CTD data from R/V F.G. Walton Smith cruise WS1010 in the Gulf of Mexico Macondo wellhead area in May-June 2010 (DWH_Deep_Microbes project)

Website: https://www.bco-dmo.org/dataset/3729
Data Type: Cruise Results
Version: 1
Version Date: 2012-09-24

Project
» RAPID Deepwater Horizon Oil Spill: Deep pelagic and benthic impacts of the oil spill (DWH_Deep_Microbes)

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

Contributors	Affiliation	Role
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Abstract
CTD data from R/V F.G. Walton Smith cruise WS1010 in the Gulf of Mexico Macondo wellhead area in May-June 2010.

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Coverage

Spatial Extent: **N**:28.827 **E**:-88.327 **S**:28.63 **W**:-88.813
Temporal Extent: 2010-05-26 - 2010-06-06

Dataset Description

CTD data from cruise WS1010 in the Gulf of Mexico (May 26, 2010 to June 6, 2010).

Methods & Sampling

All CTD sensors were calibrated by U Miami or WHOI technicians prior to sailing except the CDOM sensor, which was obtained directly from WETLABS by collaborator V. Asper. That instrument was calibrated by Wetlabs. CTD casts in the vicinity of the Macondo Wellhead were complicated by the presence of oil on the sea surface. A saltwater hose was used to spray the sea surface, parting the oil to create a clean area for the CTD to be dropped through; a similar procedure was used for deployment and recovery.

Note: There is no cast number 78.

Data Processing Description

The CTD data were processed on Seasave software as per routine operating procedures.

BCO-DMO made the following modifications:
- Replaced blanks and values of '99999' with 'nd' to indicate 'no data'.
- Separated original date/time field into separte columns.
- Changed parameter names to conform to BCO-DMO conventions.
- Added date_start_utc, time_start_utc, lat_start, and lon_start from the WS1010 event log.

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Data Files

File
WS1010_CTD.csv (Comma Separated Values (.csv), 679.00 MB) MD5:be11b80040f5f55ed26a91e9e83c9878 Primary data file for dataset ID 3729

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Parameters

Parameter	Description	Units
cast	Consecutive cast number of the instrument.	unitless
event	Unique event number. First two digits are the station number. The two digits after the decimal are the cast number at that station.	unitless
date_start_utc	Date at start of CTD cast; UTC. format: mm/dd/YYYY	unitless
time_start_utc	Time at start of CTD cast; 24-hour clock; UTC; in hours and decimal minutes. format: HH:MM	unitless
lat_start	Latitude at start of cast; postive values = North.	decimal degrees
lon_start	Longitude at start of cast; negative values = West.	decimal degrees
time_utc	Time; UTC; 24-hour clock; in hours and decimal minutes. format: HHMM.mm	unitless
day_utc	2-digit day (dd) of month; UTC.	dd (01 to 31)
month_utc	2-digit month (mm) of year; UTC.	mm (01 to 12)
year	4-digit year.	YYYY
lat	Latitude; postive values = North.	decimal degrees
lon	Longitude; negative values = West.	decimal degrees
alt	Altimeter reading.	meters
press	Pressure.	decibars
depth	Depth.	meters

temp	Temperature from primary sensor.	degrees Celsius
temp2	Temperature from secondary sensor.	degrees Celsius
cond	Conductivity from primary sensor.	S/m
cond2	Conductivity from secondary sensor.	S/m
sal	Salinity from primary sensor.	PSU
sal2	Salinity from secondary sensor.	PSU
density	Density in kilograms per cubic meter.	kg/m^3
flag_density	Density quality flag.	unitless
sigma_t	Sigma-t density in kilograms per cubic meter.	kg/m^3
O2_mg_L	Oxygen in milligrams per liter.	mg/L
O2_sat_pcnt	Percent oxygen saturation.	%
trans	Percent beam transmission. Originally named 'Beam_Attenuation_Pct'.	%
beam_c	Beam attenuation.	1/m
chl_a_fluor	Chlorophyll fluorescence in micrograms per liter.	ug/L
CDOM	CDOM in milligrams per cubic meter.	mg/m^3
PAR	PAR in micro Einsteins per square meter.	uE/m^2
PAR_depth	PAR depth.	meters
PAR_pcnt	Percent PAR.	%
SPAR	Surface PAR in micro Einsteins per square meter.	uE/m^2

