Briefing on Nearshore and Offshore Open Ocean in Greater Farallones and Cordell Bank National Marine Sanctuaries

This topic briefing focuses on oceanographic conditions and water quality in the coastal and offshore environment. See https://farallones.noaa.gov/manage/sac_meetings.html for other topic briefings for seabirds, marine mammals, or fish species found in this habitat and for conditions in estuaries and lagoons.

State of the Resource

Condition Report Data (in preparation)
CBNMS (2009-2021)

- Eutrophication was not occurring in CBNMS and risks to human health were not a significant concern for CBNMS.
- Other potential stressors were identified, including plastics, vessel discharges, and oil spills, but they are not a major concern for CBNMS.
- Climate-related changes in water quality are a major concern for CBNMS and impacts were observed, namely increased water temperature at the surface and at depth. The 2014-2016 marine heatwave (MHW) resulted in the highest sea surface temperature (SST) on record for this area so far. Extensive harmful algal blooms (HABs) were present and may be increasing. High variability and periods of anomalous conditions appear to be more extreme and longer in duration than in the past. Short periods of low dissolved oxygen were present at Cordell Bank, but severe hypoxia was not observed. These climate-related changes are notable, because they have been linked to changes in some ecosystem components, including altering abundance and distribution of pelagic species, correlations with abundance and size of krill, and the presence and intensity of HABs and domoic acid.

GFNMS (2010-2022)

- Eutrophication was not occurring in GFNMS in offshore waters.
- Species that can produce biotoxins were present; and HABs occurred, especially in 2015–2016. Human impacts from HABs were mitigated by management actions (e.g., shellfish advisories).
- There was improvement in the number of impaired water bodies (waters off of Bolinas Beach were delisted from the 303(d) list as determined by the California State Water Resources Control Board). Beach advisory days for elevated pathogenic bacteria were high in Marin County and low in Sonoma County, as determined by California State Water Resources Control Board and U.S. Environmental Protection Agency.

- Climate-related changes have been documented through several ocean indicators, such as SST and marine heatwaves, dissolved oxygen, and aragonite saturation[1] levels.
    - The 2014-2016 and 2019 MHWs were associated with elevated SST. Habitat compression was observed during the MHWs, limiting the area of prey species for seabirds and marine mammals closer to shore and shifting prey populations into areas of greater risk of whale entanglement and ship strikes.
    - No hypoxic events were observed from sampling at 10 m, 25 m, or 100 m. However, dissolved oxygen was low and near-hypoxic at 25 m and 100 m. Hypoxia occurred only offshore at depths >125 m. Acute effects of the hypoxia events were not detected.
    - Aragonite saturation state reflected corrosive conditions at a depth of 100 m offshore, but these conditions were less frequent nearshore at a depth of 25 m.
- Other stressors to the open ocean ecosystem include microplastics, vessel discharges, oil spills, and dredged material spills. Microplastics were present in GFNMS at levels similar to other ocean environments and can impact wildlife. Large to moderate oil spills did not occur between 2010 and 2021. Small spills of petroleum products from vessel incidents occurred regularly, but data on amounts were limited. No acute impacts were detected. Large amounts of discharges from cruise ships and small amounts of discharges from barges carrying clean dredged sediment occurred.

Climate Vulnerability Assessment Findings

- Vulnerability is calculated from exposure to climate and non-climate stressors, sensitivity to those stressors, and the resource's ability to adapt to the impacts caused by those stressors. Ratings presented are from the original GFNMS and CBNMS 2015 report and from 2023 revisions to some of the indicators in that report.
- Pelagic habitat has moderate vulnerability driven by high exposure to increased temperatures, low dissolved oxygen levels, low pH, changes to upwelling, and altered currents and mixing. Though overall sensitivity is moderate due to low sensitivity to non-climate stressors (e.g., harvest, pollution), sensitivity to climate change is high due to pH, dissolved oxygen, disturbance regimes, dynamic ocean conditions, and upwelling. Pelagic habitat has a high capacity to adapt because of the geographic extent and continuity of the habitat, diversity of component species and functional groups, and structural and functional integrity of the habitat.

