Jason sample event log from the R/V Atlantis (AT21-02) cruise in the Barbados seeps, Intra-American Sea during June 2012 (SEEPC project)

Website: https://www.bco-dmo.org/dataset/614998
Version: 2015-10-02

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

Contributors	Affiliation	Role
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Dataset Description

Related Dataset: AT21-02: sample log - Barbados: http://www.bco-dmo.org/dataset/615468

Methods & Sampling

Sampling was performed by ROV Jason in the Barbados Accretionary Prism area using the following methods:
- Grab - using the claw of either port or starboard manipulator to pick up the sample
- Push core - used to collect sediment core samples, or invertebrates residing in the sediment
- Slurp - use of a vacuum system to collect sample from the seafloor or water column

Data Processing Description

BCO-DMO Processing:

- replaced blanks with underscores

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Data Files

File
AT2102_dive_log.csv (Comma Separated Values (.csv), 10.01 KB) MD5:e611f719c3f16e0ce5fb4c8881f9353b Primary data file for dataset ID 614998

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Parameters

Parameter	Description	Units
dive_id	unique ID for each Jason dive	unitless
date	sampling date	YYYYMMDD
event	unique ID for each sampling event of a dive	unitless
sample_descrip	method used by ROV to collect sample	unitless
time	sampling time; 24 hour clock	HH:MM
ISO_DateTime_UTC	Date/Time (UTC) ISO formatted	YYYY-mm-ddTHH:MM:SS[.xx]Z (UTC time)
site	ID associated with particular geographic location/region	unitless
Vvan_num	frame number of Jason virtual van associated with sampling event	unitless
lat	latitude (North is positive; South is negative)	decimal degrees
lon	longitude (East is positive; West is negative)	decimal degrees
depth	depth below surface	meters
comments	free text comments	unitless

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Instruments

Dataset-specific Instrument Name	Jason
Generic Instrument Name	ROV Jason
Generic Instrument Description	The Remotely Operated Vehicle (ROV) Jason is operated by the Deep Submergence Laboratory (DSL) at Woods Hole Oceanographic Institution (WHOI). WHOI engineers and scientists designed and built the ROV Jason to give scientists access to the seafloor that didn't require them leaving the deck of the ship. Jason is a two-body ROV system. A 10-kilometer (6-mile) fiber-optic cable delivers electrical power and commands from the ship through Medea and down to Jason, which then returns data and live video imagery. Medea serves as a shock absorber, buffering Jason from the movements of the ship, while providing lighting and a bird's eye view of the ROV during seafloor operations. During each dive (deployment of the ROV), Jason pilots and scientists work from a control room on the ship to monitor Jason's instruments and video while maneuvering the vehicle and optionally performing a variety of sampling activities. Jason is equipped with sonar imagers, water samplers, video and still cameras, and lighting gear. Jason's manipulator arms collect samples of rock, sediment, or marine life and place them in the vehicle's basket or on "elevator" platforms that float heavier loads to the surface. More information is available from the operator site at URL.

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Deployments

AT21-02

Website	https://www.bco-dmo.org/deployment/535929
Platform	R/V Atlantis
Report	http://dmoserv3.whoi.edu/data_docs/SEEPC/AT21-02_CruiseREPORT.pdf
Start Date	2012-06-01
End Date	2012-06-17
Description	Cruise information and original data are available from the NSF R2R data catalog. http://www.whoi.edu/cruiseplanning/synopsis.do?id=1942 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. Science objectives (from the WHOI Cruise Planning Synopsis): Mooring recoveries and sampling at 3 Barbados seep sites (El Pilar, Orenoque A, Orenoque B) plus MOCNESS tows and some mapping (multibeam, CHIRP). We may add sample sites if we are able to undertake an advance SENTRY survey in the region (pending request). Our aim would be to add new sites separated by as much as 150-200 km max along a depth gradient and along an isobath. Use of SENTRY would allow us to undertake precision sampling of known sites, 1 to 1.5 days per station at each of 6 to 8 seep stations. This is 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. Activities at each site: 1) Sub-bottom profiling to locate seep areas 2) MOCNESS tows for larval sampling 3) Mooring recoveries (current meter, 2 sediment/larval traps per mooring) 4) Intensive sampling of seep fauna for genetic and reproduction studies

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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)

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Funding

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

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