

OFFICE OF NATIONAL MARINE SANCTUARIES COORDINATION REPORT (April 2024)

Introduction

The National Oceanic and Atmospheric Administration (NOAA) Office of National Marine Sanctuaries (ONMS) serves as trustee for the nation's system of marine protected areas (MPAs). Through active research, management, and public engagement, national marine sanctuaries sustain healthy environments that are the foundation for thriving communities and stable ocean-dependent economies. One of the purposes of the National Marine Sanctuaries Act (NMSA) is to provide authority for comprehensive and coordinated conservation and management of marine areas (Great Lakes included) of special national significance, while also promoting multiple uses. Five national marine sanctuaries are located on the U.S. west coast: Olympic Coast, Greater Farallones, Cordell Bank, Monterey Bay, and Channel Islands (OCNMS, GFNMS, CBNMS, MBNMS, and CINMS, respectively).

Purpose of the Annual Coordination Report

The West Coast Regional Office (WCRO) within ONMS appreciates the invitation to provide this annual coordination report to the Pacific Fishery Management Council (PFMC or Council). Since the first invitation in 2017, our relationship has continued to improve through knowledge and recognition of our individual mandates and shared responsibilities. The report contains an update of the following activities implemented in 2023 and likely activities in 2024: nominations and designations; condition reports, management plan reviews; climate vulnerability assessments; research and restoration work on deep-sea coral, kelp forests, blue carbon, passive acoustic monitoring, and seabird abundance and diversity; fishing outreach events; and vessel speed reduction efforts to mitigate risk of ship strikes on whales.

NOMINATIONS and DESIGNATIONS

- **Sanctuary Nomination Process – WCRO**

(www.nominate.noaa.gov)

Purpose: In response to widespread interest from the public, in June 2014 ONMS launched a revised process to accept new national marine sanctuary nominations (79 FR 33851). ONMS reviews sanctuary nominations against 11 criteria that are derived in large part from the NMSA. Nominations that successfully pass this review are added to an inventory of areas ONMS may consider for potential designation as a national marine sanctuary. The preamble to the final rule establishing the sanctuary nomination process states, “if NOAA takes no action on the nomination in the inventory, the nomination will expire after five years from the time it is accepted to the inventory.” ONMS subsequently clarified the process for assessing the continuing viability of nominations that are nearing the five-year expiration mark (84 FR 61546; November 2019), in essence to determine if the nomination after five years is still responsive to the 11 sanctuary nomination criteria described in the 2014 final rule. A sanctuary nomination is not the same as a sanctuary designation. Designation is a separate process that by law is highly public and participatory, and often takes several years to complete.

Outcome: ONMS strives to maintain a vibrant list of relevant nominations on the inventory. On the west coast, the second submission for a proposed Chumash Heritage National Marine Sanctuary (CHNMS), off central California, was added to the inventory in October 2015. A five-year review was completed for CHNMS in October 2020, with the nomination remaining in the inventory. The St. George Unangan Heritage National Marine Sanctuary (SGUHNMS) nomination, surrounding St. George Island in the Bering Sea, was accepted and added to the inventory in January 2017. A five-year review was conducted in late 2021 and early 2022, with ONMS deciding to keep SGUHNMS in the inventory for another five years. In addition, ONMS has received a sanctuary nomination from the Aleut Community of St Paul Island, Alaska. The nomination, Alaġum Kanuuġ (Heart of the Ocean; Pribilof Islands Marine Ecosystem (PRIME) Initiative; pronounced ahl-ah-GOOM ka-NOH) was submitted in December 2021 and accepted into the inventory in June 2022. As a reminder, there have been two other nominations on the west coast that were not accepted into the inventory: 1) Aleutian Islands National Marine Sanctuary, covering most of Western Alaska, the Bering Sea, and the Aleutian Islands (declined in January 2015); and 2) Southern California Offshore Banks proposal, representing Cortes, Tanner, Cherry, and Northwest Banks, and Garret Ridge (declined in March 2018).

Timelines for Designation: Six nominations are in the designation process: Lake Ontario in New York (initiated in April 2019), Papahānaumokuākea in Hawaii (initiated in November 2021), Chumash Heritage in California (initiated in November 2021; see below), Hudson Canyon in New York (initiated in June 2022), Pacific Remote Islands (initiated in April 2023), and Lake Erie Quadrangle in Pennsylvania (initiated in May 2023).

Other Nominations in the Inventory: St. George Unangan Heritage (accepted in January 2017) and Alaġum Kanuuġ: Heart Of The Ocean (accepted in June 2022). In August 2023, the nominating party requested withdrawal of the Mariana Trench nomination (originally accepted in March 2017). Upon reviewing updated information from the nominating party, the Governor, and public comments as part of the 5-year review process, ONMS determined that the nomination did not continue to meet the criteria under the NMSA. Thus, the nomination was removed in September 2023.

- **Chumash Heritage National Marine Sanctuary Designation - WCRO**

(<https://sanctuaries.noaa.gov/chumash-heritage/>)

Purpose: The purpose of the CHNMS nomination is to conserve, study, and interpret the proposed area's abundant, nationally-significant natural, historical, and cultural resources and maritime heritage, including Indigenous cultural heritage. The nomination stretches from Cambria along the San Luis Obispo County coast to Gaviota Creek in Santa Barbara County, then offshore along the western edge of the Channel Islands and boundary of CINMS, and back offshore to the north reconnecting near Cambria, along the southern boundary of MBNMS. It contains an internationally-significant ecological transition zone, supporting high biological diversity and densities of numerous important species. Important deep-sea features within the proposed sanctuary include Rodriguez Seamount, Arguello Canyon, and the Santa Lucia Bank. The nomination submitted by a large community consortium led by the Northern Chumash Tribal Council stated their view that

the proposed sanctuary should not impose future sanctuary regulations affecting commercial fisheries or recreational fishing. The nomination identified considerable threats to resources including existing and potential future oil and gas development, offshore wind farms, submarine cables, marine transport of spent nuclear waste, and decommissioning and removal of offshore and coastal energy facilities for which a sanctuary could be ideal. The nomination recognized national marine sanctuaries can provide a single forum for comprehensive, ecosystem-based and community-based planning for multiple uses. The nomination was added to the inventory of candidate sites for future designation with community support from the public, elected officials, businesses, scientists, and environmental groups.

