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Coastal Hazards Resilience

Goal: Render New England a "Coastal Hazards Ready" region by providing existing federal, state, and municipal programs with state-of-the-art data and tools to advance planning and response to storms, shoreline erosion, and coastal inundation due to projected sea-level rise from global warming.

Summary: Sea level rise is altering New England's coastal shorelines through inundation and shoreline erosion. Science-based forecasts for accelerated sea level rise over the next 100 years due to global warming are as high as 1.5 meters. Additional sea level rise is expected due to the melting of land-based glaciers in Greenland and Antarctica.

Several New England states have experienced significant abnormal inland flooding events that have lead to river flooding, loss of life and major damage to infrastructure. Backwater flooding from undersized culverts under roads causes some of this damage. In addition to roads, undersized culverts connecting embayments to the ocean through barrier beaches are locations where breaching may occur and induce inlet formation, inlet migration, and an ensuing loss of property and structures.

Data such as detailed terrestrial contour, shallow water bathymetry and mean high water positions are universally needed throughout the region to support planning for storm surge, erosion and sea level rise. A companion to data is the need to develop user-friendly tools to access and analyze data and support management decisions and recommendations.

Accomplishments:

- **Hazards Resilience Workshop (November 2007)** Thematic areas included determining impacts of past hazard events, learning the effects of climate change on the intensity and frequency of future events, and understanding the region's current resiliency to better gauge existing preparedness and improve future capacity. Nearly 60 stakeholders from diverse backgrounds participated in the workshop. Presenters provided important inspiration and background on issues like storm events and climate change impacts, as well as valuable opportunities and lessons learned from specific efforts to improve coastal hazards resiliency.
- **LiDAR Workshop (May 2009)** NROC and USGS sponsored a workshop to discuss regional LiDAR data needs and requirements.
- **New England LiDAR Proposal to USGS (2009)** New England states (data managers and data users) collaborated to submit a regional proposal for the USGS 'ARRA' Funding Opportunity for LiDAR acquisition. The New England states used the results of the May 2009 LiDAR workshop to inform the proposal.
- **Climate Adaptation Proposal to NOAA (September 2010)** NROC Hazards Committee Co-chairs worked with the Gulf of Maine Council's Climate Change Network to identify regional climate adaptation planning needs and submitted a collaborative proposal to NOAA's Climate Program Office.
- **Coastal Climate Adaptation Training (October 2010)** NROC identified the need for a regional Climate Adaptation Training for state managers. NOAA's Coastal Services Center and the Northeast States for Coordinated Air Use Management (NESCAUM) organized a training with additional support from EPA's Region 1, New England Interstate Water Pollution Control Commission, Rhode Island Sea Grant. More than 25 state agencies and regional organizations received training on coastal climate adaptation planning.

- **Significant Progress on Development of the StormSmart Coasts Network for New England** (November 2010) Individual state pages available for Rhode Island and Massachusetts.

Activity Details:

1. **Promote regional dialogue on broad-scale adaptation strategies for responding to the effects of sea-level rise.**

   Actions:

   - ***Bimonthly webinar series*** (once in two months) to share information on hazards resilience and climate adaptation tools and resources available to the region as well as specific case studies or pilot projects from New England. The webinar series will promote engagement in the New England StormSmart Coasts Network. Topics and moderator profiles will be featured on StormSmart Connect. Moderators will respond to questions posted on the discussion board.
   - ***Climate Adaptation workshop***, delivered in collaboration with the Gulf of Maine Council Climate Change Network, NOAA Coastal Services Center, and other partners. The purpose of this workshop is to provide federal and state agencies as well as non-government organizations an opportunity to share lessons learned and discuss implementation strategies that would benefit from regional buy-in and support.
   - ***Storm Smart Coasts Network*** website for New England, with state and region specific information and strategies for improving hazards resilience. The New England regional resource webpage will provide information on key adaptation and resilience programs, initiatives, and pilot projects in the region. NROC will work with regional partners to evaluate options for a web calendar to track related meetings and events and a RSS feed for stakeholder updates.
   - StormSmart Coasts Network Communication and Outreach with media. NROC will develop regional and state specific information for media to access before and after major coastal storm events. Briefs will include historic and current information about the impacts and damages of storms as well as measures to address this hazard. The StormReporter database will be a source for current observations.
   - ***Northeast Climate Adaptation Framework***, in collaboration with NESCAUM and other partners, focused on interstate and interagency coordination of adaptation policies. Specifically, NROC will discuss and design a regional approach to determine a reasonable New England sea-level rise scenario for planning purposes and to support regional messaging to the public.
   - ***Regional proposals*** for climate adaptation and hazards resilience related projects.

