

Cordell Bank, Gulf of the Farallones, and Monterey Bay National Marine Sanctuaries

Research Vessel *Fulmar* Summary of 2008 Accomplishments

- Support area: 7,103+ square miles
- Missions completed: 61
- Percent of mission days completed: 90
- Days at sea: 174
- Education and outreach participants: 445
- Scientists supported: 349
- Number of SCUBA dives: 463
- Combined SCUBA diver bottom time: 380 hours



NOAA's R/V *Fulmar*. Photo credit: Jim Capwell

The Research Vessel *Fulmar* provides regional support for three national marine sanctuaries on the central California coast as a platform for research, resource protection, education, and outreach missions. In 2008, the R/V *Fulmar* completed missions as far north of Cordell Bank National Marine Sanctuary CBNMS as Point Arena, west to the Gulf of the Farallones National Marine Sanctuary GFNMS, and throughout the Monterey Bay National Marine Sanctuary MBNMS as far south as Morro Bay. The impressive range of her second year of operations included 33 different projects located over a distance of more than 275 nm of coastal waters.

RESEARCH: Highlights Aboard R/V *Fulmar*

Field work in the central California sanctuaries relies heavily upon partnerships with a variety of research institutions and monitoring networks. The R/V *Fulmar* has proven to be an excellent platform for external partners that are conducting research within sanctuaries. The majority of days at sea aboard the R/V *Fulmar* are dedicated to research. Highlights from partner-led projects in 2008 include:

- The Partnership for Interdisciplinary Studies of Coastal Oceans PISCO, including divers from MBNMS, conducted 222 dives to survey kelp forest ecosystems.



PISCO divers Alex Macleod, Christine Donahue, and Dave Rivera with Plaskett Rock and R/V *Fulmar* in the background. View from middle downcoast survey site. Photo credit: Steve Lonhart, SIMoN/MBNMS.

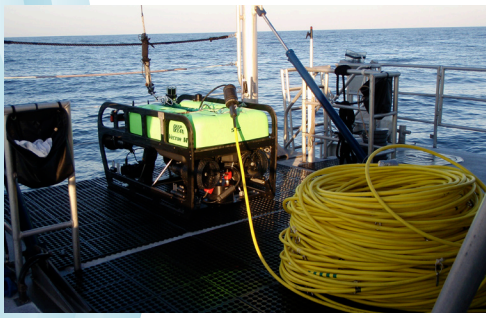


Gopher rockfish *Sebastes carnatus* in Point Lobos State Marine Reserve. Photo credit: Steve Lonhart, SIMoN/MBNMS.



NATIONAL MARINE
SANCTUARIES





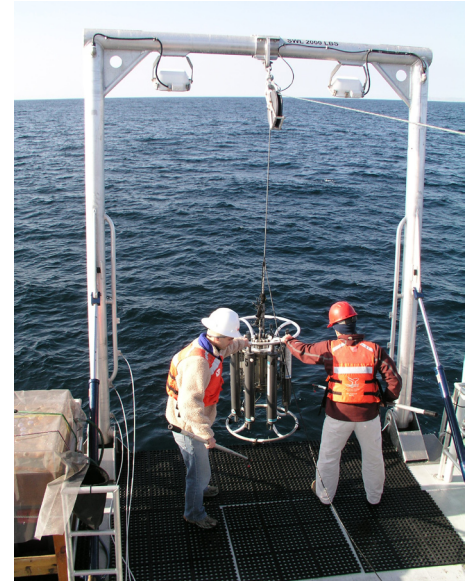
MARE's Vector 4 ROV was used for prospecting survey locations for the trawl impact study. Photo credit: Jean de Marignac, MBNMS.

- A multi-year study on groundfish trawling impacts to soft sediment communities in partnership with the Nature Conservancy, California State University, Monterey Bay CSUMB, and Marine Applied Research and Exploration MARE. This collaboration provides a unique opportunity to systematically study different levels of trawl intensity just south of the Monterey Bay National Marine Sanctuary.

- The Romberg Tiburon Center for Environmental Studies sampled nutrients that support the Gulf of the Farallones food web and designed their sampling protocols to integrate with marine bird and mammal surveys conducted by GFNMS staff.

- The US Geological Survey used a large towed camera sled to groundtruth seafloor maps in GFNMS as part of the phase II California Coastal and Marine Mapping Initiative from Pt. Reyes to Pt. Arena. The sanctuary program is a recognized partner in this large scale mapping endeavor.

