Long-term coral percent coverage data from photoquadrats recorded at random sites in the USVI starting in 1992.

Website: https://www.bco-dmo.org/dataset/736796
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: 1992-07 - 2016-08

Dataset Description

These data are evidence of the 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
random.csv(Comma Separated Values (.csv), 678.35 KB) MD5:3ab46400500387700cb91f45c820bf6c
Primary data file for dataset ID 736796

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Parameters

Parameter	Description	Units
Site	Location of the quadrat that was photographed or videotaped. Random site.	unitless
lat	Latitude of site	decimal degrees

lon	Longitude of site	decimal degrees
Quadrat	Random quadrat on which photograph was taken. Changes every year.	unitless
Year	Nominal year that quadrat was photographed or videotaped; YYYY	unitless
allCorals_percentCover	Total percent cover of all coral on seafloor in image	percent
percent_Macroalgae	Percent cover of macroalgae on seafloor.	percent
percent_CTB	Percent cover of CTB on seafloor	percent
Montastrea	Summed cover of all Montastrea	percent
Orbicella	Summed cover of all Orbicella	percent
Montastrea_cav	Summed cover of all Montastrea cavernosa	percent
Agaricia	Summed cover of all Agaricia	percent
Colpophyllia	Summed cover of all Colpophyllia	percent
Dendrogyra	Summed cover of all Dendrogyra	percent
Dichocoenia	Summed cover of all Dichocoenia	percent
Diploria	Summed cover of all Diploria	percent
Eusmilia	Summed cover of all Eusmilia	percent
Favia	Summed cover of all Favia	percent
Madracis	Summed cover of all Madracis	percent
Meandrina	Summed cover of all Meandrina	percent
Mussa	Summed cover of all Mussa	percent

Porites	Summed cover of all Porites	percent
Stephanocoenia	Summed cover of all Stephanocoenia	percent
Siderastrea	Summed cover of all Siderastrea	percent
Manicina	Summed cover of all Manicina	percent
Mycetopohyllia	Summed cover of all Mycetopohyllia	percent
Acropora	Summed cover of all Acropora	percent
Isophyllastrea	Summed cover of all Isophyllastrea	percent
Scolymia	Summed cover of all Scolymia	percent
Solenastrea	Summed cover of all Solenastrea	percent

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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.

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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

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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.

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Funding

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

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