

# Accession numbers for raw sequences associated with field collections & microcosms, 2015 and 2016

**Website:** <https://www.bco-dmo.org/dataset/739077>

**Data Type:** experimental

**Version:** 1

**Version Date:** 2018-06-19

## Project

» [Vibrio as a model microbe for opportunistic heterotrophic response to Saharan dust deposition events in marine waters](#) (Vibrio-dust deposition)

Contributors	Affiliation	Role
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## Abstract

Accession numbers for raw sequences associated with field collections & microcosms, 2015 and 2016

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## Coverage

**Spatial Extent:** Lat:24.634 Lon:-81.3547

**Temporal Extent:** 2015 - 2016

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## Dataset Description

This dataset includes NCBI GenBank accession from 2015 and 2016 field collections and experiments using Saharan source material and water from the lower Florida Keys to create microcosms for natural seawater communities. For full details, see (Westrich et al., 2016).

## Acquisition Description

Samples were collected as part of collections and experiments conducted at Looe Key reef microcosm experiments (2015 and 2016) and field collections (2016) in the Florida Keys National Marine Sanctuary (as described in other datasets with this project).

Samples (1 L) were prefiltered (2 um), concentrated on to 0.22 um filters, DNA extracted, and 16S rRNA

in the V4 region amplified using 515F/806R primers with barcodes on both ends. Sequencing was conducted using Illumina MiSeq paired-end 250 chemistry.

## 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 links to NCBI BioProject pages

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## Related Publications

Westrich, J. R., Ebling, A. M., Landing, W. M., Joyner, J. L., Kemp, K. M., Griffin, D. W., & Lipp, E. K. (2016). Saharan dust nutrients promote Vibriobloom formation in marine surface waters. *Proceedings of the National Academy of Sciences*, 113(21), 5964–5969. doi:[10.1073/pnas.1518080113](https://doi.org/10.1073/pnas.1518080113)  
*Results*

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## Parameters

Parameter	Description	Units
BioProject	NCBI GenBank BioProject accession number	unitless
study	type of study	unitless
sample_description	description of samples	unitless
year	year of sample collection	unitless
num_sequences	number of sequences	unitless
NCBI_link	link to BioProject page at NCBI GenBank	unitless

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## Instruments

<b>Dataset-specific Instrument Name</b>	Illumina MiSeq
<b>Generic Instrument Name</b>	Automated DNA Sequencer
<b>Generic Instrument Description</b>	General term for a laboratory instrument used for deciphering the order of bases in a strand of DNA. Sanger sequencers detect fluorescence from different dyes that are used to identify the A, C, G, and T extension reactions. Contemporary or Pyrosequencer methods are based on detecting the activity of DNA polymerase (a DNA synthesizing enzyme) with another chemoluminescent enzyme. Essentially, the method allows sequencing of a single strand of DNA by synthesizing the complementary strand along it, one base pair at a time, and detecting which base was actually added at each step.

<b>Dataset-specific Instrument Name</b>	
<b>Generic Instrument Name</b>	PCR Thermal Cycler
<b>Generic Instrument Description</b>	General term for a laboratory apparatus commonly used for performing polymerase chain reaction (PCR). The device has a thermal block with holes where tubes with the PCR reaction mixtures can be inserted. The cycler then raises and lowers the temperature of the block in discrete, pre-programmed steps. (adapted from <a href="http://serc.carleton.edu/microbelife/research_methods/genomics/pcr.html">http://serc.carleton.edu/microbelife/research_methods/genomics/pcr.html</a> )

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## Deployments

### Lipp\_2014-16

<b>Website</b>	<a href="https://www.bco-dmo.org/deployment/663738">https://www.bco-dmo.org/deployment/663738</a>
<b>Platform</b>	Florida Keys National Marine Sanctuary
<b>Start Date</b>	2014-07-22
<b>End Date</b>	2015-05-09
<b>Description</b>	Microbial studies

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## Project Information

### Vibrio as a model microbe for opportunistic heterotrophic response to Saharan dust deposition events in marine waters (Vibrio-dust deposition)

**Coverage:** Florida Keys, FL, USA

Description from NSF award abstract: Dust and mineral aerosols are a significant source of micro and macronutrients to oligotrophic ocean surface waters. Evidence is growing that heterotrophic microbes may play key roles in processing deposited minerals and nutrients. Yet it is not known which components of dust stimulate the heterotrophic bacteria, which cellular mechanisms are responsible for the utilization of those components and how the activity of these bacteria affect the availability and utilization of dust-derived minerals and nutrients by marine autotrophs. Knowledge of these factors is key to understanding how dust deposition impacts carbon cycles and for predicting the response of tropical oceans to future changes in the frequency and intensity of dust deposition events. The objective of this project is to examine the specific effects of aeolian dust on heterotrophic microbes in a tropical marine system under controlled conditions. The central hypothesis is that in oligotrophic tropical systems numerically minor opportunistic bacteria are the first responders to influx of dust constituents and respond primarily by rapidly accessing soluble trace metals and limiting nutrients that are deposited with Saharan dust. The project will focus on two specific aims: 1) Quantify changes in community structure, composition and transcriptional activity among marine microbial populations upon exposure to dust, and 2) Identify key components in Saharan dust aerosols that stimulate or repress growth and/or activity in *Vibrio*, a model opportunistic marine heterotrophic group. The study will use a series of controlled experiments designed to identify and quantify heterotrophic microbial response to dust deposition events using both natural communities and model bacteria (*Vibrio*) through metagenomics, transcriptomics and atmospheric and marine biogeochemical techniques. This innovative approach will identify the most critical (reactive) components leached from dust aerosols on the microbial community as well as elucidate potential mechanisms of response. There is great interest in the biological response to dust aerosols given its potentially large influence on biogeochemical cycling, but there has been relatively little work that has addressed the mechanisms of response (especially among the heterotrophic microbial fraction) or identified the relative importance of specific constituents of dust aerosols. A detailed framework for microbial response (focusing on opportunistic heterotrophs) will facilitate efforts to link autotrophic and heterotrophic processing. This contribution is significant because it will provide one of the first end-to-end (chemistry to physiology to ecology) mechanistic pathways for marine biological response to desert dust aerosols.

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## Funding

Funding Source	Award
<a href="#">NSF Division of Ocean Sciences (NSF OCE)</a>	<a href="#">OCE-1357423</a>

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