Cruise tracks from USCGC Healy HLY1003, HLY1103, HLY1203, HLY1303 in the Bering, Beaufort and Chukchi seas from 2010 to 2013 (OA - Western Arctic project)

Website: https://www.bco-dmo.org/dataset/525541
Version: 22 August 2014
Version Date: 2014-08-22

Project
» Observation and Prediction of Ocean Acidification in the Western Arctic Ocean - Impacts of Physical and Biogeochemical Processes on Carbonate Mineral States (OA - Western Arctic)

Programs
» Science, Engineering and Education for Sustainability NSF-Wide Investment (SEES): Ocean Acidification (formerly CRI-OA) (SEES-OA)
» NACP-OCB Coastal Synthesis (NACP-OCB Coastal)
» Arctic Observing Network (AON)

Contributors	Affiliation	Role
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Dataset Description

Cruise tracks generated from R2R Archive file
Cruise Id, Date/Time UTC, Lat, Lon, SOG, COG
1 minute fixes

BCO-DMO Note: HLY1303 cruise track generated from u/w discrete sample data
Navigation products are not yet available from R2R
srg/23Feb2015

Methods & Sampling

Generated from R2R archive file by BCO-DMO staff

Data Processing Description

Generated from R2R archive file by BCO-DMO staff

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Data Files

File
CruiseTracks.csv (Comma Separated Values (.csv), 6.19 MB) MD5:e8590f7f5df778f887a6033370b5fced Primary data file for dataset ID 525541

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Parameters

Parameter	Description	Units
CruiseId	Official UNOLS cruise id	text
ISO_DateTime_UTC	ISO formatted UTC Date and Time	YYYY-MM-DDTHH:MM:SSZ
Latitude	Latitude Position (South is negative)	decimal degrees
Longitude	Longitude Position (West is negative)	decimal degrees
SOG	Instantaneous Speed-over-ground	meters/sec
COG	Instantaneous Course-over-ground [deg. clockwise from North]	decimal degrees

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Instruments

Dataset-specific Instrument Name	GPS
Generic Instrument Name	Global Positioning System Receiver
Dataset-specific Description	Navigation Equipment HEALY is outfitted with Sperry Marine's Voyage Management System (VMS). This system utilizes multiple heading, position, environmental, and navigation inputs to steer the ship along a desired course. Currently, HEALY has the following GPS receivers: GPS, DGPS, P-Code GPS, and 3-D GPS. Heading inputs include two gyrocompasses and the 3-D GPS heading information. The ship is also outfitted with an electronic magnetic compass. A Dynamic Positioning System (DPS) is available for station keeping and slow speed transits (towing, dredging). HEALY's DPS attempts to do with props and a bowthruster what smaller ships do with fore and aft thrusters, so it has limitations. It was designed and built by ALSTOM and integrates the use of propellers, rudders, and the bow thruster to accomplish ship movement. DPS Limitations: At best heading in openwater, in a 20 kt wind, seas with a significant wave height of 4.0 feet and a 1 knot currents, HEALY shall be capable of maintaining a position of +/- 150 feet or 3% of water depth (whichever is greater) from a point or trackline and maintain a heading of +/- 5 degrees. The seas and wind shall be from the same direction, with the current from less the 45 degrees off the wind. Antenna Layout Top View PDF
Generic Instrument Description	The Global Positioning System (GPS) is a U.S. space-based radionavigation system that provides reliable positioning, navigation, and timing services to civilian users on a continuous worldwide basis. The U.S. Air Force develops, maintains, and operates the space and control segments of the NAVSTAR GPS transmitter system. Ships use a variety of receivers (e.g. Trimble and Ashtech) to interpret the GPS signal and determine accurate latitude and longitude.

