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IVWR



# National Shoreline Management Study<sup>1</sup>

## Eroding U.S. Shorelines - A Call for Resiliency

**The NSMS results show that the shorelines of the U.S. are eroding, with enormous implications for the health, economics, and welfare of our citizens and the environment. Climate change and sea level rise significantly compound the regional and local issues on what management steps are needed to establish resilient shorelines.**

Each region faces a unique set of challenges and requires regional solutions. Federal leadership is needed to help facilitate regional and local efforts to identify shoreline management issues, develop shoreline management plans, and provide the basis for action. Key players include state, local and city governments, and the private sector, working closely with academia, interest groups, and other stakeholders. Given that there are insufficient federal funds for U.S. shoreline protection needs, the NSMS findings point to the need to find innovative financing approaches using public-private partnerships and alternative financing options.

### North Atlantic

The shoreline extends across two sub-regions: (1) the New England region, from Maine to the north shore of Long Island comprised of cliffs, rocky shorelines and barrier islands; and (2) the Mid-Atlantic region, from the south shore of Long Island to Chesapeake Bay comprised of low-lying coastal plains and barrier islands.

**The New England sub-region is heavily developed, with repetitive damages, high costs of erosion, competing coastal economies and a sediment-starved system.**

- There is a need to aggressively manage and re-use available sediment for ecological restoration and protection from future nor'easters, hurricanes and storm surge. The challenge is moving from site-specific crisis management to comprehensive, systematic and sustainable regional shoreline management.



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**The Mid-Atlantic sub-region is sediment-rich, but susceptible to coastal storms and sea level rise.**

- Superstorm Sandy demonstrated that beach nourishment projects were effective at reducing damage, but also the need for regionally-defined strategies to achieve resilience.

- Many government agencies are seeking ways to move from site-specific reactive management to more comprehensive regionally-based shore management and from hardened shorelines to nature-based approaches, such as living shorelines, to increase resilience and long-term sustainability.

### California

The shoreline is divided into three distinct regions, each facing different issues in shoreline management: (1) Northern, (2) Central (e.g., San Francisco Bay), and (3) Southern.



Photo courtesy of ©2015 ABC News

- California's shoreline is eroding, and the social, economic, and environmental implications are enormous. With dominant port, fishing and recreation-based coastal economies at risk from the erosion of beaches, cliffs, and bluffs, as well as marshes and wetlands, billions of dollars in real estate and commercial properties, roads and railroads, tourism industry, commercial and recreational fishing, and habitat for fish and wildlife are threatened.
- Natural factors influencing erosion include El Niño and the Pacific Decadal Oscillation. Human influences include major reductions in sediment supply caused by the construction of dams (25% loss of sediments trapped by dams) and armoring shoreline bluffs. Coastal armoring covers approximately 10% of the state's shoreline (30% in southern California).
- Marshes, mudflats, and wetlands are at serious risk of survival. They can be quite resilient and adapt to changing conditions, but it depends on an adequate supply of sediment. Major wetland restoration efforts, most notably those in the San Francisco Bay and San Joaquin deltas, represent relatively new approaches for maintaining healthy shorelines and reducing impacts of sea level rise.
- Rates of nourishment of the naturally narrow beaches in southern California have decreased over the past 20–30 years. These beaches face accelerating net sand losses over the coming decades due to increased storminess, needing continuing nourishment/stabilization efforts.
- Federal, state, and local policies and regulations for sediment and shoreline management developed over the past 50+ years need to be updated to address conflicts and inconsistencies.

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- California's Coastal Sediment Management Workgroup is a model of intergovernmental collaboration for the nation. California shoreline management is a complex mix of an abundance of federal, state, and local government authorities, enhanced by serious "collaboration" with environmental interest groups. The workgroup is an effective mechanism for stakeholder and interagency coordination on shoreline issues, and is developing a Sediment Master Plan over a 10-15 year period for the California coast.

## Hawaii

### Beaches are the lifeline of the state's economy, and a major contributor to the national economy.

- Hawaii beaches are eroding and threatening shoreline development, infrastructure and natural resources. These hazards will increase in the future in occurrence and severity with climate change and sea level rise.



- Watershed approaches have traditionally been used in the Hawaiian Islands, where steep topography and sensitive coastal ecosystems such as coral reefs and native fishponds need to be managed as a system.

- Erosion-rate based development setbacks have been imposed on Maui and Kauai as an innovative

approach to keeping development out of harm's way and avoiding future costs of shoreline damage, but issues remain how to protect infrastructure, and residential/commercial properties along shorelines.

- There is a lack of beach quality sand for beach nourishment. The U.S. Corps of Engineers dredging projects are one source, but more needs to be done to find non-Federal sponsors of dredging projects. In addition, federal dollars will be needed to support the state's efforts on a range of site-specific adaptation measures.

- Regional and local sediment and shoreline management plans are critically needed to systematically approach the issues of eroding beaches and the loss of natural habitats (e.g., turtles, monk seals).



- Innovative financing approaches using public-private partnerships that were used in the recent Waikiki beach nourishment may be a model for other beaches; the Waikiki Beach Special Improvement District Association was created to help fund continuing beach nourishment.

## Great Lakes

**Shoreline management issues, including erosion and accretion, are directly tied to water levels in the Great Lakes. Water levels are the key to the Great Lakes ecology and the economic and social welfare of the people who live and work there.**

- The commercial shipping industry, fishing, and recreational boating in the Great Lakes are threatened by lower lake levels and accreting channels. There is a need to dredge marina channels for lake access.
- Each Great Lake is different, and 58% of all the region's shorelines are subject to erosion, with many beaches and bluffs receding at tens of feet per year. Beaches, infrastructure, and residential/commercial properties are at risk. Many are already losing the battle with the forces of erosion.
- Erosion and accretion are mostly thought of as socio-economic issues in the Great Lakes (e.g., loss of shoreline impacting homes). State programs specify setbacks for new builds, but whether to armor or let the shoreline retreat remains a contentious issue.

- There is a strong environmental ethic in the culture of the Great Lakes region, and much effort is on-going in restoration (e.g., invasive species, algae blooms, and contaminated sediments). A directly related issue is the erosion of lakebeds, commonly in front of armored shorelines, changing soft bottom habitats to hard bottoms, providing ideal habitat for proliferation of zebra/quagga mussels.



Photo courtesy of ©2009 NOAA

- Many federal engineered shoreline protection structures were built 50 to 200 years ago and about half are in risk of failure. The lack of federal funds to rebuild or maintain these structures translates to higher risks to those local communities, ports, and marinas.
- Sediment and shoreline best management plans should be developed for each of the Great Lakes by collaborative partnerships of federal, state, and local entities, including the private sector, academia, and non-government organizations. The focus should be on sediment and shoreline management for littoral cells within each of the lakes. For example, most dredged material from federal dredging projects is disposed of offshore or in confined disposal facilities; management plans should encourage more beneficial use of dredged material.

**For more information please visit:  
[nationalshorelinemanagement.us](http://nationalshorelinemanagement.us)**



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<sup>1</sup>The congressionally-authorized National Shoreline Management Study (NSMS) is documenting the nature and impacts of shoreline change for each region of the U.S., including the extent of shoreline change, approaches to shoreline management, socio-economic and environmental impacts of shoreline change and identifying needs for improving shoreline management and shoreline resiliency.