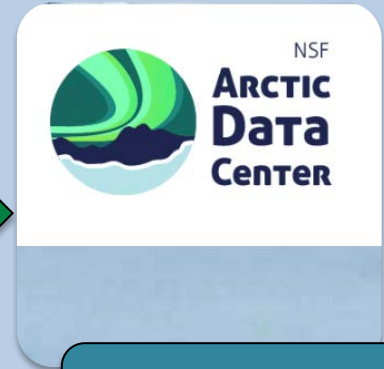
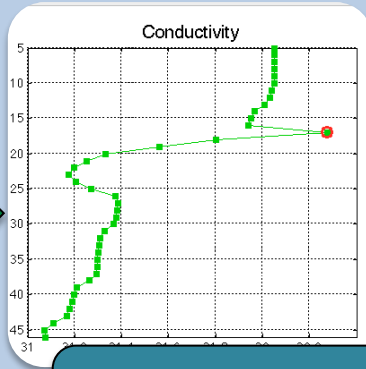
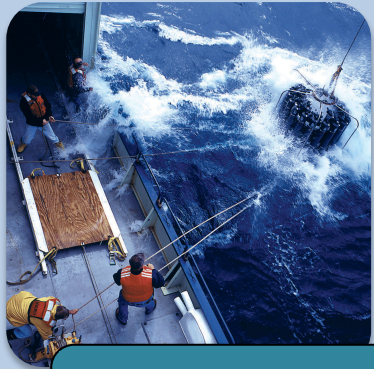
A photograph taken from the deck of a ship, looking out over a vast blue ocean. In the background, there are several mountain ranges under a clear blue sky with some light clouds. One mountain on the right has a snow-capped peak. The ship's deck, including a metal railing and a white structure, is visible in the foreground on the left side.