Pressures on Open Ocean

Human activities and natural processes can affect the condition of coastal and offshore waters through a variety of pathways. This section has been included to inform the public about the most significant overarching pressures, past, present, and potential, that may impact the open ocean environment. While some pressures are beyond the scope of what ONMS can address, the sanctuaries are monitoring and working on efforts to respond to the following pressures:

[1] "Aragonite is a specific form of calcium carbonate that many organisms produce and use to build their skeletons and shells, and the saturation state is a measure of how easily aragonite can dissolve in the water. The lower the saturation level, the more difficult it is for organisms to build and maintain their protective skeletons and shells." epa.gov

- Vessel Traffic (discharges)
- Climate Change
- Marine Debris (on the surface and in the water column)

Summary of Relevant Regulations

See links to full text, definition, exceptions, and exemptions on the regulations pages of the GFNMS and CBNMS websites.

The following GFNMS and CBNMS prohibitions can prevent impacts to the open ocean from listed prohibited activities:

1. Exploring for, developing, or producing oil, gas or minerals.
2. Discharging or depositing from within or into the Sanctuary any material or other matter.
3. Discharging or depositing, from beyond the boundary of the Sanctuary, any material or other matter that subsequently enters the Sanctuary and injures a Sanctuary resource or quality.

The following GFNMS regulation can prevent additional impacts to the open ocean:

1. Deserting a vessel aground, at anchor, or adrift in the Sanctuary.
2. Leaving harmful matter aboard a grounded or deserted vessel in the Sanctuary.

Summary of Relevant Sanctuary Projects

Conservation Science

- The sanctuaries' science projects study water column biota and oceanographic conditions as part of the Applied California Current Ecosystem Studies (ACCESS; water temperature, salinity, dissolved oxygen, pH, aragonite saturation, phytoplankton and zooplankton abundance and composition, and biodiversity through sampling environmental DNA), and the oceanographic monitoring buoy at Cordell Bank. The NOAA noise reference station measures ocean acoustics (e.g., ships and whale vocalizations). Kelp forest ecosystem health is measured with partners at CDFW, PISCO and GFA, to inform restoration activities. Science staff also interpret NOAA remote sensing data and products to inform understanding of local and regional conditions, such as habitat compression, and upwelling conditions.
- The conservation science team works with partners including Point Blue Conservation Science, UC Davis Coastal and Marine Sciences Institute's Bodega Marine Laboratory, and San Francisco State University, Estuary & Ocean Science Center to collect and interpret data, and works with the resource protection team to identify issues and with the education team to share findings.

Resource Protection

- The sanctuaries review project proposals, including proposed actions from other agencies that could potentially violate sanctuary regulations or are likely to destroy, cause the loss of, or injure sanctuary resources in the open ocean.

- Through permitting actions the sanctuaries manage, reduce, or eliminate injury to the open ocean.
- The sanctuaries work with NOAA's Office of Law Enforcement and the U.S. Coast Guard to document and enforce sanctuary regulations that protect the open ocean, work with NOAA's General Council to issue fines, conduct damage assessments, and work with responsible parties to address impacts to the open ocean.
- Emergency Response.
    - The sanctuaries participate as a member of two U.S. Coast Guard led Area Committees and participate in sub-committees to help identify sensitive sites and resources at risk, develop response strategies, provide ecological information for potential places of refuge for vessels in distress, review draft planning documents, and participate in drills.
- Marine Debris.
    - The sanctuaries remove grounded and sunken vessels, aircraft or other objects when feasible by working with emergency responders, responsible parties, and enforcement personnel.
    - The sanctuaries conducted the Baseline Data Gathering and Beach Marine Debris Assessment monitoring and recorded all marine debris at six beach sites in or adjacent to GFNMS and posted data collected to the NOAA MDMAP Online Database between 2012-2019.
    - The sanctuaries conducted a Beach-Source Marine Debris Prevention and Reduction project in 2019-2020, surveying and researching effective ways to address a top source of debris, shotgun wads, and developing a report with strategies to reduce this debris.
    - The sanctuaries conducted the Fishing Source Marine Debris Prevention and Reduction: Reel In and Recycle project to reduce lost and abandoned fishing gear.
    - Staff participate in multiple committees and working groups with partner agencies and the public devoted to addressing vessel incidents and have worked with the NOAA Marine Debris Grant Program to track debris, identify potential salvage funding sources, and strategize future management actions.

