



Center for Operational Oceanographic Products and Services



TIDES & CURRENTS

Meaningful Oceanographic Data for the Nation

NOAA's Center for Operational Oceanographic Products and Services (CO-OPS) is the authoritative source for accurate, reliable, and timely tides, water levels, currents, and other coastal oceanographic and meteorological information. Our services support safe and efficient maritime commerce



and transportation, help protect public health and safety, and promote robust, resilient coastal communities.

CO-OPS maintains ocean observing infrastructure, including more than 200 permanent water level stations on the U.S. coasts

and Great Lakes, an integrated system of real-time sensors concentrated in busy seaports, and temporary meters that collect observations for tidal current predictions. Through these systems, we provide the nation with historic and real-time data, forecasts, predictions, and scientific analyses that protect life, the economy, and the environment on the coast.

Who We Are

Oceanographers

Ensuring our data are accurate and creating useful decision support tools for the nation.

Engineers

Building more advanced oceanographic observing systems that can operate in the most challenging conditions.

Field Technical Experts

Installing and maintaining observing systems up to rigorous scientific standards.

Information Systems Experts

Developing high performing systems that manage and disseminate large amounts of data.



Safe and Efficient Maritime Commerce

We provide the maritime transportation industry with timely, accurate, and reliable observations and predictions they need to navigate through waterways and ports.



Coastal Economies and Infrastructure

We measure long-term sea level trends and provide coastal communities with data and tools to prepare for flooding from sea level rise and storms.



Harmful Algal Bloom Forecasting

Harmful algal blooms threaten human health and safety. We provide operational forecasts for the Gulf of Mexico and Lake Erie so communities can make decisions that mitigate impacts.



Mapping and Charting Support

We maintain the nation's vertical reference frameworks (tidal and Great Lakes datums) for communicating tides and water levels along the coast and Great Lakes.



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NAVIGATION SERVICES

The U.S. maritime transportation system consists of over 25,000 miles of waterways, ports, and other navigable waters. It is the backbone for moving goods throughout the United States and abroad. More than 95 percent of all U.S. trade involves some form of maritime transport, and ships move 11.4 trillion worth of products in and out of U.S. ports every year.

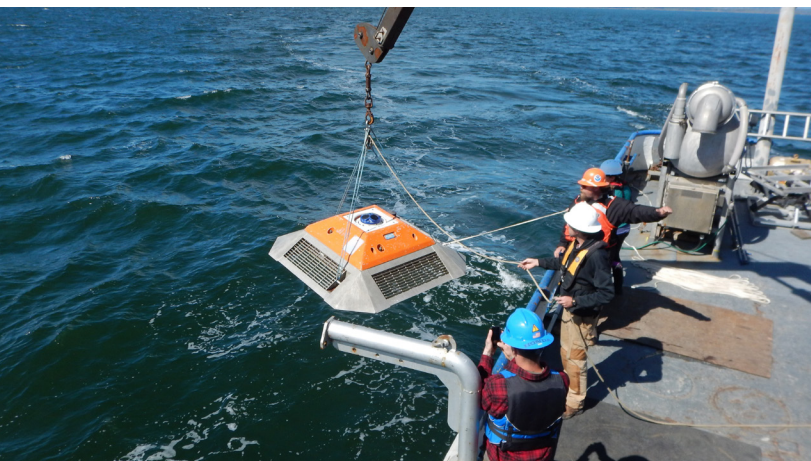
Ship operators across the globe rely on accurate information about ocean conditions, including water levels, currents, and winds, so they can plan efficient shipping routes, maximize cargo onboard, and safely navigate narrow shipping lanes.

NOAA's Center for operational Oceanographic Products and Services (CO-OPS) provides mariners with that data - including real-time environmental observations on water levels, currents, salinity, and meteorological parameters integrated with forecasts and geospatial information such as air gap clearance.

Safe and Efficient Transportation

The data CO-OPS provides improves navigation safety by reducing transit delays and allowing mariners to optimize their cargo load.

Mariners need these data, tools, and services to make critical navigation decisions, especially as significantly larger vessels transit through U.S. ports as a result of the Panama Canal expansion.



Navigation Products and Services



PORTS: an integrated system of sensors concentrated in seaports that provide commercial vessel operators with accurate and reliable real-time information about environmental conditions.



Operational Forecast Systems: nowcast and forecast (out to 48-72 hours) model information on water levels, currents, wind, salinity, and water temperature.



