U.S. IOOS ENTERPRISE

STRATEGIC PLAN 2023–2026

LAST UPDATED MARCH 12, 2024

ioos.noaa.gov

IOOS
Integrated Ocean Observing System

Acknowledgements

The Integrated Ocean Observing System (IOOS) is our eyes on the ocean, coasts, and Great Lakes. We are an integrated network of people and technology gathering observing data and developing tracking and predictive tools to benefit the economy, the environment, and public safety at home, across the Nation, and around the globe.

We gratefully acknowledge the following partners in the IOOS Enterprise:

Federal Partners

Regional Associations

Letter from the Director

Each day nearly every American is touched by some aspect of IOOS' mission—from observations used to improve weather forecasts, to data used by mariners to safely deliver food and goods into our Nation's ports, to tools and services used by decision makers to build coastal resilience. The breadth and depth of our work is awe inspiring and it is my privilege to serve as the Director of the U.S. IOOS Office.

Underpinning all of IOOS' achievements and day-to-day work is a commitment to advancing ocean, coastal, and Great Lakes observations by promoting a culture of excellence and decision-making based on transparent and reliable data, science, and information. Highlighting the central role IOOS plays in meeting the ocean, coastal, and Great Lakes needs of the Nation, the Department of Commerce, National Oceanic and Atmospheric Administration, and National Ocean Service strategic plans and the Executive Office of the President's Ocean Climate Action Plan are all inclusive of IOOS' mission.

Implementing the Inflation Reduction Act (IRA) and Bipartisan Infrastructure Law (BIL) is a large focus of our effort across 2023 and into 2024; both laws provide a unique opportunity for the U.S. IOOS Enterprise to expand its reach, tackle new projects, and unify IOOS' regional service delivery and decision support at a national level. These funds will forward the goals and objectives laid out in this strategic plan by bringing people together, collecting data, managing that data, developing use-inspired products, and providing services that respond to community needs.

The U.S. IOOS Office has been guiding IRA funds related to Climate Ready Coasts. The Ocean-Based Climate Resilience Accelerators funding opportunity will implement business accelerator programs that support small businesses and entrepreneurs to commercialize ocean, coastal, and Great Lakes-based climate solutions. IRA is also funding the IOOS Regional Associations provision of coastal resilience services that address community needs and priorities toward climate-ready coasts; these funds will expand the traditional reach of IOOS and increase our impact on communities, particularly frontline and overburdened communities.

The BIL provided U.S. IOOS with funds in the Climate and Data Services initiative under: (1) flood and inundation mapping and forecasting; (2) ocean and coastal observing systems; and (3) regional ocean partnerships. These funds open up new possibilities for recapitalizing, modernizing, and expanding our national observing system, predictions, and partnerships to address those priorities. The U.S. IOOS Office will continue executing BIL funding, building on the projects and efforts from the first two years.

The Coastal and Ocean Modeling Testbed (COMT) is also continuing to fund projects, with the fifth round of awards expected to be announced in the summer of 2024. COMT's efforts have dramatically improved the integration, comparison, analyses, and archiving of the data and model output needed to operationalize a range of existing and emerging coastal oceanic, hydrologic, and ecological models. For this funding round, projects will focus on advancing the Unified Forecast System, coastal resilience and ecosystem modeling and community modeling that aligns with NOS' modeling vision and strategy.

Achieving IOOS' goals and objectives requires a diverse workforce with a unique and wide-ranging combination of skills and capabilities, from maintaining and operating ocean data sensors and platforms, to data assimilation and modeling, to data science. To this workforce, IOOS is working to attract, develop, and retain people from all sectors. IOOS is also working with our partners to provide a steady pipeline of educated, trained, and applied scientists, technicians, and other professionals specialized in using ocean and coastal information to solve societal challenges.

The U.S. IOOS Office is experiencing growth and change this year and we are excited to announce that we will be adding staff and contractors to our team. With these hires, IOOS recognizes that our mission is best served with the leadership and contributions of people of diverse backgrounds, thought, and culture. In response to this growth, the IOOS Office is developing the first IOOS Office Strategic Plan to outline the goals, priorities, and performance metrics specific to the IOOS Office. These changes to our structure will ultimately work to better implement the goals and objectives laid out in this strategic plan.

This growth will continue to allow IOOS to better understand, model, and forecast changes to the planet and its oceans, which in turn allows us to understand how these changes will affect ocean economies and communities that depend on them, improve the safety of marine operations, improve national and homeland security, and mitigate the effects of natural hazards. We look forward to continuing to provide the models, tools, and decision support services used every day to meet the needs of the nation.

Sincerely,

Carl Gouldman
Director, U.S. IOOS

Starting in 2022, the U.S. IOOS Enterprise (IOOS) adopted an agile approach for maintaining the Strategic Plan, which includes a rolling 3-year window. The 3-year window recognizes the multi-year time horizon needed to accomplish the goals and objectives of the plan. The Strategic Plan is reviewed approximately every year, and refreshed as needed, to ensure it: (1) meets the needs of the ocean observing community; (2) continually communicates IOOS' current efforts and priorities; and (3) incorporates changes or updates in authorizing legislation, appropriations, or technical capabilities. A complete overhaul and development of a new plan may occur when: (1) a new IOOS Director is appointed; (2) a new Administration is elected; (3) significant changes to IOOS' budget are enacted (+/- 20%); (4) legislation that significantly impacts ocean observations are passed; or (5) there is a major change or update in ocean observing technology. A timeline of updates to the plan can be found in Appendix F 6.

