Office of National Marine Sanctuaries
National Oceanic and Atmospheric Administration

GREATER FARALLONES NATIONAL MARINE SANCTUARY

SUPERINTENDENT'S QUARTERLY REPORT

JANUARY THROUGH MARCH, 2017

GFNMS: UNESCO's Man and the Biosphere Reserve

The United Nations Educational, Scientific and Cultural Organization (UNESCO)'s Man and the Biosphere Programme (MAB) aims to establish a scientific basis for the improvement of relationships between people and their environments. Greater Farallones National Marine Sanctuary has been part of the Golden Gate Biosphere Reserve (GGBR), established in 1988. GGBR extends from the Bodega Research Reserve south to Jasper Ridge, and is unique in that it spans marine, coastal, and upland resources adjacent to a major metropolitan area, and thus provides easy access to outdoor education and recreation for the inhabitants of the San Francisco Bay metropolitan area. The area supports many recreational activities such as sport fisheries, hiking, bicycling and whale watching.

In March 2017, the U.S. Department of State proposed that 14 of the US Biosphere Reserves (BRs) were eligible for readmission into the UNESCO Man and the Biosphere Programme. International Advisory Committee recommendations must be reviewed and endorsed by the MAB International Coordinating Council in June 2017.

MAB combines the natural and social sciences, economics and education to improve human livelihoods and the equitable sharing of benefits, and to safeguard natural and managed ecosystems, thus promoting innovative approaches to economic development that are socially and culturally appropriate, and environmentally sustainable. The Biosphere Reserve program highlights the value of protected areas as hubs for sustainable development. It also offers an opportunity to be part of a global community working on issues of protected areas and sustainable economic development and receive international recognition.

MAB UNESCO
Man and the Biosphere Programme
Programme sur l'homme et la biosphère

MANAGEMENT

Sanctuary Advisory Council

Advisory Council holds quarterly meeting Greater Farallones National Marine Sanctuary's Advisory Council held its quarterly meeting at the Dance Palace in Point Reyes Station on February 1, 2017. The meeting drew a large public audience for the presentation and recommendations of the low overflights working group. The group was formed to review locations and dimensions of regulated low overflight zones in the sanctuary, and was comprised of local pilots and marine scientists along with sanctuary staff acting as technical advisors. The recommendations went to the sanctuary superintendent for consideration. The advisory council also elected new executive committee officers, two of whom were re-elected and will serve for the 2017-2019 term.

The sanctuary advisory council acts as an advising body to the sanctuary superintendent, and working groups relating to sanctuary issues provide recommendations for management strategies.

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CONSERVATION SCIENCE /RESEARCH

Monitoring To Understand Long-Term Trends

Coastal Monitoring – Beach Watch

Farallones scientists contribute data on massive seabird die-off for scientific publication Conservation Science staff participated in a study and co-authored a paper submitted to the journal *Science*, on the large-scale mortality of Cassin's Auklets in 2014 and 2015. The mortality event was highly correlated with sudden shifts in zooplankton prey and loss of cold water foraging habitat due to the presence of usually warm water, referred to as the "Warm Water Blob" (blob). The blob likely forced dispersing post-breeders into an atypically narrow band of cold upwelled water near the coast, where they eventually starved. The study shows that up to 11% of the world's adult population of Cassin's Auklets (270,000-530,000) died along the West Coast of North America.

The GFNMS Beach Watch project is one of three beached bird monitoring programs that participated in the collection and analysis of this mortality event. Beach Watch is an integrated sentinel site monitoring project, providing information and data on wildlife, pollution, and socio-economic issues.

Coastal Monitoring, Marine Debris

Farallones, TerraCycle team up to close the loop on marine debris thanks to a recent partnership with TerraCycle, Greater Farallones National Marine Sanctuary is now able to recycle the rigid beach plastic and cigarette butts collected during marine debris surveys. Since July 2012, Greater Farallones National Marine Sanctuary, in partnership with NOAA's Marine Debris Program and the Office of Response and Restoration, has participated in the Marine Debris Monitoring and Assessment Project. The program engages citizen scientists to use NOAA protocols for executing monthly surveys at six beach locations. Surveys provide baseline data on the type, abundance, and distribution of debris on sanctuary shores while also protecting habitat through debris clean-up efforts. In addition to data collected during surveys, the removal and recycling of beach plastic closes the loop on marine debris by diverting hard-to-recycle items from landfills and turning worn and toxic plastics into reusable pellets for new products. The partnership reduces the use of virgin plastics in product manufacture, and helps keep our seas debris-free.

