Amended Rolling Deck to Repository (R2R) event log (ELOG) taken on the R/V Atlantic Explorer cruise AE1913 in the Sargasso Sea in June of 2019

Project

» Collaborative Research: Direct Characterization of Adaptive Nutrient Stress Responses in the Sargasso Sea using Protein Biomarkers and a Biogeochemical AUV (Nutrient Stress Responses and AUV Clio)

Contributors	Affiliation	Role
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Abstract

The Electronic Logger (ELOG) tracked all deployments on the AE1913 cruise, including CTD, McLane pump, trace metal rosette, and AUV Clio deployment/recoveries, flow-through seawater sampling, sediment trap and plankton nets. Corresponding CTD files from each deployment are recorded in the "comments" column. R/V Atlantic Explorer cruise AE1913 was conducted between June 16th - 28th, 2019 in the Sargasso Sea, beginning at Bermuda Atlantic Time-series Station (BATS) and ending in the northeast shelf of Woods Hole Oceanographic Institution (WHOI).

Table of Contents

Coverage

Location: Sargasso Sea, beginning at Bermuda Atlantic Time-series Station (BATS) and ending in the northeast shelf of Woods Hole Oceanographic Institution (WHOI)
Spatial Extent: **N**:41.455978 **E**:-64.16295 **S**:31.367802 **W**:-71.247915
Temporal Extent: 2019-06-16 - 2019-06-28

Dataset Description

See the "Related Datasets" section on this page for the ELOG from cruise AE1913 and other closely related data.

* Also see all datasets related to the same cruise AE1913: https://www.bco-dmo.org/deployment/916412

Data Processing Description

Deployments and recoveries were recorded in the Rolling Deck to Repository Science Eventlogger (Elog, see Ritt (2024) and https://www.rvdata.us/about/event-log). Oceanographic samples were collected onboard the R/V Atlantic Explorer between June 16th - 28th 2019, along a transect beginning at the Bermuda Atlantic Time-series Study (BATS) site and terminating in northeast US continental shelf waters (Woods Hole Oceanographic Institution [WHOI]). Biomass was collected using the biogeochemical AUV Clio. To complement the vertical collection by Clio at Station 1, in situ battery-operated McLane pumps were used for surface biomass collection. The R/V Atlantic Explorer CTD provided physicochemical contextualization. After Clio was deployed, trace metal sampling was performed using a trace metal clean rosette equipped with 12 8L X-Niskin bottles on an Amsteel winch line. Subsamples for dissolved nutrients were collected from 0.2 µm-filtered seawater and stored at -20°C.

Coordinated deployments during AE1913: AUV Clio, McLane large volume pumps, CTD, Trace metal rosette, flow through sampling.

BCO-DMO Processing Description

* Submitted file "AE1913_R2R_ELOG.csv" was imported into the BCO-DMO data system for this dataset. Values "NaN" imported as missing data values.
** Missing data values are displayed differently based on the file format you download from a BCO-DMO page. They are blank in csv files, "NaN" in MatLab files, etc.

* Column names adjusted to conform to BCO-DMO naming conventions designed to support broad re-use by a variety of research tools and scripting languages. [Only numbers, letters, and underscores. Can not start with a number]
* Column names and order also adjusted to match the elog columns in dataset from cruise AT50-10 https://www.bco-dmo.org/dataset/922260).
* No changes made to data values.

[table of contents | back to top]

Data Files

File
926526_v1_ae1913_r2r_elog.csv(Comma Separated Values (.csv), 39.42 KB)
MD5:cd83b9d8d00db825f5208035bff06f77
Primary data file for dataset ID 926526, version 1

[table of contents | back to top]

Related Publications

Ritt., S. (2024). The ELOG Home Page Version 3.1.4. https://elog.psi.ch/elog/
Software

Rolling Deck to Repository (2018). Rolling Deck to Repository (R2R) Science Eventlogger. Accessed May 3rd, 2024 from https://www.rvdata.us/about/event-log
Software

[table of contents | back to top]

Related Datasets

IsRelatedTo

Saito, M. A., Cohen, N. (2024) **CTD profiles from R/V Atlantic Explorer cruise AE1913 in the Sargasso Sea in June of 2019.** Biological and Chemical Oceanography Data Management Office (BCO-DMO). (Version 2) Version Date 2024-10-30 doi:10.26008/1912/bco-dmo.916411.2 [view at BCO-DMO]
Relationship Description: Data from coordinated deployments during the same cruise.

