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Preparing for Renewable Energy

Discipline	Title
REN	Seabird and Marine Mammal Surveys off the Northern California, Oregon, and Washington Coasts
Establish baseline knowledge of presence and general habitat use of seabirds and marine mammals in planning for renewable energy activities.	

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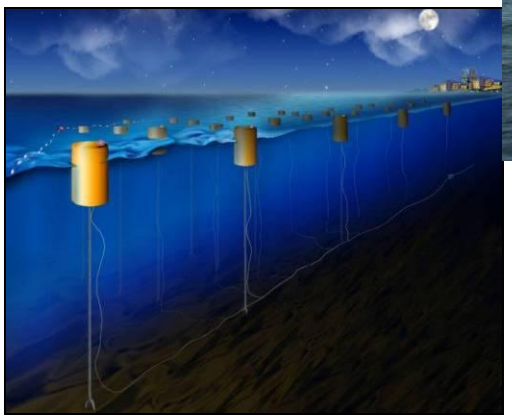
BOEM Information Need

BOEM is planning for renewable energy activity offshore northern CA, OR and southern WA. This study updates others done in the 1980s and 1990s for species composition, distribution, abundance, seasonal variation and habitat utilization of marine mammals and seabirds in these areas.

Data generated will be used for overall evaluation of potential renewable energy sites and future environmental review of specific project proposals received by BOEM.



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Objectives

1) Review and refine methodologies used for previous marine mammal/seabird aerial surveys

2) Perform six surveys per year, two each oceanographic season, offshore northern CA, OR and southern WA for two years

3) Assess, analyze and compare data collected with other sources of survey data

4) Characterize current marine mammal/seabird composition, distribution, abundance, seasonal variation and habitat use

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Methods

Conduct aerial at-sea surveys of seabirds and marine mammals in coastal shelf waters of northern CA, all of OR and southern WA

Summarize population density results and conduct 20-year comparison with 1989 surveys in OR and WA

Validate and enhance survey data for numerically abundant indicator species and important breeding areas and migratory species

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Status

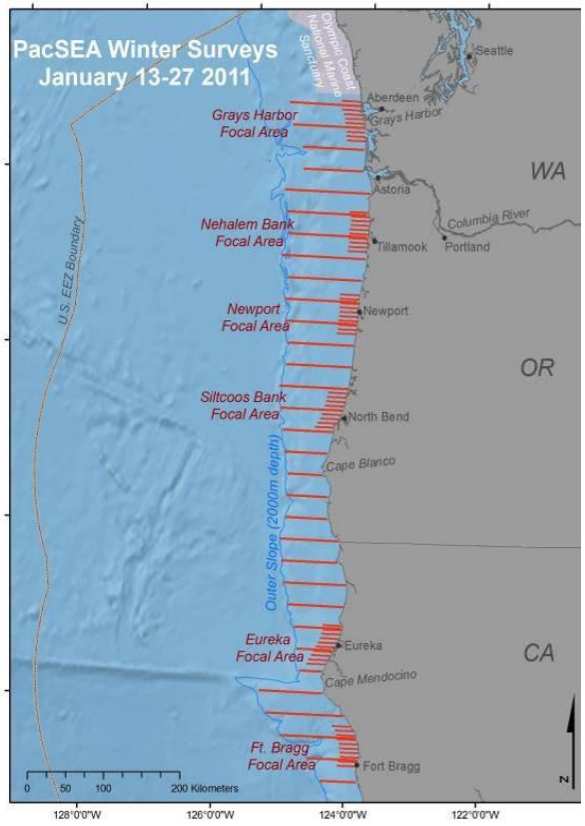
Completed first year's field work of six aerial surveys

Developed custom Access database with graphical user-interface to facilitate transcription of species observation data

Developed custom programming in Matlab™ to integrate dLOG trackline effort with transcribed species observation data

Initialized construction of custom ArcGIS™ database tool that allows user-defined spatial binning for species-specific density calculations based on trackline survey effort

Worked with UC Santa Cruz Biological and Satellite Oceanography Lab to evaluate on-board spectral radiometer data for delineating unique water masses and frontal structure associated with seabird and marine mammal distributions.



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Supporting and Monitoring Conventional Energy

Discipline	Title
Habitat/Ecology	Completion of Fish Assemblage Surveys around Manmade Structures and Natural Reefs off California
Complete 15 years of field work and analyses to determine ecological performance and regional importance of Pacific offshore platforms to highly overfished rockfish species.	

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BOEM Information Need

Decommissioning of spent oil and gas platforms off California is a subject of considerable debate. This study is focused on the importance of the populations of overfished rockfish species at offshore platforms.

Completion of this long-term study is providing data on the effects of platforms on regional rockfish populations so that BOEM can judge impacts of habitat removal and provide information to other interested parties before decommissioning.