DBO data access and management:
Physical oceanography

Leah McRaven and Robert Pickart
Woods Hole Oceanographic Institution

DBO data collection: Physical Oceanography



Hunt down DBO physical oceanography data products

Assess quality and coverage of data

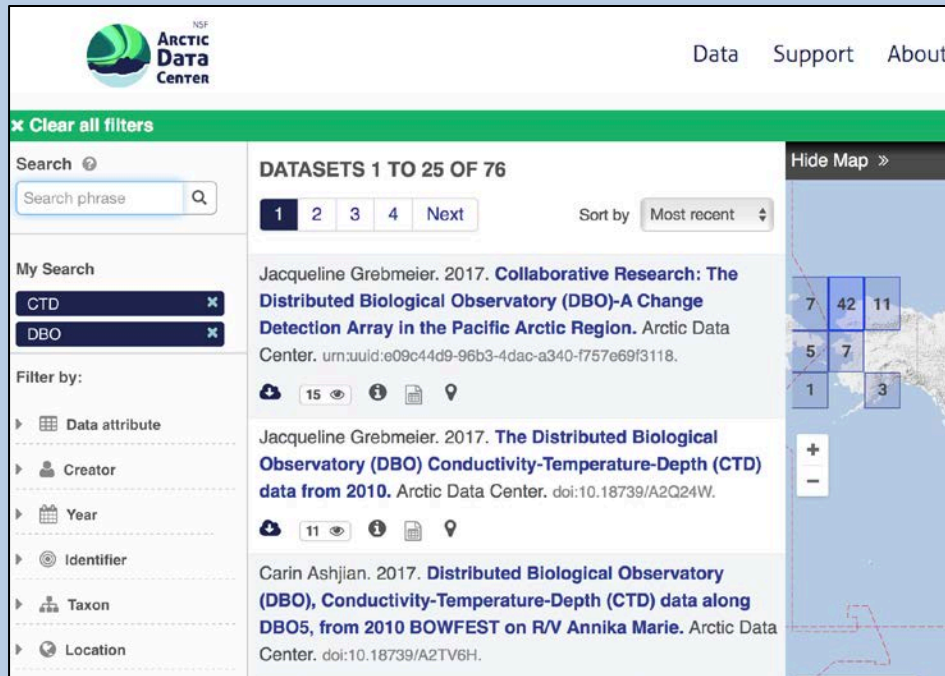
Create proper documentation of the data

Submit the data to the Arctic Data Center

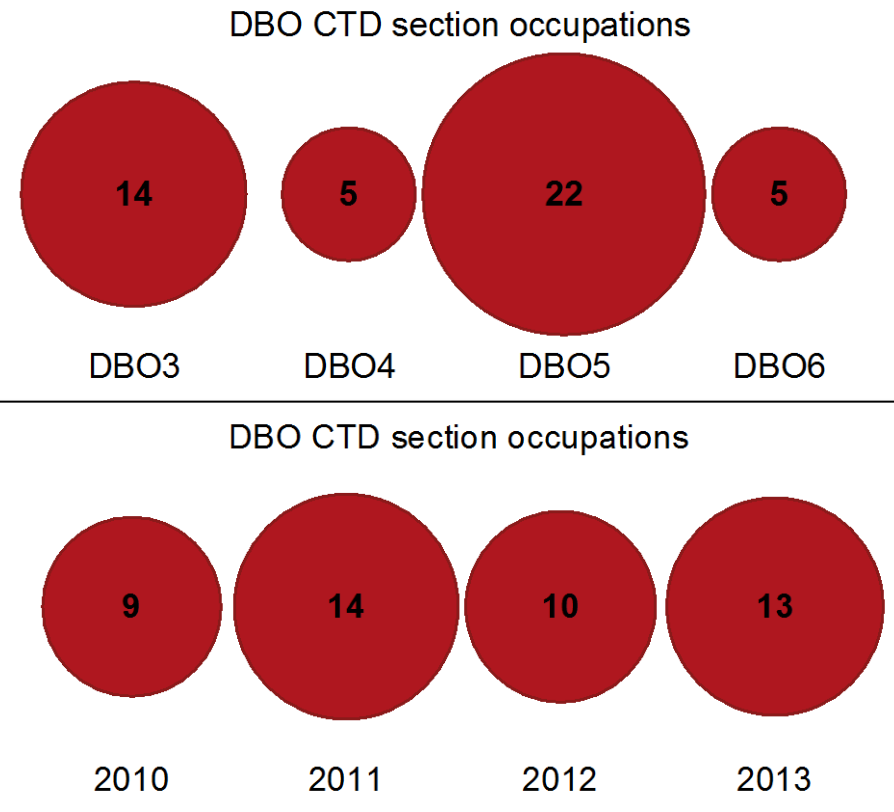
The screenshot shows the Arctic Data Center website with a navigation bar containing 'Data', 'Support', 'About', and a green 'Submit Data' button. A user profile for 'Leah McRaven' is visible in the top right. Below the navigation bar is a table listing various data products with columns for file name, 'More info', file type, size, and download count. Each row includes a 'Download' button with a cloud icon.

File Name	More info	File Type	Size	Downloads	Action
007.dcc	More info	plain text (.txt)	12 KB	1 download	Download
008.dcc	More info	plain text (.txt)	10 KB	1 download	Download
009.dcc	More info	plain text (.txt)	9 KB	1 download	Download
010.dcc	More info	plain text (.txt)	9 KB	1 download	Download
Station_table_DBO5.csv	More info	text/csv	442 B	1 download	Download
DBO_station_coordinates.csv	More info	text/csv	2 KB	17 downloads	Download
Submission_read_me_DBO5.pdf	More info	PDF	53 KB	76 downloads	Download
file_format_description.pdf	More info	PDF	102 KB	76 downloads	Download

