A Report by a Panel of the

NATIONAL ACADEMY OF PUBLIC ADMINISTRATION

for the National Marine Sanctuary System

An External Review of the National Marine Sanctuary System

NATIONAL ACADEMY OF PUBLIC ADMINISTRATION®

March 2021

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March 2021
Printed in the United States of America
Academy Project Number: 102257

Cover image sourced from the Office of National Marine Sanctuaries' official Flickr account.

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Established in 1967 and chartered by Congress in 1984, the Academy continues to make a positive impact by helping federal, state and local governments respond effectively to current circumstances and changing conditions. Learn more about the Academy and its work at www.napawash.org.

Foreword

In 2022, the Office of National Marine Sanctuaries (ONMS) will conclude a half century of service to the Nation. A relatively small Agency embedded in the Department of Commerce's National Oceanic and Atmospheric Administration, the ONMS currently manages a network of 14 national marine sanctuaries and two marine national monuments, encompassing more than 600,000 square miles of ocean and Great Lakes waters. The Agency is established to protect the extraordinary scenic beauty, biodiversity, historical connections, and economic productivity of these areas so they may continue to serve as the basis for the thriving recreation, tourism, and commercial activities that drive coastal economies.

The ONMS contracted with the National Academy of Public Administration (the Academy) to evaluate major achievements during its first 50 years, and to consider recommendations on how the Agency might prepare to address dynamic challenges and opportunities in the marine environment during the next 10-15 years. This assessment by an Academy Panel provides to ONMS actionable recommendations that, when implemented, will serve to enhance marine environmental conservation.

As a congressionally chartered, independent, non-partisan, and non-profit organization with over 950 distinguished Fellows, the Academy has a unique ability to bring nationally-recognized public administration experts together to help government agencies address challenges. I am deeply appreciative of the work of three Academy Fellows who served on this Panel.

I also commend the Academy Study Team that contributed valuable insights and expertise throughout the project. We greatly appreciate the constructive engagement of ONMS employees as well as many other individuals who provided important observations and context to inform this report.

Given the critical importance of the health and safety of the marine environment to the Nation's future, I trust that this report will be useful to ONMS as it considers organizational changes that will enhance its ability to more effectively achieve its mission.

Teresa W. Gerton

President and Chief Executive Officer

National Academy of Public Administration

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Acronyms and Abbreviations

Acronym or Abbreviation	Definition
30 by 30 Initiative	Target to protect 30 percent of the world's land and ocean by the year 2030
Academy	National Academy of Public Administration
AUV	Autonomous Underwater Vehicles
BAC	Business Advisory Council
BEA	Bureau of Economic Analysis
Bureau of Land Management	BLM
CEQ	Council of Environmental Quality
CFFP	Cooperative Forest Fire Prevention Program
Fiscal Year	FY
FTE	Full-time Equivalent Employees
FWS	Fish and Wildlife Service
GDP	Gross Domestic Product
IUCN	International Union for Conservation of Nature
Marine Environment	All oceans and lakes

MPA	Marine Protected Area
MPA Center	National Marine Protected Areas Center
MPA FAC	Marine Protected Area Federal Advisory Committee
NASA	National Aeronautics and Space Administration
NERRS	National Estuarine Research Reserve System
NEP	National Estuary Program
NFMS	National Fisheries Management Service
NMSA	National Marine Sanctuaries Act
NOAA	National Oceanic and Atmospheric Administration
NOS	National Ocean Service
NPS	National Park Service
ONMS	Office of National Marine Sanctuaries
PRSA	Public Relations Society of America
SAC	Sanctuary Advisory Council
SUCAR	Sanctuary Use Characterization, Assessment and Research
The System	National Marine Sanctuary System

UN	United Nations
USFS	United States Forest Service

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Executive Summary

The Office of National Marine Sanctuaries (ONMS), an agency within the National Oceanic and Atmospheric Administration (NOAA), will celebrate 50 years of service to the Nation during 2022. This brief report looks back on its major achievements. More important, it also looks forward to several critical challenges and opportunities that lie ahead over the next 10-15 years. The Panel concludes that ONMS has contributed in significant ways to advance its complicated mission and can make important short-term and medium-term changes to play a more decisive role in marine environmental protection in the next 10-15 years.

There are few other federal agencies that have a fully comparable task of environmental conservation and protection of the magnitude that faces ONMS (a discussion on benchmarking is provided in Section 3). To provide context, one only need turn to the amount of area under management, along with comparable budget figures. As discussed in Section 3, ONMS is responsible for more than 620,000 square miles of ocean and Great Lakes covered by 14 national marine sanctuaries and two national marine monuments. While not entirely comparable, the amount of area under ONMS authority dwarfs other important federal agencies with similar missions. Two comparable federal agencies are the National Park Service (NPS) and U.S. Wildlife Refuge System (The Refuge System). The NPS manages a total land area of about 131,000 square miles, and The Refuge System manages about 21,000,000 square acres. There are even greater disparities between ONMS, NPS, and The Refuge System if one considers budgets. ONMS has an operating annual budget in Fiscal Year (FY)2020 of $55.5 million for programs and $3 million for construction, while NPS and The Refuge System had FY2020 budgets amounting to $2.7 billion and $525 million respectively.[1] Given this context, ONMS is tasked to monitor a complex marine environment – one that is characterized by unique features – and to do so with significantly fewer resources.

Looking back since its establishment in 1972, the Panel focuses on seven major achievements. Summarized below, each is expanded upon more fully in Section 4.

1. Innovation: The National Marine Sanctuary System (the System) was among the first of its kind in creating a large scale Marine Protected Area (MPA) conservation system at a national level using adaptive management. The resource protection-driven work of the System has been shared globally.
2. Protection of Marine Resources: The fact that the System is made up of such a wide range of sites covering an enormous area is an impressive achievement and contributes directly to the goal and purpose of the system as defined in the National Marine Sanctuaries Act. Not only has the System been able to expand to new sites, but it has also expanded the reach of existing sites.
3. Conservation and scientific research: Scientific research that occurs within the System has directly contributed to the conservation and preservation of these sites. The science in the

[1] This report refers to funding budgeted under NOAA's Operations, Research, and Facilities accounts as "program" funds, and funding under its Procurement, Acquisitions, and Construction accounts as "construction" funds. Together, these two broad accounts comprise discretionary appropriations. See https://crsreports.congress.gov/product/pdf/IF/IF11185.

System includes important data collection such as site assessments and characterization. Establishing these data sets allows for an increased understanding of these sites and in turn allow for more informed decisions about how to protect and preserve them.

4. National heritage: The exploration of the maritime heritage in its multiple dimensions at some sites within the System has helped to unlock, better define, and preserve some of the nation's important historical milestones.
5. Management: The development of a dedicated and mission-driven staff capable of addressing the myriad of challenges within this enormous marine geography is not only impressive in its own right, but also has contributed to the System being able to realize significant achievements despite inadequate resources.
6. Community engagement: The formal mechanisms for community engagement that the System employs are regarded as a gold standard by many of its external stakeholders. The System has established a comprehensive framework in which local communities are treated as important stakeholders who have a say in the current and future management of the sites in and near their communities.
7. Positive externalities for partners and stakeholders: Numerous secondary positive benefits have accrued to sanctuary communities, partners, and stakeholders. Secondary benefits coming from the System include positive contributions to local economies and increased yields for stakeholders in the fishing industry.

Addressing future changes in the marine environment during the next 10-15 years in Section 5, the Panel identifies six important developments which offer both challenge and opportunity for ONMS going forward. Summarized here, these include:

1. Climate change and climate-related issues, such as ocean acidification: The impacts and effects of climate change are the biggest and most prevalent emerging theme providing both a threat and an opportunity to make a positive difference. The impacts of climate change are not just the warming of the oceans and Great Lakes, but include changing weather patterns, ocean acidification, sea level rise, range shifts of marine species, and much more. Each of these phenomena have demonstrable impacts on the sanctuary sites and the resources within them. They also provide the imperative for greater leadership in the ocean protection national and international dialogue. There is a tremendous need for greater resources to be brought to bear on expanding the System and its capacities and its presence as a leader.
2. Blue economy development: Activity in the blue economy involves a "de-coupling of socioeconomic development from environmental degradation… a subset of the entire ocean economy that has regenerative and restorative activities that lead to enhanced human health and well-being, including food security and creation of sustainable livelihoods."[2] Two areas within the blue economy that the System can and should also play a leadership role are aquaculture and the environmentally sensitive development of marine energy.
3. New technologies: New technologies, such as autonomous underwater vehicles (AUVs), have allowed humans to explore new marine areas. While technology itself is not an

[2] Spalding, *The New Blue Economy: The Future of Sustainability*. https://cbe.miis.edu/cgi/viewcontent.cgi?article=1052&context=joce.

answer to many of the questions and issues in the future of the marine environment, new tools to collect data can answer pertinent questions and develop innovative and sound solutions to protecting the marine environment, providing new opportunities for economic development and marine protection to co-exist synergistically.

4. Building personal connection to the marine environment: Beyond more traditional ways to connect to communities, like volunteer programs, visitor centers, signage and exhibits, and even websites and social media, there are emerging approaches and technologies that can help build and strengthen personal connections with the marine environment no matter how far one resides from a coastline. In particular, new technologies create new ways people explore marine environments, and to share that connection widely. Through virtual reality and artificial intelligence, (AI), one can experience the wonders of a sanctuary, and with the continual rise of social media one can virtually travel the world, from wherever they live.
5. Engaging underrepresented and indigenous communities: While the System has had success with community engagement, there are increasing opportunities to bring previously underrepresented voices to the table. Indigenous groups have traditional ecological knowledge and stewardship of these important areas and can offer a unique perspective in helping to create solutions to today's problems. Similarly, other underrepresented communities possess their own knowledge and cultural connections to ocean and coastal areas. Bringing these groups into the conversation and elevating them as important partners is increasingly important as the System adapts to the evolving marine environment.
6. Global movement on marine environment policy: Increasingly, international and domestic policymakers are advancing current scientific understanding of the marine environment and are focusing on better policies to advance the sustainability of the ocean's resources.

Combining these and other challenges and opportunities and based on a respectable ONMS success track record and trusted reputation with large segments of the marine stakeholder community, the Panel urges NOAA and ONMS leaders to act expeditiously and opportunistically to expand the vision and role of the System in the domestic and global movement on marine environment policy. In Section 6, the Panel offers 15 recommendations divided into three categories connected with their sequencing – short-, medium- and long-term recommendations, with supporting sub-recommendations. These recommendations serve to encourage ONMS to broaden its vision and aim higher/further. The recommendations are divided into the following set of six organizational areas that must be bolstered:

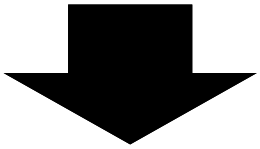
- strategy;
- finance;
- management and operations;
- organization;
- communication, outreach, and branding; and
- community engagement.

As ONMS embraces recommendations in each of these areas, the System can be better prepared to carry out the critical, complicated tasks that should be integrated into long-term ONMS goals

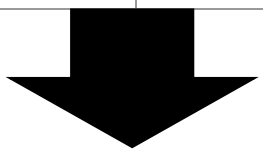
achieved in consultation with NOAA to achieve greater impact in a world that needs that impact more than ever.

The complete list of report recommendations, discussed in Section 6, is provided below.

Short Term: Setting the Foundation Within the next 12 months	
Strategy	
Refresh Strategic Vision, Focus, Value Proposition, and Impact	
Finance	
Identify Alternative Funding Sources and a Sustainable Financing Model	
Management	
Support Reauthorization of the NMSA	Create Flexible and Adaptable Management Planning Structures
Organization	
Enable and Clarify the Role of the Regions	Evaluate Workforce Planning
Communications	
Enhance Communications Plan	Bolster Support for Communications Team
Community Engagement	
Reach New Communities	



Medium Term: Launching for Growth Next 12 24 months	
Strategy	
Revisit System Protection Levels and Metrics	
Finance	
Support System Economic Valuation and Community Profiles	
Community Engagement	
Effectively Engage Indigenous Communities	Expand Partnerships



Long Term: Becoming a Leader 24 months and beyond
Organization
Expand Role as Collaborator and Convener of Marine Protection
Communications
Create and Implement a Public Outreach Campaign

Figure E.1: Short-, Medium-, and Long-Term Strategy. Figure created by the National Academy of Public Administration.

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Section 1: Project Background

The immense marine environment surrounding our Nation and the Great Lakes that lie within our shores serve as the setting for this report. The term "marine environment" refers to the same definition the National Marine Protected Areas Center provides.[3] In 1972, the Congress passed the National Marine Protection, Research, and Sanctuaries Act (NMSA), thus establishing the National Marine Sanctuary Program that later become the System (hereafter, the System) that is managed by the Office of National Marine Sanctuaries (ONMS). While a relatively small Agency with a modest annual program budget of about $55 million and construction budget of about $3 million, ONMS is embedded in the Department of Commerce's National Oceanic and Atmospheric Administration (NOAA), and has nearly a half century track record of successfully advancing its mission and vision.[4]

The System was established with the following purpose, found in legislative language: "Protect areas of the marine environment with special national significance due to their conservation, recreational, ecological, historical, scientific, cultural, archeological, education or aesthetic qualities as national marine sanctuaries."[5] Simple, and yet profound, its mission statement reads: "We protect treasured places in the ocean and great lakes." Its vision is no less inspiring: "A thriving sanctuary system that protects our nation's underwater treasures and inspires momentum for a healthy ocean."[6]

The System currently manages a network of 14 national marine sanctuaries and two marine national monuments, encompassing more than 620,000 square miles of ocean and Great Lakes waters. The Agency aims to protect the extraordinary scenic beauty, biodiversity, historical connections, recreational value, and economic productivity of these areas so they may continue to serve as the basis for thriving recreation, tourism and commercial activities that drive coastal economies. ONMS is also home to the National Marine Protected Areas Center, authorized by Executive Order 13158 in 2000, and charged with strengthening and connecting U.S. marine protected areas (including Sanctuaries) across all levels of government.

As the System approaches its golden anniversary next year, this report provides a survey of its past major accomplishments. The look-back assessment offers a context for the report's future

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[3] "(A) ocean or coastal waters (note; coastal waters may include intertidal areas, bays or estuaries); (b) an area of the Great Lakes or their connecting waters; (c) an area of submerged lands under ocean or coastal waters or the Great Lakes or their connecting waters; or (d) a combination of the above)." See U.S. National Marine Protected Areas Center, *Definitions of MPA and its Key Terms*. https://marineprotectedareas.noaa.gov/aboutmpas/termsdefinitions/.

[4] This report refers to funding budgeted under NOAA's Operations, Research, and Facilities accounts as "program" funds, and funding under its Procurement, Acquisitions, and Construction accounts as "construction" funds. Together, these two broad accounts comprise discretionary appropriations. See https://crsreports.congress.gov/product/pdf/IF/IF11185.

[5] 106th U.S. Congress, *National Marine Sanctuaries Amendments Act of 2000*. https://www.congress.gov/bill/106th-congress/senate-bill/1482/text/pl?overview=closed.

[6] U.S. Office of National Marine Sanctuaries, *Strategic Plan for Fiscal Years 2017-2022*. https://nmssanctuaries.blob.core.windows.net/sanctuaries-prod/media/docs/onms-strategic-plan-2017-2022.pdf.

focus, which prescribes actions the System should take to address future challenges and take advantage of opportunities to increase its impact and value.

1.1 Scope of Work and Methodology

The purpose of this report is to (1) evaluate the impacts and major achievements of the System over the past five decades and (2) provide high-level, long-term (10-15 years) recommendations on how best to seize future opportunities and respond to very real challenges. The results will be used to inform various key documents and projects related to the System's 50th anniversary next year.

The analysis focuses on identifying impacts, achievements, and potential directions that the System should take through focused interviews with ONMS leaders and staff, as well as with former ONMS employees, other NOAA employees, and stakeholders across a wide spectrum. The data gathering expanded to include input from external stakeholders, including other federal agencies, congressional committees, commercial and recreational fishery representatives, other recreational users, conservation groups, and industry groups to gain a fuller picture of both the challenges faced by and opportunities presented to the System. Interviews also focused on other governmental partners and stakeholders, including tribal, state, and local officials.

The analysis also considers insights from other multiple-use and conservation-oriented natural resources management programs, including those of the National Marine Fisheries Service (NMFS), National Wildlife Refuge System, and National Park Service (NPS), the National Estuary Program (NEP), National Estuarine Research Reserve System (NERRS) as well as entities such as state agencies, and conservation groups (a full list of interviewees is provided in Appendix B).

In addition, documentary research included a review of foundational statutes, regulations, and administrative guidance; budgetary and strategic planning documents; scientific articles; best practice literature; and past internal and external assessments of ONMS operations and performance.

Research and drafting of this Academy Panel report was prepared under the leadership of a three-member Panel of Academy Fellows that guided the work of a four-member professional Academy Study Team (biographical information on the Panel and Study Team is provided in Appendix A).

1.2 Building on Previous Academy Reports

The Academy prepared reports for the System on two previous occasions, in the years 2000[7] and in 2006.[8] Those findings and recommendations were positively received and were largely implemented by the Agency, guiding actions to remediate important challenging issues.

Recommendations in the first report focused mainly on the following four topics: (1) taking steps to protect marine resources in the sanctuaries more effectively; (2) working more confidently with

[7] National Academy of Public Administration, *Protecting our National Marine Sanctuaries.*
[8] National Academy of Public Administration, *Planning and Management at the National Marine Sanctuary Program.* https://s3.us-west-2.amazonaws.com/napa-2021/studies/ready-to-perform-planning-and-management-at-the-national-marine-sanctuary-p/06-11.pdf.

communities; (3) managing for results rather than focusing on planning, capacity-building, or other processes; and (4) investing in building up staff and capacity at the sites.

The second report, in 2006, focused on the following six topics: (1) strategic planning to enhance performance-based management; (2) sanctuary management planning should be informed with community involvement; (3) improved System-wide monitoring and condition reports to focus on important issues at individual sanctuaries; (4) enhancing the connection between annual operating plans and performance; (5) connecting planning and guidance document preparation with results; and (6) a future focus.

This report builds on the previous two studies, with a fresh focus on how to incorporate Agency capacity and skills developed in its first five decades to pivot appropriately to address the potentially significant changes that loom in the 10–15-years. One thing is sure, the marine environment is changing rapidly, and thus provides enormous opportunities and an imperative for ONMS to creatively address those challenges to benefit the Nation and beyond.

1.3 Organization of the Report

Besides this section, the report is organized into five more sections as follows:

Section 2 provides background information and important context for the report sections that follow. This important foundational information serves as a launching point for addressing particular elements of the scope of work.

Section 3 compares several data points connected with the System that can be compared with those of other U.S. federal and several foreign government agencies whose missions are similar. Several insights into the System are drawn in this section.

Section 4 highlights major achievements of the System since its establishment in 1972. These themes are revisited throughout the report as strengths to be built upon.

Section 5 offers important observations into six key challenges and opportunities coming up during the next 10-15 years in the marine environment. These become the context for how the Panel structures the report recommendations.

Section 6 proposes 15 recommendations to the System, divided into short-, medium-, and long-term actions, further classified into six important topics. These serve as an integrated package of actions that, when implemented over time, will prepare the System to continue achieving its mission, and expanding its critical role in protecting the marine environment.

Section 2: Background on the Sanctuary System

This section provides background information on the System, providing context for the findings and recommendations provided in this report.

2.1 Establishing Legislation

In October of 1972, Congress passed the Marine Protection, Research and Sanctuaries Act. Title III was later renamed the National Marine Sanctuaries Act (NMSA).[9] The primary objective of the System is resource protection. The NMSA permits the Secretary of Commerce to "designate any discrete area of the marine environment as a national marine sanctuary and promulgate regulations implementing the designation…" provided the area is of special national significance due to its conservation, recreational, ecological, historical, scientific, cultural, archaeological, education, or aesthetic qualities.[10]

In addition, the NMSA lists nine purposes and policies.[11] These include:

- Identifying and designating as national marine sanctuaries areas of the marine environment which are of special national significance and to manage these areas as the National Marine Sanctuary System;
- Providing authority for comprehensive and coordinated conservation and management of these marine areas, and activities affecting them, in a manner which complements existing regulatory authorities;
- Maintaining the natural biological communities in the national marine sanctuaries, and protecting, and, where appropriate, restoring and enhancing natural habitats, populations, and ecological processes
- Enhancing the public awareness, understanding, appreciation, and wise and sustainable use of the marine environment, and the natural, historical, cultural, and archaeological resources of the System;
- Supporting, promoting, and coordinating scientific research and monitoring of the resources of these marine areas;
- Facilitating all public and private uses of the resources of these marine areas to the extent compatible with the primary objective of resource protection;
- Developing and implementing coordinated plans for the protection and management of these areas with appropriate Federal agencies, State and local governments, Native American tribes and organizations, international organizations, and other public and private interests concerned with the continuing health and resilience of these marine areas;
- Creating models and incentives to conserve and manage these areas; and

[9] U.S. Office of National Marine Sanctuaries, *Celebrating 45 Years of America's Underwater Parks*. https://sanctuaries.noaa.gov/news/oct17/celebrating-45-yrs-of-americas-underwater-parks.html
[10] 106th U.S. Congress, *National Marine Sanctuaries Amendments Act of 2000*. https://www.congress.gov/bill/106th-congress/senate-bill/1482/text/pl?overview=closed.
[11] Ibid, *page 1*.

- Cooperating with global programs encouraging conservation of marine resources.

Congress has the authority to disapprove the Secretary of Commerce's designation of a sanctuary by adopting a concurrent resolution in both chambers. In the case of a national marine sanctuary that is located partially or entirely within the seaward boundary of any state, the state's governor may certify to the Secretary that the designation or any of its terms are unacceptable.[12] In such instances, the designation or unacceptable term of designation will not take effect in the area in question.[13]

Enforcement of regulations in the System is overseen by the U.S Coast Guard, the NOAA Office of Law Enforcement, and, where Joint Enforcement Agreements are in place, state officers. The NMSA also provides the System with a set of special authorities:

- The Secretary of Commerce is authorized to solicit donations for the program.
- The Secretary may designate a private company or individual as an "official sponsor" and license them to use a logo for the System or for individual sanctuaries.
- The System may create, market, and sell products.

