

DC-8 11/07/12 - 11/08/12

Aircraft: [DC-8 - AFRC](#) (See full schedule)

Flight Number: 130120

Payload Configuration: OIB Antarctic 2012

Nav Data Collected: Yes

Total Flight Time: 11.5 hours

Submitted by: Frank Cutler on 11/08/12

Flight Segments:

From:	SCCI	To:	SCCI
Start:	11/07/12 16:31 Z	Finish:	11/08/12 04:03 Z
Flight Time:	11.5 hours		
Log Number:	138003	PI:	Michael Studinger
Funding Source:	Bruce Tagg - NASA - SMD - ESD Airborne Science Program		
Purpose of Flight:	Science		
Comments:	<p>Depart SCCI at 1631Z. Calibration ramp pass conducted at 1500 ft AGL from NW to SE at 1640Z. Climb to cruise altitude block of FL310 to FL350. Cross first low altitude science waypoint at 1829Z at 7000 ft while descending to 1500 ft AGL. Arrive at 1500 ft AGL at 1835Z. Fly rectangular ground track pattern over Weddell sea ice. Cross second low altitude waypoint at 2043Z, third waypoint at 2122Z. CryoSat-2 satellite overpass at 2148Z while on northerly track. Fly loop back pattern on northbound satellite track (used to estimate sea ice drift); reverse track southbound at 2222Z (est.) and northbound at 2241Z. Complete bowtie maneuver at original track reversal start point at 2301Z. Low altitude route flown at various altitudes from 700 ft to 1500 ft AGL depending on weather. Perform radar calibration pitch maneuver at 2000 ft AGL at 0038Z. Climb off data line (satellite track) at 0112Z due to darkness and airframe icing. Climb to FL350 to FL400 altitude block for transit to Punta Arenas. XChat with school children in classrooms across the U.S. Land SCCI at 0436Z.</p>		

Flight Hour Summary:

	138003
Flight Hours Approved in SOFRS	200
Total Used	215.7
Total Remaining	-15.7

138003 Flight Reports

Date	Flt #	Purpose of Flight	Duration	Running Total	Hours Remaining	Miles Flown
10/02/12	130101	Check	5	5	195	
10/03/12	130102	Check	3.2	8.2	191.8	
10/08/12 - 10/09/12	130103	Transit	10.7	18.9	181.1	
10/10/12	130104	Transit	3.2	22.1	177.9	
10/12/12	130105	Science	11.2	33.3	166.7	
10/13/12 - 10/14/12	130106	Science	10.9	44.2	155.8	
10/15/12	130107	Science	11.6	55.8	144.2	
10/16/12 - 10/17/12	130108	Science	11.8	67.6	132.4	
10/18/12	130109	Science	11.6	79.2	120.8	
10/19/12 - 10/20/12	130110	Science	10.2	89.4	110.6	
10/22/12	130111	Science	11.2	100.6	99.4	
10/23/12 - 10/24/12	130112	Science	11.3	111.9	88.1	
10/25/12	130113	Science	11.4	123.3	76.7	

10/27/12	130114	Science	11.4	134.7	65.3
10/28/12 - 10/29/12	130115	Science	11.3	146	54
11/01/12 - 11/02/12	130116	Science	12	158	42
11/02/12 - 11/03/12	130117	Science	10.6	168.6	31.4
11/04/12	130118	Science	11	179.6	20.4
11/06/12 - 11/07/12	130119	Science	9.4	189	11
11/07/12 - 11/08/12	130120	Science	11.5	200.5	-0.5
11/09/12	130121	Transit	3.3	203.8	-3.8
11/10/12 - 11/11/12	130122	Transit	11.6	215.4	-15.4
11/11/12	130123	Transit	0.3	215.7	-15.7

Flight Reports began being entered into this system as of 2012 flights. If there were flights flown under an earlier log number the flight reports are not available online.

