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)

Website: https://www.bco-dmo.org/dataset/684453
Data Type: Other Field Results
Version: 2
Version Date: 2021-06-16

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

Program
» Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO)

Contributors	Affiliation	Role
Carr, Mark	University of California-Santa Cruz (UCSC)	Principal Investigator
Edwards, Christopher		Co-Principal Investigator
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Abstract
This dataset contains sampling information for samples collected for genetic parentage analysis from juvenile rockfish – species, sample date, location individual size and sample disposition.

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Coverage

Spatial Extent: **N**:36.6403 **E**:-121.8744 **S**:36.5217 **W**:-121.9692
Temporal Extent: 2013-07-19 - 2016-09-14

Methods & Sampling

Tissue samples are collected from juvenile fish for genetic samples. Samples from juvenile fishes are collected from larval collectors (SMURFs) and by divers using collecting nets (BINCKE) at the kelp canopy surface. Juvenile fish are taken aboard a vessel, fin-clipped (a small portion of the second dorsal or caudal fin) to obtain tissue for genetic analysis, measured, and returned to nearby kelp canopy habitat. Dataset includes the date and location of sampling, species, individual length (total length to the nearest mm), and disposition of the sampled individual (sacrificed or released).

Data Processing Description

Data are entered by hand and double checked for accuracy. Dataset is checked for valid entries and completeness.

BCO-DMO Processing Notes:
- added conventional header with dataset name, PI name, version date
- modified parameter names to conform with BCO-DMO naming conventions
- re-formatted date from m/d/yyyy to yyyy-mm-dd
- blank values replaced with no data value 'nd'
- changed lat/lon (0,0 - no location) to nd's

Dataset version 1 (2017-03-17) replaced by version 2 (2021-06-16)
* Rows for data with the following dates and gear/locations had a comment that was just a single double quote character ("). That was causing parsing issues in the dataset so the character was changed to the missing data identifier instead in data version 2.

2015-08-27 BINCKE M086 B2047 GBY
2015-08-27 BINCKE M086 BC15 GBY
2015-08-27 BINCKE M086 BC16 GBY

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Data Files

File
fish_lens_juvenile.csv (Comma Separated Values (.csv), 1.73 MB) MD5:a8baa46070ef531fac1864a25a13ab4e Primary data file for dataset ID 684453

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Related Publications

Ammann, A. J. (2004). SMURFs: standard monitoring units for the recruitment of temperate reef fishes. Journal of Experimental Marine Biology and Ecology, 299(2), 135–154. doi:10.1016/j.jembe.2003.08.014
Methods

Anderson, T. W., & Carr, M. H. (1998). Environmental Biology of Fishes, 51(1), 111–115. doi:10.1023/a:1007355408723 https://doi.org/10.1023/A:1007355408723
General

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Related Datasets

IsSupplementedBy

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]

Carr, M., Tinker, T. (2021) **Site code key for kelp forest community data collected along the coast of Monterey and Carmel, CA from 1999-2015 (Kelp Forest Resilience project).** Biological and Chemical Oceanography Data Management Office (BCO-DMO). (Version 1) Version Date 2017-08-16 doi:10.26008/1912/bco-dmo.661175.1 [view at BCO-DMO]

IsRelatedTo

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) **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]

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Parameters

Parameter	Description	Units
date	date sample was collected formatted as yyyy-mm-dd	unitless
gear	gear type used for collection: SMURF=Standardized Monitoring Unit for the Recruitment of Fishes - deployed 2m below the surface. (Ammann A.J. 2004) BINCKE=Benthic Ichthyofauna Net for Coral/Kelp Environments. (Anderson T.W. and M.H. Carr. 1998) BENTHIC SMURF=SMURF deployed on the seafloor unknown=sample with unknown collection method.	unitless
sample	Sample ID number. (NA if no sample taken)	unitless
species	Code for fish species identification abbreviated as first letter of genus and first three letters of species names. See "species codes" worksheet for values and definitions.	unitless
length_mm	total length of the fish (nd if no length measured)	millimeters (mm)
fate	whether the fish was released live or killed for sampling: released; sacrificed; unknown	unitless
condition	condition of fish released live: good; fair; poor; unknown	unitless
count_fish_captured	number of individuals represented in this sample	individual
count_samples	number of samples collected from this capture	sample
lat_gps	latitude at which sample was collected; obtained from GPS unit	decimal degrees in WGS84 coordinate system

lon_gps	longitude at which sample was collected; obtained from GPS unit	decimal degrees in WGS84 coordinate system
concerns	comment	unitless
comments	further comment	unitless
year	sampling year	unitless
month	sampling month	unitless
day	sampling day	unitless
location	samplling site code	unitless
subregion	subregion of sampling area	unitless
SMURF_array	identifier code of sampler	unitless
date_delivered_to_NMFS	date sample was delivered to NMFS	unitless
NMFS_id	sample identifier at NMFS; formatted as yyyy-mm-dd	unitless

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Instruments

Dataset-specific Instrument Name	
Generic Instrument Name	BINCKE net
Dataset-specific Description	Used by divers to collect juvenile fish
Generic Instrument Description	The Benthic Ichthyofauna Net for Coral/Kelp Environments (BINCKE) is a rectangular net opened and closed by means of a rigid, hinged frame at one end and of variable size depending upon the size and behavior of targeted species. It is used for the collection of fishes from structurally complex environments (e.g., coral reefs, kelp forests. See Anderson T.W. and M.H. Carr. 1998. BINCKE: A highly efficient net for collecting reef-associated fishes. Environmental Biology of Fishes 51:111-115.

Dataset-specific Instrument Name	SMURF
Generic Instrument Name	larval fish collector
Dataset-specific Description	SMURFs used in this study were adapted from a design used by Steele et al. (2002). Each SMURF (1.0×0.35 m dia.) was constructed using a 1.2×1.0 m section of green plastic mesh with 2.5 cm grid (Grow Guard™, model #038-2416, Israel) rolled into a cylinder. A haphazardly folded 4.5×1.2 m section of black plastic mesh with 5.0×7.5 cm grid (Conwed Plastics, model #XB 5968-100-SSF, USA) was inserted into the cylinder. The outer mesh of 2.5 cm grid did not restrict movement of settlement size fish into or out of the SMURF, it did however, prevent entry of larger fish. M.A. Steele, J.C. Malone, A.M. Findlay, M.H. Carr, G.E. Forrester. A simple method for estimating larval supply in reef fishes and a preliminary test of population limitation by larval delivery in the kelp bass, Paralabrax clathratus. Mar. Ecol. Prog. Ser., 235 (2002), pp. 195–203
Generic Instrument Description	The Standard Monitoring Unit for the recruitment of Reef Fishes (SMURF) consists of a cylinder of fine mesh plastic grid that contains a folded section of larger mesh plastic grid. See Ammann, A.J. 2004. SMURFs: standard monitoring units for the recruitment of temperate reef fishes. Journal of Experimental Marine Biology and Ecology 299:135– 154. http://dx.doi.org/10.1016/j.jembe.2003.08.014

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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

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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-1260693

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