Outcome: NOAA announced on November 10, 2021 that the agency was initiating a process to consider designating CHNMS. Throughout 2022, ONMS staff evaluated scoping comments and conducted necessary assessments, meetings, and public workshops to understand and receive feedback on key issues and produce the draft designation documents. These included interagency and tribal consultation meetings such as the PFMC meetings in September and November 2022. At its meeting on November 6, 2022, the PFMC decided not to recommend any fishing regulations to implement the proposed designation but expressed a willingness to reconsider in the future should new information about the need for fishing regulations arise. The PFMC documented this decision in a letter to ONMS WCRO dated December 1, 2022.

ONMS accepted the PFMC's response relative to the proposed designation of CHNMS. NOAA released the draft designation documents—a draft management plan, a proposed rule, and a draft environmental impact statement (EIS)—on August 25, 2023, and the public comment period ended October 25, 2023. The draft EIS analyzed the beneficial and adverse impacts of designating the area originally proposed for the sanctuary, as well as four smaller and two larger boundary alternatives. The proposed designation includes about a dozen regulations familiar to other national marine sanctuaries on the west coast. The proposed regulations did not contain any fishing regulations.

NOAA identified an Agency-Preferred Alternative for the proposed sanctuary would stretch along 134 miles of coastline from Montaña de Oro State Park in San Luis Obispo County to Naples, California, along the Gaviota Coast in Santa Barbara County and would encompass 5,617 square miles. NOAA received over 110,000 comments during the public comment period and is currently reviewing and developing responses to these comments and making adjustments to the designation materials. Following public comment on the draft designation documents, pursuant to the National Environmental Policy Act (NEPA), NOAA may choose to select a new boundary alternative in the final EIS that is within the geographic and regulatory scope of the alternatives considered in the draft EIS.

In addition to regulations that would protect habitat and species, water quality, and other resources within the sanctuary, NOAA would publish a sanctuary management plan that describes the various non-regulatory programs and initiatives that would be carried out in managing the new sanctuary. The draft management plan included a description about co-stewardship programs with Tribal and Indigenous communities, as well as the various community-based and ecosystem-based management actions.

The draft EIS identified numerous beneficial impacts from designating the Initial

Boundary Alternative and several of the alternatives, specifically to physical resources (i.e., air quality and climate change, water quality, oceanography, and geology); biological resources; commercial fishing and aquaculture; cultural heritage and maritime heritage resources; socioeconomics, human uses, and environmental justice (e.g., recreational fishing); and Department of Defense and Department of Homeland Security activities. These benefits would result largely through sanctuary regulations that would limit the scale and scope of offshore development activities and other human uses that could harm the natural, historical, and cultural resources within the sanctuary. As discussed in the draft EIS and draft management plan, the proposed sanctuary would provide conservation and comprehensive ecosystem-based management to address threats to these nationally significant resources. The sanctuary designation would conserve the area's rich biodiversity and create new opportunities for scientific research, education, and economic development, including responsible recreation and tourism. The opportunity to raise public awareness of tribal and Indigenous cultures, incorporate Indigenous knowledge into sanctuary management, and protect resources essential to these cultures, was a core motivation in the nomination of the sanctuary.

For copies of all of the nomination and draft designation materials, see the sanctuary designation website: <https://sanctuaries.noaa.gov/chumash-heritage/>.

Timeline: NOAA anticipates a decision on whether or not to designate the sanctuary by mid-2024. ONMS staff are currently preparing final documents for the sanctuary management plan, regulations, EIS, and response to comments, based on public comments on the draft designation materials. The NMSA provides various consultation review periods for the governor and Congressional committees before a sanctuary designation becomes final. For more information contact Laura Ingulsrud (laura.ingulsrud@noaa.gov).

CONDITION REPORTS

- **Condition Report Update – GFNMS**

Purpose/Process: When completed, the condition report will serve as the basis to initiate the joint GFNMS-CBNMS management plan review process (see below). The completed report will document the condition of sanctuary resources and ecosystem services between 2010 and 2022. NOAA expanded the sanctuary in 2015 and this condition report will be the first sanctuary assessment to include the expansion area. The condition report will also include ecosystem services as part of the assessment of the overall condition of GFNMS.

Timeline: The report is currently being copy edited and prepared for publication. The target date for final condition report publication is June 2024.

Partners: MBNMS, Point Blue Conservation Science, NOAA Fisheries, Central and Northern California Ocean Observing System (CeNCOOS), NOAA National Centers for Coastal Ocean Science (NCCOS), University of California (UC) Davis, San Francisco State University (SFSU), California Department of Fish and Wildlife (CDFW), California Department of Public Health (CDPH), National Park Service (NPS), Marine Mammal Commission (MMC), Oregon State University (OSU), Cascadia Research, Alvaro's Adventures, Greater Farallones Association (GFA), U.S. Fish and Wildlife Service (USFWS), Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO), Multi-

Agency Rocky Intertidal Network (MARINe), Farallon Institute, Bureau of Ocean Energy Management (BOEM), California State University (CSU) Fullerton, and CSU Long Beach.

- **Condition Report Update – CBNMS**

Purpose/Process: The condition report focused specifically on CBNMS will serve as the basis to initiate the GFNMS-CBNMS management plan review process (see below). The final report, initiated in 2021, documented the condition of sanctuary resources and ecosystem services between 2009 and 2021. NOAA expanded the sanctuary in 2015 and this condition report will be the first sanctuary assessment to include the expansion area. The condition report will also include ecosystem services as part of the assessment of the overall condition of CBNMS.

Outcome: The sanctuary’s habitats were found to be in good condition overall, with good water quality throughout the assessment period. Biodiversity appeared to be good and relatively stable. Living resources in the sanctuary are diverse, and were given a range of status and trend ratings. The primary pressures identified for the sanctuary include effects related to climate change, such as marine heatwaves and ocean acidification, as well as other human-related impacts like fishing, vessel activity, and marine debris. Ecosystem services the sanctuary supports include science, education, sense of place, heritage, consumptive and non-consumptive recreation, and harvest. These are likely to have a significant influence on the status and trends of sanctuary resources in the future, and it is important that the sanctuary works with partners moving forward. Read the [full report](#), [executive summary](#), [quick look](#), and [webstory](#).

Timeline: The final report was published in July 2023.

