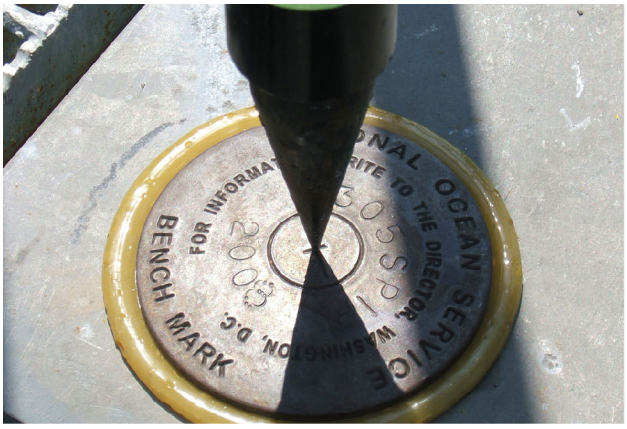
NOS Priorities ROADMAP

A guide for advancing National Ocean Service priorities over the next three to five years.

October 2016



NOAA
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
U.S. DEPARTMENT OF COMMERCE

A LETTER TO ALL NATIONAL OCEAN SERVICE STAFF MEMBERS

September 2016

Our work is about helping communities effectively anticipate and respond to change, ranging from more powerful storms and sea level rise to increased development and greater demands on our coastal resources and environments that have far reaching impacts across the United States.

This updated NOS Roadmap recommits us to work together toward a unified purpose and strategies.

- The NOS Roadmap guides **key programmatic outcomes** that require **collaboration across program offices** to support our three priorities of **coastal resilience, coastal intelligence and place-based conservation**.
- The primary audience of the NOS Roadmap is **us**---the people who work for the program offices and headquarters of the National Ocean Service.
- The outcomes and strategies provide a greater level of specificity supporting the three priorities.
- Each year, the Offices will develop cross-office actions that support the Roadmap outcomes that are closely tied to annual execution plans and aligned with the NOS Annual Operating Plan.

No matter what your job title is, or what role you play, the work you do is essential to advancing our priorities. To be successful in advancing these priorities, we bring an incredibly rich and diverse set of skills to our work. At the same time that we focus on our mission, we are working to ensure that the people who work for NOS reflect the full diversity of the American workforce and that inclusion and engagement of people of all races, gender, sexual orientations, national origins, or employment status---remains at the forefront of our approach to our workforce.

Thank you,

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INTRODUCTION

In the United States, almost 40 percent of the population lives in coastal shoreline counties. These counties contribute $6.6 trillion, or just under half of the country's gross domestic product, to the U.S. economy. The Ocean Enterprise is valued at $7 billion annually. The health of our coasts is inextricably linked to the health of our nation's economy. Global commerce through our seaports continues to grow dramatically. Today, our coasts and coastal communities are also faced with environmental shifts such as climate change, sea level rise, harmful algal blooms, and the increasingly significant impacts of catastrophic events. This makes the already challenging task of safeguarding people and infrastructure, facilitating commerce and managing coastal resources even more complex.

What does the future hold?

Increased offshore and coastal development. If current population trends continue, the U.S. coastal population will grow by another 10 million to nearly 134 million people by 2020, an eight percent increase over the 2010 Census.

Increasing demand on natural areas and ocean resources. Population along the coasts continues to grow at the same time that there is higher demand for healthy places for tourism and recreation, and food from fishing and aquaculture.

Increased demands on our marine transportation system. U.S. commercial ports directly support more than 13 million jobs. The demand for safe, effective, and resilient marine infrastructure and transportation continues to grow.

Higher intensity coastal storms. From 2006 to 2015, seven tropical cyclones each caused more than $1 billion in damage including Sandy, Irene, and Gustav.

Changing sea levels and coastal flooding. Changing sea levels and coastal flooding are likely to increase the challenges that many coastal communities already face. Nuisance flooding has increased between 300 and 925 percent since the 1960s.

Threats to human health and safety from ecological hazards. Harmful algal blooms, hypoxia, and pathogens affect people, communities, and economies. Local authorities and members of the public need early warnings to make decisions to protect the health and well-being of a particular area.

What does this mean for the National Ocean Service?

No single entity can provide the services and tools to help America address these challenges; however, NOS and our partners are uniquely positioned to provide national leadership and expertise. NOS helps people and places prepare for, respond to, and recover from coastal disasters. NOS provides communities with data, observations, modeling, tools, and training to understand, forecast and respond to the local impacts of climate change, sea level change and coastal flooding, harmful algal blooms, extreme natural events, and changing ecosystem conditions. As our coastal population continues to grow, NOS must help ensure our nation's estuarine and marine habitats and maritime history are conserved today and for generations to come. Maritime commerce, both along existing navigation lanes and new ones opening in the Arctic, will require continuously evolving decision support tools, such as

accurate charts, precise positioning, environmental observations and forecasts, and science to support safe and efficient operations, and response to oil spills and other hazards.