- The Seafloor Mapping Lab at CSUMB was the first to utilize a sanctuary vessel for high resolution multibeam sonar using the R/V *Fulmar's* hull mounting pad. Ultra high resolution bathymetry mapping is a critical need for California's State Water Mapping Initiative as part of the Marine Life Protection Act, and the initial tests aboard the R/V *Fulmar* are promising that vessel capabilities meet the precision mapping requirements.



Scientists from the Romberg Tiburon Center use a CTD to collect oceanographic samples. Photo credit: Dave Minard, MBNMS.

National Marine Sanctuary site staff led a productive research field season. In addition to actively participating in partner projects, site staff led 6 of the 14 research missions. Data and periodic reports from all research projects conducted on the R/V *Fulmar* are posted annually on the Sanctuary Integrated Monitoring Network SIMoN Web site. Research highlights from each site include:



Dale Roberts, Dan Howard, Lisa Etherington, and Michael Carver of CBNMS are joined by First Mate Hans Bruning in displaying marine debris recovered with a ROV. Photo credit: Jennifer Renzullo, GFNMS.

Cordell Bank National Marine Sanctuary:

- ❖ Testing methods of removing derelict fishing gear on Cordell Bank
 - Final report submitted to NOAA Marine Debris Program.
 - Draft of policies and procedures document produced for removing derelict fishing gear from deep water habitats.
 - Outreach expedition page produced <http://sanctuaries.noaa.gov/missions2008cordellbank/>

- ❖ Cordell Bank Ocean Monitoring Program CBOMP : marine bird and mammal surveys and oceanographic sampling in the productive area surrounding Cordell Bank.
- Data analysis for 2008 will be available on SIMoN, with additional publications to follow.
- ❖ Cordell Bank National Marine Sanctuary Buoy Maintenance
- Buoy data is integrated with West Coast Observations data, and the National Data Buoy Center.

Monterey Bay National Marine Sanctuary:

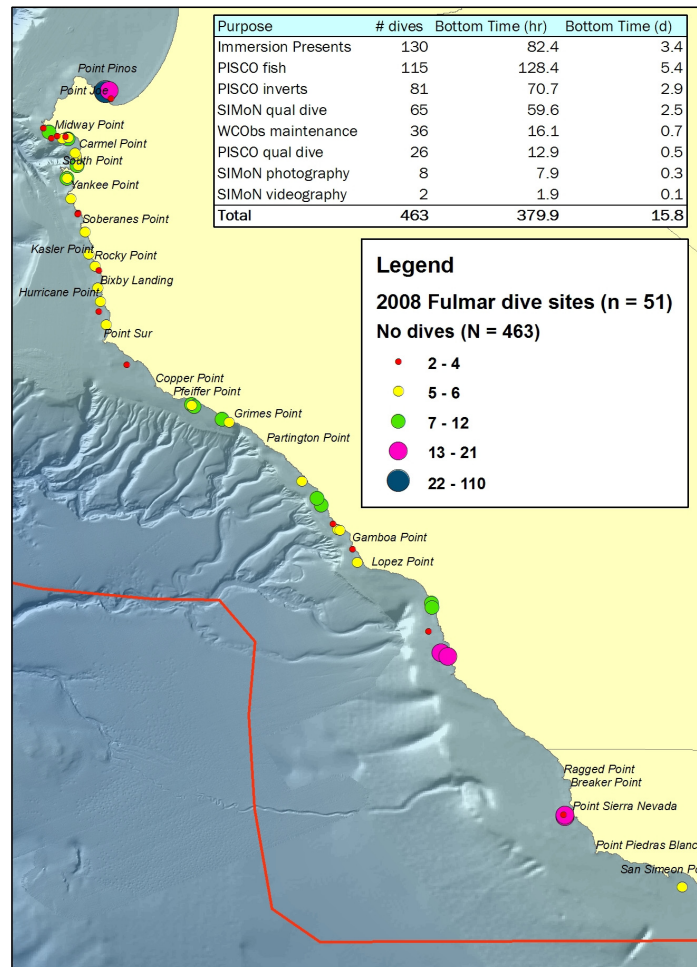
- ❖ Big Sur Nearshore Characterization
- 75 dives completed, including qualitative, photo, and video surveys of Big Sur kelp habitats. Images and long term monitoring data posted on the SIMoN Web site.

