

Sanctuary Integrated Monitoring Network (SIMoN)



Sophie De Beukelaer

Chad King

Monterey Bay National Marine Sanctuary

California Bay-Watershed Education and Training (B-WET) Conference

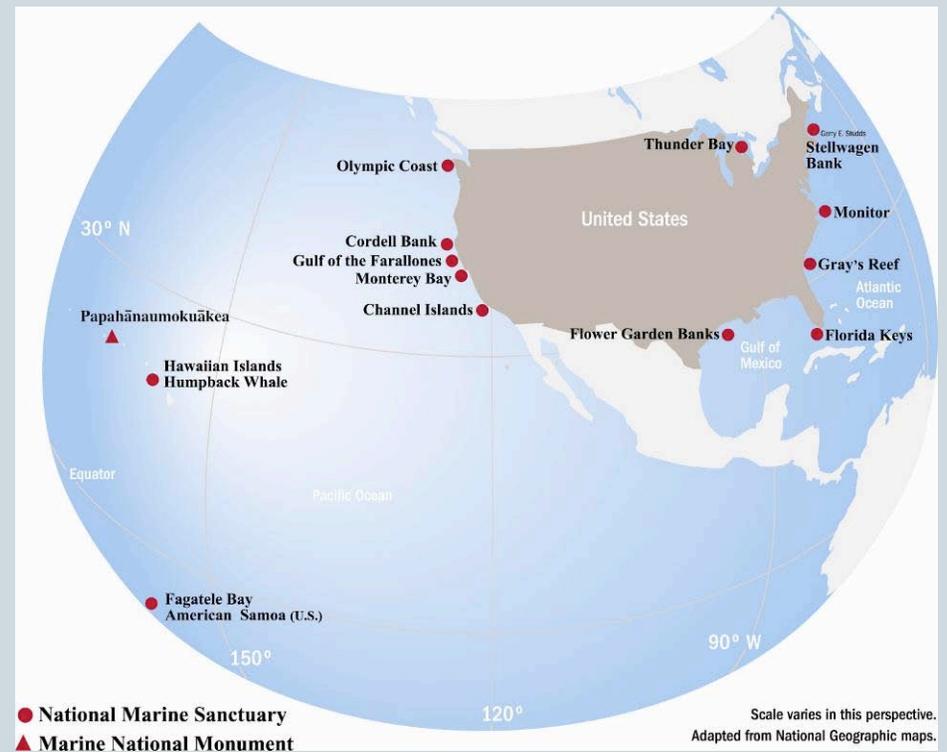
May 17, 2008



Outline



- SIMoN Overview
- SIMoN Website
 - Regional Page
 - Site Pages (Overview, Projects, Links, Maps and Graphs)
 - Resources (Species Database and Photo Library)
- Future Direction



SIMoN Goals



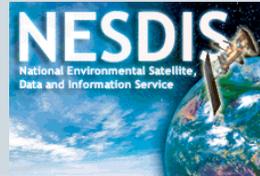
- Develop a database to track current and historic monitoring programs
- Initiate surveys and establish monitoring efforts
- To provide timely and pertinent information



SIMoN



Network Partners



SIMoN Regional Website

<http://www.sanctuariesimon.org>

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HOME MONTEREY BAY GULF OF THE FARALLONES CORDELL BANK

NATIONAL MARINE SANCTUARIES

ROCKY SHORES
KELP FORESTS
BEACHES
CONTINENTAL SHELF
SANDY FLOOR
ESTUARIES
SEAMOUNTS & BANKS
SUBMARINE CANYONS
ROCKS & ISLANDS
DEEP SEA
OPEN OCEAN
GEOLOGY
OCEANOGRAPHY
WATER QUALITY
FISHES
SEABIRDS & SHOREBIRDS
MARINE MAMMALS

SPECIAL TOPICS
- Select a topic -

SEARCH
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Cordell Bank
Gulf of the Farallones
Monterey Bay

Northern California National Marine Sanctuaries

Move your mouse over the Sanctuary outlines and click to learn about their monitoring of habitats and organisms.

WHAT'S NEW

- New SIMoN website released! To begin your visit choose a topic on the left side of the page or click a sanctuary on the map.
- Federal marine protected areas in the Monterey Bay Sanctuary. [\[More info\]](#)
- Monterey Bay National Marine Sanctuary Currents Symposium April 5, 2008 to focus on the impacts of climate change. [\[More info\]](#)

Photo Library

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Individual Sanctuary Pages

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MONTEREY BAY NATIONAL MARINE SANCTUARY

Home: Monterey Bay Sanctuary

MONTEREY BAY SANCTUARY



Designated in 1992, the Monterey Bay National Marine Sanctuary is a federally protected marine area offshore of California's central coast. Stretching from Rocky Point (just north of the Golden Gate Bridge) to Cambria (south of the Big Sur coastline), it encompasses nearly 300 miles of shoreline, 5,322 square miles of ocean, and extends from mean high tide to a seaward boundary an average of 25 miles offshore. At its deepest point, the sanctuary reaches down to 10,633 feet (more than two miles).

The diversity of habitats and upwelling ocean current patterns reviewed in this web site make the sanctuary one of the most productive marine areas in the world. With 33 species of marine mammals, 94 species of seabirds, 345 species of fishes, 4 species of turtles, 31 phyla of invertebrates, and more than 450 species of algae, the sanctuary is an outstanding area for wildlife viewing and marine research.

Approximately 8 million people live within fifty miles of the sanctuary shoreline, and many rely on its resources for pleasure or work. Human uses of the sanctuary include diving, kayaking, boating, fishing, surfing, tidepooling, and wildlife viewing. Coastal tourism, agriculture, and commercial fishing are important to the regional economy, with direct links to the sanctuary.

Associated with human uses, human impacts have to be managed to protect the sanctuary for future generations. The sanctuary staff, along with stakeholders and the public, have developed over 20 plans to address issues such as: coastal erosion, harbor dredging, submerged cables, trawling fishery impacts,

What's New in Monterey Bay Sanctuary

-  Marine protected areas in the Federal waters of the MBNMS [\[More information\]](#)
-  Zebra mussel reaches California! [\[More information\]](#)

Special Monterey Bay SIMoN Sections

- [Interactive maps](#)
- [Marine protected areas](#)
- [Invasive species](#)
- [Funding information](#)
- [Sporadic events](#)

ROCKY SHORES
KELP FORESTS
BEACHES
CONTINENTAL SHELF
SANDY FLOOR
ESTUARIES
SEAMOUNTS & BANKS
SUBMARINE CANYONS
ROCKS & ISLANDS
DEEP SEA
OPEN OCEAN
GEOLOGY
OCEANOGRAPHY
WATER QUALITY
FISHES
SEABIRDS & SHOREBIRDS
MARINE MAMMALS

MONTEREY TOPICS
- Select a topic -

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CORDELL BANK NATIONAL MARINE SANCTUARY

Home: Cordell Bank Sanctuary

CORDELL BANK SANCTUARY



Photo: Evans/CBNMS

Cordell Bank National Marine Sanctuary is an extremely productive marine environment off the coast of northern California, west of Marin County. Located about 50 miles north of San Francisco, the sanctuary is entirely offshore, with the eastern boundary six miles from shore and the western boundary 30 miles offshore at the 1000 fathom depth contour. The sanctuary was designated in 1989 to provide protection and promote responsible use of this important region, including the open water and seafloor habitats and communities. The centerpiece of the sanctuary is Cordell Bank, a four and a half by nine and a half mile rocky undersea feature located 18 miles west of the Point Reyes headlands. The bank sits at the edge of the continental shelf and rises abruptly from the soft sediments of the shelf to within 115 feet of the ocean surface.

