

DATA MANAGEMENT PLAN: “CAREER: Chasing icebergs: quantifying iceberg motion and melt in Greenland’s glacial fjords”, 7/10/2015

The data from this project will conform to the policies outlined in NSF’s Grant Proposal Guide, and more specifically, to the Division of Ocean Sciences Sample and Data Policy (<http://www.nsf.gov/geo/geo-data-policies/oce>). Data collected here will include in situ physical oceanographic observations, iceberg positions, and multibeam sonar imagery. These data will be submitted to the appropriate data center and are described individually below. Model “data” from numerical ocean simulations have no formal data center for repository.

Identified Data Centers

- **National Oceanographic Data Center, NODC** (www.nodc.noaa.gov) serves as a national archive for oceanographic data, including the CTD profiles and velocity data proposed here.
- **National Snow and Ice Data Center, NSIDC** (www.nsidc.org) serves as an archive for general cryospheric data, and will be where we submit iceberg positions and shape data.
- **National Geophysical Data Center, NGDC** (www.ngdc.noaa.gov) archives geophysical and geological data. Multibeam sonar data will be deposited here.

General types of data to be collected:

- (1) GPS-derived positions of icebergs.
- (2) Digital elevation models (DEMs) of above water iceberg shape via aerial photography.
- (3) In situ, ship based hydrographic and velocity data, such as CTD and ADCP observations.
- (4) Multibeam sonar of seafloor (bathymetry) and of underwater iceberg shape.
- (5) Model generated results: 3-D fields of water properties and velocities.

Data Summaries

1. Positions of iceberg trackers

Data type: Observational

Archive: NSIDC

Description: We will generate text files of latitude, longitude, and time of all icebergs tracked with GPS units, both expendable and recovered units (both from helicopter and ship). Raw and processed text (ASCII) files will be submitted. The processed files will delete setup messages, any positions during times pre/post deployment, and bad data (as determined by quality control flags). Metadata will include time of deployment, instrument type, and how deployed. Positions acquired from the UNAVCO units will also be submitted to their repository (www.unavco.org).

2. DEMs of above water iceberg shape

Data type: Processed observations

Archive: NSIDC

Description: Aerial photography will generate thousands of images. These images will be run through an open-source Structure for Motion software program. The resulting DEMs for each iceberg will be submitted to the NSIDC. Metadata for these DEMs will include a list of the original images, the processing script from the SfM software, and the location of the iceberg.

3. CTD and ADCP ocean observations

Data type: Observational and processed

Archive: NODC

Description: In situ water column profiles collected from CTD (both ship-based and expendable probes, XCTDs) will be submitted to the NODC. Raw text files will contain the downcast data of each profile, decimated into 1 m bins. This conforms to oceanographic standards. Metadata will include the time and location of the cast, bottom depth (if recorded), instrument used, ship or

platform used, and quality flags. ADCP data will be processed by Teledyne RDI software. Quality controlled velocity time series will be converted into the open-source NetCDF format for submission to the NODC. We will conform to conventions listed by the Carbon Hydrographic Data Office (cchdo.ucsd.edu/) and CLIVAR (www.usclivar.org/resources/). Note that since we are using non-US research vessels, we do not fall under the Rolling Deck to Repository Program (R2R) supported by NSF-OCE.

4. Multibeam sonar

Data type: Observational and processed

Archive: NGDC

Description: We will collect multibeam sonar imagery of the seafloor and submerged iceberg shapes from the ship. These data will be handled initially using the Caris processing, combining precise GPS positions with the depth data. The processed final products will be submitted to the NGDC in the Reson sonar format, which is acceptable as it can be used by the open-source MB-system software. ASCII text files of position and depth will also be created and submitted. Metadata will include the original files processed, the time and platform used, and details on the processing software. We will also submit ASCII text files of the underwater iceberg shape to NSIDC, as it is a more appropriate place for ice-related data.

5. Model generated ocean fields

This is a great, creative solution to archiving data too large to be stored and shared via a data repository.

Data type: Simulated

Archive: University of Oregon Scholar's Bank *

Description: The suite of numerical model experiments proposed will generate 3-D fields of temperature, salinity, and velocity. These will be stored in NetCDF format conforming to the standards used by the MIT General Circulation Model (www.mitgcm.org). Metadata files for each model run will be placed in UO's online, open access repository, Scholar's Bank (<https://scholarsbank.uoregon.edu>). Metadata for these files include the model used, experiment type, model parameters, and model time step. The model history files will be stored locally on Sutherland's cluster and on UO's backup facilities, as these are extremely large files (TB's), and delivered upon request.

Data Formats, Storage, and Metadata

We provided brief descriptions of the data formats above. In all cases we will save the raw data on multiple hard drives, i.e., once collected and on campus, as well as on long-term backup storage drives. The University of Oregon Information Services department will aid in long-term storage on campus (<https://it.uoregon.edu/systems/services/storage>). We will strive to follow strict data protection measures to ensure the data is not corrupted. Metadata is extremely important and we will conform to the metadata standards established by the Federal Geographic Data Commission (FGDC), known as Content Standard for Digital Geospatial Metadata (CSDGM), Ver. 2, where applicable. In addition, we will supply metadata in the specified format required by each data center, e.g., ASCII files for NODC data.

Distribution and Archiving of Data

Sutherland will work together with collaborators, University support staff, graduate students, and the postdoc, to ensure the preservation and timely distribution of data, as described above for each data type. We will submit these data to the identified data centers above within two years of collection or before the project enddate, whichever is earlier (as stated by the NSF-OCE and PLR data policies). We will happily consider requests for data before this two-year date to facilitate collaboration, which is one of the main project goals.

*Note that the UO Libraries now has a data repository with Dataverse that is separate from Scholars Bank. To learn more, go to <https://researchguides.uoregon.edu/data-management/archiving>