Benthic invertebrates from Tektite site, USVI: 1988-2007 (St. John LTREB project)

Website: https://www.bco-dmo.org/dataset/523747
Data Type: Other Field Results
Version: 1
Version Date: 2014-08-20

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

Contributors	Affiliation	Role
Edmunds, Peter J.	California State University Northridge (CSUN)	Principal Investigator
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Abstract
Benthic invertebrates from Tektite site, USVI: 1988-2007.

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Coverage

Spatial Extent: **N**:18.3153 **E**:-64.72187 **S**:18.31095 **W**:-64.7257
Temporal Extent: 1988 - 2077

Dataset Description

Photoquadrats from St. John, USVI, were used to assess the abundance of benthic invertebrates on shallow reefs of St. John, USVI from 1988-2007. This dataset contains biennial species counts of 30 benthic invertebrates from Tektite Reef and Yawzi Point.

These data were used in Colvard NB, Edmunds PJ. (2011)

Methods & Sampling

To assess changes in abundance of invertebrates and evaluate their relationship to the cover of corals and macroalgae, data were contrasted among times in biennial increments. Each of the six sites consisted of a single transect parallel to the 7-9 m depth contour, along which photoquadrats (0.25 m^2) have been sampled

since 1992. A 20-m transect was used prior to 2001 when ~17 photoquadrats were recorded on 35-mm film, but thereafter, a 40-m transect has been used along which ~40 photoquadrats were recorded using digital photography. The photoquadrats were positioned randomly along transects every year, and initially were recorded with a Nikonos V camera fitted with a 28-mm lens, strobes, and slide film (Kodachrome 64). Since 2001, digital photography with either 3.3 megapixel (Nikon Cool Pix 990) or 6.1 megapixel (Nikon D70) resolution has been employed. All cameras were mounted on a framer to hold them perpendicular to the reef.

To census the population density of invertebrates, photoquadrats were screened to identify tractable taxa based on size (>=3-cm diameter) and appearance. These organisms were identified to class, genus, and species wherever possible, although species resolution sometimes proved unreliable. The initial screening revealed a consensus group of 30 taxa (Table S1). As these taxa varied in abundance, and many were rarely seen in photoquadrats (<4 individuals/year), a subset of the initial group was created by selecting taxa that were relatively abundant (e.g., found in an average of 12% of the quadrats censused each year). This subset consisted of 14 species from 14 genera and four classes (See supplemental file: table S1), and was used to evaluate temporal trends in populations at a lower taxonomic level.

Organisms were counted on images enlarged by projection, or on computermonitors. Unitary organisms were easily counted, but colonial taxa were defined as individuals based on areas of autonomous tissue. Therefore, colonial taxa with several portions of unconnected tissue were scored as multiple individuals, even though they might share a common genotype through fission. Organismswere only scored if >50% of their area occurred within the photoquadrat, and when they occurred in adjacent photoquadrats, were scored only once.

In August 2007, benthic invertebrates were counted in situ at all sites to compare abundances with those generated from photoquadrats in the same year. In situ countswere completed during the day in quadrats (1x1 m) placed in a similar manner to the photoquadrats. Although these surveys revealed greater species richness than was visible in the photoquadrats, the enumeration was restricted to those taxa that previously had been identified as tractable. To compare the two techniques, mean abundances of the invertebrates were calculated by class, standardized to a common area, and contrasted by t-tests using quadrats as statistical replicates. Where significant differences were detected between invertebrate abundances originating from in situ and photographic techniques, the mean abundance by the photoquadrat technique were expressed as a percentage of the mean value from the field counts to evaluate the bias in using photoquadrats to quantify invertebrates (See supplemental file: figure S1).

