Regional Associations, Regional Integrated Sciences and Assessments).

OUTCOME
R3 Coastal communities utilize natural and nature-based infrastructure to enhance resilience to coastal hazards.

STRATEGY *[Lead: OCM]*
R.3.1 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.

ACTIONS	TIMELINE	NOS PROGRAMS
R3.1.1 NOS role in infrastructure improvements. Define NOS role in advancing the use of natural and nature-based infrastructure to improve hazards resilience and build upon connections with key intra- and inter-agency efforts, such as the Hurricane Sandy Rebuilding Strategy; the Systems Approach to Geomorphic Engineering (SAGE) community of practice; Regional Integrated Sciences and Assessments program; and the U.S. Army Corps of Engineers (USACE) North Atlantic Coast Comprehensive Study.	FY 14-15	**Lead:** OCM **Support:** NCCOS, ONMS, ORR
R3.1.2. Review pros and cons. Conduct a high level review of available information on the benefits and limitations of natural and nature-based infrastructure in protecting against coastal hazards, to increase awareness and understanding of current research and practices.	FY 14	**Lead:** OCM **Support:** NCCOS
R3.1.3. Sandy 19-22. Implement Hurricane Sandy Rebuilding Strategy Recommendations 19-22, that focus on how the federal government can ensure that green infrastructure is a component of Sandy recovery efforts. Compile and disseminate results of these activities.	FY 14-17	**Lead:** OCM **Support:** NCCOS
R3.1.4 Assist practitioners. Enhance science and develop training, tools and products that will assist practitioners at the regional, state and community levels to understand and apply natural and nature-based infrastructure to enhance resilience.	FY 15-17	**Lead**: OCM, NCCOS **Support**: ORR, ONMS
R3.1.5 Influence application. Evaluate and communicate results to influence the application of natural and nature-based infrastructure.	FY16-18	**Lead:** OCM, NCCOS **Support**: ORR, ONMS

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.

Coastal intelligence is just as 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. Moreover, onshore, nearshore and offshore development proposals demand attention and understanding of their options, trade-offs and impacts. 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.

OUTCOME
CI1 Meet the need for expanded commerce in busy ports through enhanced and integrated decision support tools.

STRATEGY *[Lead: OCS, IOOS]*
CI1.1 Maximize access to highly trafficked and increasingly space-constrained ports by providing ship managers with up-to-the minute information to maintain reliable safety margins.

ACTIONS	TIMELINE	NOS PROGRAMS
CI1.1.1 LA/LB. Focus initially on the port of Los Angeles/Long Beach to better understand the decisions that mariners are trying to make (such as managing underkeel clearance), how they are currently accessing NOAA navigation and positioning information, and if it meets their needs. Use the information gathered to define "deliverable(s)."	FY14-15	**Lead:** OCS, IOOS **Support:** CO-OPS, NGS, OCM.
CI1.1.2 Integrate NOAA data. Explore with partners, including private sector service providers, better ways to deliver integrated NOAA navigation and positioning data to user systems of choice.	FY14-15	**Lead:** OCS **Support:** CO-OPS, NGS, IOOS, OCM
CI1.1.3 Develop integrated product. Develop (or co-develop) integrated products or new data delivery method(s) that meet customer requirements.	FY15	**Lead:** OCS **Support:** CO-OPS, NGS, IOOS, OCM
CI1.1.4 Evaluate product. Provide training to users, solicit feedback on satisfaction of use for the purpose intended, and improve products as needed. Consider repeating the process in other ports positioning themselves for post-Panamax expansion.	FY15-16	**Lead:** OCS **Support:** CO-OPS, NGS, IOOS, OCM

OUTCOME

CI2 Coastal communities will use a decision support system for local to regional predictions of total water level and its impacts in three to five geographies.

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

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

ACTIONS	TIMELINE	NOS PROGRAMS
CI2.1.1 Inundation benchmarks. Establish "Coastal Inundation Benchmarks" in 3-5 communities and associated tool kit to apply the protocols in additional communities: Train community leaders and members on using the tool kit as a means of translating storm surge forecasts to water level impacts on their community.	FY14-17	**Lead:** CO-OPS **Support:** NGS, IOOS, OCM
CI2.1.2 Total water levels. Improve predictions of total water level: Provide and consider regional topography and bathymetry data, geodetic data, and regional scale models and expertise in order to improve predictions of total water level and its impacts. Leverage on-going team efforts on Storm Surge Roadmap and VDatum improvements.	FY14-17	**Lead:** NGS, OCS **Support:** IOOS, CO-OPS, OCM
CI2.1.3. Products for inundation. Develop new products and improve existing ones to more effectively communicate the impacts of inundation: new products will address unique regional inundation issues. Visualization of total water impacts will be improved in *Quicklook* by integrating National Weather Service (NWS) storm surge guidance or products. Collaborations with NWS on graphics, terminology and media partnerships will result in more effectively conveying above ground level flooding.	FY14-16	**Lead:** CO-OPS **Support**: OCS, IOOS, OCM

OUTCOME

CI3 Local communities use warnings of ecological hazards to take actions which manage natural resources and protect human health.

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

CI3.1 Strengthen underlying data ingestion, detection and observation capabilities, and transition experimental ecological forecasts to operations.

ACTIONS	TIMELINE	NOS PROGRAMS
CI3.1.1 HAB forecasts. Identify and engage with appropriate decision makers to determine their requirements for providing the HAB and pathogens forecasts. Engage partnerships to establish and implement risk communication frameworks associated with HAB and pathogens impacts.	FY 15	**Lead:** CO-OPS **Support**: OCM, NCCOS, IOOS

CI3.1.2. Improve ecological forecasts. Issue and continuously improve operational ecological forecasts while planning for transition of demonstration forecasts including hydrodynamic model requirements and supporting expansion to additional regions.	FY14	**Lead:** CO-OPS, NCCOS **Support:** OCS, NGS, IOOS
CI3.1.3. Disseminate HAB forecasts. Develop a standardized and modular data integration framework for analysis, production, and dissemination of HAB and pathogens forecasts on a national scale.	FY16	**Lead:** CO-OPS, NCCOS
CI3.1.4 Forecast resolution. Improve forecast resolution by implementation of better observations through: (1) rapid detection and reporting of key species and toxins in the field and (2) ready access to high resolution satellite data.	FY16	**Lead:** NCCOS **Support:** CO-OPS, IOOS, NGS

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 benefits to coastal communities. Coastal and marine places are tangible, much like a city park or natural resource district, providing a focal point for decision makers and citizens alike. This kind of conservation includes protecting special places[6] and 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 by its very nature a grassroots democratic approach to improving the lives of Americans. Being "place-based" means that programs are developed by communities for communities' benefits. Although NOS' place-based 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 modern technologies and techniques.

Conserving the values of coastal and marine places takes time, dedication, and persistence. These strategies 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' places by providing for safer maritime commerce. Building and enhancing coastal communities' ability to prepare for, respond to, and recover from disasters will similarly pay huge dividends for place-based conservation by reducing the impacts of these events on natural systems, coastal economies, and our maritime heritage.