Cordell Bank is located in the California Current upwelling system, which is associated with one of the four major eastern boundary currents of the world. Coastal upwelling initiates an annual productivity cycle that supports a rich resident biological community as well as migratory populations of sea turtles, fishes, seabirds and whales that travel thousands of miles to feed around the bank. It's the combination of a healthy benthic community on the bank in close proximity to offshore, open water species that contributes to the unique biological diversity in a relatively confined area around Cordell Bank. Cordell Bank National Marine Sanctuary comprises a diversity of habitats that harbor rich marine communities. Ocean processes, physical habitat and depth greatly influence the composition and distribution of species that inhabit the benthic and pelagic environments.

Through partnerships with state and federal agencies, and academic and research institutions, Cordell Bank National Marine Sanctuary seeks out the broader scientific community to ensure that the most effective and rigorous science can be attained. Our goal is to create sound scientific information available for resource management, monitoring, interpretation, education, planning, and policy needs.

The logistics of conducting research at Cordell Bank sanctuary can often be challenging, given the distance from shore, rough ocean conditions, complex habitat types, and depths. These factors

ROCKY SHORES
KELP FORESTS
BEACHES
CONTINENTAL SHELF
SANDY FLOOR
ESTUARIES
SEAMOUNTS & BANKS
SUBMARINE CANYONS
ROCKS & ISLANDS
DEEP SEA
OPEN OCEAN
GEOLOGY
OCEANOGRAPHY
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FISHES
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SIMoN Regional Website

The screenshot shows the SIMoN Regional Website interface. At the top left is the logo: SIMoN SANCTUARY INTEGRATED MONITORING NETWORK. A navigation bar contains links for HOME, MONTEREY BAY, GULF OF THE FARALLONES, and CORDELL BANK. Below this is a section titled NATIONAL MARINE SANCTUARIES featuring a map of Northern California with outlines for Cordell Bank, Gulf of the Farallones, and Monterey Bay. To the left of the map is a vertical menu with categories like ROCKY SHORES, KELP FORESTS, BEACHES, etc. To the right of the map is a 'WHAT'S NEW' section with two bullet points about website updates and a symposium. Below that is a 'Photo Library' section with a photo of seals and a link to search over 2,800 images. At the bottom, there are logos for NOAA and the National Marine Sanctuaries, along with contact information and a URL: http://sanctuariesimon.org.

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ROCKY SHORES
KELP FORESTS
BEACHES
CONTINENTAL SHELF
SANDY FLOOR
ESTUARIES
SEAMOUNTS & BANKS
SUBMARINE CANYONS
ROCKS & ISLANDS
DEEP SEA
OPEN OCEAN
GEOLOGY
OCEANOGRAPHY
WATER QUALITY
FISHES
SEABIRDS & SHOREBIRDS
MARINE MAMMALS

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Monterey Bay

Northern California National Marine Sanctuaries

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National Marine Sanctuaries

Regional: Rocky Shores

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NATIONAL MARINE SANCTUARIES

Home: Rocky shores
ROCKY SHORES

In Gulf of the Farallones and Monterey Bay National Marine Sanctuaries, the rocky shores are characterized by a fascinating and diverse array of intertidal organisms. The dramatic influence of the tidal cycle exposes this region's inhabitants to large fluctuations in temperature, desiccation (drying out) and wave action twice per day.

INHABITANTS

Rocky shores are divided into a series of zones that are defined by the amount of time the rocks are exposed to air and water. Individual species tend to occupy different parts of the intertidal gradient from the high intertidal zone, where environmental stress is highest, to the low intertidal zone, where biological interactions prevail.

More Information

- Monterey Bay Rocky Shores
- Gulf of Farallones Rocky Shores

The Splash Zone: Few organisms survive here. Those that can (e.g., barnacles, limpets and a type of green algae) are almost always exposed to the air and are rarely submerged by water.

The High Zone: Organisms that inhabit this zone are exposed to air more than 70 percent of the time and must develop adaptations to survive the long dry periods. For example, limpets, chitons and black turban snails form a watertight seal onto the rocks with their shells to protect themselves from drying out.

The Mid Zone: This zone is densely populated. California mussels often form large beds that provide important refuge and habitat for a variety of other invertebrates and algae.

The Low Zone: In this zone, organisms may be exposed to air just a few times a month so they are more resilient to waves and less resilient to air exposure. Inhabitants include the giant green anemone, the purple sea urchin, the sunflower star and the beautiful sea palm.

CONSERVATION AND MANAGEMENT ISSUES

There are a number of conservation concerns relative to this habitat. These include the following:

- Harvesting pressure and disease can cause declines in rocky-shore invertebrates.
- The high visitation levels that occur on rocky shores can cause changes in the diversity and abundance of intertidal organisms.

- Debris from coastal development and highway maintenance can create disturbances, similar to landslides, that can immediately eliminate habitat or have long-term impacts related to sand movement and burial on adjacent sites.
- The introduction of non-native invertebrates is a major concern. These newcomers threaten the abundance and/or diversity of native species, disrupt ecosystem balance and threaten local marine-based economies.
- Water from streams and culverts that drain onto the sanctuary's rocky shores often bring contaminants that can have a variety of biological effects.



Aggregation of Gooseneck barnacles (*Lepas anatifera*), commonly found on rocky shores. Photo: King / SIMON NOAA

MONITORING

Monitoring programs are essential to understanding short- and long-term natural variability and for assessing the health of the region's rocky shores. Most current research and monitoring efforts have two main focus areas:

- establishing the health of this ecosystem
- determining how rocky shores respond to various disturbances

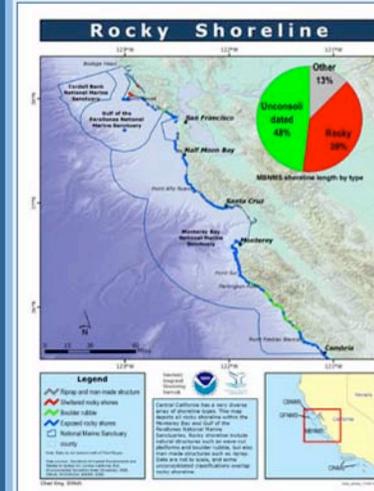


Figure 1. Zones of rocky shores within the Monterey Bay, Gulf of the Farallones, and Cordell Bank National Marine Sanctuaries. [View full size map]

Staff from both the Gulf of the Farallones and Monterey Bay sanctuaries are involved in two rocky-shore research projects:

- Long-term Monitoring Program and Experiential Training for Students (LIMPETS)
- The Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO)

In the Monterey Bay sanctuary, a study on visitor use and marine reserves at Point Pinos in Pacific Grove has evaluated how visitors affect rocky-shore communities.