Since 2013, the National Marine Protected Areas Center (MPA Center) has been part of ONMS. Authorized by Executive Order 13158, the MPA Center is charged with implementation of Section 4(a) of the Order, the development of a national system of MPAs.

2.2 Global Movement on Marine Environment Policy

The marine environment is a vast and rapidly changing spatial area with numerous jurisdictional authorities, stakeholders, communities, and users. Since the NMSA was enacted in 1972, oceanographers have made large strides in their scientific understanding and ability to predict changes in the ocean system, owing in large part to advances in monitoring technology like satellites. Oceanographers and natural resource economists have also made strides in understanding the contribution of the ocean system to the global and national economies and ecosystems, as well as coastal communities. About 40 percent of the world's population is concentrated within 100 kilometers of a coast. The Organization for Economic Cooperation and Development estimates that by 2030, $3 trillion of economic output will be generated by ocean sectors each year.[14] As the global coastal population is expected to increase by a billion people by 2050, the rise of the "blue economy" becomes ever more crucial given the importance of ocean

[12] 106th U.S. Congress, *National Marine Sanctuaries Amendments Act of 2000,* page 7. https://www.congress.gov/bill/106th-congress/senate-bill/1482/text/pl?overview=closed.
[13] The terms of designation include the geographic boundaries of the sanctuary, the characteristics of the area that give it conservation, recreational, ecological, historical, research, educational, or aesthetic value, and the activities that will be subject to regulation by the System.
[14] These ocean sectors include transportation, fishing, tourism, and energy. See Organization for Economic Co-operation and Development, *Work in Support of a Sustainable Ocean.* https://www.oecd.org/ocean/OECD-work-in-support-of-a-sustainable-ocean.pdf.

resources for food, energy, jobs, recreation, and other key ecosystem services.[15,16] Still, challenges remain in communicating this information to policy and decision-makers in ways that are actionable and sustainable.

These considerations have led international and domestic leaders to invest in advancing our current scientific understanding, and to consider the natural resources policies that can be brought to bear on the sustainability of the marine environment's resources. To take one illustration, the United Nations (UN) has called for a Decade of Ocean Science for Sustainable Development (2021-2030) to bring together researchers and stakeholders in the ocean community to develop science that will inform policies for a more productive, resilient, and sustainable ocean. In 2019, Costa Rica, France, and Britain's High Ambition Coalition for Nature and People set a target of protecting 30 percent of the world's land and ocean area by the year 2030 (the 30 by 30 initiative). During the same year, UN also proposed the 30 by 30 initiative under the Convention for Biological Diversity, an international binding treaty. Last October, California did so as well.[17] In 2020, about 15 and 7 percent of the globe's land and ocean were considered protected, respectively. By January 2021, 50 countries had committed to the 30 by 30 initiative.

On January 27, 2021, President Biden signed an executive order "Tackling the Climate Crisis at Home and Abroad" which commits the United States to the 30 by 30 conservation goal, among other efforts to address climate change. In addition, on October 20, 2020, a bill referred to as the "Ocean-Based Climate Solutions Act of 2020" was introduced in the U.S. House of Representatives. The Bill would:

> *"direct the Secretary of Commerce [acting through NOAA] … to provide for ocean-based climate solutions to reduce carbon emissions and global warming; to make coastal communities more resilient; and to provide for the conservation and restoration of ocean and coastal habitats, biodiversity, and marine mammal and fish population…".*

The Bill would direct the Secretary of Commerce to initiate the designation process for all of the areas identified in NOAA's Inventory of Successful Nominations as national marine sanctuaries and report back on steps taken within 180 days of its enactment. NOAA's Inventory of Successful Nominations is a list of areas NOAA has accepted for nomination as national marine sanctuaries. Nominations are made by the American public at the local community level. There are currently five areas in the Inventory, and the Bill would constitute a major increase in management

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[15] The blue economy refers to a range of economic uses of ocean and coastal resources – such as energy, shipping, fisheries, aquaculture, mining, and tourism. It also includes benefits that may not be marketed, such as carbon storage, coastal protection, cultural values and biodiversity. See Spalding, *The New Blue Economy: The Future of Sustainability*. https://cbe.miis.edu/cgi/viewcontent.cgi?article=1052&context=joce.

[16] See Section 5 of this report for a more detailed discussion on the blue economy.

[17] State of California Office of Governor Newsom, *Governor Launches Strategies to Use Land to Fight Climate Change*. https://www.gov.ca.gov/2020/10/07/governor-newsom-launches-innovative-strategies-to-use-california-land-to-fight-climate-change-conserve-biodiversity-and-boost-climate-resilience/.

responsibility for the System, as NOAA has only designated one sanctuary within the last twenty years and is currently working on the designation of two other sites.[18,19]

2.3 National Marine Sanctuaries and Marine National Monuments

In addition to the national marine sanctuaries, the System shares responsibility for two marine national monuments with multiple government agency partners.[20] As detailed in Section 2, national marine sanctuaries are established under the NMSA. Prospective sanctuaries are subject to examination and approval in NOAA's sanctuary nomination and designation processes. In the nomination process, local communities propose areas to be protected through the creation of a sanctuary for their special ecological significance, maritime heritage resources, or important economic uses. NOAA then examines the proposal against the requirements of NMSA, including those for special national significance, and existing management and regulatory regimes in place at the proposed area. If a nomination successfully passes the review phase, NOAA will notify the community that made the nomination all the requirements have been met. Then, NOAA places the nominated area in its Inventory of Successful Nominations.[21]

With the designation process, NOAA announces its intent to designate a new sanctuary and begins setting the scope for an analysis of the area's resources.[22] During the scoping phase, NOAA requests input from the public on potential geographic boundaries, the resources that should be protected, and other information that should be included in its resource analysis. In the next phase, NOAA prepares a draft environmental impact statement and sanctuary management plan, as well as proposed regulations and boundaries. NOAA then provides for a public review of the draft documents, lasting no less than 30 days. Before final designation, the U.S. Congress and governor of the state in which the sanctuary is proposed have the opportunity to review the documents.

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[18] The five areas are: Chumash Heritage (California, Central Coast), Lake Erie Quadrangle (Pennsylvania), St. George Unangan Heritage (Alaska), Hudson Canyon (New York, Atlantic), and Mariana Trench (Pacific). See U.S. National Oceanic and Atmospheric Administration, *Sanctuary Nominations*. https://nominate.noaa.gov/nominations/.

[19] To organize capacity for this increased responsibility, ONMS would need to engage in a focused effort to share its vision and priorities within NOAA, the Department of Commerce, and across the Federal government. There also is a need for better coordination on sharing capacity, resources, and priorities within NOAA and the Department of Commerce. As a science and research organization, NOAA has significant technical capacity, expertise, and access to resources. Other agencies in the Department also bring expertise in economic development and other areas. Developing and communicating priorities and identifying mutual areas of collaboration and resource-sharing will allow ONMS to leverage the capacity within NOAA and the Department as resource multipliers.

[20] U.S. Office of National Marine Sanctuaries, *Monuments and Sanctuaries*. https://sanctuaries.noaa.gov/about/monuments-and-sanctuaries-whats-the-difference.html.

[21] U.S. National Oceanic and Atmospheric Administration, *Sanctuary Nomination Process Guide*. https://nominate.noaa.gov/guide.html.

[22] U.S. Office of National Marine Sanctuaries, *Road to Sanctuary Designation*. https://nmssanctuaries.blob.core.windows.net/sanctuaries-prod/media/archive/management/pdfs/designation-process.pdf.

Marine national monuments are established under the Antiquities Act of 1906. The Antiquities Act grants the President and Congress authority to designate marine national monuments by executive order, a very different process than those for nominating and designating sanctuaries detailed above. Although NOAA has no formal role in the establishment of monuments, the bureau may support a presidential administration by providing information and technical expertise on the area under consideration. NOAA may co-manage monuments in partnership with the Department of the Interior. Two marine national monuments are co-managed by ONMS with federal. state, and territorial partners: Papahānaumokuākea and Rose Atoll. Three others are co-managed by NMFS and U.S. Fish and Wildlife Service: Pacific Remote Islands, Marianas Trench, and Northeast Canyons and Seamounts; ONMS has no role in the management of these monuments.

2.4 NOAA Office of National Marine Sanctuaries

NOAA headquarters consists of six staff offices, six corporate services, and six line offices.[23] The six line offices are the:

- National Environmental Satellite, Data, and Information Service (NESDIS)
- National Marine Fisheries Service (NMFS)
- National Ocean Service (NOS)
- National Weather Service (NWS)
- Office of Marine and Aviation Operations (OMAO)
- Office of Oceanic and Atmospheric Research (OAR)

NOAA's Office of National Marine Sanctuaries is positioned within NOS. ONMS' mission is to "protect treasured places in the ocean and Great Lakes."[24] ONMS envisions "a thriving sanctuary system that protects our Nation's underwater treasures and inspires momentum for a healthy ocean." According to the agency's strategic plan for fiscal years (FYs) 2017-2022, its goals are to:

1. Ensure thriving sanctuaries and other ocean parks.
2. Safeguard more underwater treasures as national marine sanctuaries.
3. Increase support for sanctuaries.
4. Deepen our understanding of sanctuaries.
5. Ensure ONMS is a great place to work.

[23] U.S. National Oceanic and Atmospheric Administration, *Organization*. https://www.noaa.gov/about/organization.
[24] U.S. Office of National Marine Sanctuaries, *Strategic Plan for Fiscal Years 2017-2022*. https://nmssanctuaries.blob.core.windows.net/sanctuaries-prod/media/docs/onms-strategic-plan-2017-2022.pdf.

Organizational Structure

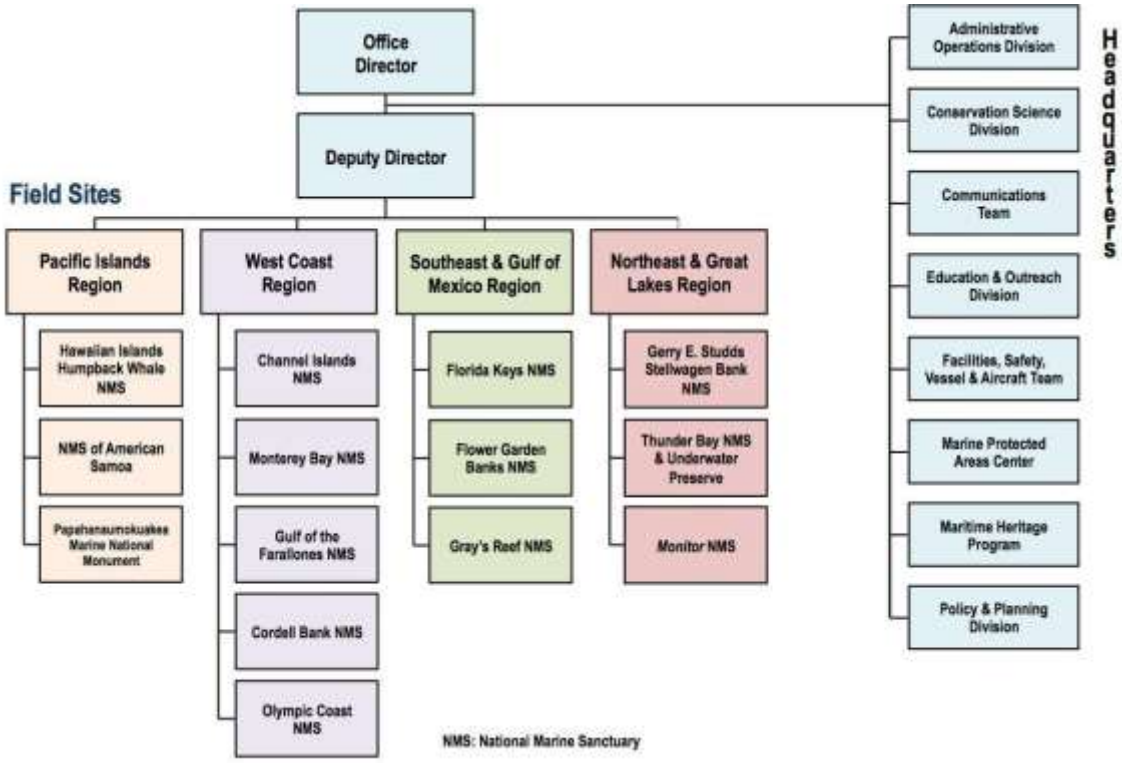

Figure 2.1: National Marine Sanctuary System Organization Chart. (Source: https://sanctuaries.noaa.gov/about/org-chart.html)[25]

[25] ONMS is reviewing their current organizational structure for potential updates and streamlining options.

Headquarters

In 2001, NOAA elevated its Marine Sanctuaries Division to the office level under the National Ocean Service line office. At its headquarters in Silver Spring, Maryland, eight divisions and teams comprise ONMS. Six of the units administer programs, and two provide mission support, as shown in Figure 2.2, below.

Program	**Mission Support**
Communications Team	Administrative Operations Division
Conservation Science Division	Facilities, Safety, Vessel and Aircraft Team
Education and Outreach Division	
Marine Protected Areas Center	
Maritime Heritage Program	
Policy and Planning Division	

Figure 2.2: ONMS Headquarters Units. Figure created by the National Academy of Public Administration. (Source: https://sanctuaries.noaa.gov/about/org-chart.html).

Regions

Northeast and Great Lakes	**West Coast**
Lake Ontario*	Channel Islands
Mallows Bay-Potomac River	Cordell Bank
Monitor	Greater Farallones
Stellwagen Bank	Monterey Bay
Thunder Bay	Olympic Coast
Wisconsin Shipwreck Coast*	
Pacific Islands	**Southeast, Gulf of Mexico, and Caribbean**
American Samoa	Florida Keys
Hawaii Humpback Whale	Flower Garden Banks
Papahānaumokuākea	Gray's Reef

**Site currently in the process of sanctuary designation.*
Figure 2.3: National Marine Sanctuary System Regions. Figure created by the National Academy of Public Administration. (Source: https://sanctuaries.noaa.gov/about/org-chart.html).

The System's regional layer is a relatively new addition to the organization, first established in 2001 when ONMS was elevated from NOAA's division level to its office level under the National Ocean Service. ONMS's regional offices are responsible for providing policy, operational, and day-to-day administrative support to the leadership and staff of all national marine sanctuaries or marine national monuments in the region. The regions also address issues of broad regional concern and are responsible for assisting the ONMS Director and Deputy Director in the administration of all regional resources and providing input to the administration of the ONMS

as a whole. The regions also oversee the analyses and public processes required for designating a new sanctuary in their region.

Sanctuary Sites

Figure 2.4: Map of the National Marine Sanctuary System. (Source: https://monitor.noaa.gov/about/sanctuary-map.html)[26]

Management in each sanctuary and monument is led by a Superintendent and, in some cases, an Assistant Superintendent. Sanctuary staff levels and funding vary by site, but generally sanctuaries employ program and mission support staff with expertise in science, research, education, communications, resource protection, maritime heritage, administration, facilities, and vessel operations. The enforcement of laws and ONMS regulations is split between the government agencies of jurisdiction in any given area, typically the U.S. Coast Guard, NOAA Office of Law Enforcement, and state fish and wildlife agencies. The System also leverages a large number of volunteers as a force multiplier. At some sites, volunteers can outnumber ONMS employees. In the case of the Channel Islands National Marine Sanctuary, the Channel Islands Naturalist Corps is an organization of volunteers that is shared between the National Park Service and ONMS.

Site staff are required to prepare both a condition report and management plan following the designation of any new sanctuary, and to review and potentially revise each approximately every five years following that designation. A condition report "provide[s] a standardized summary of resources in NOAA's sanctuaries; drivers and pressures on those resources; current conditions and trends for a resources and ecosystem services; and describe existing management responses to the pressures that threaten the integrity of the marine environment." Management plans "summarize existing programs and regulations; guide preparation of annual operating plans;

[26] The proposed "Wisconsin" sanctuary shown in Figure 2.4 will be named the "Wisconsin Shipwreck Coast National Marine Sanctuary", as shown in Figure 2.3.

articulate visions, goals, objectives, and priorities; guide management decision making; guide future project planning; ensure public involvement in management processes; and contribute to the attainment of system goals and objectives." Each Sanctuary Advisory Council (SAC) provides recommendations and stakeholder input to the sanctuary and their administrators on condition reports, management plans, and other issues in their sanctuary (refer to section on Advisory Councils below).

Advisory Councils

Business Advisory Council

The Sanctuaries Business Advisory Council (BAC), first charted in 2013, is a national-level body that provides advice and recommendations to the Director of ONMS on the sustainable management of national marine sanctuaries and ways in which the business community may help advance ONMS' goals. It focuses on engaging the private sector and non-traditional partners with mutual interest in resource conservation, assessing and expressing the value of sanctuaries and other marine protected areas (MPAs), and developing joint initiatives and projects to support the sustainability and protection of special marine places.[27] Members of the BAC liaise with the private sector on behalf of ONMS, and have the ability to form working groups with outside individuals. The council is to consist of no more than 15 voting members, appointed by the Director of ONMS. The 15 seats represent a wide variety of stakeholder interests including recreation, tourism, ocean commerce, commercial and recreational fishing, natural and cultural resource management, marketing, and conservation. Council members serve staggered two and three-year terms and may not be serve for more than three consecutive terms. The BAC meets no more than once during each fiscal quarter, and those meetings are open to the public.

In early 2021, ONMS held the first meeting of its reconstituted BAC, following expiration of a previous BAC charter in 2018. The reconstituted BAC will move forward with a particular focus on sustainable recreation and tourism for a minimum of five years. Currently, ONMS seeks to fill four seats on the council with members that have marketing experience.

Sanctuary Advisory Councils

In 1990, Congress enacted the Florida Keys National Marine Sanctuary and Protection Act, designating the Florida Keys as a marine sanctuary and requiring ONMS to establish an advisory committee for the site.[28] Seeing its positive impact in the Keys, NMSA was amended in 1992 to authorize advisory councils for each sanctuary. The SACs advise site Superintendents and leadership on management actions in the sanctuaries. SAC members serve as a liaison between a sanctuary and its community and identify potential partners and constituent groups that the Sanctuary should engage. They identify and resolve issues and conflicts in the sanctuaries and validate the accuracy and quality of information the sanctuaries use for decision-making. Most important, SACs review and provide input on sanctuary plans, proposals, and products.

[27] The United States Executive Order 13158 defines a marine protected area as "Any area of the marine environment that has been reserved by Federal, State, territorial, tribal or local laws or regulations to provide lasting protection for part or all of the natural and cultural resources therein."
[28] 101st U.S. Congress, *Florida Keys National Marine Sanctuary and Protection Act*. https://www.congress.gov/bill/101st-congress/house-bill/5909.

Membership is limited to 15 members for sanctuaries designated after 2000, and seats may be filled by representatives from federal or state agencies, regional fishery management councils, and representatives from local user groups, conservation or public interest organizations, scientific or educational organizations, or others interested in the protection of sanctuary resources. SACs generally meet publicly on a monthly, bimonthly, or quarterly basis.

Budget

In FY2020, Congress enacted a $55,500,000 appropriation for ONMS for programs, and $3,000,000 for construction.[29] This covers a current retinue of 168 full-time equivalent employees (FTEs).[30] NOAA and the National Ocean Service (NOS) take about 12 percent of the total appropriated funds each year to cover overhead costs, including headquarters facilities.

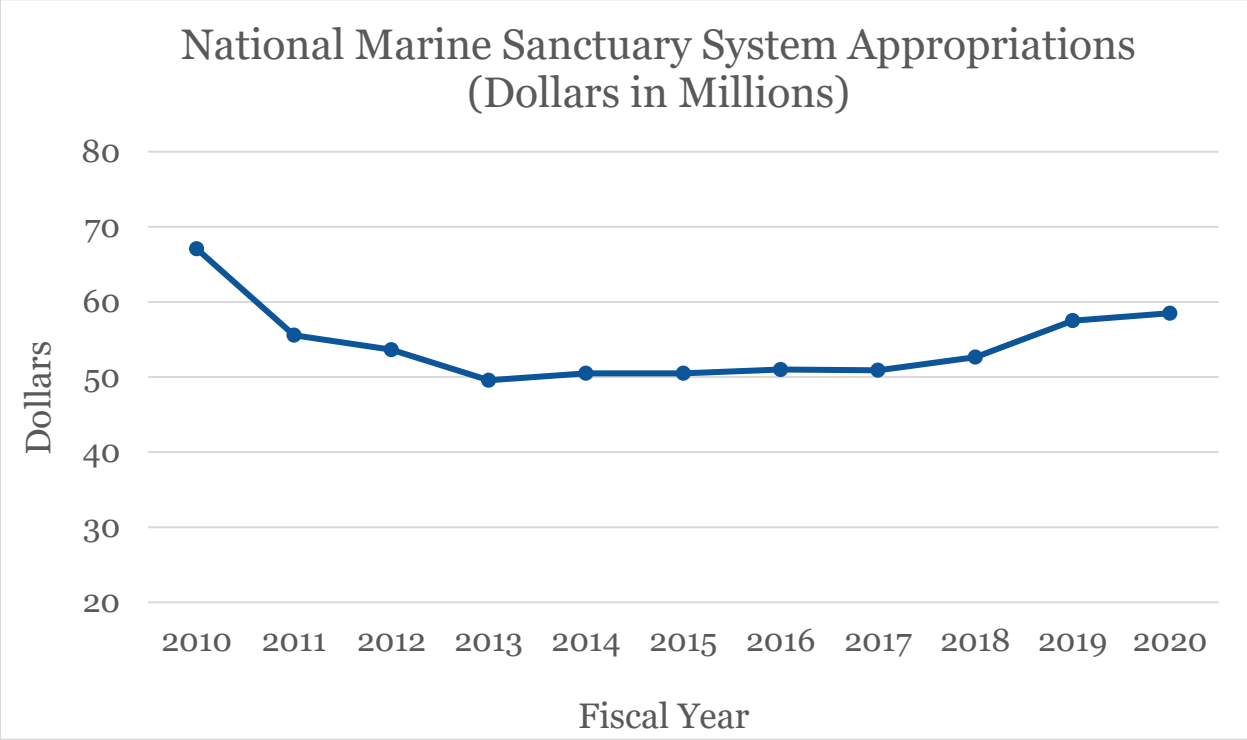

Figure 2.5: National Marine Sanctuary System Appropriations (Fiscal Year 2010-2020). Figure created by the National Academy of Public Administration. (Source: https://www.noaa.gov/organization/budget%2C-finance-performance/budget-archive).

