Parrotfish bite annotations from Florida Keys National Marine Sanctuary, 2009-2013

Website: https://www.bco-dmo.org/dataset/674439
Data Type: experimental
Version: 2
Version Date: 2021-08-06

Project
» Cascading interactions of herbivore loss and nutrient enrichment on coral reef macroalgae, corals, and microbial dynamics (HERBVRE)

Contributors	Affiliation	Role
Burkepile, Deron	Florida International University (FIU)	Principal Investigator
Vega Thurber, Rebecca	Florida International University (FIU)	Co-Principal Investigator
Copley, Nancy	Woods Hole Oceanographic Institution (WHOI BCO-DMO)	BCO-DMO Data Manager
Rauch, Shannon	Woods Hole Oceanographic Institution (WHOI BCO-DMO)	BCO-DMO Data Manager

Abstract
This dataset contains parrotfish bite observations for the study plots at Pickles Reef, Florida Keys National Marine Sanctuary from 2009-2013. Published in Nature Communications (2016) doi:10.1038/ncomms11833, Supplementary Data 2c.

Table of Contents

Coverage

Spatial Extent: **Lat**:24.9943 **Lon**:-80.4065
Temporal Extent: 2009-06-22 - 2013-08-17

Dataset Description

This dataset contains parrotfish bite observations for the study plots at Pickles Reef, Florida Keys National Marine Sanctuary from 2009-2013. Published in Nature Communications (2016) doi:10.1038/ncomms11833, Supplementary Data 2c.

Natural history of the study site:
This experiment was conducted in the area of Pickles Reef (24.99430, -80.40650), located east of Key Largo, Florida in the United States. The Florida Keys reef tract consists of a large bank reef system located approximately 8 km offshore of the Florida Keys, USA, and paralleling the island chain. Our study reef is a 5-6 m deep spur and groove reef system within this reef tract. The reefs of the Florida Keys have robust herbivorous fish populations and are relatively oligotrophic. Coral cover on most reefs in the Florida Keys, including our site, is 5-10%, while macroalgal cover averages ~15%, but ranges from 0-70% depending on location and season. Parrotfishes (*Scaridae*) and surgeonfishes (*Acanthuridae*) are the dominant herbivores on

these reefs as fishing for them was banned in 1981. The other important herbivore on Caribbean reefs, the urchin *Diadema antillarum*, remains at low densities across the Florida Keys following the mass mortality event in 1982-3.

Related Reference:
Zaneveld, J.R., D.E. Burkepile, A.A. Shantz, C. Pritchard, R. McMinds, J. Payet, R. Welsh, A.M.S. Correa, N.P. Lemoine, S. Rosales, C.E. Fuchs, and R. Vega Thurber (2016) Overfishing, nutrient pollution, and temperature interact to disrupt coral reefs down to microbial scales. Nature Communications 7:11833 doi:10.1038/ncomms11833 Supplementary Information

Data Processing Description

BCO-DMO Processing:
- added conventional header with dataset name, PI name, version date;
- modified parameter names to conform with BCO-DMO naming conventions;
- reformatted date from m/d/yyyy to ISO_Date: yyyy-mm-dd;
- reduced number of digits for 'abs_squared_deviation_from_28' from 8 to 2;
- replaced 'unknown' and 'null' with 'nd' ('no data');
- renamed 'Env' to 'sample_type'.

[table of contents | back to top]

Data Files

File
S2c_parrotfish_bites.csv (Comma Separated Values (.csv), 90.13 KB) MD5:698f9b1dc1dfd66df22d96a95492f896 Primary data file for dataset ID 674439

[table of contents | back to top]

Related Publications

Zaneveld, J. R., Burkepile, D. E., Shantz, A. A., Pritchard, C. E., McMinds, R., Payet, J. P., ... Thurber, R. V. (2016). Overfishing and nutrient pollution interact with temperature to disrupt coral reefs down to microbial scales. Nature Communications, 7(1). doi:10.1038/ncomms11833
Results

[table of contents | back to top]

Related Datasets

IsRelatedTo

Burkepile, D., Vega Thurber, R. (2021) **Benthic community composition at Pickles Reef, Florida Keys National Marine Sanctuary from 2009-2013.** Biological and Chemical Oceanography Data Management Office (BCO-DMO). (Version 2) Version Date 2021-08-06 doi:10.26008/1912/bco-dmo.674368.2 [view at BCO-DMO]

Burkepile, D., Vega Thurber, R. (2021) **Microbial sample metadata, sequencing and treatment details, temperature and salinity at Pickles Reef, Florida Keys National Marine Sanctuary from 2009-2012.** Biological and Chemical Oceanography Data Management Office (BCO-DMO). (Version 2) Version Date 2021-08-06 doi:10.26008/1912/bco-dmo.674321.2 [view at BCO-DMO]

Burkepile, D., Vega Thurber, R. (2021) **Relative abundance of phyla from Florida Keys National Marine Sanctuary, 2009-2013.** Biological and Chemical Oceanography Data Management Office (BCO-DMO).