In the Gulf of the Farallones sanctuary, the Duxbury Reef Restoration Program analyzes visitor data, determines baseline species diversity patterns and abundance on the reef, and identifies high- and low-impact areas regarding visitor use.

Monterey Bay Rocky Shores: Main



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HOME MONTEREY BAY GULF OF THE FARALLONES CORDELL BANK

MONTEREY BAY NATIONAL MARINE SANCTUARY

OVERVIEW MAPS & GRAPHS PROJECTS IMAGES LINKS

ROCKY SHORES

KELP FORESTS
BEACHES
CONTINENTAL SHELF
SANDY FLOOR
ESTUARIES
SEAMOUNTS & BANKS
SUBMARINE CANYONS
ROCKS & ISLANDS
DEEP SEA
OPEN OCEAN
GEOLOGY
OCEANOGRAPHY
WATER QUALITY
FISHES
SEABIRDS & SHOREBIRDS
MARINE MAMMALS

MONTEREY TOPICS

- Select a topic -

SEARCH

Enter search here

Home: [Monterey Bay Sanctuary](#): Rocky shores

MONTEREY BAY SANCTUARY: ROCKY SHORES



The Monterey Bay National Marine Sanctuary's rocky shores are characterized by a fascinating and diverse array of intertidal organisms. The dramatic influence of the tidal cycle exposes intertidal invertebrates and algae to large fluctuations in temperature, desiccation (drying out) and wave action twice per day. This range of environmental variables in turn interacts with biological factors to create the distinct zonation patterns evident on any trip to the rocky shore.

Individual species tend to occupy different parts of the intertidal gradient from the high intertidal zone, where environmental stress is highest, to the low intertidal zone, where biological interactions prevail. The striking vertical range occupied by these organisms has long motivated scientists and visitors to investigate the abundant and species-rich assemblage of intertidal organisms that thrive in the sanctuary. Many of the 150+ marine species found on the rocky shore do not occur subtidally, contributing to the unique nature of this habitat at the interface of land and ocean.

Rocky shores make up 56 percent of sanctuary shoreline habitat and primarily occur near the tips of and outside Monterey Bay, extending southward along the Big Sur coast and north toward San Francisco. Human use of sanctuary rocky shores ranges from research and education to harvesting, collection and passive recreation.

Current research and monitoring efforts have two focus areas:

- establishing the health of this ecosystem
- determining how rocky shores respond to various disturbances

Scientists have conducted baseline surveys of rocky-shore communities, and these systems are in turn monitored to understand trends in the abundance and distribution of numerous intertidal organisms. Establishing such baseline data will allow researchers and managers to assess future impacts on this ecosystem.

Various disturbances, which are well-documented occurrences in rocky shore habitats, can impact the typical patchy distributions of invertebrates and algae found in the intertidal zone. Natural forms of disturbance include waves, predation (e.g., sea otters remove mussels from rocky shores), wave-tossed rocks and logs, and substratum weathering and exfoliation.

More Information

- [Regional California Rocky Shores](#)
- [Gulf of Farallones Rocky Shores](#)

Monterey Bay Rocky Shores: Images

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HOME MONTEREY BAY GULF OF THE FARALLONES CORDELL BANK

MONTEREY BAY NATIONAL MARINE SANCTUARY

OVERVIEW MAPS & GRAPHS PROJECTS IMAGES LINKS

ROCKY SHORES

- KELP FORESTS
- BEACHES
- CONTINENTAL SHELF
- SANDY FLOOR
- ESTUARIES
- SEAMOUNTS & BANKS
- SUBMARINE CANYONS
- ROCKS & ISLANDS
- DEEP SEA
- OPEN OCEAN
- GEOLOGY
- OCEANOGRAPHY
- WATER QUALITY
- FISHES
- SEABIRDS & SHOREBIRDS
- MARINE MAMMALS

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- Select a topic -

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Home: [Monterey Bay Sanctuary: Rocky Shores: Images](#)

MONTEREY BAY SANCTUARY: ROCKY SHORES IMAGES

To view a larger version of the photos below click on a thumbnail image. You will also be able to view important information on each photo such as photographer, date, caption and more. For more images go to the [SIMoN Photo Library](#).

Rocky Shore Images

		
Red alga <i>Halosaccion glandiforme</i> . Photo: SIMoN / NOAA	Intertidal bench at Pillar Point. Photo: SIMoN / NOAA	Point Pinos rocky shore area and large wave. Photo: SIMoN / NOAA
		
<i>Mazzaella splendens</i> on rocks in the intertidal area south of Pescadero State Beach. Photo: SIMoN / NOAA	Striped shore crab (<i>Pachygrapsus crassipes</i>). Photo: SIMoN / NOAA	Sunburst anemone (<i>Anthopleura sola</i>) covered by a shallow tidepool at Point Piños. Photo: SIMoN / NOAA
		
Shield limpet (<i>Collisella pelta</i>) exposed at high tide at Point Piños. Photo: SIMoN / NOAA	The boat hull lodged in the upper intertidal of the F/V Boco crab site. Photo: SIMoN / NOAA	California mussels (<i>Mytilus californianus</i>) and gooseneck barnacles (<i>Dolichostylus</i>) on rocks. Photo: SIMoN / NOAA

Monterey Bay Rocky Shores: Links



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NETWORK

HOME MONTEREY BAY GULF OF THE FARALLONES CORDELL BANK

MONTEREY BAY NATIONAL MARINE SANCTUARY

OVERVIEW MAPS & GRAPHS PROJECTS IMAGES LINKS

ROCKY SHORES

- KELP FORESTS
- BEACHES
- CONTINENTAL SHELF
- SANDY FLOOR
- ESTUARIES
- SEAMOUNTS & BANKS
- SUBMARINE CANYONS
- ROCKS & ISLANDS
- DEEP SEA
- OPEN OCEAN
- GEOLOGY
- OCEANOGRAPHY
- WATER QUALITY
- FISHES
- SEABIRDS & SHOREBIRDS
- MARINE MAMMALS

MONTEREY TOPICS

- Select a topic -

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Home: [Monterey Bay Sanctuary](#); [Rocky Shores](#); [Web links](#)

MONTEREY BAY SANCTUARY: ROCKY SHORES WEB LINKS



The list of website links below provide you with access to more information on rocky shores. Each website will open in a new window.

