



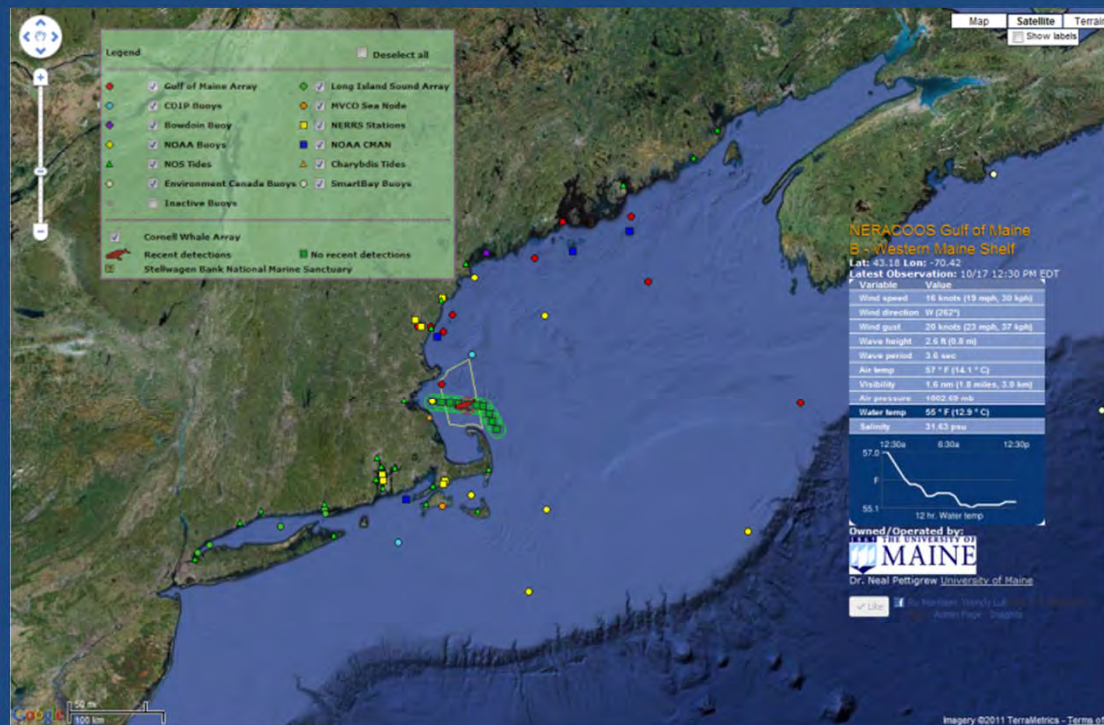
NORTHEASTERN REGIONAL ASSOCIATION
of COASTAL OCEAN OBSERVING SYSTEMS



OCEAN INFORMATION

for PLANNING, SAFETY and STEWARDSHIP

2012: A year in review



ADDRESSING SOCIETAL PRIORITIES in the NORTHEAST

NERACOOS focuses on priority themes:

- **MARITIME OPERATIONS**
Helping to improve efficiency and safety of shipping and other maritime industries, and enhancing search-and-rescue and spill response efforts.
- **COASTAL HAZARDS RESILIENCY**
Equipping managers and property owners with forecasts and observations to help save lives and property.
- **OCEAN AND COASTAL ECOSYSTEM HEALTH**
Providing critical information for forecasting and management of red tides, beach closures, and water quality.
- **OCEAN ENERGY PLANNING AND MANAGEMENT**
Delivering essential data for energy development.
- **CLIMATE VARIABILITY**
Detecting and predicting changes in key ocean properties such as sea level and ocean acidity.
- **COASTAL AND MARINE SPATIAL PLANNING**
Supplying critical ocean and weather data for more effective coastal and marine spatial planning.
- **EDUCATION AND OUTREACH**
Contributing to increased knowledge and understanding of the ocean.

US Integrated Ocean Observing System (IOOS)

- A tool that enables the Nation to track, predict, manage and adapt to changes in our marine environment and delivers critical information to decision makers to...

Improve safety



Enhance our

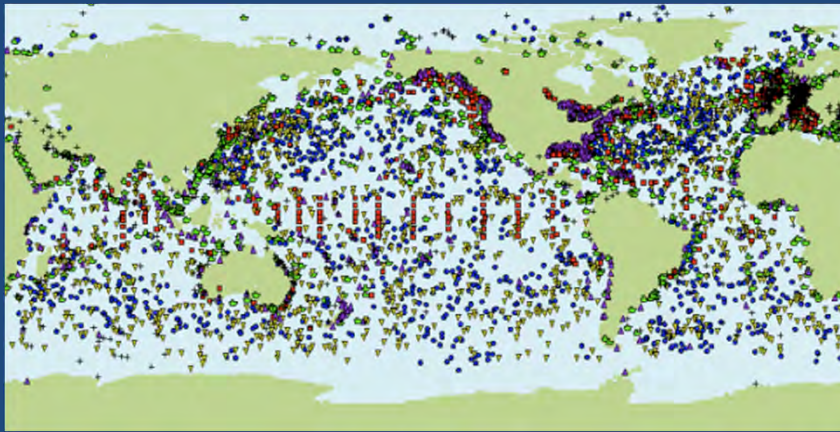


Protect our

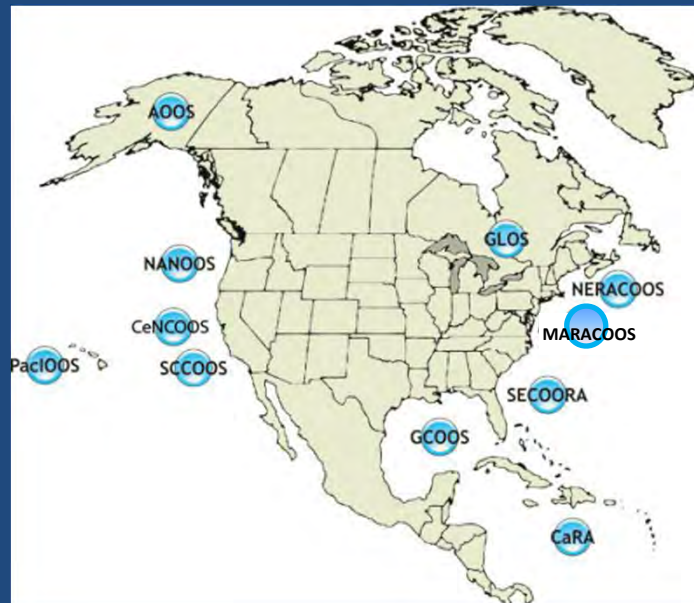


US Integrated Ocean Observing System (IOOS)

Global Component: Global
Ocean Observing System



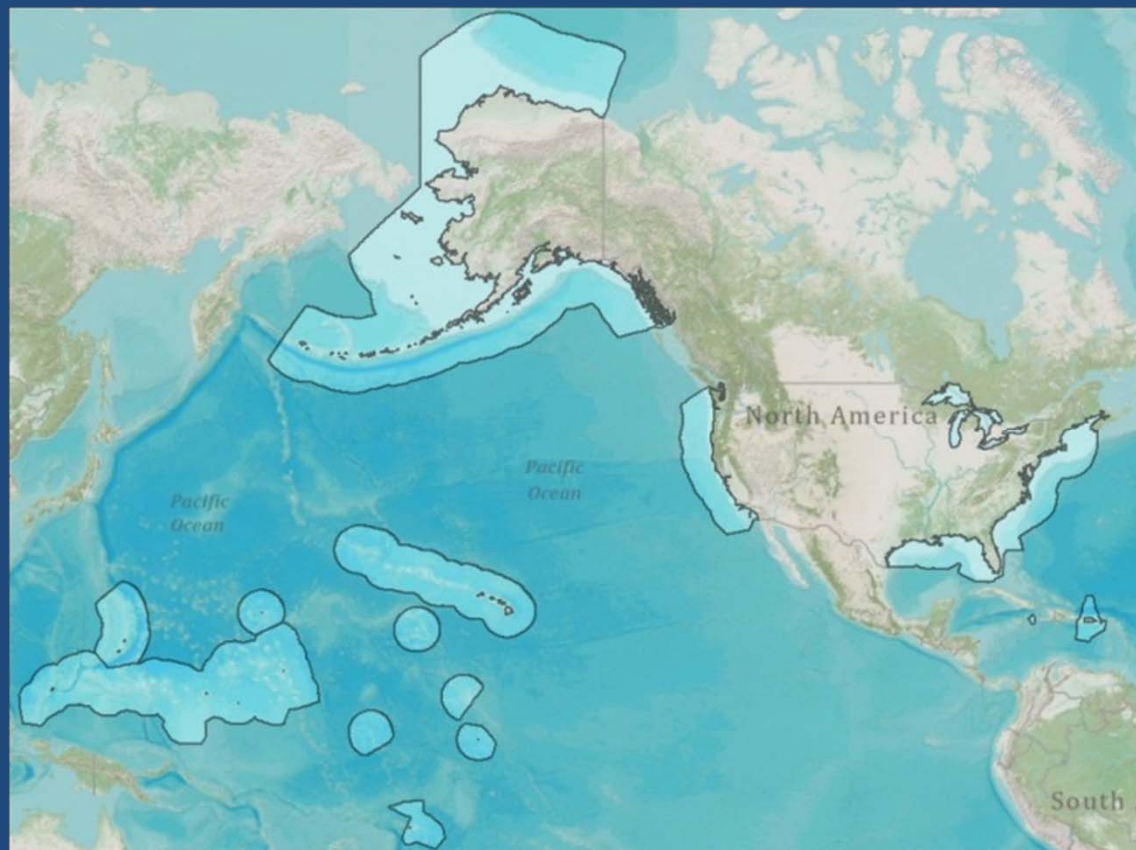
National Component:
Composed of 17 U.S.
Federal Agencies



