



OLYMPIC COAST NATIONAL MARINE SANCTUARY

A Report for Sanctuary Advisory Council Members

Reporting Period: January 14 -March 10, 2017

ABOUT THE SANCTUARY

Olympic Coast National Marine Sanctuary spans 3,189 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 plan priority areas.

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ACHIEVE EFFECTIVE AND COORDINATED MANAGEMENT

Discussions Between U.S. Navy and NOAA

Staff from the NOAA Office of National Marine Sanctuaries Maritime Heritage Program, Olympic Coast National Marine Sanctuary, and the Office of General Counsel met with the United States Navy Region Northwest, Navy Supervisor of Salvage and Naval Historical and Heritage Command, to discuss a potential exploration mission. NOAA is discussing a possible mission to explore the wreck of the submarine the USS *Bugara*, which sank in the sanctuary in 1971. The United States Submarine *Bugara* was commissioned in 1944 and conducted three WWII war patrols in the Gulf of Siam. The *Bugara* also served during the Korean Conflict. The decommissioned *Bugara* was under tow, when she flooded and sank off of Cape Flattery. Surveying and documenting the condition of shipwrecks is also a responsibility under the National Historic and Preservation Act.

OCNMS also held an annual meeting with regional representatives from the U.S. Navy. A number of issues was discussed including Navy testing and training in the sanctuary, Navy marine species monitoring and reporting activities, plans for the third phase of the Navy's periodical review of Northwest Training and Testing activities, and sanctuary research plans for the 2017 season.

Sanctuary Staff Meets With Representative Kilmer's District Staff

Olympic Coast National Marine Sanctuary (OCNMS) staff met with Representative Derek Kilmer's new field liaison for the Olympic Region, Mary Jane Robbins, who is taking over for Judith Morris, who is retiring. Staff provided high-level information about NOAA and ONMS, as well as highlighting OCNMS priorities.

Russell Callender Visits NOAA's Western Regional Office

Russell Callender, NOS Director, met with NOAA staff as part of a week-long visit to the Seattle area. Carol Bernthal, Olympic Coast National Marine Sanctuary (OCNMS) Superintendent, participated in an all-hands meeting where Russell provided an overview of NOS accomplishments, challenges and the transition underway. Afterwards, he met with NOAA regional leads, to discuss issues and programs underway within the region. OCNMS provided an overview of an ocean acidification sentinel site initiative as well as infrastructure needs.

Working to Ensure Healthy Oceans with a Changing Climate

The Commission for Environmental Cooperation hosted a two day meeting in Santa Barbara, California with marine protected area managers and scientists from Mexico, United States, and Canada to discuss how to strengthen management effectiveness and support coastal community resilience across protected areas, especially in regards to projected impacts from climate change. Representatives from NOAA included Carol Bernthal, Olympic Coast National Marine Sanctuary, Chris Mobley, Channel Islands National Marine Sanctuary, Sara Hutto, Greater Farallones National Marine Sanctuary, and Lauren Wenzel, NOAA National Marine Protected Areas Center. Participants agreed that it is very helpful to share experiences and lessons learned as we all grapple with these tough issues.

IMPROVE OCEAN LITERACY

Big Mama Makes a Splash at 30th Annual Beachcombers' Fun Fair



On March 4-5, OCNMS education staff debuted “Big Mama,” a life-size, inflatable humpback whale at the 30th Annual Beachcombers' Fun Fair at Ocean Shores Convention Center. The inflatable whale is modeled after a large, female individual from the North Pacific humpback whale population who travels through and feeds in OCNMS and the Strait of Juan de Fuca each year on her way to Alaska. Participants of the fair could take guided tours inside Big Mama to learn about whale anatomy and the adaptations these migratory marine mammals developed to survive their long, annual voyage. Big Mama served as a sanctuary ambassador to help connect people with the rich natural resources in OCNMS and our Washington coast waters, as well as the organisms it can support as a result. She also helped spread the message about the importance of

marine protected areas for migratory species, since her winter breeding grounds are located in Hawaiian Islands Humpback Whale National Marine Sanctuary. OCNMS staff provided an educational booth with kids' activities on blubber and whale entanglement, along with information about the sanctuary and the National Marine Sanctuary System. They shared information supporting Washington CoastSavers to recruit beach cleanup volunteers for the April 29 Washington Coast Cleanup. The annual festival features competitive beachcombing exhibits, seminars, informational booths, and vendors. A Saturday children's science fair morning and Sunday beach walk attracted many families. Approximately 1,000 people attended the event.