To address these challenges, the National Ocean Service is dedicated to advancing the following priorities:

1. Coastal resilience
2. Coastal intelligence
3. Place-based conservation

The NOS Roadmap Supports NOAA's Priorities and the Department of Commerce Strategic Plan

In March 2014, the Department of Commerce released its Strategic Plan for fiscal years 2014 to 2018. NOS contributes to all five goals identified in the plan, with its primary activities falling into the Environment Goal to ensure communities and businesses have the necessary information, products, and services to prepare for and prosper in a changing environment. NOS's priority of coastal resilience is also aligned with NOAA's priority of Community Resilience.

About the NOS Roadmap

The NOS Roadmap guides NOS's priorities over the next three to five years. The Roadmap includes integrated outcomes and strategies. NOS Offices are developing cross office annual actions that support the Roadmap outcomes and strategies therefore they are no longer part of the Roadmap document. These actions are closely tied to the program's yearly execution, and aligned with the NOS Annual Operating Plan.

NOS has a rich diversity of programs, tools and expertise. Each of our Offices is highly successful carrying out their respective missions. The Roadmap describes an approach that NOS is taking to better leverage resources and promote coordinated activities that take advantage of the diversity and total assets of the organization. Successfully advancing these priorities requires close collaboration across NOAA, federal and state agencies, non-profit organizations, industry, and academia.

COASTAL RESILIENCE: PREPAREDNESS, RESPONSE, AND RECOVERY

NOS recognizes that immediate and potentially life-threatening events such as hurricanes, large scale environmental disasters as well as long-term environmental impacts from climate change are real challenges to sustaining healthy coastal communities and ecosystems. NOS also recognizes that these risks are likely increasing with the potential for a higher frequency and intensity of major storm events combined with increased vulnerability of people and places due to sea-level rise and coastal erosion. Large increases in recurrent, or nuisance, flooding are already being documented in many areas of the country and are harbingers of more severe future events. Achieving resilience requires a well thought out process of threat and vulnerability identification, planning, response actions, recovery plans and actions, and continuous adaptation. Resilience also relies on accurate foundational data. NOS has learned from events such as the Deepwater Horizon Oil Spill, Hurricanes Katrina and Sandy and the effects of the Japanese earthquake/ tsunami, that our capacity to respond is often tested with respect to staffing and coordination. We will continue to improve our coordination ahead of the events to ensure an effective response. Establishing all-hazards response capabilities for NOS will require additional investment in personnel, staff time, and training, but the outcome will be a more effective capacity to respond.

Roadmap Example: "Little Splash" Emergency Response Drill Enhances Response Capabilities

With the primary goal of improving emergency response capabilities across the National Ocean Service, the Office of Response and Restoration and Office for Coastal Management teamed up to plan and execute a one-day drill that simulated a small-scale tsunami wave inundating the east coast. Exercise play took place in Silver Spring, MD; Chesapeake, VA; and Charleston, SC. Players from all NOS program offices, NOAA's Homeland Security Program Office, and other line offices within NOAA came together to address critical logistics, planning and operational issues.

We have also learned from major events and subtler and chronic changes that we must conduct advanced planning for long-term resilience. NOS's broad authorities and capabilities in coastal and ocean science, navigation, observation, positioning, resource management, habitat conservation, decision support, technical assistance, and training provide a powerful combination that enables communities to become more resilient. NOS is skilled at identifying risks and vulnerabilities and working with decision makers to apply sustainable solutions that increase resilience to the impacts of a changing climate, extreme weather, coastal inundation, oil and chemical spills, and other hazards and environmental stressors.

COASTAL RESILIENCE OUTCOME 1

NOS has the capability to respond to and manage two simultaneous significant incidents or one major event.

STRATEGY *[Lead: ORR]*

CR1.1 Develop and implement comprehensive training for all roles required within the preparedness-to-resilience all-hazards continuum, both internally and with external partners to improve

understanding of, and ability to interact with, federal structures and processes in place to support response and recovery.

STRATEGY *[Lead: ORR]*

CR1.2 Develop and implement cross-NOS preparedness drills and exercises coupled with a formal post-incident review process to enhance NOS' response and recovery posture for future all-hazards events.

COASTAL RESILIENCE OUTCOME 2

Coastal communities apply relevant criteria and standards to enhance preparedness and recovery.