Appropriated funding for ONMS for both programs and construction is shown in Figure 2.5, above. ONMS' budget has remained relatively flat over the last ten years, with an enacted program

[29] As noted in Section 1, this report refers to funding budgeted under NOAA's Operations, Research, and Facilities accounts as "program" funds, and funding under its Procurement, Acquisitions, and Construction account as "construction" funds. Together, these two broad accounts comprise discretionary appropriations. See https://crsreports.congress.gov/product/pdf/IF/IF11185.

[30] U.S. National Oceanic and Atmospheric Administration, *Congressional Budget Justification for Fiscal Year 2021*. https://www.noaa.gov/sites/default/files/atoms/files/508%20Compliant_FY21%20NOAA%20CJ.pdf.

appropriation of $53,070,000 in FY2010.[31] While about $14 million were appropriated for construction in FY2010, appropriations for construction have not exceeded $6 million since that time. When accounting for inflation, there is an effective decrease in resources, as $53,070,000 in January 2010 would translate to roughly $63,794,110 in buying power for programs in December 2020.[32] Note that the dollar amounts shown in Figure 2.5 do not include funding for the MPA Center. Before the MPA Center was integrated with ONMS in 2013, its operating budget ranged from about $1 million to $3 million. The two organizations were integrated during federal budget sequestration under the Obama Administration, and the merger did not result in an increase in appropriations for ONMS.[33]

Socioeconomic Analysis

ONMS' team of economists, in partnership with site staff; local, state, and federal agencies; academic institutions; and NGOs across the System, conduct studies on socioeconomics in the sanctuaries to identify users, determine factors driving their behavior and changes to that behavior, and estimate the socioeconomic impacts of those changes. ONMS also estimates the benefits derived from sanctuaries in order to compare them with negative impacts, particularly in the form of cost-benefit analysis. Socioeconomic analysis serves as an important tool for the System to help managers and policymakers to make informed decisions on natural resources management. To date, no holistic valuation across the System has been compiled which OMB considers validated and rigorous enough for public use.

While many of the socioeconomic studies in this area are upwards of ten years old, ONMS is making efforts to update older valuation studies, and undertake new ones. One new initiative is called the Sanctuary Use Characterization, Assessment and Research (SUCAR) program. With SUCAR, ONMS is particularly interested in understanding the profiles of communities in the sanctuaries, and the factors impacting non-users of the System, often (but not always) located in inland areas of the country, whose behavior is shaped by factors related to access, cost, preference, and awareness.

Conservation Science

ONMS' scientific enterprise is conducted by a team of HQ, region, and site-based experts in a variety of fields and an extensive network of partners from universities and other research institutions. The System's approach is to focus its science investments on the conservation issues affecting sanctuary resources and communities, such as losses in biodiversity, vessel traffic, invasive species, and pollution. Research (and other purposes) is supported by the ONMS Small Boat Fleet consisting of more than 40 vessels from small utility boats to vessels up to 85 feet in length.

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[31] U.S. National Oceanic and Atmospheric Administration, *Congressional Budget Justification for Fiscal Year 2011*. https://www.noaa.gov/sites/default/files/atoms/files/FY2011_Congressional_Budget.pdf
[32] U.S. Bureau of Labor Statistics, *CPI Inflation Calculator*. https://www.bls.gov/data/inflation_calculator.htm
[33] 112th U.S. Congress, *Budget Control Act of 2011*. https://www.congress.gov/112/plaws/publ25/PLAW-112publ25.pdf. ; 112th U.S. Congress, *American Taxpayer Relief Act of 2012*. https://www.congress.gov/bill/112th-congress/house-bill/8/text.

Among the most important synthesis products that come from the System's science team are condition reports, which are sanctuary-specific documents that provide a summary resources in each sanctuary, pressures on those resources, the current condition and trends, and management responses to the pressures that threaten the integrity of the marine environment. Specifically, the reports include information on the status and trends of water quality, habitat, living resources and maritime archaeological resources and the human activities that affect them. Condition reports are used by the System to prepare for management plan reviews and revisions, and for other research, outreach, and management purposes.

Communications, Outreach, Education, and Branding

ONMS leverages two strategic documents at the headquarters level to guide its communications, outreach, and education programs, its communications plan and education strategic plan. The communications plan summarizes the challenges facing the System, and lays out its primary communications goals:

- Expand recognition of the sanctuary brand
- Promote engagement with sanctuaries
- Increase the value we bring to our communities

The communications plan also articulates the System's key messages, in short form, and lists goals and strategies by target audience, as well as tools such as social media to reach those audiences.

The education strategic plan for FY 2010-2020 sets out the following goals:[34]

- Demonstrate education management excellence
- Enhance ocean and climate literacy through national marine sanctuaries
- Develop and strengthen strategic education partnerships

Each goal is accompanied by a set of objectives and strategies for implementation. The education strategic plan also places emphasis on leveraging partners to further its educational efforts, like aquariums, and includes rigorous evaluation procedures across most education efforts. The System also maintains its internal Best Practices Guide to Outreach and Communication, which provides guidance, templates, and other material to staff to help ensure that the sanctuary brand is used consistently across products and convey communications best practices to staff.

The education strategic plan also places emphasis on pursing additional funding opportunities with the Marine Sanctuary Foundation and other external partners. One part of this effort is utilizing ONMS' authority under the NMSA to permit sponsors of the System to use and market its brand and logo.[35] ONMS' logo takes the form of a whale tail, an integral part of the sanctuary brand. Under the NMSA, the System can use its authority to sell merchandise imprinted with the

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[34] U.S. Office of National Marine Sanctuaries, *Education Strategic Plan for Fiscal Years 2010-2020*. https://nmssanctuaries.blob.core.windows.net/sanctuaries-prod/media/archive/education/pdfs/onms_educ_strategic_2010_2020.pdf

[35] 106th U.S. Congress, *National Marine Sanctuaries Amendments Act of 2000*. https://www.congress.gov/bill/106th-congress/senate-bill/1482/text/pl?overview=closed.
; U.S. Office of National Marine Sanctuaries, *Sanctuary System Sponsorship Program*. https://sanctuaries.noaa.gov/involved/sponsorship.html

whale tail logo and permits authorized and official external sponsors, such as the National Marine Sanctuary Foundation, to do the same.

ONMS' website serves as a platform for many resources, including some of the materials it uses to engage its partners and the public. The Earth is Blue campaign brings vivid photos, videos, and engaging articles via an annual magazine to connect people to the sanctuaries.[36] ONMS posts virtual dives to the website, which are 360-degree videos of the sanctuaries, to allow the public to view them from the comfort of their homes. ONMS offers a variety of both formal and informal education programs through field-based classroom visits, visitor center programs, classroom visits, lesson plans and curricula, teacher workshops and virtual webinars. In addition, nationwide programs such as the Ocean Guardian Program work to build environmental stewardship projects into schools and communities. Of the over 73,000 students in formal programs and 65,000 additional youth and adults through informal learning opportunities, ONMS reaches 24,000 youth from underserved areas. ONMS also uses social media to reach the public, with approximately 111,000 followers on Instagram, 75,000 on Twitter, 142,000 on Facebook, and nearly 4,000 subscribers on YouTube as of February 26, 2021.[37] The System garners billions of media impressions each year.

[36] U.S. Office of National Marine Sanctuaries, *Earth is Blue Magazine*. https://sanctuaries.noaa.gov/magazine/

[37] U.S. Office of National Marine Sanctuaries, *Official Instagram Account:* https://www.instagram.com/noaasanctuaries/?hl=en; *Official Twitter Account:* https://twitter.com/sanctuaries?ref_src=twsrc%5Egoogle%7Ctwcamp%5Eserp%7Ctwgr%5Eauthor; *Official Facebook Account:* https://www.facebook.com/NOAAOfficeofNationalMarineSanctuaries/; *Official YouTube Channel:* https://www.youtube.com/user/sanctuaries

Section 3: Comparison Between ONMS and Other Similar Agencies, Domestic and Foreign

Benchmarking (comparing organizations to their peers) can help to understand relative performance, identify gaps and opportunities to improve, and identify relevant and applicable strategic, management and operational best practices. In this section, the focus of benchmarking is aimed broadly – to understand how other resource management systems are organized and managed, with a particular focus on identifying innovative and/or best practices.

An important element of benchmarking is to identify the right set of peer groups for comparison – a critical aspect to obtain useful insights. In this respect, it is challenging to find domestic organizations with a similar marine environment protection mission similar to the System. Though terrestrial and marine resource systems have their own unique characteristics, and managing them involve different techniques and processes, there are several reasons why they can still be used as valid comparables. First, there are a number of similar functional activities that both terrestrial and marine systems include, such as resource stewardship, research and monitoring, education and outreach, and law enforcement. Another is the very act of preserving special places in nature for the benefit of current and future generations. [38]

In terms of differences, there are distinctive aspects to managing marine ecosystems, such as inability to cordon off or add physical boundaries to marine resource systems, with resulting challenges to surveillance of species or law enforcement. In addition, the vertical dimension associated with marine resources (management down to the ocean floor) adds vast complexity in multiple dimensions, including challenging restoration activities.

Figure 3.1 below summarizes the chosen peer group of resource management systems, including an international (comparable developed country) system.[39] The comparison included various dimensions including Strategy, Finance, Management and Operations, Organizations, Communication and Outreach and Community Engagement. Note: In many cases, systems are managed across multiple agencies. As a result, the comparison is limited to identifying the area and budget within a single agency's purview.

[38] Carr et al., *Comparing Marine and Terrestrial Ecosystems*. http://www.ghub.org/wp-content/uploads/2020/09/09-Comparing-marine-and-terrestrial-ecosystems-implications-for-the-design-of-coastal-marine-reserves.pdf.

[39] Finding international comparable systems was also limited due the lack of available data and information.

System	Managed Natural Resources	Compatible and/or Recreational Uses	Manages Cultural Resources	Geography
National Marine Sanctuary System	Ocean & Great Lakes	Yes	Yes	Domestic (U.S), across 4 regions in 12 states and American Samoa.
National Estuarine Research Reserve System (NERRS)	Estuaries	Yes	Yes	Domestic (U.S), 29 estuaries in 24 states.[40]
National Estuary Program (NEP)	Estuaries	Yes	No	Domestic (U.S) and territories, 28 estuaries across 18 states and territories.
National Landscape Conservation System	Land	Yes	Yes	Domestic (U.S), across 10 states.
National Park System	Land	Yes	Yes	Domestic (U.S), across all states and territories
National Wildlife Refuge System	Marine, Great Lakes & Land	Yes	Yes	Domestic (U.S), across 25 states.
Great Barrier Reef Marine Park	Marine	Yes[41]	Yes	International (Australia)

Figure 3.1: Summary of Peer Groups. Figure created by the National Academy of Public Administration.

The figure below provides an overview of the selected resource management systems, comparing the total managed acres and budget allocated. The System far exceeds the total managed area compared to its peers, albeit with considerably lower funding. As an example, a close comparable, the Great Barrier Reef Marine Park manages ~70 million acres with ~$57 million, compared to the System which manages ~400 million acres with a budget of ~$55 million. A more detailed comparison is provided in the following sub-section.

[40] The Pew Charitable Trusts, *Coastal Areas Benefit from Federal-State Partnerships*. https://www.pewtrusts.org/en/research-and-analysis/articles/2019/08/08/vital-coastal-areas-benefit-from-federal-state-partnerships.

[41] However, a large part of the reef is protected by the Great Barrier Reef Marine Park, which allows recreational use but helps to limit the impact of human use, such as fishing and tourism.

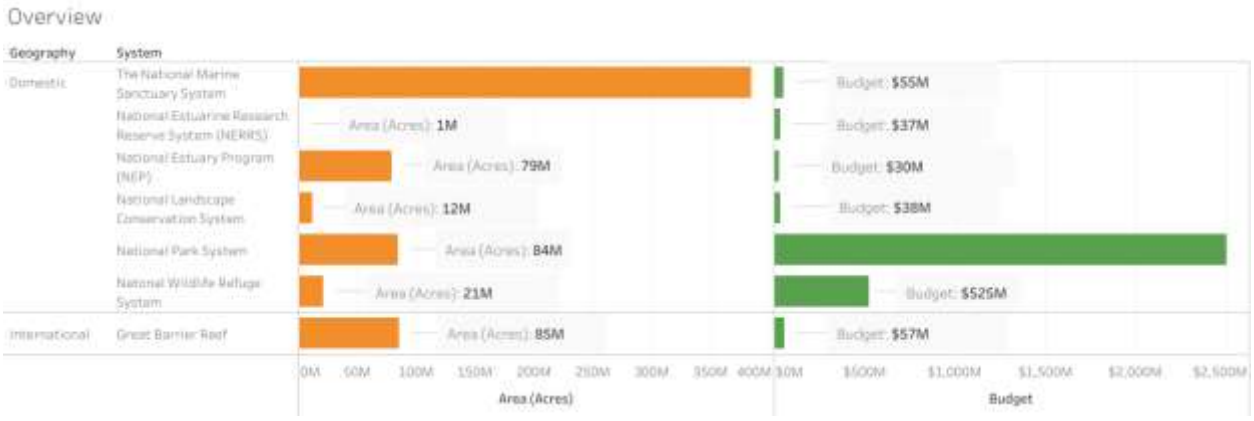

Figure 3.2: Total Managed Area and Budget by Organization. Figure created by the National Academy of Public Administration. (Source: Congressional Budget Justifications for Fiscal Year 2021; Australia Environment and Energy Budget Statements 2019-2020)[42]

3.1 Overview of Peer Groups

The National Marine Sanctuary System

The System serves as the trustee for a network of underwater parks encompassing more than 620,000 square miles (396 million acres) of marine and Great Lakes waters. The network includes 14 national marine sanctuaries and Papahānaumokuākea and Rose Atoll marine national monuments.

National Estuarine Research Reserve System (NERRS)

The National Estuarine Research Reserve System is a network of 29 coastal sites designated to protect and study estuarine systems covering over 1.3 million acres and are focused on the following: stewardship, research, training and education.[43]

The reserves represent a partnership between NOAA and coastal states with NOAA's Office for Coastal Management responsible for administering the reserve system. Each reserve is managed on a day-to-day basis by a lead state agency or university, with input from local partners.

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[42] U.S. National Oceanic and Atmospheric Administration, *Congressional Budget Justification for Fiscal Year 2021*. https://www.noaa.gov/sites/default/files/atoms/files/508%20Compliant_FY21%20NOAA%20CJ.pdf.; U.S. Environmental Protection Agency, *CBJ for FY 2021*. https://www.epa.gov/sites/production/files/2020-02/documents/fy-2021-congressional-justification-all-tabs.pdf.; U.S. Bureau of Land Management, *CBJ for FY 2021*. https://www.doi.gov/sites/doi.gov/files/uploads/fy2021-budget-justification-blm.pdf.; U.S. National Park Service, *CBJ for FY 2021*. https://www.doi.gov/sites/doi.gov/files/uploads/fy2021-budget-justification-nps.pdf.; U.S. Fish and Wildlife Service, *CBJ for FY 2021*. https://www.fws.gov/budget/2021/FY2021-FWS-Budget-Justification.pdf.; Australian Government, *Environment and Energy Department Budget Statements 2019-2020*. https://www.awe.gov.au/sites/default/files/2020-01/pbs-2019-20-environment-and-energy.pdf.

[43] Estuaries and their surrounding wetlands are bodies of water usually found where rivers meet the sea. See https://coast.noaa.gov/nerrs/.

National Estuary Program (NEP)

The National Estuary Program is a place-based program, run by the U.S Environmental Protection Agency (EPA). The Program's mission is to protect and restore the water quality and ecological integrity of estuaries of national significance. Currently, 28 estuaries located along the Atlantic, Gulf, and Pacific coasts and in Puerto Rico are designated as estuaries of national significance. In overseeing and managing the national program, EPA provides annual funding, national guidance and technical assistance to the local NEPs.[44]

National Landscape Conservation System ("National Conservation Lands")

The National Conservation Lands offer the American people exceptional opportunities for hunting, solitude, wildlife viewing, fishing, history exploration, scientific research and a wide range of traditional uses. The Bureau of Land Management 's (BLM) National Monument and National Conservation Areas program encompasses over 11.9 million acres. Currently, there are: 28 BLM National Monuments, 17 National Conservation Areas, and 6 Similarly Designated lands. An estimated 9.6M visitors come to National Monuments and National Conservation Areas.[45]

National Park System

The National Park Service preserves unimpaired the natural and cultural resources and values of the National Park System for the enjoyment, education, and inspiration of this and future generations.

The National Park System has expanded to 423 units (often referred to as parks), more than 150 related areas, and numerous programs that assist in conserving the nation's natural and cultural heritage for the benefit of current and future generations. The National Park Service manages 423 individual units covering more than 85 million acres in all 50 states, the District of Columbia, and US territories.[46]

National Wildlife Refuge System

The National Wildlife Refuge System is a system of diverse landscapes set up with the primary purpose to conserve native species dependent on its lands and waters while allowing recreational uses which must be compatible with the primary purpose of conservation. It includes 568 national wildlife systems. The U.S. Fish and Wildlife Service manages almost 21 million acres of wilderness in the National Wildlife Refuge System, with 75 wilderness areas on 63 Refuge System units across 25 states. NOAA and the Fish and Wildlife Service cooperatively manage four marine national monuments in the Pacific Ocean and one in the Atlantic.[47]

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[44] U.S. Environmental Protection Agency, *Overview of the National Estuary Program*. https://www.epa.gov/nep/overview-national-estuary-program#overview.
[45] U.S. Bureau of Land Management, *Congressional Budget Justification for Fiscal Year 2021*. https://www.doi.gov/sites/doi.gov/files/uploads/fy2021-budget-justification-blm.pdf.
[46] U.S. National Park Service, *About Us*. https://www.nps.gov/aboutus/national-park-system.htm.
[47] U.S. Fish and Wildlife Service, *About Us*. https://www.fws.gov/refuges/about/faq.html. See 'Hope Spots' in the Ocean.

Great Barrier Reef Marine Park

The Great Barrier Reef is a vast and spectacular ecosystem and one of the most complex natural systems on Earth. It covers more than 70 million acres and includes the world's largest coral reef ecosystem. It comprises almost 3,000 individual reefs, about 10 percent of the world's coral reefs.[48] It is managed by the Great Barrier Reef Marine Park Authority – a regulator that is entrusted with the responsibility of managing the park.

Key Insights

Figure 3.3 below provides a comparison of relative spend per acre of the selected peer groups. As it can be seen from the below graphic, the average budget spending per acre of the System is much lower ($0.14) compared to the Great Barrier Reef Marine Park ($0.67), and much lower compared to other domestic systems, which spend an average that ranges from $3 up to $30 per acre.

Extending the concept of spend per acre, and using a hypothetical scenario - if the System was to be funded at the same level (avg. spend per acre) as its closest comparable (the Great Barrier Reef), it would be an approximately $250 million program, as compared to its current budget of $55 million.

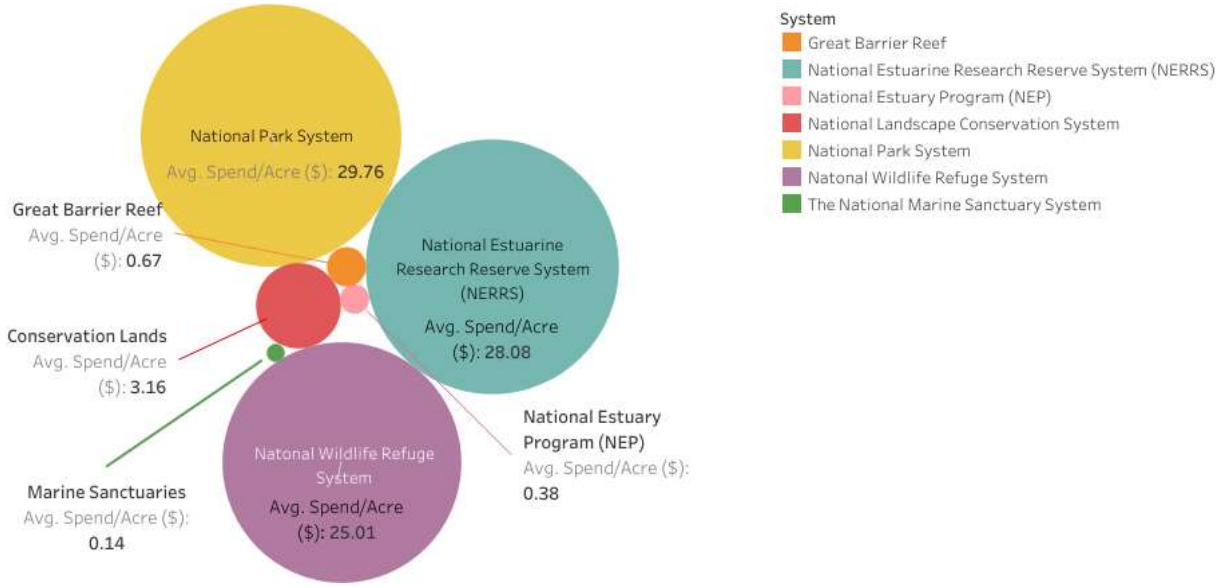

Figure 3.3: Comparison of Spend Per Acre by Organization. Figure created by the National Academy of Public Administration.

In addition to the above peer group, the Academy Study Team identified a few other comparable organizations – many of which were highlighted by stakeholders as organizations that had some innovative and/or best practice considerations. These organizations include the Audubon Society, UK's Blue Belt Programme, The Nature Conservancy, the National Estuary Program (managed by EPA) and others to examine potential practices which are summarized in the Figure 3.4 below. It

[48] Australian Government Great Barrier Reef Marine Park Authority, *Reef Facts*. https://www.gbrmpa.gov.au/the-reef/reef-facts.

highlights some key practices of select resource management and protection organizations which can inform the System's management and planning.

