

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

Research Vessel *Fulmar* Summary of 2010 Accomplishments

- Support area: 7,963+ square miles
- Missions completed: 39
- Percent of mission days completed: 91
- Days at sea: 127
- Education and outreach participants: 342
- Scientists supported: 208
- Number of SCUBA dives: 459
- Combined SCUBA diver bottom time: 358 hours



NOAA's R/V *Fulmar* in Stillwater Cove. Divers conducted surveys during the US Open Golf Tournament at Pebble Beach. Photo credit: Chad King, MBNMS/SIMoN.

NOAA's Office of National Marine Sanctuaries operates a fleet of small boats to support mission critical programs in sanctuaries. The Research Vessel *Fulmar* has provided over four years of regional support for three central California national marine sanctuaries as a platform for research, resource protection, education, and outreach missions. In 2010, the R/V *Fulmar* maintained her rigorous schedule of previous years to conduct 27 different projects in Cordell Bank, Gulf of the Farallones, and Monterey Bay national marine sanctuaries.

RESEARCH: Highlights Aboard R/V *Fulmar*

The majority of operational days at sea aboard the *Fulmar* are dedicated to conducting research (73%). Each of the central California sanctuaries maintain site specific research projects that contribute to long term monitoring data sets to meet management plan needs. Research design, methods, and results are reported on the Sanctuary Integrated Monitoring Network SIMoN Web site at www.sanctuariesimon.org. Research highlights in 2010 from these sanctuaries include:

Cordell Bank National Marine Sanctuary:

❖ Cordell Bank Reef Crest

Cordell Bank National Marine Sanctuary CBNMS tested the feasibility of using technical divers for accomplishing hands on tasks at depths of 115 200 feet over Cordell Bank. Collaborators included: ONMS technical divers and staff, University of California-Davis Bodega

Marine Lab, CA Academy of Sciences, Cordell Expeditions, University of North Carolina Wilmington, and NOAA's Cooperative Institute for Ocean Exploration, Research and Technology CIOERT. A team of six technical divers and four safety support divers worked in the following conditions:

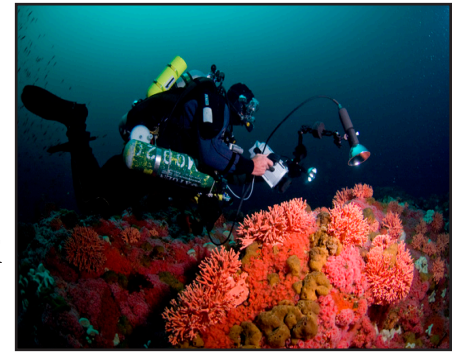
- Depths of the dive sites ranged from 123 193 feet
- Bottom currents were estimated at 0.5 to 1.5 knots
- Visibility: 30 to > 100 feet at the different dive sites
- Total dives > 100 feet: 22; 21 hours bottom time

Technical SCUBA divers exploring Cordell Bank were overwhelmed by the abundance of juvenile rockfish on the upper pinnacles of the Bank. Photo credit: Joe Hoyt for CBNMS.



To address research questions, the Reef Crest divers:

- Used high definition cameras to collect video and still images of the reef crest invertebrate and fish communities to better understand abundance and distribution patterns.
- Collected specimens to be identified and archived in the Cordell Bank collections at the California Academy of Sciences CAS .
- Dived on locations of the Bank that had not been previously surveyed and revisited some of the Cordell Expedition's locations surveyed in the 1970's and 1980's.



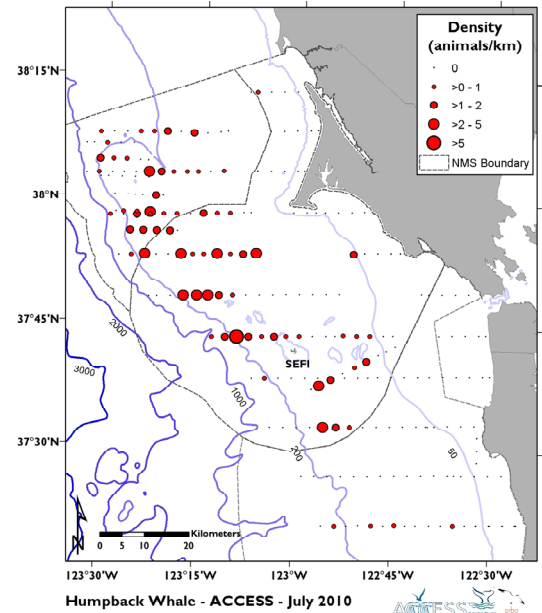
Reef Crest tech divers collected coral samples for analysis. Photo credit: Joe Hoyt for CBNMS.