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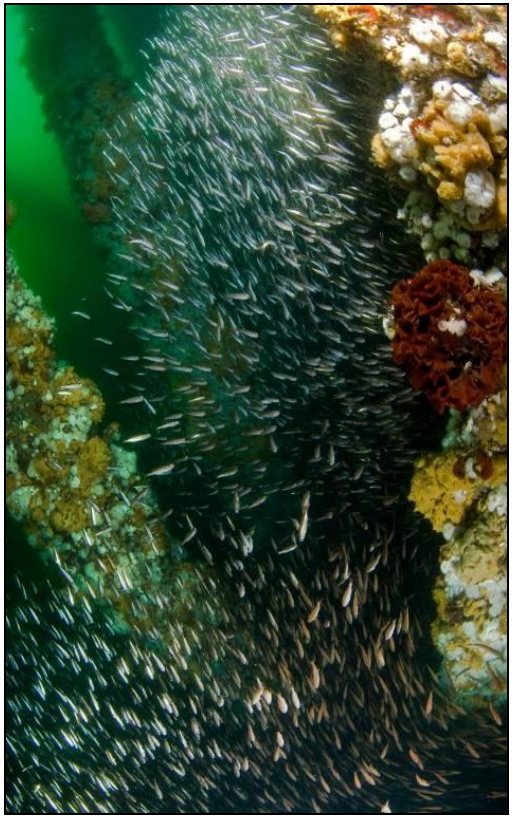
Objectives

1) Characterize fish assemblages around Pacific platforms and on nearby natural reefs

2) Describe the spatial and temporal patterns of fish diversity, density and size distribution among habitat types

3) Complete 15 years of field work and produce data sets so that trend analyses and synthesis papers can be produced



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Methods

Using SCUBA and submersibles conduct surveys of entire platform jackets, shell mounds and nearby natural outcrops

During all transects, document (1) species (if known); (2) estimated total length; (3) the habitat it occupied (e.g., platform base, rock, sand, mud, cobble, shell mound); (4) its position relative to the substrate (e.g., in crevice, on reef crest, on slope, over/under structure); and, (5) the distance of the fish from that substrate

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Supporting and Monitoring Conventional Energy and Preparing for Renewable Energy

Discipline	Title
Habitat and Ecology	**Regional Importance of Manmade Structures as Rockfish Nurseries**

BOB WOLHERS and CARL GWINN

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Overall Objective

Begin ecosystem-level synthesis of Southern California Bight data to support environmental review of BOEM decisions in the Pacific Region

- Predict large-scale ecological consequences of ongoing production or decommissioning activities for juvenile rockfishes

BOB WOLHERS and CARL GWINN

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SCOTT GEITLER and DONNA SCHROEDER

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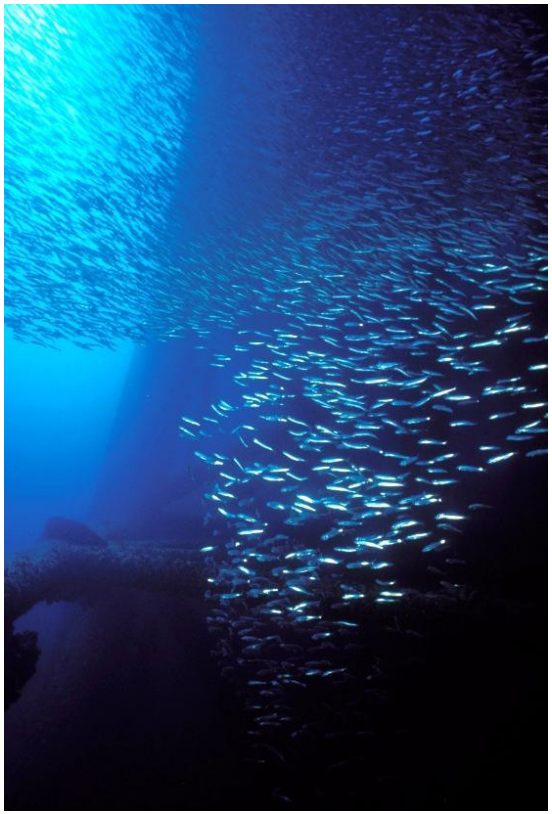
BOEM Information Needs

Conventional Energy

Ongoing Operations
Decommissioning/Rigs-to-Reefs

Renewable Energy

Prospective Leasing
Ongoing Operations
Decommissioning
Mitigation Measures



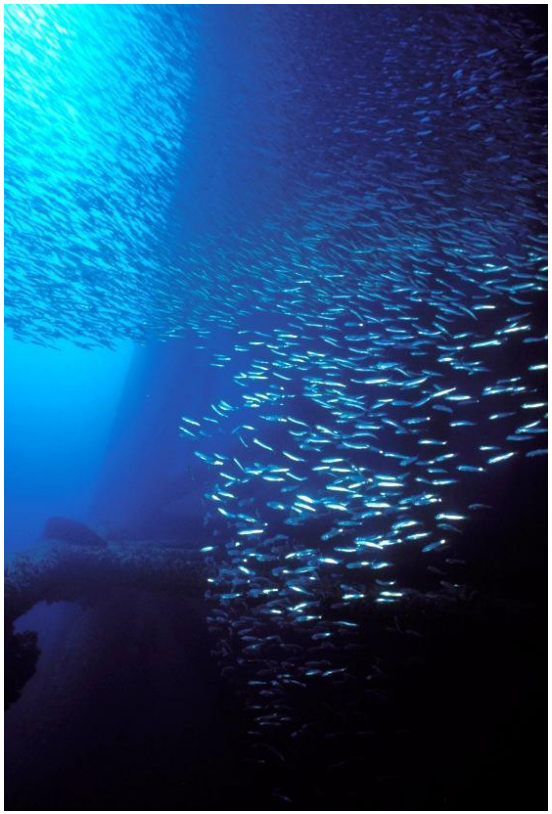
BOB WOLHERS

How Study Products will be Used

- NEPA analyses
- Essential Fish Habitat (EFH) Consultations with NOAA

- Pacific Fishery Management Council
  Habitat Areas of Particular Concern (HAPC, a subset of EFH)