Category	Examples
Strategy	● The Great Barrier Reef developed a Blueprint that involved 70 regional, national and international delegates and key stakeholders
Finance	● The Wildlife Refuge System has established a Duck Stamp Program not only to generate additional revenues but increase public awareness. In 2017, the most recent year with complete information, Duck Stamp sales totaled more than $38 million. ● The National Estuary Program raises an average of $22 for every $1 provided by EPA, by raising additional funding through annual membership appeals, license plate revenues, fines and penalties, state appropriations and intergovernmental agreements. [49]
Management and Operations	• The Great Barrier Reef, in addition to most other domestic systems, capture visitation data, allowing it to track direct and indirect visitors. • The National Park System has 28 different types of designations which offer varying degrees of resource management and protection. • The National Estuarine Research and Reserve System is managed as a partnership between NOAA and the coastal states. NOAA provides funding and national guidance, and each site is managed by a state agency or university. • The Audubon Society's organization is aligned with bird 'flyways" – inspired by how birds travel in spring and fall, a similar organizing principle relevant in a marine environment could be a potential model for management and/or organization. • Technology - The Blue Belt Programme uses technology (drones, underwater sensors, satellite data etc.) to assist in management and enforcement

[49] U.S. Environmental Protection Agency, *Financing Strategies Used by the National Estuary Program*. https://www.epa.gov/nep/financing-strategies-used-national-estuary-program.

Organization	• Talent - Audubon Society's fellows are leaders-in-training in the disciplines of environmental communications, conservation education, field organizing, field biology, public policy, geospatial information systems, and much more. • NPS, along with the US Fish and Wildlife Service has established a NPS Academy which is an innovative program that introduces diverse undergraduate and graduate students, ages 18 to 30, from across the country to careers in the NPS.
Communications and Outreach	
Community Engagement	• The Audubon Society has established a huge volunteer network, connected to nature centers, that operate largely independently but are efficient in activating communities to engage with them on a consistent and regular basis. • Many organizations, such as the National Park Service and The Nature Conservancy, make effective use of public-private partnerships.

Figure 3.4: Strategic, Management, and Operational Considerations. Figure created by the National Academy of Public Administration.

In summary, it is clear that the System's budget is far lower than its peer groups. In fact, based on an internal funding model, the estimated funding needs of the program in FY2013 was estimated to be about $136 million. While many programs and agencies face funding constraints, the magnitude of the gap is noteworthy and points to a need to address this issue for the System to meet its potential.

Section 4: Major Achievements Since 1972

In the nearly 50 years of its existence, the System has worked to gain congressional approval for the designation of new sites and the protection of marine environment areas that have special national significance.[50] This section notes the success and some of the major achievements for the System, identifying major milestones that the System has been able to reach since its inception.

At the outset, it is helpful to examine good practices to employ in evaluating organizational achievements. Success must be appropriately defined to measure and communicate achievements against a larger set vision. Enduring success is not one-dimensional, but rather it is a complex framework of smaller visions of success. Within this framework, measures of achievement come together to paint a kaleidoscope of a larger vision of an enduring legacy.[51]

4.1 Major Achievements of the System

The NMSA defines the purpose of the System as to "protect areas of the marine environment with special national significance due to their conservation, recreational, ecological, historical, scientific, cultural, archeological, educational or aesthetic qualities as national marine sanctuaries."[52] This establishing legislation emphasizes resource conservation and facilitating multiple-uses of the System that are compatible with resource protection. As mentioned above, properly defined success is multi-dimensional which the System embodies by promoting this dual mandate. Major achievements of the System can be defined as the building blocks towards both overarching visions of success. Moreover, each site within the System has its reason for establishment and defined purpose. Achievements of the System can be measured and communicated by first looking at progress towards a site's specific purpose and then fitting that progress into the overarching resource protection and compatible use framework of the System.

4.2 Challenges of Measuring System Achievements

While the NMSA creates a definition of success for the System, there have been extenuating circumstances and challenges that have hindered the System's ability to adequately measure and communicate its major achievements. Three challenges are raised in this sub-section.

First, the System is decentralized, and locations have unique features that do not lend themselves to easy across-the-System evaluation. Each site has a unique reason for establishment and definition of success. With each site striving for somewhat different goals, it is a challenge for the System to bring together the array of achievements and turn that set into a comprehensive narrative that communicates the achievements of the System as a whole.

Second, the goals and strategies to accomplish resource protection have changed in the past 50 years due to evolving threats and measures of success. For example, when the System was first

[50] 106th U.S. Congress, *National Marine Sanctuaries Amendments Act of 2000*. https://www.congress.gov/bill/106th-congress/senate-bill/1482/text/pl?overview=closed.
[51] Nash, Laura and Howard H. Stevenson, *Success That Lasts*. https://hbr.org/2004/02/success-that-lasts
[52] 106th U.S. Congress, *National Marine Sanctuaries Amendments Act of 2000*. https://www.congress.gov/bill/106th-congress/senate-bill/1482/text/pl?overview=closed.

established, oil spills were seen as one of the main threats to the conservation of MPAs, and the protection against these disasters was a driving measure of success. The threats to the System have since changed to include new focuses on climate change and adapting to emerging technologies (see Section 5 for further details on the future outlook of the marine environment) and measures of success should adapt commensurately.

Third and moreover, achievements and success in the cross-cutting fields of conservation and promoting multiple-use are often seen as zero-sum. There is a perception that one can either achieve adequate conservation, or promote multiple-use, but not promote both simultaneously. This presents a difficulty in measuring the success of the System and can be difficult to communicate in the larger conversation about the conservation of MPAs in a way that is universally accepted. Given the broad language in the NMSA and the potential perception of conflicting interests, the System's achievements exist within a multi-dimensional comprehensive framework that looks at gradual and continual progress and evolution, rather than a static question of yes or no.

4.3 Major Achievements of the System in the Past 50 Years

Despite these challenges in defining, measuring, and communicating achievements, the System has been able to make significant strides in many areas within its mission. The following touches on seven major accomplishments of the System since its inception in 1972.

Innovation

When the System was first established in 1972 it was among the first of its kind in the world to create a large-scale MPA conservation system at a national level. The establishment of the System helped to lead the way for other similar initiatives and the adaptive management and sustainably focused work of the System have been transferred to other spheres of conservation across the globe. The System has also been engaged in many international efforts related to the conservation of MPAs. ONMS is a key member of international partnerships and has established the International MPA Capacity Building Team as part of the MPA Center that aims to connect protected areas across the globe to encourage the sharing of best practices and expertise.[53] The System is viewed as having a legacy of innovation that is held in high regard by many of its international counterparts and is still considered to be a leader in many fields within protected area management despite its lack of robust funding for a program of its scope (see Section 3).

Protection of Marine Resources

The System has achieved a broad physical reach of defined spaces designated as sanctuaries and monuments that span over 620,000 square miles across 14 different sanctuaries and two monuments.[54] The System also encompasses a variety of diverse sites that protect vulnerable ecosystems as well as important cultural heritage sites across the nation and its territories. The fact that the System is made up of such a wide range of sites that cover an expansive area is an

[53] U.S. National Marine Protected Areas, *International Partnerships for Marine Protected Areas*. https://marineprotectedareas.noaa.gov/nationalsystem/international/
[54] U.S. Office of National Marine Sanctuaries, *About*. https://sanctuaries.noaa.gov/about/

achievement in and of itself and contributes directly to the goal and purpose of the system as defined in the NMSA.

The System has continued to grow, an attribute of its dedication to the mission outlined by its defining legislation, although it has the potential to do far more with greater resources. In 2019, Mallows Bay-Potomac River was designated as a sanctuary site, adding an important site of historical significance to the System's inventory. Although this designation was the first in nearly 20 years, the success of the designation process shows a continual commitment to mission and potential for further expansion. The System also has been able to expand the reach of existing sites. In January 2021, following earlier successful site expansions, the Flower Garden Banks National Marine Sanctuary expanded its reach from 56 to 160 square miles adding 14 additional reefs and banks to the sanctuary, contributing to a larger ability to conserve the vulnerable ecosystems.[55]

Conservation and Scientific Research

The conservation of marine areas with national significance is the main purpose of establishing the System as outlined in the NMSA. To take one example, in 1953 a major collision between two vessels occurred within the boundaries of the future Greater Farallones National Marine Sanctuary, resulting in a massive oil spill and two shipwrecks that continually leaked oil. Due to the site's designation as a sanctuary and the good work of the System and its partners, 80 percent of the sunken oil from the Luckenbach spill has been removed from the site and has resulted in the decline of oiled ocean wildlife by over 80 percent.[56] Scientific research that occurs within the System has also directly contributed to the conservation and preservation of these sites. The scientific work of the System includes important data collection such as site assessments and characterization. Establishing these data sets allows for an increased understanding of these sites and, in turn, allows for more informed decisions about how to protect and preserve them. While preservation, protection, and in some cases restoration, in each site can look differently, the establishment of a baseline of understanding of these important environmental areas is a major achievement of the System. This understanding also grows increasingly important as the nature of the marine environment changes every more rapidly (discussed further in Section 5).

The System is sometimes criticized for not prohibiting all fishing and promoting multi-use from some conservation groups. However, the NMSA directs a complex multi-use mandate that the System must navigate. A recent study published in the Marine Policy Journal examined MPA sites off the California coast and found that many multiple-use MPAs like sanctuaries that do not regulate fishing contain areas that prevent harmful fishing practices through overlapping

[55] U.S. Office of National Marine Sanctuaries, *Flower Garden Banks National Marine Sanctuary Triples In Size*. https://sanctuaries.noaa.gov/news/jan21/flower-garden-banks-expansion.html
[56] U.S. Office of National Marine Sanctuaries, *Conservation Science in NOAA's National Marine Sanctuaries: Descriptions and Recent Accomplishments* *https://nmssanctuaries.blob.core.windows.net/sanctuaries-prod/media/archive/science/conservation/pdfs/accomplishments.pdf*

regulations by partner agencies.[57] The achievements in conservation have also led to achievements in positive externalities for System stakeholders and partners as discussed later in this section.

Maritime Heritage

Not only does the System preserve biological and ecological sites of importance in the nation; it also preserves important sites of maritime and cultural heritage. The Maritime Heritage Program, established in 2002, is an initiative that came from ONMS that aims to add a further dimension to the understanding and acknowledgment of the national maritime legacy that allows these places and their stories to be shared with future generations.[58] The preservation of historical sites also gives insight into people's interaction and connection with nature and can lead to increased support and buy-in for the program as a whole.

Maritime Heritage within the System sites is multi-faceted. For example, Stellwagen Bank National Marine Sanctuary is not only home to sunken ships that help illustrate the seafaring history of the nation, but it also shows and celebrates the connection of people to place. The site also is an important connector to the history of the marine populations in the area through the History of Marine Animal Populations, a project made possible by NOAA and ONMS funding.[59] Research done within the site has helped to unravel the history of marine animal populations in the area, contributing to a complex story of how this site has impacted and shaped the local community.[60] The exploration of the maritime heritage in the multiple dimensions at Stellwagen and other sites within the System has helped to illuminate some of the important milestones of the country and preserve national and natural heritage.

Management

A major achievement regarding the management of the System is the development of a professional management class responsible for monitoring wide-ranging environmental and economic resources. ONMS' staff is consistently seen as a strength within the System. The development of a dedicated and mission-driven staff is a great and recognized accomplishment and has contributed to the System being able to realize other significant achievements. Despite having limited funding, especially when compared to comparable systems as described in Section 3, the System's management system has allowed ONMS staff to be resource savvy and accomplish much with little – a considerable achievement. ONMS has forged a reputation that is referenced as a model by other countries with similar agencies.

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[57] Jennifer Sletten, Mimi D'Iorio, Mary G. Gleason, Alex Driedger, Timothé Vincent, Claire Colegrove, Dawn Wright, Virgil Zetterlind, *Beyond the Boundaries: How Regulation-Centered Marine Protected Area Information Improves Ocean Protection Assessment*.
https://www.sciencedirect.com/science/article/pii/S0308597X20309908
[58] U.S. Office of National Marine Sanctuaries, *Why Maritime Heritage?*
https://sanctuaries.noaa.gov/maritime/aboutmhp.html
[59] Stellwagen Bank National Marine Sanctuary, *History of Marine Animal Populations*.
https://stellwagen.noaa.gov/maritime/history-of-marine-animal-populations.html
[60] Stellwagen Bank National Marine History, *Maritime Heritage*.
https://stellwagen.noaa.gov/maritime/welcome.html

Community Engagement

Community engagement is one of the cornerstones of the System. ONMS looks to local communities as important stakeholders in the management of sites from the designation process to the continual planning and management processes. While the engagement can vary site by site, by working with a variety of external stakeholders, the System has been able to increase buy-in and community support in numerous ways. Previous Academy reports have touched on expanding the involvement of local communities in the planning process and making public involvement part of the mission of the System.[61] The formal mechanisms for community engagement that the System employs is regarded as a gold standard by many of its external stakeholders. The System has established a comprehensive framework in which local communities are treated as essential stakeholders who have a say in the current and future management of the sites. Through local engagement at the sites through SACs and national engagements such as roundtables and the BAC, the System has placed itself directly within the community of stakeholders that have a vested interest in the areas under its protection.

Through community engagement, the System also has been able to recruit a dedicated class of volunteers that contribute greatly to its success. In 2020, volunteers contributed the equivalent work hours of 36 full-time federal employees, amounting to $1.78 million going to the System. These numbers were lower than 2019's totals—nearly 12,000 volunteers delivering labor valued at $3 million and equivalent to 66 employees—because of impacts from the Covid-19 pandemic. The engagement and buy-in from communities, as exhibited by the number of volunteers, is a major achievement for the System and an important resource multiplier that helps the System ensure that the sites are being adequately conserved and managed. ONMS also engages local communities through its network of visitor centers, signage, and exhibits. In 2020, the System reached about 130,000 visitors through 10 of their visitor centers, and millions more with exhibits and signage with its partners, such as aquariums, science centers, and signage along the coast. In addition, the system reached over 73,000 students through formal education programs as well as 65,000 additional youth and adults through informal learning opportunities including 24,000 youth from underserved areas.[62]

Positive Externalities for Partners and Stakeholders

The System's achievements in preservation and conservation, in addition to its community engagement and buy-in, have resulted in secondary achievements and numerous positive externalities and benefits to sanctuary communities, partners, and stakeholders.

There is a symbiotic effect between community engagement and positive externalities; when the community embraces and cares for the sanctuary site, that investment can benefit the communities. For example, a study by the National Marine Sanctuary Foundation found that the

[61] National Academy of Public Administration, *Protecting our National Marine Sanctuaries.*; National Academy of Public Administration, *Planning and Management at the National Marine Sanctuary Program.* https://s3.us-west-2.amazonaws.com/napa-2021/studies/ready-to-perform-planning-and-management-at-the-national-marine-sanctuary-p/06-11.pdf.
[62] Office of National Marine Sanctuaries, *Reaching Far & Wide.* https://nmssanctuaries.blob.core.windows.net/sanctuaries-prod/media/docs/20200116-education-infographic-2019.pdf

Florida Keys National Marine Sanctuary contributes $4.4 billion and 43,000 jobs annually to Florida's greater economy.[63] These positive externalities are largely a result of the tourism and recreation community that the sanctuary site attracts. This effect is not limited to the Keys, it is found throughout the System. To take another example, the Thunder Bay National Marine Sanctuary's Great Lakes maritime heritage center welcomed 80,287 visitors in 2018 which helped to contribute to over $28 million being spent in the region annually, supporting over 400 jobs.[64]

These positive externalities are not limited to direct monetary benefit, but also impact the businesses and interests of important stakeholders in other ways. Studies have revealed that increased protection and conservation of marine areas can benefit the fishing industry. MPAs, particularly highly protected areas such as certain zones within sanctuaries, can enhance and extend fish stocks and catch yields.[65] These benefits largely come from a "spillover effect." Protecting fish species and their necessary habitat allows for the species to survive and thrive, which can lead to an increase in fish population size, which further benefits the fisheries community outside of the protected area.[66] The System not only works with important stakeholders but provides benefits to and complements the work of others involved in the marine environment.

In conclusion, the System has numerous achievements both at the site and national level since its inception in 1972, only a few of which were selected to be featured in this report. The System has built a vision of conserving the marine areas of importance within the Nation and facilitating the use of these sites in a way compatible with both conservation and human use. These achievements lay the foundation for further advancement and achievement in the future, which are discussed in the next sections of the report.

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[63] National Marine Sanctuary Foundation, *Foundation Study Finds Florida Keys National Marine Sanctuary Contributes $4.4 Billion Annually to Florida's Economy*. https://marinesanctuary.org/news/foundation-study-finds-florida-keys-national-marine-sanctuary-contributes-4-4-billion-annually-to-floridas-economy/

[64] Information was shared by the U.S. Office of National Marine Sanctuaries at the Business Advisory Council meeting on January 14, 2021.

[65] Center for American Progress, *How Marine Protected Areas Help Fisheries and Ocean Ecosystems*. https://www.americanprogress.org/issues/green/reports/2019/06/03/470585/marine-protected-areas-help-fisheries-ocean-ecosystems/

[66] Halpern, Benjamin, Sarah Lester, and Julie B. Kellner, *Spillover from marine reserves and the replenishment of fished stocks*. https://darchive.mblwhoilibrary.org/bitstream/handle/1912/3891/Halpern_etal_2010_EnvCons.pdf?sequence=1

Section 5: Future Outlook for the Marine Environment

The larger marine environment in which the System exists is remarkably dynamic, and in a constant state of change since its inception. Given that the characteristics and the complex plant and animal life of this vast environment are in constant flux, the challenges and opportunities that might be expected to arise during the next 10-15 years are also remarkably daunting. The System faces a huge range of emerging challenges and opportunities as the marine and Great Lake environments continue to evolve at an increasingly rapid pace. It is thus essential for the System to be able to identify key trends and emerging issues to adequately plan for and adapt to this changing world. This section identifies some of the major topic areas that will influence the future outlook for the System to help prepare it for the future. The topics described in this Section are not intended to be an exhaustive review of future marine challenges and opportunities, but rather to suggest important ones that influence the Panel's recommendations to ONMS.

5.1 Methodology Used to Identify Key Elements Likely to Affect the System's Future

While it is impossible to predict the nature of the future of the marine environment with precision, key points in this section surfaced by identifying some salient issues and pressing topics that appear most likely. The methodology relied, in large part, on interviews conducted with a wide variety of stakeholders holding a range of viewpoints from within the marine environment community (see Appendix B for a full list of interviewed individuals). Research also included examining articles that focused on the future of the marine environment in detail. By this method, common patterns and key topic issues surfaced and are incorporated in this section. The graphic to the right is representative of this distillation. Common descriptors and issues from notes and articles were input to a computer program that counts the number of appearances of specific words and key phrases related to the future of the marine environment. The graphic displays the most prevalent topics that arose from this exercise, with topics that came up more frequently appearing larger. While this exercise is by no means meant to be a comprehensive look at all the System's future challenges or opportunities, or even to be predictive of the future, the Panel is confident that the following list outlines some of the major factors that will affect the future of the System.

Figure 5.1: Major Themes in Future Outlook Methodology. Figure created by the National Academy of Public Administration.

5.2 List of Key Future Outlook Factors

There are six key issues that the Panel wishes to highlight as ONMS looks to the future:

- climate change and climate-related issues;
- blue economy developments including the growth of aquaculture and marine energy development;
- new technologies;
- new ways to connect individuals with the marine environment;
- engagement with indigenous communities; and
- global movements to support conservation of marine environments.

While other factors could perhaps be added to this list, these factors constitute a discrete, representative set that relate to ONMS going forward.

Climate Change and Climate-Related Issues

The impacts and effects of climate change are the biggest and most prevalent emerging themes to be encountered and expected in the future. The impacts of climate change are not just the warming of the oceans and Great Lakes but include the changing of weather patterns, ocean acidification, sea-level rise, range shifts of marine species, and much more. Each of these phenomena has demonstrable impacts on the sanctuary sites and the resources within them, and they should motivate the System to expand its vision and up its game.

As the effects of climate change continue to grow, the marine waters will warm and the ocean will become more acidic.[67] These changes can have negative impacts on marine species, making it harder for them to reproduce, build habitats, and more. More than 80 percent of the earth's species are migrating and changing their breeding and feeding patterns due to climate change, and ocean species, in particular, are experiencing these changes 10 times faster than their terrestrial counterparts.[68] This presents a very real threat to sanctuary sites that help protect marine species. For example, the Hawaiian Islands Humpback Whale National Marine Sanctuary was established to protect the mating and breeding grounds of humpback whales. If the whale's migratory patterns change due to climate change, there is potential that the established boundaries of the site may no longer serve their purpose. Sea-level rise due to climate change can impact the shoreline and the animals that rely on the sanctuary sites' ecosystems such as mammals and birds. Not only is sea level rise a direct threat to the System's natural resources and its facilities such as offices and visitor centers, but it also impacts the communities surrounding the sanctuaries and the human activities that occur within the sanctuaries. Sea level rise can threaten communities and impact existing businesses that rely on the sanctuary sites such as

[67] The University of California at Davis, *Science & Climate: Ocean Acidification*. https://climatechange.ucdavis.edu/science/ocean-acidification/

[68] National Environmental Education Foundation, *Marine Species on the Move*. https://www.neefusa.org/weather-and-climate/marine-species-movehttps://www.neefusa.org/weather-and-climate/marine-species-move#:~:text=More%20than%2080%25%20of%20earth's,times%20faster%20than%20land%20species.&text=80%25%20of%20ocean%20pollution%20comes%20from%20the%20land.

fishermen, whale watch companies, or diving communities.[69] While ocean acidification, species range shifts, and sea level rise are just three of the many effects of climate change, climate change is an overarching prevalent threat to the System and the System has already seen impacts. In 2013, a weather pattern of unusually high pressure off the coast of Alaska led to a pool of persistently warm water that eventually made its way to the California Coast, raising temperatures in West Coast sanctuaries to over 7 degrees above normal in some locations. This had harmful impacts on sanctuary resources.[70] The effects of climate change are not just limited to the natural resources within the marine environment. Cultural resources and maritime heritage also face negative impacts from climate change, impacting how people connect, view, and preserve the important cultural stories and relationships of the sites. As climate change progresses these changes will only continue to happen more frequently and to a more extreme degree.

While climate change is undoubtedly the biggest challenge for the marine environment, there are several other critical issues that ONMS leaders must also consider, and balance as discussed below. As such, targeted efforts must be made to balance the distinct interests of stakeholders and capitalize on emerging opportunities, all with the underlying driving force of promoting sustainability and actions that combat climate change. When the array of emerging issues in the marine environment are approached with this mindset, opportunities exist for the System to help shape a more healthy, diverse, and sustained positive impact on the future marine environment.