STRATEGY *[Lead: OCM]*

CR2.1 Work with key partners to improve community understanding, consideration and adaptation to coastal hazard and climate risks, vulnerabilities and potential impacts, including efforts to develop standards for and indicators of community resilience.

STRATEGY *[Lead: OCM]*

CR2.2 Enhance capacity at the community level to understand and effectively communicate and address risks associated with coastal hazards.

COASTAL RESILIENCE OUTCOME 3

Coastal communities utilize natural and nature-based infrastructure to enhance resilience to coastal hazards.

STRATEGY *[Lead: OCM, NCCOS]*

CR3.1 Improve community understanding of the benefits of natural and nature-based infrastructure, and support implementation as a complement to or in place of built infrastructure, to enhance resilience to coastal hazards.

COASTAL INTELLIGENCE

Decision makers in coastal communities need actionable information to make informed choices for the safety of coastal residents, environmental protection, and economic decisions. Coastal intelligence is the source for this information.

Coastal intelligence includes observations (physical, chemical and biological), measurements, models, monitoring, assessment, analysis, and the forecasts, tools, products, and services that derive from these valuable foundational geospatial data. Coastal intelligence provides timely, actionable information, developed from reliable and authoritative science to provide insight into present and future conditions in the coastal zone.

People in the maritime community rely on coastal intelligence for a range of decisions, from how much cargo to load to choosing the most efficient and safest route between two points. They use coastal intelligence to plan seasonally for ship schedules, mitigate the long-term impacts of sea level rise on port infrastructure, and service global trade more efficiently as significantly larger vessels transit through U.S. ports as a result of the Panama Canal expansion. As our economic dependence on the U.S. Maritime Transportation System (MTS) grows, robust coastal intelligence is vital to maintaining MTS resilience, reducing maritime risk and responding to incidents when they occur.

Roadmap Example: Inundation Benchmarks Support Decision-making in Coastal Communities

To improve the use of total water level as a decision-making tool in coastal communities, the Center for Operational Oceanographic Products and Services worked with National Geodetic Survey, U.S. Integrated Ocean Observing System Program, Office of Coast Survey, and Office for Coastal Management to expand an inundation benchmark project that now includes New York City/Long Island Sound; Lower Chesapeake Bay; and coastal North Carolina. This project allows weather forecasters and emergency management officials to use well-known landmarks, such as statues, as a way to better visualize and communicate water levels and impacts during floods.

At the same time, coastal intelligence is important for coastal populations and community resilience. As the population density along our coasts increases, pressures on these ecologically sensitive and economically important areas also increase. For example, ecological forecasts provide the public with key information to make important decisions to protect the health and well-being of a particular coastal area. NOS's coastal intelligence capabilities help communities make informed decisions about sustainable use of the environment and how future choices, climate change, and coastal development will impact them.

COASTAL INTELLIGENCE OUTCOME 1

Integrated decision support tools safely enable expanded waterborne commerce in busy ports

STRATEGY *[Lead: OCS, IOOS]*

CI1.1 Provide ship managers with up to the minute data and information to maintain reliable safety margins to maximize access to highly trafficked and increasingly space constrained ports.

COASTAL INTELLIGENCE OUTCOME 2

Coastal communities make informed decisions and take actions to mitigate risks from changing water levels.

STRATEGY *[Lead: CO-OPS, NGS]*

CI2.1 Improve the ease with which coastal communities use information about water level and its impacts to make decisions.

STRATEGY *[Lead: CO-OPS, NGS]*

CI2.2 Improve the integration of observing networks, predictions, and products.

COASTAL INTELLIGENCE OUTCOME 3

Public health, natural resource management, and commercial and recreational opportunities are enhanced because of NOS's ecological forecasts.

STRATEGY *[Lead: CO-OPS, NCCOS]*

CI3.1 Transition selected ecological forecasts into operations to demonstrate how NOS-led forecasting partnerships can assist decision-makers.

STRATEGY *[Lead: CO-OPS, NCCOS]*

CI3.2 Develop a sustainable model for the research, development, and operation of ecological forecasts within NOS

PLACE-BASED CONSERVATION

America's coastal and marine environments are under increasing pressure from a number of stressors and demands. NOS's place-based conservation efforts have been effective in helping to reduce stress on marine ecosystems while providing economic and social benefits to coastal communities. Coastal and marine places, such as a national marine sanctuary, an estuarine reserve, or coral reef ecosystem, provide a focal point for decision makers, researchers, and citizens alike. Place-based conservation enables a comprehensive approach to problem solving—balancing the often competing and occasionally conflicting demands of coastal resource use, economic development, and conservation.

