

# NORTHEAST OCEAN DATA

Maps and data for ocean planning in the northeastern United States

[NortheastOceanData.org](http://NortheastOceanData.org)

## Case Study:

### Siting a New Wave-monitoring Buoy to Increase Maritime Safety and Improve Weather Forecasts

#### Northeast Ocean Data Portal User:

Northeastern Regional Association of Coastal Ocean Observing Systems (NERACOOS)

#### In Consultation with:

- Massachusetts Department of Environmental Protection
- NOAA National Ocean Service
- NOAA National Weather Service
- U.S. Army Corps of Engineers
- U.S. Coast Guard
- U.S. Geological Survey

#### Objective:

To identify the best location for a new wave-sensor buoy in Cape Cod Bay to provide data for ship pilots, weather forecasters, fishermen, whale watch operators, recreational boaters, habitat restoration practitioners, and others.

#### Related Ocean Uses:



Marine  
Transportation



Commercial  
Fishing



Recreation

Ships, tugs, and barges carry more than a billion gallons of petroleum through Cape Cod Bay every year. To ensure safe and efficient passage across those heavily trafficked waters, **captains and pilots require accurate, up-to-date information about sea conditions.**

Until 2016, however, no real-time data on wave conditions were available for Cape Cod Bay. That's when the Massachusetts Department of Environmental Protection (MassDEP), NOAA's National Ocean Service, and several other partners provided financial and logistical support to deploy a new high-tech wave-monitoring buoy approximately six nautical miles north of Sandy Neck in Sandwich, Massachusetts. **The location for the buoy was selected based in part on data and maps from the Northeast Ocean Data Portal.**

Choosing where to place the buoy presented a number of challenges, according to Tom Shyka of the Northeastern Regional Association of Coastal Ocean Observing Systems (NERACOOS),

"The Northeast Ocean Data Portal gave us critical pieces of information that helped us make our decision for where to locate the buoy."

~ Tom Shyka

Northeastern Regional Association of Coastal Ocean Observing Systems (NERACOOS)



Deploying the new wave buoy in Cape Cod Bay.

"Ninety-five percent of loaded tugs and barges pass eastbound through the Cape Cod Canal, and it is critical that we know what the sea state is in Cape Cod Bay before we enter the canal."

~ Captain Clint Walker  
Northeast Marine Pilots Association



A tug and barge transit Cape Cod Bay near Barnstable.

D.R. Davis

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**Interactive version of case study:** [northeastoceandata.org/casestudies/siting-a-new-wave-monitoring-buoy](http://northeastoceandata.org/casestudies/siting-a-new-wave-monitoring-buoy)

which collaborated with the other partners to plan the deployment. NERACOOS is responsible for long-term operation of the buoy and delivers the data on its website. The wave sensors needed to be near the main routes through the Bay to provide useful data for the shipping industry. Yet the high-tech buoy—which will cost up to \$440,000 to acquire and operate for 5 years, is relatively small, and can easily disappear from sight in a wave trough—could not be placed in a heavily trafficked area because of the risk of collision.

Additional factors needed to be taken into account to **maximize the value of the data to other users, such as the National Weather Service, U.S. Coast Guard, U.S. Geological Survey, Army Corps of Engineers, fishermen, recreational boaters, and whale-watching tour operators.**

**To help the partners make a well-informed decision, Shyka turned to the Northeast Ocean Data Portal for recent data on commercial ship traffic and recreational boating activity.** On an interactive map of these data, he used the “draw” tool to indicate potential locations for the buoy, generated a static image of the maps, and emailed it to the project partners. In a subsequent web-conferencing session using the Portal, the group viewed the online map together and evaluated potential locations while interacting with the data. The Portal’s data and maps, along with other information sources, enabled the partners to agree on the location north of Sandy Neck.

Deployed in May 2016, the buoy now transmits wave and temperature data that are used by mariners to ensure safety and efficiency, by the National Weather Service to enhance forecasts, by the U.S. Coast Guard for search-and-rescue operations, and by the U.S. Geological Survey to plan beach nourishment projects.

