Goby distribution and morphology data from Curlew Caye in the Belizean Barrier Reef collected in 2011.

Website: https://www.bco-dmo.org/dataset/728230
Data Type: Other Field Results
Version: 1
Version Date: 2018-02-23

Project
» An Integrative Investigation of Population Connectivity Using a Coral Reef Fish (Elacatinus Dispersal I)

Contributors	Affiliation	Role
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Abstract
Goby distribution and morphology data from Curlew Caye in the Belizean Barrier Reef collected in 2011.

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Coverage

Spatial Extent: **Lat**:16.789722 **Lon**:-88.075833
Temporal Extent: 2011-05-28 - 2011-08-22

Dataset Description

Geolocation and morphology data from Curlew Caye.

Methods & Sampling

We surveyed a 500 m long by 125 m wide study area on the reef at Curlew Caye, Belize by SCUBA to map and collect tissue samples from all *Elactinus lori* individuals, at depths from 10 m to 25 m. We began by fully censusing the focal study area: we marked the location of all host sponges (*Aplysina fistularis*) and fish (*E. lori*). GPS data were collected with a Garmin GPSMAP 76Cx unit in an underwater housing. Waypoints are accurate within 5 m. At each sponge we recorded: depth (m, using dive computers), number of tubes per sponge, length of largest sponge tube (nearest cm, using a tape measure). We also counted the number of fish per sponge, and noted which life history stage they fell into: resident ≥ 18 mm standard length (SL) or settler (<18 mm SL).

Data Processing Description

No data have been processed. All files include original field data.

BCO-DMO Data Processing Notes:

-Added decimal degree lat and lon to data
-Reformatted dates to yyyy/mm/dd
-Reformatted column names to comply with naming standards
-Replaced blank cells with nd

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Data Files

File
goby_distribution.csv (Comma Separated Values (.csv), 109.93 KB) MD5:c59da28a528bc2391a4927249d3b91ca Primary data file for dataset ID 728230

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Related Publications

D'Aloia, C. C., Bogdanowicz, S. M., Majoris, J. E., Harrison, R. G., & Buston, P. M. (2013). Self-recruitment in a Caribbean reef fish: a method for approximating dispersal kernels accounting for seascape. Molecular Ecology, 22(9), 2563–2572. doi:10.1111/mec.12274
Results

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Parameters

Parameter	Description	Units
date	Date of collection; YYYY/MM/DD	unitless
lunar_date	Lunar day of collection	unitless
waypoint_id	Location ID	unitless
lat	Latitude	decimal degrees
lon	Longitude	decimal degrees
depth	Depth at base of sponge	meters
sponge_tubes	Number of tubes per sponge	count

max_tube_length	Size of largest tube	centimeters
fish_1_0	Presence (1) or absence (0) of any fish	unitless
fish_n	Number of fish at sponge	count
residents_n	Number of residents at sponge	count
settlers_n	Number of settlers at sponge	count
SL_1	Standard length of fish corresponding to fish ID found on sponge	millimeters
code_1	Unique ID assigned to fish found on sponge	unitless
SL_2	Standard length of fish corresponding to fish ID found on sponge	millimeters
code_2	Unique ID assigned to fish found on sponge	unitless
SL_3	Standard length of fish corresponding to fish ID found on sponge	millimeters
code_3	Unique ID assigned to fish found on sponge	unitless
SL_4	Standard length of fish corresponding to fish ID found on sponge	millimeters
code_4	Unique ID assigned to fish found on sponge	unitless
SL_5	Standard length of fish corresponding to fish ID found on sponge	millimeters
code_5	Unique ID assigned to fish found on sponge	unitless
SL_6	Standard length of fish corresponding to fish ID found on sponge	millimeters
code_6	Unique ID assigned to fish found on sponge	unitless
SL_7	Standard length of fish corresponding to fish ID found on sponge	millimeters
code_7	Unique ID assigned to fish found on sponge	unitless

