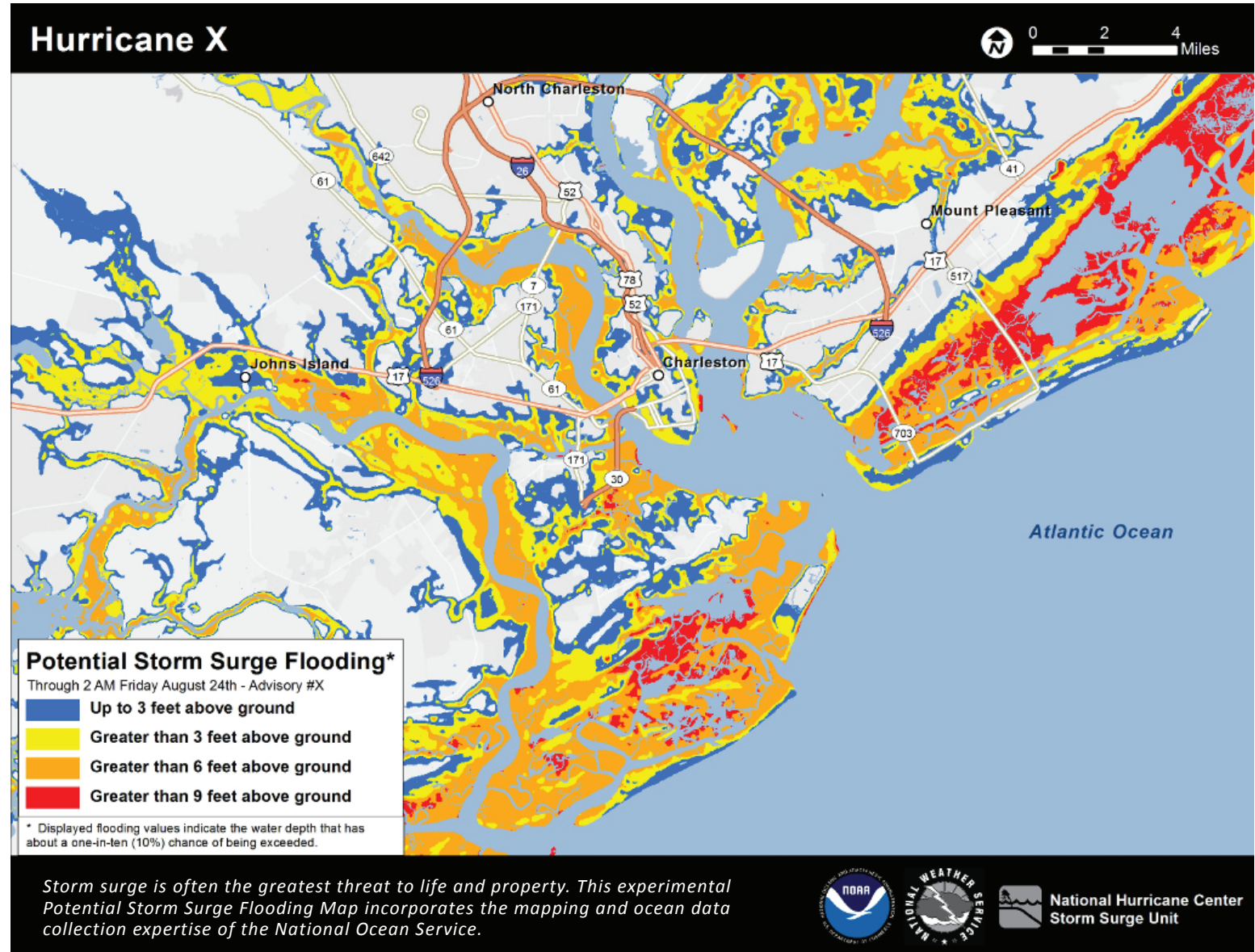




Complete destruction to Holly Beach, Louisiana, following Hurricane Rita. Credit: Doug Helton, NOAA.



## NOAA's National Ocean Service

### Navigation, Observations and Positioning

Office of Coast Survey  
National Geodetic Survey  
Center for Operational Oceanographic Products and Services  
NOAA Integrated Ocean Observing System Program

### Coastal Science and Assessment

National Centers for Coastal Ocean Science  
Office of Response and Restoration

### Ocean and Coastal Management Services

Office for Coastal Management  
Office of National Marine Sanctuaries

## Media Inquiries

Ben Sherman, ben.sherman@noaa.gov  
Keeley Belva, keeley.belva@noaa.gov  
301-713-3066

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[oceanservice.noaa.gov](http://oceanservice.noaa.gov)

# NOAA's National Ocean Service Hurricane Planning, Response, and Recovery

NOAA's National Ocean Service (NOS) brings a wealth of coastal science, management, and operational expertise to aid communities impacted by hurricanes in their recovery. NOS is on the front lines to help America understand, predict, and respond to the challenges facing our oceans and coasts. The following is a compilation of NOS's roles and responsibilities related to preparedness, response, and recovery before, during, and after a hurricane.

For more information, including links to data and tools, please go to <http://oceanservice.noaa.gov/hazards/hurricanes/>.

Positioning America for the Future



## Preparedness

Even before a storm, NOS pools our expertise in emergency response, coastal observations and modelling to prepare for, mitigate, and respond to the next hurricane.