Education and Outreach

- School Programs
    - GFNMS Visitor Center Field Trips: Pass the Plankton (4th grade) includes upwelling, plankton, and food webs and Plankton Lab (11th grade-University) provides a deeper dive into plankton sampling methods, studies live samples of phytoplankton and zooplankton, and discusses plankton's role in ocean ecosystems and vulnerability to ocean acidification.
    - At Your School Programs: Ocean Acidification: a Sea of Change (7th-12th grade) covers how increasing ocean acidity affects ocean food webs and larval stages of organisms.
    - Ocean Afterschool Programs: Plankton, Sea Turtle, and Squid modules (3rd-5th grades).

    - Virtual Plankton and Ocean Acidification (OA) programs for high school science classes (50 Programs in 50 States project), include streaming live plankton samples to high school students across the nation and discussing the effects of OA.
    - Teacher Professional Development workshops: climate change in the open ocean, ocean acidification and food web impacts.
    - Teacher at Sea (with ACCESS program)
- Community Programs
    - Community lectures about the offshore environment include messages about upwelling and oceanographic seasons and conditions.
    - Plankton, Leatherback Sea Turtle, and Squid Family Workshops in the Pier Classroom.
    - Plankton Workshops for Community Partners in the Pier Classroom.
    - Sanctuary Naturalist Training program includes content about offshore ecosystems.
    - Sanctuary Soirées have included a Squid Soirée, Leatherback Sea Turtle Soirée, and Octopus Soirée.
- Exhibits
    - The Oakland Museum of California exhibit about El Niño, plankton productivity, and upwelling. The Point Reyes National Seashore exhibit about upwelling, plankton, and drifting community. The Greater Farallones Visitor Center exhibits on upwelling, plankton, krill (including a microscope exhibit for plankton viewing). Guided plankton viewing from the naturalist station.
- Media and Outreach Activities.
    - ACCESS media, web stories about hypoxia, social media posts about the open ocean/offshore environment, and Ocean Currents radio program episodes about the open ocean environment.

Infrastructure and Vessels

Sanctuary infrastructure supports open ocean work through office infrastructure, at sea assets, and specialized tools.

- Research, GIS, Resource Protection, and Education and Outreach staff collaborate on open ocean projects and meet with project partners at the sanctuary offices.
- The Crissy Field Visitor Center delivers ocean productivity education programs utilizing the pier classroom for 2nd grade - high school students.
- GFNMS and CBNMS conduct single- and multi-day oceanographic missions on the regional research vessel *Fulmar* and longer missions on larger NOAA “White Ships” and the exploration vessel *Nautilus*.
- GFNMS and CBNMS use drifter buoys, offshore anchored buoys, XBTs, and other technology to collect oceanographic data.
- Staff monitor greenhouse gas emissions from site-based and on-the-water operations.

Summary

Open ocean habitat is impacted particularly by climate change, which has resulted in increased temperatures, ocean acidification, marine heatwaves, habitat compression, and has exacerbated harmful algal blooms. Other key pressures include vessel traffic and marine debris. GFNMS and CBNMS work to protect open ocean habitat through regulations, permitting, collaboration on enforcement, emergency response, and marine debris removal. Education staff provide information on climate change and ocean acidification, plankton and other pelagic animals, through school programs, workshops, trainings, soirees, exhibits, and media and outreach. The operations teams supports this work through support for facilities, vessels, and equipment, and monitors greenhouse gas emissions and identifies and implements GHG reducing processes.

GFNMS and CBNMS Advisory Council Recommendations

These recommendations were provided during a joining GFNMS and CBNMS Advisory Council meeting on July 14, 2023. To view council discussion on this topic, please visit https://farallones.noaa.gov/manage/sac_meetings.html and view the meeting's highlights.

Conservation Science: Continue and expand efforts technologically and geographically with partners including commercial and recreational industry to measure, understand, and monitor open ocean conditions including at-sea monitoring, sensor and hydrophone deployment, water column surveys, and through remote sensing data to: 1) better understand open ocean ecosystem, 2) track status and trends, 3) understand responses to climate change, 4) identify and quantify impacts to water quality from key pressures such as vessel traffic, climate change, and marine debris (e.g., from vessel incidents or pollutants) to inform management efforts.