The expedition details can be viewed at:
<http://sanctuaries.noaa.gov/missions/2010reefcrest/welcome.html>

Gulf of the Farallones National Marine Sanctuary:

❖ Applied California Current Ecosystem Studies ACCESS

The CBNMS research team integrated their long term collaborative regional monitoring program with Point Reyes Bird Observatory PRBO and Gulf of the Farallones National Marine Sanctuary's GFNMS Sanctuary Ecosystem Assessment Surveys SEAS to standardize monitoring protocols for these historical central California surveys. This project continues to collect integrative information on oceanographic conditions, zooplankton community structure, and seabird and marine mammal distribution and abundance. Missions were led by GFNMS and CBNMS researchers and PRBO with the support of a team of volunteers. NOAA Administrator, Dr. Lubchenco, participated on an ACCESS day trip that included a tour of research being conducted on Southeast Farallon Island SEFI .



The abundance of krill attracted many humpback whales to the region, as recorded over the course of the 10-day July 2010 ACCESS cruise.



Tucker trawl cod end filled with krill. Photo credit: Shannon Lyday, CBNMS/PRBO.



Dr. Jane Lubchenco transits out to SEFI, crossing under the Golden Gate Bridge, to participate in an ACCESS survey from R/V *Fulmar's* observer chairs. Photo credit: Jason Thompson, Mojoscoast/GFNMS.

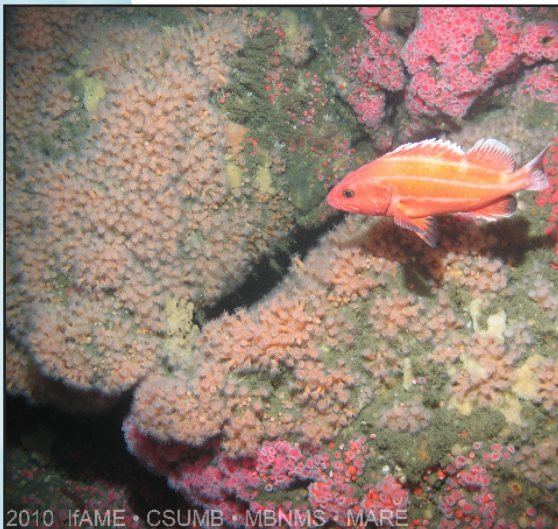
Monterey Bay National Marine Sanctuary:

❖ Deep Water Characterization of Areas of Interest for Special Marine Protected Areas MPA's

A collaborative effort with California State University Monterey Bay's Institute for Applied Marine Ecology to characterize habitats, fishes, and invertebrates on the continental shelf. An ROV operated by Marine Applied Research & Engineering MARE and Deep Ocean Engineering (DOE) was used to survey areas at Church Rock, La Cruz Canyon, and Carmel Bay. The project also used a towed camera sled from R/V *Fulmar* to document the continental shelf at Point Sur, collecting more than 25 hours of video in Monterey Bay National Marine Sanctuary MBNMS .

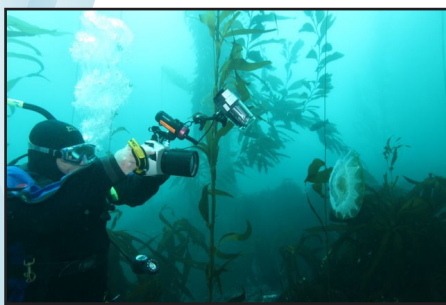
❖ MPA Monitoring and Shelf Characterization in MBNMS

Video transects were conducted with a towed camera sled for the fifth season aboard the R/V *Fulmar*. Point Sur study sites from 2007 and 2008 were revisited, completing 4 transects inside the Pt Sur MPA and 5 outside. The characterization efforts support site selection for potential federal marine protected areas while also contributing to the baseline data collection for the newly designated State Marine Reserves and Conservation Areas. Seafloor habitats, macro-invertebrates, and fishes were live annotated along the continental shelf at 50 – 250 meters depth.