IOOS is grateful to U.S. IOOS Office staff, IOOS Regional Association Directors and staff, and Interagency Ocean Observation Committee (IOOC) members for their input into the development and refresh of this plan. This document has been reviewed and approved for release by the office of the Assistant Administrator for the National Ocean Service of the National Oceanic and Atmospheric Administration within the U.S. Department of Commerce.

This document has been reviewed and approved for release by the office of the Assistant Administrator for the National Ocean Service of the National Oceanic and Atmospheric Administration within the U.S. Department of Commerce.

Foreword

The IOOS Enterprise is a globally linked, nationally coordinated Federal and non-Federal network of people and technology that observes, measures, monitors, and analyzes ocean, coastal, and Great Lakes data. IOOS translates these publicly available data into models, products, tools, information, predictions, and projections for public use every day. IOOS' trusted data are the basis for daily marine forecasts accessed immediately on smartphones; they feed into models that predict the water levels, currents, and salinity needed for the safe transportation of goods through our Nations' ports, they identify impacts of climate change on fisheries and marine ecosystems to improve management, and more.

The IOOS Enterprise consists of the U.S. IOOS Office, 11 Regional Associations, the IOOS Association, the IOOS Advisory Committee, the Global Ocean Observing System (GOOS), as well as the 17 interagency federal partners in the Interagency Ocean Observing Committee (IOOC). The IOOC works to improve the efficiency of Federal agency contributions to IOOS.

The IOOS Enterprise is inclusive and any entity contributing toward solutions or the implementation of IOOS is welcomed to be part of the Enterprise. It is the synthesis of these local, national, and global elements, working together toward shared goals and objectives that makes IOOS the robust, agile system that it is today and why this document encompasses the full Enterprise.

Climate change is transforming the ocean, coasts, and Great Lakes more rapidly than any other place on Earth, increasing pressure on blue economy sectors and coastal communities and undermining our nation's resilience and prosperity. Moreover, widening disparities in community resilience are increasingly linked to societal upheavals and disasters. IOOS' wide-ranging and cross-cutting commitment to diversity, equity, and inclusion is necessary to accomplish the mission of producing, integrating, and communicating ocean, coastal and Great Lakes information to meet our Nation's needs. Diversity drives innovation and IOOS is committed to building a culture where differences are valued and acknowledged through both top-down and grassroots approaches.

This strategic plan articulates the vision and goals for achieving a more coordinated, efficient, and advanced Enterprise that meets our Nation's safety, economic, and stewardship needs by serving as the premier source of authoritative ocean, coastal,

IOOS Societal Benefits

IOOS meets the Nation's ocean, coastal, and Great Lakes needs by integrating information and providing key services across seven areas of societal benefit:

- Improving ocean, coastal, and Great Lakes predictions across weather and climate timescales and their effects on coastal communities and the Nation;
- Improving the safety and efficiency of maritime commerce;
- Mitigating the effects of natural hazards;
- Improving public safety and national and homeland security;
- Reducing public health risks;
- Protecting and restoring healthy coastal ecosystems; and
- Enabling the sustained and sustainable use of ocean and coastal resources.

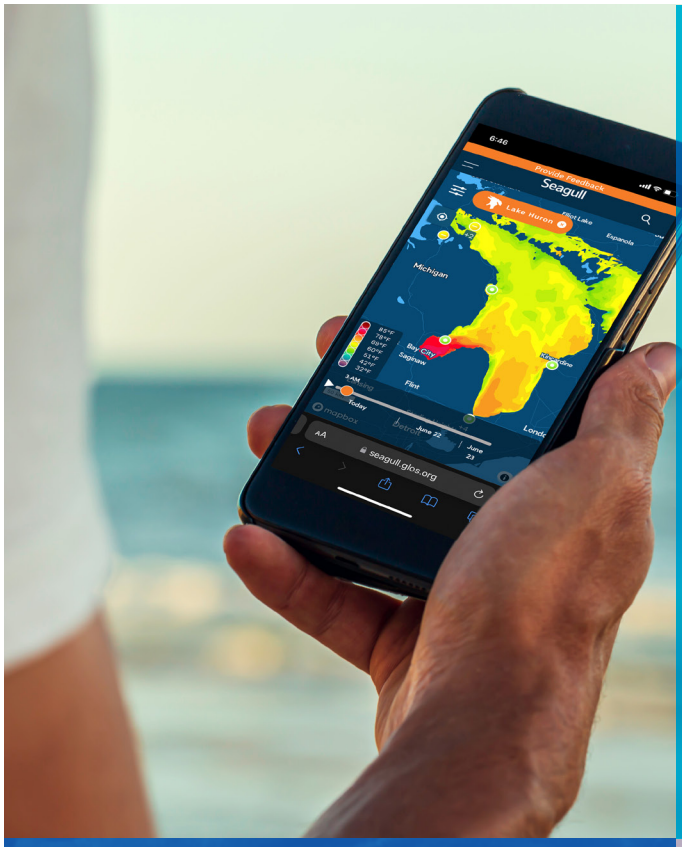
and Great Lakes data, information, and services. The five goals address IOOS' core and emerging capabilities of observation, data management and cyberinfrastructure (DMAC), modeling and analysis, user-driven products and tools, and Enterprise excellence. IOOS evaluates stakeholder needs to prioritize mature and emerging observing systems and DMAC capabilities. IOOS will continue to infuse emerging technology into operations, resulting in a more efficient, cost-effective, and advanced ocean, coastal, and Great Lakes observing system while facilitating the creation of useful products and services from its data.