Regional Component: 11 Regional Associations

US Integrated Ocean Observing System (IOOS)

The purpose of Regional Associations is to gather “required System observation data, supporting and integrating all aspects of coastal and ocean observing and information programs within a region and that reflects the needs of” stakeholders and users (ICOOS Act, 2009).



Regional Observation Network

A partnership of federal and non-federal organizations, including industry, academia, state, local and tribal governments



Building a Region-Wide Information System from the Bottom Up

NERACOOS Gulf of Maine Appledore Island CO2

Lat: 43.02 Lon: -70.54

Latest Observation: 12/05 4:50 AM EST

Variable	Value
Wind speed	11 knots (12 mph, 20 kph)
Wind direction	NW (325°)
Wind gust	13 knots (15 mph, 25 kph)
Air temp	52 ° F (11.0 ° C)
Air pressure	NA
Water temp	48 ° F (9.1 ° C)
Salinity	32.78 psu
Dissolved Oxygen	7.15 ml/l
Turbidity	0.299 ntu
Chlorophyll	1.00mg chl/m ³
CO ₂ pressure in air	412.650 µATM
CO ₂ pressure in water	427.130 µATM



Owned/Operated by:

UNIVERSITY
of NEW HAMPSHIRE
Dr. Doug Vandemark COOA

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Data returns in excess of 90%



NORTHEASTERN REGIONAL ASSOCIATION
of COASTAL OCEAN OBSERVING SYSTEMS



OCEAN INFORMATION

for PLANNING, SAFETY and STEWARDSHIP

The NERACOOS mission is:

- To lead the development, implementation, operation, and evaluation of a sustained, regional coastal ocean observing system for the northeast United States and Canadian Maritime provinces, as part of the United States Integrated Ocean Observing System (IOOS).
- To promote the development, assessment, and dissemination of data and data products that meet the needs of end users.
- To advocate through education and outreach for the regional, national, and global ocean observing system and the application of scientific assessments using environmental data to meet societal needs.

This is NERACOOS

- NERACOOS is the trusted source of regional ocean weather and information from Long Island Sound to the Gulf of Maine.
- We are one of eleven regions, the northeast Integrated Ocean Observing System (IOOS)
- We are a network of observers, modelers, forecasters, data managers, and tool developers.
- With our partners we produce practical solutions to real-world problems.
- These protect and enhance peoples' lives, livelihoods, and quality of life.

MARITIME OPERATIONS

SUPPORTING SAFETY and EFFICIENCY



+



+

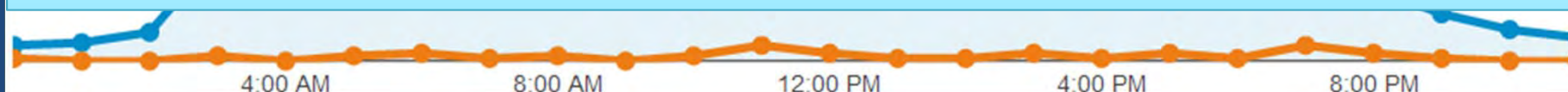


Dec 3, 2012 - Dec 3, 2012: ● Visits

Dec 3, 2011 - Dec 3, 2011: ● Visits

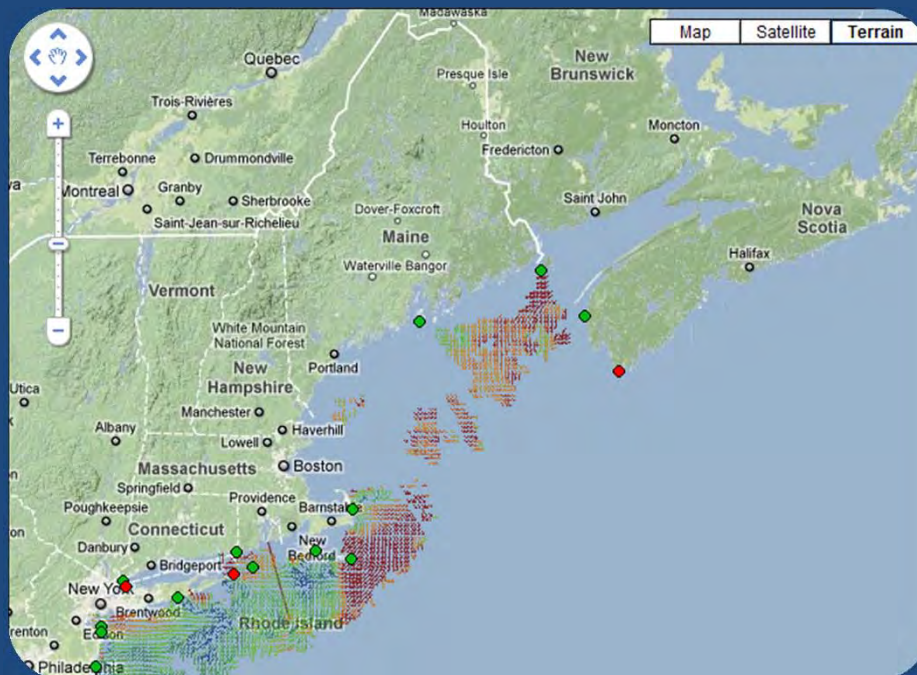
120

"I trust the weather buoys with my life. Thank you." - Maine Fisherman; "Love your service...I believe your service is a lifesaver. Thanks!" -Dave, Pilot; and "I would like you to know that information you are providing us not only aids us in our work, it almost certainly has saved lives." -Roy Atkinson, Fisherman.



Surface Currents

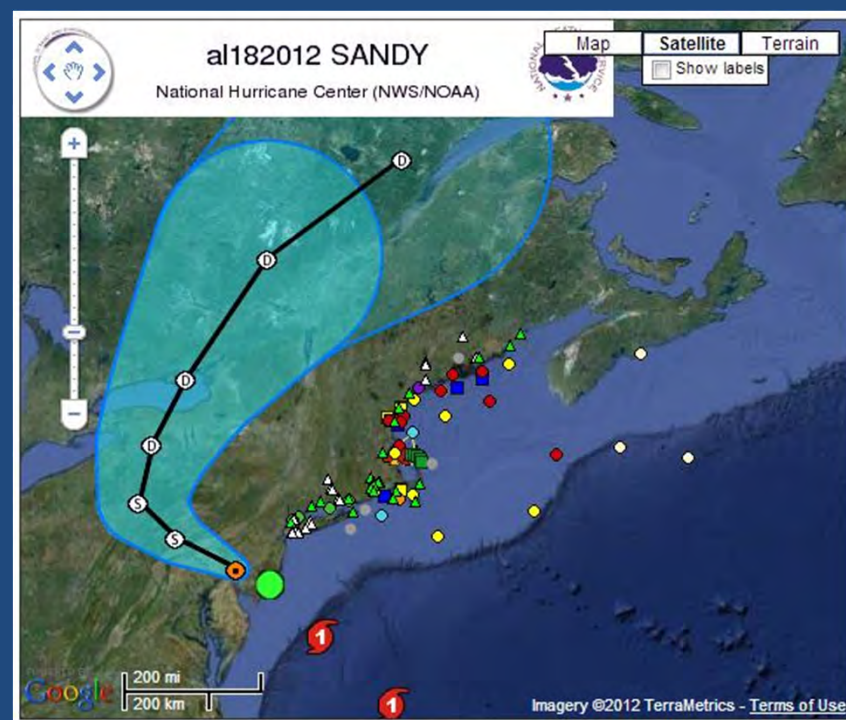
Universities of Maine and Connecticut



"The forecasts are instrumental in planning both training and routine operations, especially in winter... I cannot imagine operating without this buoy. We check it constantly throughout the day." - USCG

Hurricane Sandy

- Storm surges in LIS and RI were between 8-12 feet
- All buoys survived the storm
- Loss of two surface current radars
- Largest waves ever observed by the Long Island Sound array
- Many buoys reported wave heights around 30 feet.
- Web traffic was up 800% on Monday.



