Long-term percent coverage data of coral in photoquadrats in St. John USVI starting in 1987.

Website: https://www.bco-dmo.org/dataset/736822
Data Type: Other Field Results
Version: 1
Version Date: 2018-05-17

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

Contributors	Affiliation	Role
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Coverage

Spatial Extent: **N**:18.317 **E**:-64.72 **S**:18.307 **W**:-64.73
Temporal Extent: 1987-12-01 - 2016-08-01

Dataset Description

These data are evidence of the long-term dynamics of shallow coral reefs along the south coast of St. John from as early as 1987. These data describe coral reef community structure as percent cover based on the analysis of color photographs. All of these data originate from color images of photoquadrats recorded annually (usually in the summer) from as early as 1987. The data falls into three groups. The two groups that are contained in this data package are (1) Tektite & Yawzi and (2) Random sites. The juvenile coral density is packaged separately. Tektite – this is at 14 m depth on the eastern side of Great Lameshur Bay and is the original site of the Tektite man-in-the sea project in 1969; this project marked the birth of the Virgin Islands Ecological Research Station (later the Virgin Islands Environmental Resource Station) that hosts the field component of the project. The reef in this location consists of a single buttress that has remained dominated by Montastraea anularis since the start of the research (1987). These surveys consist of 30 photoquadrats (1 x 1 m) distributed along three, 10 m transects. Yawzi – this is at 9 m depth and is on the western side of Great Lameshur Bay and has been recorded photographically since 1987. This reef also started the study period dominated by Montastraea annularis, but has degraded much more rapidly that the Tektite site. These surveys consist of 30 photoquadrats (1 x 1 m) distributed along three, 10 m transects. Random sites – were added in 1992 to address the concern that the original sites (Yawzi and Tektite) were selected on "good" areas of reef and, therefore, could only decline in condition. The Random sites were selected using random coordinates in 1992, and consist of 6 sites (at 7-9 m depth) scattered between Cabritte Point and White Point. All lie a little shoreward of Yawzi and Tektite, and have always been characterized by low coral cover (< 10% cover). The surveys consist of 18-40 photoquadrats (0.5 x 0.5 m; with sample size determined by the exposures on a 35 mm cassette versus digital techniques) that are placed at random points along a transect.

Methods & Sampling

Sampling design and sites

Tektite – this is at 14 m depth on the eastern side of Great Lameshur Bay and is the original site of the Tektite man-in-the sea project in 1969; this project marked the birth of the Virgin Islands Ecological Research Station (later the Virgin Islands Environmental Resource Station) that hosts the field component of the project. The reef in this location consists of a single buttress that has remained dominated by Montastraea anularis since the start of the research (1987). These surveys consist of 30 photoquadrats (1 x 1 m) distributed along three, 10 m transects.

Yawzi – this is at 9 m depth and is on the western side of Great Lameshur Bay and has been recorded photographically since 1987. This reef also started the study period dominated by Montastraea annularis, but has degraded much more rapidly that the Tektite site. These surveys consist of 30 photoquadrats (1 x 1 m) distributed along three, 10 m transects.

Random Sites - The Random sites were selected using random coordinates in 1992, and consist of 6 sites (at 7-9 m depth) scattered between Cabritte Point and White Point. All lie a little shoreward of Yawzi and Tektite, and have always been characterized by low coral cover (less than 10% cover). The surveys consist of 18-40 photoquadrats (0.5 x 0.5 m; with sample size determined by the exposures on a 35 mm cassette versus digital techniques) that are placed at random points along a transect.

Data Processing Description

Parameters for Photoquadrat Analysis

CPCe software is used to quantify the area of benthic taxa using a matrix of 200 randomly spaced dots each 15 pixels in diameter. Prior to the use of CPCe the area of benthic taxa was quantified by superimposing a matrix of 200 randomly located circles on the image and counting the circles landing on the substratum category of interest.

BCO-DMO Processing Notes:

-Reformatted column names to comply with BCO-DMO standards.
-Added Latitude and Longitude to data

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Data Files

File
coral_cover.csv(Comma Separated Values (.csv), 107.91 KB) MD5:4e4ced2b83ca10121a7b253974890c19
Primary data file for dataset ID 736822

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Parameters

Parameter	Description	Units
site	Location of quadrat that was photographed or videotaped	unitless
lat	Latitude of site	decimal degrees
lon	Longitude of site	decimal degrees
Date	Date that quadrat was photographed or videotaped; YYYY/MM/DD	unitless
Quadrat	Quadrat number	unitless
percent_Coral	Percentage cover of coral on seafloor in each image	percent
percent_Macroalgae	Percentage cover of macroalgae on seafloor in each image	percent
percent_CTD	Percentage cover of CTB on seafloor in each image	percent

Instruments

Dataset-specific Instrument Name	Camera
Generic Instrument Name	Camera
Dataset-specific Description	Used to take photographs of coral
Generic Instrument Description	All types of photographic equipment including stills, video, film and digital systems.

Deployments

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

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.

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Funding

Funding Source	Award
NSF Division of Environmental Biology (NSF DEB)	DEB-0841441

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