Blue Economy Developments

The blue economy refers to a range of economic uses of ocean and coastal resources – such as energy development, shipping, fisheries, aquaculture, mining, recreation, and tourism. In addition to these "market" economic values, it includes benefits that are considered "nonmarket" values, such as carbon storage, coastal protection, cultural values, and biodiversity.[71] Activity in the blue economy involves a "de-coupling of socioeconomic development from environmental degradation… a subset of the entire ocean economy that has regenerative and restorative activities that lead to enhanced human health and well-being, including food security and creation of sustainable livelihoods."[72] While the Blue Economy is wide-ranging and multi-faceted, the Panel wishes to highlight two emerging opportunities that ONMS might capitalize on: expanding aquaculture and the rise of marine energy development.

Potential Expansion of Sustainable Aquaculture

The world relies on marine flora and fauna as key pieces in local communities' sustainability and the industrial food supply chain beyond. However, over 80 percent of fisheries around the world

[69] U.S. Office of National Marine Sanctuaries, *Climate Impacts*. https://sanctuaries.noaa.gov/management/climate/climate-impacts.html
[70] This heatwave created a harmful algal bloom off the coast of California that killed marine species and impacted the larger ecosystem. The Cordell Bank National Marine Sanctuary experiences some of the negative effects of this algal bloom in their waters. U.S. Office of National Marine Sanctuaries, *Climate Change Impacts: Cordell Bank National Marine Sanctuary*. https://nmssanctuaries.blob.core.windows.net/sanctuaries-prod/media/docs/20200820-climate-change-impacts-cordell-bank-national-marine-sanctuary.pdf
[71] Spalding, *The New Blue Economy: The Future of Sustainability*. https://cbe.miis.edu/cgi/viewcontent.cgi?article=1052&context=joce.
[72] Ibid.

are either being fished at full capacity or are already overexploited.[73] As the world's population continues to grow, so will the strains on the supply chain, and in some cases, complete disruption of local food supplies.[74] The expansion of sustainable aquaculture presents a potential solution to this global problem while factoring in the effects of climate change. Aquaculture, the farming of marine plants and animals for food, is the fastest-growing food production system in the world.[75] Sustainable aquaculture is a dynamic concept that factors the environmental, economic, and social and community sustainability into production.[76] While aquaculture can be a solution to increasing sustainability in the food supply chain, including helping repopulate depleted species, it can also put a strain on the environment, which is why future expansion of aquaculture must be designed and executed sustainably and with active oversight. MPAs, such as the sanctuary sites, can be potential locations for future aquaculture development because of their previously established levels of preservation and relatively healthy ecosystems. The System also has the potential capacity to protect native or wild fish stocks in the process, which can be harmed by poorly managed aquaculture. Sustainably managed and monitored aquaculture can in turn provide benefit to MPAs both inside and outside their boundaries by helping to enhance biodiversity and providing positive socio-economic impacts to local communities.[77] As the strain on global resources continues to grow both from population increases and due to the negative impacts from climate change, the expansion of aquaculture can become an increasingly viable solution, but it needs to be managed with oversight and care.

Growing Marine Energy Development

As the world looks to new and sustainable ways to develop energy there is an increasing focus on the expansion of marine energy, such as offshore wind and hydrogen fuel production.[78] The oceans cover over 70 percent of the Earth's surface and many populated areas are located close to water resources, creating a great potential for a previously untapped energy development source.[79] While marine energy technologies are still relatively new, the field continues to grow with electricity generation from marine technologies estimated to have grown by 13 percent in 2019 alone.[80] As new technologies develop and the global emphasis on alternative energy sources

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[73] Le Gouvello, R, Hochart, L-E, Laffoley, D, et al. *Aquaculture and marine protected areas: Potential opportunities and synergies*. https://onlinelibrary.wiley.com/doi/full/10.1002/aqc.2821
[74] Dulal, Youwaraj, *Impacts of climate change on food security in third world countries.* https://www.omicsonline.org/proceedings/impact-of-climate-change-on-food-security-in-third-world-countries-106827.html
[75] Broitman BR, Halpern BS, Gelcich S, Lardies MA, Vargas CA, Vásquez-Lavín F, Widdicombe S and Birchenough, *Dynamic Interactions among Boundaries and the Expansion of Sustainable Aquaculture.* https://www.frontiersin.org/articles/10.3389/fmars.2017.00015/full
[76] The World Bank, *Sustainable Aquaculture.* https://www.worldbank.org/en/topic/environment/brief/sustainable-aquaculture#:~:text=Environmental%20sustainability%20%E2%80%94%20Aquaculture%20should%20not,with%20good%20long%2Dterm%20prospects
[77] Le Gouvello, R, Hochart, L-E, Laffoley, D, et al. *Aquaculture and marine protected areas: Potential opportunities and synergies*. https://onlinelibrary.wiley.com/doi/full/10.1002/aqc.2821
[78] Stanford University, *Stanford researchers create hydrogen fuel from seawater.* https://news.stanford.edu/2019/03/18/new-way-generate-hydrogen-fuel-seawater//
[79] The National Renewable Energy Laboratory, *Ocean Energy Basics*. https://www.nrel.gov/research/re-ocean.html
[80] International Energy Agency, *Ocean Power*. https://www.iea.org/reports/ocean-power#tracking-progress

continues to grow, there is the opportunity for production to increase tenfold. Some estimates suggest that gradual developments in offshore wind on the East Coast could generate enough energy to power over 115 million households over the next 20 years.[81] Sustainable offshore wind energy developments can also contribute to conservation efforts, as the divestment from fossil fuels has the potential to slow many of the ongoing effects of global warming. While there is concern that building new offshore wind energy infrastructure could harm ecosystems, conservation and energy groups can work together with other relevant stakeholders, such as fisheries managers, to develop sustainable and mutually beneficial solutions for the future.[82] The System has the opportunity to serve as a convener for these solutions.

The Organization for Economic Cooperation and Development estimates that by 2030, $3 trillion in economic output will be generated by ocean sectors each year.[83] In the coming decades, the blue economy will be key to ensuring international and domestic needs for food, energy, and jobs are met. The System will need to understand the interactions of such new developments, like offshore wind energy generation, with the sanctuary sites. There is also the opportunity for the System to continue to conduct socioeconomic research on the value of sanctuaries, their economic impact, and their non-market values including ecosystem services.

New Technologies

As the marine environment changes, fortunately so have the technologies used to explore and comprehend it. New technologies, such as autonomous underwater vehicles (AUVs), have allowed humans to explore new marine areas. Remote sensing capability with satellites and sensors are undergoing a revolution in ability and cost-reduction that allows people to have "eyes and ears" on the marine environment above and below the surface. This allows for more precise management, greater visualization opportunities for the public, and greater capacity for enforcement and protection. People are thinking of new creative ways to use the marine environment while protecting it. While technology itself is not an answer to many of the questions and issues facing the future of the marine environment, it is a useful tool that can help collect data to answer pertinent questions and facilitate creative and sound solutions.

Building Personal Connections to the Marine Environment

People are inextricably connected to marine environments, as they supply people with oxygen, food, medicine, transportation, recreation, and much more. Humans have been benefiting from and connecting to, the marine environment for millions of years.[84] Despite this historical

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[81] Oceana, *Offshore Energy By The Numbers*. https://oceana.org/sites/default/files/offshore_energy_by_the_numbers_report_final.pdf

[82] British Ecological Society Journal of Applied Ecology, *Marine Renewable Energy: Potential Benefits to Biodiversity? An Urgent Call for Research*. https://besjournals.onlinelibrary.wiley.com/doi/full/10.1111/j.1365-2664.2009.01697.x

[83] Organization for Economic Co-operation and Development, *Work in Support of a Sustainable Ocean*. https://www.oecd.org/ocean/OECD-work-in-support-of-a-sustainable-ocean.pdf.

[84] The University of Hawai'i at Manoa, *Exploring Our Fluid Earth: The oceans and humans are inextricably interconnected.* https://manoa.hawaii.edu/exploringourfluidearth/standards-alignment/ocean-literacy-principles-olp/olp-6-ocean-and-humans-are-inextricably#:~:text=Humans%20have%20a%20complex%20relationship,for%20food%20and%20transportation%20(Fig.

connection, not all people in the U.S. have ready access to a marine environment. However, as noted above, there are emerging approaches and technologies that are helping to build and strengthen those personal connections. With the emergence of new technologies in the ways people explore marine environments, there are also new ways to share that connection. Through virtual reality and AI, one can experience the wonders of a sanctuary, and with the continual rise of social media, one can virtually travel the world, all from the comfort of their own home. This can allow a person in Omaha to connect with a sanctuary site such as Papahānaumokuākea in Hawaii in a way that was not possible before.

When talking about the future of how people interact with sites like the sanctuaries, one must factor in the impacts of the COVID-19 pandemic. A study from the UK showed that people have been spending more time outdoors and in natural spaces since the global restrictions and lockdowns began and are likely to continue that behavior following the lift of restrictions.[85] This shows the promise of a new wave of visitors and people interested in natural spaces like the sanctuary sites. However, COVID-19 has fundamentally changed how people visit these sites with many people being hesitant about traveling and visiting crowded areas in the wake of the pandemic. There is a global movement that is examining the future of the world following the pandemic and raising the idea of "building back greener," which envisions the opportunity to adopt sustainable and safe practices in everyday life in the new world post-pandemic.[86] The System and other MPAs have an opportunity to capitalize on this movement and rethink their visitor and community engagement strategy, redesigning it to fit the new world post COVID-19.

Engaging Indigenous Communities

As the world surrounding the marine environment changes and new solutions are needed, it grows increasingly important to bring new voices to the table. While one of the System's strengths has been community engagement, there are opportunities to further expand those conversations and engage with previously underrepresented communities. While some work has been done by the System to engage indigenous communities, it has not been consistent or methodical (see Section 6). Indigenous groups have long-standing connections to sanctuaries and other ocean spaces and hold valuable traditional ecological knowledge, described as "the primary indigenous ways of understanding relationships among species, ecosystems, and ecological process."[87] This knowledge can be a key piece in informing initiatives to adapt to the future threats of the environment by offering a differing perspective than Western science. Engaging respectfully with indigenous communities and working with them as important partners and managers of these sites is a growing opportunity to help the System combat and respond to emerging and growing threats, engage affected communities, and address historic injustices.

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[85] DiscoverWildlife, *COVID-19 strengthens our connection with nature.* https://www.discoverwildlife.com/news/covid-19-strengthens-our-connection-with-nature/
[86] Bloomberg, *How to Build Back Greener After the Pandemic.* https://www.bloomberg.com/news/articles/2020-10-29/how-to-build-back-greener-after-the-pandemic
[87] U.S. Forest Service. *Exploring the Role of Traditional Ecological Knowledge in Climate Change Initiatives.* https://www.fs.fed.us/pnw/pubs/pnw_gtr879.pdf

Global Movement on Marine Environment Policy

As discussed in more detail in Section 2, considerations related to the rapidly changing ocean system change and developing blue economy have led international and domestic policymakers to invest in advancing our current scientific understanding of the marine environment and to develop better natural resources policies that can help the sustainability of the ocean's resources. While this report does not provide an exhaustive list of actions in this movement, it does provide examples of a larger set of efforts to focus on marine and terrestrial conservation. Internationally, the movement includes the UN's Decade of Ocean Science for Sustainable Development and the 30 by 30 Initiative. In addition, it includes widespread movements to limit marine debris and plastic pollution of all kinds, prevent overfishing, and limit damage from bottom trawling and longline fishing gear.[88] Domestically, it includes President Biden's Executive Order on "Tackling the Climate Crisis at Home and Abroad" and the U.S. House of Representatives' bill, the Ocean-Based Climate Solutions Act of 2020.

5.3 The Sanctuary System Looking Forward

The above presents a snapshot of what the future could hold for the System. Within this outlook, not only are there potential threats that the System should prepare for, but there are also opportunities that the System can capitalize upon. The NMSA calls for sanctuaries to pioneer and incentivize innovative conservation management techniques, the following section presents recommendations and pivot points for the System to be able to better prepare for and help build on this potential more sustainable future.

[88] National Geographic, *A running list of action on plastic pollution.* https://www.nationalgeographic.com/environment/article/ocean-plastic-pollution-solutions; Oceana, *Impacts of Bottom Trawling on Fisheries, Tourism, and the Marine Environment.* https://oceana.org/sites/default/files/reports/Trawling_BZ_10may10_toAudrey.pdf

Section 6: Recommendations to the Sanctuary System

With a new presidential administration and the many challenges and opportunities converging within the marine environment, this report comes at an auspicious time. This section offers actionable recommendations on how the System could better prepare to address a dynamic future in its enormous operating habitat.

This section is divided into four segments. First, there is a summary description of the key themes that the report recommendations offer for the future. This narrative reveals how the Panel approaches the analysis and describes future opportunities for ONMS leaders to enhance the effectiveness of the System. Second a high-level framework for the recommendations is introduced, enumerated by sequencing the report's recommendations as either short-term, medium-term, or long-term. In the third segment of this section, the report's 15 recommendations are listed and organized into six sequenced and distinct key topics. The distinction of recommendations into these two different dimensions – by key topics and by sequencing – is an important element in the Panel's suggestions as to how implementation should proceed. Fourth, the section ends with a conclusion to the report.

6.1 Summary Themes

Given a strong track record of accomplishment as it nears the first half-century of existence, and the propitious, if challenging, opportunities presenting themselves with both changes in the marine environment and a new federal administration, the time is right for ONMS to take demonstrable steps to significantly expand its role and ambition to protect the marine environment. The world is at a critical crossroads. As noted in Section 5, there are many important issues that must be carefully and comprehensively addressed. Calls for immediate action to protect the marine environment more effectively and more broadly are ever louder and more earnest. These warnings are embraced by the Panel and this report. Now is the time for important steps by the United States to play a greater constructive role with partners. ONMS has a critical role to play in these collaborative efforts, both domestically and internationally.

This report outlines 15 actions that will enhance the System's ability to position itself to play more of a leading role than it has in the past, both within NOAA, across federal agencies, and with private industries and community partners, to advance critical environmental protection goals. There are three key themes on which this report is constructed.

The first key theme of this report is: The System must have an expanded vision and long-term goal to build itself into a more balanced, focused, and better-resourced actor that can take a leading role in NOAA and across the U.S. government in protecting the marine environment. This leading role is appropriate for ONMS to take given its mission and reputation. That said, a series of interim steps are required for ONMS to be able to perform this critical and enormous task well. Increased funding for the System will enhance this vital effort.

Second theme: As the future unfolds, with new scientific discoveries, ever scarcer resources, population growth, and new uses of the marine environment, it is essential that ONMS expand its engagement with non-traditional external stakeholders. A few examples of these stakeholders

might include sea-based shipping companies, marine-based extraction industries, commercial fisheries, and renewable energy companies. While engagement of ONMS leaders with marine conservation groups is an organizational strength and should be expanded, the future challenges and opportunities in the marine environment call for an "all hands on deck" approach, to include creative dialog and inclusion of what may be deemed as competing industries that operate at scale in the ocean or Great Lakes to achieve their missions. In addition, there are opportunities to enhance effective and respectful engagement with indigenous communities. At this critical juncture in the coming 10-15 years, it is imperative that more robust engagement with a full range of stakeholders, particularly non-traditional ones, is required to guarantee a healthy marine environment.

Third theme: ONMS in its present condition is not adequately resourced to take on this pivotal role for NOAA or the federal government generally. The Panel thus identifies several elements of the System's operations and culture that offer opportunity for improvement to build a more robust organization more capable of taking on an expanded role in NOAA and beyond. To that end, the Panel outlines several critical interim building steps required of the System in order to construct a suitable launching pad that can cement its effective long-term leadership position.

As such, this report proposes a comprehensive set of recommendations that are distinguished by subject category on one hand, and yet are interconnected in an organizational sense. These recommendations are sequenced with respect to the timing of implementation to underscore how the Panel envisions the building blocks that can assist the System to ready itself to take on a more effective role in protecting the System and the marine environment. There are short-, medium-, and long-term recommendations. As a rule, short-term recommendations are intended for implementation during the next 12 months. Medium-term recommendations are intended to be implemented during the 12-24 months following the report submission, and long-term recommendations should be embarked upon after 24 months. The precise timing connected with addressing each recommendation may vary as progress in implementation takes shape.

Even given the limited resources of ONMS over the years, the Panel is convinced that the System can and should serve as a national and global leader. One thing is certain, there is little time to waste in making the required organizational pivot. Combining particular actions to enhance performance in the immediate future will serve to prepare ONMS to effectively execute an expanded vision in close collaboration with other federal agencies.

6.2 Phased Approach to Recommendations

ONMS must adopt a phased approach to achieve its long-term vision. As illustrated below in Figure 6-1, it needs to build a solid foundation that will serve as a launching pad for growth and expansion so that it can become more of the leader needed in these times.

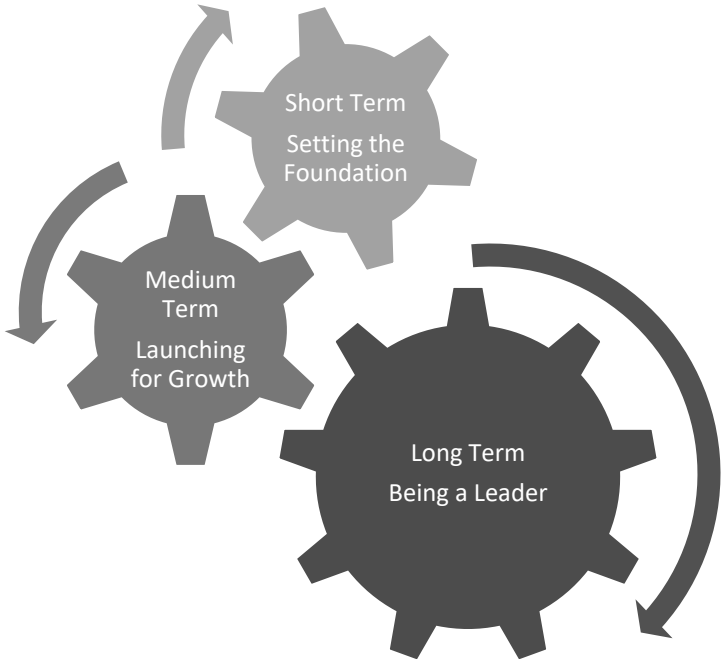


Figure 6.1: Framework of Recommendations. Figure created by the National Academy of Public Administration.

Short-Term Recommendations – Setting the Foundation (*Next 12 Months)*: As a starting point, it is vital to establish the foundation on which ONMS may assume an expanded role protecting the marine environment. Building on its strengths, ONMS must prioritize key areas such as:

- securing additional funding,
- developing a more inclusive community engagement strategy/plan,
- and growing its network of partners.

The Panel recognizes that ONMS has to work in concert with NOAA leadership to address its budget constraints. In support of its growth plans, ONMS must streamline its operations, including a simplified designation and nomination process, and agile management planning. It includes better defining the role of its regional network offices and developing a workforce plan that accounts for the evolving concept of work and workforce. Finally, it must embed technology in its operating model which will work as a resource multiplier for the System.

Medium-Term Recommendations – Launching for Growth *(Next 12-24 Months)*: This phase involves continued preparation for, and good execution on its growth and expansion, building on outcomes from the previous phase. It includes expanding its partnerships, detailed budget and resource planning, and better quantifying the socio-economic value-add of the System to communities, including its role in the blue economy.

Long-Term Recommendations – Being a Leader *(24 Months and Beyond)*: Successful outcomes from the previous phases will position ONMS to be a leader in marine protection, both on a domestic and global level. In this phase, the Panel sees the System as a growing and connected network of MPAs, making significant progress in sustained resilience and adaptation to a changing environment.

In many instances, individual recommendations are followed by suggested intermediary and subsequent steps to help implement those recommendations effectively.

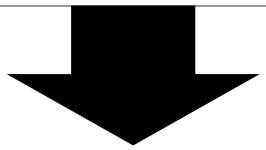
6.3 Recommendations by Focal Areas

Recommendations are organized into six focal areas that address different elements of organizational performance. These key elements include: Strategy, Finance, Management and Operations, Organization, Communications, Outreach and Branding and Community Engagement. While each can be categorized into a distinct element of organizational performance, and thus can be considered individually, this report argues that they should be seen as a cohesive whole. To that end, they are inextricably intertwined. In order to enhance success, ONMS should address them together.

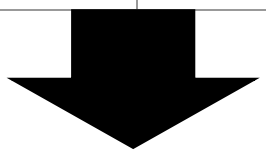
Figure 6.2 below lists the recommendations at a high level, offering them in a manner that highlights the two-dimensional approach taken in this report: implementation phases and key areas where recommendations are addressed. In doing so, the Panel offers a sequenced, holistic proposal to ONMS to serve as a guide to next steps. The recommendations are not listed in order of priority, but as an amalgamation of actions that should be included in a comprehensive action plan.

<table>
<tr><th colspan="2">Short Term: Setting the Foundation
Within the next 12 months</th></tr>
<tr><td colspan="2">Strategy</td></tr>
<tr><td colspan="2">Refresh Strategic Vision, Focus, Value Proposition, and Impact</td></tr>
<tr><td colspan="2">Finance</td></tr>
<tr><td colspan="2">Identify Alternative Funding Sources and a Sustainable Financing Model</td></tr>
<tr><td colspan="2">Management</td></tr>
<tr><td>Support Reauthorization of the NMSA</td><td>Create Flexible and Adaptable Management Planning Structures</td></tr>
</table>

Organization	
Enable and Clarify the Role of the Regions	Evaluate Workforce Planning
Communications	
Enhance Communications Plan	Bolster Support for Communications Team
Community Engagement	
Reach New Communities	



Medium Term: Launching for Growth Next 12 24 months	
Strategy	
Revisit System Protection Levels and Metrics	
Finance	
Support System Economic Valuation and Community Profiles	
Community Engagement	
Effectively Engage Indigenous Communities	Expand Partnerships



Long Term: Becoming a Leader 24 months and beyond
Organization
Expand Role as Collaborator and Convener of Marine Protection
Communications
Create and Implement a Public Outreach Campaign

Figure 6.2: Short-, Medium-, and Long-Term Strategy. Figure created by the National Academy of Public Administration.

