

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

Research Vessel *Fulmar* Summary of 2007 Accomplishments

- Support area: 7,103 square miles
- Missions completed: 61
- Days at sea: 142
- Education and outreach participants: 364
- Scientists supported: 323
- Number of SCUBA dives: 297
- Combined SCUBA diver bottom time: 221 hours



NOAA's R/V *Fulmar*. Photo credit: Paul Chetirkin, MBNMS.

The Research Vessel *Fulmar* has the unique opportunity to support three national marine sanctuaries on the central California coast as a platform for research, resource protection, education, and outreach missions. In 2007, the R/V *Fulmar* regularly completed missions from Bodega Bay to Cordell Bank National Marine Sanctuary in the north, west to the Farallon Islands and surrounding waters of the Gulf of the Farallones National Marine Sanctuary, and throughout the Monterey Bay National Marine Sanctuary as far south as Morro Bay. The extensive range of her first year of operations covered 35 different projects spread over a distance of more than 250 nm of coastal waters.

RESEARCH: Highlights Aboard R/V *Fulmar*

A variety of research institutions were awarded sea time aboard the R/V *Fulmar* through a formal proposal process. Research projects led by external partners both maintained important long-term studies that had been previously conducted from other NOAA vessels, and forged new partnerships and projects.

The Romberg Tiburon Center conducted multiple water sampling and oceanographic measurements throughout the year to identify the nutrient sources that support the Gulf of the Farallones food web. The US Geological Survey used sub-bottom profiling equipment and a towed camera sled to groundtruth the seafloor as part of the California Coastal and Marine Mapping Initiative from Ano Nuevo to Pt. Reyes.

In addition, Moss Landing Marine Labs held an oiled wildlife response course from the R/V *Fulmar* that required multiple night operations for training in capture, handling, and assessment of free-ranging sea birds.



Romberg Tiburon Center scientists collecting water samples to study nutrient sources outside of San Francisco Bay. Photo credit: David Bell, Romberg Tiburon Center.



NATIONAL MARINE
SANCTUARIES



Long-term monitoring studies conducted aboard the R/V *Fulmar* included: Southwest Fisheries Science Center research on juvenile and adult rockfish populations, the Wind to Whales program, which collects oceanographic data in conjunction with marine bird and mammal observations, and the Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO) annual dive surveys in kelp forest ecosystems with new sites in 2007 for baseline data collection in central California coast Marine Protected Areas.



PISCO divers returning to topside support after surveying shallow water rocky reef communities. Photo credit: Chad King, MBNMS.

National Marine Sanctuary site staff led nine of the 16 research missions. Data collected and analyzed by internal research projects have, in some cases, been immediately valuable to management decisions in the sanctuaries. The products from the following research missions are a testament to the success of the first year of R/V *Fulmar* operations:

Monterey Bay National Marine Sanctuary:

- ❖ Nearshore Subtidal Characterization of Big Sur (SCUBA surveys)
 - Underwater geo-referenced video and images posted on the Sanctuary Integrated Monitoring Network (SIMoN) website.
- ❖ West Coast Obs: Maintenance of 11 oceanographic buoys that collect temperature data as part of a larger network of PISCO moorings.
 - West Coast Obs data will become available to NOAA's public access National Coastal Data Development Center (NCDDC) in 2008.
 - SeaKeepers sensors aboard the R/V *Fulmar* collect an array of oceanographic data during every mission. The data will be available in an interactive map and NCDDC's live access server.
- ❖ Towed camera sled operations include three studies that use this tool:
 - Trawling Impacts: recovery rate of a recently closed trawling area versus control sites.
 - Marine Life Protection Act: gathering baseline data for potential federal Marine Protected Areas (MPAs).
 - Continental Shelf Characterization: groundtruthing multibeam and habitat maps throughout the MBNMS at 30-300 meters depth.



Continental Shelf Characterization Team annotates benthic habitat observations from a towed camera sled in the dry lab. Photo credit: James Lindholm, California State University, Monterey Bay.

Multiple products are being developed from these towed camera sled studies including capstone projects at California State University, Monterey Bay, technical reports, and interactive websites. Data and video images are also being provided to the MBNMS federal MPA working group.