- The State of California
  Rigs-to-Reefs Program



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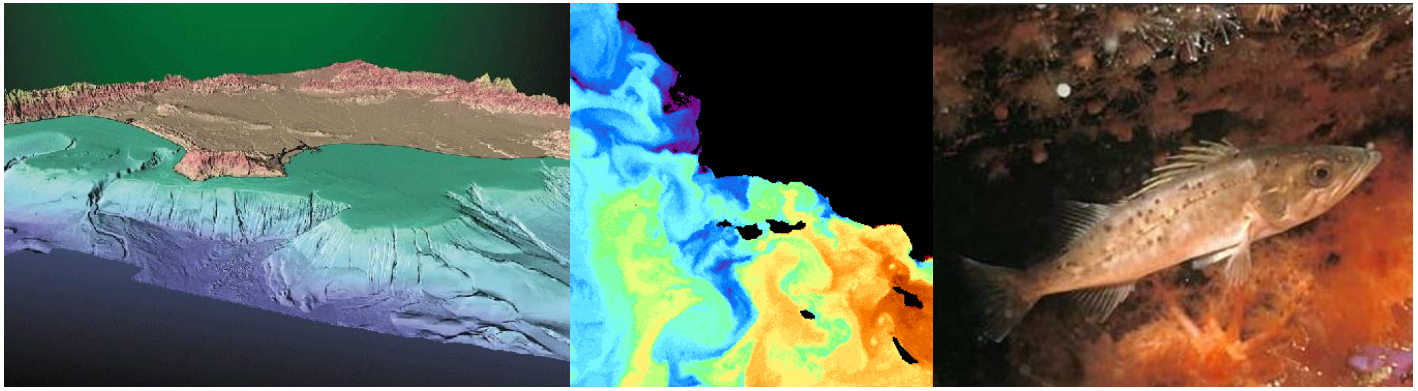
Tasks

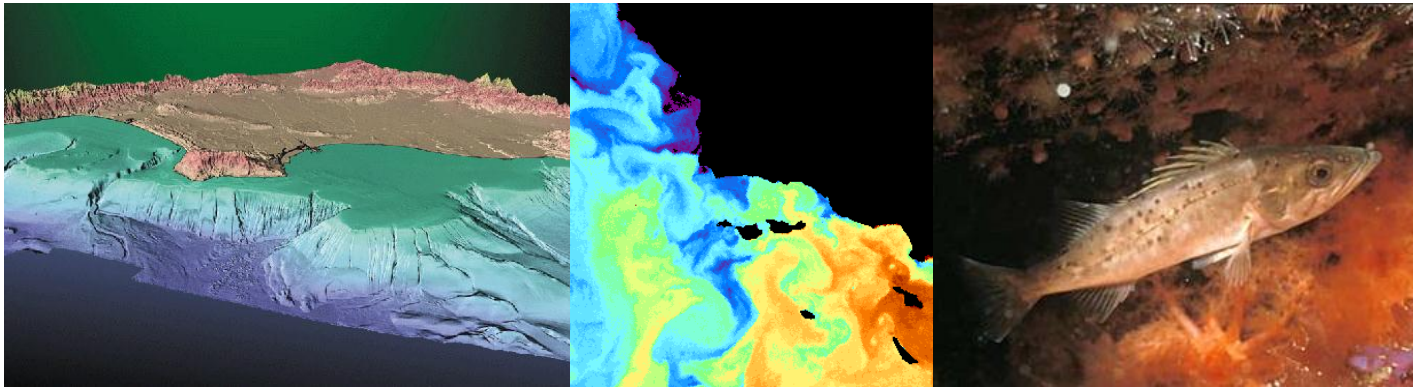
1. Synthesize geologic, oceanographic, and biologic databases



USGS and SEAPICS

Tasks

2. Use synthesis to establish a stratified sampling design and conduct field surveys to perform a stock assessment of juvenile rockfishes within the region affected by offshore oil and gas platforms



USGS and SEAPICS

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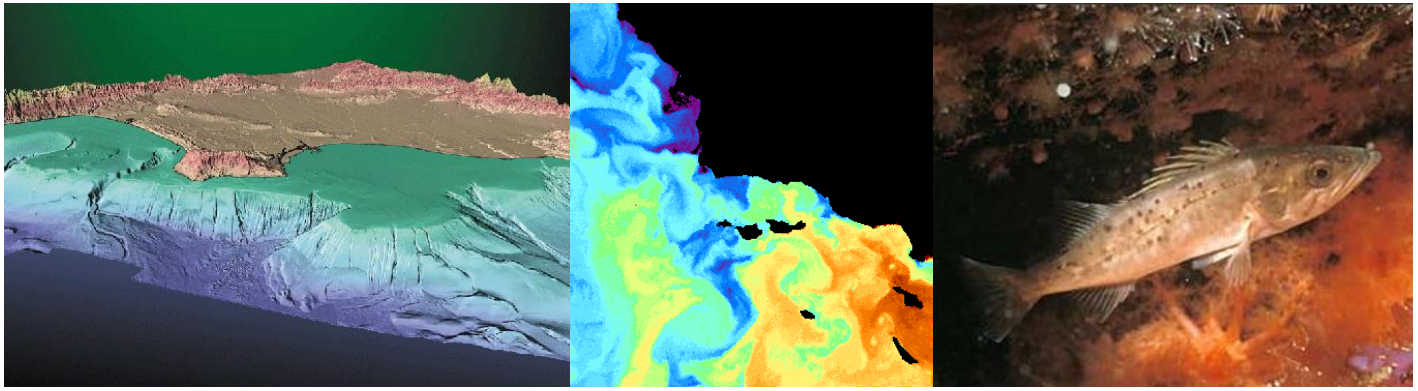
Tasks