Focal Area 1: Strategy

As described in above, the System stands at a critical juncture: the combination of a rapidly evolving future, opportunity presented by a renewed focus by the current Administration on climate change and ocean conservation, and changing stakeholder demands require it to rethink its future role in marine resource management.

Short-Term

Refresh Strategic Vision, Focus, Value Proposition, and Impact

ONMS has an ambitious strategic plan, and as one of its goals, the strategic plan emphasizes increasing support for sanctuaries. To support this goal, the plan calls for building a strategic vision for the next 50 years.[89] Since the current strategic plan runs through the year 2022, ONMS must develop a new strategic plan that includes building its long-term vision. The Panel posits this vision should reflect a more ambitious agenda in the long term: an expanded view of marine protection - a better networked connection between sanctuaries and other types of MPAs; expanded levels and types of protection; increased accessibility and reach of marine areas; an established national brand and identity; and a redefined future role – as a coordinator and leader in domestic marine protection, and a pioneer in the international environment. Though the System is limited in funding and resources, an inspiring vision will spur ONMS to innovate, identify resource multipliers, and rally its stakeholders and partners – placing a renewed focus on the important role of the ocean and the Great Lakes in marine protection.

To get to this long-term vision, ONMS needs to be better prepared, focusing on incremental steps and priorities to build its internal capacity to position itself well. However, it does not communicate the System's progress, impact, and accomplishments in a consistent manner to its stakeholders. Many stakeholders – partners and communities express a lack of clarity on its role and purpose, including its impact. In fact, the NMSA emphasis on protection and compatible uses

[89] U.S. Office of National Marine Sanctuaries, *Strategic Plan for Fiscal Years 2017-2022*. https://nmssanctuaries.blob.core.windows.net/sanctuaries-prod/media/docs/onms-strategic-plan-2017-2022.pdf.

can erroneously be perceived as a zero-sum proposition, and the word "sanctuary" has a variety of connotations that can create an inaccurate perception of the System and its purpose.

While it is essential to set a strategic vision, ONMS must also use its strategic plan to prioritize its limited resources in support of its vision. This will require intentional choices of focus areas on one hand, and reliance on its partners to fulfill other areas as well. As part of its strategic planning, it must expand to include voices and engagement from non-traditional partners/champions. As an important step, it must effectively communicate its value proposition to its stakeholders – the benefits that sanctuaries accrue to both coastal and inland areas.

Recommendation 1: Refresh ONMS' strategy to expand its vision and role, communicate the value proposition in a more clear, unambiguous, inclusive, and inspiring manner, and measure and communicate the System's environmental, social, and economic impact. It should develop a clear roadmap and plan of short-term, medium-term, and long-term priorities, align resources, and monitor progress and performance.

Medium-Term

Revisit System Protection Levels and Metrics

The System has the potential to better utilize a scheme which categorizes and characterizes various protection and regulation levels among its sanctuaries, and to apply the scheme more holistically within and across the sanctuaries. The public is generally unaware of the sanctuaries, let alone the types of protection, regulation, and management activities that take place in them. The System's MPA Center notes "the official programmatic names of many U.S. MPAs (such as sanctuaries, parks, preserves, or natural areas) rarely convey the area's actual conservation purpose, allowable uses, or management approach."[90] External stakeholders and partners also experience difficulty in acquiring a complete understanding of such features. To address this issue, the MPA Center created a classification system which provides a more straightforward explanation of MPAs in functional terms. It also lists and explains six levels of protection ranging from uniform multiple-use to no access. These protection levels are relatively easily understandable. However, they are not made prominent on the System's website and among communications geared toward the public.

While the System applies these protection levels to the sanctuary sites, and they align with the International Union for Conservation of Nature's (IUCN) protected area categories, there are limitations.[91] The System has established some "no-take" zones, like in the case of Florida Keys and Channel Islands national marine sanctuaries, but they only make up part of a larger protected areas.[92] Furthermore, a lack of accessibility in data collected among the sanctuary sites, and the

[90] U.S. National Marine Protected Areas Center, Definitions and Classification System for U.S. Marine Protected Areas. https://nmsmarineprotectedareas.blob.core.windows.net/marineprotectedareas-prod/media/docs/20200715-mpa-classification.pdf.
[91] International Union for Conservation of Nature, *Protected Area Categories*. https://www.iucn.org/theme/protected-areas/about/protected-area-categories.
[92] No-take zones totally prohibit the extraction or significant destruction of natural or cultural resources. "No-take zones are often part of multiple-use MPAs, where different levels of activity are allowed in different zones. No-take zones within multiple-use MPAs usually protect the spawning grounds of many

lack of common metrics collected centrally at headquarters, hampers ONMS' efforts to communicate progress on its resource protection mission to its domestic and international counterparts. Sites use a uniform set of performance measures phrased as questions to characterize the condition of their resources.[93] However, they are technical in nature, and can emphasize the negative impacts of activities outside of the System's jurisdiction. The System can better balance emphasis on what is also going well. For example, pollution from a source neighboring a sanctuary impacting water quality in the sanctuary would be listed, but the measures might not include a description of actions the System has taken to improve water quality that are within its span of control.

These factors create a potential obstacle for the System in participating in initiatives like the 30-by-30 initiative in a more meaningful way.[94] In other words, it can more ambitiously manage its protected areas as a system rather than a collection of nationally significant areas. An easily understandable categorization scheme designating various levels of protection, along with a set of more accessible and System-wide performance metrics, could enable ONMS to better communicate to stakeholders the actions taken in the sanctuaries that contribute toward its mission. They could also help the System to present itself as an ecosystem-based management organization, as opposed to a place-based one.

Relatedly, the System does not track sanctuary site visitation data at present. However, it does have work underway to organize its capabilities for collecting and tracking that visitation data. ONMS is partnering with researchers at West Virginia University to conduct a pilot study at two sites, Gray's Reef and the Florida Keys Sanctuaries, to analyze and evaluate methods for measuring site traffic, as well as to understand the economic activities the public engages in when visiting them. With a robust system for tracking site visitation data, the System will be able to better communicate its value proposition and justify its budget and make more informed decisions on how it will allocate staff, funding, and other resources across the sites.

Recommendation 2: Revisit the System's established levels of protection and authorities to designate sanctuaries and MPAs in the System as such. This examination should consider whether the levels, and the geographic scale at which they can be applied, meet the System's needs to move from place-based management to ecosystem and System-based management. ONMS should support the inclusion of such a toolset in a reauthorized NMSA. The determination on what these categories entail should be informed by the instructive examples employed by the U.S. Department of the Interior and National Forest System for terrestrial environments, as well as the MPA Center's classification system, and the International Union for Conservation of Nature's

aquatic species." See National Geographic, *Encyclopedic Entry: No-take zone*. https://www.nationalgeographic.org/encyclopedia/no-take-zone/.; Murray and Hee, *A Rising Tide: Monitoring, Managing, and Enforcing Marine Protected Areas*. https://www.sciencedirect.com/science/article/pii/S0964569119301206?via%3Dihub.

[93] U.S. Office of National Marine Sanctuaries, *National Marine Sanctuary System Condition Report 2013*. https://nmssanctuaries.blob.core.windows.net/sanctuaries-prod/media/archive/library/pdfs/ncr2013_high.pdf

[94] Sletten et al., *Beyond the Boundaries*. https://www.sciencedirect.com/science/article/pii/S0308597X20309908.

(IUCN) protected area categories.[95] Establishing a level of protection akin to that of the Bureau of Land Management's wilderness areas, for example, would allow the System to set aside no-take zones with clearer legal authority. Additionally, it could help to balance disparities in the way marine protections are valued in comparison to terrestrial protections. The System can feature more accessible information on protection levels and performance on its website, sanctuary site signage, and through other communication channels and mediums.

- As an initial step toward this outcome, consider leveraging academic institutions, scientific panels, and the potentially reestablished MPA Federal Advisory Committee as described in Recommendation 9 below to conduct an examination on prospective categories, as well as the performance measures and metrics described below.
- Develop a set of common and accessible performance metrics for the System, including sanctuaries and other protected areas under its authority, to monitor and evaluate mission progress, communicate that progress to the public and stakeholders, and to compare to domestic and international counterparts. This set of metrics can be used in complement to the performance questions used for System-wide condition reports. ONMS should also refer to the guidebook of natural and social indicators for evaluating marine protected area management effectiveness created by IUCN, NOAA and its partners as a starting point to develop and track common performance metrics across the System.[96] Some illustrative examples of what may be included are:
    - Amount of area protected
    - Types of activities restricted
    - Number of species the System is taking action to protect
    - Estimated whale strikes avoided
    - Amount of ocean floor mapped
    - Number of external partners
    - Number of educational activities or projects conducted
    - System economic valuation
- Track, report, and monitor site visitation data to inform System decision-making, justify the budget, and provide a basis for comparison to other resource management agencies.

Focal Area 2: Finance

Funding is critical for ONMS to achieve its objectives and will provide much needed resources to the System. It has an opportunity to explore alternative revenues sources and must pursue to ensure long-term sustainability of the System.

[95] International Union for Conservation of Nature, *Protected Area Categories*. https://www.iucn.org/theme/protected-areas/about/protected-area-categories.
[96] International Union for Conservation of Nature, *Guidebook of Indicators for Evaluating Marine Protect Area Effectiveness*. https://nmsmarineprotectedareas.blob.core.windows.net/marineprotectedareas-prod/media/archive/pdf/national-system/mpadoing.pdf.

Short-Term

Identify Alternative Funding Sources and a Sustainable Financing Model

ONMS has four potential sources of revenue: (a) appropriations; (b) fees from products and services; (c) external funding it raises on its own; and (d) funds raised by the National Marine Sanctuary Foundation.

The primary source of funding for ONMS is appropriations. Our research points to considerable resource constraints in the System. Despite these constraints and an ambitious mission, appropriations have been relatively flat over the last several years. ONMS has not communicated its need for additional funding to Congress and to pursue additional incremental appropriations, it will need to justify its progress, impact and value proposition clearly.

While greater appropriations are necessary, NMSA also provides a number of flexibilities to seek additional funding and raise revenues. It provides the Secretary authority to issue permits and charge fees, and to use fees for sanctuary management. Referring to NMSA, SEC. 316. [16 U.S.C. 1445B] includes several mechanisms to enhance support for the System, including developing products and services, marketing these products and services, and soliciting contributions.[97] The System is an outlier as a Federal agency to have such considerable flexibility in the use of such funding options and yet not employ them. However, ONMS has not been successful in raising any substantial revenues using these mechanisms. Interviewees suggest that a primary challenge to leveraging these potential sources effectively could be unfamiliarity, discomfort, or risk aversion within NOAA and Department of Commerce.

As an example, the USFS uses Passes and Permits. While many are free, some require fees or permits to help maintain, manage, and improve national forests and grasslands.[98] Similarly, the National Wildlife Refuge System has established the Migratory Bird Hunting and Conservation Stamp (commonly known as the Duck Stamp) and in 2017, Duck Stamp sales totaled more than $38 million and over $1 billion since 1934.[99]

Finally, one of goals of the National Marine Sanctuary Foundation was to develop potential revenue streams to help support the System. While it has made some progress in its effort, it has a significantly greater potential. The above-mentioned opportunities represent a significant untapped potential for ONMS. In order to achieve its priorities, and given the System's resource constraints, it is vital for ONMS to seek and pursue all avenues of additional funding sources. It must better leverage its existing authorities, in addition to seeking additional increased appropriations. Furthermore, it must reexamine its working relationship with the Foundation, starting with a shared view of priorities at each site, and across the System.

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[97] 106th U.S. Congress, *National Marine Sanctuaries Amendments Act of 2000*. https://www.congress.gov/bill/106th-congress/senate-bill/1482/text/pl?overview=closed.
[98] U.S. Forest Service, *Passes and Permits*. https://www.fs.usda.gov/visit/passes-permits.
[99] A "Duck Stamp" is required for waterfowl hunters 16 years of age and older. The Federal Duck Stamp program supports conservation of important migratory bird habitat through the purchase of wetland and associated upland habitats within the National Wildlife Refuge System. See U.S. Fish and Wildlife Service, *Duck Stamp Dollars at Work*. https://www.fws.gov/birds/get-involved/duck-stamp/duck-stamp-dollars-at-work.php.

Recommendation 3: Identify and pursue additional funding streams, including requesting additional appropriations (with a solid business case justification) and alternative and sustainable financing models.

- ONMS should assess the feasibility of collecting royalties and fees associated with services and products it provides currently, similar to those collected by the U.S. Forest Service, and pursuant to its special authorities under the NMSA. It should consider additional opportunities for providing services that can generate income while protecting the marine environment.

Medium-Term

Support System Economic Valuation and Community Profiles

Over the last ten years and beyond, many economic analyses have been conducted by the federal government, universities, and other researchers to assign market values to the benefits derived from sanctuaries.[100] Much work has been done to assign economic value to the preservation of natural resource systems, both to people who visit protected areas, or even to those who never will.[101] Economic analyses of benefits derived from the System help to inform decision-makers in natural resources management and convey the value of the System to a wide array of stakeholders. However, they focus on targeted activities in individual sanctuaries, and no holistic valuation of the entire System exists.[102] Many of the existing studies are ten years old or more. ONMS' economists are updating some of these studies and moving forward with a variety of new ones. Notably, ONMS is in the early phases of its SUCAR program. The focus of the SUCAR program is to deepen ONMS' profiles of local communities surrounding the sanctuary sites. It centers on understanding the factors that influence the behavior of non-users of the System, such as cost, access, awareness, and their preferences to engage in activities unrelated to sanctuaries.

Recommendation 4: Continue efforts to value economic benefits derived from targeted areas of the System and deepen its community profiles to understand non-users. Expand efforts to understand non-users beyond the local communities in the immediate areas of sanctuary sites, as well as for non-users comprised of underrepresented demographic groups. More targeted economic assessment activities should be consistent with the statistical methods and categories of the National Accounting Framework, which BEA uses to measure GDP. Integrate economic analyses into ONMS strategic planning and communicate the value of the System to stakeholders. In addition:

- Examine and emphasize the positive impacts, or "spill-over effects", of limited take and no-take zones on fish stocks and other marine resources in adjacent areas to stakeholders like commercial and recreational fishing groups.

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[100] U.S. Office of National Marine Sanctuaries, *Socioeconomics Research*. https://sanctuaries.noaa.gov/science/socioeconomic/research.html.
[101] Schaefer et al., *Nature as Capital*. https://www.pnas.org/content/112/24/7383
[102] The Bureau of Economic Analysis (BEA), in partnership with NOAA, is measuring the economic impact of the ocean economy on U.S. gross domestic product (GDP). ONMS contributes to this effort by providing data on the System to NOAA and BEA. Though, ONMS' data on the System is still incomplete.

- Aggregate targeted assessments over time to estimate the value of benefits derived from the System as a whole.

Focal Area 3: Management and Operations

Management and operations are the processes by which ONMS plans for and facilitates the multi-faceted dimensions of the System. The recommendations within this key topic focus on creating agility within the System and capitalizing on opportunities to streamline processes to create efficiencies.

Short-Term

Support Reauthorization of the National Marine Sanctuaries Act

As mentioned in previous sections of this report, when the System was established in 1972 there was a much different view of the marine environment than what is widely held today. The marine environment is not only vastly different than it was nearly 50 years ago, but it is constantly changing. However, the management and operations processes of the System have not kept up with these changes and are largely outdated, hindering the System's ability to react and adapt to the current movements within MPA conservation.

A major contributing factor to the System's inability to be agile and adapt to the modern marine environment is the nature of its defining legislation. The NMSA was enacted in 1972 with clarifications and changes being added on in the following years. However, the last revisions to the NMSA were passed in 2000, meaning that it has been over 20 years since the defined authority of the System has been revisited. With a lack of updated defining authority that matches the issues of today, ONMS has not been able to fully capitalize on available opportunities or quickly adapt to emerging threats. For example, the idea of energy generation and extraction has changed dramatically. When the System was first created, one of the main goals was to prevent oil drilling at these sites, leading to sweeping bans on engaging in energy development in many of the sites. With the development of renewable marine energy technologies combined with technology, there are opportunities for the System to combine conservation and economic use such as energy generation in a more sophisticated manner in appropriate areas. However, current legislation, including the Energy Policy Act of 2005 which prohibits BOEM from conducting lease sales for wind energy projects in sanctuaries, prevents ONMS from doing so.

There is also the opportunity to streamline the legislation to increase the efficiencies of processes and promote agility. The designation process as currently defined by the NMSA is fairly onerous and requires extensive time and resources which can be a strain on ONMS. The difficulty and the bottlenecking that has occurred in the designation process can be illustrated by that the fact that it takes many years to complete a designation even when greatly supported. This process can be reinvigorated through changes in the NMSA that will not only relieve some of the burdens from ONMS but contribute to the national and international movements on marine environment protection and the initiative to have 30 percent of national waters protected by 2030.

Recommendation 5: Support congressional efforts to reauthorize the NMSA to reflect the current state of the marine environment and ensure that the System will be able to continue to conserve places of national significance in the modern world. Reauthorization that looks towards

the future of the marine environment can give ONMS the tools to be more directed and focused in their actions such as supporting partnerships across all functional areas; allowing for different levels of protection and classification within the system; and allowing for adaptive management to address climate and other impacts. The reauthorization of the NMSA will not only have impacts on the designation process but can be adapted in a way that can pave the way for other recommendations in this report.

Create Flexible and Adaptable Management Planning Structures

Certain processes within ONMS' management structure should be reexamined and evaluated for possible opportunities to streamline with agility to be able to adapt to the current marine environment. Government and management focused on agility is, "mission centric, customer focused, communication and collaboration enabled, and continually demonstrates success to customers and the public. Agile government involves small teams and customer participation, empowered by leaders to take rapid action to deliver timely, transparent results."[103] Adapting agile, flexible, and adaptable management structures will enable the System to adapt to the needs of today in a timely and efficient manner.

Management plans are site-specific documents that are created to manage the individual sanctuary sites. They communicate the vision, goals, and objectives of a site; outline ongoing programs and regulations; direct management decisions at the site; and more.[104] Management plans are updated every five to ten years by the site and the planning process requires extensive research and input from the local communities and relevant stakeholders. However, at current, the management planning process is not designed to react dynamically to the present and ongoing threats and opportunities that MPAs face. The management planning process is resource-consuming, requiring extensive time from the already strained System. While the formal process for updating management plans is 5-10 years, there is a perception that the management planning process is in a continual cycle of creation, receiving comments from the community, and implementation with little opportunity for strategic foresight, prioritization, or implementation. There is also a sense that while the process is amenable to the addition of new ideas and goals to the plan, there is a reluctance to jettison old pieces of the plan that might no longer be relevant to create a streamlined and intelligible vision that can inspire.

Due to the multi-faceted nature of the System and the different activities that the sites are involved in it can also be difficult for a site to prioritize and be able to fulfill all aspects of a management plan in the amount of time set in the plan. For example, the Flower Garden National Marine Sanctuary has recently completed an extensive expansion process. This process took nine years, and many other aspects of the previously existing management plan were dropped to prioritize focus on the expansion. Given the rigid nature of the planning process and the limited resources of the System, the difficulties encountered by sites to achieve all that they set out to do in a management plan can give the appearance of a lack of success or ability, when the challenge is a lack of an adequate timeframe with built-in metrics to measures steps towards overarching goals

[103] The National Academy of Public Administration, *Defining Agile Government*. https://www.napawash.org/grandchallenges/blog/defining-agile-government
[104] U.S. Office of National Marine Sanctuaries, *Management 101*. https://sanctuaries.noaa.gov/management/mgt101.html

within the plan, or a lack of resources to implement the plan. Some improvements have already been made to the management planning processes, such as adding in sequencing steps that a condition report at the sites must be completed before the management planning process, to ensure that the plan is reacting to current conditions. However, there is still work that can be done, such as streamlining community engagement components, prioritizing different components of the plan, incorporating further sequencing, and adding performance goals and feedback loops.

Recommendation 6: Create flexible and adaptable approaches to the management planning process so that the System can address the problems of the future with more agility. These processes should balance future implementation challenges and updated planning processes. If reauthorized, the NMSA should update the requirements of the management planning cycle, moving away from a 5-10 year cycle to a focus on flexible and agile planning.

- Create a list of priorities for management plans and use that list to establish a flexible and adaptive management plan to address them.
    - The management planning processes should take place gradually with components being updated as they are prioritized and the plan itself should be deemed a "living" document, with regular updates that reflect material changes, and which include both additions and removals to respond to the current environment.
    - The management plans should have a roadmap to meet clear overarching goals with built-in and defined metrics.
- Create a regular and systematic feedback loop between the sites, regions, and headquarters to share best practices in this new flexible approach. The regional offices and headquarters should also coordinate with sites and provide a tool kit that includes templates, training, and sequencing timelines for these processes.

Focal Area 4: Organization

While the System has made strides towards the mission set forth by the NMSA since its inception, there are opportunities for ONMS to strengthen organizational health, address emerging threats, and grow in the current global environment.

Short-Term

Enable and Clarify the Role of the Regions

ONMS is a relatively decentralized organization, which allows its sites to be more responsive to issues and considerations unique to their respective environments. This flexibility is an important and necessary characteristic - however, it can also contribute to the misalignment of actions and the lack of a central unifying vision across the System as a whole.

ONMS created four regions (Southeast, Northeast, West Coast and Pacific Islands) to account for the System's growth. It was part of the reorganization effort that elevated ONMS, as a division of the former Office of Ocean and Coastal Resource Management, to its current level as an office, under the NOS. This move also reduced the direct reports to the Director of ONMS, as the site Superintendents report now to the Regional Director. However, the role of the regions has not been clearly defined. As a result, there is a lack of clarity at the staff level on the role of regions,

which is not surprising in this evolution of an organization structure but does require attention and action.

There is an additional important role for the regions in addition to serving as a coordinator between headquarters and the sites. First, the regions can play a critical role in serving as a connector to MPAs at state and regional levels, and with other state government partners. Such broader, systematic engagement will not only help in aligning actions and priorities but also help amplify the System's branding and messaging. Second, it can help in efficient management and operations by coordinating resources and needs across sites and regions. For example, regions can help to look broadly across needs and priorities common to sites and devise efficient methods for sharing infrastructure and resources. Finally, it can help in systematic sharing of best practices and lessons learned across the sites and regions.

