

A Report for Sanctuary Advisory Council Members Reporting Period: SEPT 8, 2018- NOV 8, 2018

ABOUT THE SANCTUARY

Olympic Coast National Marine Sanctuary spans 3,188 square miles of marine waters off the rugged Olympic Peninsula coastline. The sanctuary extends 25 to 50 miles seaward, covering much of the continental shelf and several major submarine canyons.

The sanctuary protects a productive upwelling zone home to numerous marine mammal and seabird species, diverse populations of kelp and intertidal algae, and thriving invertebrate communities. The sanctuary is also rich in cultural resources, with over 150 documented historical shipwrecks and the vibrant contemporary cultures of the Makah, Quileute, and Hoh Indian Tribes and the Quinault Nation.

OFFICE REPORT

OLYMPIC COAST NATIONAL MARINE SANCTUARY

NEWS AND PROGRAM UPDATES

Organized by Olympic Coast National Marine Sanctuary (OCNMS) management priorities

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TREATY TRUST RESPONSIBILITIES

NOAA seeks to work directly with the Coastal Treaty Tribes on a government-to-government basis to promote a healthy ecosystem in the waters adjacent to the Olympic Peninsula for the support and enhancement of tribal treaty rights and resources, cultural resources and activities, tribal self-determination, and sovereignty. In addition, NOAA supports and works with the Olympic Coast Intergovernmental Policy Council (IPC) to obtain guidance and the collective views of the Coastal Treaty Tribes and the state of Washington on maintaining a healthy marine ecosystem in the waters off the Olympic Peninsula for the benefit of all citizens and for future generations. NOAA believes these activities are mutually supportive of both the federal government's treaty trust responsibility as well as its responsibilities under the National Marine Sanctuaries Act (NMSA).

COLLABORATIVE AND COORDINATED MANAGEMENT

Coordination with the U.S. Navy on sanctuary permitted underwater operations

On a case by case basis, Olympic Coast National Marine Sanctuary issues permits to conduct activities that would otherwise be prohibited by sanctuary regulations. From regular meetings with U.S. Navy regional staff, sanctuary staff are aware that some of these activities have the potential of conflicting with Navy operations. When this occurs, sanctuary staff has been providing a heads up to the U.S. Navy. During recent discussions, the sanctuary and Navy have collaborated on language that will be added to certain categories of permits, requiring permit applicants to contact the Navy and to work with them to avoid conflicts.

Scientists visit Olympic Coast to discuss a potential new partnership

September 18-19, Olympic Coast National Marine Sanctuary (OCNMS) staff met with Drs. Carol Stepien and Kim Andrews from NOAA Pacific Marine Environmental Laboratory (PMEL) Genetics and Genomics Lab to discuss a new partnership among the organizations and to familiarize partners with sanctuary research capabilities and assets, including the R/V *Tatoosh*. The proposed partnership with PMEL would enhance OCNMS' long term oceanographic mooring program, which is currently wrapping up its 18th year, by regularly sampling zooplankton communities surrounding the moorings thereby beginning documenting the impacts of changing ocean conditions on important biological communities. The partnership builds on a nascent collaborative effort to analyze zooplankton samples collected by OCNMS over the past two years thanks to PMEL's development of tailored assays to inventory the components of marine communities found along the Olympic Coast while documenting community changes over time. The proposed work complements a similar PMEL effort being conducted in the Salish Sea in partnership with Dr. Julie Keister of the University of Washington, and was designed to employ the same protocols and analytical approaches in an effort to yield comparable results that will expand the explanatory power of both studies.

Talking across borders about climate change

Marine area managers from U.S., Canada, and Mexico participated in a two-day workshop hosted by the Council for Environmental Cooperation (CEC) on planning for climate change through focus on developing effective mitigation and adaptation strategies. Building on the current state of knowledge, EcoAdapt has developed an adaptation toolkit that provides practical guidance on increasing coastal resiliency in the face of climate change. The workshop evaluated and provided feedback on further refinements to the toolkit from the perspective of an end user. The toolkit will be available to the public through the Climate Adaptation Knowledge Exchange website (www.CAKEx.org).

Shared Waters: Developing a Pacific Northwest sister site partnership program

Olympic Coast National Marine Sanctuary shares a land-water interface with Olympic National Park as well as a water border with Pacific Rim National Park Reserve in British Columbia, Canada. Many marine animals, such as killer whales, use the inland waters of the San Juan and Gulf Islands in addition to outer coastal areas. Implementing common management approaches across these areas have a greater chance of maintaining or restoring productive habitats and healthy populations. Managers from the four marine protected areas gathered October 25-26 in Victoria, British Columbia to learn about and from each other, and discuss how we can work together in the future. In doing so, we learned we have a lot in common already and outlined options for future collaborative work in our shared seascape across two countries.