OCNMS Regional Coordinator of First Annual Olympic Coast Competition MATE Underwater Robots Competition

On February 18, OCNMS and partners Marine Advanced Technology and Education (MATE) conducted a one-day workshop focused on mission objectives and prop building for the first annual Olympic Coast MATE competition, of which OCNMS is regional coordinator. Approximately 45 teachers, mentors and students from eight Olympic Peninsula schools attended the workshop to understand the competition challenges and props and work on their student Remotely Operated Vehicles (ROVs) that will be used in the May 20, 2017 competition. OCNMS provided information on tools for real world data collection from ROVs including HOBO sensor tidbits used on OCNMS moorings to collect temperature data, as well as a troubleshooting activity to build student confidence in problem solving ROV challenges like blown fuses, loss of connectivity with broken wires in tether, or loose switches leading to unreliable power issues. MATE volunteers were on hand to guide student teams through the competition challenges and provide support. MATE ROV motor kits were provided to attending teams and time for motor kit assembly, pool time for flying, and vehicle modifications were built into the workshop. Next steps for our Olympic Coast MATE competition include recruitment for judges and volunteers, along with pool and poster session setup. The competition will be held at the Forks Aquatic and Health center, which is regionally central to our participating teams. The opportunity provides students with an engaging hands-on activity building skills in science, technology, engineering and math, while building skills that encourage increasing interest in marine science, and ocean exploration careers.



Sanctuary AmeriCorps Member Completes National Park Service Operational Leadership Course

OCNMS AmeriCorps member, Becca Lewis, completed the National Park Service (NPS) Operational Leadership 16-Hour Basic Course. The NPS Operational Leadership program provides the tools to increase one's awareness of safety and risk in day-to-day situations. Operational Leadership equips participants to understand their limitations and to make better risk management decisions in the here-and-now. The OCNMS education team will apply these practices to their K-12 marine science education programs.

475 Science Students Take Ocean Hero Pledge

OCNMS education staff completed the 4th grade North Olympic Watershed (NOW) Science Program in partnership with Feiro Marine Life Center. More than 475 students from twenty classes within the Port Angeles, Sequim, and Crescent school districts participated in ocean science education by engaging in classroom presentations and field investigations at Olympic Coast Discovery Center and Feiro Marine Life Center. Through hands-on activities, students developed a greater awareness about the importance of the National Marine Sanctuary System, albatross seabirds, the marine food web, plankton, and the harmful effects of marine debris. Students completed pre- and post-lesson surveys displaying an overall increase in awareness and knowledge gained regarding the lessons. With their newly enhanced desire to care for our life support system, the ocean, students took the Ocean Hero Pledge and developed individual action plans to reduce the impact of marine debris. NOW Science activities are aligned to Next Generation Science Standards.



International Visitor Leadership Participants on Marine Conservation Explore Olympic Coast Discovery Center

On February 20, seven delegates from Guatemala and El Salvador visited Olympic Coast Discovery Center (OCDC) as part of the Department of State's International Visitor Leadership Program. OCNMS staff gave an overview of the sanctuary and the National Marine Sanctuary System and interpreted the OCDC exhibits, including a demonstration of the interactive ocean acidification activity. The visitors were particularly interested in understanding educational programs that can help serve as models for Central American institutions, as well as an understanding of U.S. institutions, conservation, education, and policies aimed at conserving marine species and protecting the environment through pollution control and habitat preservation. Guests learned about balancing compatible resource use and resource conservation and protection, and gave very positive feedback. The experience helped the sanctuary achieve ONMS's goal of working with the international community to strengthen global protection of marine resources, investigate and employ appropriate new management approaches, and dissemination ONMS experience and techniques.

Showcasing OCNMS in University of Washington's Environmental Career Fair

OCNMS education staff and Vessel Operations Coordinator represented the sanctuary as one of thirty-seven regional organizations invited to attend University of Washington's Environmental Career Fair. Organized by the University of Washington's College of the Environment, students ranging from all levels of higher education came through the Mary Gates Hall interested in making connections that could lead to volunteer experiences, internships, and career-level positions. OCNMS staff interacted with more than 300 students looking for information about sanctuary careers, possible internships, and skills that benefit a career in ocean conservation.



NatureBridge Olympic Hosts Olympic Coast National Marine Sanctuary on Ocean Conservation and MPAs

OCNMS staff presented on ocean conservation and marine protected areas (MPAs) as part of a Naturebridge Olympic education program evening presentation. Twenty-six high school students and three teachers from Austin, Texas learned about the Office of National Marine Sanctuaries, OCNMS, and Ocean Literacy Principles, focusing on human actions and our impact on ocean health, as well as actions to mitigate our changing ocean environment. The evening wrapped up with a rousing game of Ocean Jeopardy, where students tested their knowledge on various ocean topics. The students spent the week learning about Olympic Peninsula ecosystems and spent the day at Makah reservation and Cape Flattery, overlooking the sanctuary, before the evening presentation.