IOOS' Strategic Plan, including the five goals outlined on the following pages, aligns with the U.S. Department of Commerce's 2022–2026 Strategic Plan, the NOAA FY22-26 Strategic Plan, and the NOS FY24-28 Strategic Plan. It is also informed and influenced by important legislative and policy prescriptions and aligns with a variety of agency strategic plans and frameworks.

This Strategic Plan charts a course towards a more coordinated, efficient, and advanced Enterprise. The IOOS Office enacted an agile implementation approach last year and will draft an IOOS Office Strategic Plan this year to improve planning and execution efforts. This approach will outline the IOOS Office's priorities, performance-based indicators, and metrics of success that will be used to forward the goals and objectives outlined in the IOOS Enterprise Strategic Plan. Through implementation, IOOS will continue to be the premier provider of authoritative, high-quality ocean, coastal, and Great Lakes information needed to meet the safety, economic, and stewardship needs of the Nation.

"Fishermen, scientists, business owners, and more use tools built on IOOS data every day, relying on it to guide smart decision making."

— Lisa Auermuller,
Assistant Manager, Jacques Cousteau National Estuarine Research Reserve



Vision

Improve lives and livelihoods with ocean, coastal, and Great Lakes information.

Mission

To produce, integrate, and communicate reliable, high-quality ocean, coastal, and Great Lakes information that meets the safety, economic, and stewardship needs of the Nation.

Guiding Principles

Productive public-private partnerships

Integrated, high-quality, and reliable data

Easy and open exchange of information

Nimble, responsive services support diverse and evolving priorities and end-user needs

Leveraged resources and innovation produce efficient, sustainable observing systems

Coordinated networks of people, technology, and information

Stakeholder-driven, science-based, and policy neutral

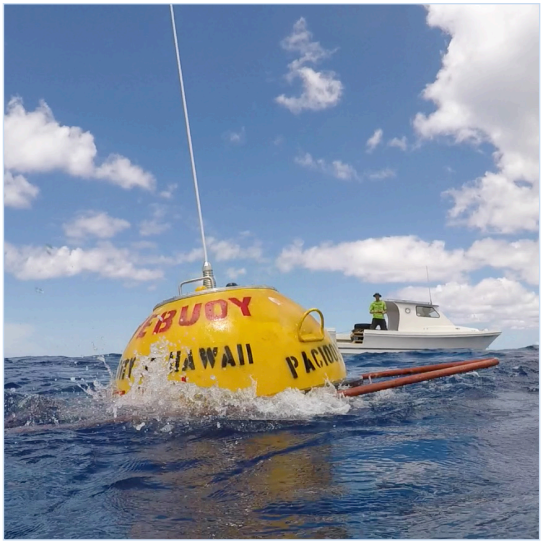
Goals and Objectives

Goal 1. Sustain long-term, high-quality observations of ocean, coastal, and Great Lakes environments to address local, regional, and national needs.

Background: Sustained observations of ocean, coastal, and Great Lakes systems are critical for the Nation's economy and security. U.S. IOOS, with its regional and Federal partners, supports an integrated system that combines *in situ* (e.g., moorings, gliders, shore stations) and remotely-sensed platforms (e.g., high frequency radars (HFR), satellites, drones, etc) to observe the range of physical, biogeochemical, and biological parameters necessary to meet an array of user needs. The national network of Regional Associations provides tailored products and information, and supports the Federal government's ability to do the same, at the scale needed to solve issues that manifest at the regional and local levels. This goal also supports the U.S. commitment to the United Nations Decade of Ocean Science for Sustainable Development by generating data, information, and knowledge for a comprehensive understanding of the ocean.

Moorings, shore stations, wave buoys, HFR, underwater gliders, and satellites all provide vital weather and sea state data to support safe navigation, recreation, efficient commerce, and the Blue Economy. Biological and ecological observing activities support a prepared and productive Nation empowered to predict and manage harmful algal blooms (HABs), hypoxia, ocean acidification, and temperature anomalies, and to understand marine biodiversity and animal movement. IOOS fosters the development and adoption of effective and reliable new technologies that address

user needs in a cost-effective and reliable manner through the Regional Associations and the Ocean Technology Transition program. U.S. IOOS facilitates collaboration and leveraging of resources among its many public and private partners to promote efficiencies, cost savings, and increased return on investment.



