

Site code key for kelp forest community data collected along the coast of Monterey and Carmel, CA from 1999-2015 (Kelp Forest Resilience project)

Website: <https://www.bco-dmo.org/dataset/661175>

Data Type: Other Field Results

Version: 1

Version Date: 2017-08-16

Project

- » [Integrative evaluation of larval dispersal and delivery in kelp rockfish using inter-generational genetic tagging, demography and oceanography](#) (Larval Dispersal in Kelp Rockfish)
- » [Kelp forest community resilience in action: adaptive responses of predators to a disease-driven food web perturbation](#) (Kelp_Forest_Resilience)

Program

- » [Partnership for Interdisciplinary Studies of Coastal Oceans](#) (PISCO)

Contributors	Affiliation	Role
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Abstract

Site code key for the kelp forest community percent cover and density datasets collected from 1999 to 2015 along the coast of Monterey and Carmel, California.

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Coverage

Spatial Extent: N:36.640454 E:-121.894574 S:36.397717 W:-121.982468

Data Processing Description

BCO-DMO Data Processing Notes:

- All column names reformatted to comply with BCO-DMO standards
- nd was entered into all blank cells

Note: version 2017-08-16 replaces version 2016-10-07: LINGCOD UC was added.

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Data Files

File
site_codes.csv (Comma Separated Values (.csv), 1.42 KB) MD5:6ceede067d2ea508f8432140db1de0cf Primary data file for dataset ID 661175

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Related Publications

Baetscher, D. S., Anderson, E. C., Gilbert-Horvath, E. A., Malone, D. P., Saarman, E. T., Carr, M. H., & Garza, J. C. (2019). Dispersal of a nearshore marine fish connects marine reserves and adjacent fished areas along an open coast. *Molecular Ecology*, 28(7), 1611–1623. doi:[10.1111/mec.15044](https://doi.org/10.1111/mec.15044)
Results

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Related Datasets

IsSupplementTo

Carr, M., Edwards, C., Garza, J. C. (2021) **Locations of fish surveys in the Monterey and Carmel nearshore from 1999-2015 (Larval Dispersal in Kelp Rockfish project)**. Biological and Chemical Oceanography Data Management Office (BCO-DMO). (Version 1) Version Date 2017-08-16 doi:10.26008/1912/bco-dmo.712843.1 [[view at BCO-DMO](#)]

Carr, M., Edwards, C., Garza, J. C. (2021) **Species, sample date, location individual size and sample disposition of adult fish surveyed near Carmel and Monterey Bays, CA, 2013-2016 (Larval Dispersal in Kelp Rockfish project)**. Biological and Chemical Oceanography Data Management Office (BCO-DMO). (Version 2) Version Date 2017-08-15 doi:10.26008/1912/bco-dmo.684426.2 [[view at BCO-DMO](#)]

Carr, M., Edwards, C., Garza, J. C. (2021) **Species, sample date, location individual size and sample disposition of juvenile fish surveyed near Carmel and Monterey Bays, CA, 2013-2016 (Larval Dispersal in Kelp Rockfish project)**. Biological and Chemical Oceanography Data Management Office (BCO-DMO). (Version 1) Version Date 2017-03-17 doi:10.26008/1912/bco-dmo.684453.1 [[view at BCO-DMO](#)]

Carr, M., Edwards, C., Garza, J. C. (2021) **Survey of fish species, number and size from transects near Carmel and Monterey Bays, CA, 1999-2015 (Larval Dispersal in Kelp Rockfish project)**. Biological and Chemical Oceanography Data Management Office (BCO-DMO). (Version 1) Version Date 2017-03-17 doi:10.26008/1912/bco-dmo.684484.1 [[view at BCO-DMO](#)]

Carr, M., Garza, J. C., Edwards, C. (2018) **Rockfish microhaplotype sequence accessions from samples near Carmel and Monterey Bays, CA, 2013-2016 (Larval Dispersal in Kelp Rockfish project)**. Biological and Chemical Oceanography Data Management Office (BCO-DMO). (Version 1) Version Date 2018-02-27 <http://lod.bco-dmo.org/id/dataset/684944> [[view at BCO-DMO](#)]