CONDUCT COLLABORATIVE RESEARCH, ASSESSMENTS, AND MONITORING TO INFORM ECOSYSTEM-BASED MANAGEMENT

Sanctuary participates in National Science Foundation Deep Ocean Observation Workshop

September 27-29, Olympic Coast National Marine Sanctuary (OCNMS) Research Coordinator, Jenny Waddell, attended a deep ocean observing workshop sponsored by the Consortium for Ocean Leadership and National Science Foundation. The workshop was intended to connect academics from the region with management entities that can use the data streams coming from assets that are part of the Ocean Observatories Initiative (OOI). Because the inshore mooring of OOI's Washington Endurance Line is located within the southern boundary of the sanctuary, resulting data can be utilized by OCNMS in important ways. Breakout discussions followed themes, allowing for an in-depth running discussion focused on cross-shelf and ocean dynamics plus impacts to zooplankton communities.

New Ocean Acidification Fellow joins Olympic Coast National Marine Sanctuary

Julie Ann Koehlinger joined Olympic Coast National Marine Sanctuary (OCNMS) on a yearlong Washington State Sea Grant Fellowship. Over the next year, Julie Ann's primary task is to form and facilitate the steering committee that will shepherd the Ocean Acidification Sentinel Site from vision to reality. As one of her first actions, Julie Ann represented OCNMS at the Global Ocean Acidification-Observing Network (GOA-ON) North American Hub Science Workshop in Victoria, British Columbia. Presentations and discussions included an overview of GOA-ON, its data portal and other associated regional networks, as well as an overview of current programs and science in North America, Canada, and Mexico. When looking at setting and prioritizing objectives for the North American hub there was interesting discussion around the necessity of a nested approach to OA research from local to regional to global, as the drivers and effects of OA, while happening worldwide, differ depending on the ecosystem in question. Also discussed was the potential for utilizing citizen scientists for gathering high quality biological data, in addition to the need to effectively communicate with policy makers and resource managers.

Sanctuary completes 18th Year of Oceanographic Mooring Program

On September 28, Olympic Coast National Marine Sanctuary (OCNMS) staff retrieved the final four (of 10) oceanographic moorings from Cape Alava and Makah Bay, then returned the R/V *Tatoosh* to her off-season slip in Port Angeles, Washington. This event marks the successful completion of OCNMS' 18th year of deploying seasonal moorings at 15 meter and 42-meter water depths at locations that span 135 miles of coastline within the sanctuary. Monitoring the coastal ocean within the sanctuary is critical to the sanctuary's mission and supports broader regional efforts to understand changing ocean conditions, including the University of Washington's Live Ocean forecast model of corrosive conditions from ocean acidification. As with last summer, OCNMS moorings documented the presence of hypoxic conditions along the coast over the summer months and gathered data that were shared quickly among researchers throughout the region. Mooring technician, Kathy Hough, and LTJG Alisha Friel, captain of the R/V *Tatoosh*, will be processing data, cleaning and calibrating instruments, and maintaining the vessel over the winter to prepare for next year's deployments



IMPROVE OCEAN LITERACY

Olympic Study Club studies Olympic Coast National Marine Sanctuary



Olympic Coast National Marine Sanctuary education staff presented to 16 members of the Olympic Study Club at their monthly meeting on September 26. The Olympic Study Club, an active club on the peninsula since 1932, dove into the habitats and organisms of Olympic Coast with an added emphasis on southern resident killer whales and the multifaceted approach being taken to protect this iconic and beloved species. The club hosts sanctuary staff annually to stay connected and up to date on the state of our ocean's health.

Neah Bay Elementary kicks off school year with Beach Day 2018!

Neah Bay Elementary School spent the day at the "beach" to kick off the new school year. Olympic Coast National Marine Sanctuary education staff participated in the event, providing marine education activities with over 130 students. Students rotated through stations, enjoying games and activities on their school campus due to weather canceling the actual beach field trip. Following beach day activities, students and staff enjoyed a school wide BBQ to cap off the celebration.



NatureBridge students take a lesson in trash-free seas

Washington Service Corps AmeriCorps members from Olympic Coast National Marine Sanctuary education team hosted six NatureBridge groups from Spokane International School. Students visited the sanctuary classroom to learn more about marine debris and the effects on seabirds such as albatross through hands on activities allowing students to explore the contents of an albatross bolus. In total, 87 students participated in the lesson, as well as NatureBridge educators and parent chaperones that were in attendance. At the end of each lesson the group brainstormed potential ways that they could collectively and individually help improve the ocean environment.



The Great Plankton Race at Port Townsend Makers Faire

Olympic Coast National Marine Sanctuary education staff supported the 2018 Makers Fair in Port Townsend on October 6. The Maker's Faire, a complementary event to the annual Kinetics Race, celebrated student ingenuity and creativity within the disciplines of Science, Technology, Engineering, Art, and Technology (STEAM). Visitors to the sanctuary booth engaged in the Great Plankton Race, playing with balance and buoyancy to create the slowest sinking organism, while learning about the base of our marine food web. Approximately 200 guests visited the Maker's Faire exploring the hands-on activities and experiments available.



