Surface water quality samples from Kiritimati, Kiribati collected in 2014 and 2015 (RAPID Kiritimati project)

Website: https://www.bco-dmo.org/dataset/665190
Data Type: Other Field Results
Version:
Version Date: 2016-11-18

Project
» RAPID: Tracking coral reef impacts of the 2014/2015 El Nino event (RAPID Kiritimati)

Contributors	Affiliation	Role
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Table of Contents

Dataset Description

This dataset contains water quality measurements collected on Kiritimati island, Kiribati in 2014 and 2015. Measured parameters include water temperature, salinity, pH, chlorophyll, turbidity, and dissolved oxygen. Values of yes or no are also supplied to describe whether it was raining or windy at the time the samples were taken.

Methods & Sampling

Surface sampling:

For the YSI, this was done off the side of the boat, at 1m depth. For the Aqufluor, this was done by swimming out from the boat, ~10m away from the vessel to avoid contamination from paint chips, gasoline, etc.

Other Sampling:

Bottom depth at all sampling locations was 10m.

YSI Measurements: Place YSI sensor into the water, and lower to 1m depth. Wait for readings to stabilize, and then record all parameters.

AquaFluor measurement procedure:

1. Test solid secondary standard and turbidity standard to ensure the instrument has not drifted throughout the day. Use this same procedure. Compare to the measurement from the beginning of the calibration.
2. Turbidity and In vivo Chl a will either be collected independently and taken as a subsample of the for chl a samples

3. In either case a 500 mL Nalgene bottle will be used, and should be collected in the same matter as the chl a sample (see 1.1)
4. Take as many independent chlorophyll and turbidity samples as you can but you will only take one sub-set sample from the extracted chlorophyll nalgenes.
5. When conducting the independent sampling, you will reuse one 500 ml brown nalgene. Wash with sterile seawater in-between samples.
6. Fill the cuvette 3/4 of the way using a transfer pipette. If you get the outside of the cuvette wet, dry completely with a kimwipe.
7. For the sub-samples of extracted chlorophyll, use the same 30cc syringe as used for nutrients.
8. Insure cleanliness of the cuvette, which are dry on the outside
9. Insert the sample (be aware of orientation), the black sample compartment does not need to be closed when reading the sample
10. Press the <Read> button. The instrument will measure and average the fluorescence signal for 10 seconds
11. The reading result will display on the top line of the Home screen, log this result
12. The top left corner will then display “WAIT” for 3 seconds. Once “WAIT” disappears, another sample can be read
13. We are going to reuse cuvettes. After you complete one sample clean the cuvette with sterile seawater and dry completely with a kimwipe. Additionally, clean the transfer syringe used for the sample with sterile seawater and dry with a kimwipe.

Data Processing Description

Data are directly from field readings.

BCO-DMO Processing Notes:

* added a conventional header with dataset name, PI name, version date
* modified parameter names to conform with BCO-DMO naming conventions
* values of NA changed to nd for no data
* removed Kiritimati,Kiribati for location/country in the data since it was same throughout. Described in the metadata.
* removed second depth value (bottom depth) which was 10m for all samples. Included this information in the acquisition description.

[table of contents | back to top]

Data Files

File
SurfaceWater.csv (Comma Separated Values (.csv), 13.03 KB) MD5:90b830497cb0fed240d16e4103d4aa8f Primary data file for dataset ID 665190

[table of contents | back to top]

Parameters

Parameter	Description	Units
sample_id	Sample identifier	unitless
lat	Latitude of sample; north is positive	decimal degrees
lon	Longitude of sample; west is negative	decimal degrees
field_season	Kiritimati field season (2014; 2015b) during which the sample was taken	unitless
site_id	Kiritimati site identifier	unitless
date	Date the sample was collected YYYY-MM-DD in Kiritimati Time UTC+14:00	unitless
time	Time the sample was collected (24 hour) Kiritimati Time UTC+14:00 in format HH:MM	unitless
water_temp	Seawater temperature	degrees Celsius
salinity	Salinity	parts per thousand (ppt)
pH	pH	pH scale
sample_depth	Depth of sample	meters
chlorophyll	Chlorophyll a (source: Aquafluor instrument)	micrograms per liter (ug/L)
turbidity	Turbidity (source: Aquafluor instrument)	Nephelometric Turbidity Unit (NTU)
rain	Raining during sample acquisition (Yes/No)	unitless
wind	Windy during sample acquisition (Yes/No)	unitless
O2_percent	Dissolved oxygen in seawater	percent (%)
O2_mg_L	Dissolved oxygen in seawater	miligrams per liter (mg/L)
notes	Notes regarding each sample	unitless