- ❖ West Coast Obs: continuously logging oceanographic data
- Temperature data from 11 oceanographic buoys maintained along the Big Sur coast are now publically accessible through NOAA's National Coastal Data Development Center NCDDC .
- SeaKeepers sensors aboard the R/V *Fulmar* collect an array of oceanographic data that are transmitted hourly during operations to NCDDC's live access server. The public can access the data and use the interactive Google map as a way to track the hourly location of the R/V *Fulmar* at http://www.ncddc.noaa.gov/website/google_maps/PaCOOS/mapsPaCOOS.htm

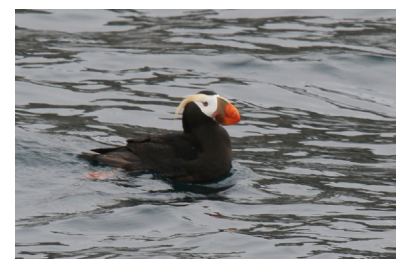
- ❖ Continental Shelf Characterization: gathering videographic survey data in the MBNMS
- Camera sled groundtruthing of seafloor maps within and adjacent to Marine Protected Areas MPAs and reconnaissance and characterization of unmapped areas to provide information for potential federal MPAs in the future.
- Sanctuary Characterization and Image Display SCID : Interactive map displaying camera sled video clips, images, and survey coverage in the MBNMS study areas. The map product is hosted and maintained by CSUMB's Institute for Applied Marine Ecology, providing a critical partnership for data collection and analysis, at <http://sep.csUMB.edu/iame/s/index.html>.

Gulf of the Farallones National Marine Sanctuary:

- ❖ SEAS: Sanctuary Ecosystem Assessment Surveys
- SEAS Pelagic Habitat surveys are designed for long term monitoring of the Gulf of the Farallones, Cordell Bank and Bodega Bay regions and includes the nearshore and offshore habitats from Sonoma to Santa Cruz Counties.



Map depicting all SCUBA dive locations aboard R/V *Fulmar*. Table inset breaks down dives by project. Data and figure: Chad King, SIMoN/MBNMS.



Tufted Puffin; breeding adult. Photo credit: Dave Minard, MBNMS.



GFNMS staff and vessel crew observing marine mammals on North Farallon Island. Photo credit: Jason Thompson

- Fifteen long term monitoring transects were established between Point Reyes and Año Nuevo. Three CalCOFI stations were integrated into the SEAS PH program to sample water column features and krill.
- GFNMS staff completed QA/QC review of SEAS-PH data sets from the past two years of data collection aboard R/V *Fulmar* in preparation of a biannual report. The technical report includes the region's nearshore and offshore habitats and marine zones, and analyses for seabirds, marine mammals, vessel activities, frontal zones, marine debris, sea turtles, target jellyfish species, and harmful algal blooms.
- The seabird and vessel activities portions of the new SEAS PH data set are included in a report for NMFS that aims to assess the need for mitigation of seabird-fisheries interactions within the U.S. West Coast groundfish fleet.

EDUCATION AND OUTREACH: Highlights Aboard R/V *Fulmar*

❖ Immersion Presents, a non-profit organization that produces ocean exploration programming for kids, aired daily telecasts on the Internet from the deck of the R/V *Fulmar*. The week long education series was led by Office of National Marine Sanctuaries and hosted by MBNMS Staff. The telepresence event was broadcast across the nation live to Boys and Girls Clubs and a variety of host sites. Mission logs, interviews with scientists, and video footage from the expedition is at: <http://www.immersionpresents.org>.

❖ Teachers and students participated in a variety of education programs at the three sanctuaries, including Teacher At Sea, B WET, MERITO, and GFNMS Teacher Institute. Cordell Bank's education workshop, Animals in Curriculum Based Ecosystem Studies ACES, instructed teachers on data collection for bird and mammal observations and oceanographic sampling.



Sacha Lozano and Sonya Padron during the MERITO broadcast in Spanish for Immersion Presents. Photo credit: Steve Lonhart, SIMoN/MBNMS.

RESOURCE PROTECTION

In 2008, more opportunities became available for resource protection missions. Small and mid-sized ROV's were field trialed from the R/V *Fulmar*, using Motorized Personal Water Craft moorings as inspection targets, which demonstrated the important role ROV's can play in a

A VALUABLE REGIONAL ASSET

The R/V *Fulmar* was successfully operated and managed by the three central California sanctuaries for 264 mission, maintenance, and training days approaching large NOAA ship operations. An important component to this management was the completion of the first full year of utilizing the Vessel Project Manager for project proposals, cruise plans, and post cruise reports. In addition, the dedicated vessel crew were instrumental to the operating schedule, and R/V *Fulmar* Captain David Minard was recognized by the Office of National Marine Sanctuaries as Staff Person of the Year.



Cross sanctuary safety training. Photo credit: Steve Lonhart, SIMoN/MBNMS.