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Instruments

Dataset-specific Instrument Name	CTD Sea-Bird 9
Generic Instrument Name	CTD Sea-Bird 9
Generic Instrument Description	The Sea-Bird SBE 9 is a type of CTD instrument package. The SBE 9 is the Underwater Unit and is most often combined with the SBE 11 Deck Unit (for real-time readout using conductive wire) when deployed from a research vessel. The combination of the SBE 9 and SBE 11 is called a SBE 911. The SBE 9 uses Sea-Bird's standard modular temperature and conductivity sensors (SBE 3 and SBE 4). The SBE 9 CTD can be configured with auxiliary sensors to measure other parameters including dissolved oxygen, pH, turbidity, fluorometer, altimeter, etc.). Note that in most cases, it is more accurate to specify SBE 911 than SBE 9 since it is likely a SBE 11 deck unit was used. more information from Sea-Bird Electronics

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Deployments

WS1010

Website	https://www.bco-dmo.org/deployment/58739
Platform	R/V F.G. Walton Smith
Start Date	2010-05-21
End Date	2010-06-11
Description	The WS1010 cruise departed from Gulfport, Mississippi. Operations consisted of hydrographic characterizations of the water column and sampling of water for geochemical and microbiological characterization using a standard CTD/Rosette. See more information from the R2R Cruise Catalog.

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Project Information

RAPID Deepwater Horizon Oil Spill: Deep pelagic and benthic impacts of the oil spill (DWH_Deep_Microbes)

Coverage: Gulf of Mexico; 26.9N, 90.7W

During late spring and summer of 2010, the Northern Gulf of Mexico (GoM) was exposed to an oil spill different in magnitude and scope from any previous spill. The Deepwater Horizon, an ultra-deep, offshore drilling platform, began working GoM oil fields in 2001. While working a well in Mississippi Canyon on April 20, 2010, a bolus of methane gas ascended the drill pipe and exploded at the surface. Two days later the platform sank and since then, substantial quantities of oil and gas have leaked from the damaged wellhead. This work addressed the offshore oceanic impacts of the BP spill.

Sediment microbial mediated processes are capable of oxidizing oil and methane in the environment. The PI's examined the impacts of the Deepwater Horizon Oil Spill on microbially mediated processes in the deep waters and sediments in the vicinity of the spill site. The work complemented several funded or planned geochemical and microbiological sampling programs focused on the oil spill response. PI's evaluated rates of water column methane oxidation and sediment sulfate reduction and methanogenesis at multiple sites around the spill site. Additional experiments quantified the impact of nutrients, oxygen and substrate concentrations on these important microbially mediated processes.

The Joye group participated in six research cruises during 2010 and received samples from another six cruises from the study area. On all cruises, water samples were collected using a CTD rosette and Niskin or Go-Flo bottles. Sediment samples were obtained by box coring, multi-coring, or using the manned submersible ALVIN.

The PI's extended the monitoring/assessment program that was initiated through the NOAA National Institute of Undersea Science and Technology (NIUST) funded cruise and further leveraged by NOAA/NIUST (cruises in July 2010, October 2010) by conducting three major expeditions in 2010. This RAPID project directly supported the PI's efforts for cruises in May/June 2010 (NSF Joye chief scientist); August 2010 (NSF Montoya, chief scientist); November/December 2010 (NSF Joye chief scientist); and July 2011 (NSF Montoya, chief scientist)

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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.

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1043225

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