CTD station locations from R/V Oceanus, R/V Endeavor cruises OC468-02, EN496, EN509 in the Gulf of Mexico; 2010-2012 (GoMX - N2 Fixation project)

Website: https://www.bco-dmo.org/dataset/3899
Version: 22 March 2013
Version Date: 2013-03-22

Project
» Nitrogen fixation, nutrient supply and biological production in the Gulf of Mexico (GoMX - N2 Fixation)

Programs
» Gulf of Mexico - Deepwater Horizon Oil Spill (GoMX - DHOS)
» Ocean Carbon and Biogeochemistry (OCB)

Contributors	Affiliation	Role
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Dataset Description

CTD - Stations
Station numbers, Dates, Times, Lats, Lons and Descriptions
Extracted from cruise event logs

Methods & Sampling

Extracted from cruise event logs

Data Processing Description

Extracted from cruise event logs

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Data Files

File
CTD_Stations.csv (Comma Separated Values (.csv), 21.42 KB) MD5:c88af645feb7ebd7449a5a11b8a9b417 Primary data file for dataset ID 3899

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Parameters

Parameter	Description	Units
CruiseId	Cruise Id	text
Op_Number	Operation Number	xxx.xx
Stn	Station Number (First 3 digits of Op_Number)	dimensionless
Evt	Event Number (Last digits after decimal point of Op_Number)	dimensionless
Date_Local	Date Local	YYYYMMDD
Time_Local	Time Local	HHMM
ISO_DateTime_UTC	Date/Time UTC	YYYY-MM-DDTHH:MM:SS.00Z
Latitude	Latitude (South is negative)	decimal degrees
Longitude	Longitude (West is negative)	decimal degrees
Lease_Block	Lease Block	text
Operation	Operation	text
Seq_Number	Sequence Number: Things that happen multiple times, are given a unique sequence number (ROV dives, CTD, MUC) ROV dives will be sequentially numbered (1,2,3,4,5) across stations CTDs will be sequentially numbered (1,2,3,4,5) across stations MUCs will be sequentially numbered (1,2,3,4,5) across stations	dimensionless
Notes	Activity and Comments	text

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Deployments

OC468-02

Website	https://www.bco-dmo.org/deployment/58119
Platform	R/V Oceanus
Start Date	2010-08-21
End Date	2010-09-16
Description	To support additional work related to the Deepwater Horizon well leak oil spill, the Oceanus operations will be coordinated with those aboard R/V Cape Hatteras. Chief Scientist pre-cruise update May 17 ,2010 ********** Over the last few days, we've rethought our fall cruise as it's become evident that much of the oil from the Deepwater Horizon leak isn't reaching the surface and that the 5000 bbl/day official release rate estimate could be low by an order of magnitude or more. The bottom line is that an awful lot of oil is getting into the water column and we really don't know much about where it's going or what it's impact is/will be on ecosystems in the Gulf. We discussed this situation with Dave Garrison on Friday and he was very supportive of us changing the focus of our cruise and using it to survey and assess the spread and impact of the oil. Dave asked us to try to assemble a team that could attack the problem of the physical spread of the oil and its impact through the food web. We're working on this but wanted to let you know of this change in plan and to start a discussion of what the revised cruise plan would look like. Our current thinking is that we would make use of the two ships in complementary ways: * The Oceanus will focus on the vertical distribution of oil and its impact on phytoplankton and zooplankton. We envision running a series of stations along a roughly E-W transect along the slope and one or more transects running out into deep water. We would be using a CTD-rosette system to sample the water column and both meter nets and the mocness to sample zooplankton. We'll also want to use a LADCP system to measure flows in deep plumes of oil. We're talking to Andreas Thurnherr at LDEO, who has experience in these measurements and expect that he'll have someone on board to carry them out. We would carry out deck incubations to assess productivity, nutrient dynamics, and toxicity of hydrocarbons in the water column. Finally, we would like to take box and gravity cores at selected stations. * The Cape Hatteras will focus on mapping the spatial extent of oil in the upper water column through a broad survey of the northern Gulf. This would involve mostly towed instrumentation and in-line analyses complemented by CTD profiles and net tows at selected stations. A limited amount of experimental work would be done on this Planned science activities include CTD casts, mocness tows, meter net tows, surface pumping for collecting large volumes of water, deck incubations, floating sediment traps, moored sediment trap (1), multicoring (if no multicore then box and gravity core), camera deployment, radioisotopes, possible small boat ops for personnel transfer between R/V Cape Hatteras and sample collecting. Additional information: WHOI cruise planning synopsisFigure of Station Locations Cruise information and original data are available from the NSF R2R data catalog.