Place-based conservation is also, by its very nature, a grassroots approach to improving the lives of Americans. Being "place-based" means that NOS looks to local and regional communities to help develop our coastal and ocean conservation programs. Although these programs are national in scope and leverage national assets and attention, they are implemented by NOS staff and partners in the places where people live: from Maine to American Samoa. Place-based programs value the experiences of local and indigenous populations and help provide services that combine their traditional knowledge with contemporary understandings and applications.

Roadmap Example: Social Science Data and Tools Support Management of Special and Protected Places

The National Centers for Coastal and Ocean Science (NCCOS) worked with the Office of National Marine Sanctuaries to study how people use and depend on the Olympic Coast National Marine Sanctuary. NCCOS assessed non-market values held by residents of the state of Washington for natural resources found in the Sanctuary and how those values might change if Sanctuary resources were degraded by stressors like coastal development and climate change. The economic models developed for this project can be used to conduct valuation studies for based on a variety of changes to natural resource attributes.

Conserving coastal and marine places takes time, dedication, and persistence. The strategies in this document will help build on significant recent achievements in place-based conservation and will help continue ongoing efforts. To be fully successful, however, place-based conservation strategies will require contributions from all NOS programs. Coastal intelligence strategies will help NOS's places by providing for safer maritime commerce. Building and enhancing coastal communities' ability to prepare for, respond to, and recover from disasters and the chronic effects of a changing climate will similarly pay huge dividends for place-based conservation by reducing, or encouraging adaptation to, the impacts of these events on natural systems, coastal economies, and our maritime heritage.

PLACE-BASED OUTCOME 1

NOS special places are valued, protected, and preserved

STRATEGY *[Lead: ONMS]*

PB1.1 Expand protection at current sites and add protection at new sites.

STRATEGY *[Lead: OCM]*

PB1.2 Raise awareness of the value of special places and the importance of stewardship for their long-term sustainability.

PLACE-BASED OUTCOME 2

Managers of NOS special places have the capacity to protect these locations and sustain the socioeconomic benefits they provide.

STRATEGY *[Lead: NCCOS, ONMS]*

PB2.1 Assess and prioritize the critical problems confronting NOS special places.

STRATEGY *[Lead: NCCOS, ONMS]*

PB2.2 Implement methods to better address threats and impacts to these special places.

STRATEGY 2.3 *[Lead: NCCOS, ONMS]*

PB2.3 Assess the social, economic, and cultural values that communities derive from NOS special places and factor them into their management.

APPENDIX 1: DEFINITIONS

All-hazards
Any incident or event, natural or man-made, which requires an organized response in order to protect human life, environment, and property as well as to minimize any disruption of government, social, and/or economic services. For NOS this is limited to those activities that are directly within our scientific expertise, authorities, and fall within the scope of NOS priorities.

Communities
In the context of the NOS roadmap, the predominant meaning will be a coastal community: towns, cities, and counties that are on the coast and rely (at least in part) on the coastal and marine environment for its welfare. However, depending on the context and where appropriate, community may refer to a collection of individuals with similar interests, such as the "marine heritage community" or "community of coastal natural resource managers."

Major Incident/Event
A major incident includes all characteristics of a significant incident, with maximum staffing and reporting, and a regional or national impact with substantial interest from the public, Congress and media. In the NOAA All-Hazards Concept of Operations (CONOPS), this would correspond to a Level 1 incident.

Resilience
The ability to prepare and plan for, absorb, recover from, and more successfully adapt to adverse events.

Significant Incident/Event
A significant incident requires a substantial surge in operations relative to the norm. This type of incident is characterized by multiple Line Office engagement, and regional or national impact. In the NOAA All-Hazards Concept of Operations (CONOPS), this would correspond to a Level 2 incident.

Special places
In the context of the NOS Roadmap, special places are those marine areas that are designated, reserved or in some way set aside for particular use(s), including conservation, and are managed by NOAA or long term NOAA partners (states and territories). Examples include, but are not limited to, National Marine Sanctuaries, National Estuarine Research Reserves, and protected areas managed by State partners.

APPENDIX 2: ACRONYMS

CONOPS	Concept of Operations
CO-OPS	Center for Operational Oceanographic Products and Services
IOOS®	NOAA Integrated Ocean Observing System Program
MTS	Marine Transportation System
NCCOS	National Centers for Coastal Ocean Science
NGS	National Geodetic Survey
NOS	National Ocean Service
OCM	Office for Coastal Management
OCS	Office of Coast Survey
ONMS	Office of National Marine Sanctuaries
ORR	Office of Response and Restoration


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