Underway data from R/V Atlantis AT26-15 in the Gulf of Mexico from May 2014 (SEEPC project)

Website: https://www.bco-dmo.org/dataset/518399
Version: 2014-07-08

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

Contributors	Affiliation	Role
Van Dover, Cindy	Duke University Department of Biology (Duke - Bio)	Chief Scientist
Ball, Bernard	Duke University Department of Biology (Duke - Bio)	Contact
Copley, Nancy	Woods Hole Oceanographic Institution (WHOI BCO-DMO)	BCO-DMO Data Manager

Table of Contents

Dataset Description

This alongtrack data set contains information on environmental conditions for each day of the RV/Atlantis cruise AT26-15.

Start: Depart Gulfport, MS 05/21/2014
End: Arrive St. Petersburg, FL 06/14/2014

Further information on the instruments is available at:
http://dlacruisedata.whoi.edu/AT/AT026L15/underway/doc

[table of contents | back to top]

Data Files

File
AT2615_underway.csv (Comma Separated Values (.csv), 8.08 MB) MD5:a06144e534b5d08d4e88aed5acb16e79 Primary data file for dataset ID 518399

[table of contents | back to top]

Parameters

Parameter	Description	Units
date	Date (utc)	mm/dd/yyyy

time	Time (utc)	HH:MM:SS
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
lat	Latitude; south is negative	decimal degrees
lon	Longitude; west is negative	decimal degrees
speed	Speed through the water	knots
head	Ship's heading	degrees true
cog	GPS course over ground	degrees
sog	GPS speed over ground	knots
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	unitless
press_bar_s	Barometric pressure from starboard side using WXT520	unitless
rain_intensity_p	Rain intensity from port side using WXT520	mm/h
rain_intensity_s	Rain intensity from starboard side using WXT520	mm/h
rain_accum_p	Rain accumulation from port side using WXT520	mm
rain_accum_s	Rain accumulation from starboard side using WXT520	mm
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_p	Relative humidity from port side using WXT520	percent
humidity_s	Relative humidity from starboard side using WXT520	percent
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_dir_c_p	True wind direction from port side	deg
wind_dir_c_s	True wind direction from starboard side	deg
radiation_s	IMET shortwave radiation	watts/square meter
radiation_l	Longwave radiation	watts/square meter
par	Photosyntheticly Active Radiation; not collected	uE/cm^2/sec
sal_ss	Sea surface salinity	psu
temp_ss	Sea surface temperature	degrees C
flvolt	Fluorescence	milliVolts
sound_vel	Sound velocity	meters/second
ISO_DateTime_UTC	Date/Time (UTC) ISO formatted	yyyy-mm-ddTHH:MM:SS[.xx]Z

[table of contents | back to top]

Instruments

Dataset-specific Instrument Name	GPS
Generic Instrument Name	Global Positioning System Receiver
Dataset-specific Description	Starboard Vaisala
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	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

AT26-15

Website	https://www.bco-dmo.org/deployment/517377
Platform	R/V Atlantis
Start Date	2014-05-21
End Date	2014-06-14
Description	Start: Depart Gulfport, MS 05/21/2014 End: Arrive St. Petersburg, FL 06/14/2014 The AT26-15 cruise was conducted as part of the project "Connectivity in western Atlantic seep populations: Oceanographic and life-history processes underlying genetic structure" (SeepC) funded by NSF OCE-1031050. The cruise included coordinated deployments of DSV Alvin and AUV Sentry. Science objectives (from the WHOI Cruise Planning Synopsis): The primary objective of the SeepC Project is to advance our general knowledge of connectivity in the deep sea using taxa found at seeps as model systems. The focus is on species and processes occurring in the Intra-American Sea (including the Caribbean, Gulf of Mexico, and eastern seaboard of the US), with attention to oceanographic circulation, life histories, and genetics. Our efforts include improving the oceanographic model for the IAS near the seabed using current data from moorings at several depths and locations and coupling this model to a Lagrangian larval transport model. We stress the importance of iterative interactions among the science teams to advance our understanding of connectivity in the deep sea through descriptive and hypothesis-driven research. We will develop effective and best methods for hypothesis testing under the constraints of working in a relatively inaccessible environment and will build capacity in understanding connectivity in deep-sea systems.

[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]