Science Flight Report
Operation IceBridge Arctic 2012

Flight: **F04**
Mission: **Alaska Coastal Zigzag A**

Flight Report Summary

Aircraft	**P-3B (N426NA)**
Flight Number	5
Flight Request	12P006
Date	Saturday, March 17, 2012 (Z)
Purpose of Flight	Operation IceBridge Mission Alaska Coastal Zigzag A
Take off time	16:48 Zulu from Fairbanks, AK (PAFA)
Landing time	00:41 Zulu at Fairbanks, AK (PAFA) on March 18, 2012
Flight Hours	8.1 hours
Aircraft Status	Airworthy.
Sensor Status	All installed sensors operational, except ATM T3.
Significant Issues	None
Accomplishments	• Low-altitude survey (1,500 ft AGL) of sea ice transects over the Beaufort and Chukchi Seas along the Alaska coast. • 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 and roll maneuvers over sea ice for snow and Ku-band radar calibration. • Completed two segments along CryoSat-2 orbits, one of which was within 11 minutes of a CryoSat-2 pass.
Geographic Keywords	Beaufort Sea, Chukchi Sea, Alaskan Coast.
Satellite Tracks	CryoSat-2 orbits 10291 and 10292
Repeat Mission	None

Science Data Report Summary

Instrument	Instrument Operational			Data Volume	Instrument Issues
	Survey Area	Entire Flight	High-alt. Transit		
ATM	☑	☒	☒	23 GB	T3 failure. No CAMBOT.
MCoRDS	☒	☒	☒	N/A	N/A
Snow Radar	☑	☒	☒	510 GB	None
Ku-band Radar	☑	☒	☒	510 GB	None
Accumulation Radar	☒	☒	☒	N/A	N/A
DMS	☑	☒	☒	142 GB	None
KT-19 Skin Temp.	☑	☑	☑	7.1 MB	None
Gravimeter	☑	☑	☑	1.5 GB	None
Magnetometer	☑	☑	☑	105 MB	None

Mission Report (Michael Studinger, Mission Scientist)

This is a new mission, designed to extensively sample first-year ice near the Alaskan coast, as well as the snow cover on it. We modified the original mission plan to include two short CryoSat-2 orbits. At 18:40 Z we started surveying CryoSat-2 ground track 10292, which was overflown by CryoSat-2 at 18:29 Z, 11 minutes before us. At 23:03 Z we began flying over ground track 10291, which was overflown by CryoSat-2 at 16:50 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 location of the survey line resulted in good sun illumination allowing to us collect very good DMS imagery.

We flew again over an area with open water in the Chukchi Sea that was clearly visible in the IR satellite image and that we had surveyed on yesterday's flight.

Individual instrument reports from experimenters on board the aircraft:

ATM: The ATM T4 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 T3 narrow scanner failed at the beginning of the survey line and did not collect data. ATM collected a total of 5.0 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 4.25 hours of data along the entire line with the new (primary) system.

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

Gravimeter: Worked well. No issues.

Magnetometer: Worked well. No issues

DMS: DMS worked well and collected 15,211 frames. One of the cameras has been replaced before the flight and both, the primary and backup camera worked flawlessly.

KT-19 skin temperature sensor: System worked well.