Photo: Tony Wills, Wikimedia Commons

Sanctuary Ecosystem Assessment Surveys (SEAS, ACCESS, etc.)

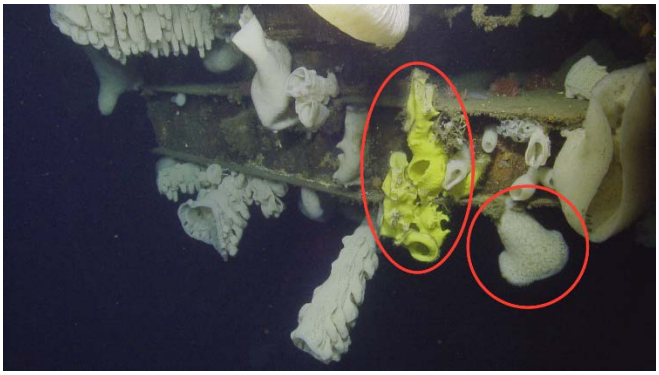
Research to prevent whale entanglement

Farallones Conservation Science staff from Applied Ecosystem California Current Surveys (ACCESS) assisted staff from Monterey Bay sanctuary to design and execute ACCESS research cruises throughout the Monterey Bay area and Santa Cruz County coast. Over the past two years, there have been increased sightings of entangled humpback, blue and gray whales in commercial and recreational crab pot gear. Sanctuary staff are working with National Marine Fisheries Service, The Nature Conservancy, and the California Dungeness Crab Fishing Gear Working Group to collect data, model the co-occurrence of large whales and crab pots, and identify baleen whale "hot spots." This is an effort to decrease the risk of entanglement of large whales in central California. ACCESS is a collaborative effort of Cordell Bank and Greater Farallones sanctuaries and Point Blue Conservation Science for ongoing data collection to understand status and trends of sanctuary resources, ecosystem health, and response to climate change.

Other Research Cruises

New sponge species to be described for science

Conservation Science staff are working with the California Academy of Sciences in San Francisco and the Royal British Columbia Museum (RBCM) in Victoria to complete the taxonomy describing two new species of sponges (a yellow Picasso sponge, *Staurocalyptus* n. sp., and a white vase sponge, *Hyalascus* n. sp.). The sponges were discovered during a survey aboard the E/V *Nautilus* in 2016, living on the shipwreck USS *Independence.* A third species of sponge, *Farrea aculeata* (Schulze), also found on the USS *Independence,* was previously only known to occur north of California. Dr. Henry Reiswig from RBCM is currently performing the measurements and imaging to describe the two new sponge species, and report the range extension and update the taxonomy of *Farrea aculeata,* since it was described only once, in 1899.



New species: yellow Picasso sponge, Staurocalyptus n. Sp.; white lattice vase sponge, Hyalascus n. sp. (c) Ocean Exploration Trust-NOAA

As a sentinel site the sanctuary recognizes the importance of biodiversity, exploration and sharing data to improve information flow and interpret science findings for management agencies.

RESOURCE PROTECTION

Protecting Habitats

Farallones sanctuary, state agency kick off joint sediment management working group

The first meeting of the Sonoma/Marin Coastal Sediment Management Working Group was held March 9th, 2017 in Point Reyes Station. The working group was formed in response to a partnership between the Greater Farallones National Marine Sanctuary and the California Coastal Sediment Management Workgroup and is comprised of representatives from all levels of government agencies and community interest groups such as conservation and fishing. The goal of the working group is to develop sediment management recommendations for specific, prioritized locations experiencing sediment issues along the Sonoma and Marin County coastline and determine governance structure for select projects. At this meeting, the group reviewed the project scope and existing data, and provided feedback to develop criteria to select priority locations for sediment management actions.

