Cruise track from RVIB Nathaniel B. Palmer NBP1201 in the Ross Sea from 2011-2012 (PRISM-RS project)

Website: https://www.bco-dmo.org/dataset/511189
Version: 2014-04-14

Project
» Processes Regulating Iron Supply at the Mesoscale - Ross Sea (PRISM-RS)

Programs
» Ocean Carbon and Biogeochemistry (OCB)
» Integrated Marine Biogeochemistry and Ecosystem Research -US (IMBER-US)

Contributors	Affiliation	Role
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Dataset Description

Cruise track data was downloaded from Marine Geoscience Data System:
http://www.marine-geo.org/tools/search/Files.php?data_set_uid=18647

More underway data is available at: http://www.marine-geo.org/link/entry.php?id=NBP1201

ISODateTime_UTC was calculated and added.

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Data Files

File
cruisetrack_NBP1201.csv (Comma Separated Values (.csv), 4.22 MB) MD5:1e73f0cb78a393559a2440050697a83b Primary data file for dataset ID 511189

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Parameters

Parameter	Description	Units
segment	cruise segment	integer
date	UTC date	mm/dd/yyyy
time	UTC time	hhmm
ISO_DateTime_UTC	Date/Time (UTC) ISO formatted	yyyy-mm-mmThh:mm:ss.00Z
lat	latitude; north is positive	decimal degrees
lon	longitude; east is positive	decimal degrees

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Instruments

Dataset-specific Instrument Name	GPS
Generic Instrument Name	Global Positioning System Receiver
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

NBP1201

Website	https://www.bco-dmo.org/deployment/506350
Platform	RVIB Nathaniel B. Palmer
Report	http://data.bco-dmo.org/PRISM/PRISM_cruise_report_draft_feb_12.pdf
Start Date	2011-12-24
End Date	2012-02-11
Description	From McMurdo Station to Punta Arenas, Chile More information from R2R: https://www.rvdata.us/search/cruise/NBP1201

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Project Information

Processes Regulating Iron Supply at the Mesoscale - Ross Sea (PRISM-RS)

Website: http://science.whoi.edu/users/olga/PRISM_RS/PRISM_RS.html

Coverage: Ross Sea continental shelf; Southern Ocean

The NSF proposal title was "Impact of Mesoscale Processes on Iron Supply and Phytoplankton Dynamics in the Ross Sea"

The Ross Sea continental shelf is one of the most productive areas in the Southern Ocean, and may comprise a significant, but unaccounted for, oceanic CO2 sink, largely driven by phytoplankton production. The processes that control the magnitude of primary production in this region are not well understood, but data suggest that iron limitation is a factor. Field observations and model simulations indicate four potential sources of dissolved iron to surface waters of the Ross Sea: (1) circumpolar deep water intruding from the shelf edge; (2) sediments on shallow banks and nearshore areas; (3) melting sea ice around the perimeter of the polynya; and (4) glacial meltwater from the Ross Ice Shelf. The principal investigators hypothesize that hydrodynamic transport via mesoscale currents, fronts, and eddies facilitate the supply of dissolved iron from these four sources to the surface waters of the Ross Sea polynya. These hypotheses will be tested through a combination of in situ observations and numerical modeling, complemented by satellite remote sensing. In situ observations will be obtained during a month-long cruise in the austral summer. The field data will be incorporated into model simulations, which allow quantification of the relative contributions of the various hypothesized iron supply mechanisms, and assessment of their impact on primary production. The research will provide new insights and a mechanistic understanding of the complex oceanographic phenomena that regulate iron supply, primary production, and biogeochemical cycling. The research will thus form the basis for predictions about how this system may change in a warming climate. The research will contribute to the goals of the international research programs ICED (Integrated Climate and Ecosystem Dynamics) and GEOTRACES (Biogeochemical cycling and trace elements in the marine environment).

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Program Information

Ocean Carbon and Biogeochemistry (OCB)

Website: http://us-ocb.org/

Coverage: Global

The Ocean Carbon and Biogeochemistry (OCB) program focuses on the ocean's role as a component of the global Earth system, bringing together research in geochemistry, ocean physics, and ecology that inform on and advance our understanding of ocean biogeochemistry. The overall program goals are to promote, plan, and coordinate collaborative, multidisciplinary research opportunities within the U.S. research community and with international partners. Important OCB-related activities currently include: the Ocean Carbon and Climate Change (OCCC) and the North American Carbon Program (NACP); U.S. contributions to IMBER, SOLAS, CARBOOCEAN; and numerous U.S. single-investigator and medium-size research projects funded by U.S. federal agencies including NASA, NOAA, and NSF.

The scientific mission of OCB is to study the evolving role of the ocean in the global carbon cycle, in the face of environmental variability and change through studies of marine biogeochemical cycles and associated ecosystems.

The overarching OCB science themes include improved understanding and prediction of: 1) oceanic uptake and release of atmospheric CO2 and other greenhouse gases and 2) environmental sensitivities of biogeochemical cycles, marine ecosystems, and interactions between the two.

The OCB Research Priorities (updated January 2012) include: ocean acidification; terrestrial/coastal carbon fluxes and exchanges; climate sensitivities of and change in ecosystem structure and associated impacts on biogeochemical cycles; mesopelagic ecological and biogeochemical interactions; benthic-pelagic feedbacks on biogeochemical cycles; ocean carbon uptake and storage; and expanding low-oxygen conditions in the coastal and open oceans.

Integrated Marine Biogeochemistry and Ecosystem Research -US (IMBER-US)

Website: http://www.imber.info/

Coverage: global

The BCO-DMO database includes data from IMBER endorsed projects lead by US funded investigators. There is no dedicated US IMBER project or data management office. Those functions are provided by US-OCB and BCO-DMO respectively.

The information in this program description pertains to the Internationally coordinated IMBER research program. The projects contributing data to the BCO-DMO database are those funded by US NSF only. The full IMBER data catalog is hosted at the Global Change Master Directory (GCMD).

IMBER Data Portal: The IMBER project has chosen to create a metadata portal hosted by the NASA's Global Change Master Directory (GCMD). The GCMD IMBER data catalog provides an overview of all IMBER endorsed and related projects and links to datasets, and can be found at URL http://gcmd.nasa.gov/portals/imber/.

IMBER research will seek to identify the mechanisms by which marine life influences marine biogeochemical cycles, and how these, in turn, influence marine ecosystems. Central to the IMBER goal is the development of a predictive understanding of how marine biogeochemical cycles and ecosystems respond to complex forcings, such as large-scale climatic variations, changing physical dynamics, carbon cycle chemistry and nutrient fluxes, and the impacts of marine harvesting. Changes in marine biogeochemical cycles and ecosystems due to global change will also have consequences for the broader Earth System. An even greater challenge will be drawing together the natural and social science communities to study some of the key impacts and feedbacks between the marine and human systems.

To address the IMBER goal, four scientific themes, each including several issues, have been identified for the IMBER project: Theme 1 - Interactions between Biogeochemical Cycles and Marine Food Webs; Theme 2 - Sensitivity to Global Change: How will key marine biogeochemical cycles, ecosystems and their interactions, respond to global change?; Theme 3 - Feedback to the Earth System: What are the roles of the ocean biogeochemistry and ecosystems in regulating climate?; and Theme 4 - Responses of Society: What are the relationships between marine biogeochemical cycles, ecosystems, and the human system?

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Funding

Funding Source	Award
NSF Antarctic Sciences (NSF ANT)	ANT-0944165

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