Sea Otter Success Story in OCNMS Showcased at Franklin Elementary Science Night

OCNMS education staff participated in the annual Franklin Elementary Science Night for local K-6 students and their families. More than one hundred students and family members were able to celebrate the success story of our Washington sea otters while learning about their critical role in the health of kelp forests. Attendees conducted a mock sea otter population survey and engaged in virtual diving experiences in Olympic Coast through Google goggles.



Sanctuary AmeriCorps Participates Martin Luther King Jr. Day of Service

Washington Service Corps AmeriCorps member, Becca Lewis, represented OCNMS at the 5th Annual Martin Luther King Jr. Day Weed Pull hosted by Port Townsend Marine Science Center. More than 50 volunteers from the surrounding communities came to help remove invasive weeds, such as English ivy and Himalayan blackberry from Fort Worden State Park.



West Coast Region Sanctuaries Seek Opportunity to Enhance OA Monitoring

Olympic Coast National Marine Sanctuary and Monterey Bay National Marine Sanctuary submitted a proposal for the 2017 Ocean Acidification Program (OAP) mini-grant opportunity. If funded, WCR sanctuaries will partner with Flathead Valley Community College, NOAA's National Centers for Coastal Ocean Science (NCCOS), and NOAA's Northwest Fisheries Science Center (NWFS), to increase accessibility and understanding of tools and protocol for ocean acidification monitoring through citizen science and education programs. WCR sanctuaries will work with Flathead Valley Community College to pilot education and outreach programs using a field-based pH-measuring instrument called "pHyter." The education and outreach programs will include citizen science, teacher workshops and student field investigations. OAP funds will support the expansion of pHyter instrument capabilities to permit iPhone and android apps to interface and upload to the international GLOBE Program GIS database, increasing accessibility of pH data worldwide. Funds will also support the development of an ocean acidification curriculum and pilot testing of the new pHyter capabilities across all WCR sanctuaries, using citizen science as the investigative model. This project will directly reach approximately 500 educators, students, and citizen volunteers through WCR site-specific education and outreach pilot programs, with potential to reach thousands more once trained educators transfer their knowledge to others and the online curriculum is made publicly available.

OCNMS AmeriCorps Member Completes NPS Interpreting Climate Change Virtual Course

OCNMS AmeriCorps member completed the National Park Service (NPS) Interpreting Climate Change Virtual Course. As part of NPS's Interpreting Climate Change Program, the course provided a strategic and practical foundation for educators to develop effective, engaging programming related to climate change as a critical resource issue affecting both natural and cultural resources. Course material covered a range of engagement techniques such as facilitated dialogue, skills for dealing with controversy, and presenting multiple perspectives. The OCNMS education team will apply these engagement practices to their K-12 marine science education programs.

OCNMS Partners with Peninsula College for Oceanography Class Field Trip

OCNMS crew of R/V *Tatoosh* hosted 13 students from Peninsula College for their annual Introduction to Oceanography class field trip. Students spent an hour and a half on the water collecting bottom samples, water samples, conducting plankton tows, measuring turbidity with a secchi disk, and taking temperature, dissolved oxygen, pH, and salinity measurements. The trip provided students an opportunity to conduct field sampling methodology and allowed them to directly experience them to the marine environment. By interacting with sanctuary scientists, students were exposed to careers in Science, Technology, Engineering, and Math.

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

Advancing the Practice of Citizen Science

The Coastal Observation and Seabird Science Team (COASST) Advisory Board held their annual meeting to discuss progress on two citizen science programs related to marine debris and beached birds. Carol Bernthal, Olympic Coast National Marine Sanctuary Superintendent, sits on the Advisory Board, which helps provide strategic direction to COASST, and is housed at the University of Washington. The group discussed progress on the development of a new marine debris program, which helps characterize marine debris from a wildlife impacts perspective, as well as exciting new advances in communication materials for the highly successful COASST program. Participation in citizen science is an important method for engaging the public in understanding and supporting science programs and their relationship to resource management issues.