Partners: Point Blue Conservation Science, NOAA Fisheries, CeNCOOS, NOAA NCCOS, California Academy of Science, Farallon Institute, Smithsonian Institute, UC Davis, SFSU, CDFW, OSU, CDPH, NPS, MMC, Cascadia Research, Bay Area Underwater Explorers, Alvaro’s Adventures, Oakland Museum of California, National Estuarine Research Reserve (NERR), Dominican University, Environmental Action Committee, GFA, and Cordell Marine Sanctuary Foundation.

- **Sanctuary Watch / Web-Enabled Condition Reports**

Purpose: Easy access to information for tracking ecosystem conditions, human connections, and management impacts is critical to timely, effective, and community-based resource management. The new Sanctuary Watch website, <https://sanctuarywatch.ioos.us/>, hosts interactive tools to better inform sanctuary management, including the web-enabled Condition Reporting (WebCR) platform. WebCRs pair artwork with information to make it easy to explore and track how ecosystem conditions are changing at a sanctuary. Sanctuary Watch data products and information are developed in collaboration with our data partners at the site, regional, and national level along with science communicators and educators.

Outcome: In 2023, ONMS collaborated with local, regional, and national data partners to develop visualizations of how key components of west coast region sanctuary ecosystems change over time. For example, in collaboration with the California Current Integrated

Ecosystem Assessment (CCIEA) team, we developed [a marine heatwave tracker](#) for each of the west coast national marine sanctuaries. Lastly, in 2023 through 2024, ONMS staff have been developing a new web framework to display visualizations of sanctuary data that shows great promise for use across the national marine sanctuary system.

Timeline: In 2024, ONMS will harmonize and update content in the OCNMS and CINMS WebCRs currently available on Sanctuary Watch, as well as release a new WebCR for MBNMS. ONMS will continue to develop new and improved syntheses and visualizations with our data partners.

Partners: NOAA’s U.S. Integrated Ocean Observing System (IOOS), CeNCOOS, SCCOOS, California Cooperative Oceanic Fisheries Investigations (CalCOFI), CCIEA Program, NOAA NCCOS, U.S. Marine Biodiversity Observation Network, MARINE, PISCO, Southern California Coastal Water Research Project (SCCWRP), Point Blue Conservation Science, UC Santa Barbara, UC Los Angeles, UC Santa Cruz, USFWS, NPS, and National Center for Ecological Analysis & Synthesis (NCEAS).

MANAGEMENT PLAN REVIEWS

The NMSA requires NOAA to “evaluate the substantive progress toward implementing the management plan and goals for the sanctuary” and “revise the management plan and regulations as necessary to fulfill the purposes and policies of this chapter” at intervals not exceeding five years (NMSA section 304(e)). Over the last decade, ONMS has strived to complete a sanctuary condition report, which describes the conditions of the sanctuary ecosystem in advance of a comprehensive management plan review for each sanctuary site. The condition report sets the stage for evaluating previous management efforts as well as the relevance of existing goals and objectives of the sanctuary. When a sanctuary pairs the condition report with the onset of sanctuary management plan review it helps create a clear link between resource protection needs and management priorities.

Nearly all national marine sanctuaries on the west coast are currently engaged with condition report development or management plan review, yet at different stages of the process. The revised management plan for MBNMS was published in 2021. Below is a summary of regional progress for the other west coast sanctuaries:

- **Management Plan Review – CINMS**

(<https://channelislands.noaa.gov/manage/plan/revision.html>)

Purpose/Process: The revision process for the 2009 CINMS management plan began in 2019, and culminated in March of 2023 with the publication of the revised final management plan and final environmental assessment. Leading up to publication, ONMS spent considerable time reviewing past actions, looking closely at the condition of and threats to the sanctuary’s resources, learning from Chumash community members, listening to and reviewing public input, and engaging in thoughtful discussions with the CINMS Advisory Council.

Outcome: CINMS published an updated sanctuary management plan containing programmatic strategies to guide sanctuary activities for 5–10 years, supported by an environmental assessment. The revised 2023 management plan continues to focus on

understanding and protecting the resources of CINMS, but also includes 11 new action plans detailing specific strategies and activities to address priority issues and to sustain core programming over the coming decade. The action plans are grouped into two main management themes: issue-based and program-based. The issue-based action plans address priority issues (i.e., climate change, marine debris, introduced species, and vessel traffic) identified through the public scoping and Sanctuary Advisory Council input processes.

Timeline: The revision process began in October 2019 and concluded in March 2023. Continued and regular tracking of implementation of actions identified in the plan are already underway. Implementation will be evaluated by performance metrics outlined in the final management plan appendices, and will inform future revisions.

Partners: Public stakeholders, Sanctuary Advisory Council members, federal and state agency partners, and Chumash community members.

- **Management Plan Review – OCNMS**

(<https://olympiccoast.noaa.gov/management/mpr>)

Purpose/Process: An update of the OCNMS 2011 management plan to evaluate substantive progress toward implementing the goals for the sanctuary, and to make revisions to the plan as necessary to fulfill the purposes and policies of the NMSA. NOAA released the Notice of Intent to Conduct Scoping for the OCNMS Management Plan Review on January 30, 2023 and accepted public comments through April 3, 2023. OCNMS staff, in consultation with tribal governments, has drafted a revision to the management plan, incorporating public comments. This draft management plan is currently undergoing review by Sanctuary Advisory Council working groups. ONMS anticipates management plan changes will require preparation of an environmental analysis under NEPA. A minor clarification to OCNMS regulations is under consideration, to ensure safe operations at local airports too close to the sanctuary boundary to meet the 2,000-foot low overflight limit for take off and landing.

Outcome: An updated sanctuary management plan containing programmatic strategies to guide sanctuary activities for 5–10 years, supported by an environmental analysis. The action plans focus around four priority areas, including collaborative management, research and monitoring, resource protection, and education/outreach. This new management plan would place greater emphasis on measuring, mitigating, and adapting to the impacts of climate change.

Timeline: NOAA aims to release the draft management plan, proposed rule, and draft environmental analysis document by the end of 2024.

Partners: Hoh Tribe, Makah Tribe, Quileute Tribe, Quinault Indian Nation, Olympic Coast Intergovernmental Policy Council, OCNMS Advisory Council, Washington State, and other experts from local, state, and federal partner agencies.

- **Management Plan Review – GFNMS/CBNMS**

Purpose/Process: An update of the GFNMS 2014 management plan and CBNMS 2014

management plan (and 2019 rapid management plan review) to evaluate substantive progress toward implementing the goals for the sanctuaries, and to make revisions to the plan as necessary to fulfill the purposes and policies of the NMSA. ONMS will start the process of management plan review for both sanctuaries as one management unit.