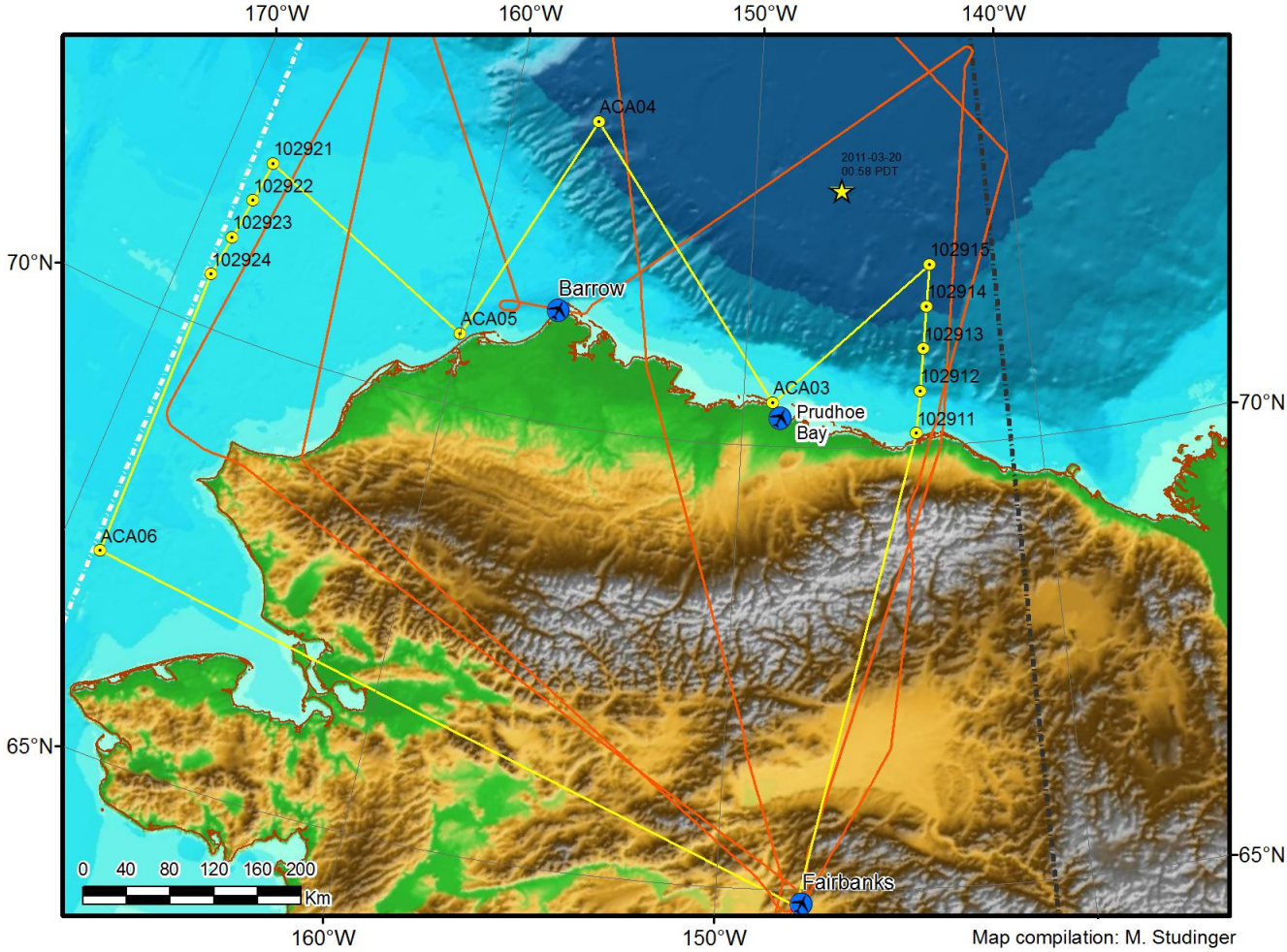

Figure 1: Today's sea ice mission plan (yellow). Star marks location of last year's ICEX2011 camp. Red lines are F01, F02 and F03.

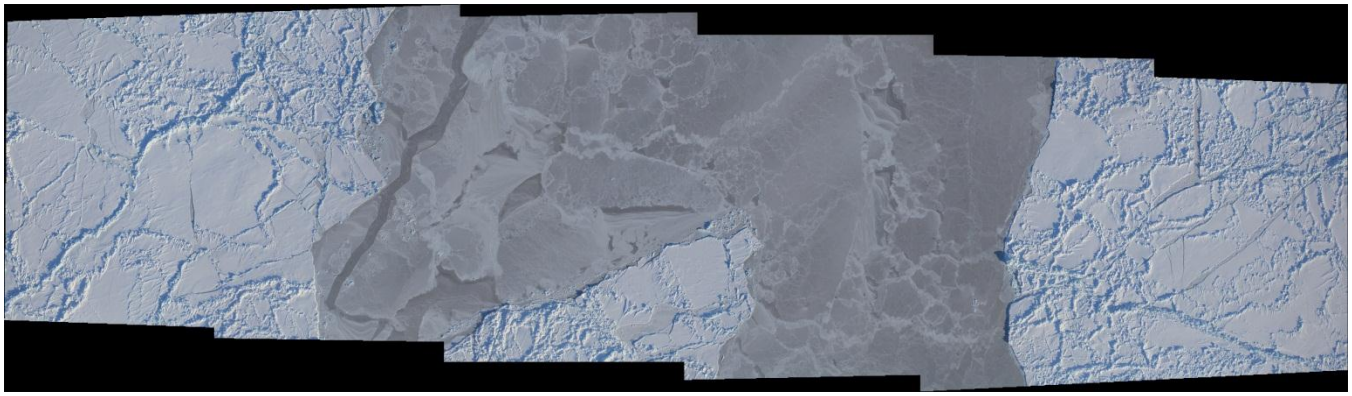

Figure 2: DMS mosaic from Eric Fraim showing sea ice structures.