(Version 2) Version Date 2021-08-06 doi:10.26008/1912/bco-dmo.674449.2 [view at BCO-DMO]

[table of contents | back to top]

Parameters

Parameter	Description	Units
sample_location_name	name of sample collection reef	unitless
latitude	latitude; north is positive	decimal degrees
longitude	longitude; east is positive	decimal degrees
SampleID	sample identifier	unitless
date_collected	date of collection formatted at yyyy-mm-dd	unitless
ElapsedDays	number of days since beginning of experiment	days
reassigned_host_taxon_name	reassigned host taxon name	unitless
mitochondria_count_from_reassigned_taxon	mitochondria count from reassigned taxon	mitochondria
secnd_likely_host_by_mitochondria	2nd most likely host by mitochondria	unitless
mitochondria_count_from_2nd_greatest_host_contributor	mitochondria count from 2nd greatest host contributor	mitochondria
Discard_conflicting_host_taxon	discard conflicting host taxon (yes/no)	unitless
Reassign_host_taxon	reassigned host taxon (yes/no)	unitless
new_host_taxon_name	new host taxon name	unitless
storm_damage	storm damage flag (yes/no)	unitless
sample_type	sample type	unitless
temp_cat	temperature category: high (>30 C) mid (24-30 C) or low (	unitless
abs_squared_deviation_from_28	absolute squared deviation from 28 degrees C.	degrees Celsius
final_tissue_change_score	final tissue change score	unitless
final_tissue_change_score_base_0	final tissue change score base 0	unitless
final_tissue_change_percent	final tissue change percent	dimensionless
tissue_loss	tissue loss	unitless
binary_tissue_loss	binary tissue loss	unitless
dead_by_end	whether coral was dead by end of experiment (yes/no)	unitless
parrotfish_bites_by_end	wether there were parrotfish bites by end of experiment (yes/no)	unitless
last_sampling_date	last sampling date formatted as yyyy-mm-dd	unitless
photographic_evidence_of_death	photographic evidence of death (yes/no)	unitless

[table of contents | back to top]

Instruments

Dataset-specific Instrument Name	
Generic Instrument Name	Camera
Generic Instrument Description	All types of photographic equipment including stills, video, film and digital systems.

[table of contents | back to top]

Deployments

Burkepile_FL_Keys

Website	https://www.bco-dmo.org/deployment/639486
Platform	Florida Keys National Marine Sanctuary
Start Date	2009-06-01
End Date	2012-08-31
Description	Herbivore effects on reef algae

[table of contents | back to top]

Project Information

Cascading interactions of herbivore loss and nutrient enrichment on coral reef macroalgae, corals, and microbial dynamics (HERBVRE)

Coverage: Key Largo, Florida Keys, USA; N 24.99430, W 080.40650

Description from NSF award abstract:
Coral reefs in the Caribbean Sea are undergoing unprecedented declines in coral cover due in large part to climate change, pollution, and reductions in fish biodiversity and abundance. Macroalgae have become abundant on reefs, probably due to decreases in herbivory (e.g., through overfishing) and increases in anthropogenic inputs of nutrients. The spread of macroalgae has negative feedbacks on reef recovery because algae are often superior competitors and suppress growth of both adult and juvenile corals. A majority of reef studies to date have focused on how stressors affect macroorganisms, while relatively few have investigated how these stressors and the resultant algal-dominated states affect microorganisms. Yet, coral reef-associated microbes play significant roles in coral reef ecosystems through biogeochemical cycling and disease. Since microbes are important mutualists of corals as well as potential pathogens, it is important to understand the mechanisms that control their taxonomic and functional diversity.

The goal of this proposal is to quantify how alterations of top-down (removal of herbivorous fish) and bottom-up (inorganic nutrient addition) forces alter macrobial as well as microbial dynamics on coral reefs in order to understand the mechanisms that reinforce coral-depauperate reef systems. This work asks two main questions:

Q1. How do nutrient enrichment and herbivore removal interact to affect benthic algal abundance, coral-algal interactions, and coral survivorship and growth?

Q2. How do nutrient enrichment and herbivore removal affect bacterial abundance, taxonomic diversity, and

functional diversity on and within corals?

The proposed research will directly and empirically address many of the current hypotheses about how bottom-up and top-down forces alter reef dynamics. The PIs will investigate: (1) the impact of multiple stressors over several years; (2) impacts on multiple levels of biological organization (from fishes to algae to microbes); and (3) the mechanisms underlying changes in algal-coral microbe interactions. Significantly, the approach will provide the statistical power necessary to distinguish between seasonal- and stress-induced changes in macro- and microbial diversity.

Resulting Publication:
Zaneveld, J.R., D.E. Burkepile, A.A. Shantz, C. Pritchard, R. McMinds, J. Payet, R. Welsh, A.M.S. Correa, N.P. Lemoine, S. Rosales, C.E. Fuchs, and R. Vega Thurber (2016) Overfishing, nutrient pollution, and temperature interact to disrupt coral reefs down to microbial scales. Nature Communications 7:11833 doi:10.1038/ncomms11833.
Access to data via Supplementary Information.

[table of contents | back to top]

Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1130786

[table of contents | back to top]