Outcome: An updated sanctuary management plan containing programmatic strategies to guide sanctuary activities for 5–10 years, supported by an environmental analysis.

Timeline: ONMS aims to start the scoping process in Winter 2024.

CLIMATE VULNERABILITY ASSESSMENTS

This science-based effort identifies how and why focal resources (habitats, species, ecosystem services, and maritime heritage resources) across a sanctuary region are likely to be affected by future climate conditions. The goal of these assessments is to provide expert-driven, scientifically sound assessments to enable marine resource managers to respond to, plan, and manage for the impacts of climate change to habitats, species, ecosystem services, and maritime heritage resources within that region. This information can help prioritize management actions, and can help managers understand why a given resource may or may not be vulnerable to a changing climate, enabling a more appropriate and effective management response.

- **Climate Vulnerability Assessment (CVA) – GFNMS and CBNMS**

Purpose/Process: ONMS conducted a CVA update for GFNMS and CBNMS together in 2023; both sites completed an extensive CVA of the North-central California region in 2014. This update consisted of expert review of the 2014 scores, revised scores based on new literature, and extensive review by multiple additional subject matter experts.

Outcome: The CVA Addendum to the report, [*Climate Change Vulnerability Assessment for the North-central California Coast and Ocean*](#) (Hutto et al., 2015), provides updated information for 25 of the 40 resources assessed in 2014, and presents first-time assessments for three maritime heritage resource categories. Of the 40 resource assessments conducted in 2014, 25 were identified by experts as requiring revision based on continued changing ecological conditions and improved scientific understanding since the 2015 publication. Revisions included modifications to the vulnerability scores and new information for the narrative descriptions based on experts' current understanding of the resource's exposure to climate change, sensitivity to climate change, and/or its capacity to adapt to these changes. These revisions resulted in increased vulnerability scores for 17 species and 6 habitats. The primary driving factor for increased vulnerability is increased exposure and sensitivity to elevated water temperatures due to the increasing frequency and severity of marine heatwaves. A few resources in particular stand out as having high increases in vulnerability to climate change since the 2015 report, including kelp forest and rocky intertidal habitat, and red abalone, blue whale, pteropod, and krill species. Newly assessed, the potential impact of climate change on maritime heritage resources was rated as high for both nearshore shipwrecks and doghole ports, and low for offshore shipwrecks.

Timeline: The CVA Addendum is under copy-edit review and is anticipated to be published by April 2024.

Partners: The following institutions/organizations have provided expert input and/or review: Several NOAA offices (Office for Coastal Management (OCM), NOAA Fisheries, Office of Protected Resources, and MBNMS), CDFW, U.S. Geological Survey (USGS), USFWS, Elkhorn Slough NERR, NPS, Point Blue Conservation Science, GFA, UC Santa Cruz, UC Davis Bodega Marine Lab (BML), CSU Monterey Bay, San Jose State University (SJSU) Moss Landing Marine Laboratories (MLML), UC Berkeley, and SCCWRP.

- **Climate Vulnerability Assessment (CVA) – OCNMS**

Purpose/Process: The OCNMS Advisory Council convened a working group to conduct the CVA. Adaptation and mitigation strategies were also developed as part of the CVA which was presented through the Sanctuary Advisory Council as recommendations to the OCNMS Superintendent.

Outcome: When published, a CVA report, which highlights vulnerability in the Olympic Coast region, and resulting adaptation and mitigation strategies that should be considered potential management priorities in the site’s management plan review.

Timeline: The CVA draft was shared with the Sanctuary Advisory Council in November 2023 for their review and approval. Once the Sanctuary Advisory Council approves the CVA, the report will undergo peer review before being finalized. This report is anticipated to be published by the end of 2024.

Partners: The CVA is being completed with support of the Sanctuary Advisory Council working group, which includes the following entities: Hoh Tribe, Makah Tribe, Quileute Tribe, Quinault Indian Nation, University of Washington, Washington Sea Grant, NOAA Pacific Marine Environmental Laboratory (PMEL), NOAA Northwest Fisheries Science Center (NWFSC), Northwest Indian Fisheries Commission, Olympic National Park (OLYM), OSU, U.S. Navy, and Sanctuary Advisory Council members representing the Research, Commercial Fishing, and Community at-large seats.

- **Climate Vulnerability Assessment (CVA) – MBNMS and CINMS**

Purpose/Process: The CVAs for MBNMS and CINMS complement similar assessments that have been completed or are being conducted by other west coast national marine sanctuaries, NOAA Fisheries, and CDFW. The MBNMS CVA is based on the CVAs for GFNMS, CBNMS, and OCNMS, with the exception of one new resource assessment for black abalone (*Haliotis cracherodii*). The CINMS CVA is based on a hybrid workshop that was conducted in Fall 2023.

Outcome: The MBNMS CVA assessed 29 species, 8 habitats, 4 ecosystem services, and 2 maritime heritage resource categories. Over 80 experts contributed to and/or reviewed individual reports. The CINMS CVA assessed 22 species representing 6 habitats, as well as 2 maritime heritage resource categories. Over 45 experts contributed to individual assessments during a hybrid workshop. The CINMS CVA workshop report is currently being written, and additional experts are expected to review report drafts.

Timeline: The MBNMS CVA report is expected to be completed by Spring 2024. An early draft of the final report was presented to the MBNMS Advisory Council in Fall 2023

and the final findings will be presented in Summer 2024 in advance of kicking off a Sanctuary Advisory Council working group for Climate Adaptation Planning. An overview of the CINMS CVA workshop was presented to the Sanctuary Advisory Council in November 2023 and they will receive a presentation on the workshop report after it is completed. The CINMS CVA report is expected to be completed by Summer 2024 and will be used for future adaptation planning efforts.

Partners: The following institutions/organizations have provided expert input and/or review: BOEM, UC Davis BML, Cal Poly Pomona, CSU Long Beach, CSU Monterey Bay, CSU Fullerton, Elkhorn Slough NERR, Marine Applied Research and Exploration, Monterey Bay Aquarium Research Institute (MBARI), CINMS, MBNMS, SJSU MLML, NOAA Fisheries, NPS, Oikonos, Paua Marine Research Group, Point Blue Conservation Science, San Diego State University, SCCWRP, UC Berkeley, UC Los Angeles, UC San Diego, UC Santa Barbara, UC Santa Cruz, USFWS, and USGS.