Partnering with the National Weather Service



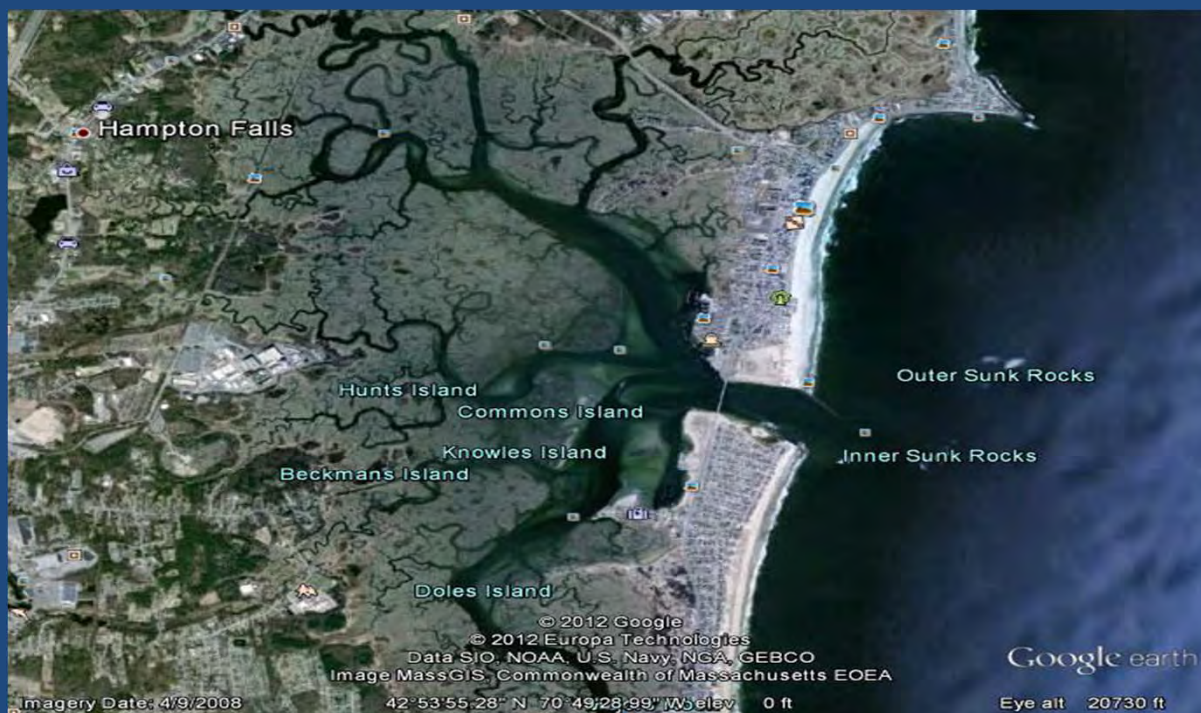
“The close relationship that NERACOOS and a front line office such as NWS GYX has was really important. I received quick responses in real-time for data requests during the storm, making the support from NERACOOS and others terrific!” John Cannon, NWS WFO Gray ME



Bob Thompson from the Taunton, Massachusetts office noted that “the IOOS buoy data were invaluable for Sandy,”

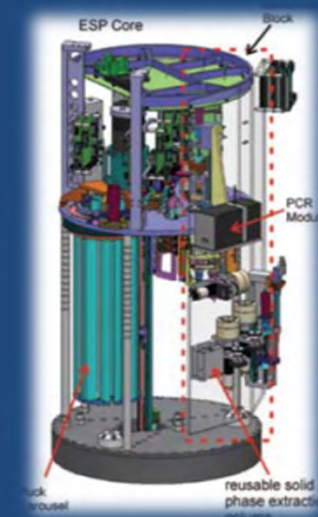
Hampton-Seabrook Coastal Inundation Forecast

The NERACOOS Northeast Coastal Ocean Forecast System (NeCOFS) team is currently working with the NWS, NH DES, and the Town of Hampton, NH, PREP and NextEra Energy to develop a coastal inundation forecast system for the Hamptons area of NH.



Harmful Algal Blooms

- Bedford Institute of Oceanography
 - Monitoring *Alexandrium* in Bay of Fundy
 - Finalizing Satellite Based HAB warning system
- Woods Hole Oceanographic Institution
 - Environmental Sample Processors (ESP)
 - Transitioning forecast system to NOAA



“... having uninterrupted access to these NERACOOS mooring time series is critically important to our Alexandrium forecasts.” - Don Anderson, WHOI.

Water Quality

- University of Connecticut
 - Hypoxia monitoring and modeling in Long Island Sound for NY and CT waste load allocations
- University of Rhode Island
 - Testing autonomous sampling technology
 - Incorporating Narragansett Bay Fixed Site Monitoring Network
- Bedford Institute of Oceanography
 - Monitoring nutrients at entrance to Gulf of Maine
- University of New Hampshire
 - Informing NH DES nutrient criteria work



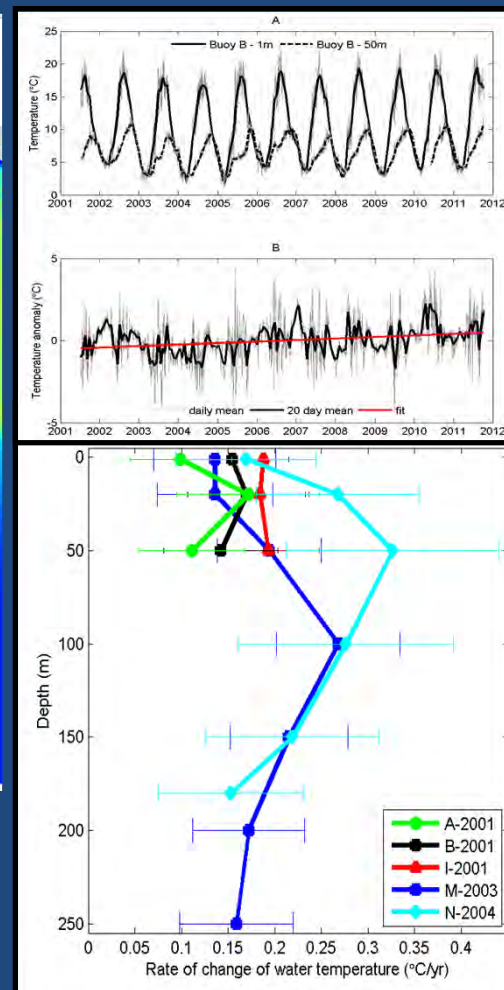
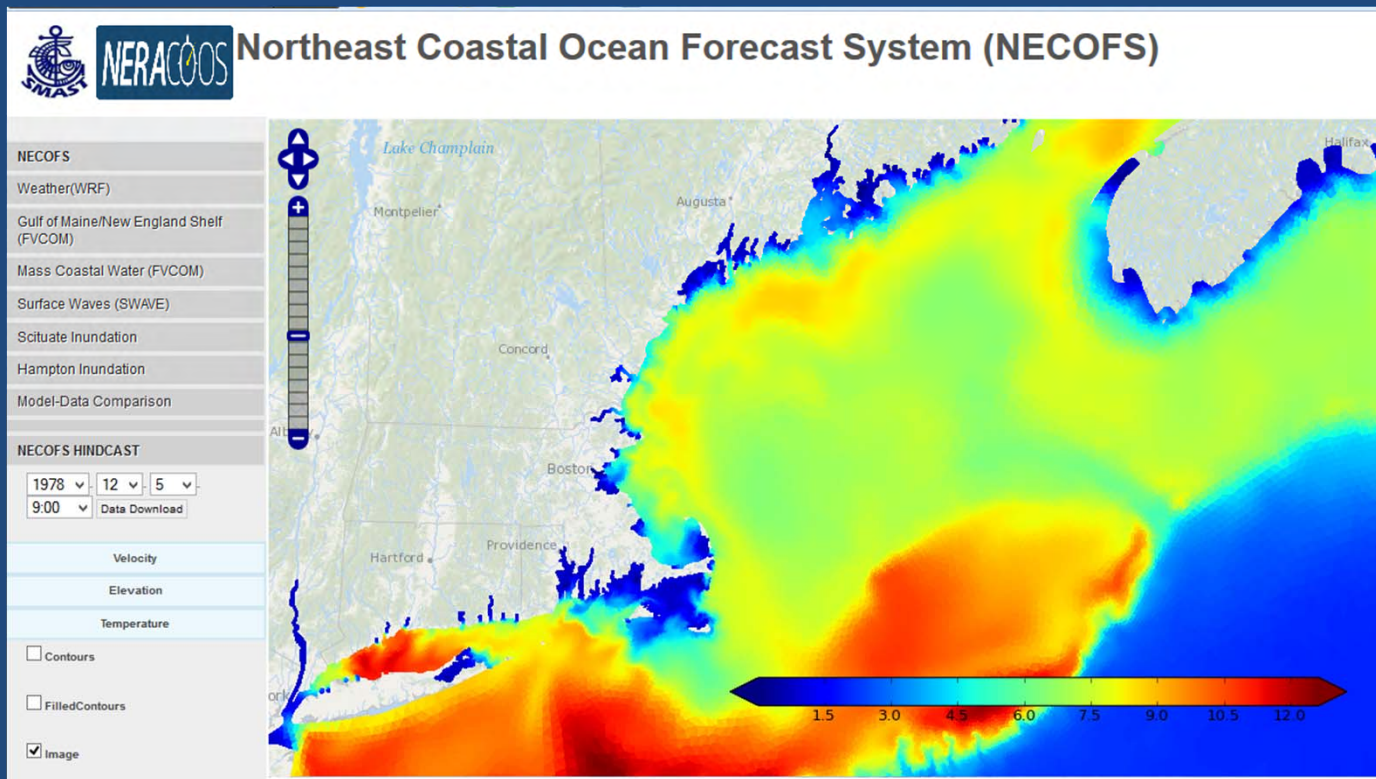
Leveraging Biological Monitoring on Buoys