DBO products: Physical Oceanography



The screenshot shows the Arctic Data Center website interface. At the top left is the NSF Arctic Data Center logo. Navigation links for 'Data', 'Support', and 'About' are at the top right. A green bar contains a 'Clear all filters' button. Below this is a search bar with a 'Search phrase' input field and a magnifying glass icon. To the right of the search bar, it says 'DATASETS 1 TO 25 OF 76'. There are pagination buttons for '1', '2', '3', '4', and 'Next', along with a 'Sort by' dropdown menu set to 'Most recent'. On the left side, there are sections for 'My Search' with filters for 'CTD' and 'DBO', and a 'Filter by:' section with expandable categories: 'Data attribute', 'Creator', 'Year', 'Identifier', 'Taxon', and 'Location'. The main content area displays three dataset entries, each with a map thumbnail showing the Arctic region. The first entry is by Jacqueline Grebmeier (2017) titled 'Collaborative Research: The Distributed Biological Observatory (DBO)-A Change Detection Array in the Pacific Arctic Region'. The second is also by Jacqueline Grebmeier (2017) titled 'The Distributed Biological Observatory (DBO) Conductivity-Temperature-Depth (CTD) data from 2010'. The third is by Carin Ashjian (2017) titled 'Distributed Biological Observatory (DBO), Conductivity-Temperature-Depth (CTD) data along DBO5, from 2010 BOWFEST on R/V Annika Marie'.



Migration to the new web database

- <https://arcticdata.io>
- 2010-2012 available (2013 ready to submit)

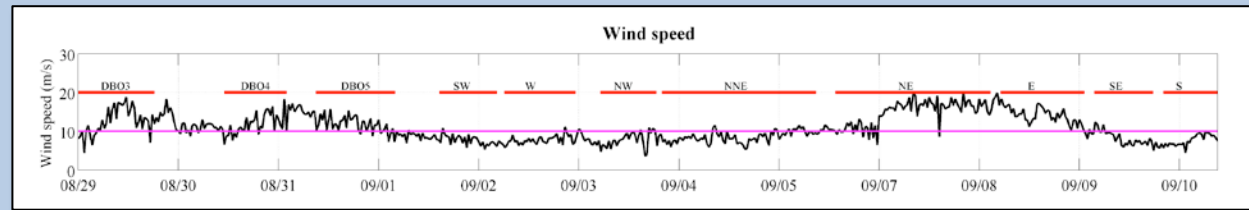
Publications

- **DBO5:** Water properties, heat and volume fluxes of Pacific water in Barrow Canyon during summer 2010 (*Itoh et al., 2015*)
- **DBO5:** Seasonal to Mesoscale Variability of Water Masses and Atmospheric Conditions in Barrow Canyon, Chukchi Sea (*Pickart et al. 2017*)
- **DBO6:** Characteristics and Dynamics of wind-driven upwelling in the Alaskan Beaufort Sea based on six years of mooring data (*Lin et al. 2017*)