RESEARCH and RESTORATION

- **Deep-Sea Coral Work**

Purpose: Deep-sea habitats in sanctuaries off the U.S. west coast are home to a diverse array of deep-sea corals, sponges, and other habitat-forming invertebrates. Although extremely slow-growing, these long-lived invertebrates form complex three-dimensional structures that provide a number of important ecosystem services. For example, deep-sea corals and sponges are considered essential fish habitat, or habitat required for the growth, reproduction, and survival of fish and other marine organisms. Between 2018–2022, ONMS, NOAA’s Northwest and Southwest Fisheries Science Centers, together with other parts of NOAA and other federal agencies, teamed up for a multi-year deep-sea coral initiative.

Outcome: Large NOAA research vessels and smaller sanctuary vessels were utilized to conduct coast-wide as well as more targeted surveys of the seafloor. Samples of eDNA and water quality as well as physical deep-sea coral and sponge specimens were collected. Remotely operated vehicle (ROV) and autonomous (“uncrewed”) underwater vehicle (AUV) surveys took place in areas subject to change as a result of Amendment 28 and throughout the five west coast sanctuaries. More than 100 visual surveys were conducted within established national marine sanctuaries, and 25 visual surveys were conducted within the proposed CHNMS. Through these surveys, scientists discovered several new species of corals and sponges, characterized a petrale sole spawning aggregation site within the boundaries of the proposed sanctuary, and discovered an expansive, novel glass sponge reef in CINMS. Along with these interesting discoveries, data from newly surveyed areas as well as from revisited sites will continue to contribute to sanctuary monitoring and management.

Timeline: The [final report](#) was published in July 2023.

Partners: The initiative was co-led by NOAA NWFSC, NOAA Southwest Fisheries Science Center (SWFSC), and ONMS. It featured extensive collaboration across NOAA, other federal partner agencies, academia, and non-governmental organizations.

- **Research and Restoration Areas for Deep-Sea Corals**

Purpose: GFNMS and MBNMS have been coordinating closely with NOAA Fisheries and PFMC on a process to designate discrete areas for deep-sea coral research and restoration that are protected from potential impacts from the Pacific Coast groundfish fisheries, while minimizing impacts to the fisheries. PFMC is leading the process with input from NOAA Fisheries and ONMS, and are currently analyzing an action to implement closures to bottom-contact gear at three areas in MBNMS. The areas are at Sur Ridge, Año Nuevo Canyon, and Ascension Canyon. ONMS hosted two public webinars in August and December 2023 to provide information on this process, further explain why protections for deep-sea corals are needed in the national marine sanctuaries, and to solicit feedback. MBNMS aims to reach out to the local fishing community—with a focus on the sablefish pot fishery—to better understand fishing patterns in the proposed areas for deep-sea coral research and restoration.

Outcome: The PFMC action would implement groundfish exclusion areas for the purposes of deep-sea coral research and restoration. The proposed management measures would apply exclusively to the Pacific Coast groundfish fishery.

Timeline: The process kicked off at the September 2023 PFMC meeting with a scoping document, and at that time, the Council made a decision to narrow the scope to include only three areas in MBNMS, excluding areas in GFNMS. At the March 2024 PFMC meeting the Council adopted a range of alternatives that includes Sur Ridge and modified boundaries for Año Nuevo Canyon and Ascension Canyon per the Enforcement Consultants report. A final decision to designate research and restoration areas for deep-sea corals is scheduled for the June 2024 PFMC meeting.

Partners: Fishermen, PFMC, NOAA Fisheries, deep-sea coral scientists from NOAA, and MBARI.

- **Kelp Forest Research and Restoration – MBNMS**

Purpose: In 2021, the California Fish and Game Commission (CFGC) amended sport fishing regulations to allow for unlimited take by recreational divers, using hand-held tools, of purple and red sea urchins in a designated area in Monterey Bay, called Tanker Reef. A collaborative effort to monitor urchin and kelp densities began in April 2021, with research divers from CDFW and MBNMS, which was independent from data collected by divers from Reef Check California (RCCA) and recreational divers (i.e., sport fishers). In addition, CDFW and MBNMS collected data for a centimeter-scale study assessing whether hand-held tools used by sport fishers would 1) damage the reef directly and 2) damage organisms under or adjacent to culled urchins.

Initial results to date from the centimeter-scale study:

- Brittle organisms (e.g., bryozoans) may suffer major/lethal damage;
- Many organisms (e.g., algae, tunicates) show minor signs of damage;
- Some organisms (e.g., anemones) exhibit behavioral responses (such as contracting into a hole) to minimize damage in spite of being particularly vulnerable to punctures by spines from urchins (hiding in the holes);
- Collateral damage occurs to both organisms and the physical reef itself;
- The extent of collateral damage due to culling using hand-held tools by divers is unknown; and

- The magnitude of collateral damage vs. natural damage is unknown.

Timeline: During the February 2024 meeting, the CFGC allowed the fishing amendment at Tanker Reef to sunset as originally planned, on April 1, 2024. Monitoring of kelp and urchins at Tanker Reef will continue through 2024 to determine whether urchin densities remain low in the culled area and if giant kelp continues to grow in the culled area. In a separate study at Tanker Reef, the centimeter-scale project data are being analyzed, and a manuscript is being written for submission to a peer-reviewed journal with a targeted submission date for Fall 2024.

Partners: CDFW, Ocean Protection Council (OPC), RCCA, and Giant Kelp Restoration (G2KR).

- **Kelp Forest Research and Restoration – GFNMS**

Purpose: Greater than 90% of kelp forest biogenic habitat in northern California and within GFNMS has been lost since 2014 and has not recovered due to repeated warm water events lowering reproduction rates of kelp, and disease events removing top predators of kelp forest grazers, red (*Mesocentrotus franciscanus*) and purple sea urchins (*Strongylocentrotus purpuratus*), leading to increased grazing pressure. Recreational red abalone (*Haliotis rufescens*) and commercial red sea urchin fisheries in the region have collapsed, with deleterious cascading effects for other ecosystem components. Research on bull kelp restoration techniques is needed to understand whether and how restoration can be effective on the north coast of California.

