

Epibenthic community sampling locations from Aleutian Island kelp forest community study, June 2016 and July 2017 (Kelp Forest Ecosystem Engineer Loss)

Website: <https://www.bco-dmo.org/dataset/727172>

Data Type: Other Field Results

Version: 1

Version Date: 2018-02-14

Project

» [Collaborative Research: Changes in ecosystem production and benthic biodiversity following the widespread loss of an ecosystem engineer](#) (Kelp Forest Ecosystem Engineer Loss)

Contributors	Affiliation	Role
Edwards, Matthew	San Diego State University (SDSU)	Principal Investigator
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Abstract

This dataset includes epibenthic community sampling locations from Aleutian Island kelp forest community study, June 2016 and July 2017: site name, island name, habitat, location, and depth.

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Coverage

Spatial Extent: N:53.39239 E:-167.62222 S:51.40996 W:-179.30663

Temporal Extent: 2016-06-17 - 2017-07-23

Dataset Description

This dataset includes epibenthic community sampling locations from Aleutian Island kelp forest community study, June 2016 and July 2017: site name, island name, habitat, location, and depth. These data are presented in Metzger et al, 2019.

Acquisition Description

Sampling locations were from the Aleutian Archipelago nearshore between longitude 173.9 and -167.6 in June 2016 and July 2017. The average depth 17.5 ft.

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
- reduced decimal precision of depth and depth_stdev from 13 decimal places to 1.

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Related Publications

Konar, B., Edwards, M. S., Bland, A., Metzger, J., Ravelo, A., Traiger, S., & Weitzman, B. (2017). A swath across the great divide: Kelp forests across the Samalga Pass biogeographic break. *Continental Shelf Research*, 143, 78–88. doi:[10.1016/j.csr.2017.06.007](https://doi.org/10.1016/j.csr.2017.06.007)

Metzger, J. R., Konar, B., & Edwards, M. S. (2019). Assessing a macroalgal foundation species: community variation with shifting algal assemblages. *Marine Biology*, 166(12).

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Parameters

Parameter	Description	Units
Site	sampling site identifier	unitless
Island	island name	unitless
Habitat	type of habitat: kelp; barren; transition	unitless
date	collection date formatted as yyyy-mm-dd	unitless
Lat	latitude; north is positive	decimal degrees
Long	longitude; east is positive	decimal degrees
Depth_avg_ft	average sampling depth	feet
Depth_stdev	sampling depth standard deviation	feet
Region	East-west sampling region	unitless

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Instruments

Dataset-specific Instrument Name	Garmin eTrex GPS unit
Generic Instrument Name	GPS receiver
Dataset-specific Description	Used to obtain location information of sampling sites.
Generic Instrument Description	Acquires satellite signals and tracks your location.

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Deployments

OC1606A

Website	https://www.bco-dmo.org/deployment/727190
Platform	R/V Oceanus
Start Date	2016-06-17
End Date	2016-07-02
Description	Project: Changes in Ecosystem Production and Benthic Biodiversity

OC1707A

Website	https://www.bco-dmo.org/deployment/729428
Platform	R/V Oceanus
Start Date	2017-07-18
End Date	2017-07-25
Description	Project: Changes in Ecosystem Production and Benthic Biodiversity

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Project Information

Collaborative Research: Changes in ecosystem production and benthic biodiversity following the widespread loss of an ecosystem engineer (Kelp Forest Ecosystem Engineer Loss)

Website: <http://sdsukelp.weebly.com/blog>

Coverage: Aleutian Islands Alaska (Attu Island to Unalaska)

NSF abstract: In many ecosystems the presence of a single dominant species can modify the physical conditions of the environment and alter patterns of biodiversity, nutrient cycling, and primary production. Losses of these "ecosystem engineers" can have profound impacts to how ecosystems function. Coastal kelps provide excellent examples of organisms whose structure modifies the physical characteristics of their habitats (light, nutrients, water motion) and supports enhanced biodiversity. The kelp forests in the coastal waters of the Aleutian Archipelago have suffered large-scale declines over the past several decades. This project will examine how these losses impact patterns of ecosystem production and biodiversity using a

combination of techniques ranging from in situ benthic chambers and shipboard incubations to remote sensing using satellite imagery. The results will provide an understanding of how such events may impact this and other ecosystems. This project will support graduate students and will introduce the public to the Aleutian ecosystems in a series of videos. The investigators will also work with a San Diego high school teacher to integrate project findings into classroom activities, and they expect to involve a teacher in their field program. The investigators will ask two highly integrated questions: 1) How do the widespread losses of kelp forests impact benthic productivity across the Aleutian Archipelago? 2) How do the widespread losses of kelp forests impact benthic biodiversity and community structure across the archipelago? To address these, the investigators will estimate changes to productivity at ten islands where they have historic data on seaweed community composition and estimates of kelp canopy cover. They will use in situ benthic chambers placed in both kelp forests and urchin barrens to measure plot-scale patterns of net ecosystem productivity (NEP), and shipboard incubations to examine net primary productivity (NPP) for the dominant macroalgae. Data for individual species rates of NPP will be scaled by their biomass and combined with in situ plot-scale benthic chamber experiments of whole communities to estimate NEP at the islands visited. These estimates will be scaled up to calculate NEP across the entire archipelago by first extrapolating results from the study sites to entire islands, and then across the archipelago. They will also estimate broad-scale patterns in production by characterizing water column irradiances across the archipelago and modeling NPP using species-level relationships between irradiance and photosynthesis. Coupling these with estimates of water column irradiance and community respiration will allow modeling of NEP across this region. Benthic biodiversity will be assessed using diver surveys and shipboard benthic trawls. Following these activities, satellite remote sensing of the kelp canopies dating back to the 1980s and the investigators' own historical data on benthic macroalgal abundances at these and other islands will be used to estimate the temporal and spatial patterns of change across the archipelago.

For more information see: Project blog: <http://sdsukelp.weebly.com/blog> Project website: <http://www.uaf.edu/cfos/research/projects/collaborative-research--/>

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1435205
NSF Division of Ocean Sciences (NSF OCE)	OCE-1435194

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