- University of Maine
 - Fish telemetry since 2005, NMFS
 - Bats since 2011, Stantec



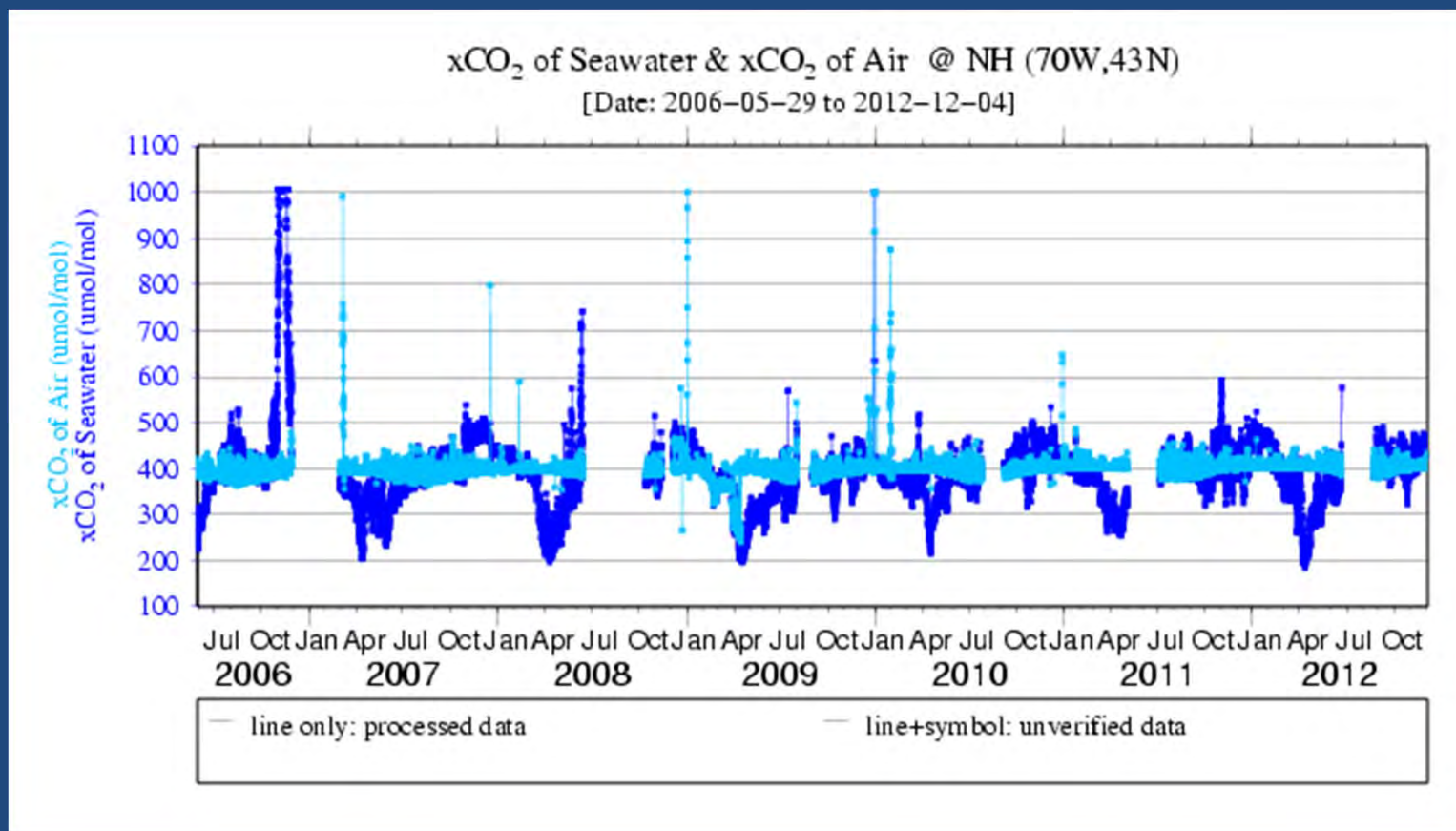
"If the marine environment is not sufficiently characterized, developers will not risk starting offshore wind projects in the Gulf of Maine. These buoys and model information will improve the viability of the Gulf of Maine as a strong candidate for offshore wind farm developments ... We look forward to working with NERACOOS on sharing monitoring information". DeepCwind Consortium

NERACOOS Informing Regional Climate Monitoring



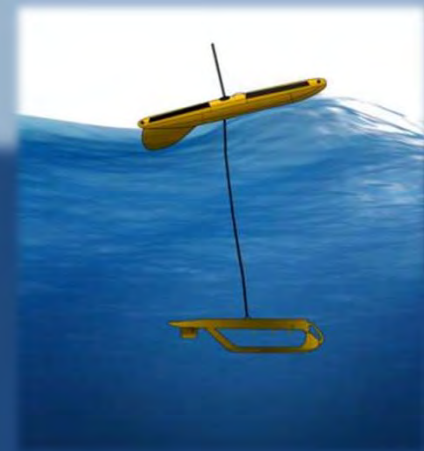
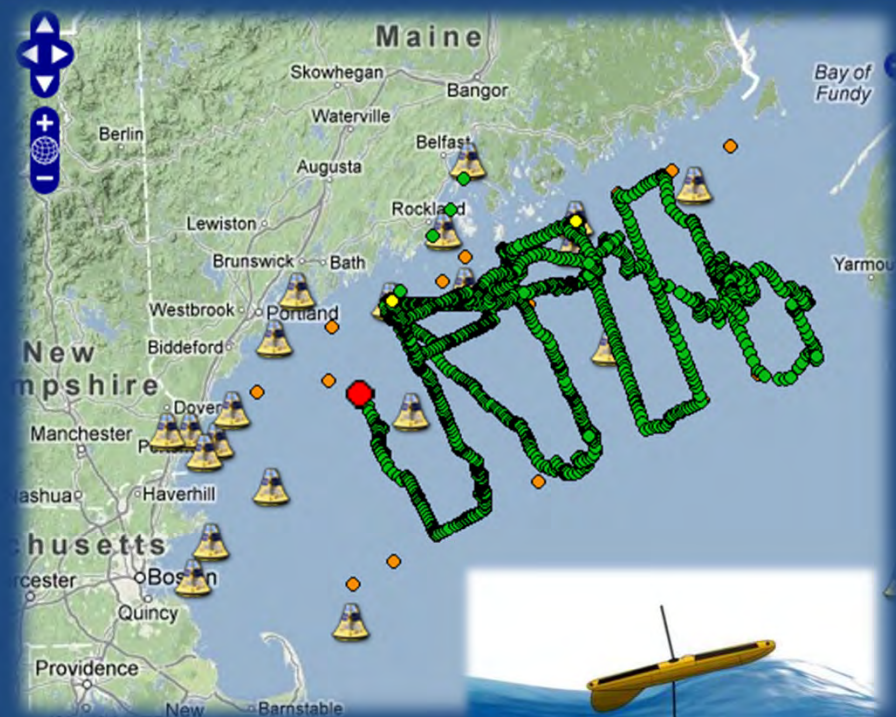
Models and Observations
NERACOOS part of 2012 National
Climate Assessment