Outcome: The project team seeks to develop and evaluate restoration techniques and strategies, and develop a network of partners and experts to contribute to the effort to support restoration of bull kelp in GFNMS. GFNMS-CBNMS, GFA, and our partners identified research and restoration sites using a variety of criteria including an evaluation of kelp persistence and site access. Sites selected are Fort Ross Cove, Timber Cove, Ocean Cove, and Stillwater Cove in Sonoma County. Depending on location, in 2023, the field team and partners conducted activities including kelp canopy mapping to identify areas of kelp persistence, environmental monitoring, ecosystem assessments, kelp propagation, outplanting methods testing, assessment of urchin removals, and kelp wrack surveys. A total of \$9.2 million in funding was received from: federal appropriations, NOAA Office of Habitat Conservation, Coastal Resilience Fund administered by the National Fish and Wildlife Foundation, Environmental Enhancement Fund administered by CDFW, Pacific States Marine Fisheries Commission, San Francisco Bay Estuary Fund, California Sea Grant, and OPC.

Timeline: In 2023, the partners began research to inform future restoration efforts. Research will be ongoing with the project moving to the restoration phase at a date to be determined.

Partners: MBNMS, CINMS, GFA, National Marine Sanctuary Foundation (NMSF), CDFW, SJSU MLML, Sonoma State University, Stanford University, UC San Diego Scripps Institution of Oceanography (SIO), UC Santa Cruz, UC Davis BML, UC Davis Coastal and Marine Sciences Institute, UC Los Angeles, CSU Monterey Bay, Woods Hole Oceanographic Institution, University of Wisconsin Milwaukee, Fort Ross Conservancy,

California Ocean Science Trust, California State Parks, NPS, The Nature Conservancy, Kashia Band of Pomo Indians, Sherwood Band of Pomo, and local commercial divers.

- **Blue Carbon Research – Carbon Sequestration in Soft Seabed Habitats**

Purpose: Blue carbon processes, including sequestration by marine plants and algae, as well as deep-sea carbon export by marine megafauna and phytoplankton, are critical components of natural sequestration in the ocean. Long-term storage of carbon sequestered in the marine environment occurs in the ocean’s sediments, which represent the largest non-fossil pool of organic carbon on the planet, yet are not well studied or protected. Current understanding of the spatial distribution of carbon in marine sediment remains limited along the U.S. west coast, constraining meaningful management and protection of these critically important carbon sinks. As requested by GFNMS-CBNMS in response to parts 1 and 2 of this series, the GFA, in partnership with NOAA OCM, conducted the first systematic evaluation of marine sedimentary carbon stocks in north-central California.

Outcome: [Blue Carbon in MPAs: Part 3, An Evaluation of Sedimentary Carbon Stocks in Greater Farallones and Cordell Bank National Marine Sanctuaries](#) provides a first-order estimate of the marine sedimentary carbon stock within surficial (top 10 centimeter) marine sediments in GFNMS, CBNMS, and the northern portion of MBNMS. The report presents a spatial model of carbon density based on a novel relationship between sediment grain size and percent organic carbon. Results show surficial sediments in these sanctuaries, which accumulated over hundreds to thousands of years, hold approximately 9 ± 3.4 million metric tons of carbon (32 million metric tons of carbon dioxide), which is equivalent to the emissions from burning 3.5 billion gallons of gasoline.

Timeline: The report was published in November 2023, and results will be used to inform the upcoming revised joint management plan for GFNMS and CBNMS.

Partners: The study was conducted as a partnership between NOAA ONMS, NOAA OCM, and GFA. Reviewers and contributors to the report include: USGS; University of St Andrews; International Partnership on Biodiversity, MPAs, and Climate Change; and the University of Colorado, Boulder.

- **West Coast Soundscapes Work**

Purpose: All west coast sanctuaries are situated within the ecologically productive California Current Ecosystem. Some parts of sanctuaries are adjacent or near to highly populated cities serving as epicenters of shipping, military, fishing, offshore renewable energy development, construction, and recreational activity. All of these human activities generate sound on varying levels and can negatively impact living marine resources, such as marine mammals, fish, and invertebrates. ONMS is charged with supporting multiple uses of sanctuary waters and a thriving blue economy, while minimizing negative impacts to living resources and habitat. Underwater noise presents a unique challenge in balancing these objectives because it is widespread and variable, and is also influenced by the environment, including the changing climate. It is also unregulated. Sound data is uniquely useful in providing insight into the presence of marine animals, environmental conditions, and human uses—and importantly how all three overlap in time and space, known comprehensively as the “soundscape.” Passive acoustic monitoring is a critical observation

approach to characterize marine habitats, describe human uses, identify species distributions and seasonal presence within sanctuaries, measure impacts, and support resource protection activities.

Outcome: Currently, passive acoustic monitoring in and around sanctuaries provides continuous, long-term observations of the broadband soundscape at 18 listening stations across the west coast. These 18 observation stations are maintained by a team of partners and coordinated by ONMS. This sanctuary-focused array of underwater recorders is further coordinated within a broader west coast Ocean Sound Observation Network (OSON) of listening stations. Across OSON, sound data is collected, quality controlled, and analyzed according to established field standards, and both raw data and products are archived at NOAA’s National Centers for Environmental Information (NCEI) passive acoustic data repository (ncei.noaa.gov/products/passive-acoustic-data). Sound indicators (e.g., vessel noise, fish presence, marine mammal distributions) inform each sanctuary’s condition reporting process by tracking status and trends of resources and describing impacts. Passive acoustic monitoring in the proposed CHNMS region is supporting the sanctuary designation process and establishing baseline understanding of conditions ahead of any increase in human activity offshore, such as offshore wind development. In 2023, two new listening stations along the central California coast were initiated via partnerships across NOAA, industry, and academic institutions just south of the Morro Bay Wind Energy Area, and inside an area off Vandenberg Space Force Base approved for a floating wind farm project, known as CADEMO (cademo.net). In 2024, a third listening station will be initiated in the Humboldt Wind Energy Area. Lastly, through a large west coast region partnership with agencies, foundations, industry, consulting firms, and academic institutions, sound data from sanctuary monitoring provides the ocean noise reduction measured values resultant from vessel speed reduction voluntary programs, such as Blue Whales Blue Skies (bluewhalesblueskies.org), which is one of three conservation benefits of slowing ships in important whale habitat.

