

All nodes from the the eastern Pacific Kelpforest database from November 2014

Website: <https://www.bco-dmo.org/dataset/553857>

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Project

» [Collaborative Research: Kelp forest interaction webs in the Aleutian Archipelago: patterns and mechanism of change following the collapse of an apex predator](#) (Kelp Forest Apex Predator Collapse)

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Coverage

Temporal Extent: 2014-11-03

Dataset Description

The purpose of the Kelpforest Database is to serve as a repository for the knowledge of the identities, life-histories, and interactions between the species present in the nearshore kelp forest ecosystems of the eastern Pacific, focusing in particular on central and southern California. The information that it houses will aid in the interpretation of species' spatial and temporal patterns (stemming from PISCO, <http://www.piscoweb.org/>, and surveys performed by the USGS), and will serve as the basis on which to construct and parameterize mathematical models of these species rich communities (including EcoPath).

The database is literature-based; its format thereby differs from that of the typical ecological database in being citation-based, rather than species- or interaction-based. Each entered value (e.g., a species' body size) is associated with an appropriate citation. The most notable consequence of this design is that multiple values (each from a different source citation) are permitted for the same entry field.

This dataset is an alphabetical list of all the nodes in the database and contains information including species working name, functional group, and its native status (native, non-native, or unknown)

Data Processing Description

The database is available at <http://kelpforest.ucsc.edu/> and can be accessed with the username of guest and the password of kelpforest. The database will remain online, and collaborators at several institutions will continue to add data to it indefinitely. Currently, the database is duplicated at BCO-DMO (as of November 2014) and made available online via several different datasets using the MySQL JGOF5/GLOBEC method.

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Data Files

File
all_nodes_ordered.csv (Comma Separated Values (.csv), 37.56 KB) MD5:293961dad07fa8422187f240ed49df34
Primary data file for dataset ID 553857

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Parameters

Parameter	Description	Units
id	database unique identification key	positive integer
working_name	Common working name for the species	
native_status	The native_status field indicates whether the species is a native. Possible values are "native", "non-native", and "unknown".	
is_assemblage	A flag to indicate whether the species is an assemblage (value is 1) or not an assemblage (value is 0).	

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Project Information

Collaborative Research: Kelp forest interaction webs in the Aleutian Archipelago: patterns and mechanism of change following the collapse of an apex predator (Kelp Forest Apex Predator Collapse)

Coverage: Pacific coast (Alaska to Baja California). Aleutian Archipelago

NSF abstract:

Research on sea otters and kelp forest ecosystems conducted over the past 35 years provides one of the better known examples of top-down forcing by a large vertebrate predator. These studies have shown that 1) sea otters indirectly maintain kelp forests by limiting herbivorous sea urchins, and 2) this trophic cascade has strong indirect effects on a number of other species and ecosystem processes. These insights were obtained largely through the comparison of islands in the Aleutian archipelago with and without sea otters, an opportunity created by the spatially asynchronous population recovery of sea otters following their decimation by the Pacific maritime fur trade.

In the course of more than 35 years of studies, these researchers have obtained an extensive amount of data on sea otter populations, kelp forest communities, and an array of associated marine wildlife from numerous Aleutian Islands with and without sea otters. Sea otter populations have since collapsed and the species is now

ecologically extinct across the entire region. In this study, Drs. Konar, Edwards and Estes will combine the multi-decadal database with this extinction event to chronicle the patterns and mechanisms of spatial and temporal change in distributions and abundances of sea urchins and fleshy macroalgae (kelps and other species). They will do this by revisiting 20 islands for which they have long-term data and re-censusing the historical kelp forest monitoring sites for the abundance and population structure of sea urchins, and for the abundance and species composition of kelps and other fleshy macroalgae. In combination, these data will provide an account of the degree to which the otter-urchin kelp trophic cascade has changed with the collapse of sea otters across the Aleutian archipelago.

The available information indicates that kelp forests collapsed very rapidly following the sea otter decline, and that this rapid shift was facilitated by the upward migration of sea urchins from deep water as opposed to in situ recruitment and growth. This group of marine scientists will test this idea by measuring various temperature- and nutrient sensitive isotopic patterns along the growth increment of sea urchin spines of animals collected from shallow and deep water. Similar to a depth refuge for urchins, studies from other areas have suggested that macroalgae may have a spatial refuge from urchin grazing in shallow waters or amongst very dense algal stands. They will explore macroalgal spatial refuges by using data collected during the re-censusing of the kelp forest monitoring sites and by extending our surveys to shallower waters and isolated kelp beds.

This research is an opportunity to rigorously explore and document the influences of a large vertebrate predator on the interaction web dynamics of its associated ecosystem. The intellectual merit of this project emphasizes the special character of oceanic islands and the Arctic for the study of near-shore ecosystem structure and processes.

Broader impacts of this project include benefits to society, teaching, and training. The project will be very newsworthy because it will describe the current status of a rapidly declining marine mammal and will document changes that have occurred due to fluctuations in the abundance of this species over the last 20+ years. Training and educational opportunities will be offered to graduate students from three different universities. The project will involve the University of Alaska Fairbanks, University of California Santa Cruz, and San Diego State University.

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1260693

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