Temperature and light intensity measurements collected during drifting in situ chamber (DISC) deployments in Southwater Caye, Belize between June and August of 2016

Website: https://www.bco-dmo.org/dataset/739220
Data Type: Other Field Results
Version: 1
Version Date: 2018-06-25

Project
» Collaborative Research: The Role of Larval Orientation Behavior in Determining Population Connectivity (Elacatinus Dispersal II)

Contributors	Affiliation	Role
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Coverage

Spatial Extent: **N**:16.84478 **E**:-88.0661 **S**:16.79035 **W**:-88.0817
Temporal Extent: 2016-06-08 - 2016-08-18

Dataset Description

Related Datasets (data collection during same DISC deployments):
* DISC: data package https://www.bco-dmo.org/dataset/739221
* DISC: Depth, Temperature, and Salinity https://www.bco-dmo.org/dataset/739541
* DISC: Deployment, environmental, and larval behavior information https://www.bco-dmo.org/dataset/739595

Methods & Sampling

The hobo logger was attached to the DISC during deployments. The DISC and hobo logger were left in the water for the duration of a day's deployments, which lasted anywhere from one to 5 hours, depending on the day. The DISC was sometimes lowered/raised between 9 meters and 18 meters, depending on the scheduled depth of deployments for that day.

The depth of the logger cannot be determined from this data alone and must be compared to the CTD data at the same date / time. See dataset "DISC: Depth, Temperature, and Salinity Data" https://www.bco-dmo.org/dataset/739541 for CTD data.

Data Processing Description

These data were not processed.

BCO-DMO Data Manager Processing Notes:
* added a conventional header with dataset name, PI name, version date
* modified parameter names to conform with BCO-DMO naming conventions
* blank values in this dataset are displayed as "nd" for "no data." nd is the default missing data identifier in the BCO-DMO system.
* added ISO timestamp (UTC)
* added start/stop lat/lons from deployment information.

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Data Files

File
templight.csv (Comma Separated Values (.csv), 1.90 MB) MD5:6bd9cf7bbf23d2c29e48715bba8dd41a Primary data file for dataset ID 739220

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Parameters

Parameter	Description	Units
disc_id	DISC (drifting in-situ chamber) identifier	unitless
deploy_id	Deployment identifier	unitless
dateTime	Date and time (UTC-6; Belize local time) in format "yyyy-mm-dd HH:MM:SS" from the hobo logger's record	unitless
temp	Water temperature	degrees Celsius
light	Light intensity	lumens per squre meter (Lux)
ISO_DateTime_UTC	Timestamp (UTC) in standard ISO 8601:2004(E) format YYYY-mm-ddTHH:MM:SSZ	unitless
deploy_depth	Nominal depth of deployment	meters
lat_start	Deployment start latitude	decimal degrees
lon_start	Deployment end longitude	decimal degrees
lat_end	Deployment start latitude	decimal degrees
lon_end	Deployment end longitude	decimal degrees

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Deployments

DISC_Deployments_Belize

Website	https://www.bco-dmo.org/deployment/740951
Platform	Belize_reefs
Start Date	2016-06-03
End Date	2016-08-18

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Project Information

Collaborative Research: The Role of Larval Orientation Behavior in Determining Population Connectivity (Elacatinus Dispersal II)

Coverage: Belizean Barrier Reef System

Description from NSF award abstract:
Understanding how far young fish move away from their parents is a major goal of marine ecology because this dispersal can make connections between distinct populations and thus influence population size and dynamics. Understanding the drivers of population dynamics is, in turn, essential for effective fisheries management. Marine ecologists have used two different approaches to understand how fish populations are connected: genetic methods that measure connectivity and oceanographic models that predict connectivity. There is, however, a mismatch between the predictions of oceanographic models and the observations of genetic methods. It is thought that this mismatch is caused by the behavior of the young, or larval, fish. The objective of this research is to study the orientation capabilities of larval fish in the wild throughout development and under a variety of environmental conditions to see if the gap between observations and predictions of population connectivity can be resolved. The project will have broader impacts in three key areas: integration of research and teaching by training young scientists at multiple levels; broadening participation of undergraduates from underrepresented groups; and wide dissemination of results through development of a website with information and resources in English and Spanish.

The overall objective of the research is to investigate the role of larval orientation behavior throughout ontogeny in determining population connectivity. This will be done using the neon goby, Elacatinus lori, as a model system in Belize. The choice of study system is motivated by the fact that direct genetic methods have already been used to describe the complete dispersal kernel for this species, and these observations indicate that dispersal is less extensive than predicted by a high-resolution biophysical model; E. lori can be reared in the lab from hatching to settlement providing a reliable source of larvae of all ages for proposed experiments; and a new, proven behavioral observation platform, the Drifting In Situ Chamber (DISC), allows measurements of larval orientation behavior in open water. The project has three specific objectives: to understand ontogenetic changes in larval orientation capabilities by correlating larval orientation behavior with developmental sensory anatomy; to analyze variation in the precision of larval orientation in different environmental contexts through ontogeny; and to test alternative hypotheses for the goal of larval orientation behavior, i.e., to determine where larvae are heading as they develop.

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1459156

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