



NERACOOS

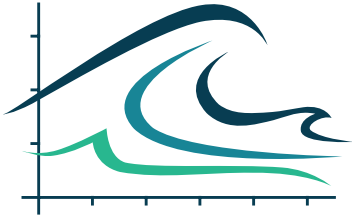
NORTHEASTERN REGIONAL ASSOCIATION
OF COASTAL OCEAN OBSERVING SYSTEMS



ANNUAL IMPACT REPORT

2023

NERACOOS



NORTHEASTERN REGIONAL ASSOCIATION
OF COASTAL OCEAN OBSERVING SYSTEMS

Note from the Executive Director

Dear Members, Partners, and Friends,

Welcome to the 2023 NERACOOS Annual Impact Report! As the following pages show, our work grew substantially in areas of high importance to our community and aligned with the goals in our *2022-2025 Strategic Plan*, necessitated by a changing climate and evolving Blue Economy.



Providing Ocean Data for Decisions

Since 2009, NERACOOS has implemented the U.S. Integrated Ocean Observing System from Long Island Sound through the Gulf of Maine.

We believe that everybody should have the information they need to advance resilient communities, economies, and marine ecosystems.

To that end, we serve people by creating, organizing, and sharing information about the ocean.

We work in ways that are science-based, policy-neutral, and collaborative as we strive to meet the needs of ocean-reliant communities.

[NERACOOS.org](https://neracoos.org)

We're better positioned to meet the challenges before us thanks to new members of the NERACOOS team who came on board in 2023: Austin Pugh is our Climate and Ecosystem Coordinator, with a particular focus on ocean acidification. Dr. Cameron Thompson is our Pelagic Ecology Research Fellow, building new models and strengthening monitoring of plankton populations. Dr. Anna Simpson is our Coastal Resilience Manager, working with coastal communities and government agencies to track impacts of rising seas and more powerful storms. Welcome Austin, Cameron, and Anna!

Of course, our success depends on many more people than those of us who are proud to work for NERACOOS. Our dedicated Board of Directors, NOAA's IOOS Office, other government agencies, the IOOS Association, fellow IOOS Regional Associations, collaborators, and users of all stripes are vital to the success of NERACOOS. We thank you all and look forward to an exciting 2024!

Sincerely,

Jake Kritzer, Ph.D.

The Inflation Reduction Act: Envisioning the Future of Ocean Observing

On August 16, 2022, President Biden signed the Inflation Reduction Act (IRA) into law, the most ambitious policy for climate action and economic prosperity in U.S. history.

The Integrated Ocean Observing System has a vital role to play in achieving the goals of the IRA. The work of IOOS Regional Associations across the nation is central in tracking impacts of climate change on ocean ecosystems. At the same time, IOOS services also underlie equitable decision-making by government agencies, and safe and profitable operations of maritime businesses.

Accordingly, the IRA provides much-needed support for IOOS. We thank the President and our champions in Congress for their leadership!

In 2023, NOAA's IOOS Office, the IOOS Association, and all eleven Regional Associations began the hard work of crafting an ambitious vision for the next chapter of our work through IRA investments. Stay tuned for this vision to begin coming to life in the year ahead!



Support for ocean observing through the Inflation Reduction Act (IRA) will benefit commercial fishing, renewable energy, and other maritime business sectors. Photo: Ørsted

STRATEGIC GOAL: SUSTAIN AND MODERNIZE THE OCEAN OBSERVING SYSTEM

Technology to Measure Effects of Offshore Wind

Will offshore wind turbines planned for the Gulf of Maine change the ocean currents that transport lobster larvae and nutrients? New high-frequency radar stations that track currents across hundreds of square miles will help answer that question. Through support from the Bipartisan Infrastructure Law, we worked with the Maine Department of Marine Resources, University of Maine, and Woods Hole Oceanographic Institution to expand coverage to encompass the Offshore Wind Research Array that is being developed by the State of Maine.