IsRelatedTo

Carr, M., Edwards, C., Garza, J. C. (2021) **Fish species code key for data collected along the shore of Monterey and Carmel from 1999-2015 (Larval Dispersal in Kelp Rockfish project)**. Biological and Chemical Oceanography Data Management Office (BCO-DMO). (Version 1) Version Date 2017-03-17 doi:10.26008/1912/bco-dmo.684512.1 [[view at BCO-DMO](#)]

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Parameters

Parameter	Description	Units
site	The unique site code where the survey was performed. This site code refers to a specific GPS location defined by a bounding box and is likely associated with a placename (i.e there may be multiple sitecodes at the 'Jalama Beach' placename).	unitless
side	A division of the site into two or three areas; referred to as sides. Sides may be East (E); West (W); South (S); North (N) or CEN (central).	unitless
lat	Latitude; north is positive.	decimal degrees
lon	Longitude; east is positive.	decimal degrees

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Deployments

Carr_1999

Website	https://www.bco-dmo.org/deployment/661099
Platform	Long Marine Lab UCSC
Start Date	1999-09-22
End Date	2015-07-24
Description	Sites of Kelp Forest Resilience project. Nearshore waters of southern Monterey Bay and Carmel Bay, California. 36 N, 121 W.

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Project Information

Integrative evaluation of larval dispersal and delivery in kelp rockfish using inter-generational genetic tagging, demography and oceanography (Larval Dispersal in Kelp Rockfish)

Website: <http://research.pbsci.ucsc.edu/eeb/rclab/kelp-rockfish-pbt-project/>

Coverage: Monterey Bay and vicinity

Description from NSF award abstract:

The spatial structure and dynamics of coastal marine fish populations are strongly influenced by the transport and recruitment of larvae. However, the scale and patterns of larval dispersal are among the most difficult demographic parameters to quantify in marine systems, due to the inability to tag and track the movement of larvae. In particular, the extent of local retention of larvae versus regional dispersal to other locations and populations is currently a hotly debated topic in the field of marine ecology and has profound implications for the design and effectiveness of Marine Protected Areas (MPAs). The research will identify patterns of larval dispersal and use those patterns to test predictions of dispersal generated by state-of-the-art circulation models.

The PI team brings together ecologists, geneticists, statisticians, and oceanographers with expertise in population demography and field sampling, mark/recapture data from genetic tags, and empirical and model-based evaluation of oceanographic processes to answer the following questions:

1. Do observed patterns of dispersal and connectivity of larval kelp rockfish correspond to patterns predicted

by high spatial resolution regional ocean circulation models? Model predictions will be tested empirically using larval settlement samples. Parentage analysis will be used to verify the occurrence of larvae derived from genetically tagged source populations.

2. Is there evidence for local retention of larval kelp rockfish within the study area? To test the hypothesis that local retention of juvenile kelp rockfish from source populations is greater than expected by existing larval transport models, the PIs will compare the proportion of recruits that are genetically identified to have been produced from within three focal sites with the proportion of larval production that was tagged in those sites.

3. Is the relative recruitment of recently settled kelp rockfish to focal sites in the study region proportionate to the relative larval production of those focal sites? The PIs will compare the proportion of tagged recruits with the proportion of larval production generated from tagged adults at varying spatial scales. They will use goodness of fit models to compare expected and observed connectivity matrices under varying hypotheses of larval dispersal. Alternatively, if the relative contribution of focal sites to larval replenishment of themselves, one another, and more distant populations is disproportionate to their relative production, can this discrepancy be explained by oceanographic processes that could facilitate particular trajectories of larval dispersal?

To determine if differences in self recruitment and connectivity can be attributed to local oceanographic features, the PIs will examine spatial and temporal correlations between these features and the spatial distribution and timing of recruitment.

Related websites:

<http://piscoweb.org>

<http://research.pbsci.ucsc.edu/eeb/rclab/kelp-rockfish-pbt-project/> (broken link)

<http://rockfish.ucsc.edu/>

<http://oceanmodeling.ucsc.edu>

Kelp forest community resilience in action: adaptive responses of predators to a disease-driven food web perturbation (Kelp_Forest_Resilience)