Students focus on Watershed health at Dungeness Riverfest 2018

Olympic Coast National Marine Sanctuary education team provided hands-on marine debris education to 900 students at the Dungeness Riverfest on Friday September 28, hosted by Dungeness River Audubon Center. Sequim's first through sixth grade students flooded the one-day festival learning about conservation efforts protecting Dungeness watershed and our one ocean. Hands-on activities at the sanctuary booth provided the opportunity to investigate marine debris and its impacts on seabirds and marine habitat with hands-on activities. OCNMS was one of 20 organizations providing information on environmental education and the interconnectedness of healthy watersheds, healthy ocean, and healthy humans.



Olympic Coast Sanctuary participates in Dungeness Crab and Seafood Festival

Olympic Coast National Marine Sanctuary was part of the 17th annual Dungeness Crab and Seafood Festival in Port Angeles on October 5-7 (www.crabfestival.org). Sanctuary staff, Washington Service Corps AmeriCorps members, and volunteers hosted an educational booth to share sanctuary related information. Visitors to the sanctuary's booth enjoyed hands-on activities, such as games and experiments designed to help them learn about ocean acidification, its impacts to sea life, along with easy to implement actions for reducing carbon footprints. The festival generally draws 10,000+ visitors each year. There were lots of inquisitive folks dropping by despite the rain on Friday and Sunday. Saturday was a beautiful sunny day, bringing lots of guests to our booth to chat and participate in our activities.



Olympic Coast National Marine Sanctuary STEM career opportunities shared at University of Puget Sound Career Fair

Olympic Coast National Marine Sanctuary Washington Service Corps AmeriCorps members represented the sanctuary at the 2018 University of Puget Sound Science, Technology, Engineering, and Math (STEM) Career Fair on October 10th. Staff interacted with over 30 students with majors in the STEM disciplines who were interested in volunteer opportunities, internships, and more information about sanctuary careers. Participating staff also engaged in opportunities to network and coordinate with other agencies and potential partners that were in attendance.



Environmental educators from around the globe unite in Spokane, Washington

Pacific Northwest Bay Watershed Education and Training (B-WET) grant recipients, NOAA staff, and partners met in Spokane, Washington to increase communication and share best practices at the annual Pacific Northwest B-WET grantee meeting and the North American Association of Environmental Educators (NAAEE) Conference. The first day was spent with a group of 16 B-WET grantees and NOAA partners to share information, to better understand various approaches to meaningful watershed educational experiences, and to learn how to better utilize and support the national evaluation process. On the second day, participants joined a larger global community of environmental educators to network and share at the NAAEE Conference. Pacific Northwest B-WET, Olympic Coast National Marine Sanctuary, and Quinault Indian Nation led and participated in multiple presentations to highlight opportunities and resources to support meaningful watershed educational experiences, and ocean acidification and climate change education.

Pacific Northwest education programs highlighted during NOAA Education Council

Pacific Northwest NOAA offices, including Olympic Coast National Marine Sanctuary, Pacific Northwest Bay Watershed Education and Training (B-WET), Padilla Bay National Estuarine Research Reserve, West Coast Region Fisheries, Northwest Fisheries Science Center, and Weather programs, came together to present during NOAA Education Council Briefs from the Field. Each office provided a short overview of their education programs and answered questions from the group.

CONSERVE NATURAL RESOURCES IN THE SANCTUARY

More than 500 Washington CoastSavers volunteers clean beaches during 2018 International Coastal Cleanup

The threat of rain was no distraction for hundreds of volunteers for the International Coastal Cleanup on September 15. More than 500 volunteers participated in the cleanup on beaches from Columbia River to Cape Flattery and along the Strait of Juan de Fuca. Olympic Coast National Marine Sanctuary (OCNMS) staff and Washington Service Corps AmeriCorps members organized volunteers at Neah Bay registration station on Makah Reservation, coordinating cleanups at Hobuck, Shi Shi, and Tsoo-Yess beaches.



This year a new partnership with the Million Waves Project was highlighted at the Hobuck Beach registration station. The Million Waves Project takes reclaimed ocean plastics that are polyethylene terephthalate (or plastics classified as #1) and turns them into 3-D printed prosthetic limbs. Million Waves had plastic shredding demonstrations, and 3-D printed limbs available on display. A nine-year old Million Waves Project prosthetic hand recipient, Abbey McPherrin and her family, also attended the cleanup.