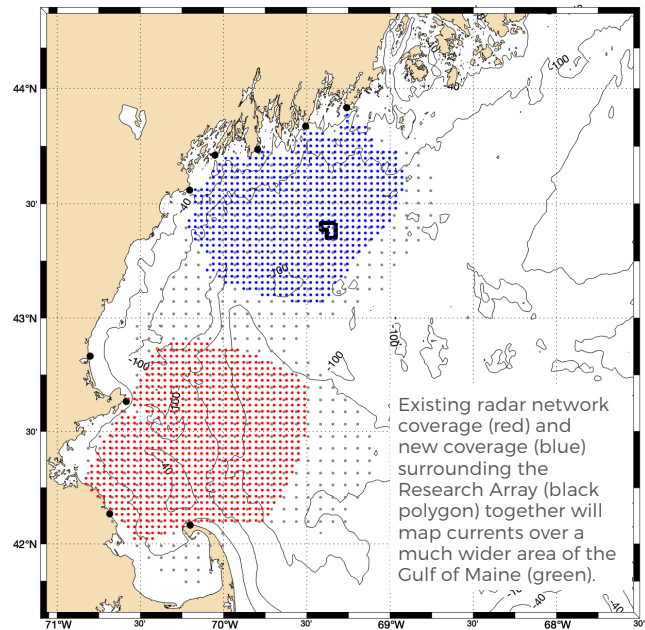
OTHER HIGHLIGHTS:

A growing number of lobster boats in Maine are carrying eMOLT environmental sensors providing data for NERACOOS models and products.

Partners: Gulf of Maine Lobster Foundation, NOAA Fisheries, University of Massachusetts - Dartmouth, Gulf of Maine Research Institute, Stony Brook University

In Buzzards Bay, a new wave buoy provided its first year of data on ocean conditions for mariners.

Partners: Massachusetts Dept. of Environmental Protection, NOAA CO-OPS, Woods Hole Group



“Whether I’m piloting fisheries surveys in the Eastern Gulf of Maine or running an offshore tugboat in busy Southern New England ports, NERACOOS provides essential tools for safe and efficient navigation.”

**Capt. Josh Duym, T/B Independence
Boston Towing and Transportation**

STRATEGIC GOAL: PROVIDE RELIABLE AND ACCESSIBLE OCEAN DATA

Federal Certification of NERACOOS Data Services

Fishermen, surfers, researchers, weather forecasters, search-and-rescue teams, and everyone else connected to the ocean needs reliable data to make good decisions. That’s why it’s critical that NOAA’s IOOS Office recertified NERACOOS as a Regional Coastal Observing System. Certification assures users that our data collection, management, and dissemination meet rigorous federal standards. Each of our implementation partners helps to meet the requirements, and we thank them all!

OTHER HIGHLIGHTS:

Data on Gulf of Maine plankton populations from the trans-Atlantic Continuous Plankton Recorder program are now available through NERACOOS.

Partners: NOAA Fisheries, Marine Biological Association (UK), Gulf of Maine Research Institute

Real-time data from oceanographic buoys deployed by offshore wind developers are available through the Mariners’ Dashboard.

Partners: Beacon Wind, Ørsted, MARACOOS, Gulf of Maine Research Institute, RPS



Reliable data and forecasts are critical to planning Coast Guard search-and-rescue missions. Photo: USCG

STRATEGIC GOAL: MEET THE CHALLENGES IN NEARSHORE ENVIRONMENTS

Preparing for Rising Seas

As we look back on our work in 2023, powerful storms have already battered the New England coast to start off 2024, underscoring the importance of providing coastal communities with data and forecasts on storm surge and flooding. Through support from Senator Jeanne Shaheen and the Northeast Regional Ocean Council, we held the first regional workshop to build a community of practice connecting coastal communities with new sensors that can boost climate resilience at the local scale.

OTHER HIGHLIGHTS:

Experts from Connecticut to Canada gathered for a milestone workshop to assemble the first Ocean Acidification Monitoring Plan for the Northeast.

