

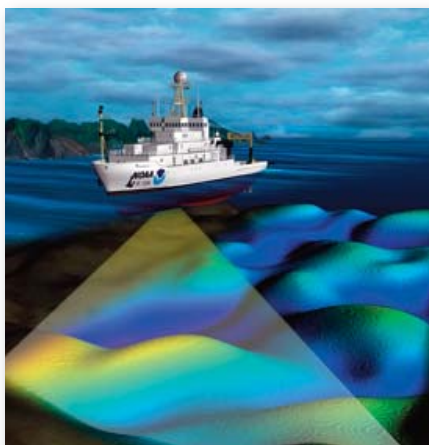


NOAA Knows...

Navigation Services

NOAA's navigation service offices help ensure safe and reliable marine transportation. The Office of Coast Survey (OCS) maps the coastal seafloor, provides the nation's nautical charts, and surveys areas hit by storms or other emergencies.

National Geodetic Survey (NGS) offers precise positioning and advanced geodetic, photogrammetric, and remote-sensing techniques to establish and maintain a consistent national positioning system that includes defining the national shoreline. Collecting, analyzing, and distributing both real-time and historical oceanographic observations and predictions, the Center for Operational Oceanographic Products and Services (CO-OPS) provides water level, current, and meteorological information.



Navigating in a Changing Global Environment

NOAA's National Spatial Reference System and the National Water Level Observation Network provide the geographic reference framework throughout the U.S. The

systems set a foundation for determining land and water elevations. Precise positioning and accurate information on constantly changing water levels help mariners safely maneuver under a bridge or above an obstruction in our nation's busy waterways.

Supporting Marine Transport and Navigation

The U.S. marine transportation system – an intricate network of navigable waterways, ports and harbors – gives our nation competitive access to suppliers and markets around the world. Mariners rely on NOAA's nautical charts, accurate positioning services, marine forecasts, and information on tides, currents, and water levels to move safely and efficiently in and out of U.S. ports.

NOAA uses sonar, photogrammetry, and remote sensing technologies to survey our oceans, coasts and waterways. This information is used to define the national shoreline and to update NOAA's nautical charts. Updated information helps mariners plan routes and avoid dangerous or ecologically sensitive areas.

In the last 50 years, ships have doubled in length, width, height, and depth. Ships built today draw up to 60 feet of water – the equivalent of a five-story building. When transiting a channel, ships may have only inches between their hulls, the channel bottom, and the underside of a bridge. The National Spatial Reference System gives pilots consistent reference points for safe navigation.

To help mariners select the safest time to transit shallow waterways, NOAA delivers real-time tide, current, wind and bridge clearance data. Conversely, when marine winds push water into a port, shippers can decide to load extra cargo before heading to deep-water foreign destinations.



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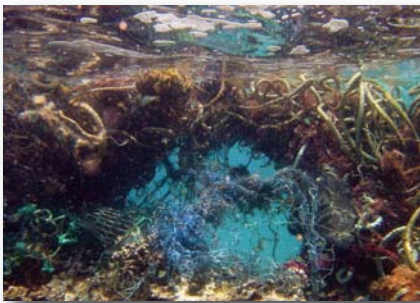


Protecting Our Ports and Waterways

NOAA's efforts speed the reopening of ports after hurricanes or severe storms. Navigation response teams move into a coastal area after a storm moves out, and survey ports and channels, searching for submerged debris and finding alternative routes for commercial and military ships. NOAA also collects airborne imagery that supports navigation safety and also helps the public, emergency managers and first responders assess the extent of storm damage.

As gateways to our largest cities and industries, U.S. ports are strategic targets for terrorists and must be protected. NOAA's underwater surveying experts conduct port hydrographic surveys to analyze military threat and to identify vulnerabilities in infrastructure.

Ports and coastal managers use NOAA tools to conserve oceans and coasts, locate and remove harmful debris, and protect the environment. Marine debris – like lost fish nets, plastic bags and other human waste – interfere with navigation safety, hurt MTS shipping and coastal industries, and pose a threat to human health and marine life. Through surveying, research, removal, and outreach, NOAA is combating this growing problem.



Knowing the relationship of water levels to land features is critical in determining an area's susceptibility to rising seas, lakes, or rivers. Local sea level rise, which is a combination of local and regional oceanographic change, global sea level rise, and the vertical land movement of an area, threatens coastal communities.

Storm surge – temporarily rising waters – results in damaging floods, which further add to the threats. NOAA provides the geospatial information to help coastal managers better understand the interface between water



and land, allowing for better planning of port operations, flood control measures, emergency preparedness, evacuation routes, and other contingencies.

Meeting New Challenges

Population growth, climate change, sea level rise, bigger ships, busier waterways, and aging coastal infrastructure are just a few of the challenges facing the marine transportation system. NOAA works with ports, coastal communities, and other constituencies to adapt to these challenges. With 3.4 million square nautical miles of a constantly changing underwater environment and 95,000 miles of changing shoreline, NOAA's work is more important than ever.

Melting sea ice in the Arctic is creating longer ice-free seasons and opening new opportunities for shipping. With more human activity in the Arctic, accidents in marine environments present unique challenges for response, assessment, and restoration. Limited resources, challenging conditions and the remote location of disasters reduce operational options. Considering current knowledge and past experience with Arctic spill conditions, responding to a major oil spill in Arctic waters is problematic.

Sea level rise caused by climate change will have significant effects on coastal communities and habitats. NOAA's geodetic data, seafloor surveys, and tide information can be used to develop programs that protect coastal infrastructure and ecosystems. Coastal zone managers also use NOAA charts, water level and current information, and elevation and shoreline data to plan coastal protection projects.

Learn more about NOAA's navigation services at: Office of Coast Survey (<http://nauticalcharts.noaa.gov>); National Geodetic Survey (<http://geodesy.noaa.gov>); Center for Operational Oceanographic Products and Services (<http://tidesandcurrents.noaa.gov>).

To learn more about NOAA visit <http://www.noaa.gov>. 