

Preliminary Science Flight Report

Operation IceBridge Arctic 2011



Flight: D12

Mission: Box 3 Flight 2

Flight Report Summary

Aircraft	LaRC B200 (NASA529)
Flight Number	D12
Flight Request	11-031 LaRC
Date	Monday, April 2, 2011 (Z)
Purpose of Flight	Monitor surface elevation in the southwestern part of Greenland, Complete interior grid lines and ICESat tracks in Box 3 grid (East of Nuuk), Test LVIS and B200 platforms ability to survey a glacier flow line on Inunguata Sermia.
Take off time	~1230 Zulu from Kangerlussuaq (BGSF)
Landing time	~1800 Zulu at Kangerlussuaq (BGSF)
Flight Hours	~5.5
Aircraft Status	Airworthy
Sensor Status	All installed sensors operational.
Significant Issues	None.
Accomplishments	<ul style="list-style-type: none"> • High-altitude survey (28,000 and 27,000 ft AGL) of the southwestern Greenland. • Completed all planned ICESat tracks in Box 3. • Complete Russell/Isunguata Sermia glacier flow line. • LVIS and camera were operated on the survey lines. • 2 Ramp passes at BGSF at 22,000 ft. • 2 Pitch and Roll maneuver over frozen fjord at BGSF
Geographic Keywords	Ice Sheet southwestern flank, East of Nuuk, Isunguata Sermia, Russell Glacier
ICESat/CryoSat Track	55
Repeat Mission	No

Science Data Report Summary

Instrument	Instrument Operational			Data Volume	Instrument Issues
	Survey Area	Entire Flight	High-alt. Transit		
LVIS	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	~60 GB	None
LVIS Camera	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	~15 GB	None
POS/AV	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2 GB	None

Mission Report (Shane Wake, Instrument Operator and Lora Koenig, Mission Scientist)

Today's mission was the second mission to be flown in Box 3 which is located east of Nuuk, with Kavdlunatsait and Frederikshab Isblink on the coast at the boxes northern and southern end, respectively. As shown in the satellite image (Figure 1) the region was clear of clouds during the flight. Today's flight was planned to survey 1 ICESat Track, 3 additional grid lines in the ice sheet interior portion of Box 3, one grid line in the middle of Box 4 on transit and the Isunguata Sermia flow line (Figure 2). The glacier flow line was flown to test the B200 platform and LVIS instrument's ability to sample a true glacier flow line, which contains more waypoints and curves than the normal grid line patterns flown by LVIS.

The B200 took off at ~1230 Zulu from Kangerlussuaq and completed a pitch and roll and a ramp pass at 22000 ft and a pitch and roll. The plane transited to the interior of Box 3 reaching the start of the survey area at 1325 Zulu and flew South on ICESat Track 55 for 150 nmi. This completed all the ICESat tracks in Box 3 and completed ICESat Track 55 from the north end of Box 4 to the south end of Box 2, a total distance of 356 nmi. The plane then headed north on grid line 302, South on 305 and north again on grid line 307 which crosses and parallels the 2000 m contour line. The plane continued north into Box 4 on grid line 407. The plane flew the Isunguata glacier flow line to test how well the B200 platform and LVIS instrument could sample a true glacier flow line as it approached Kangerlussuaq. It was difficult to keep the plane level enough throughout the large curve at the end of the flow line (Figure 2) and it is expected that with the long lever arm of LVIS flying at 28,000 ft that the exact flow line was not surveyed. This was a test and the data will be analyzed to better understand the utility of LVIS and the B200 platform to fly flow lines in the future.

The plane completed at ramp pass at 22000ft and a pitch and roll maneuver over the frozen fjord and landed at Kangerlussuaq at ~1800 Zulu.

Figure 3 below shows the coverage to date of the LVIS/ B200 grids line from this campaign.