Saito, M. A., Cohen, N. (2024) **Macronutrients and dissolved and particulate trace metals collected from the R/V Atlantic Explorer cruise AE1913 in the Sargasso Sea in June of 2019.** Biological and Chemical Oceanography Data Management Office (BCO-DMO). (Version 1) Version Date 2023-12-07 doi:10.26008/1912/bco-dmo.916429.1 [view at BCO-DMO]
Relationship Description: Data from coordinated deployments during the same cruise.

Saito, M. A., Cohen, N., Johnson, R. J. (2024) **Pigment concentration data from AUV Clio dives conducted during R/V Atlantic Explorer cruise AE1913 in the Sargasso Sea in June of 2019.** Biological and Chemical Oceanography Data Management Office (BCO-DMO). (Version 1) Version Date 2024-05-03 doi:10.26008/1912/bco-dmo.926546.1 [view at BCO-DMO]
Relationship Description: Data from coordinated deployments during the same cruise.

[table of contents | back to top]

Parameters

Parameter	Description	Units
Message_ID	Log ID	unitless
Date	Date event was created (UTC)	unitless
Event	Event identification number (ID of entry)	unitless
R2R_Event	Event identification number generated by ELOG	unitless
Instrument	Instrument used for activity	unitless
Action	Activity (deploy, recover, start, stop, etc)	unitless
Transect	Transect name	unitless
Station	Station idetnfier. BATS (1) or 2-9. (examples: "2", "St. 8 to Woods Hole #5")	unitless
Cast	Cast number or Dive number (as applicable for instrument type)	unitless
Latitude	Latitude where activity was performed	decimal degrees
Longitude	Longitude where activity was performed	decimal degrees
Seafloor	Depth of seafloor (bottom depth), if recorded	meters (m)

Author	Author of the logging of the event	unitless
Comment	Comments. CTD file name if relevant or other identifying information.	unitless
Cruise	Cruise ID	unitless
dateTimeUTC	Event DateTime in format yyyymmdd.hhmm	unitless
GPS_Time	Event DateTime from GPS	unitless
dateTime8601	Event DateTime in ISO format	unitless
Revisions	Dates of event revisions	unitless

Instruments

Dataset-specific Instrument Name	
Generic Instrument Name	AUV Clio
Generic Instrument Description	Clio is an autonomous underwater vehicle (AUV) created to accomplish the dual goals of global ocean mapping and biochemistry sampling. The ability to sample dissolved and particulate seawater biochemistry across ocean basins while capturing fine-scale biogeochemical processes sets it apart from other AUVs. Clio is designed to efficiently and precisely move vertically through the ocean, drift laterally to observe water masses, and integrate with research vessel operations to map large horizontal scales up to a depth of 6,000 meters. More information is available at https://www2.whoi.edu/site/deepsubmergencelab/clio/

Dataset-specific Instrument Name	
Generic Instrument Name	CTD Sea-Bird SBE 911plus
Generic Instrument Description	The Sea-Bird SBE 911 plus is a type of CTD instrument package for continuous measurement of conductivity, temperature and pressure. The SBE 911 plus includes the SBE 9plus Underwater Unit and the SBE 11plus Deck Unit (for real-time readout using conductive wire) for deployment from a vessel. The combination of the SBE 9 plus and SBE 11 plus is called a SBE 911 plus. The SBE 9 plus uses Sea-Bird's standard modular temperature and conductivity sensors (SBE 3 plus and SBE 4). The SBE 9 plus CTD can be configured with up to eight auxiliary sensors to measure other parameters including dissolved oxygen, pH, turbidity, fluorescence, light (PAR), light transmission, etc.). more information from Sea-Bird Electronics

Dataset-specific Instrument Name	
Generic Instrument Name	McLane Pump
Generic Instrument Description	McLane pumps sample large volumes of seawater at depth. They are attached to a wire and lowered to different depths in the ocean. As the water is pumped through the filter, particles suspended in the ocean are collected on the filters. The pumps are then retrieved and the contents of the filters are analyzed in a lab.