Partners: Northeast Coastal Acidification Network, NOAA Ocean Acidification Program, Northeast Regional Ocean Council

Water quality stations in the Skutik (St. Croix River) estuary reached one year of monitoring environmental conditions for sea-run fish restoration.

Partners: Passamaquoddy at Pleasant Point, Peskotomuhkati Nation (Canada), Maine Center for Coastal Fisheries, University of Maine



Flooded homes along the New England coast. Photo: NHDES

“NERACOOS helps keep fishermen safe and profitable every day we’re on the water, while also shedding light on complex changes unfolding in our ocean ecosystems.”

**Capt. Chris Weiner, F/V Elizabeth Ames
Bluefin Collaborative**

STRATEGIC GOAL: EXPAND ACTIVITIES FOCUSED ON MARINE LIFE

All Hands on Deck for an Unprecedented Algal Bloom

Extremes are becoming the norm, and 2023 was no exception: Globally it was the warmest year on record, and the Gulf of Maine experienced an unforeseen bloom of the (thankfully nontoxic) phytoplankton *Tripos muelleri*. As the ocean turned coffee brown and threatened to choke out marine life, scientists quickly organized to share data, gather insights from fishermen, and collaborate on understanding the bloom and its impacts. Observing tools supported by NERACOOS and partners were pivotal in the rapid response that coalesced around this strange phenomenon.

OTHER HIGHLIGHTS:

Plankton monitoring and modeling expanded to provide essential information for fisheries management, energy development, and marine mammal conservation.

Partners: Marine Biodiversity Observation Network, Bureau of Offshore Energy Management, Maine Dept. of Marine Resources, University of Maine, University of New Hampshire, Woods Hole Oceanographic Institution, Stellwagen Bank National Marine Sanctuary, NOAA Climate Program Office

A state-of-the-art autonomous vessel monitoring harmful algal blooms successfully completed its first sea trial.

Partners: NOAA Harmful Algal Bloom Observation Network, Woods Hole Oceanographic Institution, University of New Hampshire



Above: A sample of Gulf of Maine seawater colored brown by *Tripos muelleri* phytoplankton during the 2023 bloom.

Right: Magnified view of *Tripos muelleri*. Each is approximately the width of a human hair.
Photos: Joe Vallino / MBL

STRATEGIC GOAL: ENGAGE WITH PEOPLE AND COMMUNICATE OUR WORK

Centering Indigenous Knowledge in Ocean Management

We are convening a unique collaboration among Indigenous leaders and Marine Protected Area managers, thanks to support from the Lenfest Ocean Program. Partners from the Mashpee Wampanoag Tribe, Cowasuck Band of the Pennacook-Abenaki People, Stellwagen Bank National Marine Sanctuary, and three National Estuarine Research Reserves—Wells (ME), Great Bay (NH), and Waquoit Bay (MA)—have begun to map out ways that Indigenous Ecological Knowledge can improve protected area management and build resilience to climate change.

OTHER HIGHLIGHTS:

At the Maine Fishermen’s Forum and Fishermen’s Climate Roundtable, the lobster fleet shared key ecosystem observations and data needs with the NERACOOS team.

Partner: Island Institute

At the International Partnering Forum and Offshore Technology Conference, we gained insight on ocean users’ diverse needs associated with offshore wind energy development.

Partners: IOOS Association, fellow IOOS Regional Associations, especially GCOOS and AOOS