Timeline: While sanctuary partners have been monitoring sound along the west coast for decades, the U.S. Navy and ONMS began a nationally coordinated sanctuary soundscape monitoring program in 2018 called “SanctSound.” The seed investment for the SanctSound project sunset in 2022 and the project culminated with releasing web and data portals (sanctsound.ioos.us). In 2022, ONMS used SanctSound as a springboard to enhance and expand passive acoustic monitoring in sanctuaries and has continued monitoring with a cost-share model across agencies (e.g., NOAA, BOEM, U.S. Navy), foundations, academic institutions, and other partners. Long-term sound monitoring in sanctuaries will continue indefinitely (sanctuaries.noaa.gov/science/monitoring/sound).

Partners: U.S. Navy, Naval Postgraduate School, NOAA Fisheries, UC San Diego SIO, MBARI, Cal Poly San Luis Obispo, UC Santa Cruz, NOAA IOOS, NOAA NCEI, Southall Environmental Associates, Monterey Bay Aquarium, California Marine Sanctuary Foundation, NMSF, SJSU MLML, Axiom Data Science, BOEM, OSU, NOAA PMEL, Blue Whales Blue Skies, Enhancing Cetacean Habitat and Observation (ECHO) Program, Cal Poly Humboldt, and SFSU.

- **Seabird Research**

Purpose: Nancy Foster Scholar and PhD Candidate, Tammy Russell (UC San Diego SIO)

has analyzed spatial patterns of seabird abundance and diversity across the entire U.S. west coast to assess how well sanctuaries capture seabird diversity and abundance.

Outcome: The research found that overall, seabird relative abundance and diversity are higher within national marine sanctuary boundaries compared to outside, that seabird diversity reflects an increasing trend with increasing latitude, and that diversity, abundance, and survey effort were higher on the shelf and in areas closer to shore. Although relative abundance and diversity of seabirds within sanctuaries were broadly representative of corresponding biogeographic regions, the overall sanctuary network captures a range of distinct seabird communities, represented as different proportions of species, species groups, resident and migratory birds, foraging guilds, etc. The analysis of this extensive dataset provides a better understanding of seabird spatial patterns and their ecological roles within different regions, thus increasing our understanding of marine predator dynamics across national marine sanctuaries in the California Current (Russell et al., 2023)¹.

Timeline: Russell's research on spatial patterns of seabirds along the west coast was published in March 2023 (Russell et al., 2023). An analysis is underway to identify temporal patterns for seabirds along the west coast, and results are expected to be submitted for publication later this year.

Partners: UC San Diego SIO.

OUTREACH and PARTNERSHIPS

- **Get Into Your Sanctuary at MBNMS – Enhancing Recreational Fishing Opportunities**

Purpose: ONMS hosts annually the Get Into Your Sanctuary (GIYS) weekend (first weekend of August) and the GIYS photo contest. GIYS raises awareness about the natural and cultural importance of our national marine sanctuaries and sustainable and responsible ways humans can enjoy, while also protecting these federal MPAs.

Outcome: For GIYS 2023, the MBNMS visitor centers—Coastal Discovery Center in San Simeon and Sanctuary Exploration Center in Santa Cruz—held Zero Waste Fish Fests. MBNMS offered fishing from the two piers located near the visitor centers. A myriad of fish-related activities were provided to the over 500 visitors, including families, at the two visitor centers on July 29, 2023. Activities included fish printing (Gyotaku), plankton tows and food web education, scavenger hunts, and booths by community collaborators, with an emphasis on fishing. Through a variety of activities, messages to participants included recycling no-longer-needed fishing line, fish identification, sustainable fishing practices, and reducing plastics in the ocean.

Timeline: These GIYS events were held on July 29, 2023 at both visitor centers.

Partners: NOAA SWFSC Santa Cruz, CDFW, Bay Area Sportfisher Group, Cambria Fishing Club, and Capitola Boat Rentals.

¹ <https://doi.org/10.1016/j.jmarsys.2023.103887>

- **Fishermen in the Classroom – GFNMS and CBNMS**

Purpose: Students interact with and learn directly from a commercial fisherman about the lifestyles and challenges of providing seafood products to consumers.

Outcome: The sanctuaries delivered Fishermen in the Classroom education programs to 100 students in San Francisco and Point Arena where students interacted with and learned directly from a local fisherman alongside a sanctuary educator. In San Francisco, students interacted with and learned about industrial crab traps, salmon fishing gear, and participated in a dissection of a hatchery salmon. Students learned about the lifestyles and challenges of being a fisherman in central California. In Point Arena, students interacted with and learned about the urchin fishery and the severe impacts it has faced with the expansive loss of bull kelp along the Sonoma coast. Students learned how kelp loss impacts the coastal community and economy, and how commercial urchin divers are working alongside conservation organizations to restore the North Coast kelp ecosystem. A sanctuary education specialist led the presentations with an introduction to the sanctuary system and explained the importance of fishing communities to our west coast sanctuaries.

Timeline: Fishermen in the Classroom programs took place January–November, 2023.

Partners: GFA and fishermen/fisherwomen Grant Downie and Sarah Bates.

- **Get Into Your Sanctuary – Recreational Fishing Opportunities for Veterans in OCNMS and Tide Pooling on the Olympic Peninsula**

Purpose: As noted above for MBNMS, every year ONMS tries to host GIYS activities, including in OCNMS.

Outcome: For GIYS 2023, OCNMS chartered a recreational fishing vessel out of Neah Bay, Washington and brought a group from the Olympic Peninsula Veterans to fish in the waters co-stewarded by the Makah Tribe and OCNMS. Further south near Kalaloch, OCNMS staff led curious visitors to OCNMS and OLYM on a guided tidepool exploration to learn about how to safely enjoy discovering the amazing creatures who call these areas home.

Timeline: These GIYS events were held on August 3, 2023 at Makah Marina in Neah Bay, Washington, and Beach 4 Kalaloch, Washington.

Partners: Washington Tribal Assistance Resource Center, Sarge’s Place, Windsong Charters, and OLYM.

