# Acoustic summary data from hydrophone deployments at coral reefs in St. John, U.S. Virgin Islands in 2016 and 2017

**Website**: https://www.bco-dmo.org/dataset/748552
**Data Type**: Other Field Results
**Version**: 2
**Version Date**: 2020-12-11

**Project**
» Coral Chorus: The Role of Soundscapes in Coral Reef Larval Recruitment and Biodiversity (Coral Chorus)

| Contributors | Affiliation | Role |
|---|---|---|
| Mooney, T. Aran | Woods Hole Oceanographic Institution (WHOI) | Principal Investigator, Contact |
| Apprill, Amy | Woods Hole Oceanographic Institution (WHOI) | Co-Principal Investigator |
| Dinh, Jason | Woods Hole Oceanographic Institution (WHOI) | Student |
| York, Amber D. | Woods Hole Oceanographic Institution (WHOI BCO-DMO) | BCO-DMO Data Manager |

**Abstract**
A passive acoustic recorder was deployed at various coral reefs in St. John, U.S. Virgin Islands between 2016-03-28 and 2017-07-11. This dataset contains average sound pressure level, low frequency sound pressure level (50 - 1500 Hz), high frequency sound pressure level (2 kHz - 20 kHz) and peak frequency of files at each site, sorted by files with and without boat noise.

## Table of Contents



## Coverage

**Spatial Extent**: **N**:18.31789 **E**:-64.70429 **S**:18.30106 **W**:-64.76439
**Temporal Extent**: 2016-03-28 - 2017-07-11

## Dataset Description

Related dataset:

Hydrophone deployment information: https://www.bco-dmo.org/node/748536/edit

### Methods & Sampling

Methodology:

One SoundTrap ST300 passive acoustic recorder (Ocean Instruments NZ, Inc.) was deployed at each coral reef over the course of one year. Hydrophones were attached to rebar stakes 0.75 meters from the seafloor

with the omnidirectional hydrophone facing the sea surface. One-minute files were recorded every ten minutes. See Dinh et al. 2018 for more details.
RMS sound pressure level in two separate bands, overall sound pressure level, and peak frequency were calculated for each recording. Files were sorted by site and presence of boat noise. For each group of recordings, the median sound pressure level, high frequency sound pressure level, low frequency sound pressure level, and peak frequency were calculated.

Problem report:
Hydrophones were offloaded and recharged between deployments. Gaps exist due to hydrophone malfunction. See Dinh et al. for more details.

#### Data Processing Description

BCO-DMO Data Manager Processing Notes:
* added a conventional header with dataset name, PI name, version date
* modified parameter names to conform with BCO-DMO naming conventions

Data version 2: site lat and lon added to datasets.

[ table of contents | back to top ]

## Data Files

| File |
|---|
| **Acoustic_Summary.csv** (Comma Separated Values (.csv), 1.12 KB) MD5:da69deafd0cfb3af58b6495b487c47f2 |
| Primary data file for dataset ID 748552 |

[ table of contents | back to top ]

## Related Publications

Dinh, J. P., Suca, J. J., Lillis, A., Apprill, A., Llopiz, J. K., & Mooney, T. A. (2018). Multiscale spatio-temporal patterns of boat noise on U.S. Virgin Island coral reefs. Marine Pollution Bulletin, 136, 282–290. doi:10.1016/j.marpolbul.2018.09.009
*Results*
,
*Methods*

[ table of contents | back to top ]

## Parameters

| Parameter | Description | Units |
|---|---|---|
| Site_Code | Site number (corresponds to Dinh et al., 2018) | unitless |
| Site_Name | Full Name of deployment site | unitless |
| Boat_Presence | Boat presence. Yes indicates boat noise present, no indicates boat noise absent | unitless |
| Median_SPL | Median RMS sound pressure level | dB re 1 uPa |
| Median_Low_SPL | Median RMS sound pressure level in 50 - 1500 Hz band | dB re 1 uPa |
| Median_High_SPL | Median RMS sound pressure level in 2 - 20 kHz band | db re 1 uPa |
| Median_Peak_Frequency | Median frequency with highest acoustic power | Hz |
| lat | Site latitude | decimal degrees |
| lon | Site longitude | decimal degrees |

[ table of contents | back to top ]

## Instruments

| | |
|---|---|
| **Dataset-specific Instrument Name** | SoundTrap ST300 passive acoustic recorder (Ocean Instruments NZ, Inc.) |
| **Generic Instrument Name** | Acoustic Recorder |
| **Generic Instrument Description** | An acoustic recorder senses and records acoustic signals from the environment. |

[ table of contents | back to top ]

## Deployments

**Coral_Chorus_St_John**

| | |
|---|---|
| **Website** | https://www.bco-dmo.org/deployment/748532 |
| **Platform** | Virgin Islands |

[ table of contents | back to top ]

## Project Information

**Coral Chorus: The Role of Soundscapes in Coral Reef Larval Recruitment and Biodiversity (Coral Chorus)**

*NSF Award Abstract:*
Coral reef ecosystems host some of the highest biodiversity of life per unit area on Earth and harbor about one-quarter to one-third of all marine animals. Reef-associated animals are a major source of protein for millions of people, and reefs offer shoreline protection and provide a significant source of tourism revenue, especially in developing countries. Factors that influence supply and settlement of young (larval) fish, coral, and associated animals can have large impacts on reef ecosystem and population structure, and learning more about these can help improve understanding of how to maintain the benefits provided by coral reefs. This study will lead to a detailed, mechanistic understanding of how young larvae use natural sounds to orient toward, locate, and select preferred settlement habitat. The approach will combine detailed field measurements

and experiments to isolate key soundscape variables that impact coral reef larvae.

For marine communities, such as those on coral reefs, factors influencing larval supply and settlement can have major impacts on community structure and population replenishment. There are now some indications that sound plays an important role in attracting larvae to suitable settlement habitat. There is little understanding of what soundscape habitat information is available to larvae and how differences and variability in sound can influence settlement. This project will include comprehensive experiments, environmental measurements, and modeling with the goal of understanding the role of sound in influencing larval recruitment and local biodiversity. The investigators will measure in situ settlement of larval fish and coral in relation to different soundscapes and habitat conditions in a marine protected area using traditional larval sampling methods, moored acoustic recorders, and a suite of environmental observations. Controlled and calibrated environmental playback experiments will isolate soundscape components and determine specific and fundamental acoustic cues larvae use to orient and settle. The spatial and temporal variability of soundscape cues and components across reef habitats will be established. Finally, the project will determine the relevant ranges of sound plumes that larvae may encounter through direct measurements of the sound fields of multiple reefs.

[ table of contents | back to top ]

## Funding


| Funding Source | Award |
|---|---|
| NSF Division of Ocean Sciences (NSF OCE) | OCE-1536782 |


[ table of contents | back to top ]