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Deployments

HLY1003

Website	https://www.bco-dmo.org/deployment/523770
Platform	USCGC Healy
Start Date	2010-09-07
End Date	2010-09-27
Description	Original cruise data are available from the NSF R2R data catalog USCGC Healy Science-Technical Support

HLY1103

Website	https://www.bco-dmo.org/deployment/523773
Platform	USCGC Healy
Start Date	2011-10-03
End Date	2011-10-27
Description	Original cruise data are available from the NSF R2R data catalog USCGC Healy Science-Technical Support

HLY1203

Website	https://www.bco-dmo.org/deployment/523775
Platform	USCGC Healy
Start Date	2012-10-05
End Date	2012-10-25
Description	Original cruise data are available from the NSF R2R data catalog USCGC Healy Science-Technical Support

HLY1303

Website	https://www.bco-dmo.org/deployment/523781
Platform	USCGC Healy
Report	http://dmoserv3.whoi.edu/data_docs/OA_Western_Arctic/Healy_2013_Final_Cruise_Report-NO_FOUO.pdf
Start Date	2013-10-05
End Date	2013-10-30
Description	Original cruise data are available from the NSF R2R data catalog USCGC Healy Science-Technical Support **Methods & Sampling** The nav file for HLY1303 was generated from the underway discrete sample data. R2R has not yet produced the nav products for HLY1303 srg/23Feb2015 **Processing Description** The nav file for HLY1303 was generated from the underway discrete sample data. R2R has not yet produced the nav products for HLY11303 srg/23Feb2015

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Project Information

Observation and Prediction of Ocean Acidification in the Western Arctic Ocean - Impacts of Physical and Biogeochemical Processes on Carbonate Mineral States (OA - Western Arctic)

Website: https://www.sfos.uaf.edu/oarc/

Coverage: Beaufort and Chukchi Seas

Extracted from the NSF award abstract:

The investigators will assess ocean acidification in the western Arctic Ocean, using ship time that is currently scheduled for annual mooring turnarounds in the Beaufort Sea. On these cruises, in September of 2011-2013, the investigators will collect samples for measurement of carbonate system parameters, inorganic nutrients, dissolved oxygen, oxygen isotopes, and oxygen/argon ratios, as well as continuous underway measurements of dissolved oxygen, oxygen/argon ratios, and pCO2. These data will be used to gain insights and perspectives into the extent of ocean acidification in the western Arctic Ocean; the key physical, chemical, and biological processes influencing the saturation states of aragonite and calcite; and potential impacts to pelagic and benthic communities. Water column observations will be synthesized with data from the associated NSF AON (Arctic Observing Network)-funded mooring, including temperature, salinity, nitrate, oxygen, pCO2, and pH, as well as carbon and hydrographic data collected on other cruises in the region. During each field season the PI will travel to several native villages to discuss the potential impacts of ocean acidification at town meetings and in classrooms. The work will contribute to carbon cycle studies coordinated under a variety of science plans and implementation structures that aim to establish accurate estimates of carbon budgets and fluxes and the

underlying mechanisms that regulate them.

NOTE: Rolf Sonnerup is a former Principal Investigator (PI) on award PLR_1040694, Laurie Juranek is a former Co-PI, who is now PI for this award.

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Program Information

Science, Engineering and Education for Sustainability NSF-Wide Investment (SEES): Ocean Acidification (formerly CRI-OA) (SEES-OA)

Website: https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503477

Coverage: global

NSF Climate Research Investment (CRI) activities that were initiated in 2010 are now included under Science, Engineering and Education for Sustainability NSF-Wide Investment (SEES). SEES is a portfolio of activities that highlights NSF's unique role in helping society address the challenge(s) of achieving sustainability. Detailed information about the SEES program is available from NSF (https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=504707).

In recognition of the need for basic research concerning the nature, extent and impact of ocean acidification on oceanic environments in the past, present and future, the goal of the SEES: OA program is to understand (a) the chemistry and physical chemistry of ocean acidification; (b) how ocean acidification interacts with processes at the organismal level; and (c) how the earth system history informs our understanding of the effects of ocean acidification on the present day and future ocean.

Solicitations issued under this program:
NSF 10-530, FY 2010-FY2011
NSF 12-500, FY 2012
NSF 12-600, FY 2013
NSF 13-586, FY 2014
NSF 13-586 was the final solicitation that will be released for this program.

PI Meetings:
1st U.S. Ocean Acidification PI Meeting(March 22-24, 2011, Woods Hole, MA)
2nd U.S. Ocean Acidification PI Meeting(Sept. 18-20, 2013, Washington, DC)
3rd U.S. Ocean Acidification PI Meeting (June 9-11, 2015, Woods Hole, MA – Tentative)

NSF media releases for the Ocean Acidification Program:

Press Release 10-186 NSF Awards Grants to Study Effects of Ocean Acidification

Discovery Blue Mussels "Hang On" Along Rocky Shores: For How Long?

