Long-term coral recruit spat counts from USVI starting in 2009.

Website: https://www.bco-dmo.org/dataset/736835
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
Edmunds, Peter J.	California State University Northridge (CSUN)	Principal Investigator
Kelley, Thomas	National Park Service (NPS)	Contact
Ake, Hannah	Woods Hole Oceanographic Institution (WHOI BCO-DMO)	BCO-DMO Data Manager

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Coverage

Spatial Extent: **N**:18.317 **E**:-64.72 **S**:18.307 **W**:-64.73
Temporal Extent: 2009-08 - 2016-06

Dataset Description

In this study, coral recruitment was measured on a kilometer-wide scale on shallow (5–6 m depth) fringing reefs in St. John, US Virgin Islands, with the objective of determining the extent to which variation in recruitment was affected by biophysical coupling involving temperature and flow. Coral recruitment was measured using settlement tiles deployed at 10 sites along 10 km of shore. The tiles were first deployed in August 2006, and thereafter replaced every ≈6 months to sample from either August to January, or January to August over 2 years. Seawater temperature was recorded at the 10 sites using logging thermistors, and flow was quantified using drogues. Overall, corals recruited at a rate equivalent to 76 corals m− 2 6 months− 1, and were represented mostly by poritids (43% of recruits), agaricids (29%), faviids (17%) and siderastreids (7%). Although the density of recruits differed among sites in a pattern that varied among periods and years, there was a consistent trend for mean density to decline from ≈ 4 corals tile− 1 at eastern sites, to ≤ 1 coral tile− 1 at western sites. One aspect of seawater temperature – the daily range – differed among sites and was greater at western compared to eastern sites, and while it was related inversely to recruitment over one of the sampling periods, it was equivocal as a physical process affecting recruitment. Instead, our results are consistent with biophysical coupling involving patch depletion and downstream filtering, whereby patches of coral larvae are delivered to the south shore of St. John and depleted of larvae through settlement as the water progresses westward.

Methods & Sampling

Sampling Methods

These data come from (1) Cabritte Horn, (2) Tektite, (3) Yawzi Point, (4) West Little Lameshur Bay, and (5) White Point. All tiles are at 5-6 m depth and these data describe tiles that are on the reef for ~12 months with

replacement occurring in August of each summer. There are 14-16 tiles at each site. Numbers vary due to errors. The tiles are collected, bleached, dried and scored for coral recruits that are scored for presence on the top, side, and bottom of each tile. Top, Bottom and Side are summed to give densities for "All surfaces" by family. The complete method is described in Green and Edmunds (2011).

Data Processing Description

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
spat_counts.csv (Comma Separated Values (.csv), 31.31 KB) MD5:607df17cfa7af6360190928224ef8482 Primary data file for dataset ID 736835

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Parameters

Parameter	Description	Units
Site	Site of sampling	unitless
lat	Latitude	decimal degrees
lon	Longitude	decimal degrees
Year	Year in which recruitment tiles werev recovered and censured. All tiles were replaced in July/August and thus 2009 reports recruitment from July/August 2008 to July/August 2009.	unitless
TOTAL	All corals found on all syrfaces; all others by family. Other = unknown.	count per centimeter squared
Siderastreidae	Densities of recruits on all surfaces of settlement tiles (top + bottom + sites) for a combianed area of 225 + 225 + 60 = 510 cm^2.	count per centimeter squared
Faviidae	Densities of recruits on all surfaces of settlement tiles (top + bottom + sites) for a combianed area of 225 + 225 + 60 = 510 cm^2.	count per centimeter squared
Agaricidae	Densities of recruits on all surfaces of settlement tiles (top + bottom + sites) for a combianed area of 225 + 225 + 60 = 510 cm^2.	count per centimeter squared
Poritidae	Densities of recruits on all surfaces of settlement tiles (top + bottom + sites) for a combianed area of 225 + 225 + 60 = 510 cm^2.	count per centimeter squared
Acroporidae	Densities of recruits on all surfaces of settlement tiles (top + bottom + sites) for a combianed area of 225 + 225 + 60 = 510 cm^2.	count per centimeter squared
Other	Densities of recruits on all surfaces of settlement tiles (top + bottom + sites) for a combianed area of 225 + 225 + 60 = 510 cm^2.	count per centimeter squared
Astrangia	Densities of recruits on all surfaces of settlement tiles (top + bottom + sites) for a combianed area of 225 + 225 + 60 = 510 cm^2.	count per centimeter squared

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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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