



Preparing the Nation for Sea Level Rise and Coastal Flooding

The United States has one of the world's largest and most diverse coastal zones with more than 95,000 miles of shoreline.¹ We depend upon healthy and abundant coastal resources to drive our economy by providing food, jobs, storm protection, transportation, health benefits, and recreation. However, changes in our climate system are altering our coastal environment in profound ways, impacting vital coastal ecosystems and making coastal communities more vulnerable. Climate change is gradually causing global sea level rise, which contributes to coastal flooding. Additionally, in some areas, land is sinking (called *subsidence*) and sea level varies due to winds and ocean circulation changes. Combined, these factors determine a region's vulnerability to the impacts of climate change; some communities are more at risk than others. NOAA is at the forefront of identifying ongoing changes and preparing our coastal communities and businesses for future sea level rise and coastal flooding events.

As a coastal nation, the U. S. has a lot at stake. About 40% of all Americans—more than 123 million people—live in coastal counties and depend on these resources for food, jobs, storm protection, and recreation.² Almost \$1 trillion of U.S. imports arrive through the country's seaports annually.³ Approximately 45%, or about \$6.4 trillion, of the nation's gross domestic product was generated by coastal communities, which supported more than 51 million jobs.⁴ In 2010, Almost 3 million jobs directly depended on ocean and Great Lakes resources and generated over \$250 billion annually.

NOAA has seen a growing demand from Americans who want to understand how and why our coasts are changing and what will be the impacts on their lives and livelihoods. NOAA is uniquely positioned to provide trusted information to coastal-dependent businesses and communities to help them protect and preserve valuable habitat and infrastructure.

Fishing Creek, Dorchester County, MD



Est. property damage
\$487,679.00

\$998,330.00

FEMA, Salisbury University, and NOAA

Homes and docks along Fishing Creek, on Maryland's Eastern Shore, at normal water level (top) and water level during a once-in-a-century flood (bottom) with estimates of resulting property damage.

NOAA envisions a future with a strong economy *and* thriving coastal communities and ecosystems

Climate related changes are already having profound impacts on our nation's coasts. Long-term sea level rise and short-term coastal flooding from storms are threatening critical infrastructure, such as roads, sewers and power grids, and eroding the ability of wetlands and dunes to protect coastal communities and provide habitat for fish, birds, and wildlife. These impacts are expected to increase over time as the climate system continues to change. Lessons from recent storms like Hurricanes Sandy and Katrina have taught us that our communities are at risk from coastal flooding.

NOAA provides the foundational climate science research, observations, and modeling to help people understand and prepare for climate-related changes and resulting coastal impacts. NOAA will build on its current public-private partnership of scientists, resource managers, businesses, and policy leaders working together to better predict and prepare for the combined threats of sea level changes and coastal flooding events. Working together, we can use NOAA's unique scientific capabilities, such as the ability to produce scenarios of future conditions that include various projections of sea level rise and flooding, to keep communities safe, help businesses grow, build sustainable infrastructure, and protect natural resources.

NOAA is helping the nation prepare for sea level rise and coastal flooding

NOAA has a cross-agency, interdisciplinary team developing products and services to help people sustainably manage their communities, infrastructure, and natural resources. For example:

- *We track changes on past and current water levels and ocean and coastal conditions*, and we provide timely scientific information and products for decision makers.
- *We forecast future coastal conditions* by predicting water levels from all sources and the rate of change of total water levels from coastal

inundation, to communicate how high the water is going to be, and when and where.

- *We strengthen coastal resource management, risk reduction and preparedness* by developing models that support planning by predicting coastal water levels.
- *We build products* that allow decision makers to visualize the potential impacts from future coastal inundation conditions.
- *We empower decision makers* to use social science and NOAA's tools, data, and information to make the right call for the economic wellbeing and resilience of their communities and natural resources.
- *We assess risks and impacts to coastal resources and communities* by broadening understanding of climate and coastal inundation-related hazards using the best available science. We incorporate socio-economic information with potential sea level rise and flooding scenarios to identify the most vulnerable communities.



Flooding at the Hooper Strait Lighthouse in St. Michaels, Maryland.

Chesapeake Bay Maritime Museum

Climate variability and change present real threats to our coasts. NOAA is working with partners to build climate-smart coastal communities.

- ¹ <http://www.ngs.noaa.gov/RSD/coastal>
- ² <http://stateofthecoast.noaa.gov/population>
- ³ <http://www.census.gov/foreign-trade/Press-Release/2010pr/12/ft920/exh6.pdf>
- ⁴ <http://coastalsocioeconomics.noaa.gov>