Russian River mouth, Sonoma County Credit: NOAA

Protecting Breeding Seabird Colonies

Human "high fliers" help protect seabirds

The Sanctuary's Seabird Protection Network (Network) has successfully partnered with Half Moon Bay Airport, in Half Moon Bay, CA, to educate pilots about the threat of low overflights and wildlife disturbance to seabird populations along the California coast. Recently network staff collaborated with the airport manager to notify hundreds of pilots about the importance of maintaining at least 1,000 feet elevation over a Common Murre colony located near the airport. The mailing was sent prior to Dream Machines, the airport's annual fly-in event in April, which attracts hundreds of pilots every year.

Half Moon Bay Airport is located next to a colony of more than a thousand Common Murres. This colony is of special conservation concern because it is recovering from complete extirpation in the 1980's. Today, the colony is prone to impact from low overflights by aircraft approaching and exiting the airport. Educating pilots about this colony ahead of the airport's annual fly-in maximizes the likelihood that pilots will take proactive measures to avoid it, furthering the colony's recovery potential.

Minimizing Risk from Oil Spills and Vessels

Sanctuary review new spill response technology

Conservation Science staff participated in a biennial workshop on new technologies for oil spill detection, response and assess impacts from oil spills. The workshop was hosted and coordinated by the state's Office of Spill Prevention and Response. Approximately 150 people attended the four-day workshop from numerous federal and state marine resource protection agencies, academic institutions and commercial organizations. The workshop emphasized new technologies in communicating resources at risk, data sharing platforms, geo referencing and visualization of response and damage assessment data, shoreline oiling assessment and clean up endpoints, wildlife reconnaissance and recovery, and digitizing and automating field data more effectively.

GFNMS has experts on staff, with decades of skills in oil spill response, damage assessment and impacts of oil on wildlife and are leaders in recuperating restoration costs for sanctuary wildlife and habitats. Attending these types of workshops contributes to our continued training and sharing our expertise.

Developing Solutions to Respond to Climate Change

Conducting international climate workshops

The Climate Program Coordinator at Greater Farallones National Marine Sanctuary, in partnership with EcoAdapt and the Commission for Environmental Cooperation (CEC), created a Rapid Vulnerability Assessment (RVA) tool and piloted this tool at two climate vulnerability assessment workshops for marine protected area (MPA) managers in December 2016. In Victoria, British Columbia, 18 MPA managers, representing Parks Canada, Fisheries and Oceans Canada, and Olympic Coast National Marine Sanctuary and National Park in Washington convened December 1 to 2. In Ventura, California, 29 MPA managers, representing the Mexican government, El Vizcaino Biosphere Reserve and Isla Guadalupe in Mexico, and Channel Islands National Marine Sanctuary and National Park in California, convened December 7-8. The RVA tool will be refined from workshop participant input and results will be presented to CEC staff in February 2017, with application to other MPAs in North America soon to follow. This tool will enable MPA managers across North America to better understand climate impacts to their resources and increase their capacity to respond with minimal financial burden.

Farallones climate program participates in coastal resilience workshop

On Thursday, January 20, the Federal Emergency Management Agency (FEMA) Region IX and NOAA's Office for Coastal Management, along with other state and county partners, held a Coastal Resilience Workshop for San Mateo County. The Climate Program Coordinator for Greater Farallones National Marine Sanctuary briefly presented the Sanctuary's climate work and participated in a "resource market" to showcase climate adaptation planning resources that may be useful for city and county planners. San Mateo County has played an integral role in shaping some of the adaptation recommendations as part of the Sanctuary's Climate Action Plan, and continued engagement with city and county planners will be critical to the success of this plan.

Greater Farallones climate work highlighted at national estuaries conference

The significant work of the Greater Farallones Sanctuary Climate Program, and the critical role played by its Sanctuary Advisory Council, were presented to attendees of the 8th National Summit on Coastal and Estuarine Restoration: “Our Coasts, Our Future, Our Choice,” December 15, 2016 in New Orleans, Louisiana. From the development of Climate Vulnerability Assessments to beginning implementation of adaptation responses, attendees learned from multiple agencies regarding successful examples of climate adaptation planning. The Sanctuary presented in a session with Point Blue Conservation Science, Stanford’s Center for Ocean Solutions, University of Southern California Sea Grant, and the NOAA Sentinel Site Program. Participation in national conferences enables widespread dissemination of lessons learned and successful methodology for implementing climate adaptation in marine protected areas.