Related Science Report:

OIB - DC-8 11/07/12 Science Report

Mission: OIB

Mission Summary:

F16 Weddell Sea - Endurance

Accomplishments

- Low-altitude survey (1,500 ft AGL) over sea ice in the Weddell Sea.
- Successful CryoSat-2 underflight at 21:48:33 UTC in the southern Weddell Sea
- Flew a loop back maneuver passing a 107-km-long sea ice profile (58 nm) 3 times in 30 minutes to estimate drift rate on the CryoSat-2 orbit in the central Weddell Sea.
- ATM, snow and Ku-band radars, gravimeter, and DMS were operated on the survey lines.
- Conducted pitch maneuvers for time stamp verification of snow and Ku-band radars.
- Conducted one ramp pass (1,500 ft AGL) at Punta Arenas airport after takeoff for ATM, snow and Ku-band radar instrument calibration.
- Hosted question and answer sessions on x-chat during the flight with two classrooms today in Kansas with 46 total students.
- In total during this campaign, we have had 48 chats reaching 678 students. Teachers and students have logged in from CA, KS, MD, MO, NH, NM, NY, PA, VA in the US and Santiago, Punta Arenas, Puerto Natales in Chile
- Satellite Tracks: CryoSat-2 descending orbit # 3704
- Repeat Mission: yes, with different CryoSat-2 line

Science Data Report Summary

Instrument	Operated	Data Volume	Instrument Issues/Comments
ATM	yes	59 GB	None
DMS	yes	116 GB	Failure of primary DMS system. Collected 14,000 frames*
Snow Radar	yes	707 GB	None. 5 mins of unusable data due to altitude changes.
Ku-band Radar	yes	707 GB	None. 5 mins of unusable data due to altitude changes.
MCoRDS	yes	N/A	MCoRDS not operated due to sea ice mission

KT-19	yes	20 MB	None
Gravimeter	yes	1.3 GB	None
DC-8 On-board Data	yes	40 MB	None

*The primary system (DMS #7) failed after 3/4 of the survey line. The backup system (DMS #9) was used resulting in a data gap of 4 minutes.

Mission Report (Michael Studinger, Mission Scientist)

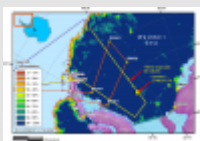
The decision to launch this morning was by far the most difficult weather call we had to make on this deployment. We spent almost 45 minutes at the weather office at the Punta Arenas airport looking at models and satellite imagery together with the forecaster. The issue was that two renditions of the GFS model indicated drastically different conditions in the survey area. The rendition we use showed good conditions for almost the entire survey line, with the exception of the north eastern part near the ice margin. The version at the met office predicted fog over large parts of the survey area – conditions that would have been hopeless for a survey flight. After studying the situation carefully we decided to launch. It turned out to be right decision. The entire survey line was cloud free, or clouds that we were able to underfly, with the exception of the north eastern part near the ice margin. When the clouds became too low for underflight we climbed to 4,200 ft and continued to collect radar data. Eventually, clouds, icing and darkness made it impossible to continue survey operations. At 01:12 between waypoints 3704S and 3704T near the ice margin we aborted the survey line and returned to Punta Arenas, having completed almost the entire line. The Weddell Sea is a very large area and forecast models frequently fail to predict the weather conditions in the area (Fig. 1). It is quite rare to have weather conditions over such a large area suitable for low-altitude survey flights and a window that allows a satellite underpass. CryoSat-2 passed overhead at 21:48:33 Z in the southern Weddell Sea. During the time of the satellite underpass we flew over a good mix of different types of sea ice, including leads, that will greatly help calibrating and validation the data sets (Fig 2). We also flew a loop back maneuver on the CryoSat-2 ground track in which we flew over a 107-km-long profile 3 times in 30 minutes to estimate sea ice drift along the CryoSat-2 orbit. All in all we had a very successful day in challenging conditions and we extremely satisfied to have completed the sea ice mission with the highest priority on this deployment.

We also hosted another question and answer session on today's flight. In total during this campaign, we have had 48 chats reaching 678 students. Teachers and students have logged in from CA, KS, MD, MO, NH, NM, NY, PA, VA in the US and Santiago, Punta Arenas, Puerto Natales in Chile.

ATM laser altimetry data collection	Time (UTC)	Hours
Begin low altitude data collection	18:30	
End low altitude data collection	00:40	6.2
Total		6.2

Images:

Trajectory map of today's science mission



[Read more](#)

Sea ice conditions during the time of the CryoSat-2 underpass



[Read more](#)

Submitted by: Michael Studinger on 11/08/12

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