MARE's *Beagle* ROV obtained high resolution digital images in deep water areas of interest within MBNMS. Yelloweye rockfish. Photo credit: CSUMB/MARE/MBNMS

consisting of 24 different species. This information is used to support fisheries management and to evaluate MPA efficacy at Carmel Pinnacles State Marine Reserve, which was implemented in September 2007.



Dr. Steve Lonhart captures images and video during a BSNC dive. Photo credit: Chad King, MBNMS/SIMoN

❖ Big Sur Nearshore Characterization BSNC SIMoN staff successfully surveyed 4 sites in September from the R/V *Fulmar*, accomplishing 22 dives totaling 1,204 minutes total bottom time. Poor weather conditions cancelled April and May surveys. Spectacular video footage was recorded of the arch at Square Black Rock. This monitoring project builds upon surveys conducted from 2003 – 2005 as part of the Coast Highway Management Plan .

❖ California Department of Fish and Game CDFG Mark and Recapture MPA study MBNMS and CDFG divers completed a total of 38 survey dives over the course of four dive days to characterize the diversity and abundance of rockfish, as well as locate previously tagged fish. Time spent on fish surveys was 31.5 hours resulting in 759 fish recorded,

❖ Partnership for Interdisciplinary Studies of Coastal Oceans PISCO Central California Subtidal MPA Monitoring Over the past six years, MBNMS has partnered with University of California, Santa Cruz PISCO and CDFG to implement and monitor the MPA network in central CA. NOAA actions to aid the state are part of the support system that multiple resource agencies, both state and Federal, provide to ensure the network is effectively implemented and adaptively managed. SIMoN staff and research divers from UC Santa Cruz's PISCO program sampled long term monitoring sites along the Big Sur coastline completing 308 dives, totaling over 15,028 minutes spent underwater without incident aboard R/V *Fulmar* in 2010.

❖ **Archaeological Diver Reconnaissance Expedition**

The first archaeological diver reconnaissance expedition within MBNMS was led in the fall of 2010 by ONMS, in partnership with the National Park Service and Coastal Maritime Archaeology Resources group. Shipwreck sites in the San Simeon and Monterey areas were surveyed and photographed using non invasive techniques, including high resolution digital still and video imagery. A site description noting major artifact distribution will be completed in 2011. <http://montereybay.noaa.gov/maritime/field.html>.

RESOURCE PROTECTION: Highlights Aboard R/V Fulmar

Sanctuary staff and NOAA law enforcement officers are tasked with protecting the resources within the sanctuaries. Some highlights include:

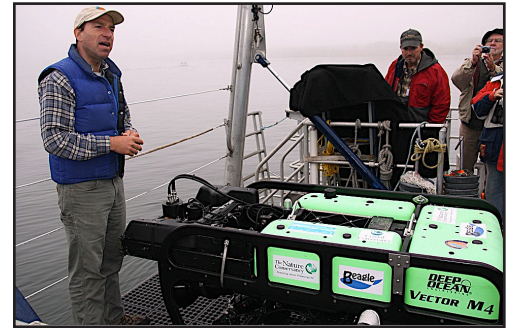
❖ **Benthic Trawl Impact and Seafloor Habitat Recovery**

The R/V *Fulmar* provided the platform to compare distributions in benthic microhabitats across a gradient of trawling effort in the second year of the project. Video and still images were successfully collected with the *Beagle* ROV operated by MARE and staffed by the Nature Conservancy, MBNMS and CSUMB for three transects in each of the eight experimental blocks in Estero Bay.

❖ **Seabird Protection Network**

The NOAA Office of Law Enforcement and GFNMS

co hosted a collaborative enforcement orientation from the deck of the *Fulmar* covering all regulations that apply in Sanctuary waters, such as MPAs, the white shark protection zone, and four Special Closure zones. Participants included federal, state, and local enforcement personnel from NOAA, Department of Interior, USCG and CDFG. Also, the attorneys who prosecute marine resources cases: NOAA General Counsel, Department of Justice, and local District Attorneys.



MARE's Dirk Rosen explains Trawl Impact methods to Coastal Discovery Center docents. Photo credit: Brittany Cooper, MBNMS volunteer

EDUCATION AND OUTREACH: Highlights Aboard R/V Fulmar

A variety of media outlets brought the R/V *Fulmar* into homes across the country, and around the world. An excellent platform for education missions, the central California sites tied teaching, internships, and even a variety of ocean film festival activities to the research and wildlife experiences found aboard the *Fulmar* in 2010.