CONSERVE NATURAL RESOURCES IN THE SANCTUARY

Sanctuary Reviews Circumstances of Lost Vessels

The waters off the Olympic Coast of Washington State are a national treasure, deserving of a special recognition and protection. They also serve as an important marine highway, and provide a livelihood and recreation for many, that ply its waters in vessels large and small. Since Olympic Coast National Marine Sanctuary was designated in 1994, it has worked to help partners in

preventing oil spills. While there have been no large spills in this period, it is not uncommon for smaller vessels to be lost. The sanctuary has reviewed the circumstances of 46 vessels that have sunk, grounded or capsized over a 22 year period. It is hoped that this analysis will assist the sanctuary in identifying ways to reduce future losses. The abandonment of sunken or grounded vessels is one of the more challenging enforcement and management issues of Olympic Coast National Marine Sanctuary, making up the majority of our open enforcement cases. The report is meant to inform a planned Advisory Council working group, which will look into the issue and make recommendations to the Sanctuary Superintendent. The report can be downloaded at <http://sanctuaries.noaa.gov/science/conservation/olympic-coast-vessel-incident-1994-to-2016.html>.

UNDERSTANDING THE SANCTUARY'S CULTURAL, HISTORICAL AND SOCIOECONOMIC SIGNIFICANCE

NOAA Report Highlights Economic Benefits of Recreation In and Near Olympic Coast National Marine Sanctuary

Visitors to NOAA's Olympic Coast National Marine Sanctuary and the immediate area boosted the region's economy with \$102 million in spending, supporting nearly 1,200 jobs and generating \$46 million in local income for business owners and employees in 2014, according to a NOAA analysis using the most recent figures available.

The report looked at the spending patterns of recreational visitors to the sanctuary region, as well as what they did there. About 41 percent of Washington State's 2.62 million households visited the Outer Coast, benefiting the economies of an eight-county area near the sanctuary, which includes Clallam, Grays Harbor, Jefferson, King, Kitsap, Mason, Pierce and Thurston counties. Fourteen percent of these visitors participated in recreation in and near the sanctuary. On average, each of these visitors took roughly 1.7 trips to the area each year.

Visitors to the region participated in more than 32 different recreational activities in the sanctuary region, including fishing, watersports and diving. The top four most popular activities were visiting the beach, coastal sightseeing, wildlife watching and hiking/biking.

A series of peer-reviewed volumes make up the full report, *Socioeconomics of Recreation on the Outer Coast of Washington State and Olympic Coast National Marine Sanctuary, 2014*. NOAA's Office of National Marine Sanctuaries produced the report in collaboration with NOAA's National Centers for Coastal Ocean Science, Ecotrust/Point97, Surfrider Foundation, and Washington State. Information was collected from recreational users through an online survey conducted between 2014 and 2015. The survey included a total of 6,219 households representative of all households in the state and yielded a 90.3 response rate. The report is available at <http://sanctuaries.noaa.gov/science/socioeconomic/olympiccoast/>.

SANCTUARY PERMITTING

Issued Permits and Authorizations

OCNMS-2016-009 – Adrienne Sutton, NOAA Pacific Marine Environmental Lab

Project Title: Ocean acidification test bed to evaluate new low-cost, low-power mooring profiling technology

Permitted Activity: Installation of an oceanographic buoy, and altering or disturbing the seafloor in connection with anchor placement

Project Location: Adjacent to Cha'ba and NEMO buoys off La Push, WA

Permit Duration: Six months, April through October 2017

Comment: This permit supports test deployment of pCO₂ sensors in association with other oceanographic installations to test sensor qualities and refine ocean acidification modeling.

Pending Permit Requests

OCNMS-2016-010 – Chris Morgan, NatureBridge

Project Title: NatureBridge Drift-Card Citizen Science Project

Permitted Activity: Discharge to sanctuary waters, specifically discharge of biodegradable (thin plywood) drift cards from shoreline locations

Project Location: Proposed discharge sites are Cape Flattery, Cape Alava, and Second or Third Beach

Permit Duration: One year requested; multi-year permit may be considered

Comment: This permit supports continuation of a NatureBridge field science program to engage students in education of marine currents and ocean stewardship. Approval from Olympic National Park and tribal landowners will be required to support sanctuary permit issuance.

OCNMS-2017-001 – Consortium for Ocean Leadership - OOI

Project Title: Ocean Observatories Initiative - Endurance Array 25m Inshore Mooring and Glider Operations
Permitted Activity: Installation of buoys, and altering or disturbing the seafloor in connection with anchor placement
Project Location: Near southern boundary of OCNMS, off Copalis Head
Permit Duration: Original permit was for three years, currently through June 2018. Amended permit will extend through the end of 2019.
Comment: Permit OCNMS-2015-001 needs to be reissued as a new permit to update to current OOI staff. Based on a review of backscatter imagery, there will be a minor revision on the mooring location.

