Preliminary surveys of benthic cover before artificial reef construction in the Caribbean from 2014-2017

Website: https://www.bco-dmo.org/dataset/542703
Data Type: Other Field Results
Version: 2015-01-14

Project
» Fish aggregations and biogeochemical hot spots across regional environmental gradients (Fish and biogeochem hot spots)

Contributors	Affiliation	Role
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Abstract

Transect surveys enumerating seagrass, algal cover and benthic invertebrates were conducted at multiple sites in The Bahamas and Haiti in June 2014. The experiments utilized artificial reefs that mimic natural patch reef habitats, concentrating fishes at high densities.

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Coverage

Spatial Extent: **N**:26.6062 **E**:-73.6051 **S**:18.08719 **W**:-78.51647
Temporal Extent: 2014 - 2017

Dataset Description

Transect surveys enumerating seagrass, algal cover and benthic invertebrates were conducted at multiple sites in The Bahamas and Haiti in June 2014. The experiments utilized artificial reefs that mimic natural patch reef habitats, concentrating fishes at high densities.

Methods & Sampling

Species of seagrass, algae, other benthic cover (e.g., sponge, coral) or invertebrate species were counted from 1 m^2 quadrats. For seagrasses, the number of seagrass shoots were counted within 10 x 10 cm quadrats placed randomly within the larger 1 m^2 quadrat. Percent coverage was the proportion of 1 m^2 quadrat covered by that species, as measured on the standard Braun-Blanquet scale:
<5% (1 individual) – 0.1
<5% (few individuals) – 0.5
<5% (many individuals) – 1
5-25% - 2
25-50% - 3
50-75% - 4

75-100% - 5
Benthic invertebrates such as sponges, molluscs and starfish were counted from the 1 m^2 quadrats.

Data Processing Description

BCO-DMO Processing:

version: 2015-01-14
- added lat/lon for site HH1

version: 2014-12-30
- added lat/lon for sites AC, HH, HL, MH, SC

version: 2014-12-08
- added conventional header with dataset name, PI name, version date
- renamed parameters to BCO-DMO standard
- added lab, lat, lon columns

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Data Files

File
benthic_cover_v3.csv(Comma Separated Values (.csv), 349.47 KB) MD5:07516435cc4fa2e116465f25379aa154 Primary data file for dataset ID 542703

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Parameters

Parameter	Description	Units
Thalassia_cnt1	seagrass shoots counted from within 10 x 10 cm quadrats	shoots
Thalassia_cnt2	seagrass shoots counted from within 10 x 10 cm quadrats	shoots
Thalassia_cnt3	seagrass shoots counted from within 10 x 10 cm quadrats	shoots
Thalassia_cnt4	seagrass shoots counted from within 10 x 10 cm quadrats	shoots
Syringodium_cnt1	seagrass shoots counted from within 10 x 10 cm quadrats	shoots
Syringodium_cnt2	seagrass shoots counted from within 10 x 10 cm quadrats	shoots

Syringodium_cnt3	seagrass shoots counted from within 10 x 10 cm quadrats	shoots
Syringodium_cnt4	seagrass shoots counted from within 10 x 10 cm quadrats	shoots
Halodule_cnt1	seagrass shoots counted from within 10 x 10 cm quadrats	shoots
Halodule_cnt2	seagrass shoots counted from within 10 x 10 cm quadrats	shoots
Halodule_cnt3	seagrass shoots counted from within 10 x 10 cm quadrats	shoots
Halodule_cnt4	seagrass shoots counted from within 10 x 10 cm quadrats	shoots
Thalassia_pcnt_cvr	seagrass percent cover from 1 m^2 quadrats	percent
Syringodium_pcnt_cvr	seagrass percent cover from 1 m^2 quadrats	percent
Halodule_pcnt_cvr	seagrass percent cover from 1 m^2 quadrats	percent
Halimeda_spp_pcnt_cvr	seagrass percent cover from 1 m^2 quadrats	percent
Penicillus_all_other_pcnt_cvr	seagrass percent cover from 1 m^2 quadrats	percent
Rhipocephalus_spp_pcnt_cvr	seagrass percent cover from 1 m^2 quadrats	percent
Udotea_spp_pcnt_cvr	seagrass percent cover from 1 m^2 quadrats	percent
Penicillus_pyriformes_pcnt_cvr	seagrass percent cover from 1 m^2 quadrats	percent
Laurencia_spp_pcnt_cvr	seagrass percent cover from 1 m^2 quadrats	percent
Acetabilaria_spp_pcnt_cvr	seagrass percent cover from 1 m^2 quadrats	percent
Penicillus_dumetosus_pcnt_cvr	seagrass percent cover from 1 m^2 quadrats	percent