OCNMS is a founding member of Washington CoastSavers and contributes significantly to the organization's long-range planning, funding and event coordination

Submarine cables in Olympic Coast National Marine Sanctuary: History, Impact, and Management Lessons

Olympic Coast National Marine Sanctuary (OCNMS) has just released a report on two Pacific Crossing fiber optic telecommunications system submarine cables installed in 1999 and 2000 by plow burial in the seafloor of OCNMS. At the time, there were no published studies on impacts of submarine cable installation to seafloor habitats or biological communities, making it challenging for resource management and permitting agencies to determine appropriate measures associated with these installations. As a result, the authorization to install the cable in OCNMS required post-installation field studies to monitor the impact of cable installation on benthic habitats and biological communities and the extent of recovery over time.

Sanctuary managers are responsible for balancing the needs of society, the ecological condition of natural resources, and consideration for existing uses of the area. The reported observations provide useful scientific information about the sanctuary's benthic habitats as well as management implications and monitoring recommendations for cable installations. Effective cable route planning can help identify areas susceptible to significant or persistent impacts that could be avoided during future project construction. Post-installation field studies conducted by sanctuary staff between 2000 and 2004 found recovery of seafloor habitats and biological communities to be relatively rapid, within months to a few years, particularly in areas of granular substrates. The longest lasting impacts may be changes to the physical structure of the seafloor along the trench. The report can be viewed at

<https://sanctuaries.noaa.gov/science/conservation/submarine-cables-in-olympic-coast-nms.html>.

UNDERSTANDING THE SANCTUARY'S CULTURAL, HISTORICAL, AND SOCIOECONOMIC SIGNIFICANCE

Olympic Coast Sanctuary explores sustainable business practices at tourism summit

November 1 – 2, Olympic Coast National Marine Sanctuary staff attended the Olympic Peninsula Tourism Commission's Annual Tourism Summit. Tourism professionals ranging from private business owners to governmental representative gathered to consider how to avoid the "over-tourism" trap through networking, collaboration, and engagement. Guest speaker topics included a debrief on the recently approved state supported "New Tourism Marketing for Washington state," a results review of the third party "Olympic Peninsula Destination Assessment," and avoiding unintended consequences through lack of strategic planning in "Coping with Success."

A guest panel provided insights into “Working with Social Media Influencers” and attendees participated in “Learning Labs” breakout sessions to brainstorm on “Practical Steps for Sustainable Tourism on the Olympic Peninsula,” “Best Practices for Visitor Center and Volunteer Management,” and “How to Stay Ahead of Technology Trends that Affect Your Business.” Participants were encouraged to share their thoughts on how businesses and organizations can be proactive in promoting long-term sustainable business practices on the Olympic Peninsula.



SANCTUARY PERMITTING

Issued Permits and Authorizations

OCNMS-2018-010 – Bruce Taft, NOAA National Data Buoy Center (NDBC)

Project Title: Maintenance of Coastal-Automated Marine Network (C-MAN) weather station on Destruction Island, Washington

Permitted Activity: Low overflight

Project Location: Destruction Island

Permit Duration: October 1, 2018 through March 31, 2023

Comment: Fly below 2,000 feet to land on Destruction Island to service the Coastal-Automated Marine Network (C-MAN) weather station. This operation will be supported by a U.S. Coast Guard helicopter.

OCNMS-2018-011 – Paul Matthias, Woods Hole Oceanographic Institution

Project Title: Ocean Observatories Initiative (OOI) - Endurance Washington Inshore Moorings and Glider Operations

Permitted Activity: Deployment and maintenance of an oceanographic mooring and the deployment of two autonomous underwater vehicles (Teledyne-Webb Slocum Gliders).

Project Location: The mooring is in the southern portion of the sanctuary, and the gliders will operate throughout the sanctuary.

Permit Duration: October 9, 2018 through September 30, 2023

Comment: This is an ongoing activity currently covered by an OCNMS research permit; the new permit changes the responsible permit holder and extends the time period of the permit.

OCNMS-2018-012 – Daniel Stabbert, Pacific Survey Group, LLC

Project Title: AUV and ROV Operational Tests within the Olympic Coast National Marine Sanctuary

Permitted Activity: Testing of two AUVs with HISAS sonar, LIDAR, magnetometer, and high-resolution video and photography equipment.

Pending Permit Requests

There are currently no pending permits.

LEARN ABOUT YOUR SANCTUARY / NATURAL HISTORY

Olympic Coast National Marine Sanctuary and Feiro Marine Life Center November Speaker Series is Hot, Sour & Breathless - Oceans under Stress

On Tuesday, November 20, beginning at 6:00 pm at the Feiro Marine Life Center, Dwight Owens, of Ocean Networks Canada, will speak about the stress our global ocean is under from warming, acidification, and oxygen declines. This talk outlines these three interrelated stressors, examining impacts and actions we can take to counteract them, and gives us a glimpse into the fascinating world of ocean science.