OCNMS-2017-002 – U.S. Fish and Wildlife Service
Project Title: Aerial Surface-nesting Seabird Survey
Permitted Activity: Low-altitude overflights of migratory seabirds on or near Washington Islands National Wildlife Refuge Complex Islands
Project Location: Airspace above NWR islands
Permit Duration: Five years
Comment: Permit OCNMS-2012-005 needs to be reissued as a new permit to update to current USFWS staff and extend permit dates.

MULTI-2017-001 – Annette Henry, Southwest Fisheries Science Center
Project Title: Drifting acoustic spar buoy recorders (DASBR) Passive Acoustic Monitoring of Cetaceans
Permitted Activity: Discharge of drifting buoys
Project Location: Throughout the California Current Ecosystem
Permit Duration: Through the end of 2019
Comment: This is a multi-sanctuary permit for all west coast sanctuaries. MBNMS is the lead for processing the permit.

LEARN ABOUT YOUR SANCTUARY / NATURAL HISTORY

Humpback Whale Monitoring Program Results Point to Origin of Whales Migrating Through OCNMS



Results of a 30-year monitoring program of humpback whales (*Megaptera novaeangliae*) in Glacier Bay National Park revealed interesting aspects of the species' natural history. Humpback whales were once considered endangered, but current science indicates that 9 of the 14 distinct population segments are no longer endangered or threatened, including the Hawaii population of humpbacks that feed in SE Alaska in summer months. Monitoring in Glacier Bay demonstrated long-term site fidelity, with about a quarter of the current population sighted over 30+ years of monitoring. Other findings include >75% of females had their first calf by age 13; the maximum female reproductive span was 32 years; the maximum number of calves was 11. About half the humpback

whales that feed off the Washington coast in summer months are from the Hawaiian population (considered a healthy population segment), while other humpbacks are from the Mexico population (Endangered Species Act-listed as threatened) and Central America population (ESA-listed as endangered). More information is available at www.fpir.noaa.gov/PRD/prd_humpback.html

Burrowing Sea Cucumbers Emerge Due to High Surf and Waves on Outer Coast

High surf and big waves in mid-January moved sand around and left a bunch of curious sea life alive and stranded on top of the beach. These odd-looking creatures are called rat-tailed sea cucumbers (*Paracaudina chilensis*), a species that is patchily distributed on open-coast, sandy beaches. These sea cucumbers are a food source for birds and other animals. Unlike sea cucumbers commonly found on the seafloor surface, rat-tailed sea cucumbers have no tube feet and are subsurface deposit feeders. Their "tail" end is opposite their mouth. Fleshy "respiratory trees" (comparable to gills) emerge from their tails and can be seen projecting from the sand when covered with water. Sea cucumbers are echinoderms (phylum Echinodermata), like sea urchins and sea stars. Echinoderms typically have pentaradial, or five-sided, symmetry (think of the pattern of holes on the surface of a sand dollar test or shell). A definitive characteristic of rat-tailed sea cucumbers is the five internal, longitudinal muscle bands. Normally, it takes big waves to erode sand and expose these interesting creatures to human visitors to the beach.



REGIONAL / NATIONAL MARINE SANCTUARY SYSTEM NEWS

Risk of Toxic Shellfish on West Coast Increases with Water Temperature

High levels of domoic acid, a shellfish toxin, are correlated with warmer ocean temperatures offshore of Oregon and Washington. National Center for Coastal and Ocean Science supported researchers led by scientists from Oregon State University found an association between domoic acid levels in shellfish and climate-scale warm ocean conditions in a study that gives a unique, large-scale perspective relative to previous work. The strong connection with anomalously warm ocean conditions has implications for greater outbreak occurrence as oceans continue to warm due to climate change. The study also produced a climate-based model, which predicts the time and location of domoic acid levels that could exceed public safety limits in Oregon, Washington, and California. This tool, along with the study's findings, will improve managers' abilities to anticipate harmful algal blooms (www.noaa.gov/what-is-harmful-algal-bloom) and target fishery closures and openings to avoid economic distress while protecting public health.

Projected Effects of Ocean Acidification in the California Current

A NOAA-supported study projects that Dungeness crab and some commercial finfish species living on the sea floor may decline in future years due to increased ocean acidification in the California Current (<http://oceanservice.noaa.gov/facts/acidification.html>). The estimates were based on computer models forecasting changes in the California Current ocean ecosystem, which includes an expected rise in summer ocean acidification of 50 percent. Other marine organisms, including zooplankton, seabirds, marine mammals, and fish that live in the water column, are expected to be less affected. Scientists used global projections of CO₂ over the next 50 years, chemical and physical ocean data, and the ecology of 75 species to project the future relative abundance of each, along with potential economic impacts. Ocean acidification is expected to directly affect certain food-source species within the marine food web that are eaten by some commercially valuable species, including Dungeness crab, rockfish, and sole.