Addressing climate change vulnerabilities along North America’s Pacific coast

In March the Marine Protected Area (MPA) Center, Channel Islands National Marine Sanctuary, Channel Islands National Park, Greater Farallones National Marine Sanctuary, and Olympic Coast National Marine Sanctuary participated in a workshop of North American MPA programs and their partners to share lessons on assessing vulnerabilities to climate change impacts. The workshop participants discussed the results of a study on whale watching within Pacific Coast MPAs in the three countries, including potential social and economic vulnerabilities to climate impacts. The workshop is part of a project by the Commission for Environmental Cooperation (CEC) on MPA vulnerability assessments to begin to address climate impacts in North American MPAs. Participants also discussed the need for potential future collaboration through the CEC and the North American MPA Network, and identified collaboration opportunities.

MPAs on the West Coast of North America are strongly linked by the California Current, and share similar conservation challenges. This CEC project provides an opportunity to develop climate change planning capacity in the three countries, and provides a foundation for future trilateral collaboration to conserve shared species and habitats. It is an important step to understand how climate change may impact the economic dependency of coastal communities and tourism.

EDUCATION

Increasing Awareness of the Sanctuary

San Francisco International Ocean Film Festival draws nearly 3,900 participants

From March 9 through 12, 2017 the 14th Annual San Francisco International Ocean Film Festival (SFIOFF), co-founded by the Farallones sanctuary and sponsored in part by NOAA and the National Marine Sanctuary Foundation, was a standout success, drawing 3,865 participants. The main festival featured independent films and four panel discussions, bringing together 3,280 members of the public, scientists, educators and ocean communicators. An additional 585 students attended the free student film festival. The Farallones sanctuary, through the SFIOFF Screening Committee, helps determine program content. Farallones staff participated in panel discussions, engaged in Q&As on films relating to ONMS, and

conducted onsite outreach. Dr. Sylvia Earle spoke on marine protected areas – “Hope Spots” – and women in research. Cordell Bank also sponsored a Student Film Competition. Featured films covered ocean exploration, sports, science, climate change issues, and sustainability.

Film is an excellent public outreach medium for teaching about ocean issues and the steps we can take to address them. Powerful visuals help “make science matter” by deepening the public’s appreciation of the ocean, and conveying the relevance of scientific investigations to our everyday lives.

Dr. Sylvia Earle with researchers Drs. Sal Jorgenson and Barbara Block. Credit: Matthew Tominaga/SFIOFF

Exhibits

The Farallones sanctuary is currently contributing exhibit and signage content and interpretive materials for a major renovation of the Randall Museum in San Francisco. The exhibits are focused on nearshore environments and wildlife, explore the interface between the land, rivers and sea, and encourage visitation and on-site learning. The content includes ecosystem dynamics and relationships – how various creatures and elements of different habitats interact and affect each other as integrated systems.

The sanctuary has regularly partnered with aquariums, visitor centers and museums. These include the Exploratorium, the California Academy of Sciences, National Park Service, and others to exchange information, incorporate the ocean into their messaging, and generate synergy among their programs. This, combined with several scientific collaborations, gives each facility an expanded outreach capability and enhanced, integrated messaging.

Events - Public Programs

Outsider Outreach

Sanctuary Educator Speaks at Stanford Sustainability Seminar

On February 2 twenty Stanford University upper division undergraduates majoring in diverse fields such as Engineering, Earth Systems, Political Science, and Human Biology spoke with a Greater Farallones sanctuary educator about the role of education in sustainability, as part of the "Pathways in Sustainability Careers" seminar. The seminar series connects Stanford students with a different guest speaker each week to engage in an hour-long open dialogue about the broad subject of sustainability. Discussion topics included the importance of community engagement for the financial sustainability of education projects as well as how students with an interest in sustainability can better prepare for their professional future.