REGIONAL / NATIONAL MARINE SANCTUARY SYSTEM NEWS

Citizen Science in national marine sanctuaries grows to 9,312 volunteers

During fiscal year 2018, the NOAA Office of National Marine Sanctuaries had 9,312 citizen science volunteers who supported citizen science efforts, such as Beach Watch, Spotter Pro, and Stellwagen Sanctuary Seabird Stewards, with 82,637 hours of service. This is the equivalent of \$2 million dollars or the time of approximately 41 full time employees. In total, there were 12,310 volunteers around the United States helping to protect and conserve America's underwater treasures to safeguard them now and for future generations. These individuals worked 127,983 hours over the fiscal year in a wide variety of activities including beach cleanups, visitor center docents, and wildlife monitoring. Their work is the equivalent of \$3.16 million dollars of in-kind support or the value and time of 64 full time employees.

Stellwagen Bank National Marine Sanctuary participates in Cape Cod Plastic Pollution Summit

The sanctuary's education coordinator participated in an invitation-only summit on plastic pollution on Cape Cod organized by Care for the Cape and Islands on Nov. 1. The summit included members of local, state, and federal government agencies located on Cape Cod, environmental organizations, faith-based organizations, and the business community. This was an initial meeting to introduce the players facing the issues of plastic pollution, marine debris, and recycling/reuse. Participants provided success stories and discussed challenges and possible solutions for the region. The sanctuary contributed information about its new marine debris traveling exhibit and funding (with the National Marine Sanctuary Foundation) for the marine debris reduction campaign by the Lobster Foundation of Massachusetts.

Marine Debris Traveling Exhibit Finds Home at Cape Cod Museum of Natural History

A new traveling exhibit "Trash Travels" has been installed at the Cape Cod Museum of Natural History. Funded by NOAA's Marine Debris Program, the exhibit includes a touchscreen kiosk which offers six short NOAA marine debris videos and a new powerpoint video from the sanctuary, which covers local marine debris issues. The exhibit also includes a window shade banner and "Trash Travels" rack cards. The Cape Cod Museum of Natural History is the first stop for the exhibit. The sanctuary is now looking for a home for the second unit.

Thunder Bay National Marine Sanctuary & PureMichigan: Sharing Best Practices in Tourism Marketing Partnerships

Sanctuary staff represented Thunder Bay National Marine Sanctuary (TBNMS) at the Michigan Museums Association's annual conference, From the Ground Up: Leadership in Museums, from October 28-30 in Dearborn, Michigan. Superintendent Jeff Gray co-presented a workshop session, Michigan.org and YOU, with PureMichigan staff members. Attendees learned about TBNMS and their successful partnership with the PureMichigan brand for tourism marketing through web assets and radio advertising. Gray also answered questions from attendees regarding best practices for regional tourism partnerships and co-marketing opportunities within communities, using TBNMS and the City of Alpena's rebranding to the "Sanctuary of the Great Lakes" as a case study. Michigan museums are an economic engine, with nearly 2.5 billion spent on arts and culture tourism in Michigan in 2015. (Creative State

Michigan Nonprofit Report (2015)). The sanctuary's visitor center, Great Lakes Maritime Heritage Center, supports Michigan's museum community.

Ocean Users Workshops to begin

Beginning November 28, Office of National Marine Sanctuaries, NOAA Office of Law Enforcement, and NOAA Fisheries will be holding a series of ocean users' workshops on the islands of Hawai'i, Maui (two locations), Oahu, and Kauai. The public will learn about safe and lawful wildlife viewing and boating around Hawaii's marine mammals and sea turtles. Whale and dolphin watchers, boat captains, ocean tour operators, and other ocean users are invited.

Florida Keys community finds and reports new historical resources

The Florida Keys community is helping sanctuary managers with locating historical resources. This fall, a dive shop owner found a 200+-year-old cannon and a commercial fisherman discovered a segment of wooden wreckage. Both recognized that they should not move, damage, or disturb their discoveries. The cannon's size and shape was similar to another isolated cannon nearby, suggesting that a sinking ship jettisoned its guns as it crashed across the reef. To increase this kind of reporting and monitoring of historical resources, Florida Keys National Marine Sanctuary (FKNMS) staff is partnering with the Florida Public Archaeology Network's Heritage Monitoring Scouts program. This training initiative seeks to empower more citizen scientists with the knowledge to support FKNMS' historical resource inventory.

Foster cruise to inform on fish life cycles in Florida Keys National Marine Sanctuary

On November 5, scientists from Florida Keys National Marine Sanctuary (FKNMS) and partner agencies embarked on a 10-day cruise aboard the NOAA ship *Nancy Foster* to conduct research around the Marquesas and Dry Tortugas Islands. To protect the longevity of popular fish, scientists are trying to better understand where fish go to spawn, and what habitats they prefer within FKNMS. This expedition uses multi-beam sonar to measure the depth and features of the seafloor to help find common characteristics between different spawning sites. Sonar technology looks for the presence of fish with science divers either dropping cameras in the water, using remotely-operated vehicles or entering the water themselves to visually confirm fish species and their numbers, and whether they appeared to be gathering for a potential spawn. Scientists also will perform maintenance on a network of underwater acoustic receivers that detect specially-tagged fish.