Data Processing Description

BCO-DMO Processing Notes:

- original file: Colvard and Edmunds Data for JEMBE 2011.xlsx
- combined Tektite and Yawzi Pt data into one dataset
- added conventional header with dataset name, PI name, version date
- replaced spaces with underscores
- added lat/lon columns

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Data Files

File
inverts_tektite-yawzi.csv (Comma Separated Values (.csv), 66.25 KB) MD5:02d47732a0c0383e58af765180b15bc0 Primary data file for dataset ID 523747

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Supplemental Files

File
Colvard_Edmunds_Data_for_JEMBE_2011_BCODMO.xlsx (Octet Stream, 318.32 KB) MD5:edab5399ff9e039c05c4a92bae5ea902 Complete data for publication Colvard, N. B., & Edmunds, P. J. (2011). Decadal-scale changes in abundance of non-scleractinian invertebrates on a Caribbean coral reef. Journal of Experimental Marine Biology and Ecology, 397(2), 153–160. https://doi.org/10.1016/j.jembe.2010.11.015.
ColvardEdmunds2011_suppl-matl filename: ColvardEdmunds2011_suppl-matl.pdf (Portable Document Format (.pdf), 133.82 KB) MD5:03abef522906e6261898b08f5f425eb1 Supplemental figure for related datasets 523747, 523731 and 525499 and publication doi:10.1016/j.jembe.2010.11.015. Describes table S1 & S2 as well as figure S1&S2.

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Related Publications

Colvard, N. B., & Edmunds, P. J. (2011). Decadal-scale changes in abundance of non-scleractinian invertebrates on a Caribbean coral reef. Journal of Experimental Marine Biology and Ecology, 397(2), 153–160. https://doi.org/10.1016/j.jembe.2010.11.015
Results

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Related Datasets

IsRelatedTo

Edmunds, P. J. (2022) **Benthic invertebrate taxonomy, species and codes - St. John USVI survey 1988-2007 (St. John LTREB project).** Biological and Chemical Oceanography Data Management Office (BCO-DMO). (Version 1) Version Date 2014-08-20 doi:10.26008/1912/bco-dmo.523731.1 [view at BCO-DMO]
Relationship Description: Species codes

Edmunds, P. J. (2022) **Benthic invertebrates from 6 sites pooled, USVI: 1992-2007 (St. John LTREB project).** Biological and Chemical Oceanography Data Management Office (BCO-DMO). (Version 1) Version Date 2014-08-20 doi:10.26008/1912/bco-dmo.525499.1 [view at BCO-DMO]
Relationship Description: Benthic invertebrates from 6 sites pooled, USVI: 1992-2007

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Parameters

Parameter	Description	Units
year	year of survey	YYYY
site	location of survey	unitless
lat	latitude; north is positive	decimal degrees
lon	longitude; east is postive	decimal degrees

slide_num	slide image identification	unitless
photo_id	digital image identification	unitless
A	species codes	unitless
B	species codes	unitless
C	species codes	unitless
D	species codes	unitless
E	species codes	unitless
F	species codes	unitless
G	species codes	unitless
H	species codes	unitless
I	species codes	unitless
J	species codes	unitless
K	species codes	unitless
L	species codes	unitless
M	species codes	unitless
N	species codes	unitless
O	species codes	unitless
P	species codes	unitless
Q	species codes	unitless

R	species codes	unitless
S	species codes	unitless
T	species codes	unitless
U	species codes	unitless
V	species codes	unitless
W	species codes	unitless
X	species codes	unitless
Y	species codes	unitless
Z	species codes	unitless
AA	species codes	unitless
AB	species codes	unitless
AC	species codes	unitless
AD	species codes	unitless

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Instruments

Dataset-specific Instrument Name	camera
Generic Instrument Name	Camera
Dataset-specific Description	1992-1999: Nikonos V film camera using Kodachrome 64 film 2000-2006: Nikon Coolpix 990 - 3.3 megapixel digital camera 2007-2008: Nikon D70 - 6.1 megapixel digital camera
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
NSF Division of Environmental Biology (NSF DEB)	DEB-0343570

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