❖ **Sanctuary in the Sea**

After months of winter planning, rescheduling, and adapting to available filming platforms, Bob Talbot Productions gained access to white shark territory at the Farallon Islands aboard the *Fulmar* to capture amazing footage for the film "Sanctuary in the Sea". The film went on to win Best Environmental Film at the 2011 San Francisco Ocean Film Festival, featuring legendary Farallon Islands' urchin diver, Ron Elliott.

"Not often we do we encounter a film that speaks so deeply to our hearts through a magic combination of stunning imagery of our ocean and innovative cinematic techniques, blended with the deeply personal perceptions of someone whose life has been bound to it in exhilaration, in contemplation, and in hope. This film does." -SF Ocean Film Festival

Upper Left: Male elephant seal. Lower Left: Bob Talbot and Paul Chetirkin filming elephant seals on SEFI. Photo credits: Chad King, MBNMS/SIMoN

❖ **Discovery Channel's Daily Planet Features MPA Monitoring in MBNMS**

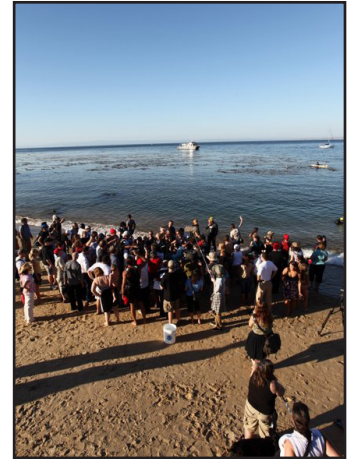
On December 14, Discovery Channel's 'Daily Planet' TV show featured a very popular segment on SCUBA diving efforts to monitor kelp forests in state-designated marine protected areas within MBNMS. SIMoN staff, the crew of the R/V *Fulmar*, and the UC Santa Cruz science divers assisted the production crew to capture several hours of footage. The excellent underwater footage was filmed by Chad King using video equipment rented by the Discovery Channel. <http://watch.discoverychannel.ca/#clip389874>



Dr. Steve Lonhart talks about kelp forest surveys to Discovery Channel. Photo credit: Chad King, MBNMS/SIMoN

❖ **US Open Media Campaign**

In preparation for the US Open Golf Championship, MBNMS and National Marine Sanctuary Foundation staff hosted a "Media Day" aboard the R/V *Fulmar*. Journalists with ESPN interviewed staff, shot video footage of Pebble Beach Golf Course from the water, and were provided Sanctuary messaging used in the US Open broadcast. Over 400 individual media outlets covered this sporting event with world wide broadcasts, providing an unprecedented outreach opportunity for MBNMS which is the backdrop of this famous golf course.



Bruckner immediately took interviews about conserving special places upon his beach arrival; *Fulmar* in background. Photo credit: Chad King, MBNMS/SIMoN

BLUE Ocean Film Festival, Monterey, CA

❖ **Marathon Swimmer Bruckner Chase Completed 25 Mile Swim across Monterey Bay**

Bruckner persevered for 14 hours through stinging jellies to raise awareness for MBNMS and the BLUE Ocean Film Festival. He is the second person to accomplish this amazing feat. Dan Basta and Bill Douros joined the swim for the last mile, and all were congratulated by a large crowd gathered at San Carlos Beach. The R/V *Fulmar* escorted Chase providing secondary support to the operation.

❖ **NOAA Adopt a Drifter Buoy Launched from R/V *Fulmar***

MBNMS coordinated 70 students from two area high schools who participated in a dockside education program at the Monterey Harbor as part of the BLUE Ocean Film Festival. After the program, 10 students, two teachers, staff from the Monterey Herald newspaper and MBNMS headed 10 miles offshore to deploy a buoy that's being tracked by NOAA's Climate Program Office. NOAA Adopt a Drifter Program: <http://www.adp.noaa.gov>.



Andrew DeVogelaere assists Bill Douros in demonstrating how to don an immersion suit with captain Dave Minard. Photo credit: Steve Lonhart, MBNMS/SIMoN. Below: Captain Dave Minard. Photo credit: Chad King, MBNMS/SIMoN

AN ICONIC REGIONAL ASSET

The R/V *Fulmar* was successfully operated and managed by the three central California sanctuaries for 211 mission, maintenance, and training days. This platform was vital to maintaining important long-term monitoring projects with partners in addition to forging alliances to meet the needs of new partners and new outreach opportunities for the sanctuaries.

