# DC-8 10/18/12

**Aircraft:** DC-8 - AFRC (See full schedule)
**Flight Number:** 130109
**Payload Configuration:** OIB Antarctic 2012
**Nav Data Collected:** Yes
**Total Flight Time:** 11.6 hours
**Submitted by:** Frank Cutler on 10/20/12
**Flight Segments:**

| | | | |
|---|---|---|---|
| **From:** | SCCI | **To:** | SCCI |
| **Start:** | 10/18/12 12:00 Z | **Finish:** | 10/18/12 23:37 Z |
| **Flight Time:** | 11.6 hours | | |
| **Log Number:** | 138003 | **PI:** | Michael Studinger |
| **Funding Source:** | Bruce Tagg - NASA - SMD - ESD Airborne Science Program | | |
| **Purpose of Flight:** | Science | | |
| **Comments:** | Depart SCCI at 1200Z. Perform calibration ramp pass to the SE and overfly targets at 1207Z at 1500 ft AGL. Climb to cruise altitudes of between FL310 & FL350. Descend to 1500 ft AGL to cross first science waypoint at 1630Z. Perform passes over glacier area and overfly final waypoint at 1919Z. Perform pitch maneuvers for radar instruments calibration at times 1904Z and 1919Z. High altitude ATM data collected during transit segments. Climb to FL350 to FL400 block for transit to Punta Arenas. Xchat with school children in class rooms across USA during mission. Land SCCI at 2337Z. | | |

**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 10/18/12 Science Report

**Mission:** OIB
**Mission Summary:**

### F05 Recovery Glacier Channel #1

#### Accomplishments

- Low-altitude survey (1,500 ft AGL) along and across the Recovery Glacier and several subglacial lakes in the area.
- Completed all planned survey lines.
- Collected additional high altitude data en route to and from the survey area.
- ATM, MCoRDS, snow and Ku-band radars, gravimeter, and DMS were operated on the survey lines.
- Collected additional ATM and DMS high-altitude data over sea ice in the Bellingshausen Sea on transit home.
- Conducted pitch maneuvers for time stamp verification of snow and Ku-band radars.
- Conducted roll maneuvers for MCoRDS over sea ice from high altitude for instrument calibration.
- Conducted one ramp pass (1,000 ft AGL) at Punta Arenas airport after takeoff for DMS, ATM, snow and Ku-band radar instrument calibration.
- Hosted several question and answer sessions on x-chat during the flight with 106 students and 5 teachers from across the United States (3rd, 9th and 10th graders). The participating schools today were from California, New York, and New Hampshire.
- Satellite Tracks: ICESat orbits: 0112, 0350, 0335, 0082, 1302, 0181, 0171
- Repeat Mission: none

#### Science Data Report Summary

| Instrument | Operated | Data Volume | Instrument Issues/Comments |
|---|---|---|---|
| ATM | yes | 38 GB | None |
| DMS | yes | 66 GB | None |
| Snow Radar | yes | 314 GB | None |
| Ku-band Radar | yes | 314 GB | None |
| MCoRDS | yes | 550 GB | None |
| KT-19 | yes | 20 MB | None |
| Gravimeter | yes | 1.2 GB | None |
| DC-8 On-board Data | yes | 40 MB | None |

#### Mission Report (Michael Studinger, Mission Scientist)

We seem to have fallen into a pattern of changing our plans the day of the flight. Our primary mission plan for

today was the Bellingshausen #2 mission based on the AMPS model forecast we saw yesterday afternoon. The new model run we downloaded this morning indicated the same favorable conditions for the Bellingshausen Sea region (see Figure 2). Again, the forecast we got at the met office at the Punta Arenas airport was different. The airport uses the GSF model at a grid resolution of 120 km, but it seems that this model does a very decent job at predicting clouds over sea ice. The GSF model indicated scattered to broken clouds from the flight elevation down to the surface. Satellite images showed the predicted cloud cover in the area (Figure 3). We would have probably lost a good amount of data on this flight. The Bellingshausen #2 mission has only medium priority and we already have flown a sea ice mission in this area. Therefore we decided that is was not worth risking an only partially successful flight at this early point in the campaign when we still have high-priority mission plans with high regional priority available. We were confident that the Recovery Glacier area was cloud free and decided to launch for Recover Channel #2.

The Recovery Glacier and its tributaries drain a large part of the East Antarctic ice sheet. The system of ice streams reaches far inland, something that has been discovered only some 10 years ago from RADARSAT data. The entire area is very difficult to reach because it is far away from most of the research bases. We have very little data on the geometry of the channel in the bedrock below the ice stream. It is critical for ice flow models to have the shape and depth of the channel in order to model the flow of ice correctly. Also, if we want to calculate how much ice is flowing through this channel we need the ice velocity, which can be measured from space by satellites and the depth and shape of the channel in order to calculate the "flux". Knowing the flux is important in order to determine the so called mass balance of the ice sheet. We need to know how much ice the ice sheet is loosing through ice streams and glaciers. We started collecting data over Recovery Glacier last year. It was applauded by the community because everyone was desperate to get the data. We go back this year to densify our grid of flight lines and also do some repeat measurements. There are several small subglacial lakes in the area. These lakes drain and refill, something that can be determined by looking at how the ice surface elevation changes over time. This is why we go back this year. Together with the ICESat data and our data from last year we can construct a history of how often these lakes drain and refill.

The weather in the area was perfect (see Figure 4) and we completed all planned survey lines. We also collected high altitude data on transits to and from the survey area.

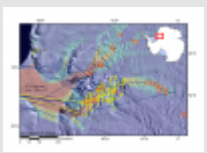
We also completed a ramp pass at Punta Arenas airport at 1,500 ft AGL after takeoff to ensure data collection during daylight for DMS and ATM instrument calibration and also for snow and Ku-band radar calibration.

We hosted again several question and answer sessions on x-chat during the flight with 106 students and 5 teachers from across the United States (3rd, 9th and 10th graders). The participating schools today were from California, New York, and New Hampshire. These x-chat sessions are organized and coordinated by NSERC's Emily Schaller. The Mission Tool Suite for this activity is programmed by Aaron Duley and others from NASA's Ames Research Center.

| ATM data collection | Time (UTC) | Hours |
|---|---|---|
| Begin high altitude data collection | 15:42 | |
| Begin low altitude data collection | 16:26 | 0.7 |
| End low altitude data collection | 19:20 | 2.9 |
| End high altitude data collection | 20:10 | 0.8 |
| Begin high altitude data collection | 20:52 | |
| End high altitude data collection | 21:20 | 0.5 |
| Total | | 4.9 |

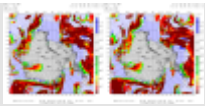
**Images:**

## Trajectory of today’s science mission over Recovery Glacier



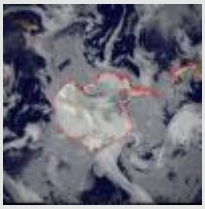
Read more

## AMPS model forecast



Read more

## Infrared satellite composite image



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## View of the Shackleton Range, Antarctica

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**Submitted by:** Michael Studinger on 10/20/12

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