Discovery nsf.gov - National Science Foundation (NSF) Discoveries - Trouble in Paradise: Ocean Acidification This Way Comes - US National Science Foundation (NSF)

Press Release 12-179 nsf.gov - National Science Foundation (NSF) News - Ocean Acidification: Finding New Answers Through National Science Foundation Research Grants - US National Science Foundation (NSF)

Press Release 13-102 World Oceans Month Brings Mixed News for Oysters

Press Release 13-108 nsf.gov - National Science Foundation (NSF) News - Natural Underwater Springs Show How Coral Reefs Respond to Ocean Acidification - US National Science Foundation (NSF)

Press Release 13-148 Ocean acidification: Making new discoveries through National Science Foundation research grants

Press Release 13-148 - Video nsf.gov - News - Video - NSF Ocean Sciences Division Director David Conover answers questions about ocean acidification. - US National Science Foundation (NSF)

Press Release 14-010 nsf.gov - National Science Foundation (NSF) News - Palau's coral reefs surprisingly resistant to ocean acidification - US National Science Foundation (NSF)

Press Release 14-116 nsf.gov - National Science Foundation (NSF) News - Ocean Acidification: NSF awards $11.4 million in new grants to study effects on marine ecosystems - US National Science Foundation (NSF)

NACP-OCB Coastal Synthesis (NACP-OCB Coastal)

Website: http://www.nacarbon.org/cgi-nacp/working_groups/wg.pl?synthesis=1#coastal

Coverage: global coastal zones

In late June 2008, the OCB Project Office sent out a call for participation in the Coastal Synthesis Activity as part of the North American Carbon Program (NACP) Interim Synthesis Activities. The objective of this activity is to stimulate the synthesis and publication of recent observational and modeling results on carbon cycle fluxes and processes along the North American continental margin. The current state of knowledge of the magnitude, spatial distribution, and inter-annual variability of carbon sources and sinks in coastal waters is incomplete. Thus, the goal of this activity is to synthesize individual, small-scale studies across broader spatial and temporal scales to improve quantitative assessments of the North American coastal carbon cycle. Because the coastal oceans have important and complex linkages with terrestrial, atmospheric, and open ocean biogeochemical cycles, we encourage the participation of researchers focused on both organic and inorganic carbon, as well as nitrogen and phosphorous cycle topics related to carbon balance and related issues such as hypoxia impacts on continental margins.

Planning for the coastal synthesis activity was initiated during a breakout session at the 2008 OCB Summer Science Workshop. The proposed coastal synthesis activity is initially broken into five U.S. geographical sub-regions (Atlantic Coast, Pacific Coast, Gulf Coast, Arctic Coast, and Laurentian Great Lakes), with leads identified for each region. Researchers were encouraged to consider ongoing projects and think about how those projects might relate to one or more of the regional syntheses. Additional information available at the NACP Web site (http://www.nacarbon.org/cgi-bin/working_groups/wg.pl) includes a list of active NACP Interim Synthesis activities and working groups.

The majority of data sets uploaded for this project will be synthesis data sets, representing an integration of previously compiled data from the various sub-regions.

Related Links:

NACP Coastal Synthesis Web Site (includes regional links)

Arctic Observing Network (AON)

Website: http://www.arcus.org/search-program/aon

Coverage: Arctic Ocean

The AON is envisioned as a system of atmospheric, land- and ocean-based environmental monitoring capabilities--from ocean buoys to satellites--that will significantly advance our observations of Arctic environmental conditions. AON is an integral part of the interagency U.S. government initiative--the Study of Environmental Arctic Change (SEARCH) program, an NSF initiative growing out of the International Polar Year (IPY) to improve observational capabilities in the Arctic and leave a long-term legacy for the benefit of science and society. Data from the AON will contribute to scientific research leading to (1) increased knowledge and understanding of the regional and global causes and consequences of present-day environmental arctic

change, (2) scenarios for and prediction of the course of future arctic change and its regional and global consequences, and (3) the development of adaptive responses to arctic change.

AON currently consists of 51 projects funded by the NSF Office of Polar Programs. The AON projects fall into the following SEARCH Implementation Plan categories: Atmosphere; Ocean and Sea Ice; Hydrology/Cryosphere; Terrestrial Ecosystems; and Human Dimensions.

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Funding

Funding Source	Award
NSF Arctic Sciences (NSF ARC)	PLR-1041102

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