

COASTAL RESILIENCE: PREPAREDNESS, RESPONSE, AND RECOVERY

NOS recognizes that immediate and potentially life-threatening events such as hurricanes as well as long-term environmental impacts from climate change are very 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 of major storm events combined with enhanced risks of greater coastal impacts due to sea-level rise and coastal erosion. Achieving resilience⁴ requires a well thought out process of threat and vulnerability identification, planning, response actions, and recovery activities. NOS has learned from events such as the Deepwater Horizon Oil Spill, Hurricanes Katrina and Sandy and the effects of the Japanese earth quake, that our capacity to respond is often tested with respect to staffing and coordination. There is a need for enhanced coordination and better incident pre-planning to conduct an organized and 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.

Lessons learned from major events also include the importance of advanced planning for long-term resilience. The range of NOS 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 to enable communities to advance their resilience goals. NOS is skilled at identifying risks and vulnerabilities and working with decision makers to apply sustainable solutions that increase resilience to the impacts of climate change, extreme weather, coastal inundation, oil and chemical spills, and other hazards and environmental stressors.

OUTCOME

R1 NOS has the capability to respond to and manage two simultaneous significant incidents⁵ or one major event³.

STRATEGY [Lead: ORR]

R1.1 Develop and implement comprehensive training for all roles required within the preparedness-to-resilience all-hazards¹ 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.

ACTIONS	TIMELINE	NOS PROGRAMS
R1.1.1 Online all hazards directory. Clarify and define existing NOS roles and capabilities relative to all-hazards preparedness, response, recovery and resilience, and identify the respective roles and capabilities of key internal NOAA and external partners. Capture information in a regularly updated, on-line all-hazards directory.	FY 14-15, and regularly updated thereafter	Lead: ORR, OCM Support: All NOS Program Offices
R1.1.2 Assess training and requirements. Assess exiting training and establish clear training requirements for staff and key partners engaged in preparedness, response, recovery and resilience activities.	FY 14-15	Lead: ORR, OCM Support: All NOS Program Offices
R1.1.3 Training in individual performance plans. Build all-hazards responsibilities and training requirements into individual performance	FY 15	All NOS Program Offices

plans for all relevant staff.		
R1.1.4 NOS Incident Management Team. Designate and train an NOS Incident Management Team, per the NOAA Concept of Operations (CONOPS), to manage emergency events and disaster recovery activities in partnership with NOAA Homeland Security Program Office (HSPO), under the established Incident Command System (ICS), and National Disaster Recovery Framework (NRDF).	FY 15	Lead: OCM, ORR, NOS HQ
R1.1.5 Fully trained NOS staff. Conduct/complete necessary training as specified in the training requirements in the second action above, and track progress toward achievement of full NOS training requirements.	FY 14-16, and ongoing thereafter	All NOS Program Offices

STRATEGY [Lead: ORR]

R1.2 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.

ACTIONS	TIMELINE	NOS PROGRAMS
R1.2.1 Online calendar of drills. Develop an on-line calendar of existing drills and exercises in which NOS/NOAA staff and relevant external partners could participate to improve preparedness for response and recovery actions.	FY 14-15	Lead: ORR, OCM
R1.2.2 Regular all-hazards drills. Organize and conduct regular NOS all-hazards exercises and drills of varying scope and scale to improve response and recovery preparedness on specific hazards, sectors, and/or geographies. Ensure that drills and exercises incorporate a range of partners and places, and emerging scientific understanding and technical applications, and include NOS focus areas (e.g., ONMS, National Estuarine Research Reserves (NERRS), Disaster Response Center (DRC), ports).	FY 15 and regularly thereafter	Lead: ORR, OCM OCS, ONMS Support: All NOS Program Offices
R1.2.3 NOS hotwash. Establish a formal NOS-wide after-action incident review process (“hotwash”) to be done following all significant all-hazards events (or individual phases of large events over a long period) to evaluate organizational performance, document lessons learned, and enhance future response and recovery preparedness. Coordinate and communicate activities and/or results, as appropriate, with relevant national preparedness goal frameworks at the interagency level.	FY 14-15, and for all relevant incidents thereafter	Lead: ORR, OCM Support: All NOS Program Offices
R1.2.4 POCS for incidents. Establish a standing cross-NOS all-hazards working group to serve as the primary POCs for coordination of NOS pre-incident preparedness and post-incident evaluation.	FY 14	Lead: ORR, OCM Support: All NOS Program Offices

OUTCOME

R2 Coastal communities apply relevant criteria and standards to enhance preparedness and recovery.

STRATEGY [Lead: OCM]

R2.1 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.

ACTIONS	TIMELINE	NOS PROGRAMS
R2.1.1 Interagency preparedness/recovery. Define NOS role in preparedness and recovery and ensure appropriate connections to key interagency efforts such as the NRDF; National Mitigation Framework; National Response Framework; and National Institute of Standards and Technology (NIST) efforts to develop a disaster resilience framework on measurement science for sustainable construction and manufacturing.	FY 14	Lead: OCM, ORR
R2.1.2. Resilience standards/indicators. Inventory and synthesize existing federal and non-federal efforts to develop criteria, standards for, and/or indicators of resilience (Federal Emergency Management Agency (FEMA); United States Geological Survey (USGS): Sea Grant; Department of Homeland Security (DHS); University of North Carolina Natural Hazards Center, private sector).	FY 14-15	Lead: OCM, ORR Support: All NOS Program Offices that support all-hazards
R2.1.3 Tools to apply standards. Develop tools, products and services that will help practitioners at the regional, state and community levels understand and apply the various standards and indicators that define high-quality disaster preparedness and recovery for a post-disaster community.	FY 14-16	Lead: OCM, ORR Support: All NOS Program Offices that support all-hazards
R2.1.4 Community pilots. Identify community and/or sector-oriented pilot projects to test applicability and usefulness of available criteria, standards or indicators. Consider a variety of community attributes, including non-impacted communities, as well as communities that have undergone recovery from a recent disaster. For the latter, document the use of indicators to measure the success of recovery using their actual recovery experiences.	FY 15	Lead: OCM, ORR Support: All NOS Program Offices that support all-hazards
R2.1.5 Evaluate community pilot. Implement and evaluate community pilot projects to determine effectiveness of criteria and applicability on a broader regional or national scale.	FY16-FY18	Lead: OCM, ORR Support: All NOS Program Offices that support all-hazards

STRATEGY [Lead: OCM]

R2.2 Enhance capacity at the community level to understand and effectively communicate and address risks associated with coastal hazards.

ACTIONS	TIMELINE	NOS PROGRAMS
R. 2.2.1 Socioeconomic information. Acquire and integrate socioeconomic information with physical and biological information to improve assessment of risk and vulnerability for planning and decision-making.	FY 14-16	Lead: OCM Support: All NOS Program Offices that support all-hazards
R 2.2.2 Develop risk communication training. Develop training and other tools to advance the application of risk communication methods at the community level. Utilize networks of partners to ensure the effectiveness of this effort.	FY 14-16	Lead: OCM Support: ORR, NCCOS, ONMS, CO-OPS, IOOS
R2.2.3 Provide risk communication training. Provide training and evaluate tools for risk communication utilizing the NOS and NOAA network of places and partners (ONMS, NERRS, Coastal Zone Management (CZM), DRC, Sea Grant, Cooperative Institutes, IOOS	FY 15-18	Lead: OCM Support: NCCOS, ONMS, ORR, IOOS

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