California Geological Survey - An index to online geologic field trips

The California Geotour is an interactive index of online geologic field trip guides, including those for coastal areas of central California.
Open in a new window: <http://www.consrv.ca.gov/cgs/geotour/>

PISCO: Partnership for the Interdisciplinary Studies of Coastal Oceans

PISCO is a long term, large scale research program aimed at more fully understanding the nearshore environments on the West Coast.
Open in a new window: <http://www.piscoweb.org>

LIMPETS: Long term Monitoring Program and Experiential Training for Students

Middle school, high school and other volunteer groups monitor the rocky intertidal, sandy shore and offshore areas to provide critical data while increasing public awareness.
Open in a new window: <http://limpets.noaa.gov/welcome.html>

USGS - Geology and Coastal Hazards in the Northern Monterey Bay, California, A Field Trip Guidebook

The purpose of this field trip is to explore the relationships between local geology, coastal hazards, and human influences in the northern Monterey Bay, which is a tectonically active, high wave energy coastal environment.
Open in a new window: <http://geopubs.wr.usgs.gov/open-file/of00-438/>

USGS - Photo Tour from Año Nuevo to Santa Cruz, California

Monterey Bay Water Quality: Projects



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HOME MONTEREY BAY GULF OF THE FARALLONES CORDELL BANK

MONTEREY BAY NATIONAL MARINE SANCTUARY

OVERVIEW MAPS & GRAPHS PROJECTS IMAGES LINKS

Home: [Monterey Bay Sanctuary](#); [Water Quality](#); [Monitoring projects](#)

MONTEREY BAY SANCTUARY: WATER QUALITY MONITORING PROJECTS



Review the list of water quality monitoring projects below. A full description is available for each project.

Southwest Ocean Outfall Regional Monitoring Program [VIEW PROJECT](#)

The City and County of San Francisco owns and operates the Oceanside Water Pollution Control Plant that collects, treats to secondary standards, and then discharges municipal wastewater and storm water into the Pacific Ocean approximately 3.75 miles offshore of Ocean Beach.

Monterey Bay Sanctuary Snapshot Day [VIEW PROJECT](#)

Snapshot Day (SSD) is a one-day event that utilizes citizen volunteers to collect and analyze water samples from streams that enter the Monterey Bay National Marine Sanctuary. SSD began on the Central Coast on Earth Day 2000 and has become a widely recognized volunteer event in which important water quality information is gathered.

Central Coast Long-term Environmental Assessment Network (CCLEAN) [VIEW PROJECT](#)

CCLEAN provides the initial nearshore component of the Central Coast Regional Water Quality Control Board's Central Coast Ambient Monitoring Program (CCAMP). This multidisciplinary program includes sampling in watersheds that flow into coastal regions, in estuarine coastal confluences, and at coastal sites.

Ecological Effects of the Moss Landing Thermal Discharge [VIEW PROJECT](#)

ROCKY SHORES
KELP FORESTS
BEACHES
CONTINENTAL SHELF
SANDY FLOOR
ESTUARIES
SEAMOUNTS & BANKS
SUBMARINE CANYONS
ROCKS & ISLANDS
DEEP SEA
OPEN OCEAN
GEOLOGY
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MONTEREY TOPICS
- Select a topic -

SEARCH
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HOME MONTEREY BAY GULF OF THE FARALLONES CORDELL BANK

MONTEREY BAY NATIONAL MARINE SANCTUARY

OVERVIEW MAPS & GRAPHS PROJECTS IMAGES LINKS

Home: [Monterey Bay Sanctuary](#); [Water Quality](#); [Monitoring projects](#); [Project information](#)

MONTEREY BAY SANCTUARY: WATER QUALITY MONITORING PROJECT INFORMATION

[\[Print Friendly Version \]](#)

MONTEREY BAY SANCTUARY SNAPSHOT DAY

Principal Investigator(s)
Bridget Hoover (Monterey Bay National Marine Sanctuary)

Start Date	Funding
2000-04-24	--

Overview

Snapshot Day (SSD) is a one-day event that utilizes citizen volunteers to collect and analyze water samples from streams that enter the Monterey Bay National Marine Sanctuary (MBNMS). SSD began on the Central Coast on Earth Day 2000 and has become a widely recognized volunteer event in which important water quality information is gathered. The Monterey Bay Citizen Watershed Monitoring Network, Coastal Watershed Council, California Coastal Commission, MBNMS Water Quality Protection Program, and The Ocean Conservancy worked together to organize the event.

During Snapshot Day 2005, 161 volunteers monitored 163 sites in the four counties bordering the sanctuary (San Mateo, Santa Cruz, Monterey, and San Luis Obispo). Water bodies as diverse as urban drainages, brackish sloughs, and major river systems were monitored. Trained volunteers measured dissolved oxygen, pH, conductivity, temperature, transparency/turbidity, and collected water samples to send to a laboratory for nutrient and bacteria level analysis. These are all parameters that measure the health of a water body and its ability to support fish and other aquatic organisms. Most of the sites monitored appear to fall in the "healthy" range, and overall water quality conditions seemed better for the 2005 Snapshot Day event than previous years.

Summary to Date

The results from Snapshot Day 2005 are encouraging. Based on the data from the event, the number of exceedances for water temperature, dissolved oxygen, turbidity, *E.Coli*, nitrate and orthophosphate were down this year compared to 2004. Eighty-six of the sites (53%) did not have a single exceedance for any of the water quality objectives, which is almost identical to 2004 data. Many of the water bodies along the San Mateo Coast and Big Sur Coast were, overall, in very good condition. In contrast, the water bodies in urban and agricultural areas seem to be more impacted by the surrounding land use.

Dissolved oxygen was the most common field measurement that did not meet the water

Monterey Bay Water Quality: Maps and Graphs



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- ROCKY SHORES
- KELP FORESTS
- BEACHES
- CONTINENTAL SHELF
- SANDY FLOOR
- ESTUARIES
- SEAMOUNTS & BANKS
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- OPEN OCEAN
- GEOLOGY
- OCEANOGRAPHY
- WATER QUALITY**
- FISHES
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- MARINE MAMMALS

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- Select a topic -

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HOME
MONTEREY BAY
GULF OF THE FARALLONES
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MONTEREY BAY NATIONAL MARINE SANCTUARY

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MAPS & GRAPHS
PROJECTS
IMAGES
LINKS

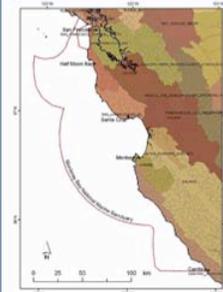
Home: [Monterey Bay Sanctuary](#); [Water Quality](#); [Maps and graphs](#)

MONTEREY BAY SANCTUARY: WATER QUALITY MAPS AND GRAPHS



This page provides maps and graphs of data collected on water quality in the Monterey Bay National Marine Sanctuary. The SIMoN [interactive maps](#) also show water quality data.

Watersheds Leading to the Sanctuary



This map shows the watersheds that lead to the Monterey Bay National Marine Sanctuary. Color and label indicate the Cataloging Unit Name of each watershed area.

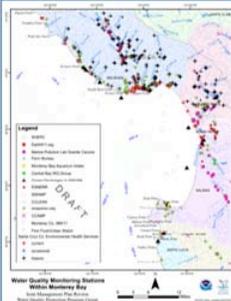
[\[Open in new browser window\]](#)

Annual Average Precipitation Levels



This map shows the annual average precipitation levels for areas in and around Santa Cruz County.

