Underway data from cruise Atlantis 2101 from R/V Oceanus OC471-02 in the Blake Ridge, Cape Fear Diapir from August 2011 (SEEPC project)

Website: https://www.bco-dmo.org/dataset/521654
Version: 2014-08-06

Project
» Connectivity in western Atlantic seep populations: Oceanographic and life-history processes underlying genetic structure (SEEPC)

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Table of Contents

- Dataset Description
- Data Files
- Parameters
- Instruments
- Deployments
- Project Information
- Funding

Dataset Description

This alongtrack data set contains information on environmental conditions for each day of the RVOceanus cruise OC471-02.

Start: Depart Bridgetown, Barbados 05/17/2011
End: Arrive San Juan, Puerto Rico 05/20/2011

Further instrument information available at: R2R and at the WHOI cruise data archives.

[table of contents | back to top]

Data Files

File
OC471-02_underway.csv (Comma Separated Values (.csv), 1.22 MB) MD5:4b3da77aebc4068700e6e1e99cafbde2 Primary data file for dataset ID 521654

[table of contents | back to top]

Parameters

Parameter	Description	Units
date	date (UTC)	mm/dd/yyyy

month	month	1 to 12
day	day	1 to 31
year	year	YYYY
yrday_gmt	GMT day and decimal time; as 326.5 for the 326th day of the year or November 22 at 1200 hours (noon)	unitless
ISO_DateTime_UTC	Date/Time (UTC) ISO-8601:2004(E) formatted	YYYY-mm-ddTHH:MM:SS
time	Time (UTC)	HH:MM:SS
depth_12	Depth in meters obtained from the Knudsen 12 kHz channel; 4 meter transducer depth correction has been applied	meters
depth_35	Depth in meters obtained from the Knudsen 3.5 kHz channel; 4 meter transducer depth correction has been applied	meters
temp_air_p	Air temperature from port side using WXT520	degrees C
temp_air_s	Air temperature from starboard side using WXT520	degrees C
press_bar_p	Barometric pressure from port side using WXT520	hPa
press_bar_s	Barometric pressure from starboard side using WXT520	hPa
press_bar	Barometric pressure obtained from primary source (WXTS520)	hPa
lat	Latitude; south is negative	decimal degrees
lon	Longitude; west is negative	decimal degrees
cond_ss_FSI	Sea surface conductivity from Falmouth Scientific TSG (OCM-S-212)	milli-Siemens/centimeter
temp_ss_FSI	Sea surface temperature from Falmouth Scientific TSG (OCM-S-212)	degrees C
precip_rate_IMET	Precipitation from the IMET precipitation sensor on the forward mast; 14.5m above the waterline	mm/hr

precip_rate_WXT	Precipitation from port side using WXT520 (WXTP_Rc)	mm/hr
cog	GPS course over ground	degrees
sog	GPS speed over ground	knots
rain_accum_p	Rain accumulation from port side using WXT520	mm
rain_accum_s	Rain accumulation from starboard side using WXT520	mm
rain_intensity_p	Rain intensity from port side using WXT520	mm/h
rain_intensity_s	Rain intensity from starboard side using WXT520	mm/h
humidity_p	Relative humidity from port side using WXT520	percent
humidity_s	Relative humidity from starboard side using WXT520	percent
wind_dir_r_p	Relative wind direction from port side using WXT520	degrees
wind_dir_r_s	Relative wind direction from starboard side using WXT520	degrees
wind_speed_r_p	Relative wind speed from port side using WXT520	m/sec
wind_speed_r_s	Relative wind speed from starboard side using WXT520	m/sec
humidity	Relative humidity obtained from primary source (WXTS520)	percent
cond_ss_SBE	Surface conductivity from SBE45	mS/cm
sal_ss_SBE	Sea surface salinity from SeaBird-45	psu
temp_ss_SBE	Sea surface temperature from SeaBird-45	degrees C
flvolt_SBE	Fluorescence from SeaBird-45	milliVolts
temp_ss_SBE48	Sea surface temperature from SeaBird-48	degrees C

sal	Salinity calculated from FSI sea surface temperature and conductivity data values in accordance with UNESCO 44	psu
cond_ss_FSI_2	Falmouth Scientific TSG (OCM-S-212) sea surface conductivity	mmho/cm or milli-Siemens/centimeter
flvolt	Sea surface temperature Fluorescence	milliVolts
temp_ss_FSI_2	Falmouth Scientific TSG (OTM-S-212) sea surface temperature	degrees C
head	Ship's heading obtained from primary true heading source (ship's gyro)	degrees
speed	Ship speed in knots extracted from EDO Speedlog VHW data string	knots
radiation_s	Short wave radiation	watts/square meter
wind_dir_c_p	True wind direction from port side	degrees
wind_dir_c_s	True wind direction from starboard side	degrees
wind_dir_c	True wind direction from primary source (WXTS520); corrected for ship motion in degrees; using meteorologic convention of 'from' not 'to'	degrees
wind_speed_c_p	True wind speed from port side	m/s
wind_speed_c_s	True wind speed from starboard side	m/s
wind_speed_kts	True wind speed in knots	knots

[table of contents | back to top]

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.