Coverage: Monterey Bay and Carmel Bay, California; 36 N, 121 W

A key goal of ecology is to understand how species interactions -- competition, predation, mutualism -- influence the structure (e.g., biodiversity) and functions (e.g., productivity) of ecological communities and contribute to the stability and resilience of ecosystems. Kelp forests along the West Coast of North America have been a model ecosystem in which marine ecologists have explored these questions. That work has provided evidence that predators, including sea otters, sea stars, and fishes, can be important in controlling sea urchins that otherwise overgraze forests and create alternative "barrens" states, devoid of kelp. However, other examples suggest that disease and disturbance, not predators, suppress urchin overgrazing. Here we employ experiments and surveys to determine whether and how sea otters and sea stars act separately and in combination to control the rapid growth of sea urchin populations that is occurring in concert with a sea star "wasting" epidemic along the West Coast of North America. The results of this work will (i) advance our understanding of how multiple predators interact to influence community structure, stability and resilience, and (ii) shed light on how species interactions contribute to the stability of these forests that are the foundation of productive commercial and recreational fisheries. The project will involve citizen scientists contributing to surveys of sea otter abundance, foraging behavior and diet, and underrepresented (largely Latino) undergraduates and results will be disseminated in several public outreach facilities and K-12 educational programs.

This project will advance our understanding of the combined roles of species diversity and predators in contributing to the stability and resilience of community structure. Though both predators and diversity have been the focus of numerous studies, fewer have explored how predator diversity does or does not enhance the resilience of marine ecosystems. The investigators will determine the relative contributions of southern sea otters (*Enhydra lutris lutris*) and two species of sea stars (*Pycnopodia helianthoides* and *Pisaster giganteus*) in controlling the density and size structure of two prey species, the purple sea urchin (*Strongylocentrotus purpuratus*) and a snail (*Promartynia pulligo*), and the cascading effects on survival and density of giant kelp (*Macrocystis pyrifera*). Orthogonal manipulations of predator access in large field enclosures/exclosures will be used to assess the relative roles of redundancy, complementarity and "sampling effect" (i.e. particular importance of either species) among the two predators on both direct mortality and indirect (trait-mediated) foraging behavior of their prey. The PIs will evaluate whether results from the experiments "scale up" to explain geographic variation in the relative densities of predators (otters and stars), prey (urchins) and the major

primary producer (giant kelp) and the ability of sea otters to compensate for declines in sea stars to control the rapid growth in purple sea urchin populations that can otherwise cause phase shifts (forests to barrens) of these ecosystems.

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Program Information

Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO)

Website: <http://www.piscoweb.org/>

Coverage: West coast of North America from Mexico to Alaska

The Partnership for Interdisciplinary Studies of Coastal Oceans is a long-term ecosystem research and monitoring program established with the goals of:

- understanding dynamics of the coastal ocean ecosystem along the U.S. west coast
- sharing that knowledge so ocean managers and policy makers can make science based decisions regarding coastal and marine stewardship
- producing a new generation of scientists trained in interdisciplinary collaborative approaches

Over the last 10 years, PISCO has successfully built a unique research program that combines complementary disciplines to answer critical environmental questions and inform management and policy. Activities are conducted at the latitudinal scale of the California Current Large Marine Ecosystem along the west coast of North America, but anchored around the dynamics of coastal, hardbottom habitats and the oceanography of the nearshore ocean – among the most productive and diverse components of this ecosystem. The program integrates studies of changes in the ocean environment through ecological monitoring and experiments. Scientists examine the causes and consequences of ecosystem changes over spatial scales that are the most relevant to marine species and management, but largely unstudied elsewhere.

Findings are linked to solutions through a growing portfolio of tools for policy and management decisions. The time from scientific discovery to policy change is greatly reduced by coordinated, efficient links between scientists and key decision makers.

Core elements of PISCO are:

- Interdisciplinary ecosystem science
- Data archiving and sharing
- Outreach to public and decision-making user groups
- Interdisciplinary training
- Coordination of distributed research team

Established in 1999 with funding from The David and Lucile Packard Foundation, PISCO is led by scientists from core campuses Oregon State University (OSU); Stanford University's Hopkins Marine Station; University of California, Santa Cruz (UCSC); and University of California, Santa Barbara (UCSB). Collaborators from other institutions also contribute to leadership and development of PISCO programs. As of 2005, core PISCO activities are funded by collaborative grants from The David and Lucile Packard Foundation and the Gordon and Betty Moore Foundation. Core support, along with additional funding from diverse public and private sources, make this unique partnership possible.

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1538582

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