Water Quality Monitoring Stations within Monterey Bay

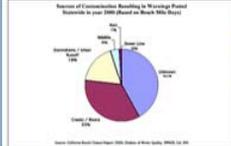


Water Quality Monitoring Stations
Within Monterey Bay
Map by the Water Quality Protection Group

This map shows the location of monitoring stations for the various water quality agencies and organizations in the Monterey Bay area. This map was prepared for the Monterey Bay National Marine Sanctuary's Joint Management Plan Review by the Water Quality Protection Program Group and SIMoN.

[\[Open PDF in new browser window\]](#) (292 Kb PDF)

Sources of Contamination Resulting in Warnings

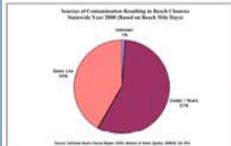


Sources of Contamination Resulting in Warning Posted Statewide in year 2000 (based on Beach Vils Data)

This graph shows the sources of contamination resulting in warnings posted statewide in 2000. The largest source of contamination is from unknown origins.

[\[Open in new browser window\]](#)

Sources of Contamination with Closures



Sources of Contamination Resulting in Beach Closures Statewide Year 2000 (based on Beach Vils Data)

This graph shows the sources of contamination resulting in beach closures statewide in 2000. The largest source of contamination is from creeks and rivers.

[\[Open in new browser window\]](#)

[\[Top of page \]](#)

SIMoN Interactive Maps



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HOME <http://www.ncddc.noaa.gov> - Water Quality Monitoring Sites in the MBNMS - Mozilla Firefox

SIMoN Interactive Maps

Water Quality Monitoring Sites in the MBNMS Scale 1: 2129807

NAVIGATION
[Navigation icons: Home, Previous, Next, Full Screen, Print, etc.]

SELECTION
[Selection icons: Pointer, Lasso, Rectangle, etc.]

OUTPUT
[Output icons: Print, Save, etc.]

Water Quality Legend:

- Water Quality
- Swamp M
- CCLEAN M
- Garrapata Creek Watershed M
- Monterey Bay Aquarium M
- Sewer Authority Mid-Coastside M
- Monterey Co. AB411 M
- CCAMP M
- Santa Cruz Co. Dept Env Health M
- Central Bay M
- Pebble Beach M
- Earth911.org M
- ESNERR M
- NRCS M
- SWQPA Storm Drains M
- Snapshot Day M
- First Flush - Urban Watch M
- Marine Pollution Lab - Granite Canyon M
- SWQPA Discharge M
- USGS Gauge Stations M
- Elkhorn Slough
- SWQPA M
- Base Data

Interactive Map Panels:

- INTERACTIVE MAPS**
Home: Interactive maps
What is GIS?
Click here for information on the interactive maps
- SIMoN Water Quality Viewer**
This SIMoN water quality National Marine Sanctuaries many agencies on the Central California Coast
- Central California Marine Habitat Viewer**
This SIMoN water quality National Marine Sanctuaries many agencies on the Central California Coast
- West Coast Observatories Viewer**
This Internet geospatially observations National Marine Sanctuaries. two categories of observations

Map Information:
Map created by National Coastal Data Development Center
Lon: -120° 7' 51" Lat: 35° 58' 9" USNG: 10S GE 58734 84344 (NAD83)

Refresh Map
 Auto Refresh
Help

Special Topics: Weather and Tides

SIMoN
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NETWORK

HOME MONTEREY BAY GULF OF THE FARALLONES CORDELL BANK

NATIONAL MARINE SANCTUARIES

Home: Weather and tides

WEATHER AND TIDES



Conditions in central and northern California are constantly changing and before planning an activity to one of the wonderful destinations in the Sanctuaries, it will be helpful to check the current conditions. Below are a list of links for current weather and tides for central and northern California. Investigating these sites will provide many more links to other areas of relevant information.

A comprehensive list of oceanographic and meteorological data available in the central and northern California coastal region is available on the CeNCOOS [oceanObs inventory](#) website.

REGIONAL CALIFORNIA INFORMATION

National Weather Service Radar Image for the San Francisco Bay Area
Current radar imagery of the central California coast, including the Monterey Bay National Marine Sanctuary.
<http://www.srh.noaa.gov/radar/latest/DS.p19r0/si.kmux.shtm>

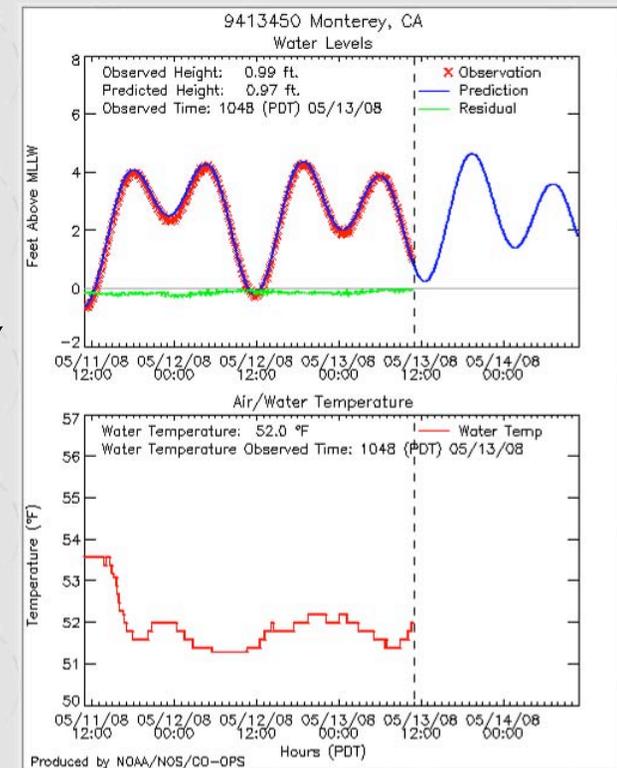
Coastal Marine Zone Forecasts for Northern Central California
Clickable map of northern central California to get coastal marine zone forecasts.
<http://www.nws.noaa.gov/om/marine/zone/west/mtrmz.htm>

NOS Tidal Observation Network
Clickable map of the United States that allows for viewing of water levels in various locations of coastal states. Click on the California portion of the map to view available sites near the Monterey Bay National Marine Sanctuary.
<http://tidesonline.nos.noaa.gov/geographic.html>

