Seagrass morphometric data from biomass sampling conducted at several sites in the Western Atlantic during April-May 2018 and August-September 2018

Website: https://www.bco-dmo.org/dataset/851924
Data Type: Other Field Results
Version: 1
Version Date: 2021-05-24

Project
» Collaborative Research: The tropicalization of Western Atlantic seagrass beds (Tropicalization Seagrass Beds)

Contributors	Affiliation	Role
Campbell, Justin	Smithsonian Marine Station (SMS)	Principal Investigator
Altieri, Andrew	Smithsonian Institution (NMNH)	Co-Principal Investigator
Douglass, James	Smithsonian Institution (NMNH)	Co-Principal Investigator
Heck, Kenneth	Smithsonian Institution (NMNH)	Co-Principal Investigator
Paul, Valerie J.	Smithsonian Institution (NMNH)	Co-Principal Investigator
Rhoades, Olivia	Smithsonian Institution (NMNH)	Contact
Rauch, Shannon	Woods Hole Oceanographic Institution (WHOI BCO-DMO)	BCO-DMO Data Manager

Abstract
This dataset includes seagrass morphometrics from biomass sampling collected immediately after experimental deployment (April - May 2018) and four months after deployment (August - September 2018). Western Atlantic sampling sites include the following locations: Bocas del Toro, Panama; Bonaire; Little Cayman, Cayman Islands; Carrie Bow, Belize; Puerto Morelos, Mexico; Andros, Bahamas; Eleuthera, Bahamas; Corpus Christi, Texas; Galveston, Texas; Naples, Florida; Crystal River, Florida; St. Joes, Florida; and Bermuda.

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Coverage

Spatial Extent: **N**:29.701 **E**:-76.627 **S**:9.352 **W**:-97.035
Temporal Extent: 2018-04-16 - 2018-10-11

Dataset Description

Seagrass biomass sampling was conducted in the Western Atlantic at the following locations: Bocas del Toro, Panama; Bonaire; Little Cayman, Cayman Islands; Carrie Bow, Belize; Puerto Morelos, Mexico; Andros, Bahamas; Eleuthera, Bahamas; Corpus Christi, Texas; Galveston, Texas; Naples, Florida; Crystal River, Florida; St. Joes, Florida; and Bermuda.

Methods & Sampling

Field collection procedures:
Haphazardly select 10 locations to sample with a PVC core. At each location, carefully place the PVC core (15cm diameter) on the sediment surface. It is extremely important to check both the inside and outside edges of the PVC ring to ensure that seagrass leaves are not trapped underneath. If there are leaves inside the ring that originate from shoots outside the PVC ring, carefully pull these leaves out. Conversely, if there are leaves outside the PVC ring that originate from shoots inside the ring, carefully pull these leaves inside. Only after this has been completed, insert the ring 10cm into the sediment while simultaneously twisting the core to sever belowground rhizomes. Carefully remove the core and place all captured aboveground and belowground vegetative biomass into a mesh bag. Gently shake the bag underwater to remove loosely attached sediment.

Lab processing procedures for morphometric data:
In the lab, take each mesh bag and carefully transfer its contents into a separate tub filled with freshwater. Gently agitate the seagrass material in the freshwater to further remove loosely attached sediment. Record the total number of *Thalassia* shoots, any evidence of grazing bite marks (number of grazing marks per shoot) and a visual estimate of epiphyte loading. Arrange all shoots on a smooth surface (e.g. glass plate) and record the length in mm of the longest leaf from each shoot.

Data Processing Description

BCO-DMO Processing:
version 1 (2021-05-24):
- converted date format to YYYY-MM-DD;
- replaced "NA" with "nd" to indicate "no data";
- added latitude, longitude, and site_name fields from the site coordinates data file;
- converted latitude and longitude to decimal degrees;
- removed commas from the notes and site_name columns.