3. Via geospatial analysis, determine the relative importance of offshore manmade structures and natural reef habitats as rockfish nurseries



USGS and SEAPICS

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GARRY MCCARTHY

Status

2010 – Workshop

2010-2011 – Seafloor mapping data synthesized into one compatible GIS

2011 – Oceanographic data assembled and used to identify region of influence

2011 – Sampling design completed

Summer 2012 – Field surveys begin

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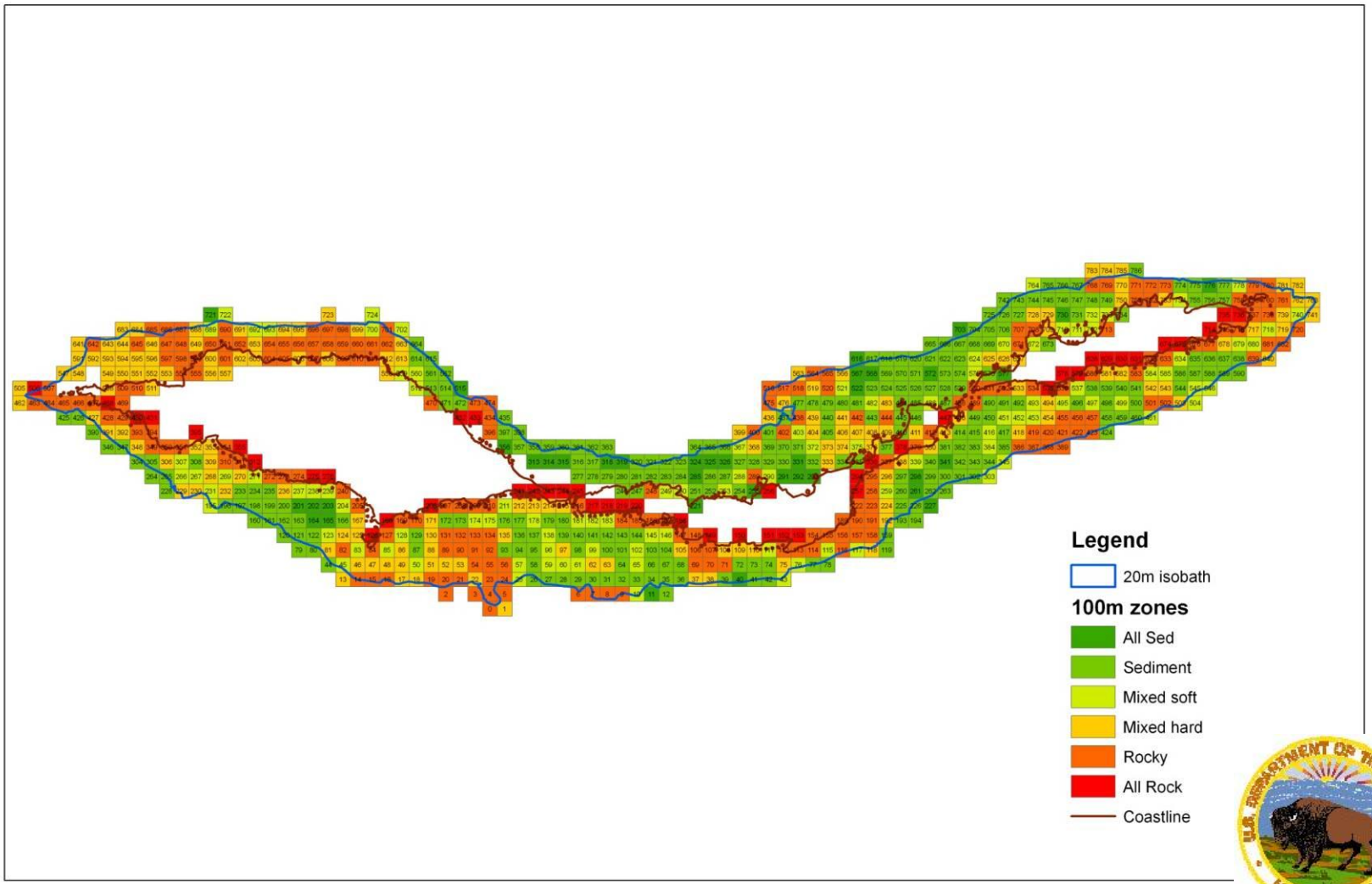

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Discipline	Title
Marine Mammals	**Southern Sea Otter Range Expansion and Habitat Use and Interaction with Manmade Structures**



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USGS

Overall Objective

Assess how a protected species (southern sea otter) may be affected by offshore structures and identify any behavioral adaptations to the extensive natural oil and gas seeps in the area