Resource Protection: Continue to work on a variety of activities to reduce human-induced impacts to the sanctuaries including: 1) track human activities that impact the open ocean, assess which activities have the greatest impacts, and reduce impacts (e.g. work with response partner agencies to prevent and respond to spills and discharges); and 2) work with enforcement partners to educate vessel operators and harbors to promote stewardship of the sanctuary to enforce and reduce violations of sanctuary regulations. Review the effectiveness of sanctuary regulations in protecting open ocean habitat and determine if changes may be needed. Align GFNMS and CBNMS regulations on deserted vessels and leaving harmful matter aboard vessels. Ensure reporting of incidents, violations, or marine debris easily accessible via online reporting.

Education and Outreach: Through all education and outreach programming and communications, continue to connect the state of the ocean with the health of the sanctuaries by incorporating ocean and climate literacy concepts. Make a direct link between changing ocean conditions (e.g. OA and harmful algal blooms) and actions individuals and communities can take to maintain healthy sanctuaries. Refine climate messages around the mechanisms of climate change to include how sanctuaries are part of building climate resilience and the role the

ecosystem plays in the carbon cycle (blue carbon). Climate change messages can be magnified to create awareness, hope, and move audiences behaviors to actions that are healthy for the sanctuaries. Sanctuary ocean ambassador programs should request agencies license professional and/or certified naturalists and organizations that provide access to open ocean; continue to participate and collaborate with MPA collaboratives on outreach; and research management best practices.

Infrastructure: Continue to support open ocean work through offering shared collaboration space at sanctuary offices, provide access to on-the-water sanctuary and partner assets (e.g. vessel, ROVs, and UAS) and update and expand exhibits and public visitor center space to better inform the public on the status of nearshore and open ocean habitats. Reduce greenhouse gas emissions from sanctuary at-sea operations by converting to more efficient fuel (renewable diesel), boat design (propellers), and engine types (hybrid electric) and explore innovative technologies.

Briefing on Maritime Heritage in Greater Farallones and Cordell Bank National Marine Sanctuaries

State of the Resource

This evaluation looks at the assessment of tangible resources and recognizes that these are non-renewable resources.

Condition Report Data (in preparation)

- CBNMS
  - CBNMS has one known historical resource[1] in the sanctuary, a shipwreck, the ex-USS *Stewart (DD-224)*. It was intentionally sunk within what is now the sanctuary in 1946 but it has not been relocated since. Although its condition is unknown and thought to be worsening, it is a significant cultural and archaeological resource for its role in U.S. Naval operations in WWII and likely continues to retain cultural and historical significance and educational value.
- GFNMS
  - GFNMS has 34 known shipwrecks; 17 have been documented by federal, state and private partners, and 13 coastal and offshore wrecks have been partially assessed for condition. Only a few have had comprehensive archaeological surveys.
    - All are experiencing physical degradation primarily due to natural processes. Human disturbances are thought to be minimal during the condition report assessment period (2010-2022).
    - Three shipwrecks are listed on the National Park Service's National Register of Historic Places[2], the *Norlina*, the SS *Pomona*, and the USS *Conestoga*.
  - GFNMS has 24 historic doghole port sites
    - Surveys were conducted at 14 Sonoma County sites by federal and state partners; a few port remnants were documented

[1] "Historical resource" means any resource possessing historical, cultural, archaeological or paleontological significance, including a site, contextual information, structure, district, and object significantly associated with or representative of earlier people, culture, maritime heritage, and human activities and events (15 CFR 922.11).
[2] The National Register of Historic Places is the official list of the Nation's historic places worthy of preservation. The National Register is the official Federal list of districts, sites, buildings, structures, and objects significant in American history, architecture, archeology, engineering, and culture. National Register properties have significance to the history of their community state, or the nation.Authorized by the National Historic Preservation Act of 1966, the National Park Service's National Register of Historic Places is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect America's historic and archeological resources.

        - Two doghole ports are listed on the National Register of Historic Places as part of Landing Historical and Archaeological Districts.
        - The other doghole port sites have been included in a multiple property listing[3] submitted to the National Park Service. No sites have been documented as looted during the condition report assessment period; anecdotal evidence indicates some could have occurred in that time frame.
    - Archaeological sites are adjacent to or near the sanctuary in some locations; these have not been assessed in the condition report.