Science, Technology, Engineering, and Math (STEM) students in higher education benefit from access to a diversity of practitioners that work in the many sectors of the workforce. As undergraduates with an interest in sustainability approach graduation, students are seeking professional contacts and insights into career pathways.

Architecture students tour tide station, learn about sea level rise measurement

In January, Farallones communications staff gave a tour to twelve architectural students and instructors from the San Francisco Art Institute, of the Golden Gate Tide Station located on Greater Farallones National Marine Sanctuary campus. The students are participating in a course relating architectural planning to climate change impacts. San Francisco, surrounded on three sides by water, faces tthe challenges of the Earth’s rising sea levels. These art and architecture students learned about the ecological systems that underlie the San Francisco Bay Area as a case study for understanding how

cities worldwide can plan for the future. The students visited several sites along San Francisco's coastline, and learned of regional efforts to adapt to the effects of climate change.

Understanding the changes on urban landscapes related to ocean climate change has become an integral part of city and community planning, to ensure resiliency to climate impacts such as increases in severe weather occurrences and sea level rise, and to understand how these changes can also impact wildlife near population centers.

Tales of shipwrecks enthrall yacht club members

On February 15, a full-house gathering of 70+ Sausalito Yacht Club members sat enthralled as they listened to dramatic accounts of a number of shipwrecks in the Farallones marine sanctuary, outside San Francisco's Golden Gate. Farallones communications staff presented archival, ROV and sonar images from the Maritime Heritage Program, focused on the vessels *Ituna*, the *Selja*, and the USS *Conestoga.* The *Conestoga's* accidental discovery during 2014-2015 expedition cruises solved a 95-year-old mystery. The tug had disappeared between San Francisco and Hawaii, but had sunk just off San Francisco near the Farallon Islands.

The sanctuary's mandate to protect cultural resources is sometimes overlooked in favor of its work in ecosystem conservation, but maritime heritage topics attract a different constituency, and provide a broader definition of the "resource protection" mandate for national marine sanctuaries.

Sanctuary Explorations Series

The Sanctuary Exploration Series provides monthly opportunities for the public to connect with and experience our national marine sanctuaries. Building a strong public sanctuary constituency as well as inspiring ocean literacy, conservation ethics and wildlife etiquette through experiential learning are the goals for the series.

In the path of the great gray whale migration

On January 14, Greater Farallones National Marine Sanctuary education staff partnered with the Oceanic Society to provide an opportunity to experience the gray whale migration. With GFNMS and Oceanic Society naturalists, forty-two participants in the Sanctuary Explorations program observed gray whales on their southward migration just outside the Pillar Point Harbor. They encountered seabirds, including Common Murres, several gull species, and Brown Pelicans, and watched sea lions sun themselves on the harbor buoys, between foraging bouts. Participants learned about the natural history of gray whales, their nearshore distribution, and the conservation efforts that helped to protect and recover this once-endangered species. A naturalist discussed proper whale- and other wildlife-watching "etiquette."

Into the lair of the giant elephant seal with the Farallones national marine sanctuary

In February, Greater Farallones National Marine Sanctuary education staff partnered with a California State Parks interpretive guide to lead a walk through the Natural Preserve at Año Nuevo State Park, into one of the largest mainland breeding colonies of northern elephant seals in the world. Every year up to 10,000 elephant seals, some reaching 5,000 lbs., come here to breed, give birth, and molt. Twelve Sanctuary Explorations participants ventured into the rookery and watched males battle for prime beach real estate and the right to mate. Nearby, females birthed and suckled their newborn pups. The group learned about the fascinating natural history, behavior and ecology of the once nearly extinct northern elephant seals, while observing them first hand during this fun, exciting and dynamic walk.

Snoozing elephant seal. Credit NOAA.