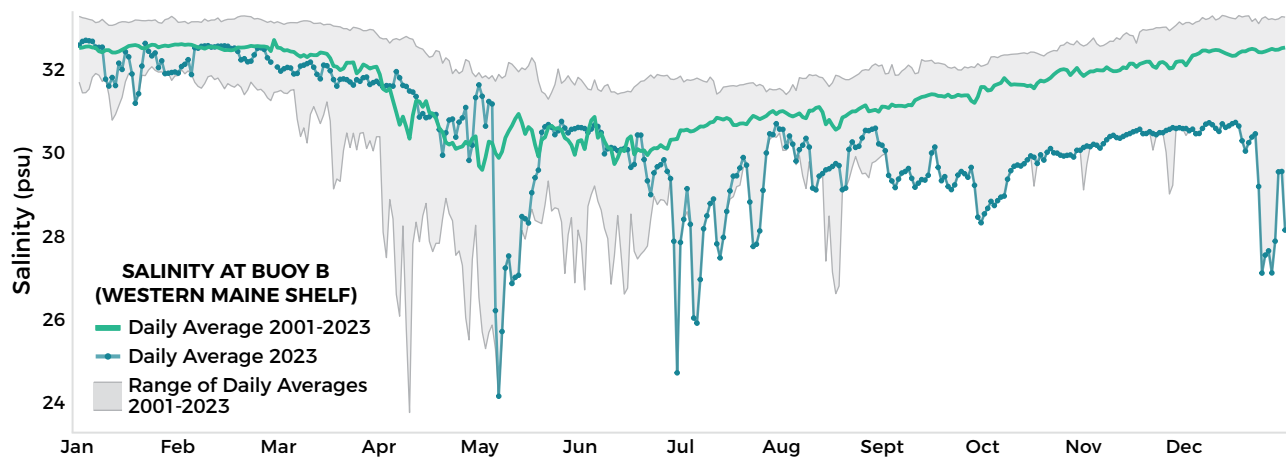


Indigenous leaders and Marine Protected Area managers gather with NERACOOS staff on the shores of Great Bay, New Hampshire.

“As the newest National Estuarine Research Reserve, the long-term monitoring by our partners at NERACOOS and UConn provides an invaluable baseline against which to gauge environmental change here in Long Island Sound.”

**Kevin O’Brien, Manager of the Connecticut National Estuarine Research Reserve
NERACOOS Board of Directors**

ECOSYSTEM SPOTLIGHT: A Rainy Year Alters Ocean Salinity



Summer rainfall records were broken across the Northeast in 2023—followed by many winter records for good measure. Much of that rain fell directly onto the ocean, and still more flowed to the sea through rivers. For marine ecosystems, this meant that new extreme low salinity measurements were recorded at many NERACOOS stations. The plot above shows that salinity data from Buoy B on the Western Maine Shelf tracked the 20-year average early in the year but then set new long-term minimums in the latter half of the year. Many marine organisms are resilient to fluctuations in salinity, but smaller plankton and larvae might suffer if water is too fresh for too long.

NORTHEAST OCEAN OBSERVING SYSTEM



Deployment of buoys for monitoring ocean conditions.
Photo: University of Connecticut

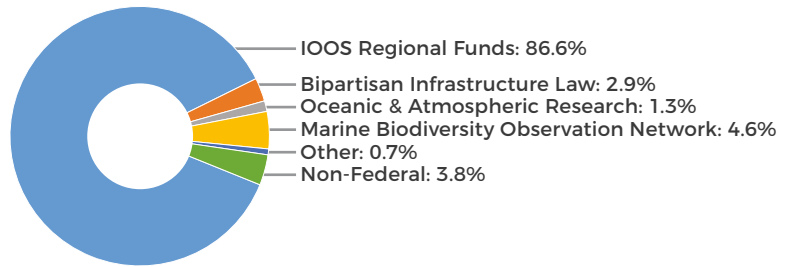


A new autonomous vessel equipped with sensors to detect harmful algal blooms. Photo: WHOI

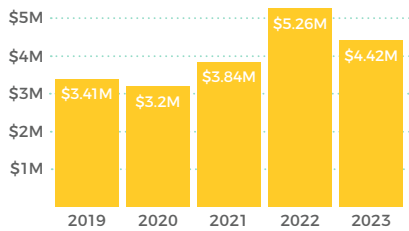
2023 Financials

NERACOOS is funded primarily by NOAA through the U.S. IOOS Regional Program. In 2023, NERACOOS received additional funding from the IOOS Bipartisan Infrastructure Law, NOAA's Marine Biodiversity Observation Network, NOAA's Operational Oceanographic Products and Services, NOAA's Oceanic and Atmospheric Research - Climate Program Office, NOAA's Ocean Acidification Program, NOAA's Office for Coastal Management, Massachusetts Department of Environmental Protection, Massachusetts Water Resources Authority, Woods Hole Oceanographic Institution, the Environmental Protection Agency through the Casco Bay Estuary Program and the University of Maine, New Hampshire Sea Grant, and others.

