better sun illumination than yesterday's line allowing to us collect very good DMS imagery.

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 yesterday's failure. The ATM T4 wide scanner encountered a cooler failure and lost 12 minutes of data in the north-western corner of the survey area. ATM collected a total of 6.4 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 5 hours of data along the entire line with the backup system that has been used last year. A few minutes of data were lost due to a necessary disk change.

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

Gravimeter: Worked well. No issues.

Magnetometer: Worked well. The fluxgate magnetometer failed occasionally.

DMS: DMS worked well and collected over 16,000 frames. No issues on the primary camera. The backup camera continued to behave flaky.

KT-19 skin temperature sensor: System worked well.

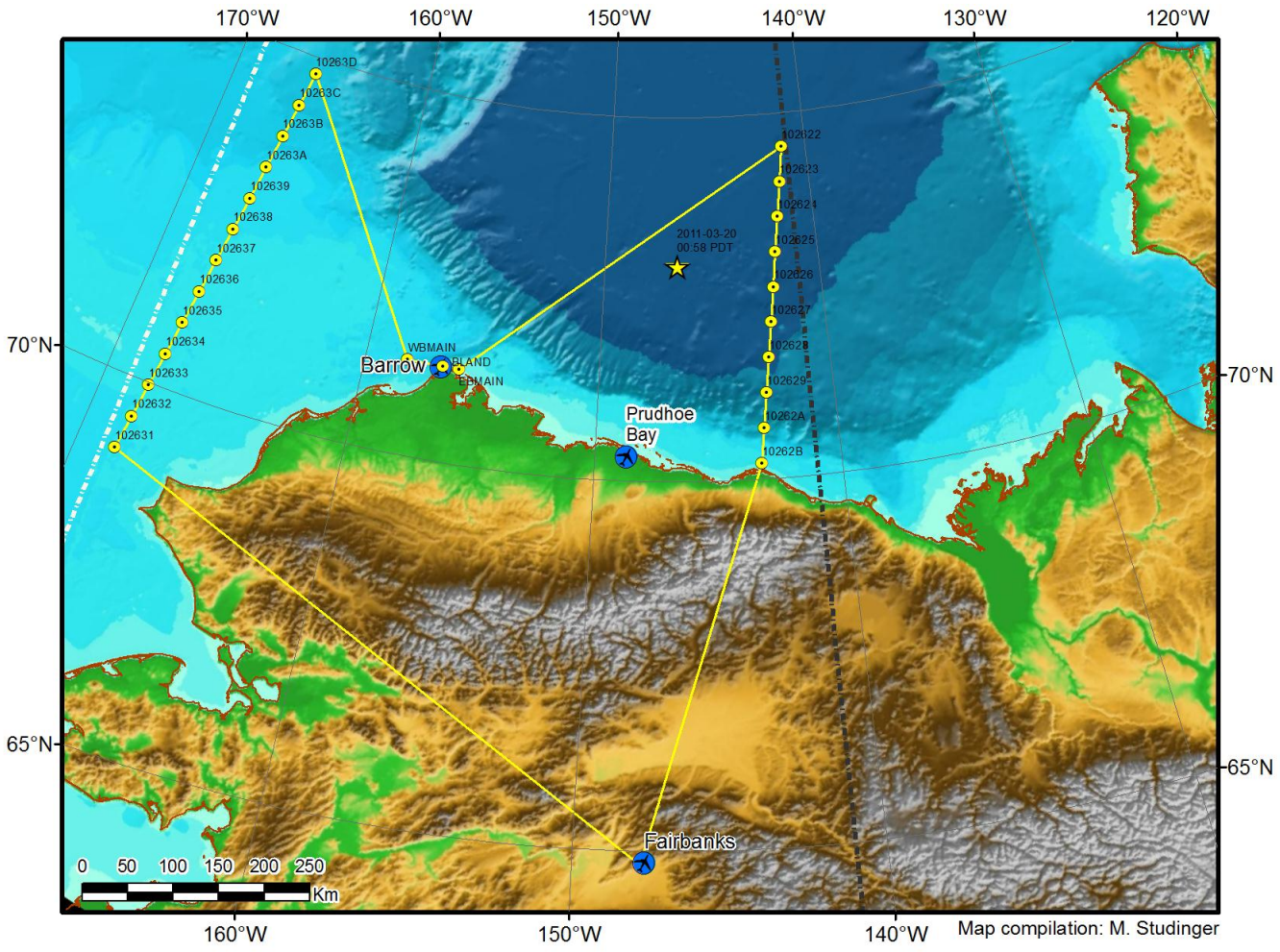

Figure 1: Today's sea ice mission plan. Star marks location of last year's ICEX2011 camp.

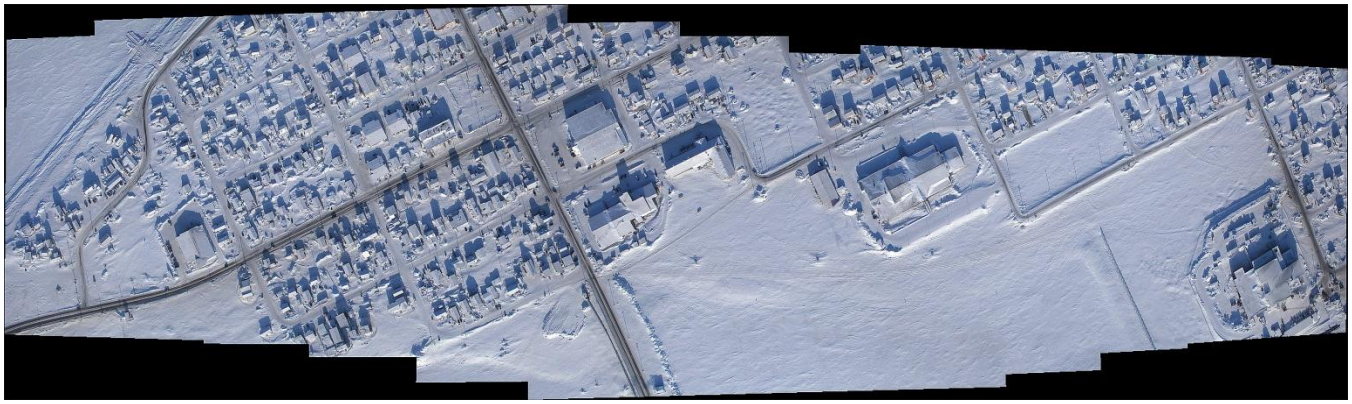

Figure 2: DMS mosaic of the town of Barrow, AK from Eric Fraim.