Height of sea fans from surveys in St. John, US Virgin Islands in August of 2020

Website: https://www.bco-dmo.org/dataset/869656
Data Type: Other Field Results
Version: 1
Version Date: 2022-02-11

Project
» RUI: Pattern and process in four decades of change on Caribbean reefs (St John Coral Reefs)

Contributors	Affiliation	Role
Edmunds, Peter J.	California State University Northridge (CSUN)	Principal Investigator
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Abstract
Data describe the height of Gorgonia ventalina recorded in August 2020 in 1 x 1 m quadrats in St. John, US Virgin Islands. These data support the publication Edmunds & Brown (2021) in the Bulletin of Marine Science doi.org/10.5343/bms.2020.0061.

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Coverage

Spatial Extent: **N**:18.316899 **E**:-64.725955 **S**:18.315582 **W**:-64.731651
Temporal Extent: 2020-08

Methods & Sampling

Analyses were completed on snorkel during August 2020. A 40 m transect was haphazardly placed along the 2-2.5 m depth contour at each site, and quadrats (1 x 1m) were randomly placed along the transect. Colonies of *Gorgonia ventalina* were measured in each quadrat when their holdfasts were within the sampling area. Colonies were distinguished between the yellow and purple morph and their max height was measured with a flexible tape measure.

Location: St. John, US Virgin Islands 18.315°N, 64.716°W
White Point = site on the south shore of St. John 18.316899N, -64.731651W
Yawzi Point = site on the south shore of St. John 18.315582N, -64.725955W

Data Processing Description

Systat 13.0 software

BCO-DMO Data Manager Processing Notes:
* Parameters (column names) renamed to comply with BCO-DMO naming conventions. See https://www.bco-dmo.org/page/bco-dmo-data-processing-conventions
* Lat and Lon columns added for sites from positions in the metadata.
* Lat and Lon rounded to 5 decimal places
* Checked species name "Gorgonia ventalina" in the World Register of Marine Species (WoRMS) on 2022-02-11. It was an exact match to LSID: urn:lsid:marinespecies.org:taxname:290045

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Data Files

File
seafan_sizes.csv (Comma Separated Values (.csv), 14.38 KB) MD5:bd9614066cce76f0901cb53b5bd8ce0a Primary data file for dataset ID 869656

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Related Publications

Edmunds, P. J., & Brown, D. J. (2021). Unprecedented densities of Gorgonia sea fans on coral reefs in St. John, US Virgin Islands? Bulletin of Marine Science, 97(1), 163–164. https://doi.org/10.5343/bms.2020.0061
Results

Systat Software, Inc. (n.d.). SYSTAT - Powerful Statistical Analysis and Graphics Software Available from https://systatsoftware.com/products/systat/.
Software

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Related Datasets

References

Edmunds, P. J., Brown, D. J. (2022) **Density of sea fans from surveys in St. John, US Virgin Islands in August of 2020.** Biological and Chemical Oceanography Data Management Office (BCO-DMO). (Version 1) Version Date 2022-02-11 doi:10.26008/1912/bco-dmo.869648.1 [view at BCO-DMO]
Relationship Description: Results from the same study.

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Parameters

Parameter	Description	Units
Site	Site name (Yawzi Point or White Point).	unitless
Height	Greatest height of each fan	centimeters (cm)
Color_Morph	Fan color (purple or yellow)	unitless
Lat	Site latitude	decimal degrees
Lon	Site longitude	decimal degrees

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Project Information

RUI: Pattern and process in four decades of change on Caribbean reefs (St John Coral Reefs)