SL_8	Standard length of fish corresponding to fish ID found on sponge	millimeters
code_8	Unique ID assigned to fish found on sponge	unitless
SL_9	Standard length of fish corresponding to fish ID found on sponge	millimeters
code_9	Unique ID assigned to fish found on sponge	unitless
SL_10	Standard length of fish corresponding to fish ID found on sponge	millimeters
code_10	Unique ID assigned to fish found on sponge	unitless
SL_11	Standard length of fish corresponding to fish ID found on sponge	millimeters
code_11	Unique ID assigned to fish found on sponge	unitless
SL_12	Standard length of fish corresponding to fish ID found on sponge	millimeters
code_12	Unique ID assigned to fish found on sponge	unitless
SL_13	Standard length of fish corresponding to fish ID found on sponge	millimeters
code_13	Unique ID assigned to fish found on sponge	unitless
SL_14	Standard length of fish corresponding to fish ID found on sponge	millimeters
code_14	Unique ID assigned to fish found on sponge	unitless
SL_15	Standard length of fish corresponding to fish ID found on sponge	millimeters
code_15	Unique ID assigned to fish found on sponge	unitless
SL_16	Standard length of fish corresponding to fish ID found on sponge	millimeters
code_16	Unique ID assigned to fish found on sponge	unitless
SL_17	Standard length of fish corresponding to fish ID found on sponge	millimeters

code_17	Unique ID assigned to fish found on sponge	unitless

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Instruments

Dataset-specific Instrument Name	GPSMAP 76Cx (Garmin)
Generic Instrument Name	GPS receiver
Dataset-specific Description	Used to collect GPS data
Generic Instrument Description	Acquires satellite signals and tracks your location. This term has been deprecated. Use instead: https://www.bco-dmo.org/instrument/560

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Deployments

Belize_2010

Website	https://www.bco-dmo.org/deployment/704795
Platform	lab Buston
Description	Buston lab expeditions to Belize beginning in 2010.

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Project Information

An Integrative Investigation of Population Connectivity Using a Coral Reef Fish (Elacatinus Dispersal I)

Website: http://people.bu.edu/buston/lab/Welcome.html

Coverage: Belizean Barrier Reef System (16.803 degrees North 88.096 degrees West)

Understanding the patterns, causes and consequences of larval dispersal is a major goal of 21st century marine ecology. Patterns of dispersal determine the rates of larval exchange, or connectivity, between populations. Both physical factors (e.g., water movement) and biological factors (e.g., larval behavior) cause variation in population connectivity. Population connectivity, in turn, has major consequences for all aspects of an organism's biology, from individual behavior to metapopulation dynamics, and from evolution within metapopulations to the origin and extinction of species. Further, understanding population connectivity is critical for the design of effective networks of marine reserves, creation of vital tools in conservation, and the development of sustainable fisheries.

Over the last decade, three methods, each of which tells something slightly different, have emerged as leading contenders to provide the greatest insights into population connectivity. First, coupled biophysical models make assumptions regarding water flow, larval behavior and ecology, to predict population connectivity. Second, indirect genetic methods use spatial distributions of allele frequencies to infer population connectivity. Third, direct genetic methods use parentage analyses, tracing recruits to specific adults, to measure population connectivity. Despite advances, lack of integration means that we do not know the predictive skill of

biophysical models, or the extent to which patterns of dispersal predict spatial genetic structure. The overall objective of this proposal is to conduct an integrated investigation of population connectivity, using all three methods in one tractable system: the neon goby, Elacatinus lori, on the Belizean Barrier Reef. There are three motives for this choice of study system: i) fourteen highly polymorphic microsatellite loci have been developed, facilitating the assignment of recruits to parents using parentage analyses and the measurement of dispersal; ii) the physical oceanography of the Belizean Barrier Reef is well-studied, facilitating the development and testing of coupled biophysical models; and, iii) E. lori has a relatively small biogeographic range, facilitating analysis of the spatial distribution of allele frequencies throughout its range.

Broader Impacts. The grant will support one postdoc and two graduate students who will be trained in scientific diving, marine fieldwork, population genetics, biophysical modeling, and mathematical modeling, and will gain collaborative research experience. PIs will incorporate research findings in their courses, which cover all these topics. The grant will also broaden participation of under-represented groups by supporting six undergraduates from groups traditionally underrepresented in STEM fields. In each year of the project there will be an All Participants meeting to reinforce the network of participants. A project website will be developed, in English and Spanish, on the theme of larval dispersal and population connectivity. This will include a resource for K-12 marine science educators developed in collaboration with a marine science educator. All PIs will ensure that results are broadly disseminated to the scientific community and general public via appropriate forms of media.

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1260424

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