NOAA Released Draft Plans for Proposed National Marine Sanctuaries in Wisconsin and Maryland

Americans have an unprecedented opportunity to participate in the designation of two new national marine sanctuaries that protect over 200 years of our nation's history and honor the people that risked their lives to better ours. The public is invited to weigh in on two proposals for new NOAA national marine sanctuaries in Wisconsin (<http://sanctuaries.noaa.gov/wisconsin>) and Maryland (<http://sanctuaries.noaa.gov/mallows-bay>) that would protect nationally significant shipwrecks from the 1800s, World War I, and maritime battlegrounds. If designated, these two sites would be the first new sanctuaries since 2000. Both potential sanctuaries were proposed to NOAA through its sanctuary nomination process and received broad community and bi-partisan support. National marine sanctuaries are a type of marine protected area managed for the conservation of their natural and cultural resources, and the promotion of sustainable recreation and tourism. The deadline to submit public comment is March 31, 2017.

ONMS Leads U.S.-France Meeting to Promote Bilateral Cooperation on Marine Protected Areas and Maritime Heritage

On January 18-19, ONMS staff participated at the first U.S.-France bilateral meeting on marine protected area (MPA) cooperation. The meeting took place at the Fred W. Smith National Library for the Study of George Washington, Virginia and was advertised by the French Embassy as part of the Franco-American Climate Talks on Oceans, or FACT-O series. Members convened to define priority topics to implement the current cooperation Memorandum of Understanding (MOU) between ONMS and the French MPA Agency. The meeting served as an opportunity to sign new "declaration on intent" for the cooperation on marine heritage between the two countries, and define its cooperation priorities. Nicole Le Boeuf, Deputy Assistant Administrator for NOAA's National Ocean Service and John Armor, ONMS Director, led the U.S. delegation. Serge Segura, Ambassador of the Oceans, Françoise Gaill, Coordinator of the Scientific Committee of the Ocean and Climate Platform, and Michel L'Hour, from the Ministry of Culture and Communication, led the French delegation. At the end of the day-and-a-half day meeting, the two delegations agreed on a draft workplan, which identified specific topics or activities for bilateral cooperation on connectivity and sister sites, climate change, cultural resources, and education and outreach, and maritime heritage. Members of the two delegations will work on a final workplan over the next few months. This existing framework has promoted the sister park cooperation between Stellwagen Bank National Marine Sanctuary and Agoa Marine Mammal Sanctuary in the French Antilles, and between Papahānaumokuākea Marine National Monument and French territories of French Polynesia and New Caledonia. The U.S. and France controlled the world's two largest exclusive economic zones and share many interests and territories in the wider Caribbean and the Pacific Ocean.



Risk Assessment of Shipping Noise to Baleen Whales off Southern California

Low-frequency noise, which is part of the acoustic environment for baleen whales, has increased in many areas of the northeast Pacific Ocean. ONMS and NOAA Fisheries conducted a risk assessment of noise from commercial shipping in Southern California waters. The assessment explored how noise can be influenced by various place-based management regimes and identified several areas where the acoustic environment may impact blue, fin, and humpback whales because their habitats overlap with areas of elevated noise from shipping traffic. High regional exposure to shipping noise was suggested in Southern California. Channel Islands National Marine Sanctuary was found to be one of the places with lower predicted noise. Learn more at <http://sanctuaries.noaa.gov/science/sentinel-site-program/noise.html>.

Addressing Vulnerabilities of Coastal Ecosystems and Communities Along North America's Pacific Coast

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 Ecosystem, 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.

MARINE-RELATED NEWS COVERAGE

Fisheries Disaster Declared for Local Waters and PNW

"A fisheries disaster has been declared for Grays Harbor, Willapa Bay, coastal waters, and local rivers. In a release, U.S. Secretary of Commerce Penny Pritzker determined there are commercial fishery failures for nine salmon and crab fisheries in Washington, Alaska, and California." www.kxro.com/fisheries-disaster-declared-local-waters-pnw

NOAA Fisheries Wants to Hear From You About Protecting Endangered Killer Whales

"The Fisheries Division of the National Oceanic and Atmospheric Administration wants input from citizens about a proposed 'whale protection zone' along the west side of San Juan Island." <http://q13fox.com/2017/01/18/noaa-fisheries-wants-to-hear-from-you-about-protecting-endangered-whales>