[table of contents | back to top]

Instruments

Dataset-specific Instrument Name	AquaFluor Handheld Fluorometer
Generic Instrument Name	Fluorometer
Dataset-specific Description	Aquafluor - AquaFluor Handheld Fluorometer (Turner Designs P/N: 998-0851)
Generic Instrument Description	A fluorometer or fluorimeter is a device used to measure parameters of fluorescence: its intensity and wavelength distribution of emission spectrum after excitation by a certain spectrum of light. The instrument is designed to measure the amount of stimulated electromagnetic radiation produced by pulses of electromagnetic radiation emitted into a water sample or in situ.

Dataset-specific Instrument Name	YSI - Professional Plus (Pro Plus) Multiparameter Instrument
Generic Instrument Name	YSI Professional Plus Multi-Parameter Probe
Dataset-specific Description	YSI #SKU6050000
Generic Instrument Description	The YSI Professional Plus handheld multiparameter meter provides for the measurement of a variety of combinations for dissolved oxygen, conductivity, specific conductance, salinity, resistivity, total dissolved solids (TDS), pH, ORP, pH/ORP combination, ammonium (ammonia), nitrate, chloride and temperature. More information from the manufacturer.

[table of contents | back to top]

Deployments

RAPID_2014-2015_Gates

Website	https://www.bco-dmo.org/deployment/665194
Platform	Kiritimati
Start Date	2014-08-21
End Date	2015-05-09
Description	**Methods & Sampling** surface water quality

[table of contents | back to top]

Project Information

RAPID: Tracking coral reef impacts of the 2014/2015 El Nino event (RAPID Kiritimati)

Coverage: Christmas Island (2N, 157W)

Extracted from the NSF award abstract:

As anthropogenic climate change intensifies, coral reefs face growing threats from associated decreases in ocean pH and increases in ocean temperature. While such stressors increase steadily through time, coral reefs also experience natural climate extremes, such as El Niño events, that rapidly reshape reef structure and function over a period of months. The El Niño event forecast for 2014/2015 presents the opportunity to study how such events affect coral reef ecosystems. This research will identify which species are most resilient to high temperature stress, and determine whether the presence of specific types of algal endosymbionts in the corals is predictive of the capacity of their coral hosts to survive temperature stress. By studying the reefs at remote sites with documented gradients in human use and pollution, the investigators will be able to tease apart the influence of El-Nino induced temperature changes from local impacts on the reef. This information will ultimately help to identify which components of the coral reef ecosystem are most vulnerable and provide a prognosis for the survival of different types of corals and endosymbionts in a warming world.

This project focuses on reefs at Christmas Island (2N, 157W) - a site that is predicted to be heavily affected by warming during El Niño. In September 2014, roughly 3 months prior to peak El Niño warming, the investigators will install an array of ocean monitoring equipment around Christmas Island. During that field trip, they will also conduct extensive ecological surveys of the reef, collect coral, water and sediment samples for the analysis of

Symbiodinium communities that will be analyzed at the University of Hawaii using high throughput sequencing approaches, and characterize ocean geochemistry at both windward and leeward sites on Christmas Island. These activities will be repeated in subsequent trips during peak El Niño conditions, and post El Niño conditions, to allow the investigators to monitor the acute responses of the environment and ecosystem and their near-term recovery, respectively. During the last trip, they will drill several coral colonies to assess how the corals record such a large thermal stress in terms of skeletal morphological and skeletal geochemistry changes.

[table of contents | back to top]

Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1446274

[table of contents | back to top]