

INFRASTRUCTURE SYSTEMS REBUILDING PRINCIPLES

Introduction. In October 2012, the hybrid cyclone-nor'easter known as Hurricane Sandy roared toward the mid-Atlantic Coast. Even as the hurricane transitioned to a post-tropical cyclone, wind, waves, and storm surge wreaked havoc along the Atlantic Coast, especially to the coasts of New York, New Jersey, and Connecticut. The National Oceanic and Atmospheric Administration (NOAA) and the U.S. Army Corps of Engineers (USACE) are dedicated to working together to help rebuild more resilient and sustainable coastal communities that can adapt to and better mitigate the impacts of coastal hazards.



NOAA and USACE developed this document to promote a unified strategy for our activities in restoring the coast following “Superstorm” Sandy.

Purpose. Improve long-term performance of coastal rebuilding and restoration actions undertaken through the Infrastructure Systems Recovery Support Functions under the National Disaster Recovery Framework following Superstorm Sandy by implementing Executive Order 11988ⁱ and these consistent principles on a regional scale that:

- Anticipate a changing environment;
- Integrate economic, social, and environmental resiliency and sustainability; and
- Promote long term community protection.

Audience. This document is intended for government at all levels – Federal, State, local and Tribal, non-governmental organizations, and the public to guide coastal restoration activities following Superstorm Sandy.

Principles. Recognizing that natural systems and processes are inextricably linked with and contribute to the resiliency of physical infrastructure, community well-being and coastal economies, we will:

1 **Work together in a collaborative manner across multiple scales of governance (i.e., local, State, Tribal, and Federal) and with relevant entities outside the government to develop long-term strategies that promote public safety, protect and restore natural resources and functions of the coast, and enhance coastal resilience.**





- Involve stakeholders and levels of government in the scoping, development, implementation, and monitoring of integrated solutions, and pursue a broad and diverse range of sustainable public and private actions to increase the resiliency of natural and built systems, and revitalize the economy of the coast.
- Work across the Federal government to promote alignment of agency actions ensuring that taxpayer dollars are invested wisely and sustainably and to allow for intensification of anticipated benefits from these synchronized actions.

▪ Leverage partnerships inside and outside of the Federal government to maximize all appropriate sources of funding, resources, and expertise. Where needed, provide effective guidance and policies for restoration of affected coastal regions.

- Work with State and local partners to effectively sequence and focus rebuilding and restoration actions in coastal areas based on need, vulnerability, timing, and access. Leverage ongoing and planned activities (e.g., FY13 mapping and observing activities) related to coastal resilience and restoration.
- Align and deliver data, tools, and information (e.g., physical, ecological, economic, etc.) in easily accessible formats to facilitate informed action by stakeholders. Ensure that the Federal government provides useful and timely technical assistance and information that enables sound leadership and decision-making. Work with stakeholders to identify and prioritize additional data, mapping, decision support tools, and other technical needs for recovery actions.
- Learn from the experience of Superstorm Sandy and other storm events by conducting assessments to understand what worked and what did not. Ensure regional collaboration to identify shared needs, advance best practices, and communicate lessons learned.

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Improve coastal resilience by pursuing a systems approach that incorporates natural, social, and built systems as a whole.

- Promote integration of natural and built systems in response, recovery, and mitigation approaches, including incorporation of natural features in planned built features, where feasible. Utilize adaptive management to encourage flexible decision-making and seek to modify critical infrastructure in response to changing conditions.
- Advance understanding and integration of a system-based approach and the benefits provided by protecting and restoring the natural environment and their “services,” including coastal buffering.



- Support community resiliency by promoting sustainable economic activities of the region and strengthening the existing social institutions and networks to engage and empower all parts of the community.
- Identify and pursue economically-viable solutions that minimize impacts to the natural functions of floodplains and coastal ecosystems, and enhance the services they provide to coastal communities.
- Work together to identify priority actions on a system or subsystem basis in order to inform short and long-term investment plans, while providing transparency to local and regional governments and taxpayers.
- Align investments to assure that water dependent uses of the coast, particularly ports and related built and informational infrastructure, support working waterfronts that are more efficient, safe, secure, resilient, and environmentally sustainable, considering uncertainties about future conditions.

3

Promote increased recognition and awareness of risks and consequences among decision makers, stakeholders, and the public.

- Improve understanding of risks and consequences among decision makers to encourage risk-informed decisions that consider best available information and future, often uncertain changes in the natural and built environments, including the effects of climate change, land-use change, and coastal development.
- Invest in risk communication efforts, capitalizing on existing social science, including an emphasis on the disclosure of risks that have not or cannot be mitigated in an economically feasible manner.
- Encourage the full spectrum of risk communication including awareness, information sharing, education, and action. Identify actions that can be taken to mitigate residual risks and promote more resilient communities and sustainable coasts.
- Encourage coordination of, and common approaches to characterization of risks, vulnerabilities, and mitigation strategies in a manner that is sensitive to information needs and requirements of private interests, communities, and different levels of government.
- Develop and share user-friendly information and tools for assessing impacts, managing risks, and risk/reward tradeoffs related to different project options.



Glossaryⁱⁱ.

Adaptive management. A decision process that promotes flexible decision making that can be adjusted in the face of risks and uncertainties— such as those presented by climate change—as outcomes from agencies or private sector actions and other events become better understood through monitoring and improved knowledge.

Ecosystem. A dynamic complex of plant, animal, and microorganism communities and the nonliving environment, interacting as a functional unit. Humans are an integral part of ecosystems.

Ecosystem Services. The benefits people obtain from ecosystems.

Mitigation. Capabilities necessary to reduce loss of life and property, and damage to natural resources or ecosystem services by lessening the impact of disasters. Mitigation capabilities include, but are not limited to, community-wide risk reduction projects; efforts to improve the resilience of critical infrastructure and coastal ecosystems; risk reduction for specific vulnerabilities from natural hazards or acts of terrorism; and initiatives to reduce future risks after a disaster has occurred.

Recovery. Those capabilities necessary to assist communities affected

by an incident to recover effectively, including, but not limited to, rebuilding infrastructure systems; providing adequate interim and long-term housing for survivors; restoring health, social, and community services; promoting economic development; and restoring natural and cultural resources.

Redevelopment. Rebuilding degraded, damaged or destroyed social, economic and physical infrastructure in a community, State or Tribal government to create the foundation for long-term community health and resiliency.

Resilience. Ability to adapt to changing conditions and withstand and rapidly recover from disruption due to emergencies.

Response. Those capabilities necessary to save lives, protect property and the environment, and meet basic human needs after an incident has occurred.

Restoration. For the purposes of this document, the term “restoration” includes not only returning a physical structure, essential government or commercial services or a societal condition back to a former or normal state of use through repairs, rebuilding, relocation, or reestablishment; but also includes the restoration of natural and ecological

systems and processes that are inextricably linked with and contribute to the resiliency of physical infrastructure and coastal economies.

Sustainability. Meeting the needs of the present without compromising the ability of future generations to meet their own needs. Providing solutions that can be maintained over time within resource availability.

System. Integrated whole of the natural and built environments.

ⁱ Executive Order 11988: Floodplain Management—requires Federal agencies to avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative.

ⁱⁱ The definitions used in this Glossary are from the following sources: National Disaster Recovery Framework (September 2011), Millennium Ecosystem Assessment (2005), and USACE Civil Works Strategic Plan: Sustainable Solutions to America’s Water Resources Needs (September 2011), as modified to incorporate administration policies under E.O. 11988, Floodplain Management.