Goal 1 Driver. Dedicated resources and efforts are required to sustain, operate, and maintain ocean and coastal operations over long timeframes. To sustain efforts, IOOS must balance the maintenance and operation of the mature observing system while expanding the system to tackle emerging societal issues.

Objective 1.1 Leverage investment to improve system efficiencies, identify synergies, and provide common platforms to execute various missions.

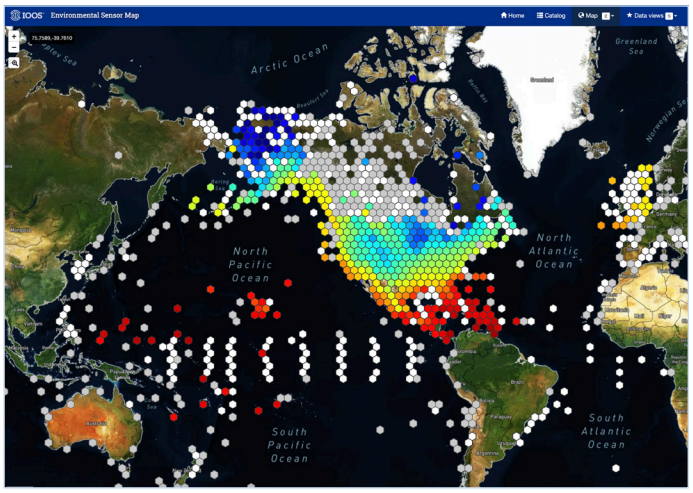
Objective 1.2 Sustain and operate a national network of regional observing systems composed of multidisciplinary observations from a variety of technologies.

Objective 1.3 Improve coverage of observing systems and modernize aging infrastructure to fill critical gaps in regional and national observing networks to address high-priority needs.

Objective 1.4 Incorporate sustainable and innovative technologies to address existing and emerging needs and transition proven technologies to operational use or other applications.

Objective 1.5 Advance and sustain marine life observations, products, tools, and decision support services.

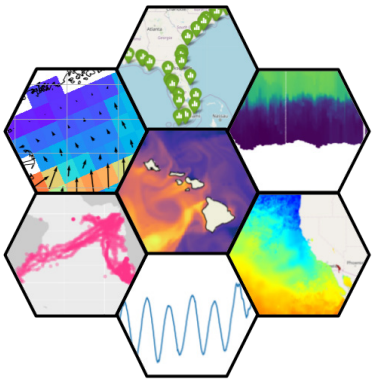
Goal 2. Deliver standardized, reliable, and accessible data.



Background: Ocean, coastal, and Great Lakes data are produced by a complex network of public and private partners. The IOOS Regional Associations prioritize local and regional needs while supporting national observing programs and are certified to meet federal standards for data and management to ingest, store, and host data from buoys and moorings, HFR, underwater gliders, and even animal-equipped oceanographic sensors. IOOS national data management activities include assimilating these data at a national scale, operating Data Assembly Centers for specific data types, and long-term archiving. Collectively, IOOS data are provided at both national and regional scales via standard web services allowing for interactive maps and applications, and individual Regional Association portals. Regardless of the data source, IOOS strives to ensure that all data deliver the information that end-users and stakeholders trust and value by being clearly attributable, meeting FAIR data standards (findable, accessible, interoperable, and reusable), and endeavoring to meet CARE data principles (Collective Benefit, Authority to Control, Responsibility, and Ethics).

Goal 2 Driver: Ocean, coastal, and Great Lakes data come in many formats from a variety of platforms and sensors and are available through a number of web-based sites. IOOS strives to simplify and streamline integrated data access and discovery by providing data sources at regional and national scales.

Objective 2.1 Promote standardization, automation, discovery, and equitable access of data across the ocean enterprise where IOOS connects private and public data providers, data consumers and distributors, academia, industry and the public to create a dynamic ocean data ecosystem that drives innovation, collaboration, and commerce.



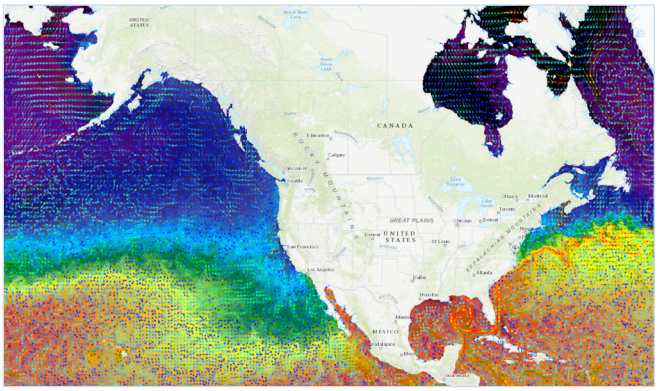
Objective 2.2 Strengthen data stewardship to improve data quality, access, attribution, exchange, delivery, and storage across Federal agencies and regional partners.