Sanctuary group explores wild Redwood Coast
In March, 16 Sanctuary Explorations participants explored the breathtaking beauty of the wild north coast at Point Arena-Stornetta Public Lands with Farallones sanctuary naturalists and wildlife experts. They were joined by local experts who offered unique insights about the Point Arena-Stornetta Public Lands area. Local whale researchers spoke about their ongoing studies. The group sighted a pair of singing Pigeon Guillemots starting to nest, as well as many gray whales traveling slowly as they rounded the historic Point Arena Lighthouse. Participants learned how and why these lands and waters are federally protected, about the fascinating geology of the area, and the natural history about many local species. They also learned about the Farallones Beach Watch citizen science program that monitors these shores. The group enjoyed a rare sighting of bottlenose dolphins as the program ended!

Explorers experience Sonoma/Mendocino county coast. Photo: Sara Heintzelman

Assemblies & Other School Programs

Galileo partnership serves diverse student body
This quarter, the sanctuary education team partnered with Galileo High School to provide 119 high school students with a suite of programs. Sanctuary educators led four Fisherman in the Classroom programs. Four Visitor Center field trips focused on plankton studies and two whale watching trips, to serve a total of 119 high school students.

In March, Farallones sanctuary educators, as part of a “mini” Maker Faire, led an underwater robotics activity station at the Francis Scott Key Elementary School. Part science fair and part county fair, the Maker Faire, co-sponsored by electronics industry giants Intel and Avnet, is an all-ages gathering of “tech” enthusiasts, crafters, educators, tinkerers, hobbyists, engineers, science clubs, authors, artists, students, and commercial exhibitors. The Maker Faire features innovation and experimentation across the spectrum of science, engineering, art, performance and craft.

Eighty San Francisco elementary students and their families tried their hand at designing and building Remotely Operated Vehicles (ROVs) during the event using ROV kits and PVC pipes and joints. The event celebrates learning through tinkering, engineering, and creating while providing activities that are integrated into Next Generation Science Standards.

Family Workshops

Farallones Sanctuary Family Workshops give budding marine scientists an opportunity to share their enthusiasm and increase their ocean literacy at the sanctuary visitor center and pier classroom. These workshops have a regular following and provide new participants recruited from school programs an exciting hands-on opportunity to stay connected to sanctuary education programs throughout the year. Three hundred forty-five people participated in Family Workshops this quarter.

Visitor Center

The Farallones sanctuary Visitor Center serves ocean enthusiasts of all ages, from the San Francisco Bay Area and all over the world. School programs include plankton netting for view under the microscope, searching for shore crabs and activities in the Visitor Center to learn about animal adaptations. Students take part in indoor as well as outdoor activities on Crissy Field Beach in the Golden Gate National Recreation Area. Total Visitor Center attendance for this quarter numbered 3,905.

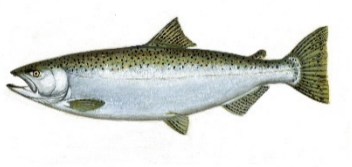
Farallones Visitor Center Field Trip programs promote ocean literacy and provide standards-based interactive programs inside the center and in the field for kindergarten through high school. Visitor Center field trips served 701 students this quarter.

Oceans After School: Using the endless appeal of our local marine wildlife and habitats, the sanctuary education team offers 16 hours of fun, hands-on, lively marine science programs for after-school programs on topics such as sharks, salmon, seabirds, whales, squid, and plankton. These enrichment programs are dynamic, interactive, and integrated into state standards. Our marine science educators deliver the programs during an eight-week window and primarily serve low-income, under-served students. One hundred seventy-one students completed the program this quarter.

At-Your-School (AYS) Programs

The At Your School (AYS) programs served schools throughout the San Francisco Bay area, primarily during the school term. The AYS program has reached tens of thousands of Bay Area students with programs such as the Crab Cab, Seabird Shuttle, Sharkmobile and Ocean Acidification. AYS is an outreach program of Greater Farallones National Marine Sanctuary designed to promote environmental literacy and increase students' awareness and knowledge of coastal and marine life. It includes standards-based interactive classroom programs for kindergarten through twelfth grade.

During the quarter, AYS staff traveled throughout the Bay Area to bring ocean education to schools in Alameda, Contra Costa, San Mateo, Marin, Santa Clara and San Francisco counties. In total, the programs served 1,294 students and teachers this quarter.