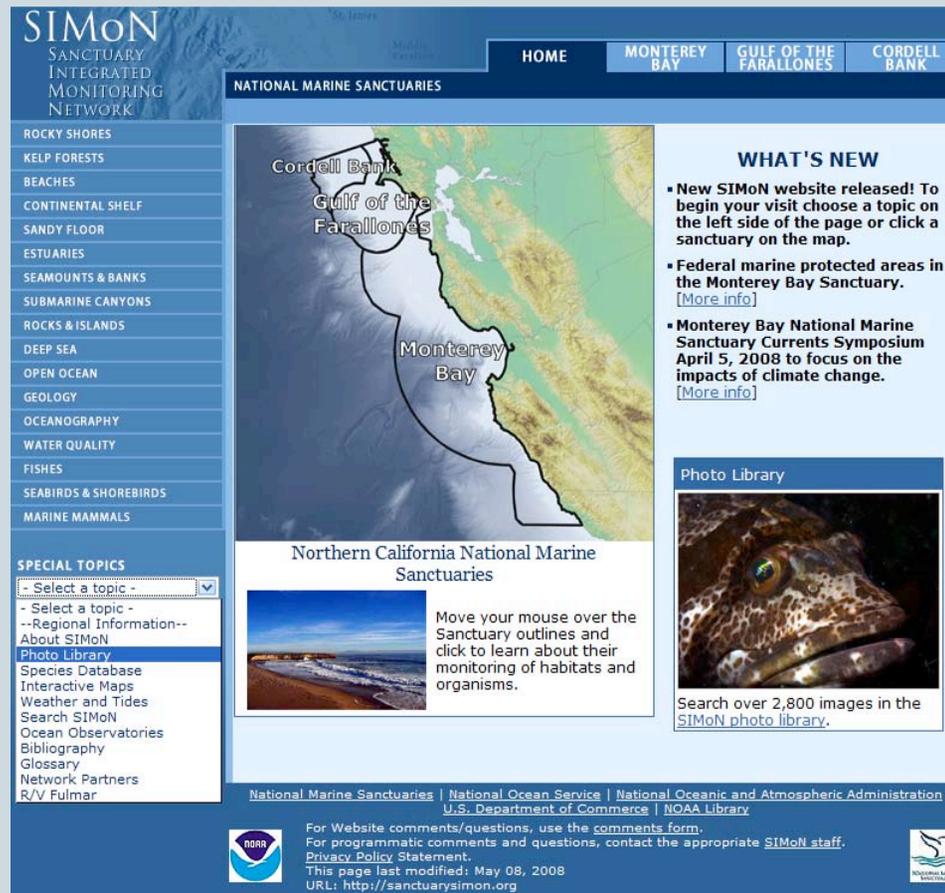
GULF OF FARALLONES AND CORDELL BANK NMS INFORMATION

National Weather Service Forecast for north of San Francisco
The five day weather forecast for the area north of San Francisco provided by the National Weather Service.
San Francisco:
http://www.wrh.noaa.gov/total_forecast/index.php?wfo=mtr&zone=caz006
Point Reyes:

[Refresh this page](#)
9413450 Monterey, CA



Special Topics: Photo Library



The screenshot displays the SIMoN website interface. At the top left, the logo reads "SIMoN SANCTUARY INTEGRATED MONITORING NETWORK". A navigation bar includes "HOME", "MONTEREY BAY", "GULF OF THE FARALLONES", and "CORDELL BANK". Below this is a "NATIONAL MARINE SANCTUARIES" section featuring a map of Northern California with outlines for Cordell Bank, Gulf of the Farallones, and Monterey Bay. A sidebar on the left lists various marine habitats such as Rocky Shores, Kelp Forests, and Seamounts & Banks. A "SPECIAL TOPICS" dropdown menu is open, showing options like "Photo Library" and "Species Database". To the right of the map, a "WHAT'S NEW" section contains three news items with "More info" links. Below that is a "Photo Library" section with a close-up image of a fish and text indicating over 2,800 images are available. The footer contains logos for NOAA and the National Marine Sanctuaries, along with contact information and a URL: http://sanctuarysimon.org.

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NETWORK

HOME MONTEREY BAY GULF OF THE FARALLONES CORDELL BANK

NATIONAL MARINE SANCTUARIES

ROCKY SHORES
KELP FORESTS
BEACHES
CONTINENTAL SHELF
SANDY FLOOR
ESTUARIES
SEAMOUNTS & BANKS
SUBMARINE CANYONS
ROCKS & ISLANDS
DEEP SEA
OPEN OCEAN
GEOLOGY
OCEANOGRAPHY
WATER QUALITY
FISHES
SEABIRDS & SHOREBIRDS
MARINE MAMMALS

SPECIAL TOPICS
- Select a topic -
- Select a topic -
--Regional Information--
About SIMoN
Photo Library
Species Database
Interactive Maps
Weather and Tides
Search SIMoN
Ocean Observatories
Bibliography
Glossary
Network Partners
R/V Fulmar

Cordell Bank
Gulf of the Farallones
Monterey Bay

Northern California National Marine Sanctuaries

Move your mouse over the Sanctuary outlines and click to learn about their monitoring of habitats and organisms.

Photo Library

Search over 2,800 images in the [SIMoN photo library](#).

National Marine Sanctuaries | National Ocean Service | National Oceanic and Atmospheric Administration
U.S. Department of Commerce | NOAA Library

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This page last modified: May 08, 2008
URL: <http://sanctuarysimon.org>

Special Topics: Photo Library

The screenshot shows the SIMoN (Sanctuary Integrated Monitoring Network) website's Photo Library page. The header includes the SIMoN logo and navigation tabs for HOME, MONTEREY BAY, GULF OF THE FARALLONES, and CORDELL BANK. A sidebar on the left lists various marine environments like Rocky Shores, Kelp Forests, and Seamounts & Banks, along with a 'SPECIAL TOPICS' dropdown and a search bar. The main content area is titled 'PHOTO LIBRARY' and features a 'Quick Search' section with a text box and a 'Search' button. Below this are four categories of photo thumbnails: Seascapes, Marine mammals, Seabirds and Shorebirds, and Fishes. The 'Search by Keyword' section includes a text input field, a 'Search' button, and examples of keywords. The 'Search by Species' section has a dropdown menu for 'Common name (scientific name)' and a 'Search' button. The 'Search by Location' section has a dropdown menu for 'Location' and a 'Search' button.

Search by:

- Quick Search
- Keyword
- Species
- Location

Photo Library: Invertebrates

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ROCKY SHORES
KELP FORESTS
BEACHES
CONTINENTAL SHELF
SANDY FLOOR
ESTUARIES
SEAMOUNTS & BANKS
SUBMARINE CANYONS
ROCKS & ISLANDS
DEEP SEA
OPEN OCEAN
GEOLOGY
OCEANOGRAPHY
WATER QUALITY
FISHES
SEABIRDS & SHOREBIRDS
MARINE MAMMALS

SPECIAL TOPICS
- Select a topic -

SEARCH
Enter search here

HOME MONTEREY BAY GULF OF THE FARALLONES CORDELL BANK

NATIONAL MARINE SANCTUARIES

Home: Photo Library: Search results

PHOTO LIBRARY: SEARCH RESULTS

Search results appear below. Up to twenty images will be displayed per page. Hyperlinked page numbers, 'Next', and 'Previous' allow navigation through all results.