Recommendation 7: Clearly define the role of the regions in the System with a particular emphasis on playing the role of regional connectors and coordinators, leading improvements in regional management and operations, and sharing of best practices and lessons learned across the System. The regions must play the important role of coordinating both regional and site-level activities to align with, and advance priorities identified in, the new strategic plan.

- Headquarters and the regions, working as a team, need to better coordinate and prioritize partnerships with other NOAA, federal agencies, and non-federal government agencies at the national and regional level to develop shared actions and priorities based on the new and revised strategic plan.
- Better utilize the regions to enhance System branding, messaging, and outreach beyond local, site-specific awareness.
- Share management best practices and lessons learned across the System, including coordination of resources.

Evaluate Workforce Planning

As discussed in Section 4, the development of a professional management class and dedicated workforce is one of the major achievements of the System. ONMS staff is dedicated to the mission set out by the NMSA and has exhibited several innovative practices and resource sharing among sites which have helped the System be seen as a network rather than individual sites. However, when the potential future of the marine environment is compared to the current characteristics and breakdown of the workforce, certain threats and opportunities begin to appear on the horizon.

ONMS' workforce is aging. By the end of 2023 over 36 percent of its workforce is eligible to retire in the current and two upcoming Fiscal Years.[105] With this potential wave of retirements, the System stands to lose a large amount of institutional knowledge as many staff have been with ONMS for long tenures and have played major roles in the creation and development of the System's management process. There is a need to update the workforce planning model, not only to address this issue at present but also to plan for the future and give the next generation a sense of career path and growth within the organization. Given the changing nature of the marine

[105] Based on information provided to the National Academy of Public Administration from the U.S. Office of National Marine Sanctuaries on November 18, 2020.

environment, the skills that ONMS' workforce needs to operate in the future are most likely different than the skills that the workforce currently possesses. With the continual development and growing dependence on new technologies, the workforce will turn to a more analytical framework, moving away from performing traditional tasks to focusing on critical decision making.[106] There is also the need to focus on sustainable development and having a workforce that can develop a new green infrastructure that is equipped to handle and combat the growing impacts of climate change.[107] All of this is underscored by the growing need to increase diversity in the workforce and the recent changes in the work environment that have been brought on by the COVID-19 pandemic, e.g., being able to balance a flexible work model while maintaining the importance of connection to place.[108]

Related to workforce planning, a strength ONMS can capitalize on is the willingness and passion of volunteers who work in the System. In 2020, volunteers contributed the equivalent work hours of 36 full-time federal employees, amounting to $1.78 million going to the System.[109] While there is a strong interest from community members to volunteer at sites, the System cannot fully capitalize on this interest, demonstrated by many sites having waitlists for volunteers. Volunteers must receive training and resources to effectively communicate and care for the System. With limited resources, the volunteer training that ONMS can provide is also limited. The Community Engagement sub-section of Section 6 goes into further detail about ONMS's ability to connect with the community, but when thinking about the future of workforce planning, the potential capacity of volunteers should not be discounted.

Recommendation 8: Reexamine workforce planning with an eye toward the future. Workforce skills of the future should be focused on creating an analytical framework, optimizing the use of new technologies, and building sustainable infrastructure. The skills the ONMS invests in should be aligned with the System's specific goals and strategic planning.

- During workforce planning, particular attention should be paid to the potential benefits of increased focus and resource devotion to volunteer programs. There should be a focus on leveraging volunteers in new ways that can complement future workforce planning and alleviate the transition to a new workforce planning strategy.

Long-Term

Expand Role as Collaborator and Convener of Marine Protection

ONMS is a global leader in marine resource management, with a history of innovation owing to the NMSA of 1972. Given the increasing interest in ocean conservation and management globally with the UN Decade of Ocean Science and the growing worldwide support for 30 by 30, there is an opportunity for ONMS, with NOAA's approval, to become a leader and convener in these global

[106] World Economic Forum, *The Future of Jobs: Employment, Skills and Workforce Strategy for the Fourth Industrial Revolution*. http://www3.weforum.org/docs/WEF_Future_of_Jobs.pdf
[107] Jobs for the Future, *Exploring the Green Infrastructure Workforce*. https://www.voced.edu.au/content/ngv:75924
[108] Jobs for the Future, *The Future of Work Grand Challenge*. https://www.jff.org/what-we-do/impact-stories/future-work-grand-challenge/
[109] Volunteer numbers from 2020 are impacted by the COVID-19 pandemic. See U.S. Office of National Marine Sanctuaries, *Volunteer*. https://sanctuaries.noaa.gov/involved/volunteer_future.html.

movements and use its expertise to promote these initiatives both domestically and globally. As described in Section 2, the establishment of the System has helped to lead the way for other similar initiatives across the globe. ONMS continues to lead a number of international MPA conservation efforts; the National MPA Center (within ONMS) is a key member of international partnerships such as the IUCN Marine and Polar Program and the North American MPA Network.

In order to achieve this vision, ONMS must work on a focused effort to share its vision and priorities within NOAA, the Department of Commerce, and across the Federal government. Most important, it must understand the priorities of its Federal partners and work with them to develop a clear value proposition for all parties. This type of collaboration previously existed on a large scale with the Marine Protected Areas Federal Advisory Committee (MPA FAC). The Committee was chartered in 2003 to advise NOAA and the Department of the Interior on ways to strengthen the national system of MPAs. The Committee was made up of representatives from a diverse group of stakeholders and had a designated federal officer from ONMS to help facilitate these conversations.[110] The prior administration did not renew the Committee in 2019. While this type of collaboration has continued to occur to some extent, it is based on personal relationships and across a few sites – the System can benefit from better and better structured strategic partnerships.

There also is a need for better coordination on sharing capacity, resources, and priorities within NOAA and the Department of Commerce. As a science and research organization, NOAA has significant technical capacity, expertise, and access to resources. Other agencies in the Department also bring expertise in economic development and other areas. Developing and communicating priorities and identifying mutual areas of collaboration and resource-sharing will allow ONMS to leverage the capacity within NOAA and the Department as resource multipliers. In addition, there are opportunities to leverage the resources of other federal partners that have overlapping and adjacent mission priorities. Examples include co-locating visitor centers, sharing research data and resources etc. While these may occur on a one-off basis, ONMS can benefit from a more systematic, strategic approach. A true partnership model and lens (identifying benefits to all partners) can help ONMS to leverage resources of its federal partners.

Recommendation 9: Expand role as a collaborator and convenor within NOAA, the Department of Commerce, and the larger federal community (and internationally) to establish and champion a shared agenda of marine protection that considers the mission objectives of its partner agencies.

- Reinstate the MPA FAC to provide a mechanism for stakeholder input to the U.S. MPA programs at a national scale and promote alignment of actions and efforts across all domestic MPAs and Federal partners.
- Work with NOAA and Department of Commerce Leadership to develop a shared agenda of priorities for marine protection and work with NOAA partners on shared actions and activities, including working to reinstate the National Ocean Policy Committee (formerly, the National Ocean Council).

[110] U.S. National Marine Protected Areas, *MPA Federal Advisory Committee*. https://marineprotectedareas.noaa.gov/fac/.

- Build on its initial foundation to expand its global focus and take a leadership role in international marine protected areas; share best practices and lessons learned with the global community.
- Work with Federal partners and Regional Fisheries Management Councils to better delineate management responsibilities for federal marine national monuments.

Focal Area 5: Communications, Outreach, and Branding

One key challenge - and opportunity - for ONMS is increasing awareness and appreciation of the System among its non-users. Non-users are often (but not always) located in inland areas of the country, who do not utilize the System due to factors related to access, cost, preference, or awareness. ONMS is particularly interested in understanding the profiles of these groups because their engagement would better fulfill its mission and also create a more robust constituency and engagement for the System.

Short-Term

Enhance Communications Plan and Bolster Support for Communications Team

ONMS' Communications Plan was prepared in 2017 and is still in use; it has not been updated four years later. It has a clear link to the mission. However, while it lists ONMS' strategic goals, it lacks a clear connection to the current ONMS Strategic Plan. Even though it includes varied strategies according to target audiences, no organizational units or staff members are named or assigned to the communications strategies. An overarching finding of this report is that communicating with, convening, collaborating, and aligning stakeholders is a core competency of the System. As noted in Recommendation 2, ONMS needs to develop a new Strategic Plan, before the current one expires in 2022. ONMS' Strategic, Communications, and Education Plans should thus be the foundation for undertaking the expanded efforts prescribed in this arena. In order to build a strong foundation for the System in the face of its future outlook, the communications plan should adhere to best practices in the discipline of external communications (not to be confused with the System's internal Best Practices Guide to Outreach and Communication). Just as OMB Circular A-11 promotes increasing sophistication in strategic planning to improve government performance, greater sophistication in its communications plans and incorporation of contemporary best practices in the field can improve ONMS' mission performance across its programs.[111] A strong and well-supported communications team will be necessary to make the most effective use of the communications plan, and to implement its objectives. Enhanced communications planning taken together with a strengthened communications team will provide a launching point for the public outreach campaign the Academy Study Team prescribes below. In the present day and age, communications are not simply a good practice, but are foundational to achieving the System's mission.

Recommendation 10: Update and revise ONMS' communications plan using contemporary best practices for communications and communications planning, in tandem with its

[111] U.S. Office of Management and Budget, *OMB Circular A-11, Part 6*. https://obamawhitehouse.archives.gov/sites/default/files/omb/assets/a11_current_year/a11_2016.pdf.

development of a new strategic plan beyond 2022.[112] Focus attention on the following practices, in particular. Expand detail on the connections between goals in ONMS' communications plan and its strategic plan. The communications plan should emphasize the impacts of the System consistent with its strategic goals. Establish clear communications goals and objectives to guide its communications plan strategies, which are specific, measurable, accountable, realistic, and time bound. Assign task owners responsible for carrying out the strategies for various target audiences, as detailed in its communications plan. Create and integrate performance metrics to monitor and evaluate progress on these goals, objectives, and activities. There are a number of resources available which provide guidance on what to measure and how to do so. For example, the Public Relations Society of America (PRSA) convened a Measurement Task Force to identify standard approaches for measuring the impact of public relations in 2009, which have been updated since that time. These approaches may be applied to public communications, outreach, and engagement strategies.[113] PRSA also provides a framework by which to select metrics and tie them to outcomes.[114]

Recommendation 11: Elevate the priority level of System communications, and direct greater support and resources to ONMS' communications efforts and focus such efforts on priority projects. The ongoing integration of the Communications Team with the Education and Outreach Division is a welcome step and will facilitate the public outreach campaign the Panel prescribes below, and efforts to convene and partner with stakeholders in the ocean community.

Long-Term

Create and Implement a Public Outreach Campaign on Behalf of the Marine Environment and the System

A key mission area for the System is making contact with, educating, and engaging the public. The System also contributes to an important component of NOAA's mission to share knowledge and information with others by providing a gateway into local communities for its other agencies and line offices, more broadly. In the future outlook, the System looks to expand existing sanctuaries, designate new sanctuaries, and move from place-based management to ecosystem-based management. The success of these efforts will rely on the System broadening the constituency for sanctuaries and communicating a more complex set of information in a rapidly changing world. There are current and future opportunities for the System to expand its audience among non-users of the sanctuaries, people that live in areas isolated from the sanctuaries (in inland areas of the United States, for example), and underrepresented demographic groups. While much work has been done in this area, opportunities also remain to increase engagement with indigenous

[112] Examples of contemporary best practices include Cornell University, *Communications Plans' Best Practices Checklist*. https://hr.cornell.edu/sites/default/files/communication_best_practices.pdf.; SpriggHR, 10 Internal Communications Best Practices. https://sprigghr.com/blog/hr-professionals/10-internal-communications-best-practices/.

[113] Public Relations Society of America Measurement Task Force, *Measurement Standardization*. https://apps.prsa.org/Intelligence/BusinessCase/MeasurementStandarization/.

[114] The International Association for the Measurement and Evaluation of Communication, *Public Relations Metrics Framework*. https://apps.prsa.org/intelligence/BusinessCase/Documents/AMEC/ValidPublicRelationsMetricsFramework.pdf; Jeffrey, *Consider the AMEC Framework!*. https://prsay.prsa.org/2013/05/16/confused-about-how-to-tie-pr-outputs-to-organizational-outcomes-consider-the-amec-framework/.

nations and groups. Communications campaigns offer opportunities to engage new audiences and increase public interest.[115]

Academic reviews of climate change communications campaigns offer lessons that are also applicable to communications campaigns in the marine environment, and often have substantial overlap with issues relevant to the ocean. Traditionally, climate change communications have been statistical and factual in nature.[116] While valuable for the provision of information and have shown some impacts on behavioral intentions, they have not addressed cultural and political values to inspire the level or speed of action necessary to mitigate climate change. Narrative communications, however, can have greater impact on values because they are in a more easily relatable format. "Narratives have a beginning, middle, and end and present conflicts that may be resolved by the characters in the story." Contemporary literature suggests that identifiable characters and imagery are critical to engage audiences and in impacting values.

Narrative delivery is an equally important component of narrative communications. With climate change campaigns, celebrities are frequently messengers for narratives. Fictional characters and popular culture have been used to great effect in similar domains like in natural resources management. Perhaps the most widely known and longest running example of this is the USFS Smokey Bear Wildfire Prevention Campaign. Even before Smokey Bear, USFS organized the Cooperative Forest Fire Prevention Program (CFFP).[117] After *Bambi* was released by the Walt Disney Company in 1942, CFFP requested and received permission to use the movie's characters on its materials for forest fire protection.

Other government agencies, like the National Aeronautics and Space Administration (NASA) have had well-recognized success in branding and brand awareness.[118] Various case studies seek to distill the elements of NASA's efforts which make its brand so wide-reaching. Observations include NASA's understanding that its brand is about how the public sees them, feels about them, and talks about them, which drives NASA to deliver an emotional connection to their public products.[119] It also personalizes its content to reach more audiences. One example is the "benefits to you" page on its website.[120] The page is populated with content which explains the benefits NASA provides to households, cities, and across Earth more generally. Additionally, NASA provides opportunities for two-way engagements with private businesses on its website.

One key element of NASA's success in this area is its use of its public affairs office to leverage the press and journalists in the private sector to support its public outreach campaigns, particularly

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[115] Bieniek-Tobasco, *The Narrative Impacts of Climate Change Storytelling*. https://search.proquest.com/openview/11e1f4d305f8c0a43a61d144078b8c38/1?pq-origsite=gscholar&cbl=18750&diss=y.
[116] Ibid, *page 74.*
[117] The Ad Council and U.S. Forest Service, *About the Campaign*. https://smokeybear.com/en/smokeys-history/about-the-campaign.
[118] NASA typically spends about .026 percent of its budget, or roughly $5 million, on external communications to the public each year. See https://www.nasa.gov/sites/default/files/512594main_10-09_PromotingNASAforSeptember2010.pdf.
[119] Digital Spark Marketing, *Major Secrets to the NASA Success.* https://digitalsparkmarketing.com/innovative-marketing-ideas/.
[120] U.S. National Aeronautics and Space Administration, *Benefits to You.* https://www.nasa.gov/topics/benefits/index.html.

for ongoing projects.[121] For example, during the Apollo-era, NASA public affairs staff distilled stories and narratives from its own engineers, producing press releases meant to be copied verbatim by news outlets, as well as preparing pre-packaged segments that could be easily broadcast on television.

In the modern era, NASA has combined outreach for ongoing exploration missions with characters and narrative storytelling. On February 18, 2021, NASA landed its Perseverance rover on the surface of Mars.[122] NASA publicly chronicled Perseverance's journey to great effect, while humanizing it to make it relatable, before and after the landing. Part of the effort included creating a dedicated Twitter account for Perseverance in February 2020, throughout which NASA posts information from the perspective of the rover, and through an anthropomorphic lens.[123] As of February 26, 2021, Perseverance has a following of over 2.4 million on the popular social media platform.

Observers of NASA's public engagement strategy cite the Space Act of 1958 as the impetus for its success, which mandates that NASA "provide for the widest practicable and appropriate dissemination of information concerning its activities and results thereof."[124] Thus, there is an essential part of NASA's mission to disseminate, inform, and educate the American public. The System has a similar charge and authority to educate the American Public under the NMSA.

Within the last couple of decades, there has been a proliferation in mass media focused on climate change programming. By extension, programming on the marine environment has proliferated through mediums like films and documentaries. These recent trends are occurring contemporaneously with the global movement on marine environment policy described in Sections 2 and 5 of this report. The System has an opportunity to use this momentum to make sanctuaries relevant to a broader audience than ever before. Additionally, there are numerous opportunities for the System to engage with external organizations it has not collaborated with yet for partnership. These include, but are not limited to trade associations, non-governmental scientific and educational organizations, and museums and aquariums. While the potential for expanding engagement among marine conservation groups is an important organization strength of the System, the future challenges and opportunities in the marine environment call for an "all hands on deck" approach, to include inclusion of stakeholders that have apparent and/or even openly competing interests and objectives.

At the local level, increased public awareness of sanctuaries, and the rules that apply therein, can contribute significantly to compliance with those rules. Interviewees stated that it is easy for sanctuary users to be unaware they are in a sanctuary, citing a lack of signage in bordering communities as one example.

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[121] Digital Spark Marketing, *Major Secrets to the NASA Success*. https://digitalsparkmarketing.com/innovative-marketing-ideas/.
[122] U.S. National Aeronautics and Space Administration, *2020 Mission Perseverance Rover*. https://mars.nasa.gov/mars2020/.
[123] U.S. National Aeronautics and Space Administration, *Official Perseverance Rover Twitter Account:* https://twitter.com/NASAPersevere?ref_src=twsrc%5Egoogle%7Ctwcamp%5Eserp%7Ctwgr%5Eauthor.
[124] U.S. National Aeronautics and Space Administration, *Promoting NASA*. https://www.nasa.gov/sites/default/files/512594main_10-09_PromotingNASAforSeptember2010.pdf.

Recommendation 12: Mount a public outreach campaign similar to the Smokey Bear Wildfire Prevention campaign, while using the instructive experiences of an agency like NASA to ensure its appropriate use of outreach techniques to expand public awareness of the System. Use the value proposition prescribed in Recommendation #1 to communicate the System's benefit and relevance in an intelligible, accessible, and appealing way. Include the use of narratives, characters, and collaboration with private partners to amplify the System's resources and message, while avoiding jargon and technical explanations that relate to its operations. Pursue opportunities to integrate the System's branding and value proposition with elements of popular culture, like in the example of USFS and the Walt Disney Company.

- Enhance the physical visibility of individual sanctuaries by increasing the quantity of signage in local communities, interpretive exhibits at partner facilities, and at sanctuary access points on the coasts.
- Recruit interns and volunteers to work with staff on the System's social media campaigns, and to generate innovative ideas for reaching younger and more diverse generations of the public in the context of evolving media and communications technologies such as three-dimensional videography (virtual dives).

- Additional suggestions and effective practices are provided by organizations like OneCause, which help other organizations to amplify their message and raise additional funding for their programs.[125] While resources of this nature typically focus on nonprofit or for-profit entities, they can be adapted and applied to a public outreach campaign by government entities. This guidance includes suggestions on when to begin a public awareness campaign, what communications channels to utilize, and how to engage partners.[126]

Focal Area 6: Community Engagement

Community engagement has been a large success of the System, however, there are additional opportunities for ONMS to capitalize on in this area. There are underrepresented and underserved communities that the System has not previously reached out to, as well the opportunity to build and strengthen the connection to the ocean with the broader American and global public.

Short-Term

Reach New Communities

As mentioned in Section 4 of this report, people have long been connected to the marine environment and the specific sanctuary sites. There is an opportunity to increase this connection, through partnerships and beyond to reach new people to build new connections to the System and in new ways.

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[125] OneCause, *About Us.* https://www.onecause.com/about-us/.
[126] OneCause, *Nonprofit Awareness Campaigns: The Complete Guide for 2021.* https://www.onecause.com/blog/awareness-campaigns/.; Rushing, *Five Steps to Creating Public Outreach Campaigns.* https://www.prnewsonline.com/five-steps-to-creating-public-outreach-campaigns-that-engage-and-inspire/.

There is a clear interest from communities to engage with the System, demonstrated by the number of adults and students ONMS reaches each year in person or virtually, the visitation numbers that the System has begun to collect, the waiting list to become volunteers, and the economic impact of the visitors on the local communities. However, related to the Communication and Outreach piece above, visitors of sanctuaries often do not know much about the System or that they are even in or beside a sanctuary. Increasing communication and outreach efforts will help to increase awareness in some ways but there are other opportunities for the System to take in increasing community engagement. Education is a key tool in connecting people to the marine environment and building community engagement. Environmental education not only encourages environmental stewardship by connecting people's actions to the sites they enjoy but benefits communities by creating a deeper connection to place.[127] Education also can build a new generation of advocates for the System. A Gallup Poll found that 67 percent of people aged 18 to 29 say that global warming is a real, man-made, and serious threat compared to the 49 percent of people aged 30 to 49. The System can capitalize on the invigoration of the younger generations to environmental issues and bring the System into this conversation through expanded education efforts, helping to build a generation of champions. Education can also connect the System, the communities, and NOAA as a whole. The System is a gateway into communities and can use education to spread the message of and connect people not only to the System but to the greater NOAA landscape. Currently ONMS offers a variety of both formal and informal education programs through field-based classroom visits, visitor center programs, classroom visits, lesson plans and curricula, teacher workshops and virtual webinars. In addition, nationwide programs such as the Ocean Guardian program build environmental stewardship projects into schools and communities. ONMS currently reaches 73,000 students in formal programs and 65,000 additional youth and adults through informal learning opportunities including 24,000 youth from underserved areas.[128]

There is also the opportunity to reach new, diverse, and underserved communities. Going to visit a sanctuary site is not widely accessible to everyone as it requires resources to travel and time and therefore a large portion of the national community is not being currently reached by the System. A recent study by the Center for American Progress exploring the "Nature Gap" found that people of color are more likely to live in an area that is nature deprived and low-income communities are more likely to experience nature deprivation.[129] While this report does not dive into specifics in this area, as the nation looks to expand the reach of preserved areas through the 30 by 30 initiative and others, there is an opportunity to ensure that all have access to these areas and look to how the System fits into this picture.

In the wake of the COVID-19 pandemic, how people interact with the System has and will continue to change (see Section 5). The System can adapt its approach to community engagement to encompass these global changes, as well as capitalize on the growing movement of "building back

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[127] The National Environmental Education Foundation, *Benefits of Environmental Education*. https://www.neefusa.org/education/benefits.