DBO data quality: Physical Oceanography

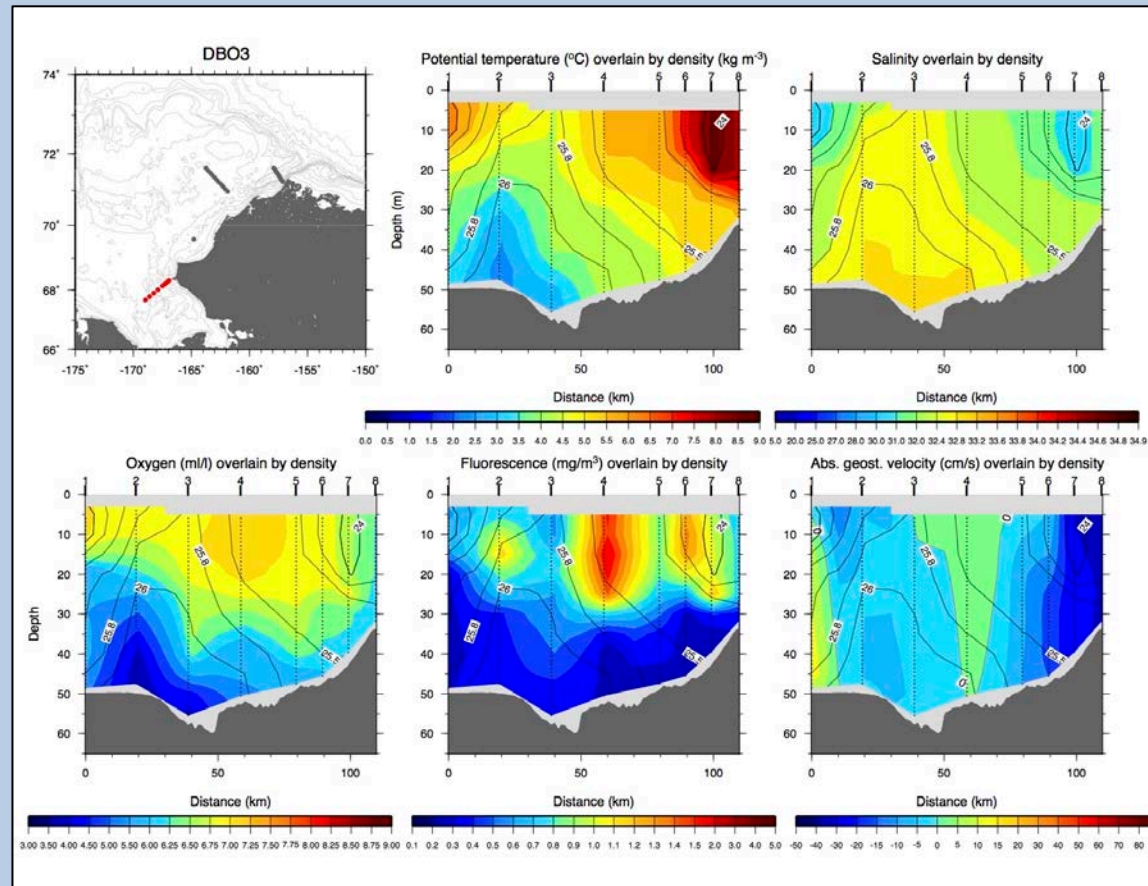
Sampling design

- Close to complete DBO sections
- Completing stations with minimum breaks
- Grad students!



CTD Instrumentation

- Ensuring recent calibration dates
- Asking for dual sensors
- Time is more important than pin pointing exact station locations



Shipboard ADCP

- We are no longer quality controlling this for DBO, *but* data are automatically saved to R2R
- **Please ensure the system is turned ON**
- 10 kts or less steaming along DBO lines

DBO data submission: Physical Oceanography

The screenshot displays four PDF pages related to DBO data submission. The top-left page, 'DBO_Station_Coordinates.pdf', contains a table of station coordinates. The top-right page, 'Station_table_DBO3.pdf', lists station data with corresponding file names. The middle-left page, 'Submission_read_me_DBO3.pdf', provides submission details. The bottom page, 'file_format_description_hex.pdf', describes file formats.

DBO Region	DBO Station	Latitude	Longitude
DBO1	DBO1.1	62.010	-175.060
DBO1	DBO1.2	62.050	-175.210
DBO1	DBO1.3	62.219	-174.877
DBO1	DBO1.4	62.390	-174.570
DBO1	DBO1.5	62.468	-174.083
DBO1	DBO1.6	62.560	-173.550
DBO1	DBO1.7	62.787	-173.500

Station	Latitude	Longitude	Corresponding File
03.1	68.300	-166.935	rusalca11071.hex
03.2	68.242	-167.122	rusalca11069.hex
03.3	68.185	-167.308	rusalca11068.hex
03.4	68.128	-167.495	rusalca11067.hex
03.5	68.013	-167.867	rusalca11066.hex
03.6	67.898	-168.235	rusalca11065.hex
03.7	67.783	-168.602	rusalca11064.hex
03.8	67.670	-168.960	rusalca11061.hex - rusalca11063
03.9	67.534	-169.306	station not occupied
03.10	67.432	-169.596	station not occupied
03.11	67.311	-169.941	station not occupied
03.12	67.190	-170.285	station not occupied
03.13	67.063	-170.637	station not occupied
03.14	66.935	-170.992	station not occupied

Submission Read Me

Submission Title: Distributed Biological Observatory (DBO), Conductivity-Temperature-Depth (CTD) data along DBO3, from 2011 RUSALCA on R/V Kromov.