Dataset-specific Instrument Name	IMET
Generic Instrument Name	Improved Meteorological Recorder
Generic Instrument Description	An IMET Recorder is an instrument package that can be mounted on a ship or buoy to record mean weather data including air and sea-surface temperature, incoming short and long-wave radiation, precipitation, humidity, wind velocity and barometric pressure. Each sensor in the system communicates digitally and returns calibrated values to a central data recorder.

Dataset-specific Instrument Name	MicroTSG
Generic Instrument Name	MicroTSG Thermosalinograph
Dataset-specific Description	SBE-45
Generic Instrument Description	An externally powered, high-accuracy instrument, designed for shipboard determination of sea surface (pumped-water) conductivity and temperature. Salinity and sound velocity can also be computed.

Dataset-specific Instrument Name	SBE48
Generic Instrument Name	Sea-Bird SBE 48 Hull Temperature Sensor
Generic Instrument Description	The SBE 48 is a high-accuracy temperature recorder with non-volatile memory, designed for shipboard determination of sea surface temperature. Installed with magnets just below the water line, the SBE 48's temperature sensor is in contact with the inside of the ship's hull. For more information, see the SBE48 Manual.

Dataset-specific Instrument Name	WXT520
Generic Instrument Name	Weather Transmitter
Generic Instrument Description	The ship-mounted Vaisala Weather Transmitter WXT520 measures: Wind speed and direction; Liquid precipitation: rainfall, duration, intensity; Barometric pressure; Air temperature and Relative humidity. (for more information see http://www.vaisala.com/en/products/multiweathersensors/Pages/WXT520.aspx)

[table of contents | back to top]

Deployments

OC471-02

Website	https://www.bco-dmo.org/deployment/521430
Platform	R/V Oceanus
Report	http://dmoserv3.whoi.edu/data_docs/SEEPC/OC471-02_cruise_report.pdf
Start Date	2011-05-17
End Date	2011-05-20
Description	cruise for SEEPC project. Cruise information and original data are available from the NSF R2R data catalog. Science Objectives (from Cruise Planning Synopsis): Preliminary science activities at 3 Barbados seep sites (El Pilar, Orenoque A, Orenoque B) on the accretionary wedge for return visit to sites with DSRV Alvin in May-June 2012. Part of the Seep Connectivity Project funded by NSF to investigate historical and contemporary linkages among Barbados, Gulf OF MExico, and Blake Ridge seep species. Science Activities At each site: 1) Sub-bottom profiling to locate seep areas 2) MOCNESS tow for larval sampling 3) Deep-water (35 m HOB) mooring deployment (current meter, 2 sediment/larval traps per mooring) 4) Bone/wood package deployment

[table of contents | back to top]

Project Information

Connectivity in western Atlantic seep populations: Oceanographic and life-history processes underlying genetic structure (SEEPC)

Coverage: Western Atlantic, Gulf of Mexico, Intra-American Sea

This project will evaluate connectivity on spatial scales that match those at which vent systems are being studied (3500 km), with a set of nested seeps (within the Barbados system) within which connectivity can be explored at more local spatial scales (30 to 130 km), and with species that span depth (600 m to 3600 m) and geographic ranges (30 km to 3500 km) and that have diverse life-history characteristics. Five deep-sea seep systems in the Intra- American Sea (IAS) are targeted: Blake Ridge, Florida Escarpment, Alaminos Canyon, Brine Pool, Barbados (El Pilar, Orenoque A, Orenoque B). The primary objective is to advance our general knowledge of connectivity in the deep sea. The focus is on species and processes occurring in the IAS, with attention to oceanographic circulation, life histories, and genetics. Questions that apply in shallow-water systems motivate this study:

1. What phylogeographic breaks occur in the system? It is important to distinguish between phylogeographic

history and connectivity. A phylogeographic break with no shared alleles between populations implies a long history of isolation or possibly cryptic speciation.

2. Are populations connected by ongoing migration? This is the fundamental question about connectivity and the scale of genetic variation in marine species with planktonic larvae.

3. What biophysical processes underlie observed connectivities? Biological processes (e.g., larval distributions in the water column, timing of reproduction, and planktonic larval duration) and physical processes of transport and dispersion interact to determine connectivity.

The oceanographic model for the IAS will be improved and coupled to a Lagrangian larval transport model. The field program includes time-series sampling of larvae at seeps with records of current velocities, water column sampling to determine larval distribution potential, shipboard studies of larval biology and behavior, and sampling of benthic target species. Phylogenetic and population genetic tools will be used to explore historical and contemporary gene flow. Iterative interactions among the science teams will advance our understanding of connectivity in the deep sea and to develop effective and best methods for hypothesis testing under the constraints of working in a relatively inaccessible environment. Since their discovery, deep-sea chemosynthetic ecosystems have been novel systems within which to test the generality of paradigms developed for shallow-water species. This study will explore scale-dependent biodiversity and recruitment dynamics in deep-sea seep communities, and will identify key factors underlying population persistence and maintenance of biodiversity in these patchy systems.

Google Earth map showing positions of stations, CTD, XBT, multibeam locations (KMZ file dlownload)

[table of contents | back to top]

Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1031050

[table of contents | back to top]