Flower Garden Banks research team completes fourth quarter water quality cruise

The Flower Garden Banks National Marine Sanctuary research team completed a quick one day cruise to exchange seabird data sondes and HOBO thermistors that track temperature, salinity, and turbidity on the reef crest of East Flower Garden, West Flower Garden, and Stetson banks. Conductivity, temperature, & dissolved oxygen casts were also performed to record water column profiles and collect waters samples at all three banks on 30 October 2018. This is part of the long-term monitoring partner projects with Bureau of Ocean Energy Management and Bureau of Safety and Environmental Enforcement.

Deep-sea habitats in national marine sanctuaries along the West Coast

Deep-sea or cold-water corals and sponges form remarkably complex and fragile communities in all five west coast national marine sanctuaries. Cold-water corals and sponges form three-dimensional habitats that provide a multitude of micro-niches for associated species, such as fish, shrimp, and crab. In turn, these communities are much higher in biomass and diversity than surrounding unstructured deep-sea areas. The West Coast Regional Office has created a [story map](https://sanctuaries.noaa.gov/about/deep-sea-habitats-in-nms-of-the-west-coast.html) to improve public awareness of deep-sea coral communities, their importance to the health and biodiversity of national marine sanctuaries along the west coast, and they are studying and protecting these deep-sea habitat. <https://sanctuaries.noaa.gov/about/deep-sea-habitats-in-nms-of-the-west-coast.html>.

E/V *Nautilus* seamounts expedition in Papahānaumokuākea Marine National Monument

Scientists aboard Ocean Exploration Trust's E/V *Nautilus* explored seamounts (underwater mountains) within Papahānaumokuākea Marine National Monument. Throughout the expedition, NOAA's Mokuāpapa Discovery Center, University of Hawai'i, Waikīkī Aquarium, and Maui Ocean Center hosted live streaming. Audiences

worldwide viewed 1.5 million minutes of live streaming and posted 4,544 questions. Sixty-nine ship-to-shore interactions reached more than 2,400 people in 15 U.S. states, American Samoa, and Mexico. This expedition covered 944 linear nautical miles, mapped 10 seamounts, launched 11 remotely operated vehicle (ROV) dives, plus collected 51 rock samples (~900 lbs.), 44 biological samples, and 22 water samples, to help determine how and when the seamounts formed and to document the biological communities that occupy them. Daily social media updates and thousands of news stories covered the mission, including a video of a gulper eel that had 2 million views. The *Nautilus* expeditions are supported by NOAA Office of Exploration and Research.

<https://sanctuaries.noaa.gov/science/nautilus18/welcome.html>.

Virtual classroom for educators hits a high in FY18

Formal and informal educators around the globe have connected with national marine sanctuaries through a virtual classroom that increases the accessibility of science-based learning. The [National Marine Sanctuaries Webinar Series](#) has been providing educators with educational and scientific expertise, resources, and training to support ocean and climate literacy in the classroom through these distance learning opportunities. In FY18, there have been eight webinars in the series with 2,157 registrants and 929 attendees to the live webinars. Based on post-webinar evaluation, 67 percent of educators plan to integrate these materials into their work within the next year. 95 percent are likely to attend a future presentation in the National Marine Sanctuaries Webinar Series with 97 percent likely to recommend this webinar series to others.

Tracking the movements of giants

In the September 2018, the research team at Channel Islands National Marine Sanctuary (CINMS) installed a telemetry array around Santa Barbara Island and tagged four giant sea bass. This “king of the kelp forest” is a top predator that has been slowly recovering after years of decline. Despite protections, this species still faces a number of threats including poaching. Staff are hoping to understand how this species uses waters in CINMS and responds to a variety of anthropogenic stressors. The three-year project seeks to understand site fidelity and long-term habitat use of giant sea bass. The technology being used is also compatible with a similar tagging projects in the Southern California Bight. Through partnerships with local researchers, we will be looking at the long-term migrations of giant sea bass. We will identify individuals through telemetry, as well as through photo ID, as each sea bass’s spots act as unique identifiers.

ONMS Director joins Farallones, Cordell, Pt. Blue scientists on final 2018 research cruise

On September 25 during the last of three 2018 Applied California Current Ecosystem Studies (ACCESS) research cruises, John Armor, ONMS Director and NOS Acting Deputy Director joined scientists aboard the R/V *Fulmar*. Now in its 15th year, this collaboration by Cordell Bank and Greater Farallones national marine sanctuaries with Point Blue Conservation Science measures oceanographic parameters, prey availability, and predator distribution and abundance on pre-determined transect lines three or four times a year. They encountered exceptionally calm seas, but fog made observations challenging. Highlights included lunge-feeding humpback and blue whales concentrated near the continental shelf break where they normally occur. Seabird sightings included various shearwaters, fulmars, numerous storm-petrels, and rhinoceros auklets. Acoustic sampling detected abundant krill, mostly on the sea floor, making them difficult to sample in net tows. Funders, media, and advisory council members also joined the cruise.

