Percent cover of coral in pacific Panama using the coral point count method from 2016-2018

Website: https://www.bco-dmo.org/dataset/747525
Data Type: Other Field Results
Version: 1
Version Date: 2018-10-05

Project
» Collaborative Research: Climate Change, Mesoscale Oceanography, and the Dynamics of Eastern Pacific Coral Reefs (Coral Climate ETP)

Contributors	Affiliation	Role
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Abstract
Percent cover of coral in pacific Panama using the coral point count method from 2016-2018.

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Coverage

Spatial Extent: **N**:8.63174097 **E**:-79.028169 **S**:7.40308698 **W**:-81.759072
Temporal Extent: 2016-10 - 2018-03

Dataset Description

Percent cover of coral in pacific Panama using the coral point count method.

Methods & Sampling

Permanent quadrats that were established during the first year of the project were revisited twice per year for two years, and photographed during each visit. Benthic cover estimates were derived from the photographs by randomly overlaying 50 points on each image in coral point count (CPCE), and classifying the benthic composition underneath. Any point over live coral was assigned a bleaching score from 1 to 5, with a 1 indicating fully pigmented and 5 indicating completely bleached. The average bleaching score for each quadrat was calculated from all points over live coral.

Data Processing Description

BCO-DMO Processing Notes:

- added conventional header with dataset name, PI name, version date
- modified parameter names to conform with BCO-DMO naming conventions

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Data Files

File
percent_cover_cpce.csv (Comma Separated Values (.csv), 22.13 KB) MD5:3245c0d8c583c66f2dcb82daa8c6e0c2 Primary data file for dataset ID 747525

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Parameters

Parameter	Description	Units
Gulf	name of the region	unitless
Site	name of the site	unitless
Latitude	latitude in decimal degrees north	decimal degrees
Longitude	longitude in decimal degrees east	decimal degrees
GulfN	numerical gulf identifier	unitless
SiteN	numerical site identifier	unitless
Replicate	replicate	unitless
coralN	number of coal points identified	count
notcoralN	number of non-coral points identified; excluding points that fell on quadrat or were unidentifiable.	count
TotalMinusTape	otal number of points excluding those that fell on quadrat or were unidentifiable.	count
CC	percentrage coral cover	percent (%)
MeanHealth	average health score of coral points ranges from 1 to 5 with 1 indicating fully pigmented and 5 indicating completely bleached.	health score
UIN	Unique Identifing Number	unitless
Time	When the sampling took place.	unitless
Block	Replicate number within each site.	unitless
TimeStep	Categorical description of when sampling took place.	unitless

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Instruments

Dataset-specific Instrument Name	photographed
Generic Instrument Name	Camera
Dataset-specific Description	The corals were photographed and the buoyant weight was measured for the “initial” time.
Generic Instrument Description	All types of photographic equipment including stills, video, film and digital systems.

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Project Information

Collaborative Research: Climate Change, Mesoscale Oceanography, and the Dynamics of Eastern Pacific Coral Reefs (Coral Climate ETP)

Website: https://research.fit.edu/marine-paleolab/research-projects/eastern-tropical-pacific/

Coverage: Pacific Panamá

Coral reefs are under threat around the world, and climate change is the main reason they are declining. Knowing how local conditions on a reef exaggerate or mask the impacts of climate change make it possible to predict which reefs are most likely to survive longer and, therefore, which reefs deserve the greatest effort and funding for conservation. Reefs off the Pacific coast of Panama are vulnerable to the impacts of global climate change but are also strongly influenced by small-scale currents and other local conditions. The goal of this study is to see how those local differences affect coral growth and the ability of the corals to build reefs. Climate change appears poised to shut down reef growth off Pacific Panama within the next century. Considering that sea-level rise is accelerating at the same time, if coral reefs shut down they will not be able to protect populated shorelines from storm damage and erosion. In addition to its scientific insights, this project will provide undergraduate and graduate training, provide research training for underrepresented groups, advance women in scientific careers, and contribute important information for management and policy. The results will be incorporated into innovative curricular materials for K through 12 classes in Title-I schools in Florida aligned with Next Generation (Common Core) standards, and standards for Climate and Ocean Literacy. An annual film festival will be organized for K through 12 students to explore themes in marine science through videography.

Global climate change is now the leading cause of coral-reef degradation, but the extent to which mesoscale oceanography overprints climatic forcing is poorly understood. Previous studies in Pacific Panama showed that reef ecosystems collapsed from 4100 to 1600 years ago. The 2500-yr hiatus in reef-building occurred at locations throughout the Pacific, and the primary cause was increased variability of the El Nino-Southern Oscillation. This study will determine the influence of contemporary variability in mesoscale oceanography in the eastern tropical Pacific (ETP) on variability in the condition of local coral populations. Insights from the living populations will be combined with paleoecological and geochemical studies of reef frameworks to infer past conditions that were inimical or beneficial to coral growth and reef accretion. Three primary hypotheses will be tested in Pacific Panama:
H1. Mesoscale oceanography is manifested in gradients of reef condition, coral growth, and coral physiological condition. Physiographic protection from upwelling currents and thermocline shoaling confers positive effects on coral growth rate and physiology.
H2. The impacts of mesoscale oceanographic regimes on the growth and condition of reef-corals were felt at least as far back as the mid- to late Holocene.
H3. Physiographic protection from upwelling currents and thermocline shoaling conferred positive effects on vertical reef accretion in the past and shortened the late-Holocene hiatus.
Specific research approaches to test these hypotheses will include collecting high-resolution, oceanographic time series to characterize contemporary environments along gradients of physical conditions; collecting ecological and geochemical data on the condition of living coral populations; and extracting cores from the reef frameworks and analyzing the coral assemblages taxonomically, taphonomically, and geochemically to assess patterns of biotic and paleoenvironmental variability. Strong spatial and temporal variability in the physical drivers of reef development make the ETP an excellent model system in which to examine the response of

coral reefs to climate change over a range of physical regimes. This research will provide a unique opportunity to tease apart the controls on reef development across multiple spatial and temporal scales. The climatology underlying the late-Holocene hiatus was similar to probable scenarios for the next century, implying that climate change could be driving reef ecosystems of the ETP (and elsewhere) toward another collapse. Understanding how the hiatus unfolded along oceanographic gradients will increase our power to predict the future responses of reefs to a rapidly changing climate.

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1535007
NSF Division of Ocean Sciences (NSF OCE)	OCE-1535203

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