

# Octocoral species abundance during transect surveys at four sites on the south shore of St. John, US Virgin Islands from November to December 2017

**Website:** <https://www.bco-dmo.org/dataset/751176>

**Data Type:** Other Field Results, Cruise Results

**Version:** 1

**Version Date:** 2019-11-04

## Project

» [RAPID: Resilience of Caribbean octocorals following Hurricanes Irma and Maria](#) (Octocorals and Hurricanes)

| Contributors                   | Affiliation  | Role                   |
|--------------------------------|--|------------------------|
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## Abstract

This dataset contains octocoral colony heights measured during transect surveys at four sites on the south shore of St. John, US Virgin Islands in November 2017 following Hurricanes Irma and Maria.

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## Coverage

**Spatial Extent:** N:18.31671667 E:-64.71043333 S:18.30293333 W:-64.72993333

**Temporal Extent:** 2017-11-21 - 2017-12-01

## Dataset Description

This dataset contains octocoral colony heights measured during transect surveys at four sites on the south shore of St. John, US Virgin Islands in November 2017 following Hurricanes Irma and Maria.

## Methods & Sampling

Survey design:

All sites were located at 6 to 9 meters depth.

Censuses at East Cabritte, Europa and Tektite were based on 50x10m areas that were arbitrarily selected and permanently marked with stainless steel eyebolts at the corners of the sites. A total of six transect lines, also marked with eyebolts, were laid out at 10 m intervals. All octocorals present in 1 x 1 m quadrats along the 10-meter long transects were scored. In 2014 ten quadrats were surveyed along each line. In 2015 and 2016 ten quadrats were scored along each transect line at Europa and Tektite and five randomly chosen quadrats were surveyed at East Cabritte. The transect identifier "transect\_pos" has values 0, 10, 20, 30, 40 or 50 which represent position in meters within the 50x10 survey area corresponding to each of the 6 transects (e.g. 20 =

20m).

The census at Booby Rock was conducted in a single day in which 2 transects were randomly placed along a 50 m line that was arbitrarily placed on a constant depth contour. Only 4 1x1 m quadrats were surveyed along each transect. The transect identifier (transect\_pos) for transects at Booby Rock refers to position along the 50 m line.

#### Sampling methods:

Identifications were based on traits visible in the field, and samples of representative colonies were collected for further analysis in cases in which field identification was uncertain. Sclerites from those samples were examined for species identification.

Colony heights were measured as the maximum distance from the base of the octocoral colony until the farthest tips of the branch (i.e. not necessarily perpendicular to the substrate). All measures rounded to the nearest cm with the exception of 5 cm which only includes colonies  $\geq 5$  cm. Starting in 2016, measures less than 5 cm reflect colonies with thick branches which could only have  $<5$  cm heights due to partial mortality.

Two height measures are present, height of living tissue, which only includes that part of the axis with living tissue and total height which is the distance from the base to the tip of the tallest branch regardless of whether the tips or base had living tissue. (Only colonies with some living tissue were measured).

Species names for field\_codes in this dataset can be found in the related dataset: <https://www.bco-dmo.org/dataset/733063>

These data are a continuation of BCO-DMO project "Ecology and functional biology of octocoral communities" (<http://www.bco-dmo.org/project/562086>)

## Data Processing Description

### BCO-DMO Processing Notes:

- added conventional header with dataset name, PI name, version date
- modified parameter names to conform with BCO-DMO naming conventions
- added lat, lon, Genus\_Species, Genus, and Species fields
- converted latitude and longitude to decimal degrees
- re-formatted date from d-Mon-yy to yyyyymmdd

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## Data Files

| File  |
|---|
| <b>Adult_Surveys.csv</b> (Comma Separated Values (.csv), 102.62 KB)<br>MD5:a19a90e2fe6cc0630cb2a08ade106584 |
| Primary data file for dataset ID 751176   |

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## Related Datasets

### IsReferencedBy

Lasker, H., Edmunds, P. J., Wells, C. (2023) **Identity and heights of Octocoral species found on transects at 6 sites on the south shore of St John, U.S. Virgin Islands in 2021 and 2022.** Biological and Chemical Oceanography Data Management Office (BCO-DMO). (Version 1) Version Date 2023-04-18 <http://lod.bco-dmo.org/id/dataset/893615> [[view at BCO-DMO](#)]