Coral rescue mission on the Florida reef

Florida’s coral reefs are experiencing a multi-year outbreak of coral disease. The devastating disease, affecting half the hard coral species in Florida, now impacts more than 75 percent of the reef tract from the northern reaches in Martin County to the Lower Florida Keys nearing Key West. With the majority of the reef in Florida Keys National Marine Sanctuary, NOAA plays a lead role in addressing an issue that could have a detrimental effect on the marine ecosystem and the local economy. Recently, NOAA and Florida Fish and Wildlife researchers collected and stored 88 corals that represented 10 species, to serve as a “bank” of healthy corals as an initial coral rescue project. The “banked” corals ensure genetic diversity that will be critical for restoration efforts in the wake of the recent stony coral tissue loss disease. The multi-layered collaborative response effort involves community members, federal and state agencies, academic institutions, and nonprofit organizations.

<https://floridakeys.noaa.gov/coral-disease/>

Two new sponge species identified near Farallones from 2016 ROV research cruise

Scientists from the California Academy of Sciences and the Royal British Columbia Museum, in collaboration with Greater Farallones National Marine Sanctuary, described two new sponge species collected during the 2016 research near the Farallon Islands, on a joint NOAA-Ocean Exploration Trust research cruise. The specimens, *Staurocalyptus pamelaturnerae* and *Hyalascus farallonensis*, were growing on the wreck of USS *Independence*, on the side of the midship gun turret, in the northwest section of Monterey Bay National Marine Sanctuary adjacent to Greater Farallones National Marine Sanctuary off San Francisco. A third sponge, *Farrea schulzei*, also found on the USS *Independence*, had not been described since the late 1800's and was re-described, renamed, and its range of occurrence was updated. The paper, "Four new species of Hexactinellida (Porifera) and a name replacement from the NW Pacific", was authored by Dr. Henry M. Reiswig and published in Zootaxa, <https://doi.org/10.11646/zootaxa.4466.1.11>

Underwater dragonslayers - August 2018 Lionfish Invitational Cruise Completed

Did you know that 1,000 lionfish in their invasive range can consume over 5 MILLION PREY FISH IN 1 YEAR? Teams of divers and researchers recently travelled to Flower Garden Banks National Marine Sanctuary to participate in the semi-annual "Lionfish Invitational." Armed with a permit and "spear," divers removed over 800 invasive lionfish from Gulf of Mexico waters, just within four days and doubling the previous record. These lionfish will be examined for age, growth, and stomach contents to see which and how many native fish species these invasive predators are eating. Lionfish have been documented to eat over 100 species of fish and invertebrates, including commercially important species such as snapper and grouper.

Protecting resources in partnership with DOD

Homeland security and military readiness can be achieved in harmony with resource protection, but proactive collaboration and communication is key. Thunder Bay National Marine Sanctuary works with the Department of Defense (DOD), Air National Guard, Alpena Combat Readiness Training Center in Alpena to provide areas to practice critical military exercises and TBNMS in turn receives multibeam sonar/mapping surveys of areas created through the exercises. The goal of the partnership is to find ways to limit impacts to sanctuary resources and the Great Lakes by identifying areas within the range that could have the least amount of impact on cultural and natural resources (e.g., shipwrecks and fish habitat). Additionally, NOAA has worked with the DOD to identify ways to modify exercise logistics and operations to increase efficiencies and lessen impacts without sacrificing military readiness.

Sea to Shining Sea: Excellence in Interpretation and Education Award

This year's winner is "Exploring Sanctuary Biodiversity Through a Marine Art Contest: A STEM to STEAM Initiative" - Anne Smrcina. For 17 years, Stellwagen Bank National Marine Sanctuary has managed an art contest to bring awareness of the amazing biodiversity found within the sanctuary's waters. Anne Smrcina has taken this project and continuously grown it into a well-established and well-known event. Collecting entries from up to 900 participants locally and even globally, the art showcases this special ocean place that is one of the most biologically diverse in the Gulf of Maine. The art is displayed around the greater Boston area in high-traffic partner venues, bringing attention to Stellwagen Bank National Marine Sanctuary. Teachers use the contest as a way to start a conversation about stewardship and conservation, bringing these important topics to their students through art. This project showcases just one of the many ways we can reach the public to increase sanctuary engagement and awareness.