Caulerpa_sertularioides_pcnt_cvr	seagrass percent cover from 1 m^2 quadrats	percent
Caulerpa_racemosa_pcnt_cvr	seagrass percent cover from 1 m^2 quadrats	percent
Caulerpa_cupressoides_pcnt_cvr	seagrass percent cover from 1 m^2 quadrats	percent
Caulerpa_paspaloides_pcnt_cvr	seagrass percent cover from 1 m^2 quadrats	percent
Ventricaria_spp_pcnt_cvr	seagrass percent cover from 1 m^2 quadrats	percent
Dictyota_spp_pcnt_cvr	seagrass percent cover from 1 m^2 quadrats	percent
Dictyospaeria_spp_pcnt_cvr	seagrass percent cover from 1 m^2 quadrats	percent
green_turf_pcnt_cvr	seagrass percent cover from 1 m^2 quadrats	percent
Avrainvillea_spp_pcnt_cvr	seagrass percent cover from 1 m^2 quadrats	percent
red_turf_pcnt_cvr	seagrass percent cover from 1 m^2 quadrats	percent
Batophora_oerstedii_pcnt_cvr	seagrass percent cover from 1 m^2 quadrats	percent
unknown_brown_sheet_pcnt_cvr	seagrass percent cover from 1 m^2 quadrats	percent
Ceramium_spp_pcnt_cvr	seagrass percent cover from 1 m^2 quadrats	percent
Cladophoropsis_macromeres_pcnt_cvr	seagrass percent cover from 1 m^2 quadrats	percent
Cladophora_spp_pcnt_cvr	seagrass percent cover from 1 m^2 quadrats	percent
Valonia_spp_pcnt_cvr	seagrass percent cover from 1 m^2 quadrats	percent
Gelidium_sp_pcnt_cvr	seagrass percent cover from 1 m^2 quadrats	percent
unkown_brown_Cell_pcnt_cvr	seagrass percent cover from 1 m^2 quadrats	percent
Rosenvingea_spp_pcnt_cvr	seagrass percent cover from 1 m^2 quadrats	percent

Cyanobacteria_pcnt_cvr	percent cover from 1 m^2 quadrats	percent
other_red_algae_pcnt_cvr	percent cover from 1 m^2 quadrats	percent
bud_coral_pcnt_cvr	percent cover from 1 m^2 quadrats	percent
Porites_pcnt_cvr	percent cover from 1 m^2 quadrats	percent
rose_coral_pcnt_cvr	percent cover from 1 m^2 quadrats	percent
Chalinula_molitba_sponge_pcnt_cvr	percent cover from 1 m^2 quadrats	percent
other_sponge_pcnt_cvr	percent cover from 1 m^2 quadrats	percent
sea_biscuit_cnt	number counted from within 10 x 10 cm quadrats	individuals
razor_clam_cnt	number counted from within 10 x 10 cm quadrats	individuals
sea_urchin_cnt	number counted from within 10 x 10 cm quadrats	individuals
sea_cucumber_cnt	number counted from within 10 x 10 cm quadrats	individuals
sea_anemone_cnt	number counted from within 10 x 10 cm quadrats	individuals
queen_conch_cnt	number counted from within 10 x 10 cm quadrats	individuals
starfish_cnt	number counted from within 10 x 10 cm quadrats	individuals
other_Conch_Whelk_cnt	number counted from within 10 x 10 cm quadrats	individuals
Cassiopea_spp_cnt	number counted from within 10 x 10 cm quadrats	individuals
stone_crab_cnt	number counted from within 10 x 10 cm quadrats	individuals
large_hermit_crab_cnt	number counted from within 10 x 10 cm quadrats	individuals

Deployments

Layman_2014

Website	https://www.bco-dmo.org/deployment/542786
Platform	Caribbean_nearshore
Start Date	2014-01-01
End Date	2014-11-30
Description	Coral reef surveys as part of the project "Fish aggregations and biogeochemical hot spots across regional environmental gradients".

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Project Information

Fish aggregations and biogeochemical hot spots across regional environmental gradients (Fish and biogeochem hot spots)

Coverage: Caribbean

Description from NSF award abstract:
Consumers in marine ecosystems have long been acknowledged for their role in top-down regulation of ecosystems, but their influence through bottom-up pathways such as nutrient supply is often underappreciated and has not been integrated into models of coastal ecosystem dynamics. Yet, nutrient supply from consumers may be a regulating factor when consumers aggregate, such as fishes around structurally complex habitat. Examining this bottom-up mechanistic pathway is essential for a more holistic understanding of seagrass ecosystems, which are important and threatened globally. This study will address the following questions: (1) Does concentrated nutrient supply from consumers result in distinct biogeochemical hot spots in seagrass beds? and (2) How do consumer effects on ecosystem processes vary across regional environmental contexts where nutrient availability and fishing pressure vary? The PIs will conduct experiments at multiple sites within three biogeographic regions in the Caribbean (The Bahamas, Hispaniola, and Grenada/St.Vincent/Grenadines). The experiments will utilize artificial reefs that mimic natural patch reef habitats that concentrate animals at high densities. Response variables reflecting ecosystem processes (e.g., seagrass nutrient content, seagrass biomass, primary producer diversity) will be measured at reef sites and compared with control sites (seagrass sites without reefs). The spatial extent over which ecosystem processes may be affected, i.e., distance from artificial reef, will be quantified and used to detect ecological thresholds in ecosystem responses. Predictor variables, including measures of ambient nutrient availability, fish densities and fish grazing rates, will be used to contextualize the relative importance of consumer-mediated nutrient supply. The hierarchical experimental design and two-pronged analysis will characterize relationships across environmental gradients found among and within the biogeographic regions, facilitating a conceptual framework needed to predict when, where, and why consumer-mediated nutrient supply is an important control of ecosystems processes in seagrass beds.

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1405198

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