Cordell Bank National Marine Sanctuary:

- ❖ Cordell Bank Ocean Monitoring Program (CBOMP): marine bird and mammal surveys and oceanographic sampling in the productive area surrounding the bank.
 - Data analysis for 2007 will be available on SIMoN, with additional publications to follow.
- ❖ Soft Bottom Benthic Community Characterization: exploring areas surrounding Cordell Bank via a towed camera sled
 - Written report with habitat characterization data produced.
- ❖ Cordell Bank National Marine Sanctuary Buoy Maintenance
 - Buoy data is integrated with West Coast Obs data, and the National Data Buoy Center.



Lisa Etherington deploys a CTD as part of a CBOMP survey. Photo credit: Michael Carver, CBNMS.

Gulf of the Farallones National Marine Sanctuary:

- ❖ SEAS: Sanctuary Ecosystem Assessment Surveys
 - 2007 data will build on previous surveys providing important baseline data for assessing damage from the M/V *Cosco Busan* oil spill.

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

- ❖ Volunteer appreciation and recognition for work accomplished in the sanctuaries: BeachCOMBERS, TeamOCEAN, Bay Net, LiMPETS, and Water Quality programs participated.

- ❖ CNN International interviewed Dr. Sylvia Earle amid humpback whales for a series on explorers that aired in the Fall of 2007.
- ❖ The West Coast Regional Office introduced congressional staffers to GFNMS and MBNMS over a two-day cruise that highlighted sites on the water as well as NOAA facilities shore-side.
- ❖ Teachers and students were introduced to the three sanctuaries through several programs such as: Teacher At Sea, B-WET, MERITO, and GFNMS Teacher Institute.



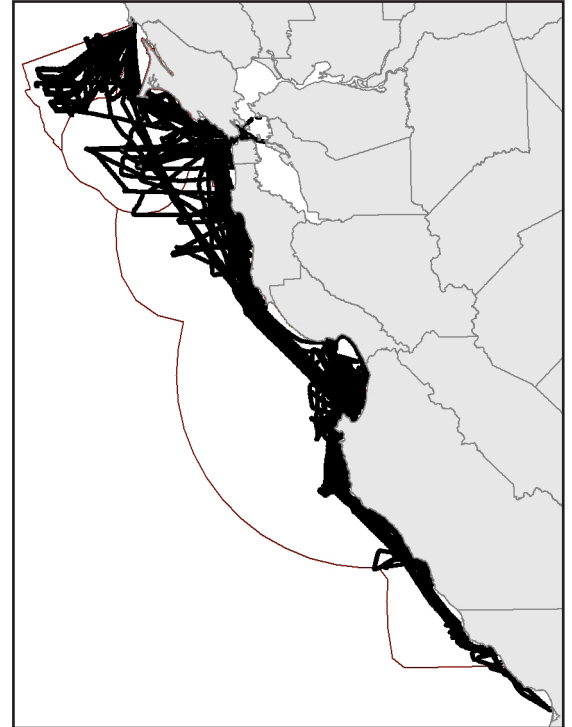
Richard Quest interviews Dr. Sylvia Earle on the R/V *Fulmar* flying bridge. Photo credit: Chad King, MBNMS.

RESOURCE PROTECTION

Central California sanctuaries face a variety of resource protection challenges from oil spill preparedness to engaging stakeholders to participate in management decisions. The R/V *Fulmar* proved to be an excellent platform for viewing seabirds and marine mammals in 2007, bringing together stakeholders involved in the MLPA planning process. In addition, future joint management plan changes to Motorized Personal Water Craft (MPWC) drew public attention to the permitted MPWC areas. Maintenance and replacement of moorings that mark these areas is a Resource Protection Team priority.

A VALUABLE PLATFORM

The 2007 field season aboard the R/V *Fulmar* often exceeded vessel capability expectations. The number of external research proposals submitted for days at sea in 2008 is more than double the previous year. In addition to the successful missions conducted by researchers and educators, the *Fulmar* Regional Operations Team and Management Team reached their own milestones in coordinating complex schedules and operations between three national marine sanctuaries and the surrounding scientific community.



2007 R/V *Fulmar* cumulative mission coverage, Bodega Head to Morro Bay.



Staff aptly celebrate the 15th Anniversary of MBNMS aboard the R/V *Fulmar*. Photo credit: Steve Lonhart, MBNMS.



A humpback whale made use of the R/V *Fulmar* as a scratching post for almost an hour to the delight of the MBNMS staff aboard. Photo credit: Andrew White, MBNMS