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Data Files

File	
biomass_morphometrics.csv	(Comma Separated Values (.csv), 141.26 KB) MD5:fcc02640dd20fa3177ff5d14561a83d2
Primary data file for dataset ID 851924	

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Related Datasets

IsRelatedTo

Campbell, J., Altieri, A., Douglass, J., Heck, K., Paul, V. J. (2021) **Seagrass weights from biomass sampling conducted at several sites in the Western Atlantic during April-May 2018 and August-September 2018.** Biological and Chemical Oceanography Data Management Office (BCO-DMO). (Version 1) Version Date 2021-05-24 doi:10.26008/1912/bco-dmo.754403.1 [view at BCO-DMO]

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Parameters

Parameter	Description	Units
site_code	site code	unitless
site_name	site name	unitless
latitude	site latitude	degrees North
longitude	site longitude	degrees East
recorder	person who recorded the data	unitless
season	season and year in which cores were collected	unitless
date_collected	date the cores were collected; format: YYYY-MM-DD	unitless
plot	plot/core number	unitless
shoot_count	total number of shoots in core	unitless
shoot	individual thalassia shoot	unitless
grazing_shoot	if grazing is visible on the individual thalassia shoot (0 = no; 1 = yes)	unitless
grazer_shoot	types grazing marks found on the individual thalassia shoot: f = fish; u = urchin; c = crab; t = turtle; a = all; fu = fish and urchin; fc = fish and crab; ft = fish and turtle; uc = urchin and crab; ut = urchin and turtle; ct = crab and turtle.	unitless
grazingct_shoot	number of grazing marks found on the individual thalassia shoot	unitless
longestleaf_shoot	length of the longest leaf on the individual thalassia shoot	millimeters (mm)
epiphyte_load	visual epiphyte load estimation on the individual thalassia shoot: 0 = Blades look clean; no epiphytes visible; 1 = Blades have a light or patchy coating of epiphytes; 2 = Moderately dense epiphytes are obvious on most blades; 3 = Almost all blades are densely covered in epiphytic growth; blade surfaces obsured.	unitless
notes	notes about the row of data	unitless

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Instruments

Dataset-specific Instrument Name	PVC core
Generic Instrument Name	Push Corer
Generic Instrument Description	Capable of being performed in numerous environments, push coring is just as it sounds. Push coring is simply pushing the core barrel (often an aluminum or polycarbonate tube) into the sediment by hand. A push core is useful in that it causes very little disturbance to the more delicate upper layers of a sub-aqueous sediment. Description obtained from: http://web.whoi.edu/coastal-group/about/how-we-work/field-methods/coring/

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Project Information

Collaborative Research: The tropicalization of Western Atlantic seagrass beds (Tropicalization Seagrass Beds)

Website: https://marinegeo.si.edu/research/research-in-action/underwater-meadows-and-resilient-seas

Coverage: Western Atlantic

NSF Award Abstract:
The warming of temperate marine communities is becoming a global phenomenon, producing new biotic interactions that can result in a series of cascading effects on ecosystem structure. For example, the poleward expansion of herbivore populations can lead to the consumption of habitat-forming vegetation, which alters the ecological services provided by coastal environments (a phenomenon known as tropicalization). Many of the habitats at risk, such as kelp forest and seagrass beds, provide foundational habitat that supports complex food webs. Seagrass meadows along the Gulf of Mexico are currently experiencing an influx of tropical grazers, however a integrated understanding of how these communities might ultimately respond is lacking. This project describes the first experiment to quantify the disruptive effect of tropicalization on the ecology of a widely-distributed seagrass. A major contribution of this project will be the development of a seagrass research collaborative network to serve as a platform for broader scientific inquiry and future collaboration. The collaboration spans a total of 11 institutions, and this network will foster extensive collaborations among junior and senior scientists, as well as many undergraduate and graduate students. Given the geographic scope of this work, the research team will further pursue outreach opportunities across the network by hosting a series of public lectures and science café events promoting topics in marine ecology and conservation.

This study will develop a large-scale manipulative experiment across the Caribbean, premised upon a comparative network of 15 marine sites, which will quantify how temperature and light interact with grazer effects on the dominant tropical seagrass, Thalassia testudinum. Sites have been selected along a latitudinal gradient (from Bermuda to Panama), such that light and temperature vary, allowing the investigators to test for the effects of abiotic factors on the ecological effects of increased grazing (tropicalization simulated via artificial leaf clipping). At each of the 15 marine sites, grazing treatments will be crossed with nutrient manipulations in a factorial design for 18 weeks, after which seagrass structure and functioning will be assessed via measurements of areal productivity, shoot density, aboveground biomass, and carbohydrate storage. Experiments will be conducted both in the summer and winter seasons, when abiotic gradients are at their weakest and strongest, respectively. Emerging statistical techniques in hierarchical mixed modeling and structural equation modeling will further allow for integration of experimental and observational data.

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1737247

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