Summary:

Chief Scientist: Rebecca Woodgate (woodgate@apl.washington.edu)
Associated Program: Russian-American Long-term Census of the Arctic (RUSALCA)
Ship: R/V Kromov
Cruise:
Dates: Jul 18 – 19, 2011
DBO line: DBO3

Description:

The Pacific sector of the Arctic Ocean is experiencing major reduction and increases in sea surface temperatures. One of the key uncertainties marine ecosystem will respond to seasonal shifts in the timing of spring delays in fall sea ice formation. Variations in upper ocean water hydro production, pelagic-benthic coupling and sediment carbon cycling are temperature change. To more systematically track the broad biological and associated environmental change, an international consortium of coordinated "Distributed Biological Observatory" (DBO) that includes measurements at multiple trophic levels, along with satellite and moor DBO currently focuses on five regional biological "hotspot" locations that allows for consistent sampling and monitoring at five biologically a latitudinal gradient: DBO 1 (SLIP)-south of St. Lawrence Island (SLI) of SLI, DBO3 (southern Chukchi Sea), DBO4-NE Chukchi Sea, and DBO5-NE Chukchi Sea.

This data has been collected and submitted as part of the Distributed Biological Observatory (DBO) program. Data were originally collected as part of the Russian-American Long-term Census of the Arctic (RUSALCA) project, headed by Rebecca Woodgate (woodgate@apl.washington.edu). Conductivity-Temperature-Depth (CTD) data were collected on the R/V Kromov. During this cruise, data were taken along the hydrography transect, DBO3. There are 22 hex and bl data files containing parameters: pressure, depth, temperature, conductivity, oxygen, fluorescence, and potential temperature.

Methods:

CTD casts were performed using a ship-provided Sea Bird 911p (<http://www.seabird.com/sbe911plus-ctd>) configured to measure conductivity, oxygen current, and other variables. The CTD data were collected on the SBE Deck Unit providing demodulated data to a personal computer (<http://www.seabird.com/software/seasave-v7>) acquisition software.

Description of Sea-Bird file formats

The hex, bl, and XMLCON file formats are commonly used by Seabird Electronics for recording Conductivity-Temperature-Depth (CTD) data. The following is an excerpt from the Sea-Bird Electronics data processing manual (http://www.seabird.com/sites/default/files/documents/SBEDataProcessing_7.26.4.pdf), which describes each file format. Please refer to the Sea-Bird Electronics website for more information (<http://www.seabird.com/software/sbe-data-processing>).

hex file

Hexadecimal raw data file created by Seasave from real-time data stream from SBE 9p (Seasave > 7.0), 16, 16plus, 16plus V2, 19, 19plus, 19plus V2, 21, 25, 25plus, or 49. Data uploaded from memory of SBE 16, 16plus, 16plus-IM, 16plus V2, 16plus-IM V2, 17p (used with SBE 9plus CTD), 19, 19plus, 19plus V2, 21, 25, or 37. Converted (engineer units) data file created by Seasave from real-time data stream from SBE 45. File includes header information.

bl file

Bottle log information output bottle file, containing bottle firing sequence number and position, date, time, and beginning and ending scan numbers for each bottle closure. Beginning and ending scan numbers correspond to approximately 1.5-second duration each bottle. Seasave writes information to file each time bottle fire confirmation is received from SBE 32 Carousel Water Sampler or SBE 55 ECO Water Sampler or (only when used with SBE 911plus) G.O. 1016 Rosette. File can be used by Data Conversion.

XMLCON file

XMLCON configuration files, written in XML format, were introduced with SBE Data Processing and Seasave 7.20a. A .xmlcon file uses XML tags to describe each line in the configuration file. Versions 7.20a and later allow you to open a .con or a .xmlcon file, and to save the configuration to a .con or a .xmlcon file. Instruments introduced after 7.20a are compatible only with .xmlcon files. Please refer to the Sea-Bird Electronics website for more information (<http://www.seabird.com/software/sbe-data-processing>).

Data collection

- Do the data exist?
- If possible, document when occupying a DBO station (log sheet or header)

Data submission

- Included in submission:
 - The data in acceptable format
 - Metadata: parent program, file formats, etc.
 - Description of the DBO program

Formats

- Seabird CNV files are best
- Please no Excel!

Moving Forward

- Please talk to me!
- ltrafford@whoi.edu



Thank You!