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

Coverage: United States Virgin Islands, St. John: 18.318, -64.7253

NSF Award Abstract:
The coral reef crisis refers to the high rates of death affecting tropical reef-building corals throughout the world, and the strong likelihood that coral reefs will become functionally extinct within the current century. Knowledge of these trends comes from the monitoring of coral reefs to evaluate their health over time, with the most informative projects providing high-resolution information extending over decades. Such projects describe both how reefs are changing, and answer questions addressing the causes of the changes and the form in which reefs will persist in the future. This project focuses on coral reefs in United States waters, specifically around St. John in the US Virgin Islands. These reefs are protected within the Virgin Islands National Park, and have been studied more consistently and in greater detail than most reefs anywhere in the world. Building from 33 years of research, this project extends monitoring of these habitats by another five years, and uses the emerging base of knowledge, and the biological laboratory created by the reefs of St. John, to address the causes and consequences of the bottleneck preventing baby corals from repopulating the reefs. The work is accomplished with annual expeditions, staffed by faculty, graduate students, undergraduates, and teachers, coupled with analyses of samples at California State University, Northridge, and Florida State University, Tallahassee. The students and teachers assist with the research goals at the center of this project, but also engage in independent study and integrate with the rich and diverse societal context and natural history of the Caribbean. The scope of the science agenda extends to schools in California, where students are introduced to the roles played by marine animals in ecosystem health, concepts of long-term change in the biological world, and the role of science engagement in promoting positive environmental outcomes. In addition to generating a wide spectrum of project deliverables focusing on scientific discovery, the project promotes STEM careers and train globally aware scientists and educators capable of supporting the science agenda of the United States in the 21st Century.

This project leverages one of the longest time-series analyses of Caribbean coral reefs to extend the time-series from 33 to 38 years, and it tests hypotheses addressing the causes and consequences of changing coral reef community structure. The project focuses on reefs within the Virgin Islands National Park (VINP) and along the shore of St. John, US Virgin Islands, and is integrated with stakeholders working in conservation (VINP) and local academia (University of the Virgin Islands). Beginning in 1987, the project has addressed detail-oriented analyses within a small spatial area that complements the large-scale analyses conducted by the VINP. The results of these efforts create an unrivaled context within which ecologically relevant hypotheses can be tested to elucidate mechanisms driving ecological change. Building from image- and survey- based

analyses, 33 years of data reveal the extent to which these reefs have transitioned to a low-abundance coral state, and the importance of the bottleneck preventing coral recruits from contributing to adult size classes. The intellectual merits of this project leverage these discoveries to address eight hypotheses: (H1) long-term changes are defining a cryptic regime change, with the low coral abundance reinforced by, (H2) enhanced community resilience, (H3) low post-settlement success, (H4) negative effects of peyssonnelid algal crusts (PAC) on juvenile corals, (H5) inability of juvenile corals to match their phenotypes to future conditions, (H6) impaired population growth caused by reduced genetic diversity, (H7) the premium placed on PAC-free halos around Diadema sea urchins for coral recruitment, and (H8) biotic homogenization occurring on a landscape-scale.

This award reflects NSF's statutory mission and has been deemed worthy of support through evaluation using the Foundation's intellectual merit and broader impacts review criteria.

Related Projects:

- Affiliated with MCR-LTER - https://www.bco-dmo.org/project/2222
- Serves as a new project that builds on NSF DEB-1350146 - RUI-LTREB Renewal: Three decades of coral reef community dynamics in St. John, USVI: 2014-2019 - https://www.bco-dmo.org/project/734983
- Overlaps with OCE 17-56678 (which focuses on soft corals with H. Lasker) - Collaborative Research: Pattern and process in the abundance and recruitment of Caribbean octocorals - https://www.bco-dmo.org/project/752508
- LTREB Long-term coral reef community dynamics in St. John, USVI: 1987-2019 - https://www.bco-dmo.org/project/2272
- RUI: Pattern and process in four decades of change on Caribbean reefs - https://www.bco-dmo.org/project/835192
- RAPID: Hurricane Irma: Effects of repeated severe storms on shallow Caribbean reefs and their changing ecological resilience - https://www.bco-dmo.org/project/722163

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-2019992

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