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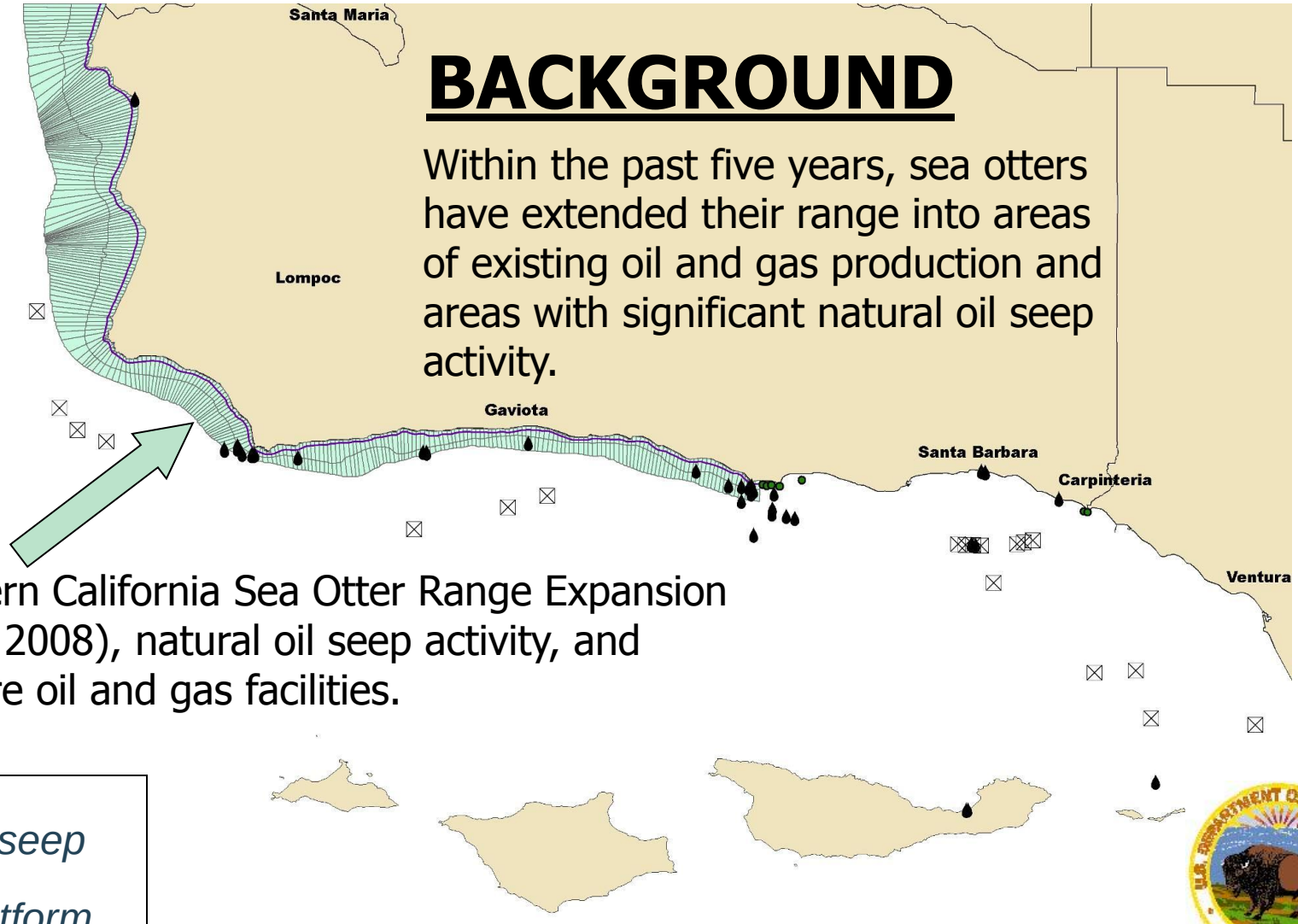
BACKGROUND

Within the past five years, sea otters have extended their range into areas of existing oil and gas production and areas with significant natural oil seep activity.



Southern California Sea Otter Range Expansion (USGS 2008), natural oil seep activity, and offshore oil and gas facilities.

oil seep

platform

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BOEM Information Needs

Conventional Energy

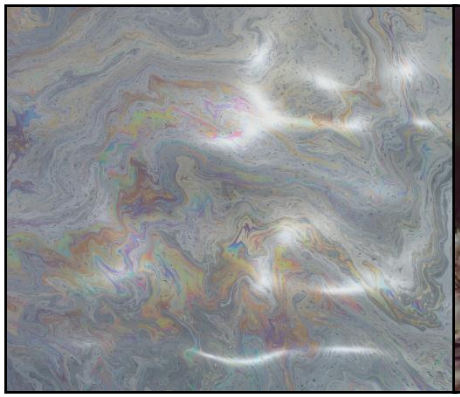
Ongoing Operations

Renewable Energy

Ongoing Operations

How Study Products will be Used

- NEPA analyses
- Endangered Species Act, Section 7 Consultations with US Fish and Wildlife
- Oil Spill Response