Fisherman in the Classroom

From January 1 to March 31, 2017 Greater Farallones National Marine Sanctuary education staff teamed up with local fishermen to deliver 24 Fisherman In The Classroom programs to 614 grade school students at 13 schools in San Francisco and Berkeley. The teaching team brought in fishing-related props like a salmon specimen, an industrial crab trap, fishing lures and hooks, and delivered a presentation on fishing in Central California. Students played a giant dice game similar to chutes and ladders, based on the salmon life cycle, which points up survival challenges, desirable habitat characteristics, predator/prey relationships, and adaptations.

Students learned about the challenges, economics and rewards of fishing for salmon and Dungeness crab in sanctuary waters, as well as the relationship between the fisherman and sanctuary conservation policies. The Fisherman in The Classroom Program increases students' ocean literacy and expands their knowledge of commercial fishing in national marine sanctuaries. The program also strengthens ties with the Northern California fishing community and introduces the concept of sustainable fishing and fisheries management to students.

Crab fishers. Credit: NOAA Sea Grant

Educator Training/Professional Development

Deep-sea science inspires teacher use of NOAA materials

As part of the National Marine Sanctuaries Webinar Series, 136 formal and informal educators registered for the *Deep-Sea in the Classroom: Exploring Coral Communities of the West Coast National Marine Sanctuaries* presentation provided by Greater Farallones Association staff. Participants took a journey hundreds of feet beneath the surface of the ocean and learned how to use remotely operated vehicles (ROV) footage to utilize real scientific methods to explore deep-sea coral communities. This webinar series is a way to connect with educators and provide them with educational and scientific expertise, as well as resources and training to support ocean and climate literacy with their students. Seventy percent of attendees plan to integrate these materials into their educational settings. Ninety percent agreed that the content of the webinar made them understand that national marine sanctuaries help protect the ocean and Great Lakes and 97% are likely to attend a future presentation in the National Marine Sanctuaries Webinar Series. An archive of the webinar is available, and a listing of upcoming webinars can be found at:
http://sanctuaries.noaa.gov/education/teachers/deep-coral-communities/deep-sea-intro.pdf

LiMPETS – Long-term Monitoring Program & Experiential Training for Students

The Long-term Monitoring Program and Experiential Training for Students – LiMPETS – is a statewide national marine sanctuary program that trains teachers and students to become involved in real scientific investigations and become ocean stewards. Teacher workshops expand teacher knowledge and ultimately increase the number of student citizen scientists doing science along our shores. It also introduces new teachers from a diversity of communities to the national marine sanctuary program. In all this quarter, 446 students and teachers took part in LiMPETS programs.

AGU group learns of sanctuary student science

In December 2016, LiMPETS students presented their research at the American Geophysical Union Conference in San Francisco, attended by around 24,000 scientists. High school students from the Branson School displayed a poster using LiMPETS rocky intertidal data, while Careers in Science interns from the California Academy of Sciences explained the relationship of body size and the prevalence of parasites in Pacific mole crabs.

By presenting at this scientific conference, LiMPETS students are empowered by their experience, and gain scientific communication skills in a real-world setting.

Research Symposium spotlights youth science

Farallones LiMPETS (Long-term Monitoring Program and Experiential Training for Students) staff presented coastal ecological data trends at the Beyond the Golden Gate Research Symposium in December 2016, co-hosted by GFNMS. Through an oral presentation, attendees learned about the LiMPETS youth-based citizen science program and its long-term population trends of sea stars, mussels, and sea lettuces at monitoring sites along the North-central California coast. In a poster presentation, LiMPETS' 15 years of sandy beach monitoring data revealed a correlation between El Niño events and recruitment of sand crabs at Ocean Beach in San Francisco.

MEDIA & COMMUNICATIONS

CBS Evening News features shipwreck, deep-sea corals exploration, new deep ocean technology

CBS Evening News ran a story on how emerging technology has changed the nature of deep-water explorations. Featuring an interview with Farallones science staff the program focused on the deep-sea explorations aboard various NOAA and other vessels such as the E/V *Nautilus* in 2016. Staff outlined how new tools have revolutionized deep-water investigations, and improved the quality and quantity of data that is used for conservation, management and policy applications. They discussed the recent series of missions to explore deep sea corals and

shipwrecks: which technology was used, the findings, and how these will impact future research efforts. The story aired during annual Sweeps Week.

