



# Coastal Adaptation to Climate Change

## Background

The National Park Service (NPS) manages 12,000 miles of shoreline across 88 ocean and coastal parks. These areas currently experience effects from climate change, including greater uncertainty in the Great Lakes' water levels, changing storm patterns, increasing ocean acidity, and melting permafrost. Parks in the coastal zone are already experiencing the effects of sea level rise and will become more vulnerable as sea level rise accelerates. Climate change will amplify the existing dynamic nature of coastal and shoreline areas, threatening park resources, infrastructure, and public recreational opportunities. “Anticipatory planning” and engagement with local communities to consider new, more sustainable ways to provide visitor services and protect heritage resources in these dynamic environments are critical. Even if plans are not in place before storm events, recovery actions can employ new sustainability concepts. For example, following Hurricanes Sandy, Harvey, Irma, Maria, Matthew, and Florence, the NPS has since implemented a Rapid Review Team specialized in making quick and adaptive decisions to optimize the storm recovery process and promote future resilience. Lessons learned from this effort, and projects underway in a variety of coastal and Great Lakes parks will inform next steps for climate change adaptation in these dynamic areas.

## Approach

The NPS is working with scientists and other partners to develop local, landscape, and ecosystem-scale adaptation strategies that protect coastal resources and promote their long-term sustainability. The science-based and collaborative approach draws on goals and objectives outlined in the servicewide Climate Change Action Plan. Development of these coastal adaptation strategies entails:

- Support scientific research, inventory, and monitoring activities to gather data and improve understanding of climate and weather phenomena affecting coastal parks.
- Conduct risk and vulnerability assessments to identify projected impacts of climate and other stressors on park resources and operations.
- Develop guidance and tools to help NPS managers understand vulnerability and take actions that will increase sustainability, including actions that are compatible with the dynamic coastal environment.
- Develop educational materials to inform the public about the need for comprehensive, swift, and effective measures to help the NPS conserve ocean and coastal park resources for future generations.



Shoreline erosion at West Ship Island, near Fort Massachusetts in Gulf Islands National Seashore. Coastal erosion is an ongoing issue in the Northern Gulf of Mexico barrier islands, exacerbated by stronger storm events associated with climate change.

Adaptation in the coastal environment involves cultural and natural resources as well as recreational, and transportation facilities. In undertaking this work, the NPS is leveraging servicewide assets and programs and collaborating with other agencies, jurisdictions, and external partners.

## Status and Next Steps

- *Vulnerability assessments* for sea and lake level changes published for 22 parks through a partnership with the USGS. Currently, an assessment of vulnerability assessments is underway depicting best practices in identifying cultural, natural, and infrastructure vulnerability within the NPS.
- The NPS has developed a *Coastal Adaptation Strategies Handbook* for coastal area park response to effects associated with storms and sea level rise.
- Western Carolina University completed *exposure to 1m of sea level rise assessments* for facilities in 40 coastal parks.
- University of Colorado Boulder led a project that provides *historical data and projections* for sea level and storm surge for 118 parks.
- The NPS continues to evaluate coastal zone construction projects after storm events for adaptation to climate change.

## More Information

Rebecca Beavers, Ph.D.  
Coastal Geology and Coastal Adaptation Coordinator ph: (303) 987-6945  
Geologic Resources Division email: Rebecca\_Beavers@nps.gov

Cat Hawkins Hoffman  
Chief ph: (970) 225-3567  
Climate Change Response Program email: Cat\_Hawkins\_Hoffman@nps.gov

Amanda Babson, Ph.D.  
Coastal Adaptation Coordinator ph: (970) 267-7211  
Northeast Region email: Amanda\_Babson@nps.gov

<http://www.nps.gov/climatechange>