Tide and Current Predictions: customized tide and tidal current predictions calculated on the-the-fly. CO-OPS is responsible for providing annual tide and current prediction tables for the nation.



COASTAL HAZARDS

Flooded streets and parking lots, overflowing sewer systems, higher water during storms, disappearing coastlines. City planners in coastal states are all facing the same question: what decisions do we need to make today to protect our people, land, and infrastructure from extreme events and sea level rise?

NOAA's Center for Operational Oceanographic Products and Services (CO-OPS) is the nation's source for coastal inundation data and sea level trends through its network of long-term water level gauges. With this data and online tools and analysis, CO-OPS enables coastal communities to better plan for and mitigate risk from changing ocean conditions.

Long-term Sea Level Trends

The National Water Level Observation Network is a system of more than 200 permanent stations on the coasts that continuously record accurate information on water levels. Once a station has collected this data for more than 30 years, CO-OPS scientists are able to calculate the local rate of mean sea level rise or fall – or, a sea level trend.

Using these trends as a guide, communities can implement long-term adaptation plans to protect their economy from coastal hazards, including retrofitting stormwater drains, elevating or moving infrastructure, or using natural and nature-based green infrastructure practices to protect shorelines.



Response and Recovery

For many coastal communities, the impacts of sea level change are here now, not years away. Coastal cities are already dealing with higher tides, more frequent tidal flooding, and more extreme water levels during storms. CO-OPS provides a suite of tools, including critical real-time information and outlooks that communities can use to prepare for these coastal hazards.

Additional Products and Services



Coastal Inundation Dashboard: a decision-support tool that helps communities anticipate and monitor what sea levels will do along the coast in the short-term and plan for the impacts of a high water event.



High tide flooding report: annual tidal flooding monitoring and experimental outlooks for cities with long-term water level records.



Storm QuickLook: a synopsis of near real-time oceanographic and meteorological observations at locations affected by a tropical cyclone.



High Tide Bulletin: series of seasonal bulletins to let people know when and why their region may experience higher than normal high tides.



Harmful algal bloom forecasts: Regular forecasts for the Gulf of Mexico and Lake Erie.



MAPPING AND CHARTING

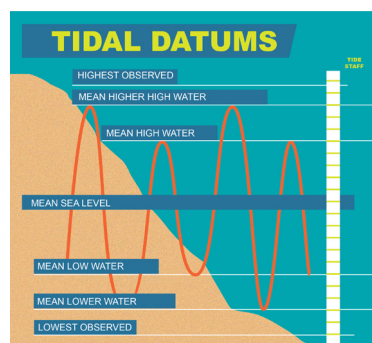
Water levels in our nation's Great Lakes, estuaries, and oceans are always changing. Engineers, surveyors, and shoreline mappers— anyone planning a project near or on the ocean or Great Lakes – must have accurate water level information and common reference points in order to measure elevation relative to the water.

NOAA's Center for Operational Oceanographic Products and Services (CO-OPS) is responsible for producing and maintaining critical water level data and datums that provide a foundation for many coastal activities, including hydrographic surveys, nautical charting, shoreline mapping, navigation, marine boundary determinations, and dredging.

At the core is the National Water Level Observation Network (NWLON), a permanent observing system of more than 200 water level gauges throughout the U.S. and its territories. NWLON is the source for accurate real-time and historical water levels for governments, the commercial navigation sector, and recreational users.

Tidal Datums

Water level data collected from NWLON must meet rigorous scientific standards because it is used to calculate tide and water level datums, the official vertical reference framework for our



nation's coast. A tidal or water level datum is a reference plane in the ocean or Great Lakes – preserved and accessible through a point on land known as a benchmark – used as the starting point to measure local water heights and depths.

CO-OPS oceanographers produce and maintain the Nation's official tide and water level datums, a highly complex and challenging process. These products benefit everything from NOAA nautical charts to U.S. Army Corps of Engineers infrastructure projects to local marsh restoration, and they serve as the legal basis for marine boundary and shoreline determination.

Additional Mapping and Charting Support Services



VDatum: a free tool designed to convert one type of datum to another, enabling seamless integration of data into a common reference framework, located at vdatum.noaa.gov/



Nautical Chart Support: tidal zoning and other oceanographic input for hydrographic and shoreline mapping surveys to ensure vertical control to National Ocean Service standards.