Science Flight Report
Operation IceBridge Arctic 2012

Flight: **F09**
Mission: **Wingham Box**

Flight Report Summary

Aircraft	**P-3B (N426NA)**
Flight Number	10
Flight Request	12P006
Date	Monday, March 26, 2012 (Z)
Purpose of Flight	Operation IceBridge Mission Wingham Box
Take off time	11:00 Zulu from Thule Air Base (BGTL)
Landing time	18:48 Zulu at Thule Air Base (BGTL)
Flight Hours	8.0 hours
Aircraft Status	Airworthy.
Sensor Status	All installed sensors operational.
Significant Issues	None
Accomplishments	• High (4500 ft) and low-altitude survey (1,500 ft AGL) of sea ice transects along a CryoSat-2 orbit. • Completed entire mission as planned, except for the line near Qaanaaq because of strong headwinds on the back back. • ATM, snow, Ku-band and accumulation radars, gravimeter, magnetometer, DMS and KT-19 skin temperature sensor were operated on the survey lines. • MCoRDS radar was 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. • CryoSat-2 underpass at 15:46 Z. • No ramp pass at Thule because of low ceiling.
Geographic Keywords	Arctic Ocean, Arctic Basin, Canada Basin
Satellite Tracks	CryoSat-2 orbit 10421
Repeat Mission	None

Science Data Report Summary

Instrument	Instrument Operational			Data Volume	Instrument Issues
	Survey Area	Entire Flight	High-alt. Transit		
ATM	☑	☒	☒	40 GB	None
MCoRDS	☒	☒	☒	N/A	N/A
Snow Radar	☑	☒	☒	310 GB	None
Ku-band Radar	☑	☒	☒	310 GB	None
Accumulation Radar	☑	☒	☒	44.5 GB	None
DMS	☑	☒	☒	58 GB	None
KT-19 Skin Temp.	☑	☑	☑	6 MB	None
Gravimeter	☑	☑	☑	1.5 GB	None
Magnetometer	☑	☑	☑	120 MB	None

Mission Report (Michael Studinger, Mission Scientist)

This is a new mission to collect data along an out-and-back flight path over a representative CryoSat-2 ground track which passes through the SARin mode CryoSat-2 region also referred to as the “Wingham box”. The original plan was to fly the outbound leg at 15,000 ft AGL to get a wide as possible swath with ATM T3 to estimated drift rates. Unfortunately, the spare ATM T3 laser does not have the power to do this and we planned on a maximum of 10,000 ft altitude for data collection. The cloud cover in the region forced us down to 4,500 ft AGL. The advantage of this was that this altitude allowed collection of snow and Ku-band radar data. The weather was hazy on the high altitude segment, but clear on the low altitude part with clouds above us as expected from the satellite images and forecast. We collected data 90 km north of the edge of the Wingham box and turned around 55 km south of the box, shorter than planned in order to leave enough time to fly a sea ice line along the fjord of Qaanaaq. Unfortunately, strong headwinds on the way back prevented us from getting the short line outside Qaanaaq. We got 100% coverage with both ATM lasers, both high and low, and also, both, the snow and Ku-band radar. CryoSat-2 passed overhead at 15:46 Z, near waypoint 10421 on the low altitude leg. All other science targets were clouded in today.

Individual instrument reports from experimenters on board the aircraft:

ATM: Both ATM systems worked well and collected good data along the entire line in cloud free conditions. ATM collected a total of 3.2 hours of science data and got 100% coverage despite haze.

MCoRDS: The MCoRDS system was not operated on this flight due to the sea ice mission. Tests during the flight revealed a previously unknown strong noise on the system of unknown origin.

Snow and Ku-band radar: The snow and Ku-band radars worked well and collected 2.2 hours of data along the entire line with the new (primary) systems, both at 4,500 ft AGL and at 1,500 ft AGL.

Accumulation radar: Worked well and collected 1.7 hours of data during the low altitude portion.

Gravimeter: Worked well. No issues.

Magnetometer: Data logging was switched to the SGL system and no spikes were observed other than the usual HF radio interference.

DMS: DMS worked well and collected data on both systems today.