Search Results for "Invertebrates": 948 images [\[Back to Search \]](#)

Page 1 of 48 [1](#) [2](#) [3](#) [4](#) [5](#) [6](#) [7](#) [8](#) [9](#) [10](#) [11](#) [12](#) [13](#) [14](#) [15](#) [16](#) [17](#) [18](#) [19](#) [20](#)
[21](#) [22](#) [23](#) [24](#) [25](#) [26](#) [27](#) [28](#) [29](#) [30](#) [31](#) [32](#) [33](#) [34](#) [35](#) [36](#) [37](#)
[38](#) [39](#) [40](#) [41](#) [42](#) [43](#) [44](#) [45](#) [46](#) [47](#) [48](#) [Next>>](#)

	Photographer Josh Pederson	Location Soberanes Point
	Species Sponge (unidentified)	
	Caption Unidentified sponge species at Soberanes Point at approximately 45 feet depth. Christmas tree worms (<i>Spirobranchus spinosus</i>) with plumes out are also present.	

	Photographer Josh Pederson	Location Soberanes Point
	Species Lobed compound tunicate (<i>Cystodites lobatus</i>)	
	Caption Unidentified tunicate resembling <i>Cystodites lobata</i> at Soberanes Point at approximately 45 feet depth.	

	Photographer Josh Pederson	Location Soberanes Point
	Species Fluted bryozoan (<i>Hippodiplosia insculpta</i>)	
	Caption Fluted bryozoan <i>Hippodiplosia insculpta</i> at Soberanes Point at approximately 45 feet depth.	

	Photographer Josh Pederson	Location Soberanes Point
	Species	

Photo Information



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HOME MONTEREY BAY GULF OF THE FARALLONES CORDELL BANK

NATIONAL MARINE SANCTUARIES

Home Photo library Search results: Photo information

PHOTO LIBRARY: PHOTO INFORMATION

[\[Back to List \]](#) [\[Back to Search \]](#)

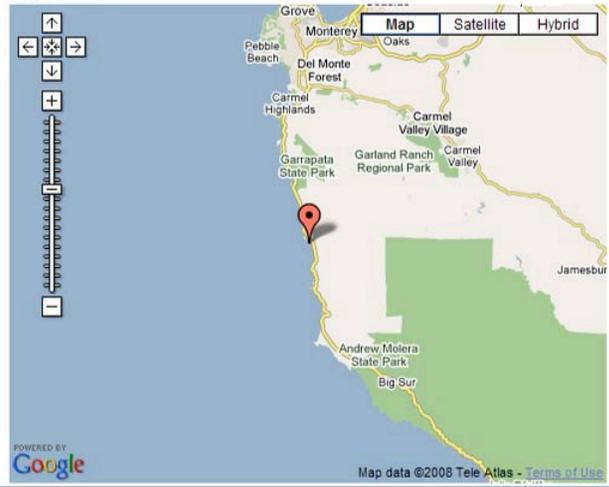
File name	Date taken	Location	Site
SIL_082306_1529.jpg	2006-08-23	Big Sur	Palo Colorado Canyon
Latitude	Longitude	Species:	
36.397978	-121.9094	Giant-spined star (<i>Pisaster giganteus</i>) Sea lemon (<i>Anisodoris nobilis</i>)	
Photographer	Photo credit		
Steve Lonhart	Steve Lonhart / SIMoN NOAA		
Photographer's comments	--		
Caption	The noble doris <i>Peltodoris nobilis</i> next to the giant-spined star <i>Pisaster giganteus</i> .		



[\[Download full size image \]](#)
(879 KB | 1200 x 800 pixels)

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Photo Location Map



Map data ©2008 Tele Atlas - [Terms of Use](#)

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U.S. Department of Commerce | NOAA Library

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Special Topics: Species Database

The screenshot displays the SIMoN (Sanctuary Integrated Monitoring Network) website. The header includes the SIMoN logo and navigation tabs for HOME, MONTEREY BAY, GULF OF THE FARALLONES, and CORDELL BANK. A vertical menu on the left lists various marine habitats and species categories. The 'SPECIAL TOPICS' section is expanded to show the 'Species Database' option. The main content area features a map of Northern California National Marine Sanctuaries, highlighting Cordell Bank, the Gulf of the Farallones, and Monterey Bay. Below the map, there is a section titled 'Northern California National Marine Sanctuaries' with a small image and text encouraging users to explore habitats and organisms. To the right, a 'WHAT'S NEW' section lists recent updates, including a new website release and a symposium on climate change impacts. A 'Photo Library' section offers access to over 2,800 images. The footer contains logos for NOAA and the U.S. Department of Commerce, along with contact information and a last modified date of March 05, 2008.

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INTEGRATED
MONITORING
NETWORK

HOME MONTEREY BAY GULF OF THE FARALLONES CORDELL BANK

NATIONAL MARINE SANCTUARIES

ROCKY SHORES
KELP FORESTS
BEACHES
CONTINENTAL SHELF
SANDY FLOOR
ESTUARIES
SEAMOUNTS & BANKS
SUBMARINE CANYONS
ROCKS & ISLANDS
DEEP SEA
OPEN OCEAN
GEOLOGY
OCEANOGRAPHY
WATER QUALITY
FISHES
SEABIRDS & SHOREBIRDS
MARINE MAMMALS

SPECIAL TOPICS
- Select a topic -
--Regional Information--
About SIMoN
Photo Library
Species Database
Interactive Maps
Weather and Tides
Search SIMoN
Ocean Observatories
Bibliography
Glossary
Network Partners
R/V Fulmar

Cordell Bank
Gulf of the Farallones
Monterey Bay

Northern California National Marine Sanctuaries

Move your mouse over the Sanctuary outlines and click to learn about their monitoring of habitats and organisms.

WHAT'S NEW

- New SIMoN website released! To begin your visit choose a topic on the left side of the page or click a sanctuary on the map.
- Federal marine protected areas in the Monterey Bay Sanctuary. [\[More info\]](#)
- Monterey Bay National Marine Sanctuary Currents Symposium April 5, 2008 to focus on the impacts of climate change. [\[More info\]](#)

Photo Library

Search over 2,800 images in the [SIMoN photo library](#).

National Marine Sanctuaries | National Ocean Service | National Oceanic and Atmospheric Administration
U.S. Department of Commerce | NOAA Library

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URL: <http://sanctuaries.simon.org>

Special Topics: Species Database



SIMoN
SANCTUARY
INTEGRATED
MONITORING
NETWORK

HOME MONTEREY BAY GULF OF THE FARALLONES CORDELL BANK

NATIONAL MARINE SANCTUARIES

ROCKY SHORES
KELP FORESTS
BEACHES
CONTINENTAL SHELF
SANDY FLOOR
ESTUARIES
SEAMOUNTS & BANKS
SUBMARINE CANYONS
ROCKS & ISLANDS
DEEP SEA
OPEN OCEAN
GEOLOGY
OCEANOGRAPHY
WATER QUALITY
FISHES
SEABIRDS & SHOREBIRDS
MARINE MAMMALS

SPECIAL TOPICS
- Select a topic -

SEARCH
Enter search here

[Home: Species database](#)

SPECIES DATABASE



The SIMoN species database contains natural history information on a subset of the more commonly seen plants and animals that live in or seasonally travel through the sanctuaries along the coast of California. In addition to the distribution and habitat use of these species, facts on seasonal use, feeding behavior, reproduction, and conservation issues are also provided. Use the search options below to find species of interest. Initially your search results will be viewed as species summaries, but full descriptions are also available. For more information, including on how to efficiently search for species, see the [FAQ's](#) below.

