Data describing Gorgonia ventalina interactions on St. John, Virgin Islands in 2015.

Website: https://www.bco-dmo.org/dataset/662645
Data Type: Other Field Results
Version: 1
Version Date: 2016-10-25

Project
» LTREB Long-term coral reef community dynamics in St. John, USVI: 1987-2019 (St. John LTREB)
» Collaborative research: Ecology and functional biology of octocoral communities (VI Octocorals)

Program
» Long Term Research in Environmental Biology (LTREB)

Contributors	Affiliation	Role
Lasker, Howard	State University of New York at Buffalo (SUNY Buffalo)	Principal Investigator
Ake, Hannah	Woods Hole Oceanographic Institution (WHOI BCO-DMO)	BCO-DMO Data Manager

Abstract
Data describing Gorgonia ventalina interactions on St. John, Virgin Islands in 2015.

Table of Contents

- Coverage
- Dataset Description
  - Methods & Sampling
  - Data Processing Description
- Data Files
- Related Publications
- Parameters
- Deployments
- Project Information
- Program Information
- Funding

Coverage

Spatial Extent: **Lat**:18.3166 **Lon**:-64.72988
Temporal Extent: 2015-03-07 - 2015-03-17

Dataset Description

Data supporting Gambrel, B. and Lasker, H.R., 2016

Methods & Sampling

Methodology from Gambrel, B. and Lasker, H.R., 2016

While colony asymmetry was observed in many species, the planar form of *G. ventalina* was particularly conducive to quantifying colony size and asymmetry. The surface areas of both symmetric and asymmetric *G. ventalina* colonies were measured to evaluate the extent of asymmetry. We did not distinguish between intra- and inter-specific competitive interactions with asymmetric *G. ventalina* since our goal was to compare the sizes of asymmetric and symmetric colonies.

We sampled at Europa Bay, where similar numbers of symmetric and asymmetric *G. ventalina* colonies were

found. We searched for *G. ventalina* within the same 500 m2 area as the belt transects, and we selected colonies based on their health (colonies overgrown with algae or hydrocorals were excluded from the study), size class (15−24 cm, 25−34 cm and 35−44 cm tall) and the presence or absence of asymmetry, since we wanted similar numbers of colonies in each category. A total of 142 G. ventalina colonies (78 symmetric and 64 asymmetric) were photographed. Each image included a 1 m2 quadrat and a ruler.

Data Processing Description

Methodology from Gambrel, B. and Lasker, H.R. 2016: Interactions in the canopy among Caribbean reef octocorals. Marine Ecology Progress Series. 546: 85–95, doi: 10.3354/meps11670

The Perspective Tool in the program GIMP (Version 2.8) was used to correct parallax in the images, and ImageJ (Version 1.48, NIH) was then used to measure the height and surface area of the colonies. The surface areas of symmetric and asymmetric colonies were tested for normality using a Shapiro-Wilk normality test and for equal variances using a Levene Test (analyses were performed using R software). Areas were square root transformed to meet the assumptions of the analysis of covariance (ANCOVA) to test if the linear regressions of the surface areas and heights of symmetric and asymmetric colonies were different.

BCO-DMO Data Processing Notes:

- filled blank cells with "nd"
- replaced spaces with underscores
- replaced species codes with full names
- added latitudes and longitudes to data

[table of contents | back to top]

Data Files

File	
Gorgonia_asymmetry.csv	(Comma Separated Values (.csv), 8.01 KB) MD5:4df941b393ea10458d79e2861bad50e1
Primary data file for dataset ID 662645	

[table of contents | back to top]

Related Publications

Gambrel, B., & Lasker, H. (2016). Interactions in the canopy among Caribbean reef octocorals. Marine Ecology Progress Series, 546, 85–95. doi:10.3354/meps11670
Methods

[table of contents | back to top]

Parameters

Parameter	Description	Units
date	Date sampling occurred; mm/dd/yy	unitless
lat	Latitude; N is positive	decimal degrees
lon	Longitude; W is positve	decimal degrees
number	PI issued ID number for colony	unitless
height	Height of each colony was measured to the nearest centimeter.	centimeters
area	Surface area of the colonies determined from images	centimeters squared
perimeter	Perimeter of colonies determined from images	centimeters
interaction	0=no interaction between colonies; 1= colony-colony interaction	unitless
AsymSym	0=symetric colony; 1=asymetric colony	unitless

[table of contents | back to top]

Deployments

Edmunds_StThomas

Website	https://www.bco-dmo.org/deployment/630432
Platform	Virgin Islands
Start Date	2011-01-01
End Date	2015-03-17
Description	coral studies

Edmunds_VINP

Website	https://www.bco-dmo.org/deployment/523357
Platform	Virgin Islands National Park
Start Date	1987-01-01
End Date	2016-09-01
Description	Studies of corals and hermit crabs

[table of contents | back to top]

Project Information

LTREB Long-term coral reef community dynamics in St. John, USVI: 1987-2019 (St. John LTREB)

Website: http://coralreefs.csun.edu/

Coverage: St. John, U.S. Virgin Islands; California State University Northridge

Long Term Research in Environmental Biology (LTREB) in US Virgin Islands:

From the NSF award abstract:
In an era of growing human pressures on natural resources, there is a critical need to understand how major ecosystems will respond, the extent to which resource management can lessen the implications of these responses, and the likely state of these ecosystems in the future. Time-series analyses of community structure provide a vital tool in meeting these needs and promise a profound understanding of community change. This study focuses on coral reef ecosystems; an existing time-series analysis of the coral community structure on the reefs of St. John, US Virgin Islands, will be expanded to 27 years of continuous data in annual increments. Expansion of the core time-series data will be used to address five questions: (1) To what extent is the ecology at a small spatial scale (1-2 km) representative of regional scale events (10's of km)? (2) What are the effects of declining coral cover in modifying the genetic population structure of the coral host and its algal symbionts? (3) What are the roles of pre- versus post-settlement events in determining the population dynamics of small corals? (4) What role do physical forcing agents (other than temperature) play in driving the population dynamics of juvenile corals? and (5) How are populations of other, non-coral invertebrates responding to decadal-scale declines in coral cover? Ecological methods identical to those used over the last two decades will be supplemented by molecular genetic tools to understand the extent to which declining coral cover is affecting the genetic diversity of the corals remaining. An information management program will be implemented to create broad access by the scientific community to the entire data set.

The importance of this study lies in the extreme longevity of the data describing coral reefs in a unique ecological context, and the immense potential that these data possess for understanding both the patterns of comprehensive community change (i.e., involving corals, other invertebrates, and genetic diversity), and the processes driving them. Importantly, as this project is closely integrated with resource management within the VI National Park, as well as larger efforts to study coral reefs in the US through the NSF Moorea Coral Reef LTER, it has a strong potential to have scientific and management implications that extend further than the location of the study.

Collaborative research: Ecology and functional biology of octocoral communities (VI Octocorals)

Website: http://coralreefs.csun.edu/

Coverage: St. John, US Virgin Islands: 18.3185, 64.7242

The recent past has not been good for coral reefs, and journals have been filled with examples of declining coral cover, crashing fish populations, rising cover of macroalgae, and a future potentially filled with slime. However, reefs are more than the corals and fishes for which they are known best, and their biodiversity is affected strongly by other groups of organisms. The non-coral fauna of reefs is being neglected in the rush to evaluate the loss of corals and fishes, and this project will add on to an on-going long term ecological study by studying soft corals. This project will be focused on the ecology of soft corals on reefs in St. John, USVI to understand the Past, Present and the Future community structure of soft corals in a changing world. For the Past, the principal investigators will complete a retrospective analysis of octocoral abundance in St. John between 1992 and the present, as well as Caribbean-wide since the 1960's. For the Present, they will: (i) evaluate spatio-temporal changes between soft corals and corals, (ii) test for the role of competition with macroalgae and between soft corals and corals as processes driving the rising abundance of soft corals, and (iii) explore the role of soft corals as "animal forests" in modifying physical conditions beneath their canopy, thereby modulating recruitment dynamics. For the Future the project will conduct demographic analyses on key soft corals to evaluate annual variation in population processes and project populations into a future impacted by global climate change.

This project was funded to provide and independent "overlay" to the ongoing LTREB award (DEB-1350146, co-

funded by OCE, PI Edmunds) focused on the long-term dynamics of coral reefs in St. John.

Note: This project is closely associated with the project "RAPID: Resilience of Caribbean octocorals following Hurricanes Irma and Maria". See: https://www.bco-dmo.org/project/749653.

The following publications and data resulted from this project:
2017 Tsounis, G., and P. J. Edmunds. Three decades of coral reef community dynamics in St. John, USVI: a contrast of scleractinians and octocorals. Ecosphere 8(1):e01646. DOI: 10.1002/ecs2.1646
Rainfall and temperature data
Coral and macroalgae abundance and distribution
Descriptions of hurricanes affecting St. John

2016 Gambrel, B. and Lasker, H.R. Marine Ecology Progress Series 546: 85–95, DOI: 10.3354/meps11670
Colony to colony interactions
Eunicea flexuosa interactions
Gorgonia ventalina asymmetry
Nearest neighbor surveys

2015 Lenz EA, Bramanti L, Lasker HR, Edmunds PJ. Long-term variation of octocoral populations in St. John, US Virgin Islands. Coral Reefs DOI 10.1007/s00338-015-1315-x
octocoral survey - densities
octocoral counts - photoquadrats vs. insitu survey
octocoral literature review
Download complete data for this publication (Excel file)

2015 Privitera-Johnson, K., et al., Density-associated recruitment in octocoral communities in St. John, US Virgin Islands, J.Exp. Mar. Biol. Ecol. DOI: 10.1016/j.jembe.2015.08.006
octocoral density dependence
Download complete data for this publication (Excel file)

Other datasets related to this project:
octocoral transects - adult colony height

[table of contents | back to top]

Program Information

Long Term Research in Environmental Biology (LTREB)

Website: https://www.nsf.gov/funding/opportunities/ltreb-long-term-research-environmental-biology

Long Term Research in Environmental Biology (LTREB)

Supports research for a period of 10 years or longer to generate an extended time series of data with a focus on evolutionary biology, ecology and ecosystem science.

Synopsis
The Long Term Research in Environmental Biology (LTREB) Program supports the generation of extended time series of data to address important questions in evolutionary biology, ecology, and ecosystem science. Research areas include, but are not limited to, the effects of natural selection or other evolutionary processes on populations, communities, or ecosystems; the effects of interspecific interactions that vary over time and space; population or community dynamics for organisms that have extended life spans and long turnover times; feedbacks between ecological and evolutionary processes; pools of materials such as nutrients in soils that turn over at intermediate to longer time scales; and external forcing functions such as climatic cycles that operate over long return intervals.

[table of contents | back to top]

Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1334052

[table of contents | back to top]