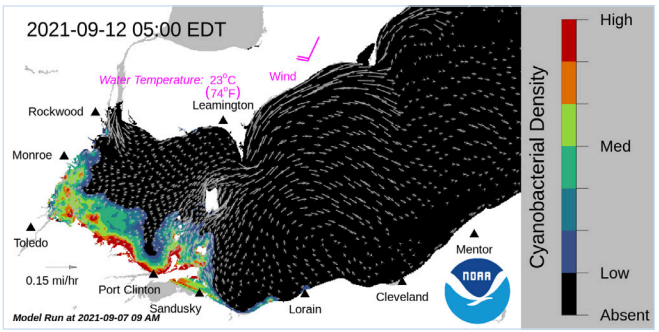
Objective 2.3 Provide data services at the regional level through trusted, certified regional data centers to increase the availability, interoperability, and use of high-quality data.

Objective 2.4 Support the ongoing maintenance and operation of data management systems to sustain long-term data stewardship.

Objective 2.5 Create, maintain, and expand the capacity of functional data assembly centers as go-to data sources through collaboration between IOOS, National Data Buoy Center, National Centers for Environmental Information, and other partners.

Goal 3. Support model predictions that address a wide range of user requirements.





Background: Users desire forecasts and predictions so they can plan and adapt to changes. Models aid our understanding of ocean circulation and properties over various timescales and provide the ability to predict conditions and events. Modeling and analysis are an integral part of IOOS because they allow for the interpolation, interpretation, and prediction of the environment, which are especially valuable when available observations are limited or a synoptic perspective is required. IOOS regional models integrate cross-disciplinary, cross-platform data from diverse partners to improve predictions of ocean, coastal, and Great Lakes phenomena. Many of the IOOS Regional Associations support modeling efforts for maritime commerce and safety, ecological forecasting, and water levels by providing an important link between NOAA, Federal partners, and regional modeling capabilities.

Sustained development of modeling capabilities and the application of models to enhance the design and operation of observing systems is a vital component of a truly integrated system. IOOS' modeling efforts support interoperability and serve to efficiently integrate systems across disciplinary boundaries by aligning with NOAA's Unified Forecast System (UFS), Earth Prediction Innovation Center (EPIC), and the National Ocean Service (NOS) Modeling Vision. IOOS is bridging the gap between ocean, atmospheric, and terrestrial systems through model integration involving riverine inputs, currents, storm surge, and coastal inundation.

Goal 3 Driver: On their own, observations data do not go far enough to address stakeholder needs for actionable information. Numerical modeling bridges the divide between data and information by extracting relevant information for end-users, informing modelers on tool accuracy, and allowing resource managers to design optimal observing systems. IOOS supports a vibrant modeling community devoted to innovating models that link coastal and global phenomena.

Objective 3.1 Continually develop and sustain research and community models and model-based products to provide state-of-the-art information needed by regional stakeholders.

Objective 3.2 Transition modeling innovations from the research community into operations through the Coastal and Ocean Modeling Testbed (COMT) and/or Regional Associations as demonstration environments and proving grounds.

Objective 3.3 Assess model skill and advance data assimilation through data delivery, technical advancement, and regionally led research to improve model accuracy.

Objective 3.4 Advance modeling approaches to inform decisions on the design and implementation of optimal observing systems and maximize the use of regional observations.

Goal 4. Provide integrated, user-driven products and tools.

Background: IOOS supports science and services that are open, accessible, and extensible. IOOS operates and maintains a growing suite of portals and visualization tools to translate data into usable products to promote data analysis and support decision-making. The COORA Act recognized the responsibilities of the IOOS Program Office to work with the IOOS Regional Associations to develop products for decision makers with respect to weather, search and rescue, water quality monitoring, and HABs. Regional Associations work with local stakeholders to understand how and why they use information and to create data products that are accessible and easy to use. Regional products support preparedness and response to hurricanes, hypoxia, HABs, red tide, oil and other hazardous marine spills, and other water quality criteria enabling everyday decision making. Wind, wave, current, and water-level forecasts support safe and efficient transportation, navigation, and marine commerce. Identifying and understanding ocean variability, chemistry, and upwelling hot spots allows resource managers and industry to make informed decisions. Biodiversity and animal movement products support ecosystem assessments, management and use, sanctuary condition reports, fish stock assessments, and compliance with protected species laws. The NOAA Service Delivery Framework supports the IOOS Program Office's efforts to operate these ocean, coastal, and Great Lakes products and tools, which also forwards the Nation's commitment to the United Nations Decade of Ocean Science to deploy solutions for sustainable ocean development.

Goal 4 Driver: The translation of observations into meaningful information and products requires the integration of variable, complex data and models with a focus on stakeholder requirements.

Users with regionally or topically specific needs often require focused, integrated, user-friendly decision support tools.

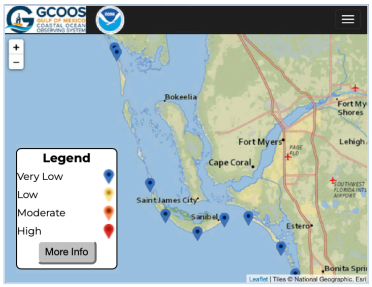
Objective 4.1 Develop regionally relevant, user-driven analysis, decision-support, and visualization products and tools to address historic and emerging stakeholder requirements.

