Microbial sample metadata for water samples used in SourceTracker analysis, 2009-2012

Website: https://www.bco-dmo.org/dataset/674390
Data Type: Other Field Results
Version: 1
Version Date: 2016-12-19

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
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Abstract
This dataset contains microbial sample metadata for water samples used in SourceTracker analysis, from Pickles Reef, Florida Keys National Marine Sanctuary from August of 2011 and 2012. Published in Nature Communications (2016) doi:10.1038/ncomms11833, Supplementary Data 2d.

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Coverage

Spatial Extent: **Lat**:24.9943 **Lon**:-80.4065

Dataset Description

This dataset contains microbial sample metadata for water samples used in SourceTracker analysis, from Pickles Reef, Florida Keys National Marine Sanctuary from August of 2011 and 2012. Published in Nature Communications (2016) doi:10.1038/ncomms11833, Supplementary Data 2d.

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
- reduced decimal places of HCOM temperature and salinity columns from 4 or 8 to 3 in consideration of sampling precision; reduced lat and lon from 6 to 5 places
- reformatted date from m/d/yyyy to ISO_Date: yyyy-mm-dd
- removed the following columns from display: project, concatenated_date, year, month, day, plot_code_month_year; SequencingCenter, OldSampleID; altitude, country, assigned_from_geo, elevation, env_biome, env_feature, HCOM_temp_0m_degrees; HCOM_temp_5m_degrees; HCOM_avg_0m_degrees; HCOM_avg_temp_5m_degrees; temp_and_salinity_source, SourceSink, Description, ANONYMIZED_NAME, degrees_above_28, degrees_below_28.

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Data Files

File
S2d_water_metadata.csv (Comma Separated Values (.csv), 4.71 KB) MD5:327ff8cddd36fe9d4bbbf07322362aa9 Primary data file for dataset ID 674390

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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

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Parameters

Parameter	Description	Units
sample_location_name	name of sampling location	unitless
latitude	latitude; north is positive	decimal degrees
longitude	longitude; east is positive	decimal degrees
depth	sample collection depth	meters

primer_name	primer identifier	unitless
SampleID	sample identifier	unitless
BarcodeSequence	genetic sequence of barcode for this sample	unitless
LinkerPrimerSequence	linker primer sequence	unitless
Replicate	replicate number	unitless
SampleID_no_replicate	SampleID without replicate number appended	unitless
McMindsSampleID	McMinds Sample identifier	unitless
Individual	identifier for individual organism	unitless
barcode_number	barcode identifier number	unitless
run_prefix	run name prefix	unitless
analysis_name	analysis identifer; same as project	unitless
sequencing_run	sequencing run identifier	unitless
sample_site_id	sampling site identifier	unitless
date_collected	date sample was collected formatted as yyyy-mm-dd	unitless
HCOM_temp_0m	temperature at surface from Hybrid Coordinates Ocean Model HCOM_31_0	degrees Celsius
HCOM_temp_5m	temperature at 5 meters depth from Hybrid Coordinates Ocean Model HCOM_31_0	degrees Celsius
HCOM_avg_temp_0m	average temperature at surface from Hybrid Coordinates Ocean Model HCOM_31_0	degrees Celsius
HCOM_avg_temp_5m	average temperature at 5 meters depth from Hybrid Coordinates Ocean Model HCOM_31_0	degrees Celsius

HCOM_salt_0m	salinity at surface from Hybrid Coordinates Ocean Model HCOM_31_0	PSU
HCOM_salt_5m	salinity at 5 meters depth from Hybrid Coordinates Ocean Model HCOM_31_0	PSU
HCOM_salt_avg_0m	average salinity at surface from Hybrid Coordinates Ocean Model HCOM_31_0	PSU
HCOM_salt_avg_5m	average salinity at 5 meters depth from Hybrid Coordinates Ocean Model HCOM_31_0	PSU
plot_code	plot code	unitless
Project	project identifier; same as analysis_name	unitless
Env	Marine	unitless
temp_cat	temperature category: high (>30 C) mid (24-30 C) or low (<24 C)	unitless

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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

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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.

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Funding

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

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