Dataset-specific Instrument Name	PITS Sediment Traps
Generic Instrument Name	Sediment Trap
Generic Instrument Description	Sediment traps are specially designed containers deployed in the water column for periods of time to collect particles from the water column falling toward the sea floor. In general a sediment trap has a jar at the bottom to collect the sample and a broad funnel-shaped opening at the top with baffles to keep out very large objects and help prevent the funnel from clogging. This designation is used when the specific type of sediment trap was not specified by the contributing investigator.

Dataset-specific Instrument Name	trace metal clean rosette equipped with 12 8L X-Niskin bottles
Generic Instrument Name	Trace Metal Bottle
Generic Instrument Description	Trace metal (TM) clean rosette bottle used for collecting trace metal clean seawater samples.

[table of contents | back to top]

Deployments

AE1913

Website	https://www.bco-dmo.org/deployment/916412
Platform	R/V Atlantic Explorer
Start Date	2019-06-16
End Date	2019-06-28
Description	coordinated deployments: McLane pumps, AUV Clio, CTD, trace metal rosette

[table of contents | back to top]

Project Information

Collaborative Research: Direct Characterization of Adaptive Nutrient Stress Responses in the Sargasso Sea using Protein Biomarkers and a Biogeochemical AUV (Nutrient Stress Responses and AUV Clio)

Coverage: Bermuda Atlantic Time Series

NSF Award Abstract:

Microscopic communities in the ocean can be surprisingly diverse. This diversity makes it difficult to study the individual organisms and reactions that control specific reactions controlling nutrient cycles. Past studies confirm that iron and nitrogen are vital elements for biological growth. There is increasing evidence, however, that other chemicals such as silica, zinc, cobalt, and vitamin B12 may be just as important. This project will provide an unprecedented view of community distributions using new molecular methods to isolate and link active proteins to specific chemical cycles during the very first research deployment of a brand-new autonomous underwater vehicle (AUV). The AUV will collect samples in programed patterns by pumping water directly into its filtering mechanism and then return the samples to the ship for analysis. The Bermuda Atlantic Time-series Study (BATS) station, which provides abundant supporting data, is the site for this innovative investigation into the microbial ecology and chemistry of the open oceans. Additionally, data will be widely distributed to other scientists through the Ocean Protein Portal website being developed by the Woods Hole Oceanographic Institute (WHOI) and the Biological and Chemical Oceanography Data Management Office. Data will also contribute a new teaching module in the Marine Bioinorganic Chemistry course at WHOI.

This first scientific deployment of the newly engineered and constructed biogeochemical AUV, Clio, will generate a novel dataset to examine marine microbial biogeochemical cycles in the Northwestern Atlantic oligotrophic ocean in unprecedented detail and at high vertical resolution. First the project proposes to understand if the microbial community reflects the varying chemical composition and cyanobacterial species through nutrient response adaptations. Additionally, the research will determine if iron stress in the low light Prochlorococcus ecotyope found in the deep chlorophyll maximum is a persistent feature influenced by seasonal dust fluxes. The highly resolved vertical data from the in situ pumping capabilities of Clio are fundamental to a rigorous examination of these biogeochemical questions. This highly transformative dataset will greatly advance understanding of the nutrient and trace element cycling of this region and will be the first field validation of the potentially revolutionary capability these new approaches represent for the study of marine microbial biogeochemistry.

[table of contents | back to top]

Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1658030

[table of contents | back to top]