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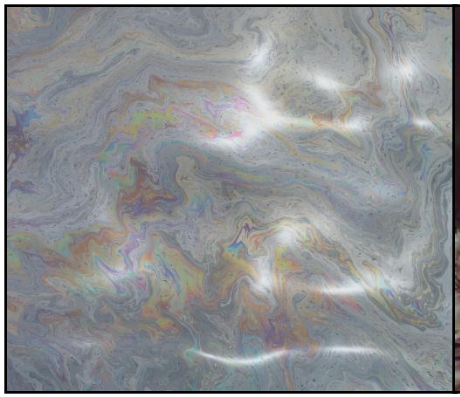
Tasks

1) Delineate movements and spatial use patterns by sea otters along the southern California coast
2) Identify important sea otter resting and foraging areas adjacent to offshore structures
3) Assess sea otter distribution and behavior in the vicinity of natural oil and gas seep areas



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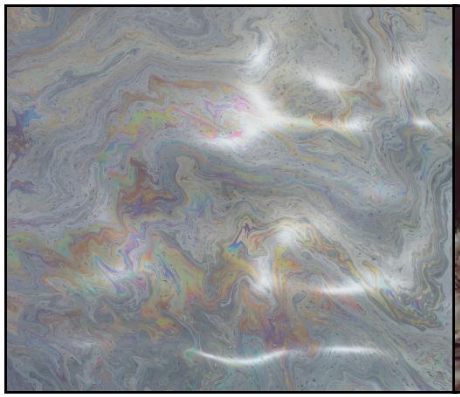
Tasks

4) Combine data on tagged animal movements, habitat use patterns and population distribution and create population-level "risk of exposure" models for spatially-explicit threats such as natural oil seeps or hypothetical oil spill scenarios.

Status

2011 – Logistics and personnel preparations complete

2012 – First tagging and tracking efforts begin in February



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Supporting and Monitoring Conventional Energy and Preparing for Renewable Energy

Discipline	Title
Habitat/Ecology	BOEM Multi-Agency Rocky Intertidal Network (MARINe)

Ongoing monitoring of rocky intertidal sites adjacent to OCS facilities allows BOEM to directly assess potential and/or real impacts to the coastline from ongoing OCS operations. Potential impacts to the shoreline are of particular concern because OCS operations are located close to shore, and public concern with these impacts has a considerable effect on the program.

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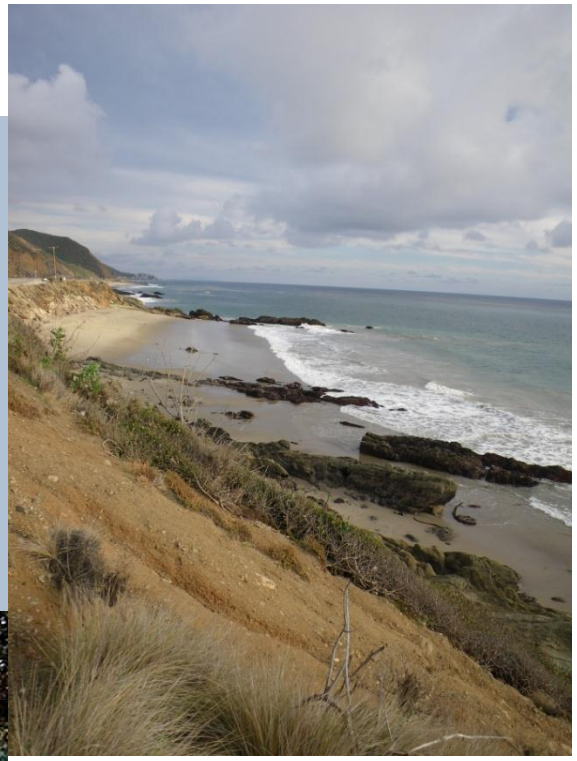
Objectives

This study provides for the monitoring of 24 rocky intertidal sites on the mainland shore immediately adjacent to existing OCS facilities. The study also provides for overall coordination of the MARINe partnership, shared database and information from sites across the west coast and northern New England. These data put into context data collected adjacent to OCS activities and provide BOEM with access to the data needed for management decisions. In the future, these data can be used to evaluate changes from renewable projects, especially wave facilities, which have the potential to reduce wave energy at the shoreline.



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Methods

Twenty-four sites were established along the mainland adjacent to producing oil and gas facilities to provide for geographic coverage and a mix of habitat types from exposed rock platforms to sheltered, sand-influenced sites. Fixed photoplots are used to monitor key species such as mussels, barnacles, anemones, rockweed, turf algae. Irregular plots and transects track motile species such as black abalone and seastars. Owl limpets are counted and measured in circular plots. Motile invertebrates are counted and measured.

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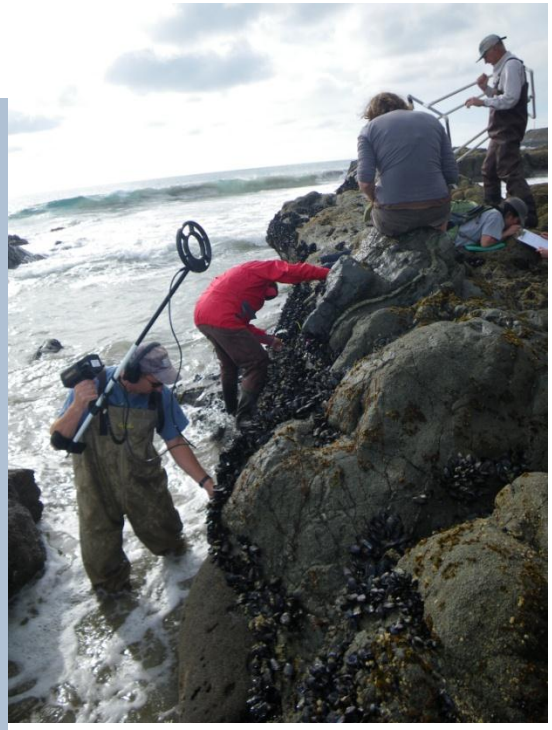
Status

