Shallow-water temperature from Summerland Key, FL from December, 2017 to May, 2018 after Hurricane Irma

Website: https://www.bco-dmo.org/dataset/739288
Data Type: Other Field Results
Version: 1
Version Date: 2018-06-26

Project

» RAPID: Effects of Hurricane Irma on shallow-water marine ecosystems: Assessing resiliency of sponge and macroinvertebrate communities in the Florida Keys (Irma Sponge Inverts)

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Abstract

These data are temperature recordings from a shallow-water (<1 m) habitat on the south side of Summerland Key, FL related to sponge and macroinvertebrate surveys post-Hurricane Irma.

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Coverage

Spatial Extent: **Lat**:24.660893 **Lon**:-81.456059
Temporal Extent: 2017-12-14 - 2018-05-23

Methods & Sampling

Location: Shallow seagrass habitat, Summerland Key, FL depth <1 m (24.660893, -81.456059)

Data recorders were attached to the substratum with cable ties attached to a cement block. Temperature recordings were made from December, 2017 to May, 2018.

The first data logger had an recording interval of 30 min. It was removed on October 11, 2015 at 10:00, and replaced later in the day (October 11, 2015; 15:00). The new data logger had a recording interval set to 15 min. That data logger was collected on January 7th, 2016 (9:45), and replaced (12:00) with a logger that had a measuring interval of 30 mins.

Data loggers were not kept free of algae, and thus the light intensity measurements become unreliable later in the deployment. Algal growth was noticeable after approximately 3 weeks.

Data Processing Description

Data were processed using Hoboware.

Data Files

File
temp.csv (Comma Separated Values (.csv), 378.08 KB) MD5:1de650d028e6b99e9028494a1e9b5d46 Primary data file for dataset ID 739288

Parameters

Parameter	Description	Units
Replicate	Replicate	unitless
Day	Day in format "dd" (time zone GMT-05)	unitless
Month	Month in format "MMMM" (full month name) (time zone GMT-05)	unitless
Year	Year in format "yyyy" (time zone GMT-05)	unitless
Time	Time in format "HH:MM" (time zone GMT-05)	unitless
Temperature	Temperature	degrees Celsius
ISO_DateTime_UTC	ISO timestamp based on the ISO 8601:2004(E) standard in format YYYY-mm-ddTHH:MMZ (UTC)	unitless

Instruments

Dataset-specific Instrument Name	Hobo Pendant Temperature/Light 64K Data Logger
Generic Instrument Name	Temperature Logger
Generic Instrument Description	Records temperature data over a period of time.

Deployments

Hill_Irma_Sponge_Inverts

Website	https://www.bco-dmo.org/deployment/739303
Platform	Florida Keys National Marine Sanctuary

Project Information

RAPID: Effects of Hurricane Irma on shallow-water marine ecosystems: Assessing resiliency of

sponge and macroinvertebrate communities in the Florida Keys (Irma Sponge Inverts)

Coverage: Summerland Key, FL

Hurricane Irma was a massively destructive storm that traveled directly over the lower Florida Keys. While the above water damage was obvious, effects from the hurricane on shallow benthic marine habitats in the Florida Keys is unknown. Shallow water habitats, which are important nurseries for economically important fisheries, likely experienced the strong effects from the storm. Sponge communities in these ecosystems perform vital ecological functions due to their feeding behavior, which involves pumping large quantities of water and filtering material from the water column. The project tests important hypotheses about sponge responses to ecological disruptions that are caused by hurricanes. Sponges are abundant in many reef ecosystems, and play essential ecological roles, so learning about system responses to sponge community disturbances is important. The work trains undergraduates in field research, data management and analysis, and science communication. Some of the activities developed as part of this project are incorporated in the University of Richmond Integrated Science Experience (URISE), and the first-year Science, Math and Research Training (SMART) course, both of which are designed to increase participation in STEM disciplines by individuals from underrepresented groups. Furthermore, the research is presented in a variety of public forums to disseminate as widely as possible.

Sponges represent a significant benthic-pelagic coupling point in tropical reef habitats. The recently proposed sponge loop hypothesis predicts that these animals release detritus as a function of their biofiltering capabilities, which is then consumed by organisms at the base of the food web. Hurricane Irma may have disrupted components of the sponge loop, and the investigators are exploring four hypotheses related to the storm's effects. First, the proposed work tests whether sponge damage from the storm was non-random, disproportionately affecting larger sponges. The second hypothesis examines the effects of the storm on macroinvertebrate communities in these habitats. This work builds on sponge and macroinvertebrate surveys conducted by the investigators in the years preceding the storm. Thirdly, the hypothesis that the hurricane influenced bacterioplankton populations through disruption of sponge feeding is tested. The PIs also compare pre- and post-hurricane plankton structure via flow cytometery using inhalant-exhalent water samples collected as part of an on-going study of sponge feeding behavior. Finally, inhalant-exhalent water samples are collected from shallow-water populations of several sponges from different size categories to determine if feeding behavior shows any demographic shifts based on the size of the sponge. Samples are processed to examine the retention efficiencies and prey selectivity of the host sponges using flow cytometry. Initial surveys are conducted of sponges (size, density, diversity) and macroinvertebrates in December, 2017. Preliminary sponge pumping activity occurs then too. Extensive surveys take place again in May-July, 2018 with further monitoring to occur in subsequent years.

Funding