New Marine Wildlife Hospital to Open in Seattle

"Wildlife officials euthanized a very sick sea lion in Port Angeles over the weekend, but the veterinarian who made the tough choice is also creating a marine life hospital to avoid the same reality in the future." www.king5.com/tech/science/environment/new-marine-wildlife-hospital-will-open-in-seattle/388550697

Earth Sets a Temperature Record for the Third Straight Year

"Marking another milestone for a changing planet, scientists reported on Wednesday that the Earth reached its highest temperature on record in 2016, trouncing a record set only a year earlier, which beat one set in 2014. It is the first time in the modern era of global warming data that temperatures have blown past the previous record three years in a row." www.nytimes.com/2017/01/18/science/earth-highest-temperature-record.html?emc=edit_th_20170119&nl=todaysheadlines&nlid=59190854&r=2

NOAA Completes Review of Exposure to a Mixture of Toxic Chemicals

"High levels of contaminants in long-lived Southern Resident killer whales are one of the primary threats to the whales according to a recent National Oceanic and Atmospheric Administration (NOAA) report. Some of the most common persistent organic pollutants in and around Puget Sound are polybrominated diphenyl ethers (PBDEs) in flame retardants and the long-lasting pesticides such as PCBs and DDTs that still exist in the environment." <http://sanjuanislander.com/news-articles/environment-science-whales/whales-2/23912/noaa-completes-review-of-exposure-to-a-mixture-of-toxic-chemicals>

Invasive Species Add Up To Big Losses For Washington

“Invasive species could cost the state of Washington \$1.3 billion a year if left unchecked, a new study found.”

www.opb.org/news/article/invasive-species-add-up-to-big-losses-for-washington/

Orca Protection Zone Proposed Off San Juan Island

“Petitioners have requested a no-go zone for motorboats off San Juan Island to protect southern resident orcas while opponents say that such a move would not solve the real problem— not enough salmon.”

www.peninsuladailynews.com/news/orca-protection-zone-proposed-off-san-juan-island/

Dungeness Crab Vulnerable To Ocean Acidification in Unexpected Ways, Study Finds

“New research shows Dungeness crab fisheries could suffer as the Pacific Ocean grows more acidic. Increasing acidification from carbon pollution will drive down food supplies for crab, according to new scientific modeling from the University of Washington and National Oceanic and Atmospheric Administration.”

<http://kuow.org/post/dungeness-crab-vulnerable-ocean-acidification-unexpected-ways-study-finds>

One Scientist’s Mission To Scan Every Fish On The Planet

“In a tiny island laboratory in the Northwestern-most corner of Washington, one marine biologist is on a mission: scan every known fish species in the world. It’s a painstaking and smelly task, but one that promises to fundamentally change the way scientists and educators look at marine anatomy.”

<http://kuow.org/post/one-scientist-s-mission-scan-every-fish-planet>

Serious Concern for Sunflower Sea Stars

“Science usually happens a millimeter at a time. When looking at an animal population, for example, changes in abundance are often revealed in the data as a slight trend line amid cyclical ups and downs. But then there’s what’s happened to our sunflower sea stars.”

www.islandsweekly.com/news/serious-concern-for-sunflower-sea-stars/

Scientists Learn Why Women Go Through Menopause by Studying Killer Whales

“Scientists allege in a recent study that menopause, when females no longer produce eggs to bear children, was an evolutionary development that helps end conflict between mothers and daughters.”

www.yahoo.com/beauty/science-learned-why-women-go-through-menopause-by-studying-killer-whales-221324299.html

Ocean Acidification to Hit West Coast Dungeness Crab Fishery, New Assessment Shows

“The acidification of the ocean expected as seawater absorbs increasing amounts of carbon dioxide from the atmosphere will reverberate through the West Coast’s marine food web, but not necessarily in the ways you might expect, new research shows.”

www.nwfsc.noaa.gov/news/features/ocean_acidification_west_coast_dungeness_crab_fishery/index.cfm

What Happens When an Endangered Whale Pod Loses its Wise Old Grandma?

“With the death of Granny, the matriarch of the northeast Pacific’s southern resident killer whales, a century’s worth of knowledge and leadership is lost as well.”

www.hakaimagazine.com/article-short/what-happens-when-endangered-whale-pod-loses-its-wise-old-grandma

West Seattle-Based The Whale Trail Expanding Orca Awareness, Again

“That’s a brand-new sign – in San Simeon, California – along The Whale Trail, the shore-based network of whale-watching spots established by the West Seattle-based advocacy group of the same name.”