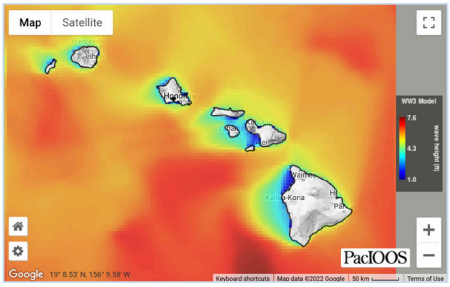
Objective 4.2 Generate and disseminate pan-regional products and tools to respond to environmental issues and seasonal hazards that span larger areas and ecosystems.

Objective 4.3 Create national products that incorporate cross-disciplinary data to provide a single, user-friendly access point to integrated information.

Objective 4.4 Promote IOOS products on international and cross-institutional scales to optimize usage and relevance.

Objective 4.5 Understand the economic value of IOOS data and information to enable communication about the benefits of the observing systems and tools.





Goal 5. Increase the reach and effectiveness of IOOS through partnerships, stakeholder engagement, and investment in Enterprise excellence.

Background: IOOS is a "system of systems" that links local and regional coastal, ocean, and Great Lakes observations to the national and global level through the IOOS Program Office, the IOOS Regional Associations, the IOOC, and the GOOS. To ensure partners effectively contribute to IOOS and link to other national and global observation systems, IOOS maintains strong connections to, and understanding of, our partners. IOOS works collaboratively within NOS, across other NOAA line offices, and with the IOOC agencies to coordinate efforts, share information, and address changing observing requirements. To fulfill the need for ocean, coastal, and Great Lakes information, IOOS pursues outreach and education to new audiences, including Federal, state, and local governments, tribal communities, private and nonprofit sectors, and academia to fill gaps, develop information products, address emerging needs, and promote the use of IOOS data.

Goal 5 Driver: IOOS partners are distributed across Federal and state agencies, non-governmental organizations, and private industries around the country. Coordination and communication are essential for success. IOOS relies on balanced and robust partnerships built on trust and a shared mission. We work closely with the national network of Regional Associations to develop and nurture these relationships on a regional and national level. Underserved communities must be engaged in the co-design of observing systems and tailored products to ensure that all have access to information and tools needed to fully prepare for and respond to coastal change. As stakeholder needs evolve over time, partnerships must remain nimble and transparent through effective communications and engagement to remain a cohesive and effective Enterprise.

Objective 5.1 Engage in continuous dialog with partners, including historically underrepresented communities, to gather feedback and refine requirements for IOOS products and services.

Objective 5.2 Increase the operational efficacy of Federal, state, and other partner investments to support regional, national, and global activities and innovative research.

Objective 5.3 Expand and strengthen the network of partnerships, especially industry and Federal partners, to innovate ocean observations and information products.

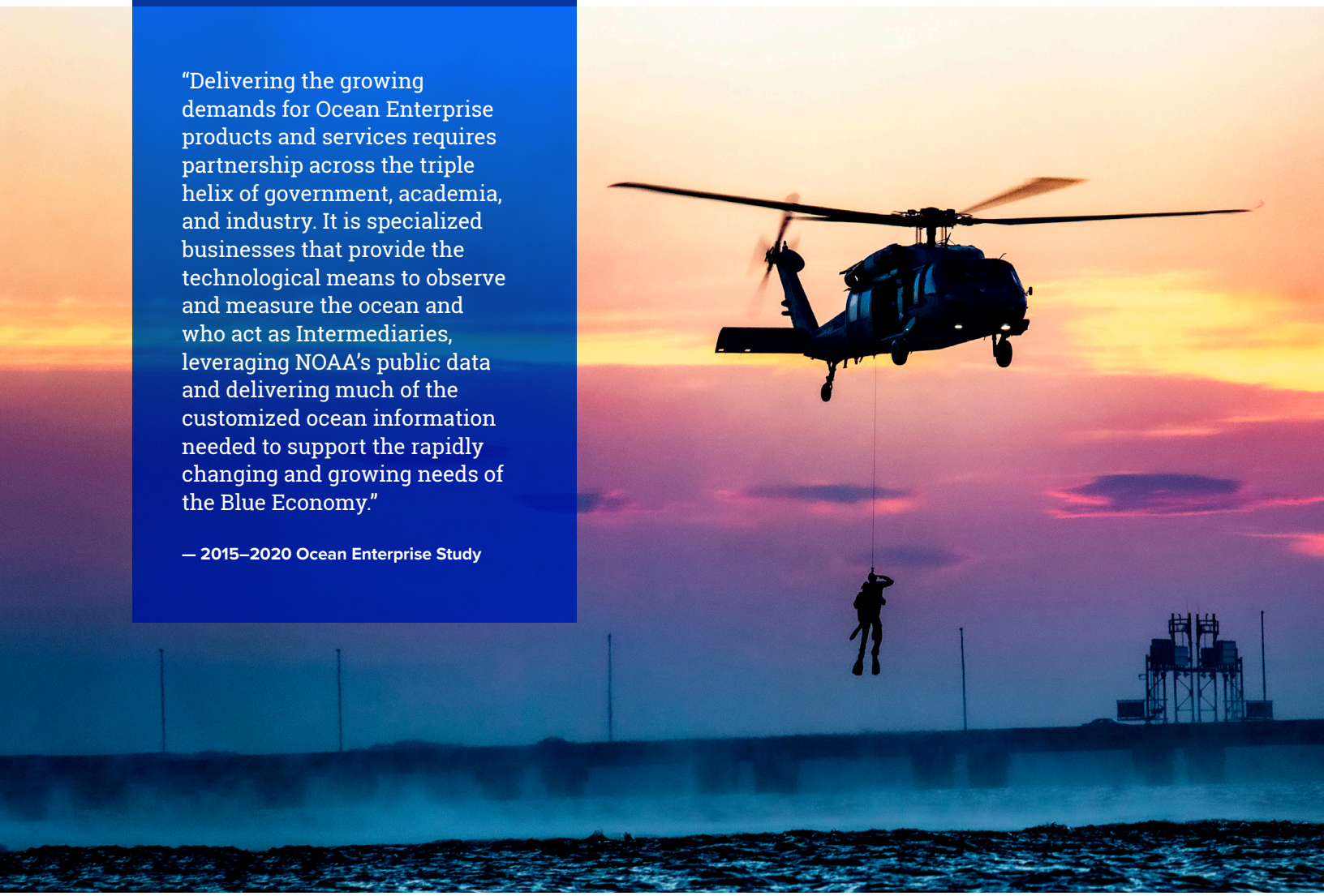
Objective 5.4 Empower communities of practice to expand observing capabilities and expertise.