Media's outreach ranges far beyond sites' more localized education and outreach capabilities. News stories have proven to be an effective, illustrative, and often moving ways to increase broad public awareness of ocean issues, such as impacts from human activities on wildlife. Televised coverage is often immediate, is visual, and draws the audience into the issue. It can also spur action by decision makers and concerned stakeholders to respond to their constituents and take appropriate actions.

Farallones whale conservation efforts profiled

The Lighthouse Peddler, published out of Point Arena, CA, featured a two-part article in its March and April issues about the early days of blue and humpback whale research in and around the Gulf of the Farallones off San Francisco. The articles profiled Greater Farallones 1986 startup funding of the initial three years of research by Cascadia Research in this area, and subsequent discoveries about the abundance and distribution of these two endangered species. Part Two expanded on the sanctuary's Applied California Current Ecosystem Studies (ACCESS) that focus on these whales and seabirds as ecosystem health indicators, and gather information on their abundance and distribution to help prevent whale deaths from ship strike.

Photo: Blue whale dangerously near shipping lanes. Credit: John Calambokidis/Cascadia Research

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2017 Calendar Updates

May

24 Sanctuary Advisory Council meeting, Bodega Bay.

28 Farallones Sanctuary Explorations: Tidepool Adventure, Bolinas. Contact sara.heintzelman@noaa.gov

June

2 Kent Island restoration. Contact Kate.bimrose@noaa.gov

5-30 Marine Explorers Camp. Contact Rietta.hohman@noaa.gov

17 Kent Island restoration. Contact Kate.bimrose@noaa.gov

July

7 Kent Island restoration. Contact Kate.bimrose@noaa.gov

8 Beach Watch Orientation, Gualala. Contact klindquist@farallones.org

12 Beach Watch Orientation, Bodega Bay. Contact klindquist@farallones.org

15 Kent Island restoration. Contact Kate.bimrose@noaa.gov

17-29 Marine Explorers Camp. Contact Rietta.hohman@noaa.gov

August

4 Kent Island restoration. Contact Kate.bimrose@noaa.gov
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7-11 Marine Explorers Camp. Contact Rietta.hohman@noaa.gov

12 Get Into your Sanctuary Farallon Islands Cruise. Contact sara.heintzelman@noaa.gov

16 Sanctuary Advisory Council Meeting (joint with Monterey Bay NMS), Half Moon Bay

19 Kent Island restoration. Contact Kate.bimrose@noaa.gov

September

1 Kent Island restoration. Contact Kate.bimrose@noaa.gov

October

6 Kent Island restoration. Contact Kate.bimrose@noaa.gov

14 SharktoberFest, GFNMS HQ. http://farallones.noaa.gov

21 Kent Island restoration. Contact Kate.bimrose@noaa.gov

November

29 Sanctuary Advisory Council meeting, San Francisco

Ongoing: Each month the Visitor Center offers special Weekend Family Workshops with themes such as sharks, squid, salmon, plankton and now ROVs! These programs can also be the focus for your exclusive birthday parties or other special events. For booking programs for individuals, or for your special event programs, contact Justin.Holl@noaa.gov.

Also, every Saturday at noon our VC naturalists feed aquarium critters. Just drop in!

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CONTACT INFORMATION

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PO Box 29386
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www.Farallones.org
Phone 415/ 561-6625; fax 415/ 561-6616

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GET INVOLVED, AND STAY INFORMED!

Visit the Greater Farallones Association website for updates, details and registration for sanctuary expeditions: www.farallones.org, as well as the Association Facebook page.

To learn how you can become involved in the sanctuary visit: http://Farallones.noaa.gov; or to subscribe to Upwelling, the Farallones Marine Sanctuary Association newsletter: visit http://www.Farallones.org.

Follow Greater Farallones National Marine Sanctuary on Facebook and Twitter: click on

Learn more about the Sanctuary Advisory Council: http://Farallones.noaa.gov/manage/SanctuaryAdvisory Council.htm

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