With Existing Resources	With Additional Resources
Bimonthly webinar series	Adaptation workshop
StormSmart Coasts Network	Develop hazards resilience information for StormSmart Coast Network
Regional proposals	Northeast climate adaptation framework and SLR scenario planning

2. **Act on data acquisition priorities and user-friendly tools needed to support planning for and responses to coastal hazards.**

Actions:

- ***Digital Elevation Meeting*** to coordinate 2011-2012 LiDAR data collection plans. Discuss and review process and success of NE LiDAR collection in 2010.
- ***Mapping Product Recommendations*** for priority regional tools such as flood elevation maps and sea level inundation visualizations. NROC will facilitate regional discussion around high priority mapping products and application needs that make use of the 2010 NE LiDAR data.
- ***Seafloor Mapping Workshop*** to coordinate regional bathymetric data collection. This workshop builds on the success and methodology of the 2009 NE LiDAR workshop. NROC will facilitate the development of regional seafloor mapping priorities and leverage existing mapping activities in partnership with the Gulf of Maine Mapping Initiative (GOMMI). (See also Ecosystem Health activity #2)
- ***Southern New England Mapping Initiative*** created to extend the work of GOMMI to Long Island Sound. (See also Ecosystem Health activity #2)
- ***Inundation Visualization Tools*** for storm surge, sea level rise, and economic impacts. NROC will provide input on the development of visualization tools for inundation and seal level rise.

With Existing Resources	With Additional Resources
Meeting of regional digital elevation team	Seafloor mapping workshop
Recommendations for priority regional LiDAR mapping products	Southern New England mapping initiative
	Economic impact analysis of storm surge and sea level rise

3. Partner with academia, industry and public agencies to develop a plan for an Integrated Ocean Observing System (IOOS) that supports storm surge and inundation forecasting and response.

Actions:

- ***Recommendations*** for further aligning NROC and NERACOOS Hazards Resilience Committees. Recommendations will include a memo to NERACOOS that identifies opportunities for Committees to collaborate and key management requirements for ocean observations to support hazards information and monitoring.
- Development of hazards resilience requirements for ocean observations (in partnership with NERACOOS)

With Existing Resources	With Additional Resources
Recommendations for aligning NROC and NERACOOS Hazards Resilience Committees	Development of hazards resilience requirements for ocean observations (in partnership with NERACOOS)

4. Pilot Project – Methodology for Unified Coastline Data Layer.

Actions:

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- ***Methodology*** for developing a unified coastline data layer. Share methodology with NE states and make recommendations for New England Unified Coastline Data Layer.
- ***Pilot data layer*** for Southern Maine. Highlight results of pilot work on NROC website and New England StormSmart Coasts Network.

With Existing Resources	With Additional Resources
Methodology for unified coastline data layer	Unified coastline data layer for New England states
Pilot data layer for Southern Maine	

2010-2012 Committee Members:
Julia Knisel, Massachusetts Office of Coastal Zone Management (State Co-chair)
Adrianne Harrison, NOAA (Federal Co-chair)
Susan Russell-Robinson, US Geological Survey (Federal Co-chair)