NERACOOS Informing Regional Climate Monitoring: Ocean Acidification



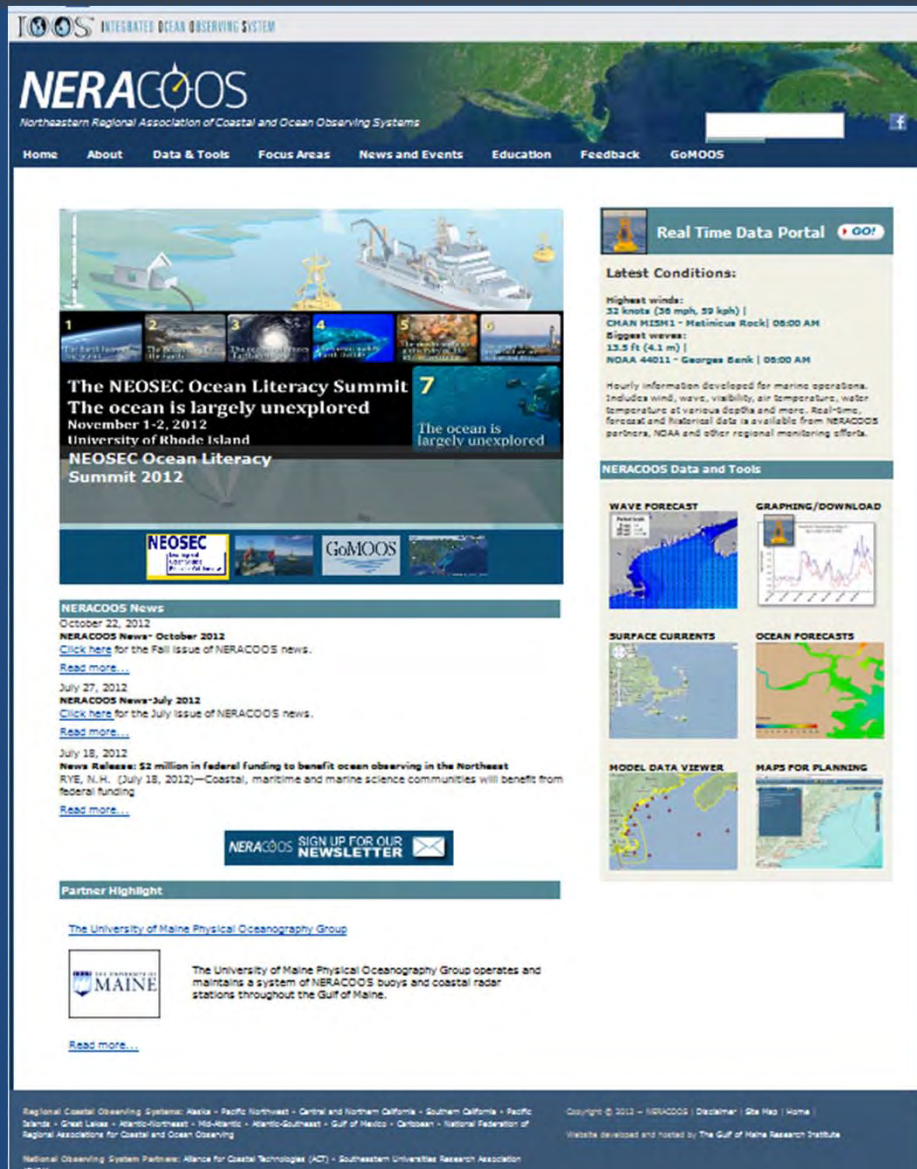
Testing new technology

Wave Glider and Fetch Node Mission



Launched on May 3
and recovered July 27

New website and products



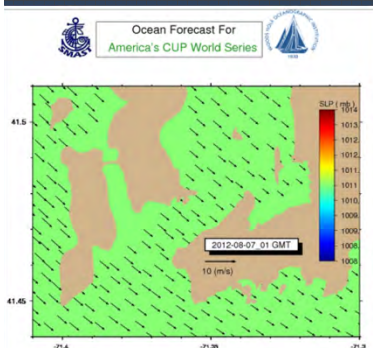
Web stats 2011 vs.
2012

Visits: up **778%**
120,954 vs 13,770

Unique visitors: up **1,260%**
84,823 vs 6,237

Page views: up **178%**
197,641 vs 70,985

New website and products



Additional data from this buoy

■ [All Data From This Station](#)

■ [Compare Stations](#)

■ [12 Hour History](#)

■ [Quick History](#)

■ [Wind and Wave Forecast](#)

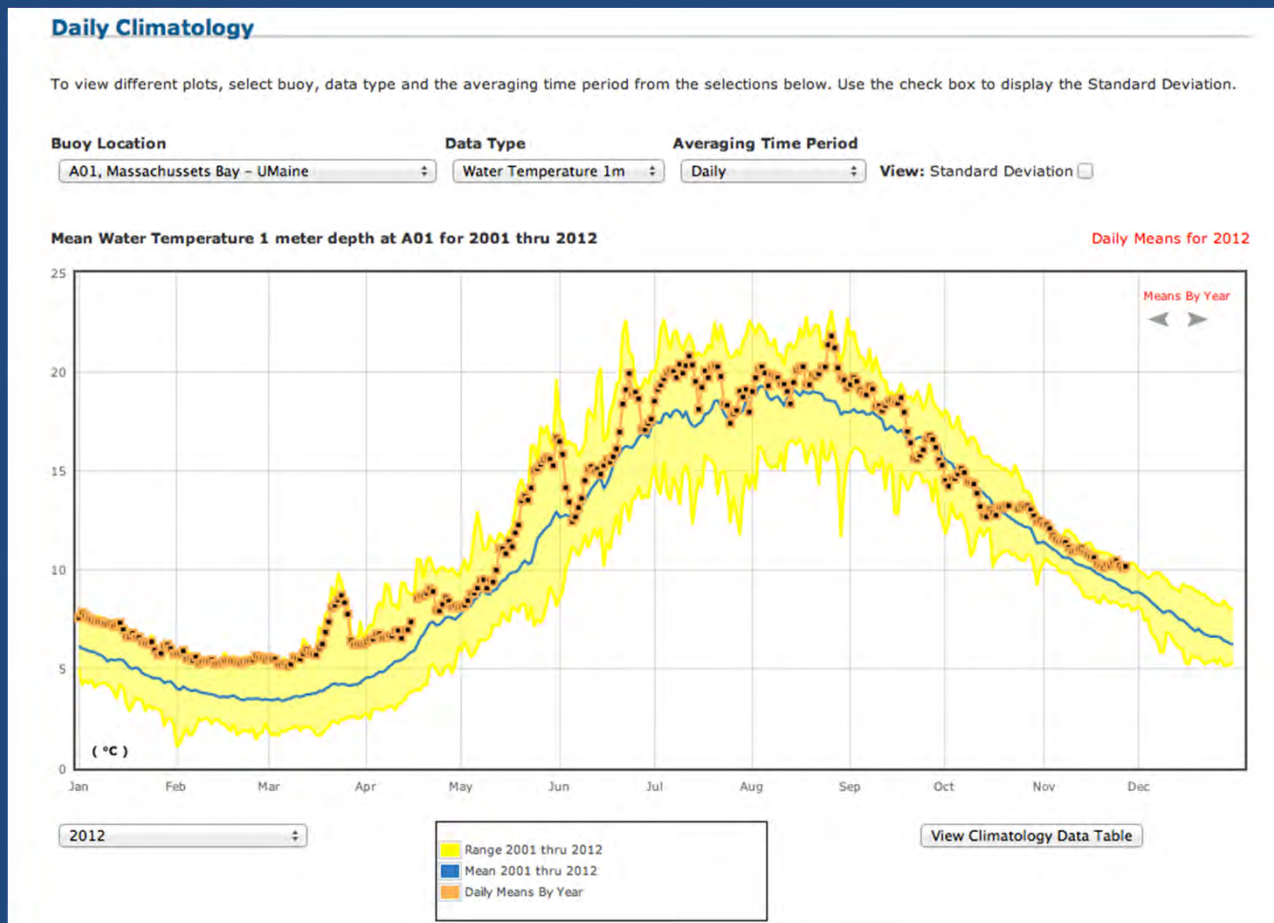
■ [Graphing and Download](#)