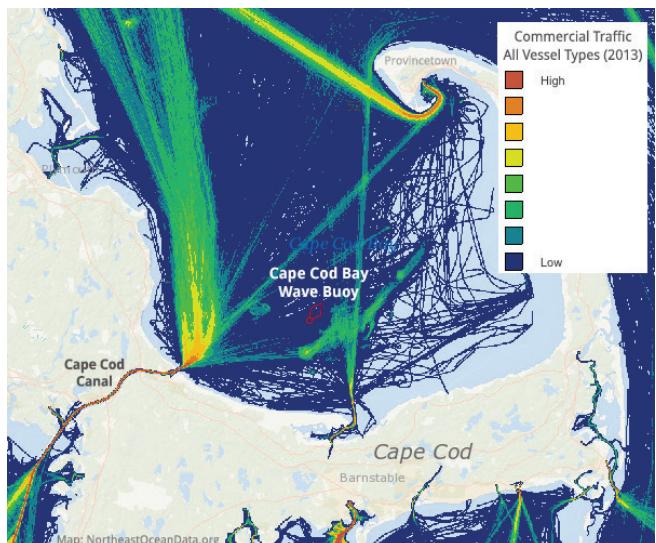
#### About the Northeast Ocean Data Portal:

The Northeast Ocean Data Portal is an information resource and decision support tool for ocean planning, management, and decision making in the northeastern United States from Long Island Sound to the Gulf of Maine.

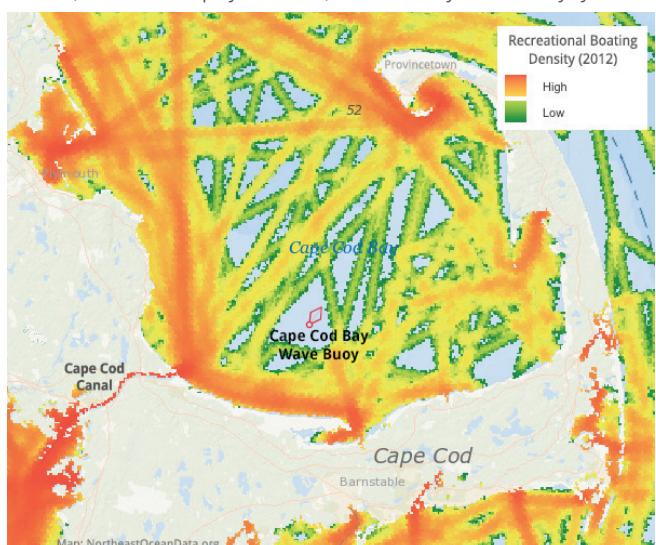
Used by a wide range of government agencies, non-government entities, and ocean stakeholders, the Portal offers user-friendly access to maps and data on many types of ocean uses and the ecosystem.

Questions? Email us at [contact@northeastoceandata.org](mailto:contact@northeastoceandata.org).

More case studies of Data Portal uses are available at [NortheastOceanData.org/casestudies](http://NortheastOceanData.org/casestudies)



NERACOOS and partners used maps of commercial vessel traffic (above) and recreational boating density (below) from NortheastOceanData.org to identify a low-traffic area for siting the new wave-monitoring buoy. The buoy's location, after it was deployed in 2016, is indicated by the red buoy symbol.



#### CDIP Wave Buoy - Cape Cod Bay, MA

Lat: 41.83 Lon: -70.32

Latest Observation: 02/01 2:37 PM EST

Variable	Value
Wave height	1.0 ft (0.3 m)
Wave period	2.5 sec
Wave direction	NW (315°)
Water temp	39 °F (4.0 °C)

2.2 2:37a 8:37a 2:37p  
ft  
0.3 12 hr. Wave height



The buoy transmits real-time data on wave conditions and water temperature to NERACOOS.org (graph above) and other websites.