Search

Search by Common Name (e.g., rockfish, Humpback, Brandt's)

Search by Species Group

-- Species Group --

Browse Index

Done

Special Topics: Species Database

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INTEGRATED
MONITORING
NETWORK

ROCKY SHORES
KELP FORESTS
BEACHES
CONTINENTAL SHELF
SANDY FLOOR
ESTUARIES
SEAMOUNTS & BANKS
SUBMARINE CANYONS
ROCKS & ISLANDS
DEEP SEA
OPEN OCEAN
GEOLOGY
OCEANOGRAPHY
WATER QUALITY
FISHES
SEABIRDS & SHOREBIRDS
MARINE MAMMALS

SPECIAL TOPICS

- Select a topic -

SEARCH

Enter search here

NATIONAL MARINE SANCTUARIES

Home: [Species database](#): [Search results](#): [Species information](#)

SPECIES DATABASE: SPECIES INFORMATION

PISASTER GIGANTEUS

[\[Back to List \]](#) [\[Back to Search \]](#)

Geographic range:

--

Key features:

--

Similar species:

--

Habitat(s):

exposed rocky shore, exposed sandy beaches, protected rocky shore, protected sandy beaches

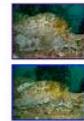


More Information

[Full Description](#)

[Seasonal Behavior](#)

[References](#)



[\[See more photos \]](#)

[National Marine Sanctuaries](#) | [National Ocean Service](#) | [National Oceanic and Atmospheric Administration](#)
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SANCTUARY
INTEGRATED
MONITORING
NETWORK

[HOME](#)

[MONTEREY BAY](#)

[GULF OF THE FARALLONES](#)

[CORDELL BANK](#)

NATIONAL MARINE SANCTUARIES

Home: [Species database](#): [Search results](#): [Species information](#): [Full description](#)

SPECIES DATABASE: FULL DESCRIPTION

[\[Back to Species \]](#) [\[Seasonal Behavior \]](#) [\[References \]](#)

PISASTER GIGANTEUS

Primary common name:

--

ITIS code:

157256

Synonymous name(s):

--

General grouping:

Sea stars, urchins, cucumbers, sand dollars, brittle stars

Geographic Range

Range description:

Pisaster giganteus can be found from Vancouver Island, British Columbia to Isla Cedros, Baja California.

Northern latitude extent:

--

Southern latitude extent:

--

East longitude extent:

--

West longitude extent:

--

Intertidal Height

Lowest intertidal height:

0 meters OR 0 feet

Highest intertidal height:

90 meters OR 299.7 feet

Intertidal height notes:

Pisaster giganteus occupies the entire intertidal.

Subtidal Depth Range

Minimum depth:

0 meters OR 0 feet

Maximum depth:

90 meters OR 299.7 feet

Subtidal depth notes:

Pisaster giganteus lives subtidally down to 90 m.

Habitats

Special Topics: Glossary



SIMoN
SANCTUARY
INTEGRATED
MONITORING
NETWORK

HOME MONTEREY BAY GULF OF THE FARALLONES CORDELL BANK

NATIONAL MARINE SANCTUARIES

ROCKY SHORES
KELP FORESTS
BEACHES
CONTINENTAL SHELF
SANDY FLOOR
ESTUARIES
SEAMOUNTS & BANKS
SUBMARINE CANYONS
ROCKS & ISLANDS
DEEP SEA
OPEN OCEAN
GEOLOGY
OCEANOGRAPHY
WATER QUALITY
FISHES
SEABIRDS & SHOREBIRDS
MARINE MAMMALS

SPECIAL TOPICS
- Select a topic -
- Select a topic -
--Regional Information--
About SIMoN
Photo Library
Species Database
Interactive Maps
Weather and Tides
Species of Concern
Search SIMoN
Ocean Observatories
Bibliography
Glossary
Network Partners
R/V Fulmar

[Home](#) | [Glossary](#)

GLOSSARY



The glossary below provides descriptions of common terms found on the SIMoN website. These terms are arranged in alphabetical order and grouped according to their first letter. Special thanks to the **Monterey Bay Aquarium** for sharing this information with SIMoN.

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

abdomen: the belly region of a vertebrate animal, or the hind segment of the body of an insect, crustacean or other arthropod.

abyss: a very deep region.

abyssal plain: the flattened floor of the deep ocean offshore from the continental margin.

abyssal zone: the deep sea region below 13,000 feet (4,000 meters).

adaptation: a characteristic body part, shape or behavior that helps a plant or animal survive in its environment.

aerobic: containing oxygen or requiring oxygen.

albatross: a large seabird that spends much of its life wandering over the open ocean far from land.

algae: a large group of primitive plants that live mostly in water. Kelp and other seaweeds are algae. Algae have simple bodies--many kinds exist as single cells.

algin: a slippery substance extracted from brown algae, including kelp. Algin is used in paint, toothpaste, ice cream and many other products because it thickens liquids and binds oily and watery liquids together.

amphipods: small, shrimp-like crustaceans.

anaerobic: not containing oxygen or not requiring oxygen.

anchovies: small silvery fishes that swim in big schools. Anchovies are eaten by tuna, salmon, penguins, and many other predators.

anemone: a sea animal with a crown of stinging tentacles at the top of a fleshy stalk. Often

Provide Feedback



Map of Submarine Canyons
This map shows the various submarine canyons in the Monterey Bay National Marine Sanctuary.
[\[Open in new browser window\]](#)

Map of Partington Canyon
The Partington Canyon extends from the Big Sur coast. This map shows the contour of the ocean bottom near the canyon.
[\[Open in new browser window\]](#)

Profiles showing comparison of Monterey Canyon and Grand Canyon
From "Submarine Canyons" by Shepard and Dill (1966).
[\[Open in new browser window\]](#)

[\[Top of page \]](#)

[National Marine Sanctuaries](#) | [National Ocean Service](#) | [National Oceanic and Atmospheric Administration](#)
U.S. Department of Commerce | [www.noaa.gov](#) | [www.library.noaa.gov](#)

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SEND COMMENTS



Help to improve the SIMoN website!
By evaluating the SIMoN website and sharing your comments in the form below, you help to shape the SIMoN website. Your feedback is critical for improving the organization, content, and informational products of SIMoN.
Your participation is very appreciated.

Name: (optional) Email address: (optional)

What is your main interest in the SIMoN Website?:
 Monitoring Information
 Education Material
 SIMoN Program Information
 Sanctuary Habitats
 Interactive Mapping
 Other

Rate your overall satisfaction with the SIMoN website:
 5 (High)
 4
 3
 2
 1 (Low)

Rate your satisfaction with the content the SIMoN Website?:
 5 (High)
 4
 3
 2
 1 (Low)

Rate your satisfaction with the navigation of the SIMoN website:
 5 (High)
 4
 3
 2
 1 (Low)

General comments:

Future Directions



SIMoN Regional Website
<http://www.sanctuarysimon.org>