[128] Office of National Marine Sanctuaries, *Reaching Far & Wide*. https://nmssanctuaries.blob.core.windows.net/sanctuaries-prod/media/docs/20200116-education-infographic-2019.pdf

[129] Center for American Progress, *The Nature Gap*. https://www.americanprogress.org/issues/green/reports/2020/07/21/487787/the-nature-gap/.

greener" following the pandemic. Technology is a key tool that the System can use to help build this new approach to connecting people to the System. While the System has already engaged in creating videos and virtual experiences of the System, there are opportunities to build on what has previously been done with new technologies augmented reality or virtual reality.

Recommendation 13: Devise new ways to engage communities. ONMS should create localized community campaigns that target previously untapped community groups and should work with previously established organizations and businesses (community groups, restaurants, hotels, etc.) to build connection with communities. The System should document successes and failures in community engagement and house them in a central location to build upon and make necessary engagements.

- Use the latest technologies when appropriate and explore new ways to connect people to the sanctuaries virtually.
- The new approach to community engagement should focus on education and educating the wider public about the sanctuaries and their extensive benefits along with the threats to and imperative of better protecting the marine environment generally.
- Further research should be done to examine how the System can best serve and engage underrepresented and diverse communities.

Medium-Term

Effectively Engage Indigenous Communities

The lands and waters surrounding many of the sanctuary sites are the traditional lands of indigenous peoples. These groups have been using these sites as a part of their culture for thousands of years and depend on their resources.[130] While the System does try to engage with indigenous people, engagement has varied from site to site.

Certain sanctuary sites have strong relationships with their local indigenous communities. The Olympic Coast National Marine Sanctuary's waters are encompassed by the treaty ocean areas of four coastal tribes: the Makah, Quileute, and Hoh Tribes, and the Quinault Indian Nation.[131] These sovereign governments have had a strong interest in the management of the site ever since its designation. In 2007, the Intergovernmental Policy Council, the first of its kind in the nation, brought the four treaty tribes, the State of Washington, and NOAA together to discuss policy matters pertaining to the sanctuary's waters.[132] While the relationship between the four treaty tribes and ONMS is extensive, it is also an outlier. While NOAA provides broad guidance on tribal consultation, most sites within the System do not have a formal mechanism or guidance to engage with their local indigenous communities. The importance of engaging these communities is growing as there is a focus on cultural heritage in the System and engaging with indigenous

[130] U.S. Office of National Marine Sanctuaries, *Earth is Blue Magazine: Indigenous Cultures.* https://sanctuaries.noaa.gov/magazine/1/indigenous-cultures.
[131] U.S. National Marine Protected Areas, *Olympic National Marine Sanctuary's Intergovernmental Policy Council.* https://marineprotectedareas.noaa.gov/toolkit/olympic-coast-intergov-policy-council.html#:~:text=The%20Olympic%20Coast%20National%20Marine,and%20the%20Quinault%20Indian%20Nation.
[132] Ibid

communities is an important aspect of telling the stories of the sites. Engaging with these communities also recognizes their rights and interests as stewards of the resources and allows the System to integrate their traditional ecological knowledge in managing its sites most effectively, including dealing with climate change effects. Engaging indigenous communities is also an important component of combatting the effects of climate change. Indigenous communities have firsthand knowledge of how the environment and natural resources have been impacted due to climate change and can play a critical role in implementing sustainable reform to impede the detriments to the sites.

Recommendation 14: Broaden official representation of indigenous groups in sanctuary designation and management processes including strategic planning. To enhance its outreach efforts, ONMS should provide sites with guidelines on how to properly engage with local indigenous groups and include expert training to their staff on how to respectfully engage with both federally recognized tribes and non-formally recognized indigenous groups.

Expand Partnerships

There is a wide variety of organizations and companies that have a vested interest in the marine environment. Examples include commercial and recreational fishing interests, travel companies, energy corporations, and conservation-focused non-profits. While the System has already engaged many of these groups through established forums such as the site-focused SACs and the Systemwide BAC, there are many groups that the System has yet to engage with. This lack of engagement is not due to a lack of interest from the outside organizations but can be partially attributed to the fact that the System has not established or communicated a clear value proposition as to why organizations should partner with the System. A clear value proposition that defines the mutually beneficial relationship of partnering with the System can entice new groups and help expand the System's outreach to external partners. This in turn benefits the System through the resource multipliers that the partners can provide, including in the communications arena. Expanding partnerships is increasingly important given the current state of the marine environment. New technologies are developing that have created new ways to explore the ocean and Great Lakes (see New Technologies in Section 5) and the System has the opportunity to capitalize on these technologies through expanding partnerships.

Increased partnerships can also lead to increased buy-in and advocacy on behalf of the System. Although there is a perception that certain stakeholders in the marine environment have conflicting interests, such as conservation-focused groups and extracting groups, there is common ground to be found between most groups (see Positive Externalities in Section 4). Through increasing partnerships and bringing different voices to the table, the System can create a forum of champions of the System where that common ground is established and then built on by different groups to support the System. Expanding partnerships can also help expand the System's strategic planning processes. As mentioned earlier in this section of the report many partners and stakeholders express a lack of clarity on the System's role and purpose, including its impact. By expanding partnerships and bringing stakeholders into the strategic planning processes the System can better define its strategic intent. Given that the future outlook of marine environments is so vast and rapidly changing, bringing in partners to plan for and face the future is a resource multiplier for the System.

Recommendation 15: Establish and communicate a clear value proposition as to why organizations should partner with the System. Continue to explore leveraging public-private and public-NGO partnerships in partners' areas of skill.

- Bring different partners together to engage in collective advocacy, and help champions coalesce around a set of actions to increase not only resources but potential funding to the System in the long term.
- Expand outreach to include non-traditional partners/champions of sanctuaries in strategic planning for the System, as well as in planning for site-specific activities.

6.4 Conclusion

Water is vital to the earth's natural balance; after all, it gives us life. This report is prepared at an opportune time, with a confluence of dynamic impactful changes and threats observed and accelerating in the marine environment. Others are forecasted to emerge in the next 10-15 years that will require coordinated and decisive action. These challenges and opportunities provide a context and urgency that cries out for an expanded ONMS vision of its future role in this ecosystem. The increasing material threats to the seas must be adroitly addressed to protect further deterioration of this precious resource. Sylvia Earle, perhaps the most world-renowned oceanographer, said with respect to the care of marine resources: "Our past, our present, and whatever remains of our future, absolutely depends on what we do now."

This report commends ONMS for significant positive contributions to advance its statutory goals. It also calls for a substantial broadening of ONMS engagement, not only within the U.S. government, but also among stakeholders, and global bodies working in the seas.

This report also calls for ONMS, in close consultation with NOAA, to systematically expand engagement with the widest variety of stakeholders that share the marine environment, particularly with indigenous communities and those stakeholders that have apparent and/or even openly competing interests and objectives. In addition, ONMS must continue on a successful trajectory that has been well traveled over several decades to work closely with conservation and research groups - traditional partners for collaboration. More must be done to communicate the clear value-add that ONMS programs contribute to protect, expand, and project its overwhelmingly critical services in such a vast scale. Safe advancing of the blue economy is a key factor in this equation.

In order for ONMS to take on these long-term goals, this report outlines several recommendations that can be embraced and implemented in the short- and medium-term to build the capacity to take on these major objectives with aplomb. The report speaks to the following set of six organizational areas that must be bolstered – and where Panel recommendations are proffered as a launch point: Strategy; Finance; Management and Operations; Organization; Communication, Outreach, and Branding; and Community Engagement. As ONMS embraces recommendations in these areas, the System will be better prepared to carry out the more complicated tasks that are within its reach and commensurate with the report's long-term goals.

Clearly, time is needed to build up the necessary organizational skills and infrastructure for any organization to create great things. Given its successful first half century, the Panel sees ONMS as

the appropriate vehicle within both NOAA and in the broader government to play a significant role as principal convener and guide for multi-agency effort, and in an international context, that engages with private and public sector actors, including research organizations. As Jacques Yves Cousteau, the great oceanographer who shaped an entire generation of thinking about the marine environment, has said: “I said the oceans are sick, but they aren’t going to die. There is no death possible in the oceans – there will always be life – but they’re getting sicker every year.” There is no time to wait.

Appendices

Appendix A: Panel (or Expert Advisory Group) and Study Team Member Biographies

Panel of Academy Fellows

James Murley (Chair), James F. Murley has recently been appointed the Chief Resiliency Officer for Miami Dade County, which is a participant in the Rockefeller 100 Resilient Cities Program. Murley was also recently appointed to the City of Miami Sea Level Rise Committee, and has spent over 10 years with the Florida Atlantic University, where he oversaw research on urban and environmental issues. He is a founding Board member of the American Society for Adaptation Professionals and a Fellow at the National Academy of Public Administration. Murley has served as the Secretary of the Department of Community Affairs, chaired the Florida Energy and Climate Commission, and served as the Executive Director of 1000 Friends of Florida and the Executive Director of the South Florida Regional Planning Council. He is a former Vice-Chair of the Miami-Dade County Sea Level Rise Task Force, and is a veteran of the planning side of government. Mr. Murley also has a significant history in the federal government, having served as the Director of the Coastal Program Office at NOAA.

Felicia Marcus, Felicia Marcus is the William C. Landreth Visiting Fellow at Stanford University's Water in the West Program, an attorney, consultant and member of the Water Policy Group. She most recently served as chair of the California State Water Resources Control Board, implementing laws regarding drinking water and water quality and state's water rights, hearing regional board water quality appeals, settling disputes and providing financial assistance to communities to upgrade water infrastructure. Before her appointment to the Water Board, Marcus served in positions in government, the non-profit and private sector. In government, Felicia served as the regional administrator of the Environmental Protection Agency's Pacific Southwest region. Preceding the EPA, Marcus served as the president of the board of Public Works for the City of Los Angeles. In the non-profit world, she was the western director for the Natural Resources Defense Council, and prior to that the executive vice president and chief operating officer of the Trust for Public Land.

Sally Selden, Brig. Gen. Sally Selden, Ph.D., is the provost and dean of The Citadel. As the college's chief academic officer and second ranking official, she leads strategic planning for the college's academic mission and ensures academic programs are world-class and aligned with the college's core values. Prior to serving as provost at The Citadel, Selden spent 18 years at the University of Lynchburg where she served as provost, associate provost, director of the MBA program, department chair of management, director of the Masters in Nonprofit Leadership, faculty chair (elected), and professor of management. Prior to joining the University of Lynchburg, she was an assistant professor at the Maxwell School of Citizenship at Syracuse University. Selden is a distinguished scholar and teacher of nonprofit management, human resource management and leadership studies. She has published extensively and her work has appeared in multiple public administration journals.

Study Team

Brenna Isman, *Director of Academy Studies*. Ms. Isman has worked at the Academy since 2008 and oversees the Academy studies, providing strategic leadership, project oversight, and subject matter expertise to the project study teams. Prior to this, Ms. Isman was a Project Director managing projects focused on organizational governance and management, strategic planning and change management. Her research engagements have included working with the National Aeronautics and Space Administration, the Environmental Protection Agency, the Social Security Administration, the Department of Veterans Affairs, as well as multiple regulatory and Inspector General offices. Prior to joining the Academy, Ms. Isman was a Senior Consultant for the Ambit Group and a Consultant with Mercer Human Resource Consulting. Ms. Isman holds a Masters of Business Administration (MBA) from American University and a Bachelor of Science (BS) in Human Resource Management from the University of Delaware.

Roger Kodat, *Senior Project Director*. Mr. Kodat has led more than 30 projects for the Academy. He brings twenty years of commercial and investment banking experience with JPMorgan Chase, and six years of senior level federal government experience at the Department of the Treasury. Appointed by President George W. Bush in 2001 to serve as Deputy Assistant Secretary of Treasury, he was responsible for Federal Financial Policy. Some of his tasks at Treasury included policy formulation for the 2006 Postal Accountability and Enhancement Act; rule making and oversight of Federal loan and loan guarantee programs; and management of the Federal Financing Bank (a $32 billion bank at that time). Mr. Kodat holds a BS in Education from Northwestern University and both an MBA in Finance and Masters of Arts (MA) in Political Science from Indiana University.

Sukumar Rao, *Senior Advisor*. Mr. Rao is President of the Parnin Group and has specialized in cross-agency program implementation, performance improvement, IT strategy, digital transformation, and information architecture and data management. Previously, he was a Principal at SRA International. He served as the project manager for a number of OMB-led cross-agency initiatives to evaluate the performance of operations and service delivery of the 24 CFO ACT agencies, including mission areas, IT and mission-support/administrative operations. He brings a depth of IT strategy experience that includes evaluation of government-wide high risk IT projects, assessment of cloud computing and shared services, and design and implementation of digital transformation initiatives. He also served as Program Manager for a Homeland Security Science and Technology Program, leading and managing the strategic planning process to design 108 a $30 million R&D program to improve a nationwide emergency alert system. Mr. Rao has an MBA from Columbia University and Master of Science and Bachelor of Engineering degrees in Telecommunications. He is a Project Management Professional (PMP) and Certified Technology Business Management Executive (CTBME).

Kyle Romano, *Senior Research Associate*. Mr. Romano has provided research support for several Academy studies. Most recently, he has served on Academy projects assessing the value of a potential non-profit foundation for the Department of Energy, and the U.S. Forest Service's research and development enterprise. He graduated from the Indiana University School of Public and Environmental Affairs where he earned a Master of Public Affairs. He attended the University

of Central Florida for his undergraduate studies where he earned a B.A. in Political Science and a B.S. in Legal Studies.

Gillian Townsend, *Senior Research Associate.* Ms. Townsend joined the Academy in November 2019. She has served on several Academy studies, including work with the National Oceanic and Atmospheric Administration, the National Park Service, and the Department of Commerce Office of Inspector General. Most recently, she has served on the Academy project assisting the Department of Homeland Security in developing a strategic plan. Ms. Townsend attended the College of William & Mary where she earned a B.A. in Government and History.

Appendix B: List of Interviewees

National Oceanic and Atmospheric Administration (NOAA)

- **RADM Timothy Gallaudet,** Ph.D, Deputy Administrator and Assistant Secretary of Commerce for Oceans and Atmosphere
- **Nicole LeBoeuf,** Acting Assistant Administrator, NOAA's National Ocean Service
- **Letise LaFeir,** PhD, Senior Advisor, Office of the Under Secretary of Commerce for Oceans and Atmosphere
- **RDML Nancy Hann,** Deputy Director for Operations, NOAA's Office of Marine and Aviation Operations

Office of National Marine Sanctuaries

Headquarters and Regional Offices

- **John Armor**, Director
- **Ellen Brody,** Regional Management Analyst, Northeast and Great Lakes Region and Proposed Lake Ontario Sanctuary
- **Matt Brookhart,** Regional Director, Northeast and Great Lakes Region and Acting for the Southeast and Gulf of Mexico Region
- **William Douros,** Regional Director, West Coast Region
- **Russ Green,** Assistant Superintendent, Thunder Bay National Marine Sanctuary and Regional Management Analyst, Proposed Wisconsin Shipwreck Coast Sanctuary
- **Rebecca Holyoke,** Deputy Director
- **Joseph Hoyt,** National Maritime Heritage Program Coordinator
- **Kristina Kekuewa,** Regional Director, Pacific Islands Region
- **Jessica Kondel,** Chief, Policy and Planning Division
- **Ed Lindelof,** Senior Policy Analyst
- **Elizabeth Moore,** Senior Policy Advisor
- **Danielle Schwarzmann,** Chief Economist
- **Matthew Stout,** Communications Director and Acting Chief of Staff
- **Mitchell Tartt,** Chief, Conservation Science Division
- **Kate Thompson,** Chief, Outreach and Education Division and Acting Communications Director
- **Hans K Van Tilburg**, PhD, Maritime Heritage Coordinator
- **Lauren Wenzel,** Director, National MPA Center

National Marine Sanctuaries Foundation

- **Kris Sarri,** President and CEO

National Marine Sanctuary Site Staff and Sanctuary Advisory Council (SAC) Members

Channel Islands National Marine Sanctuary

- **Chris Mobley,** Superintendent

Cordell Bank National Marine Sanctuary

- **Dan Howard,** Superintendent

Florida Keys National Marine Sanctuary

- **Sarah Fangman,** Superintendent
- **George Garret,** SAC Chair
- **Joe Weatherby**, SAC Member

Flower Garden Banks National Marine Sanctuary

- **GP Schmahl,** Superintendent
- **Scott Hickman,** SAC Chair
- **Mark Belter,** SAC Member

Greater Farallones National Marine Sanctuary

- **Maria Brown,** Superintendent
- **John Berge,** SAC Member

Gray's Reef National Marine Sanctuary

- **Stan Rogers**, Superintendent

Hawaii Humpback Whale National Marine Sanctuary

- **Sol Kaho'ohalahala,** SAC Chai

Mallows Bay-Potomac River National Marine Sanctuary

- **Paul Orlando**, Superintendent

Monterey Bay National Marine Sanctuary

- **Brian Nelson,** SAC Chair

Olympic Coast National Marine Sanctuary

- **Carol Bernthal,** Superintendent
- **Lee Whitford,** SAC Chair
- **Joel Kawahara,** SAC Member

Stellwagen Bank National Marine Sanctuary

- **Pete DeCola,** Superintendent

Thunder Bay National Marine Sanctuary

- **Jeff Gray**, Superintendent

USS Monitor National Marine Sanctuary

- **Dave Alberg,** Superintendent

United States Congress

Senate Committee on Commerce, Science, and Transportation

- **Fern Gibbons,** Deputy Policy Director
- **Alexis Rudd**, Knauss Sea Grant Fellow

House Committee on Natural Resources

- **Lora Snyder**, Staff Director

Congressional Offices

- **Anthony Ching,** Policy Advisor, Office of Congressman Ed Case (Hawaii-01)

Appropriations Committees

- **Darren Benjamin**, Professional Staff
- **TJ Lowdermilk**, Professional Staff
- **Blaise Sheridan,** Professional Staff
- **Matt Womble**, Professional Staff

External Stakeholders and Interest Groups

- **Illeana Alexandar,** Project Assistant, Meridian Institute*
- **Mónica Alvarez Malvido,** Coordinator of Interinstitutional Affairs**,** National Commission of Protected Natural Areas (CONANP) Mexico
- **Phil Anderson,** At-large representative, Pacific Fishery Management Council
- **Michelle Bachman,** Fishery Analyst, New England Fishery Management Council
- **Stephanie Bailenson,** Senior Policy Advisor for Oceans and Coasts, The Nature Conservancy
- **Brian Baird,** (Retired), Former Marine Protected Areas Federal Advisory Committee Chair
- **Dan Basta,** (Retired), Former Director of the Office of National Marine Sanctuaries
- **Jack Belcher,** Managing Director, National Ocean Policy Coalition
- **Robert C. Burns,** Ph.D. Professor and Director, Division of Forestry and Natural Resources, WVU College of Agriculture, Natural Resources and Design
- **VADM Scott Buskirk**, (USN, ret), Blue Economy Subcommittee Member
- **Sarah Chasis,** Senior Strategist, Oceans Division, Nature Program, Natural Resources Defense Council
- **Noah Chesnin,** Policy Program Manager, Wildlife Conservation Society
- **Jim Connaughton**, Chief Executive Officer, Nautilus Data Technologies and former Chairman of the White House Office of Environmental Quality
- **Valerie Craig**, Interim Chief Science and Innovation Officer, National Geographic
- **David Dipre,** Captain, Florida Fish and Wildlife Conservation Commission
- **Catherine French,** Volunteer, Channel Islands Naturalist Corps
- **Mike Friis**, Program Manager, Wisconsin Coastal Management Program
- **Brent Greenfield,** Executive Director, National Ocean Policy Coalition
- **David Gutierrez Carbonell**, Managing Director, National Commission of Protected Natural Areas (CONANP) Mexico
- **Kristen Hislop,** Director, Marine Conservation Program, Environmental Defense Center
- **Tom Ingram,** President and CEO, The Diving Equipment & Marketing Association
- **Ed Johnstone,** Fisheries Policy Spokesperson, Quinault Indian Nation
- **Amy Kenney**, Executive Director, National Ocean Protection Coalition
- **Dan Laffoley**, Principal Advisor on Marine Science and Conservation, IUCN's World Commission on Protected Areas, IUCN's Global Marine and Polar Program
- **Dr. Jane Lubchenco**, University Distinguished Professor at Oregon State University, Former NOAA Administrator (and now White House Science Advisor)
- **Meghan Massaua,** Senior Mediator, Meridian Institute*

- **Roderic Mast,** President and CEO, Oceanic Society
- **Laura Morton,** Senior Director, Policy and Regulatory Affairs Offshore, American Clean Power
- **Tom Nies**, Executive Director, New England Fishery Management Council
- **Steve Olson**, Senior Vice President of Government Affairs, Association of Zoos and Aquariums
- **Ryan Orgera,** Chief Executive Officer, Sanibel Captiva Conservation Association
- **Becky Ota,** Environmental Program Manager, California Department of Fish and Wildlife
- **Secretary Leon Panetta,** Chairman, The Panetta Institute for Public Policy and Former Secretary of Defense
- **Ruth Perry,** PhD, Marine Science and Regulatory Policy Specialist, Shell Exploration & Production Company
- **Millicent Pitts,** CEO and Executive Director, Ocean Exchange
- **Catherine Reheis-Boyd**, President, Western States Petroleum Association (WSPA)
- **Claire Richer,** Federal Affairs Director, American Clean Power
- **Dr. Jerry Schubel**, (Retired), Former President of the Aquarium of the Pacific
- **Mark Spalding**, President and Chair of the Board of Directors, The Ocean Foundation
- **Eileen Sobeck,** Executive Director, California State Water Resources Control Board
- **Pete Stauffer,** Environmental Director, Surfrider Foundation
- **Nicole Vasilaros,** Senior Vice President, Governmental and Legal Affairs, National Marine Merchants Association
- **Richard Vevers,** Founder and CEO**,** The Ocean Agency
- **Tom Vinson,** Vice President, Policy and Regulatory Affairs, American Clean Power
- **Mike Weber,** (Retired), Former Program Officer of Resources Legacy Fund
- **Joshua Berger,** Founder and Board Chair, Washington Maritime Blue

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