1) **Fall fieldwork at the BOEM-funded sites was completed by mid-December. A quarterly report was circulated covering activities.**

2) **A data analysis report for this study will be completed in March which covers the past six years of sampling. This report was leveraged with other MARINe partners to additionally produce a complimentary interactive website for MARINe data from all MARINe sites from Alaska to Mexico for the past 30 years. This will be linked to www.MARINE.gov. The new site is hosted by UC Santa Cruz at www.pacificrockyintertidal.org.**

3) **MARINe is holding its annual Taxonomic Workshop at UC Santa Cruz February 23-25, 2012.**



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Discipline	Title
Habitat/Ecology	Pacific Region Intertidal Sampling and Monitoring (PRISM) Study
In-house staff familiar with OCS operations participate in the ongoing monitoring of rocky intertidal systems, study the influence of ongoing adjacent activities and thus support the MARINe effort.	

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Objectives

1) **Collect long-term data about natural and anthropogenic perturbations in the rocky intertidal habitat in a manner that enables BOEM to determine effects from OCS operations, accidental oil spills and future renewable energy activities.**

2) **These data will also enable BOEM to monitor changes in the shoreline habitat due to establishment of wave and wind facilities. One change, for example, is the potential for community level changes due to reduction of wave energy at the shore.**

3) **Conduct short, focused examinations in the field that improve our understanding of rocky intertidal ecology as it relates to the impact, response and recovery from oil spills and wave devices.**

4) **Fulfill our commitment to participate in the Cooperative Agreement with the University of California for MARINe.**

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Methods

Methods vary by task:

Task 1) Monitoring: Methods same as those for MARINe. In particular, PRISM members count and measure motile invertebrates in each of the photoplots for use in understanding abundance trends.

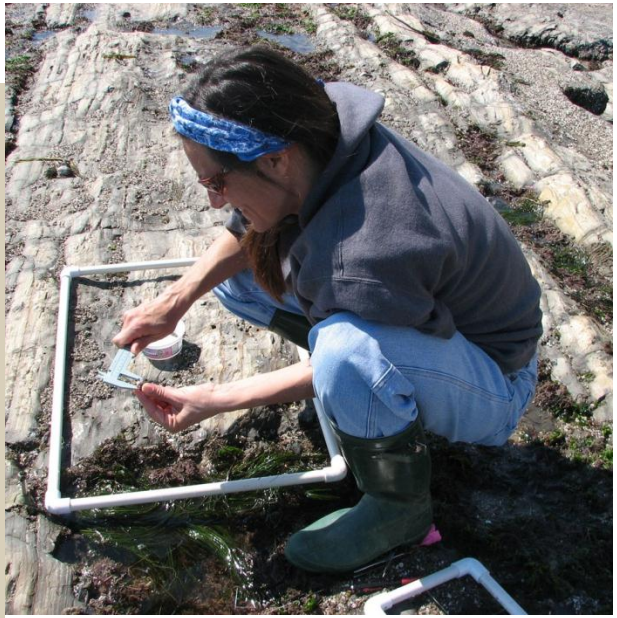
Task 2) Mussel Recovery Study analysis: Data from early BOEM in-house effort has been reentered so that PRISM members can use community statistics to evaluate changes.

Task 3) Hosting annual MARINe meetings and webinars

Tasks 4, 5) Updating field maps: Consultant hired to update and redraw field maps of BOEM sites with field assistance from PRISM.

Task 6) Protocol videotape: PRISM taking photos in the field of each protocol and creating video for training and archival purposes.

Task 7) Voucher archiving plan: Scientist from UC Berkeley contracted to develop algae archival plan.



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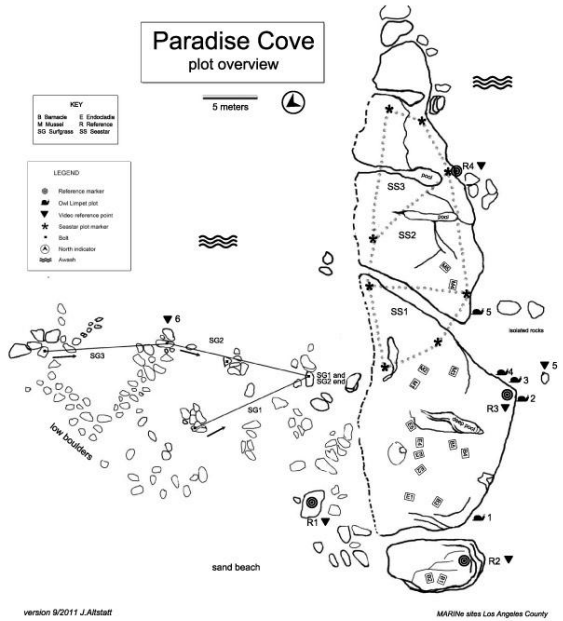
Status

The PRISM team assisted in the field at 9 sites this fall and have produced 12 maps for 4 sites in Los Angeles and Ventura Counties. This spring PRISM will be field checking the maps and updating triangulation values and GPS coordinates.