■ [Station Description](#)

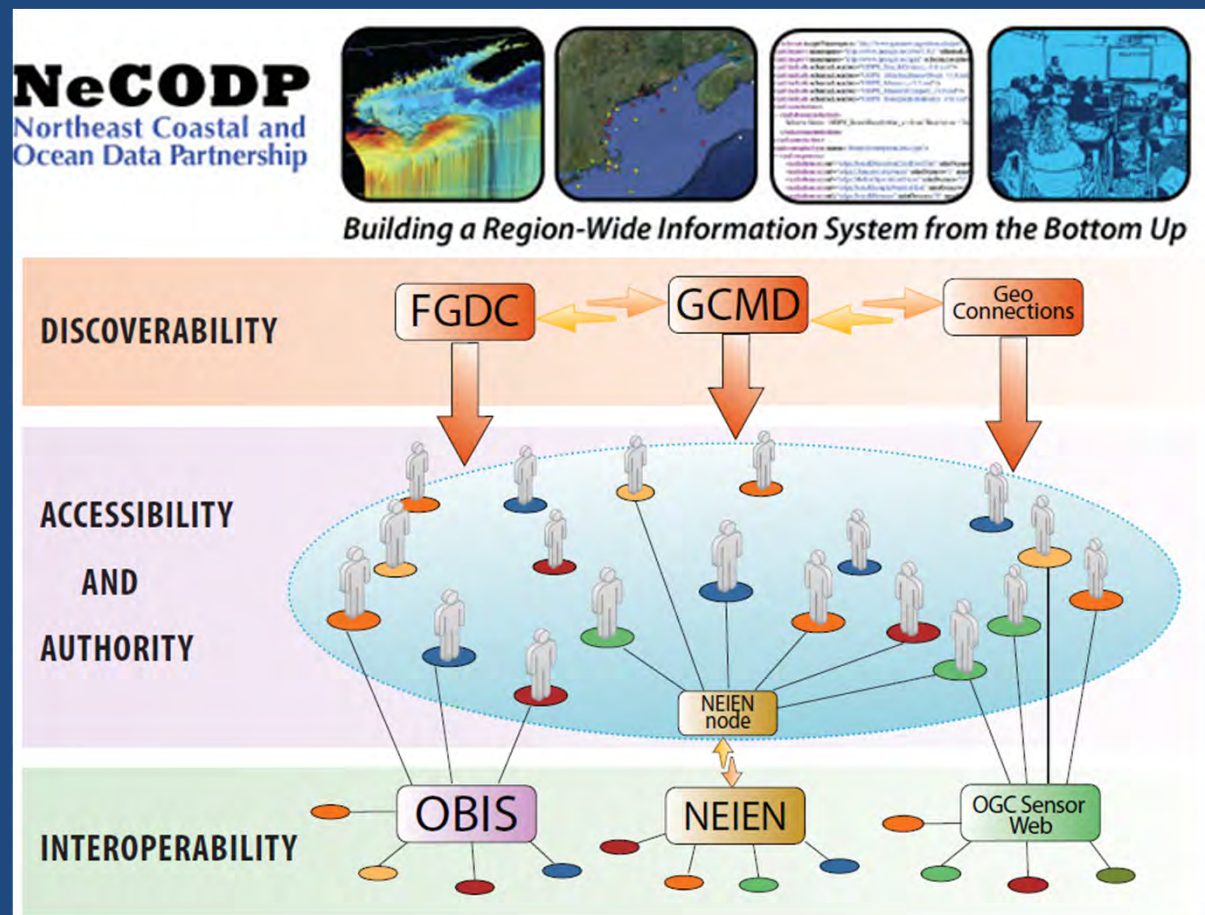
■ [Explanation of Data Types](#)

- GoMOOS.org retired on April 15, 2012
- Integrated GoMOOS products
- Text a buoy/Twitter
- USGS tide gauges online
- RSS feed developed- neracoos.org/RSS
- Drifters online- neracoos.org/datatools/drifter
- Created Forecast Viewer Tool for participants at the Newport America's Cup June 23-July 1

New website and products - Climatologies



Data Management



Data for Ocean Planning

NORTHEAST OCEAN DATA

Search this site...

HOME MAPS » DATA VIEWER » DATA » ABOUT CONTACT NEWS

INTERACTIVE MAPS



AQUACULTURE



ENERGY



**MARINE LIFE:
MAMMALS**

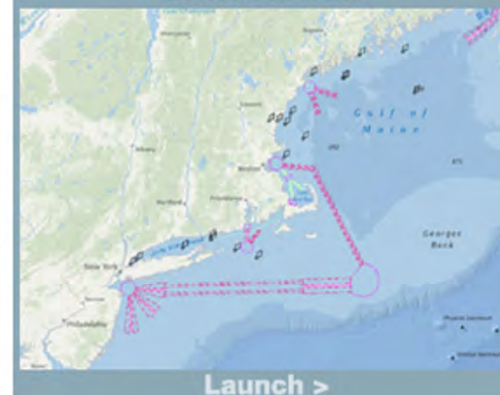


**MARITIME
COMMERCE**

Coming soon: **COMMERCIAL FISHING**
RECREATION
MORE MARINE LIFE: FISH, BIRDS, MAMMALS, TURTLES

The Northeast Ocean Data Working Group is developing an interactive atlas of human and environmental aspects of the ocean in New England. The maps listed above are preliminary components of the atlas. We release new maps on an ongoing basis, and we continually improve and revise the existing maps to present the best available information in a useful format. We are working closely with many public- and private-sector organizations to identify information needs, data sources, and the most effective ways to present information in these maps.

DATA VIEWER



Launch >

This website is a decision support tool for ocean planning in the northeastern United States, providing resource managers, planners, scientists, and stakeholders with interactive maps, data, tools, and information on human and natural dimensions of the ocean.

NEWS

- Redesign of Northeast Ocean Data website
- Updates to NE Ocean Data databases
- Working Waterfront article on NE Ocean Data

DATA

- Data Download
- External Data Sources
- Policies and Standards

NERACOOS Communication and Outreach Activities

- 89 new likes since 2011
- participation in events
- focus groups
- quarterly newsletters



DATA and RESOURCES for EDUCATORS

NERACOOS
NORTHEASTERN REGIONAL ASSOCIATION OF COASTAL OCEAN OBSERVING SYSTEMS

Ocean Literacy

Supporting Education

DATA AND RESOURCES for EDUCATORS

NERACOOS delivers real-time ocean and weather information, ocean forecasts and long-term ocean information in the Northeast that support and enhance classroom, community, safety, management, research and education and makes it accessible through accessible resources. The information approach encompasses the following four components:

1. Regional Collaboration
2. Scientific Education Partnership
3. Ocean Observing-Based Programs and Activities
4. Educative Resources and Guidance

REGIONAL COLLABORATION

NERACOOS provides information that helps audiences develop their own understanding of the ocean's influence on weather and climate and the relationship between ocean and human. The "Ocean Literacy" is critical to working our ocean and coastal regions. NERACOOS works closely with NEOSC, the New England Ocean Science Education Collaborative, to provide Ocean Literacy. The Ocean Literacy Principles provide framework to engage people in education and outreach activities related to ocean literacy.

NEOSC
New England Ocean Science Education Collaborative

For example, the Families By the Seaside project was awarded to NERACOOS and its partners to create meaningful learning experiences for underserved and underserved families of informal science education centers by integrating technology into their programs.

NERACOOS helps to sponsor the **NEOSC Biennial New England Ocean Literacy Summit**, which provides a unique opportunity for educators, scientists, and decision makers to gather for networking, presentations, and hands-on workshops that highlight education and scientist collaborations.

SCIENTIST-EDUCATOR PARTNERSHIPS

NERACOOS and its members are working to build regional capacity for implementing broader impact activities by ocean scientists, and working with education to ensure that the coastal and oceanic data and coastal ocean science research is effectively used in formal education in its broadest sense.

One example of this effort is **Right Whales and Ocean Observing: An Exhibit that Connects People to Research**. Scientists from the University of New Hampshire's Center for Coastal and Estuarine Science (CCESE) are working with staff from the Seacoast Science Center in Portsmouth, New Hampshire, to create an exhibit that highlights Right Whale research in CCESE. New England's only designated marine sanctuary. It will highlight how the research is done, look at the vessel, and how the data is translated into policy and management.