Objective 5.5 Foster the next generation of science, technology, engineering, and math specialists through targeted education, training, and research opportunities.

Objective 5.6 Elevate outreach and engage new audiences to convey the societal and economic value of sustained ocean, coastal, and Great Lakes observing systems.

"Delivering the growing demands for Ocean Enterprise products and services requires partnership across the triple helix of government, academia, and industry. It is specialized businesses that provide the technological means to observe and measure the ocean and who act as Intermediaries, leveraging NOAA's public data and delivering much of the customized ocean information needed to support the rapidly changing and growing needs of the Blue Economy."

— 2015–2020 Ocean Enterprise Study



Appendix 1. Core Variables

A list of coastal and ocean variables to be measured, integrated, and coordinated across observing systems was developed early in the formation of IOOS[1] to allow users to simultaneously exploit multiple datasets. This list has been expanded over time[2] to include the following 34 core variables required to detect and predict changes in the ocean:

IOOS CORE VARIABLES

PHYSICS

Bathymetry
Bottom character
Currents
Heat flux
Ice distribution
Salinity
Sea level
Surface waves
Stream flow
Temperature
Wind speed and direction

BIOGEOCHEMISTRY

Acidity
Colored dissolved organic matter
Contaminants
Dissolved nutrients
Dissolved oxygen
Ocean color
Optical properties
Pathogens
Partial pressure of carbon dioxide
Total suspended matter

BIOLOGY & ECOSYSTEMS

Biological vital rates
Nekton diet
Sound
Species and abundance of:

- Coral
- Fish
- Invertebrates
- Marine mammals
- Microbes
- Phytoplankton
- Zooplankton
- Sea birds
- Sea turtles
- Submerged aquatic vegetation

Appendix 2. References

IOOS' efforts support interoperability and serve to efficiently integrate systems across disciplinary boundaries by aligning with other NOAA and Federal Partner efforts, including:

- NOAA Unified Forecast System (UFS) Strategic Plan 2021–2025
- NOAA Earth Prediction Innovation Center (EPIC) Strategic Plan 2020–2025
- NOAA National Ocean Service (NOS) Modeling Vision
- 2015–2020 Ocean Enterprise Study
- U.S. Department of Commerce's 2022–2026 Strategic Plan
- NOAA FY22-26 Strategic Plan
- NOS FY24-28 Strategic Plan

Appendix 3: Endnotes

1. Toward a U.S. Plan for an Integrated, Sustained Ocean Observing System from 1999
2. Updated list includes Biological Integration and Observing (BIO) Task Team recommendations from 2016
3. OECD (2016), *The Ocean Economy in 2030*, OECD Publishing Paris.
4. World Bank Definition: The Blue Economy is sustainable use of ocean resources for economic growth, improved livelihoods and jobs, and ocean economic health.
5. National Research Council. 2003. *Fair Weather: Effective Partnership in Weather and Climate Services.* Washington, DC: The National Academies Press.

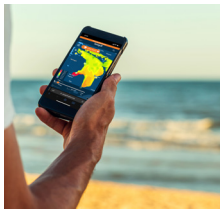
Appendix 4. Definitions

- Ocean Economy. The sum of the economic activities of ocean-based industries, together with the assets, goods and services provided by marine ecosystems.
- Marine Economy. The quantitative assessment of the U.S. Ocean Economy, comprising the economic contributions of multi-sector ocean and coast-related activities.
- Blue Economy. The sustainable, equitable and socially inclusive use of ocean and Great Lakes resources to benefit economies, livelihoods and ocean ecosystem health.
- Ocean Enterprise. All entities in the public, private, non-profit, research and academic sectors that provide infrastructure and capacity for ocean observation, measurement and forecasting, or who deliver operational ocean information products and services.

