# 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)

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## 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

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## Data Files

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

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## 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 |

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## 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) |

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## 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. |

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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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