

Size and abundance data for fish communities across the Thalassia Experimental Network (TEN) sites in the Western Atlantic from 2018-2019

Website: <https://www.bco-dmo.org/dataset/784770>

Data Type: Other Field Results

Version: 1

Version Date: 2019-12-19

Project

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

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Abstract

Size and abundance data for fish communities across the Thalassia Experimental Network (TEN) sites in the Western Atlantic from 2018-2019.

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Coverage

Spatial Extent: N:28.714 E:-76.6266 S:9.3516 W:-97.0348

Temporal Extent: 2018-05-01 - 2019-05-09

Dataset Description

Size and abundance data for fish communities across the Thalassia Experimental Network (TEN) sites.

Methods & Sampling

Fish surveys consisted of 50m x 2m x 2m visual benthic transects in the seagrass within and adjacent to the experimental array (20m x 10m) at each site. Where possible, these were conducted on SCUBA; otherwise, surveys were conducted by a single snorkeler. Surveys were initiated at one side of the long end of the

subtidal caging experiment, with 20m of the transect within the experimental array and 30m outside of the array. Divers recorded both the abundance and estimated binned size of all fish species observed (>0.5cm minimum size, both cryptic and non-cryptic species occurring on the benthos or in the water column). Fish surveys were conducted every two weeks (with a minimum visibility of 3m) at each site in the TEN network.

Data Processing Description

Data Processing: Data was processed in R Statistical Software (R version 3.6.1 (2019-07-05)). All data files were merged and QA/QC'ed to ensure proper and consistent formatting and ensuring consistent species identification and spelling.

BCO-DMO Processing:

- added latitude, longitude, and full site names from the site coordinates file provided to BCO-DMO;
- converted the latitude and longitude values from degrees-minutes-seconds to decimal degrees;
- replaced missing/empty values with "nd" ("no data").

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Data Files

File
TEN_fish_survey.csv (Comma Separated Values (.csv), 15.07 MB) MD5:4764ee36f73a54b5c14b2dedd45bd073
Primary data file for dataset ID 784770

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Parameters

Parameter	Description	Units
site	Site code; refer to "full_names" column for complete name	unitless
lat_dd	Site latitude in decimal degrees	degrees
lon_dd	Site longitude in decimal degrees	degrees
season	Season during which each survey was taken	unitless
date_collected	Date (local time zone) each survey was taken; format: yyyy-mm-dd	unitless
visibility	Visibility through the water column at the time the survey was conducted	meters (m)
array	Whether the survey took place inside or outside the array. 0 = outside, 1 = inside, 2+ = unknown	unitless
fish_spp	Scientific name of the fish species (Genus_species). Where a species was unidentifiable to the species level, a genus or family-level name was given (i.e. Scarus_spp)	unitless
size_class	Estimated size class of the species, measured as length of the fish from tip to end of tail. Each number is the lower bound of the size class category of the species, with the upper bound being the next available size class (e.g. if an individual is in the "5" size class, that indicates that it is greater than or equal to 5cm and less than 10cm in length).	centimeters (cm)
abundance	Count of the number of individuals seen in a given size class of a given species	unitless
full_names	Full name of the site	unitless

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Instruments

Dataset-specific Instrument Name	snorkel
Generic Instrument Name	Diving Mask and Snorkel
Generic Instrument Description	A diving mask (also half mask, dive mask or scuba mask) is an item of diving equipment that allows underwater divers, including, scuba divers, free-divers, and snorkelers to see clearly underwater. Snorkel: A breathing apparatus for swimmers and surface divers that allows swimming or continuous use of a face mask without lifting the head to breathe, consisting of a tube that curves out of the mouth and extends above the surface of the water.

Dataset-specific Instrument Name	SCUBA
Generic Instrument Name	Self-Contained Underwater Breathing Apparatus
Generic Instrument Description	The self-contained underwater breathing apparatus or scuba diving system is the result of technological developments and innovations that began almost 300 years ago. Scuba diving is the most extensively used system for breathing underwater by recreational divers throughout the world and in various forms is also widely used to perform underwater work for military, scientific, and commercial purposes. Reference: https://oceanexplorer.noaa.gov/technology/technical/technical.html

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Deployments

TEN_2018-2019

Website	https://www.bco-dmo.org/deployment/784708
Platform	Thalassia Experimental Network
Start Date	2018-04-16
End Date	2019-05-22
Description	Thalassia Experimental Network (TEN) sites sampled in 2018-2019; several sites in the Western Atlantic - including sites in the following locations: Bocas del Toro, Panama; Lac Bay, 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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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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