### Disaster Preparedness

NOAA's Disaster Response Center (DRC) enhances capacity to prepare for and respond to disasters. The DRC brings together NOAA-wide resources to prepare federal, state, and local decision makers for a variety of hazards and threats. The DRC hosts trainings, drills, and workshops to help Gulf communities prepare for storms while enhancing NOAA's coordination and emergency planning to conduct an organized and effective response.

### Water-level Monitoring

The Center for Operational Oceanographic Products and Services monitors and disseminates observations of water levels, currents, and weather information in real time via the National Water Level Observation Network and the Physical Oceanographic Real-Time System. Collected real-time environmental information helps coastal authorities prepare for, mitigate, and respond to storm tides and coastal flooding. NOS also regularly updates Storm QuickLook, an online compilation of ocean and weather observations within a coastal area.

### Ocean and Coastal Observations Data

NOAA coordinates the U.S. Integrated Ocean Observing System (IOOS®). This federal, regional, and private-sector partnership provides ocean and coastal data and information to support preparation and response efforts and to inform forecasts and predictions ahead of hurricanes. For example, the IOOS regions collect data inside the hurricane with unmanned, underwater robotic vehicles to increase understanding of hurricane intensity. In addition, High Frequency



Geo-referenced aerial imagery taken by NOS shows the New Jersey coastline after Sandy.

radar systems measure surface current speed and direction as hurricanes pass through, to aid models and forecasts. IOOS is also partnering with National Weather Service (NWS) to make High Frequency radar data accessible through the NWS Advanced Weather Interactive Processing System and National Centers for Environmental Prediction data tanks. IOOS data helps decision makers protect our safety, economy, and environment.

## Rapid Hurricane Response

Following hurricanes, NOS is one of the key partners immediately responding with a range of activities. NOS efforts focus on navigation surveys to restore maritime commerce; aerial surveys to assist in those efforts and to aid on-the-ground responders and local authorities; and oil spill cleanup and damage assessment.

### Navigation Surveys

Immediately following a hurricane, the Office of Coast Survey provides emergency hydrographic services for affected port areas. These services are performed by Navigation Response Teams. These mobile emergency response units use echo sounders to check for submerged obstructions that pose hazards to vessels, collect data to update nautical charts, and provide mapping support. The work of these teams is essential to speeding the re-opening of ports and waterways.



Damage to oceanfront homes along the Rhode Island coastline after Sandy.

## Aerial Imagery Surveys

As soon as weather permits following major natural disasters, the National Geodetic Survey begins aerial survey missions to assess damages to affected areas. Typical weather-related events include hurricanes, tornadoes, and floods. NGS responds to other events, such as oil spills, as well. Directly georeferenced-imagery data are collected, rapidly processed, and made available via open-source Geographic Information Systems (GIS). These data and images provide emergency and coastal managers with information needed to develop recovery strategies, facilitate search and rescue efforts, identify hazards to navigation and HAZMAT spills, locate errant vessels, and provide documentation necessary for damage assessment through the comparison of before-and-after imagery. Images are also available to view and download by the general public as a tool to assess impacts to their homes and community.

## Pollution Response

After a hurricane, the Office of Response and Restoration (OR&R) provides scientific support to hazardous materials response efforts in coastal areas. The office surveys vessels or containers that may be leaking fuel, oil, or other hazardous materials; flies missions to identify and document spill sources; and uses computer models to predict spill movement and determine pollution threats. OR&R also provides guidance on marine debris and vessel salvage, conducts shoreline cleanup assessments, collects information



NOAA Ship Thomas Jefferson retrieves side scan sonar after surveying the Hudson River for sunken containers, debris, and shoaling that pose dangers to ships and lives.

to understand natural resource impacts from spills in affected areas, and works to assess and restore resources injured by spills.

## Contamination Assessments

NOAA's National Status and Trends (NS&T) Program, part of the National Centers for Coastal Ocean Science, coordinates with multiple partners to develop strategies to assess the environmental impacts of contaminants in coastal and estuarine waters in the aftermath of hurricanes. Of special concern is assessing the risk to human health of eating fish and shellfish and ensuring seafood safety.

## Maps and Data Analysis

The Office of Response and Restoration's Environmental Response Management Application (ERMA®) integrates static and real-time data for science based decisions in one common operational picture for emergency response. Following a hurricane, the Office for Coastal Management provides the satellite and aerial images needed to generate maps that help officials understand the long-term effects of the hurricane. These data products include pre-hurricane imagery and digital elevation data from a variety of sources; before and after imagery comparisons; and maps depicting ecological impacts, debris assessment, and wetlands loss along the coast.

## Recovery

NOS leads coastal management efforts across the nation and is the primary conduit for data and services to support informed coastal decision making. NOS has unique expertise in protecting coastal and estuarine habitat, reducing marine debris, and providing navigation, coastal mapping, observing, monitoring, and high-accuracy geospatial positioning services. In combination with our decision support, technical assistance, and training activities, NOS provides an unparalleled and powerful suite of resources and tools to aid recovery.

## Long-term Recovery and Planning

The Office for Coastal Management provide assistance in long-term recovery planning in areas impacted by a hurricane. Staff may assist in the development of coastal project plans, coordinate with other federal and state organizations involved in recovery planning, and assist with the design and implementation of activities to involve local communities in planning for their own long-term recovery.