KT-19 skin temperature sensor: System worked well.

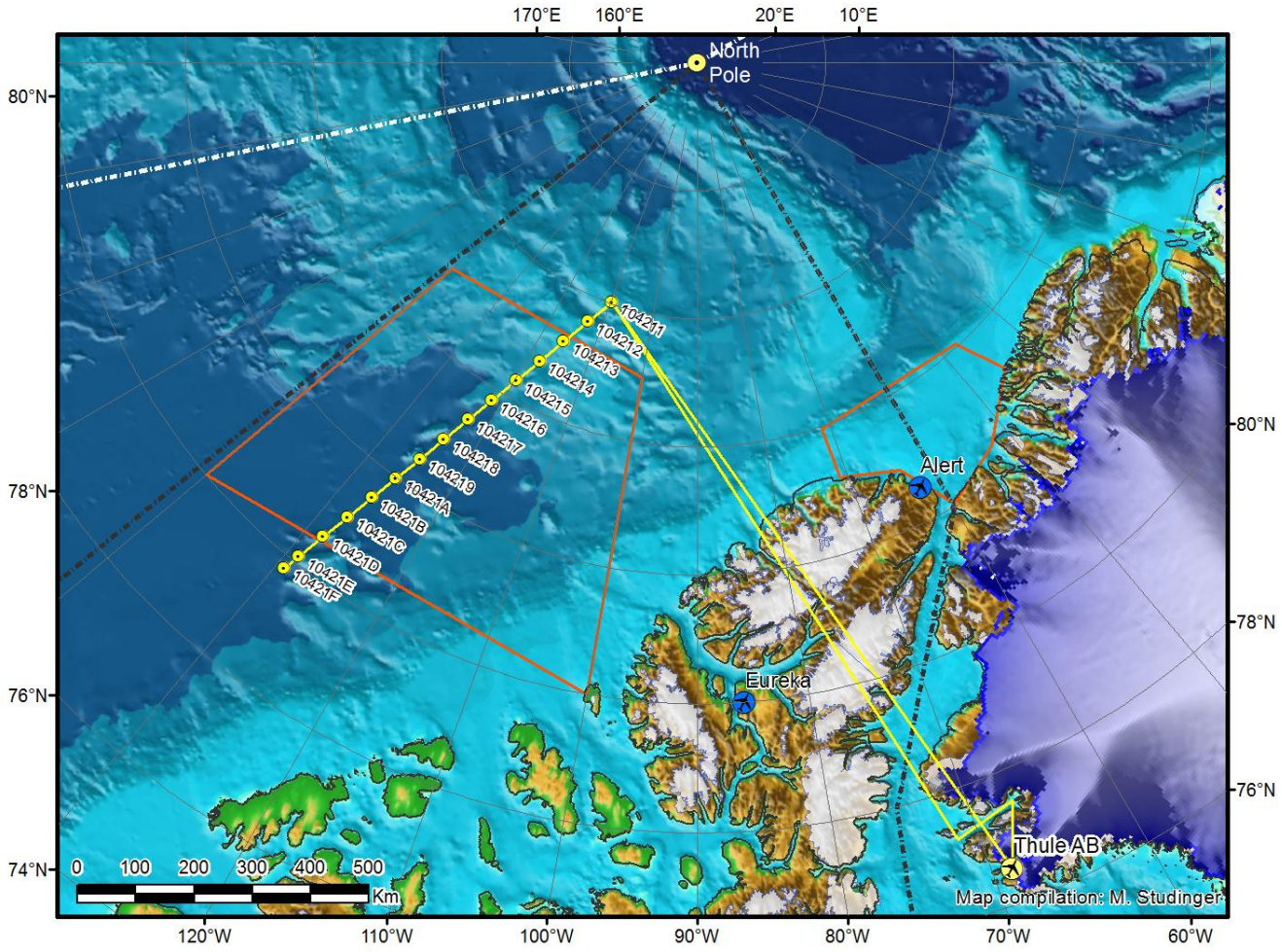

Figure 1: Today's sea ice mission plan (yellow). Red boxes are Wingham Box and temporary SAR mode mask north of Alert.