## Parameters

| Parameter               | Description   | Units            |
|-------------------------|---|------------------|
| Census_Year             | Census Year   | unitless         |
| Date                    | Day - Month - Year on which data were collected.  | unitless         |
| Site                    | Census locations  | unitless         |
| Transect_Position       | Transects positioned in a marked 50x10m area with stainless steel eye bolts marking each corner and each of the 6 transect. Transects were 10m long across the 50x10m area. So there were 0m; 10m; 20m; 30m; 40m; 50m.  | meters (m)       |
| Side_of_transect        | Side of the transect tape (Left or Right) orientation looking towards open ocean with the nearest shore to the back.  | unitless         |
| Meter_on_transect       | From 0m to 9m. 1x1m quadrats were positioned randomly along the 10 m transect. The values refer to the position of the "shoreward" corner of the quadrat. Thus "0" refers to the quadrat placed between the 0 and 1 meter marks   | meters (m)       |
| Species_code            | Octocorals species acronyms. Field identifications of Pseudoplexaura flagellosa and P. wagnaari are difficult among small colonies and for analysis purposes the two species should be lumped as a single group. Field identifications of Eunicea mammosa E. laxispica and E. succinea are sometimes difficult s and for analysis purposes the two species should be lumped as a single group. LINES WITH NO SPECIES ENTRY IDENTIFY QUADRATS IN WHICH NO OCTOCORALS WERE PRESENT- This is also noted in the comments as "No colonies present" | unitless         |
| Height_of_living_tissue | Maximum distance from the base of the octocoral colony until the farthest tips of the longest branch with living tissue (i.e. not necessarily perpendicular to the substrate). All measures rounded to the nearest cm with the exception of 5 cm which only includes colonies $\geq 5$ cm. Measures less than 5 cm reflect colonies with thick branches which could only have   | centimeters (cm) |
| Total_Height            | total height  | centimeters (cm) |
| Genus_Species           | Full species name   | unitless         |
| Genus                   | Genus name  | unitless         |
| Species                 | Species name  | unitless         |
| lat                     | latitude in degrees north   | decimal degrees  |
| lon                     | longitude in degrees east   | decimal degrees  |
| Comments_1              | Comments. C. gibbosum denotes the presence of Cyphoma giibbosum a grazing snail that strips living tissue from octocoral colonies.  | unitless         |
| Comments_2              | Numbers refer to sample numbers of 4 cm dried tissue specimens collected for species identification.  | unitless         |

## Deployments

WS17317

|                    |   |
|--------------------|---|
| <b>Website</b>     | <a href="https://www.bco-dmo.org/deployment/751198">https://www.bco-dmo.org/deployment/751198</a> |
| <b>Platform</b>    | R/V F.G. Walton Smith   |
| <b>Start Date</b>  | 2017-11-21  |
| <b>End Date</b>    | 2017-12-01  |
| <b>Description</b> | Transect surveys at four sites on the south shore of St. John, US Virgin Islands.                 |

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## Project Information

### **RAPID: Resilience of Caribbean octocorals following Hurricanes Irma and Maria (Octocorals and Hurricanes)**

**Coverage:** St John, US Virgin Islands

#### NSF Award Abstract:

Disturbance and subsequent recovery have been key factors in the dynamics of coral reef populations, but in the Caribbean, there has been a steady decline in the abundance of hard corals accompanied by increased abundance of algae. This characterization overlooks the observation that at some sites for which there are quantitative data, the abundances of octocorals (sea fans and sea plumes) have increased. Closer inspection of those data reveals that octocorals have also declined at times, but unlike hard corals, they recovered and are now more abundant in at least some locations than 30 years ago. The change in abundances of these organisms would appear to be due to the greater resilience of octocorals. The damage inflicted by Hurricanes Irma and Maria on the south shore of St. John, U.S. Virgin Is. provides a window into these processes. Abundances of hard corals on these reefs have been monitored for the past 30 years and the octocorals have been followed for the past 4 years. Colonization of the newly opened space on the reef will be studied to determine if further shifts in abundances can be expected and to understand the basis for the greater resilience of octocoral populations. Characterizing the resilience of octocorals relative to hard corals will have implications for the fate of Caribbean reefs in a world subject of increasing levels of stress. This will be of importance to policy makers and managers, because hard corals and octocorals provide substantially different ecosystem services. In addition to its impact on our fundamental understanding of reef processes, the grant will support the training of graduate students.

Coral reefs have been recognized to be disturbance driven systems for over 50 years and disturbance has been considered to be important in maintaining diversity of reef communities. However, the past 30 years has been characterized by declines in the abundances of scleractinians, often associated with acute events such as hurricanes and bleaching events. A knowledge of the effects of disturbance and subsequent recovery that occurs during these events is critical to understanding the changes in reef structure that have occurred in the last 30 years. At sites for which there are data, changes in the relative abundance of scleractinians and octocorals appear to coincide with disturbance followed by octocoral recovery and a lack of scleractinian recovery. This change must reflect changes in larval supply, settlement, and/or survival, and those differences should be greatest following disturbance. The effects of Hurricanes Irma and Maria on the south shore of St. John provide the opportunity to characterize recruitment following disturbance and identify the processes that may limit successful recruitment on contemporary reefs. Data are already available on the abundance of octocoral and scleractinian species over the past 4 years, and annual censuses have provided data on octocoral recruitment and survival and species level characterizations of octocoral abundances. Recruitment and survival are also being related to spatial complexity of the habitat at the scale of mm and cm and the effects on hurricane driven changes in that spatial complexity will also be assessed. The frequency and intensity of disturbances will at the least continue at historical or greater levels. The comparison of data from before and now after disturbance will provide a powerful assessment of the resilience of octocorals and scleractinians and the role of recruitment and recruit survival in their relative resilience. Thus the effects of Hurricanes Irma and Maria provide a window on the nature of future reefs.

Note: This project is closely associated with the project "Ecology and functional biology of octocoral communities". See: <https://www.bco-dmo.org/project/562086>.

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## Funding

| Funding Source   | Award                       |
|--|-----------------------------|
| <a href="#">NSF Division of Ocean Sciences (NSF OCE)</a> | <a href="#">OCE-1801475</a> |

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