REGIONAL / NATIONAL MARINE SANCTUARY FOUNDATION NEWS

Celebrating 46 years of the National Marine Sanctuaries Act

<https://marinesanctuary.org/blog/celebrating-46-years-of-the-national-marine-sanctuaries-act/>

The National Marine Sanctuary Foundation celebrates the National Marine Sanctuary System. We champion the continued protection of these amazing places, strive to connect people to their sanctuaries and broader ocean conservation, and advocate for the designation of new sites and expansion of existing ones. Join us in exploring and celebrating the wonders of the National Marine Sanctuary System.

Celebrating 26 years of whale protection and research at Stellwagen Bank and Hawaiian Islands Humpback Whale national marine sanctuaries

<https://marinesanctuary.org/blog/stellwagen-bank-hawaiian-humpback-sanctuary-26-anniversary/>

Stellwagen Bank National Marine Sanctuary and Hawaiian Islands Humpback Whale National Marine Sanctuary are two truly special places on our planet. These two places are extremely unique but share one specific commonality. Both were appointed by Congress on November 4, 1992. They recently celebrated their anniversaries as protected areas that provide a safe habitat for a diverse number of incredible species. To celebrate a quarter of a century of protection, research, and ocean stewardship we want to highlight just a few of the ways these two places have impacted our oceans.

Lessons from the deep

<https://marinesanctuary.org/go-deeper/lessons-from-the-deep/>

From the water to the classroom, sanctuaries are dynamic living laboratories for learning that inspire discovery, inquiry, and a fascination for the underwater world. From teaching sustainable recreation to divers and boaters to inspiring the next generation of ocean stewards in classrooms and beyond, the National Marine Sanctuary Foundation supports learning for all ages.

Blue star dive operators report removing nearly three tons of marine debris from Florida Keys National Marine Sanctuary as part of goal: Clean Seas Florida Keys

<https://marinesanctuary.org/news/goal-clean-seas-update-2/>

Local Blue Star Dive Operators DiveN2Life, Key Dives, and The Dive Shop at the Reef recently reported results from Goal: Clean Seas Florida Keys cleanup dives supported by the National Marine Sanctuary Foundation . Between July and November, these dive operators collectively removed 5,958 pounds of marine debris and more than 5,517 feet of displaced line from reefs and the seafloor throughout Florida Keys National Marine Sanctuary.

OCNMS Online

Visit our website at: <http://olympiccoast.noaa.gov/>.

Follow us on Facebook and Twitter!

<https://www.facebook.com/usolympiccoastgov>

<https://twitter.com/olympiccoast>

Please take a few moments to peruse the site. Your feedback is greatly appreciated.

*Comments and suggestions can be sent to:
jacqueline.laverdure@noaa.gov.*

Ocean-Related Websites

National Oceanic and Atmospheric Administration

<http://www.noaa.gov/>

National Ocean Service

<http://oceanservice.noaa.gov/>

Office of National Marine Sanctuaries

<http://sanctuaries.noaa.gov/>

NOAA Marine Debris Program

<http://marinedebris.noaa.gov/>

NOAA Online Media Library

<http://sanctuaries.noaa.gov/photos>

Encyclopedia of National Marine Sanctuaries

<http://www8.nos.noaa.gov/onms/park/>

NOAA Ocean Explorer

<http://oceanexplorer.noaa.gov/>

National Data Buoy Center

<http://www.ndbc.noaa.gov/rmd.shtml>

Washington's Ocean Resources

<http://www.ecy.wa.gov/programs/sea/ocean/index.html>

CoastWatch – West Coast Regional Node

<http://coastwatch.pfel.noaa.gov/>

Northwest Association of Networked Ocean Observing Systems

<http://www.nanoos.org/>

NOAA Pacific Marine Environmental Laboratory

<http://www.pmel.noaa.gov/>

OLYMPIC COAST NATIONAL MARINE SANCTUARY

OCNMS STAFF

LEARN MORE ABOUT YOUR SANCTUARY

The Sanctuary Office Report is produced bi-monthly by Olympic Coast National Marine Sanctuary in conjunction with sanctuary advisory council meetings. To learn more about the sanctuary, please visit our website at:

<http://olympiccoast.noaa.gov/>.

To learn more about the sanctuary advisory council, please visit:

http://olympiccoast.noaa.gov/involved/sac/sac_welcome.html.

OFFICE OF NATIONAL MARINE SANCTUARIES (ONMS)

Olympic Coast National Marine Sanctuary is one of the marine protected areas in the National Marine Sanctuary System encompassing more than 600,000 square miles of marine and Great Lakes waters from Washington State to the Florida Keys and from Lake Huron to American Samoa. The system includes 13 national marine sanctuaries and Papahānaumokuākea and Rose Atoll marine national monuments. Visit the ONMS website at:

<http://sanctuaries.noaa.gov/>.

Get Involved!

To learn how to get involved in the sanctuary visit:

<http://olympiccoast.noaa.gov/involved/welcome.html>.

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