OCEAN OBSERVING-BASED PROGRAMS AND ACTIVITIES

NERACOOS real-time data and ocean forecasts can be used in displays, kiosks and online educational tools. The Seacoast Science Center in Portsmouth, New Hampshire, encourages visitors to learn about the upcoming seasonal migration through the Gulf of Maine and about phytoplankton blooms. A display installed at the Seacoast Science Center high school in southeastern Connecticut displays data in Long Island Sound directly from the NERACOOS data.

EDUCATION RESOURCES AND GUIDANCE

NERACOOS is a resource for real-time and historical information about the ocean that can be used by educators and students.

- Real-time data can be used in displays, kiosks and online educational tools.
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NEOSC
New England Ocean Science Education Collaborative

New England Ocean Science Education Collaborative

Seacoast Science Center

BOATCAMP

Marine Science Center

New England Aquarium

Mystic Aquarium

Portsmouth Housing Authority

Jump Start Youth Connection

Girl's Inc., Lynn

Chelsea Inter-generational Learning Center

Subase New London Navy Child & Youth Services

"I believe the ocean literacy principles give us a very firm foundation on which to stand." —Dr. Kathryn Sullivan

NEOSC Ocean Literacy Summit 2012

The ocean is largely unexplored

"a truly useful and energizing event" —attendee

NERACOOS
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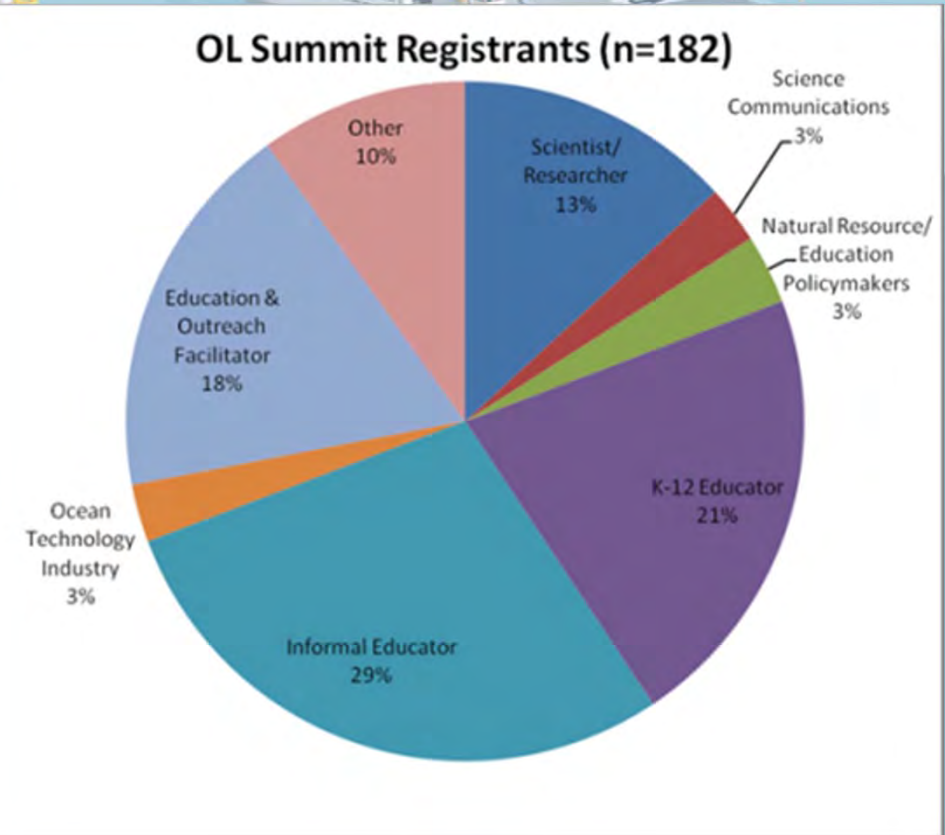
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The New England Ocean Literacy Biennial Summit 2012

The ocean is largely unexplored

- Co-sponsored and Coordinated
- NERACOOS Speakers
- NERACOOS Buoys second most exciting ocean data to use in class after Dr. Ballard's Teacher at Sea program



NEOSEC Ocean Literacy Summit 2012

The ocean is largely unexplored

November 1-2, 2012 at the University of Rhode Island

Strategic Planning and Implementation Team

- April 3 and September 25 Meetings
- New Membership
- Operational Efficiencies
- Future Equipment needs
- Alternative Funding Options and Plans
- Merged working groups with NROC



This is NERACOOS

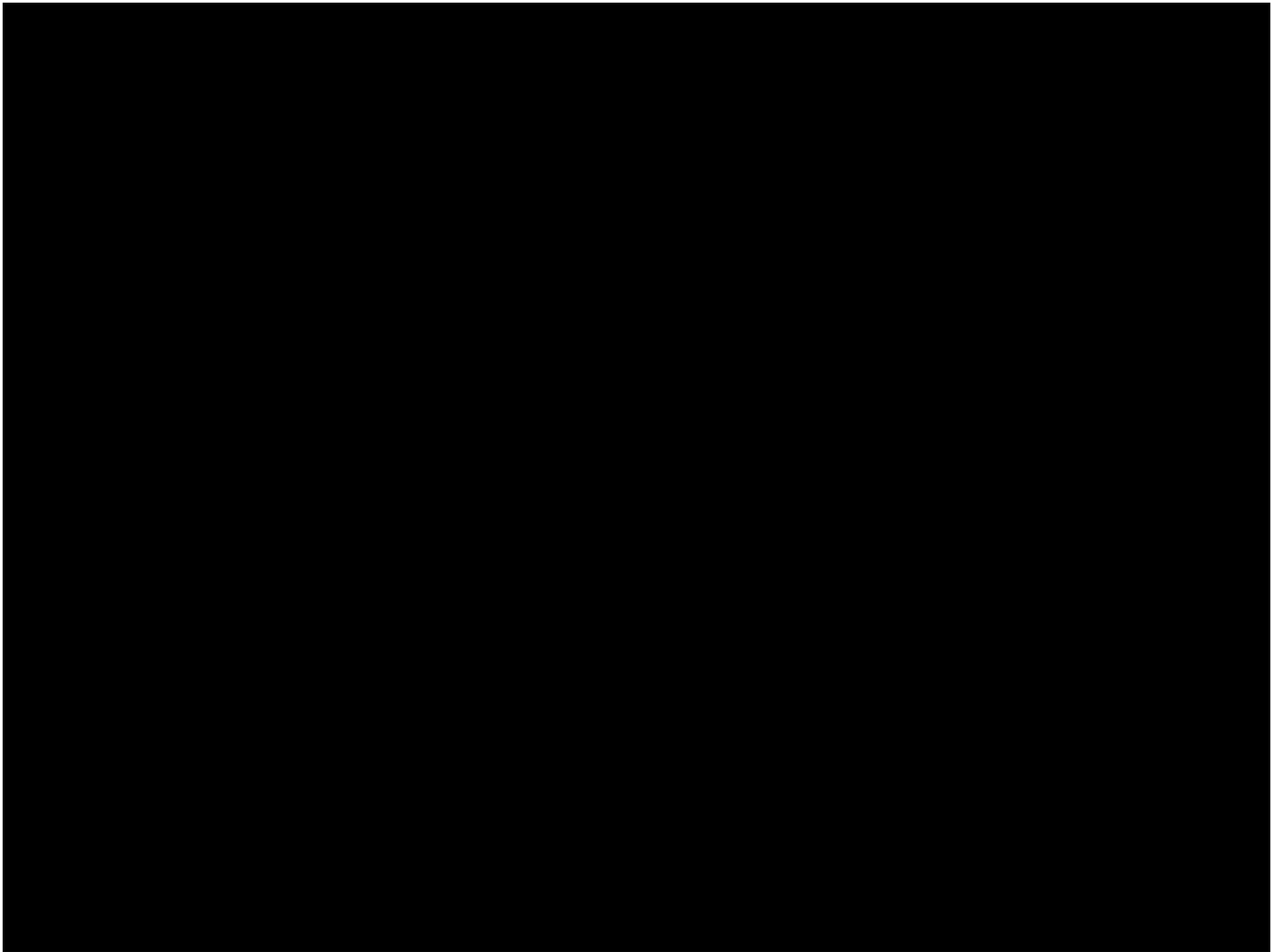
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KEEP MOVING FORWARD

“Around here, however, we don’t look backwards for very long. We keep moving forward, opening new doors and doing new things ... and curiosity keeps leading us down new paths.”