Climate Vulnerability Assessment Findings (in preparation)

- Exposure and sensitivity were factored into an assessment of the potential future impacts on Maritime Heritage Resources (MHR). Adaptive capacity was not included, as is general practice among MHR practitioners, because MHR are non-renewable and cannot adapt to climate impacts. 2023 was the first time MHR were assessed for a climate vulnerability assessment. Across the 3 MHR categories of resources assessed (Doghole Ports, Nearshore Shipwrecks, and Offshore Shipwrecks), exposure and sensitivity to climate-driven changes were rated as highest for doghole ports and lowest for offshore shipwrecks. This is due to the significant disturbances expected in coastal and nearshore areas from increased wave action and erosion, increased sedimentation and inundation. Dissolved oxygen and pH were common stressors noted across all 3 resource categories.
- Doghole ports have **high** potential to be impacted by climate change due to **very high** exposure and **moderate** sensitivity, with wave action, sedimentation, erosion, and dissolved oxygen as the most critical climate stressors. Doghole ports also have very high sensitivity and experience high current exposure to the non-climate stressors of artifact movement (e.g. movement by ocean currents) and biochemical degradation.
- Nearshore shipwrecks have **high** potential to be impacted by climate change due to **high** exposure and **moderate** sensitivity, with the same climate stressors identified as for doghole ports: primarily, wave action, sedimentation, erosion and dissolved oxygen. Nearshore wrecks are similarly highly sensitive to artifact movement and biochemical degradation, though current exposure to artifact movement was indicated to be moderate.
- Offshore shipwrecks have **low** potential to be impacted by climate change due to **moderate** exposure and **low** sensitivity, with dissolved oxygen as the only climate stressor rated higher than moderate. Again, artifact movement and biochemical degradation were identified as high sensitivities for this resource category, though the current exposure is low and moderate, respectively.

[3] A multiple property submission covers a grouping of individual properties characterized by common physical and/or associative attributes, tied to a historic context. The cover form contains much of the context for evaluation, which does not have to be repeated in individual nominations submitted as part of the group. It facilitates evaluations of significance for related resources, enabling easier assessment of National Register of Historic Preservation eligibility for individual properties.

Pressures on Maritime Heritage
Human activities and natural processes can affect the condition of maritime heritage resources through a variety of pathways. This section has been included to inform the public about the most significant overarching pressures, past, present, and potential, that may impact these resources. While some pressures are beyond the scope of what ONMS can address, the two sanctuaries are monitoring and working on efforts to respond to the following pressures:

- Impacts from research that contacts the seafloor
- Damage from benthic fishing
- Climate change - wave action, sedimentation, erosion
- Illegal take of structural remains and artifacts

Summary of Relevant Regulations

See links to full text, definition, exceptions, and exemptions on the regulations pages of the GFNMS and CBNMS websites.

The following GFNMS and CBNMS prohibitions can prevent impacts on historical resources from listed prohibited activities:

1. Exploring for, developing, or producing oil, gas or minerals.
2. Constructing, placing or abandoning any structure, drilling into, dredging, or otherwise altering the submerged lands of the Sanctuary.
3. Possessing, moving, removing, or injuring, or attempting to possess, move, remove or injure, a Sanctuary historical resource.

Summary of Relevant Sanctuary Projects

Supporting the National Program
The Office of National Marine Sanctuaries Conservation Science Division leads and coordinates maritime heritage activities across the sanctuary system. Current systemwide activities focus on documenting physical resources, such as historic shipwrecks, ports and landings, and prehistoric archaeological sites; reviewing archival documents; recording oral histories, and documenting historical practices and traditional seafaring and ecological knowledge of indigenous cultures and coastal communities in web stories, maritime cultural landscape publications, and other media. A regional Maritime Heritage Coordinator supports all West Coast sanctuaries, since there are no site level Maritime Heritage Programs in the Region. GFNMS and CBNMS contribute by supporting activities at the sites.

Conservation Science

- Conservation Science staff work with ONMS and West Coast Region maritime heritage staff and partners to identify potential sites for subsurface visual surveys and may conduct or assist surveys and analysis of submerged archaeological resources.