Below are the detailed Flight notes from the Instrument Operator. Times from the Instrument Operator on the plane are in local Kangerlussuaq time (-2 hours from Z)

09:00 All three Javad's GPS receivers started (plane stationary), Applanix 510&610 turned on

10:20 System check, everything ok

10:28 Take off

10:35 Roll and Pitch Maneuvers

10:40 Ramp Pass over airport at 22000ft

11:25 First point on first line reached

14:36 Descent to 27000ft due to traffic (stayed at this altitude for rest of flight)

15:45 Ramp Pass over airport at 22000ft

16:03 Landed

16:11 Stationary on Ramp

*Still noise on Ch3 (Detector C) while radio transmitting

Individual instrument reports from experimenters on board the aircraft:

LVIS: Worked well, ~99% or better coverage, there was continued radio interference on transmit from some radio transmission. The interference should not cause any significant problem to the altimetry data.

LVIS Camera: Worked well, no issues.

POS/AV: Worked well, no issues.

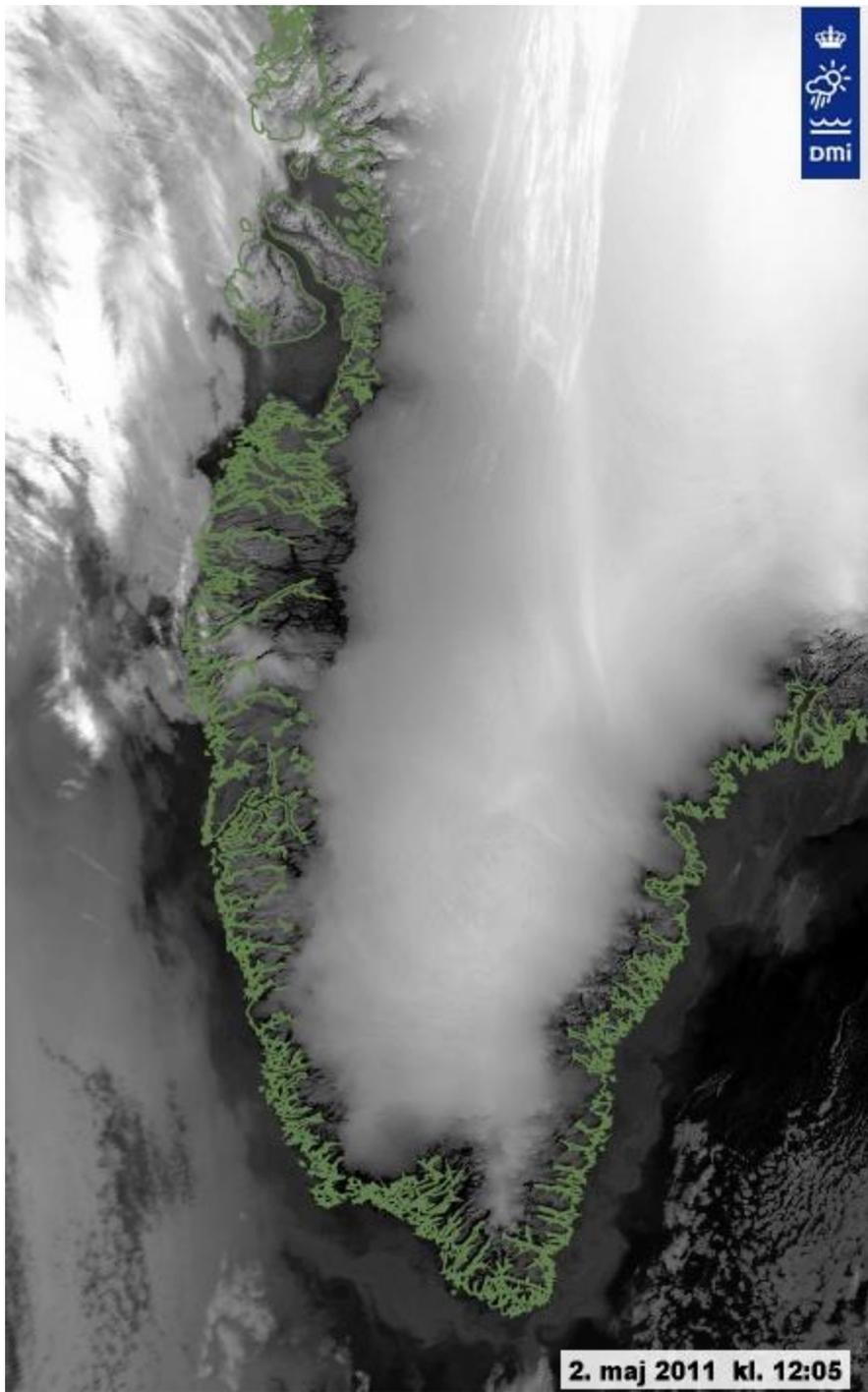


Figure 1: IR Satellite image taken during the flight.

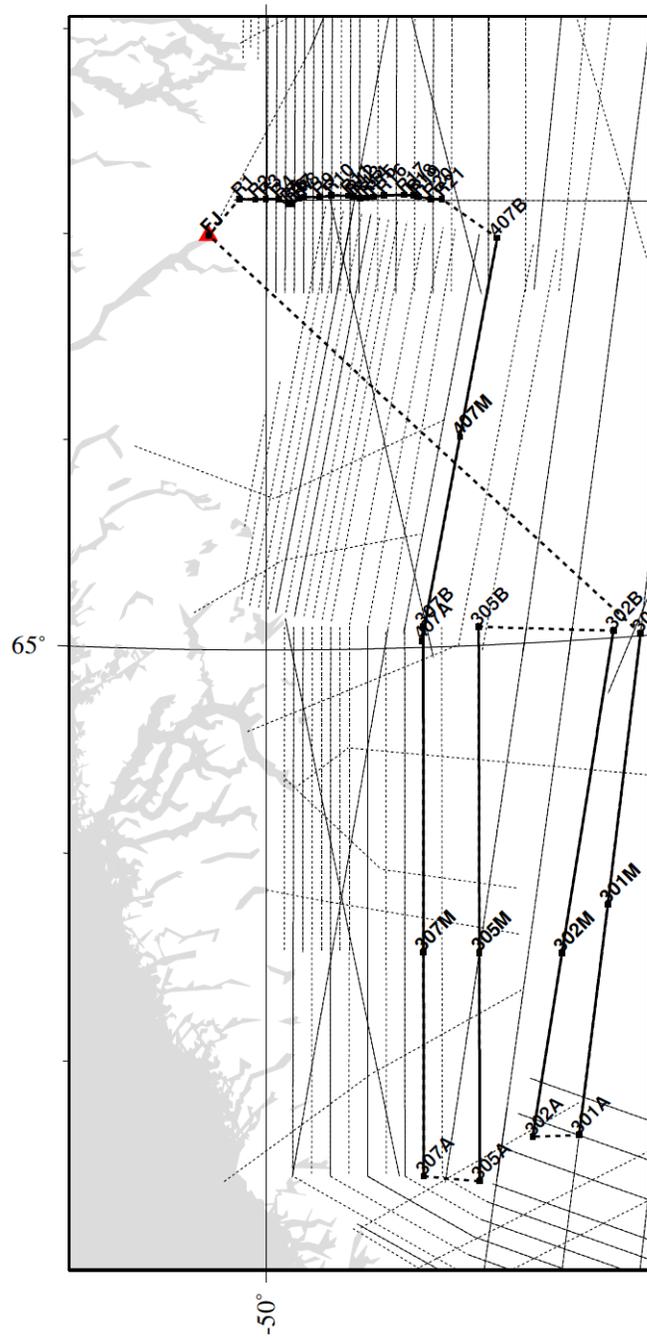


Figure 2: Proposed B200 flight plan for May 2, 2011 (Bold Black). Solid black lines are previously flown lines.