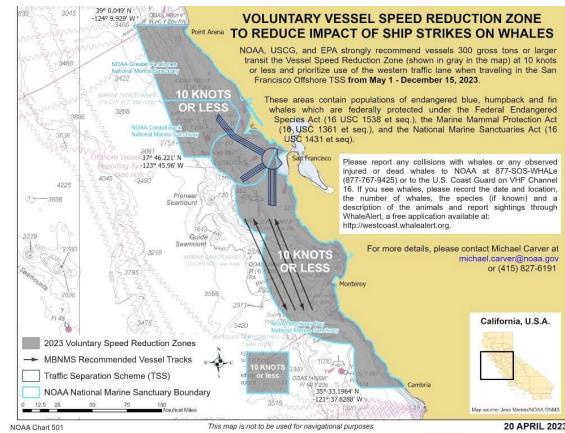
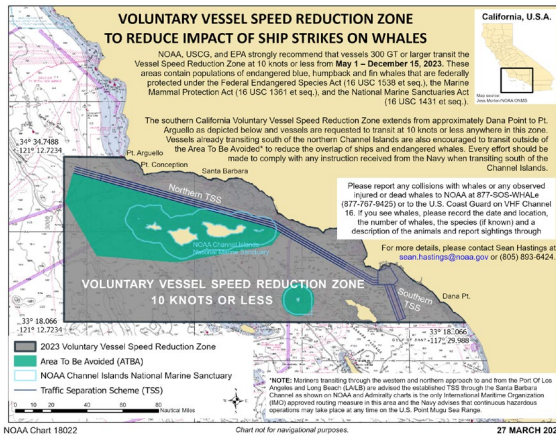
RESOURCE PROTECTION

- **Shipping and Whales**

Purpose: The purpose of the voluntary seasonal Vessel Speed Reduction (VSR) program off California is to reduce the risk of fatal ship strikes to endangered blue, fin, and humpback whales, reduce ocean noise, and protect public health within and near GFNMS, CBNMS, MBNMS, and CINMS. These species are protected under the Federal Endangered Species Act (16 U.S.C. 1538 et seq.), the Marine Mammal Protection Act (16

U.S.C. 1361 et seq.), and the NMSA (16 U.S.C. 1431 et seq.). Any unauthorized take of whales, even if unintentional, by vessels transiting in U.S. waters violates federal statutes.

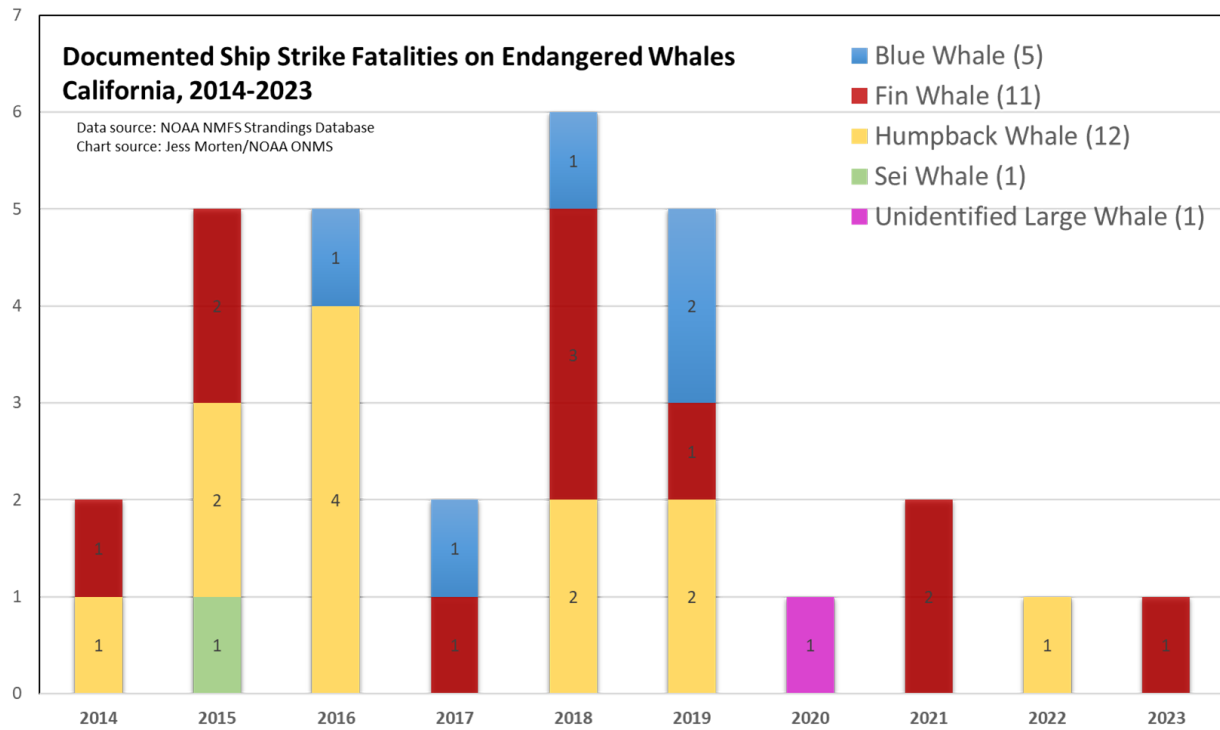
In 2023, between May 1 and December 15, NOAA, U.S. Coast Guard (USCG), and U.S. Environmental Protection Agency (EPA) requested all ocean-going vessels (≥ 300 gross tonnage) traveling through the VSR zones voluntarily reduce speeds to 10 knots or less. Based on recommendations from the MBNMS Advisory Council in February 2023, MBNMS joined the VSR program, on the scale of the entire sanctuary.



Outcome: Results from the 2023 season are:

- In the southern California VSR zone, ocean-going vessels transited 761,419 total nautical miles with an overall cooperation rate of 64%, up from 60% in 2022.
- In the San Francisco/Monterey Bay VSR zone, ocean-going vessels transited 270,368 total nautical miles with an overall cooperation rate of 67%, up from 61% in 2022.
- Between 2019–2023, 10 ship strike fatalities on endangered whales were observed and documented in California, down from 20 documented ship strike fatalities on endangered whales in the five years prior.²
- Modeled estimates suggest that levels of cooperation achieved by these voluntary VSR efforts have contributed to a reduction of fatal ship strike risk of ~20–25% for humpback and blue whales in these areas off California.

² Observed, documented ship strike data are considered an incomplete tally of the total number of ship strikes due to many factors complicating documentation of ship strikes: struck whales may sink or be carried away from observation by ocean currents; locations where whales wash up are unreachable; and availability of necropsy teams.



Timeline: The VSR season started on May 1 and ended on December 15 in 2023; the start and end dates are subject to extension if whales are present before/after the VSR season.

Partners: NOAA Fisheries, USCG, and EPA.