Data from surveys of Eunicea flexusa colonies on St. John, VI National Park from 2014.

Website: https://www.bco-dmo.org/dataset/662377
Data Type: Other Field Results
Version: 1
Version Date: 2016-10-24

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
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Abstract
Data from surveys of Eunicea flexusa colonies on St. John, VI National Park from 2014.

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Coverage

Spatial Extent: **N**:18.31685 **E**:-64.72187 **S**:18.31095 **W**:-64.72988
Temporal Extent: 2014-08-06 - 2014-08-14

Dataset Description

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

Methods & Sampling

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

Since physical effects of octocoral–octocoral proximity were common, we examined the physical effects on different species by comparing their interspecific interactions with 75 colonies of *E. flexuosa*. The choice of *E. flexuosa* was based on its abundance and on the reliability of identifying *E. flexuosa* colonies in the field. We sampled at East Cabritte, as the high octocoral density there led to a high incidence of interactions. We searched for *E. flexuosa* within the same 500 m2 area as the belt transects and selected colonies based on the presence of interspecific interactions. Tissue damage due to proximity between octocorals was categorized

into first and second-degree damage. First-degree damage was defined as slight signs of abrasion including fewer polyps or retracted polyps in contact areas and lightly eroded calyces, whereas second-degree damage involved the erosion of the soft tissue past the surface layer, sometimes down to the proteinaceous skeleton. If an octocoral had branches exhibiting both first and second-degree damage, it was scored as having the more severe, second-degree damage. Colonies in close proximity were identified to species and were assessed for damage and asymmetry. Fisher's exact tests of independence were used in R to test for the effect of the species pairing on damage type and the presence or absence of colony asymmetry.

Data Processing Description

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

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Data Files

File
EF_interactions.csv (Comma Separated Values (.csv), 11.50 KB) MD5:5447c2ec44e56166c73a54f9180b4340 Primary data file for dataset ID 662377

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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

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Parameters

Parameter	Description	Units
date	Date sampling occurred; mm/dd/yy	unitless
location	Site where sampling occurred	unitless
lat	Latitude; N is positive	decimal degrees
lon	Longitude; W is positve	decimal degrees
species	Species of coral that was sampled	unitless
height	Height of each colony was measured to the nearest centimeter.	centimeters
width	Width of each colony was measured to the nearest centimeter.	centimeters
depth	Depth of each colony was measured to the nearest centimeter.	centimeters
colonyEffect_0	No apparent effect of colony interaction	unitless
colonyEffect_1	Slight abrasion from colony interaction	unitless
colonyEffect_2	Clear abrasion from colony interaction	unitless
colonyEffect_3	Other damage (swollen, misshaped, stunted branches etc.) from colony interaction	unitless
colonyEffect_4	Asymmetrical growth from colony interaction	unitless

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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

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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

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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.

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Funding

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

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