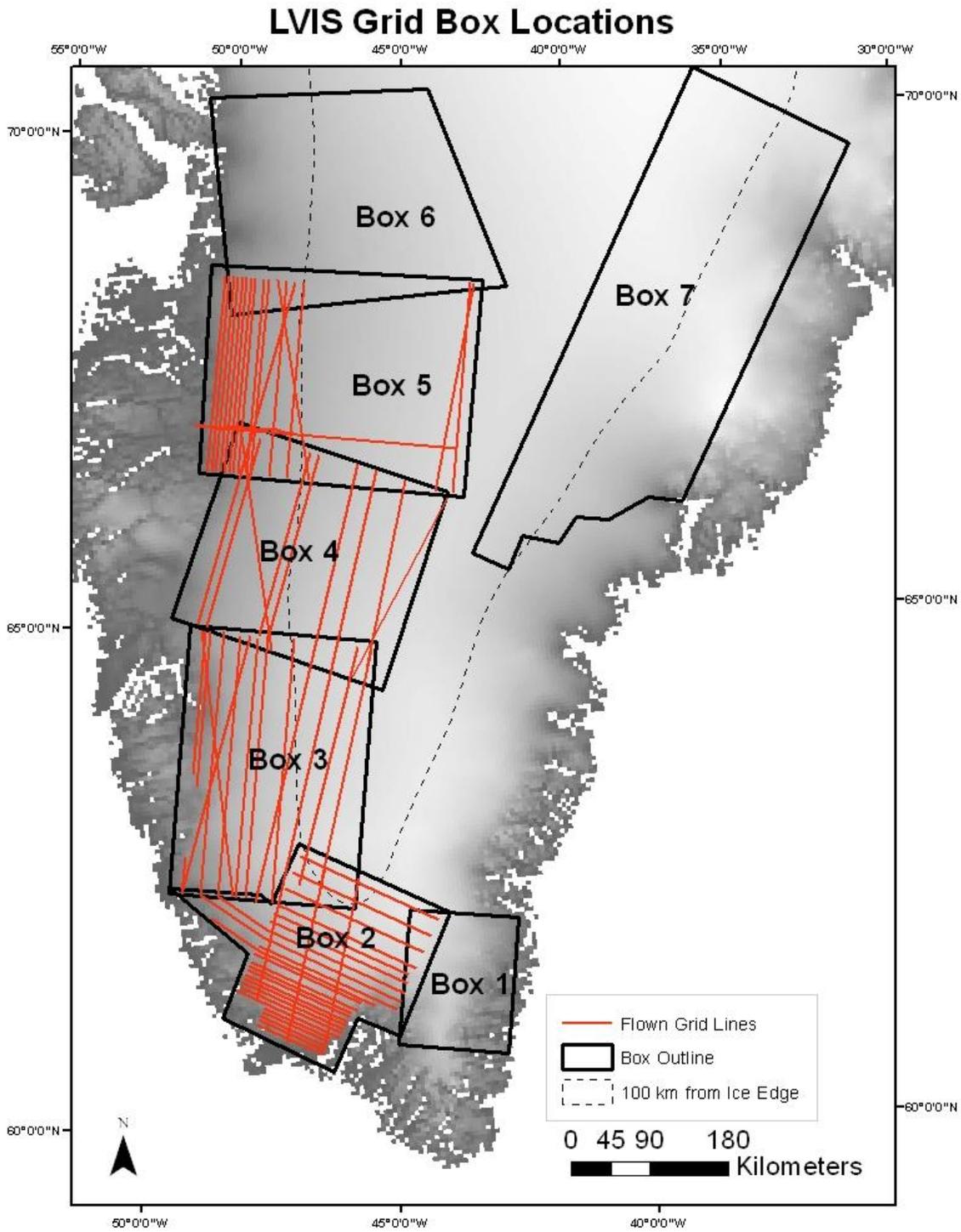


Figure 3: LVIS grid lines flown to date during the B200 Arctic 2011 Operation IceBridge Campaign.