PRISM has held several webinars for new protocols which will be discussed at the upcoming Taxonomic Workshop, including the archiving protocol funded by BOEM. The workshop this year will be hosted by BOEM and UC Santa Cruz at Long Marine Lab.



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Discipline	Title
REN	**Survey of Benthic Communities near Potential Renewable Energy Sites Offshore Oregon and Washington**

This project is focused on describing benthic invertebrates found in both soft and hard substrate habitats on the OCS. The goal of this project is to establish species-habitat relationships to predict invertebrate communities that may be found in areas targeted for future development.

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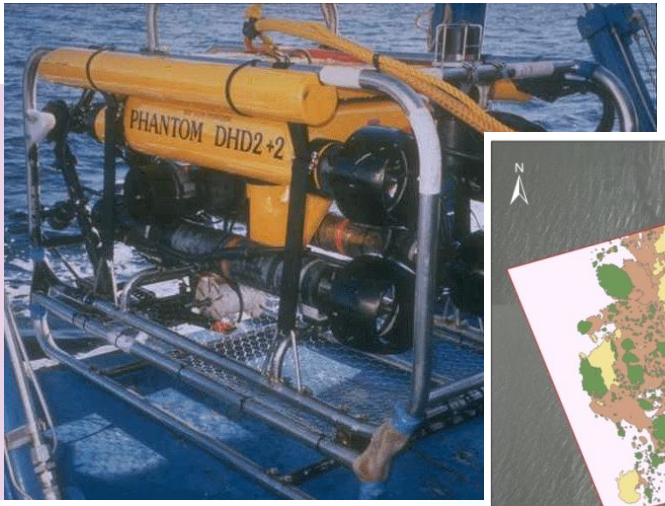
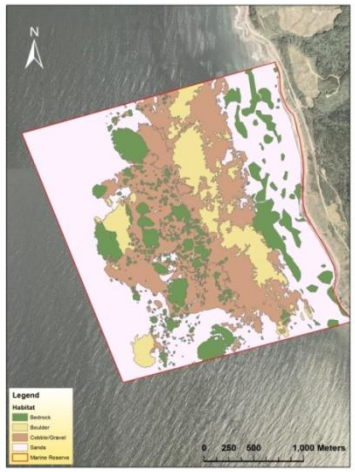
Objectives

The objective of this study is to understand species-habitat relationships and develop predictive capabilities of where benthic invertebrate species of interest and unique communities occur. In order to develop species-habitat relationships, this study will identify, analyze and report on key factors that drive invertebrate species and distributions.

Field work was targeted to benthic regions where wave and wind energy is most feasible. Surveys are intended to characterize different water depths and representative soft and hard substrate habitats.





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Methods

A sampling plan was developed using existing information. Specific sampling areas spaced across the OCS region likely to see future renewable energy projects (see red boxes on map) were identified. These areas represents different habitat types and key biological regions. Each was mapped, ground-truthed, and sampled using ROV transects and benthic grabs. Maps showing species-habitat relationships are then developed from these data.

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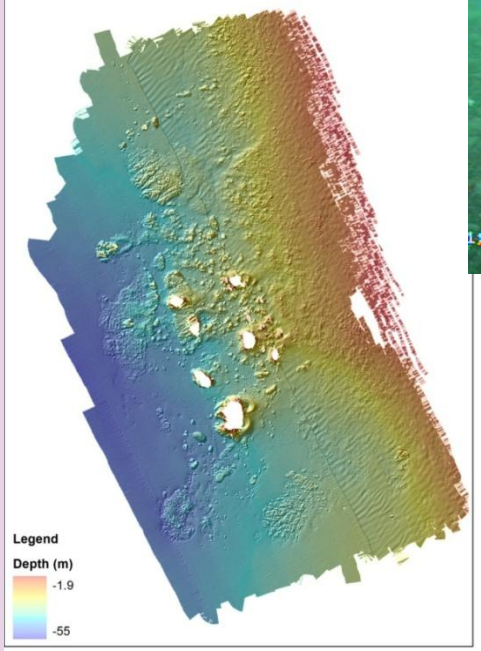
Status

- **A total of 118 of the 120 proposed box cores were taken across 6 sites in 2010.**
- **Multibeam sonar and acoustic backscatter surveys were completed at 5 sites in 2010 and 2011.**
- **ROV surveys completed at three sites in 2011 and planning for more in 2012.**
- **Existing physical and biological datasets will be analyzed with newly collected data.**
- **Invertebrate specimens collected from this study will be sent to the Smithsonian and will be the first samples sent under BOEM's renewable energy studies program.**
- **This study dovetails well with the BAA Parametrix Bayesian MSP study and are managed by the same database.**
- **Surveys across three states was only possible through collaborations with the NSF Ocean Observing Initiative, NOAA and the Oregon state waters mapping project.**



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Status

Field work began 1996 and was completed October 2011

Final analyses underway and will be complete June 2012

Numerous scientific publications and BOEM Reports

In 2009, the State of California paid for an independent review of data, which upheld conclusions

In 2010, the State of California legislated a Rigs-to-Reefs option to be used when platforms are decommissioned