- Walt Disney







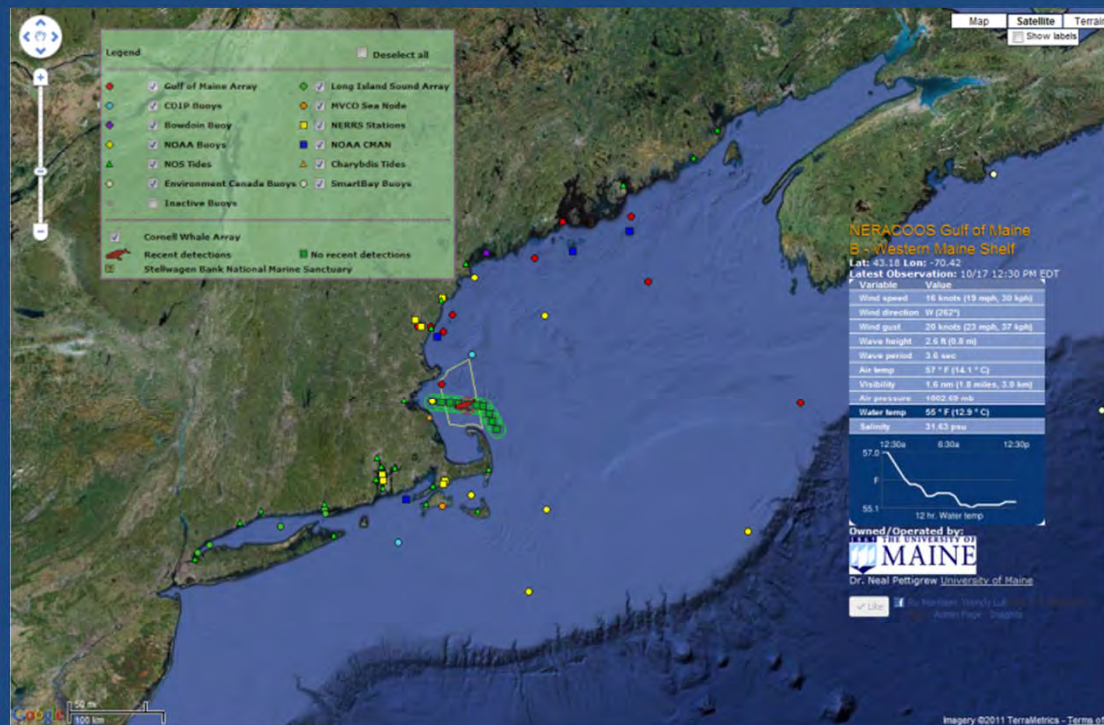
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2013: The year ahead

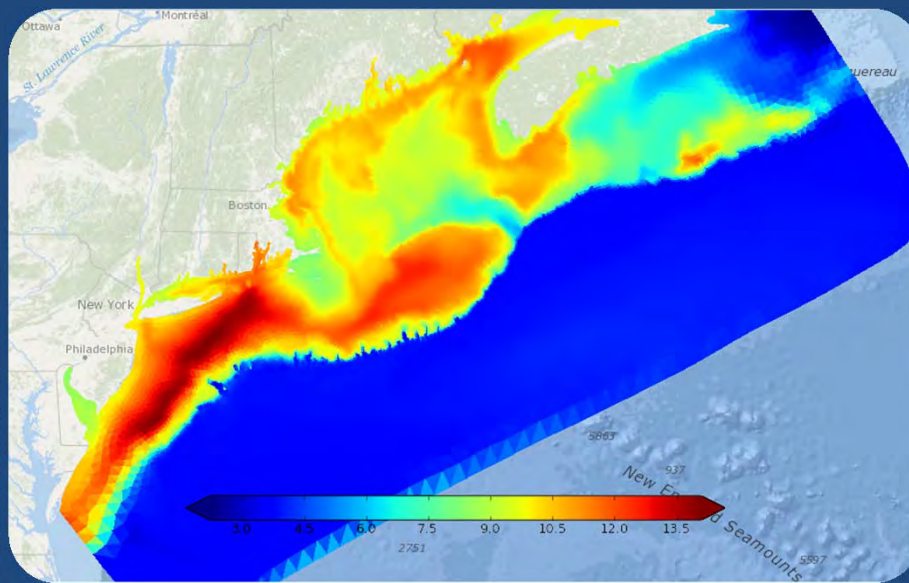
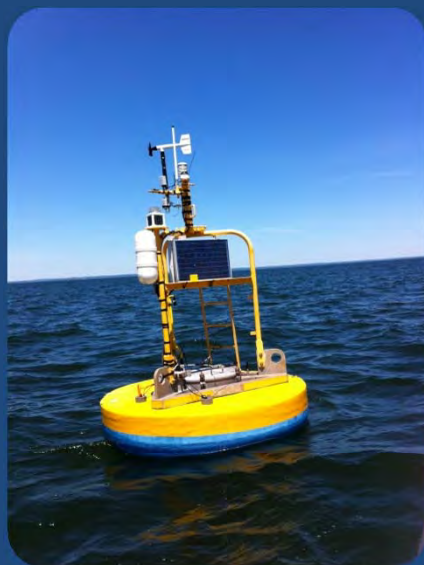


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NERACOOS 2013: Sustaining critical infrastructure

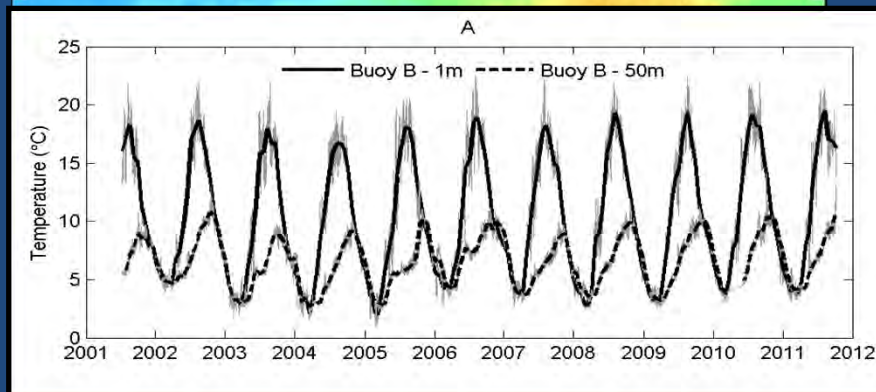
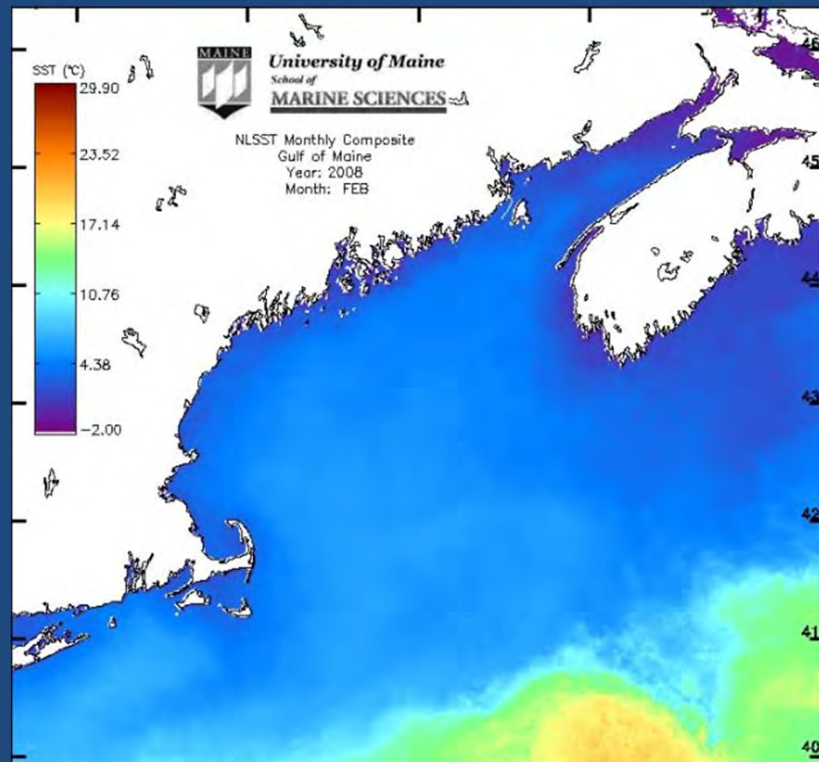


NERACOOS 2013: Stakeholder Engagement



Intra and Inter -Regional Collaboration

NERACOOS 2013: More information and better access



DATA and RESOURCES for EDUCATORS



Business Model

Private – Public
Partnerships

Breaking News: December
4, 2012 Portsmouth NH

*NERACOOS Board
approves development of a
membership structure.
The Benefits are huge!*



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