Resource Protection

- Resource protection staff review permit applications for potential adverse impacts on historical resources as defined in the National Marine Sanctuary Act and work with

ONMS and West Coast Region maritime heritage staff to ensure proper consultation and documentation is completed as required under the National Historic Preservation Act and other federal laws and regulations.
- Through permitting actions the sanctuaries manage, reduce, or eliminate injury to MHR.
- Similarly, resource protection staff review other proposed federal actions, including proposed management plans and regulations, for adverse impacts on maritime heritage resources to ensure proper consultation and documentation is completed as required under the National Historic Preservation Act and other federal laws and regulations.
- The sanctuaries work with NOAA's Office of Law Enforcement to document and enforce sanctuary regulations that protect MHR.

Education and Outreach

Education and Outreach staff communicate maritime heritage topics through various education and outreach programs and communications. The staff work with the west coast region and national program to include sanctuary related maritime heritage topics in regional and national products and programs.

- School programs
    - Ocean After School: Maritime heritage presentation and activities
    - Fisherman in the Classroom "At Your School" programs for 7th-12th grades. Brings local commercial fishermen into Bay Area classrooms to teach students about the rich cultural history and current day relevance of commercial fishing in North-central California
- Community programs
    - Oral History Public Event featuring Cordell Expeditions divers
    - Sanctuary Lectures: Abalone Soiree (history of abalone fishing)
- Summer Camp: Maritime heritage presentation and activities
- Exhibits/Signs-Oakland Museum of CA exhibits feature relevant heritage around CBNMS
- Media & outreach activities-
    - Social media posts featuring maritime heritage artifacts, maritime landscape (historical use of the ocean)
    - Shipwrecks of GFNMS Story Map on the sanctuary website, Get into your Sanctuary Story Map that features destinations to visit throughout and adjacent to the sanctuary, including maritime heritage features
    - Earth is Blue online videos featuring Doghole Ports, USS *Conestoga*, Nautilus video featuring the *Ituna*,
    - Poster: Harvestable Bounty of the Sea featuring fishing vessels of past and present
    - Cordell Expeditions Oral History project: written and audio files on website and archived in NOAA and local libraries.
    - Ocean Currents radio program maritime heritage topics

Infrastructure and Vessels
Sanctuary infrastructure that supports maritime heritage includes office infrastructure and at-sea assets.

- The sanctuary hosts ONMS regional and national maritime heritage staff for information sharing and collaboration planning.
- Sanctuary staff have developed web offerings for ONMS-led maritime heritage projects such as the Doghole Port Study and a Storymap on Shipwrecks of Greater Farallones and the Narrows of the Golden Gate.
- The sanctuary vessel *Fulmar* and exploration vessel *Nautilus* and remotely operated vehicles have been used to support ONMS-led maritime heritage missions, e.g., surveys of the SS *Dorothy Wintermote* and *Ituna*, and discovery of the USS *Conestoga*.

Summary

Currently GFNMS and CBNMS do not have a maritime heritage program. Site staff support maritime heritage activities such as condition reports and climate vulnerability assessments, National maritime heritage research and monitoring projects, and consultations. Maritime heritage is incorporated into exhibits, outreach materials, and education programs. The operations team supports this work through facilities and vessels.

GFNMS and CBNMS Advisory Council Recommendations

These recommendations were provided during a joining GFNMS and CBNMS Advisory Council meeting on July 14, 2023. To view council discussion on this topic, please visit https://farallones.noaa.gov/manage/sac_meetings.html and view the meeting's highlights.

Conservation Science: Continue to work with and support ONMS and West Coast Region maritime heritage staff and partners to identify potential sites for surveys and conduct or assist with surveys of archaeological and cultural resources to support characterization of maritime heritage resources and environmental conditions and obtain information that can be used in outreach products and to inform management of these resources. Encourage and support research activities regarding the mysterious "holes" found on Cordell Bank to determine the purpose and/or use of the holes and their historical/maritime heritage significance. Survey potential pollution threats from existing shipwrecks to existing natural resources.