<http://westseattleblog.com/2017/01/west-seattle-based-the-whale-trail-expanding-orca-awareness-again/>

Drones are Added to Orca Protection Zone

“Most San Juan Islanders know vessels and aircraft can’t be within 200 yards of the Southern resident orcas, thanks to a state law adopted in 2008, but what about drones?”

www.islandsweekly.com/news/drones-are-added-to-orca-protection-zone/

Why Whales Leap Into the Air

“After hundreds of hours of observations, we now know it’s true: breaching humpback whales are yelling.”

www.hakaimagazine.com/article-short/why-whales-leap-air

Evidence Suggests Harmful Algae Blooms Impact Species From Humans To Whales

“There is growing evidence that harmful algae blooms have widespread health impacts on everything from humans to whales.”

<http://kyuk.org/post/evidence-suggests-harmful-algae-blooms-impact-species-humans-whales>

A Look at the Northwest Earthquake That Shook the World

“Just before midnight on Jan. 27, 1700, Japan woke to a massive tsunami, a surprise since no one there felt the earthquake that would’ve caused it. Years later, scientists finally figured out why – it all started in Cascadia, exactly 317 years ago.”

www.seattlepi.com/local/seattle-history/article/A-look-at-the-NW-earthquake-that-shook-the-world-10883711.php

Study: Predators Might Play Major Role in Chinook Declines

“Seals and sea lions are taking a major bite out of the threatened chinook salmon population in Puget Sound, and the competition for food could be having repercussions for endangered Southern Resident killer whales, according to a new study.”

www.kitsapsun.com/story/news/local/environment/2017/01/29/study-predators-might-play-major-role-chinook-declines/97162580/

Researchers: Warm Pacific Water Led to Vast Seabird Die-Off

“A year after tens of thousands of common murrelets, an abundant North Pacific seabird, starved and washed ashore on beaches from California to Alaska, researchers have pinned the cause to unusually warm ocean temperatures that affected the tiny fish they eat.”

www.statesmanjournal.com/story/tech/science/environment/2017/02/10/researchers-warm-pacific-water-led-vast-seabird-die-off/97737418

Scientists Have Just Detected a Major Change to the Earth’s Oceans Linked to a Warming Climate

“A large research synthesis, published in one of the world’s most influential scientific journals, has detected a decline in the amount of dissolved oxygen in oceans around the world — a long-predicted result of climate change that could have severe consequences for marine organisms if it continues.”

www.washingtonpost.com/news/energy-environment/wp/2017/02/15/its-official-the-oceans-are-losing-oxygen-posing-growing-threats-to-marine-life/?utm_term=.4b69dd9e4d1d&wpisrc=nl_green&wpmm=1

La Niña is Out and El Niño May be coming, and Here’s What that Means for Our Weather

“La Niña is over. It only lasted a few months, but tropical warmth is taking over again. While the Pacific will probably hover in the neutral territory between La Niña and El Niño into the summer, some models are hinting El Niño could return as early as this summer.”

www.washingtonpost.com/news/capital-weather-gang/wp/2017/02/09/la-nina-is-out-and-el-nino-is-coming-heres-what-that-means-for-our-weather/?utm_term=.014803f9ff6d

World’s Oldest Wild Bird Has Baby at 66

“Almost every year for six decades, Wisdom the albatross has laid an egg at her home in the Midway Atoll. On February 16, the U.S. Fish and Wildlife Service announced that Wisdom just hatched another chick.”

<http://news.nationalgeographic.com/2017/02/oldest-bird-wisdom-albatross-laysan/>

OCNMS ONLINE

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

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<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's Pacific Marine Environmental Laboratory

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

OLYMPIC COAST NATIONAL MARINE SANCTUARY

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>.

OCNMS Staff

Carol Bernthal – Superintendent

George Galasso – Deputy Superintendent for Policy & Programs

Kevin Grant – Deputy Superintendent for Operations & Administration

Liam Antrim – Resource Protection Specialist

Eric Evans – IT Consultant

Carey Floyd – Graphic and Web Designer

Alisha Friel – NOAA Corps Officer, Vessel Operations Coordinator

Nicole Harris – Education Specialist

Kathy Hough – Survey Technician

Norma Klein – Office Administrator

Karlyn Langjahr – SAC Coordinator and Discovery Center Manager

Jacqueline Laverdure – Education and Outreach Coordinator

Rebecca Lewis – Education and Stewardship Specialist

Robert Rountree – Visitor Services Specialist

Jenny Waddell – Research Coordinator

Nancy Wright – Geographer

Contact Information

Olympic Coast National Marine Sanctuary

115 East Railroad Ave., Suite 301
Port Angeles, WA 98362
Phone (360) 406-2074
Fax (360) 457-8496