EN496

Website	https://www.bco-dmo.org/deployment/58932
Platform	R/V Endeavor
Start Date	2011-07-02
End Date	2011-07-27
Description	Original data are available from the NSF R2R data catalog

EN509

Website	https://www.bco-dmo.org/deployment/58933
Platform	R/V Endeavor
Start Date	2012-05-25
End Date	2012-06-20
Description	Original data are available from the NSF R2R data catalog

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Project Information

Nitrogen fixation, nutrient supply and biological production in the Gulf of Mexico (GoMX - N2 Fixation)

Coverage: Northern Gulf of Mexico

From the NSF proposal abstract
This project will study the interplay of physical, chemical, and biological factors in supplying nitrogen, an essential nutrient, to temperate coastal and offshore waters of the Gulf of Mexico. The Gulf is an economically important but understudied marginal sea with major commercial and recreational fisheries as well as extensive fossil fuel deposits. Diazotrophic (N2-fixing) cyanobacteria bloom regularly in offshore and coastal waters of the Gulf and the limited data suggest that they contribute significant quantities of both nitrogen and carbon to the pelagic food web. These diazotrophs may play also a critical role in supplying N to other organisms, including the ichthyotoxic red tide dinoflagellate Karenia brevis. Despite its importance, little is currently known of the factors that promote N2-fixation in the Gulf or the relative significance of different physical and biological processes in creating conditions that favor N limitation in the water column. The Gulf of Mexico is strongly influenced by both riverine inputs and advective processes, providing an excellent model system for studying nutrient dynamics, physical forcing of productivity, terrestrial-oceanic linkages, and the potential impact of land use and climate change on marine ecosystems.

The relatively small basin of the Gulf of Mexico provides an opportunity to quantify and study interactions among physical, chemical, and biological processes relevant to a broad range of other coastal and oceanic systems. Land-use and climate change are likely to affect the circulation and hydrography of the Gulf, as well as the magnitude and nature of riverine inputs, all with uncertain impacts on the biogeochemistry of the Gulf of Mexico. This research will provide timely insights into these processes and will generate a baseline of understanding for evaluating and predicting the impact of future land use and climate changes in the system. This project will make an important contribution to our understanding of the factors that regulate N2-fixation and its role in supporting the biota in temperate waters. The following specific goals are included in the work:

1. Identify the major diazotroph groups in the Gulf of Mexico and characterize their distribution and activity in different regions and water masses.

2. Quantify the impact of advective processes, mesoscale features, and riverine inputs on nutrient limitation and N2-fixation in the Gulf, and evaluate the controls on N2-fixation and the degree of spatial and temporal niche differentiation among diazotroph assemblages in different regions affected by these processes.

3. Use satellite data and physical models to scale up our measurements spatially and to evaluate the regional significance of N2-fixation in the Gulf of Mexico. The researchers will also use a coupled physical/biological model to explore variability in the physical forcing and the potential impact of likely land use and climate change scenarios in altering nutrient dynamics and N2-fixation in the Gulf of Mexico.

The investigators and their institutions have a strong commitment to undergraduate and graduate education. This project includes support for graduate students, a technician, and undergraduates. In addition to peer-reviewed papers and websites, workshops aimed at K-12 teachers, and a program involving high school teachers in research will be used to disseminate the results of this project broadly in the local community. The investigators are committed to increasing the diversity of the ocean science community and are active in recruiting and training efforts at their institutions.

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Program Information

Gulf of Mexico - Deepwater Horizon Oil Spill (GoMX - DHOS)

Coverage: Northern Gulf of Mexico

Grants for Rapid Response Research (RAPID)
The RAPID funding mechanism is used for proposals having a severe urgency with regard to availability of, or access to data, facilities or specialized equipment, including quick-response research on natural or anthropogenic disasters and similar unanticipated events.

GOM - Broader Impacts
The need to understand the impact of this largest oil spill to date on ecosystems and biochemical cycling is self evident. The consequences of the disaster and accompanying clean up measures (e.g. the distribution of dispersants) need to be evaluated to guide further mediating measures and to develop and improve responses to similar disasters in the future. Would it be advantageous if such oil aggregates sink, or should it rather remain suspended? Possibly measures can be developed to enhance sinking or suspension (e.g. addition of ballast minerals) once we understand their current formation and fate. Understanding the particle dynamics following the input of large amounts of oil and dispersants into the water is a prerequisite to develop response strategies for now and in the future.

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.

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-0928495

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