Resource Protection: Continue to work with and support ONMS and West Coast Region maritime heritage staff and partners as needed to protect historical resources. Identify and coordinate with site education and science programs maritime heritage project priorities. Continue to review permit applications and other proposed federal actions for potential impacts on historical resources and implementation of measures to avoid or mitigate adverse impacts on historical resources. Work with ONMS or regional Maritime Heritage Program staff to ensure proper consultation and documentation is completed as required. Reevaluate pollution threats from existing shipwrecks to existing natural resources

Education and Outreach: Continue to work with and support ONMS and West Coast Region maritime heritage staff and partners and connect historical maritime stories and artifacts to current conservation issues and communities in media and outreach programs. Magnify messages about National Historic designations and rich maritime cultural history in education programs and communications.Encourage collaboration with other state and local entities to develop and share education resources for school groups and the general public and integrate maritime heritage (e.g.doghole ports, commercial and local uses) in naturalist training. Work with Point Arena Lighthouse to design and install exterior interpretive signs to communicate about the maritime history in the region. Work with Sonoma County Regional Parks to pursue future interpretive collaborations in the Sonoma region to include sanctuary maritime heritage (e.g. Gualala River Regional Park Visitor Center). Update existing maritime heritage signs at existing ports of departure to GFNMS such as Pillar Point Harbor.

Infrastructure: Continue to work with and support ONMS and West Coast Region maritime heritage staff and partners by providing access to sanctuary and partner at-sea assets. Expand Crissy Field Visitor Center to provide space for additional maritime heritage exhibits. Ensuring adequate resources to support sanctuary staff.

Draft Letter of Support for the Applied California Current Ecosystem Studies (ACCESS) and 20 Year Celebration

September 8, 2023

Maria Brown,
Sanctuary Superintendent

Dear Superintendent Brown,

The Sanctuary Advisory Councils of Cordell Bank National Marine Sanctuary (CBNMS) and Greater Farallones National Marine Sanctuary (GFNMS) congratulate the Office of National Marine Sanctuaries (ONMS) on 20 years of data collection by the Applied California Current Ecosystem Studies (ACCESS) project and request continued support for the next 20 years to ensure ongoing research and monitoring to inform sanctuary management.

GFNMS, CBNMS, and Point Blue Conservation Science have collaborated on ACCESS research and monitoring since 2004 to enhance the ability to protect and manage GFNMS, CBNMS and the northern portion of Monterey Bay National Marine Sanctuary (MBNMS). The ACCESS project has led to a wealth of data and information that is used to inform management of these areas. ACCESS data were critical to the recent development of the GFNMS and CBNMS condition reports, without which the sanctuary would be lacking information on the status and trends of many resources in the sanctuaries. Data and analyses from ACCESS are used to address such issues as ship strikes and entanglement of endangered and threatened baleen whales, location of foraging hot spots of seabirds and marine mammals, and understanding environmental changes and their influences on the abundance and distribution of seabirds, marine mammals, and their forage species. ACCESS data are used in the prediction of spatial use patterns of focal marine species, helping to illustrate how patterns of use may change in response to changing ocean conditions. This information can help to identify areas of significant ecological resources, areas where important habitat may overlap with human uses, and help to illuminate where management actions may be most effective.

As oceans face extreme variability and changing conditions resulting from climate change, it is critical to continue the important work of ACCESS. We urge you to continue sustained support for the project into the future and to plan for the long term by supporting planning and growth. ACCESS serves as an exemplary model of ecosystem monitoring that can be shared with other sanctuary sites. Also, it is important to continue training the next generation of scientists and allow for succession planning so that ACCESS can continue uninterrupted into the future. With further investments, ACCESS can continue to collect baseline ecosystem data, assess alternative management strategies to protect top predators and their forage species, identify additional areas as important ecological hot spots, and develop products that can be used in condition

reports so that sanctuaries can then identify proactive management actions and maintain healthy ocean ecosystems across multiple sites.

We acknowledge and appreciate ONMS's foresight and leadership in funding this critical project early on and maintaining support over time. The extension of the ACCESS project will further improve the management and effectiveness of our three central California sanctuaries and we urge your continued support of this program moving forward.

Sincerely,

_____ _____

GFNMS Advisory Council CBNMS Advisory Council

The councils are an advisory body to the sanctuary superintendent. The opinions and findings of this letter/publication do not necessarily reflect the position of the sanctuaries and the National Oceanic and Atmospheric Administration