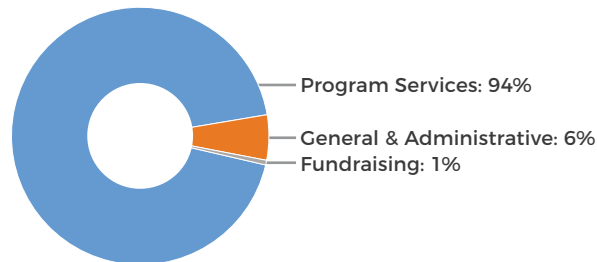
REVENUE: \$4,416,060



ANNUAL REVENUES



EXPENSES: \$4,188,508



The amounts presented here are derived from NERACOOS' unaudited financial statements for the year ending September 30, 2023. Audited financial statements are available at neracoos.org.

2023 NERACOOS Board of Directors

OFFICERS

Rhonda Moniz, President Underwater Investigative Group
Nicole Bartlett, Vice President NOAA North Atlantic Regional Team
Prasade Vella, Secretary Massachusetts Bays National Estuary Program
Chris Williams, Treasurer New Hampshire Dept. of Environmental Services

DIRECTORS

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Diane Foster University of New Hampshire
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Steve Lohrenz University of Massachusetts Dartmouth
Todd Morrison Nobska Development Corporation
Kevin O'Brien Connecticut National Estuarine Research Reserve
Jim O'Donnell University of Connecticut
Neal Pettigrew University of Maine
Hung Pham Massachusetts Maritime Academy
David Ullman University of Rhode Island
Zhaohui Aleck Wang Woods Hole Oceanographic Institution

* Stepped down in January 2023 due to an employment change.

NERACOOS Staff

Jake Kritzer	Executive Director
Katy Bland	Engagement and Research Manager
Rob Cardeiro	Finance Director
Jackie Motyka	Strategy Director
Austin Pugh	Climate and Ecosystems Coordinator
Caitlin Shanahan	Administrative Assistant
Tom Shyka	Technology Director
Emily Silva	Administrator
Anna Simpson	Coastal Resilience Manager
Cameron Thompson	Pelagic Ecology Research Fellow

2023 NERACOOS Membership

SUSTAINING MEMBERS

Kelly Cove Salmon
 Massachusetts Water Resources Authority
 University of Connecticut
 University of Maine School of Marine Sciences
 University of Massachusetts Dartmouth
 University of New Hampshire

SUPPORTING MEMBERS

Bar Harbor Whale Watch
 Penobscot Bay and River Pilots Association
 Provincetown Center for Coastal Studies
 Woods Hole Group
 Woods Hole Oceanographic Institution

ASSOCIATE MEMBERS

Mel Cote
 Connecticut Dept. of Energy & Environmental Protection
 Fisheries and Oceans Canada
 Footprints in the Water
 Gulf of Maine Lobster Foundation
 Maine Department of Marine Resources
 Massachusetts Lobstermen's Association
 St. Lawrence Global Observatory
 Teledyne
 Waterview Consulting

AFFILIATES

Environmental Protection Agency
 Gulf of Maine Council on the Marine Environment
 Massachusetts Bays Program
 Massachusetts Coastal Zone Management
 Narragansett Bay National Estuarine Research Reserve
 New Hampshire Department of Environmental Services

The NERACOOS Membership program assists our system's operation and improvement. Thank you, Members, for your generosity! If you are interested in supporting NERACOOS by becoming a member, please contact emily@neracoos.org.



@neracoos



Northeastern Regional Association of Coastal Ocean Observing Systems (NERACOOS)

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