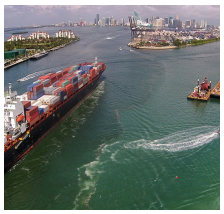
Appendix 5: Photo Credits

Front cover and back cover. American Samoa. Photo credit: PacIOOS

Page 4. IOOS Regional Associations. Photo credit: U.S. IOOS Office. U.S. IOOS Office



Page 5. IOOS Great Lakes Seagull app. Photo credit: GLOS. Used with permission.



Page 5. Port of Miami. Photo credit: SECOORA. Used with permission.

Page 6. CeNCOOS HFR. Photo credit: CeNCOOS. Used with permission.

Page 6. IOOS ATN Turtle. Photo credit: U.S. IOOS Office. Used with permission.

Page 6. NOAA Aquaculture. Photo credit: NOAA. Used with permission.

Page 6. NOAA Ocean Gliders. Photo credit: NOAA. Used with permission.

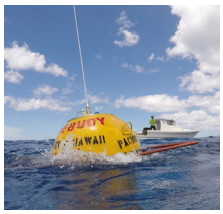
Page 6. PacIOOS Indigenous Partners. Photo credit: PacIOOS. Used with permission.

Page 6. MBON Tagged Seals. Photo credit: MBON. Used with permission.

Page 6. NOAA Ship. Photo credit: NOAA. Used with permission.

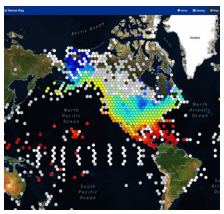
Page 7. GLOS HFR. Photo credit: GLOS. Used with permission.

Page 7. NOAA Ocean Glider. Photo credit: NOAA. Used with permission.

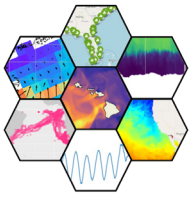


Page 8. PacIOOS Wave Buoy. Photo credit: PacIOOS. Used with permission.

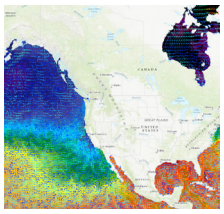
Page 8. IOOS ATN Turtle. Photo credit: U.S. IOOS Office. Used with permission.



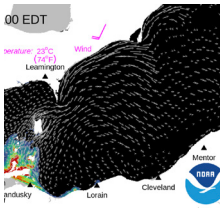
Page 9. IOOS Environmental Sensor Map. Photo credit: U.S. IOOS Office. Used with permission.



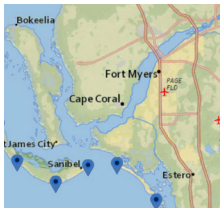
Page 9. IOOS CodeLab. Photo credit: U.S. IOOS Office. Used with permission.



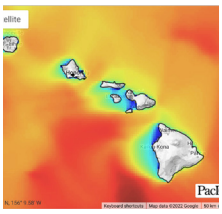
Page 10. EDS Water Temp and Currents. Photo credit: U.S. IOOS Office. Used with permission.



Page 10. Forecasted surface bloom in Lake Erie. Photo credit: NCCOS. Used with permission.



Page 11. GCCOOS HABscope. Photo credit: GCOOS. Used with permission.



Page 11. PacIOOS Wave Tool. Photo credit: PacIOOS. Used with permission.

Page 11. SECOORA ShellCast. Photo credit: SECOORA. Used with permission.

Page 12. USGS Sallenger. Photo credit: USGS. Used with permission.

Page 12. BOEM Offshore Wind. Photo credit: BOEM. Used with permission.

Page 13. Search and rescue exercise in Norfolk, Va. Photo credit: Navy. Used with permission.

Appendix 6. Revision History (Chronological)

6.1 Revision Process. To ensure relevance, accuracy, and utility, the U.S. IOOS Office will review this document; major legislation, budget, technological, and/or administration changes; and other relevant documents approximately every one year. Updates to the U.S. IOOS Strategic Plan will be made as needed, and captured in Appendix 6.2 (below).

6.2 Revision History (Chronological)

- January 19, 2024. Updated title with the date of the most recent update.
- December 12, 2023. Appendix 4 was added to clarify definitions of Blue Economy and related terms.
- December 12, 2023. Appendix 6 was included to summarize changes to the 2023 refresh of the U.S. IOOS Enterprise Strategic Plan.
- December 12, 2023. A new Letter from the Director was provided to communicate current status.
- December 12, 2023. The foreword was updated to communicate current status and note alignment with NOS, NOAA, and DOC plans.
- December 12, 2023. Objective 1.5 was added to show increased focus on marine life.
- March 12, 2024. Appendix 5 photo credit was updated to American Samoa and included the link to the image.

Our Eyes on the Ocean, Coasts, and Great Lakes

IOOS
Integrated Ocean Observing System

U.S. Integrated Ocean Observing System
1315 East-West Highway, 2nd Floor
Silver Spring, Maryland 20910
ph: +1 (240) 533-9444
ioos.noaa.gov | noaa.ioos.webmaster@noaa.gov

VER. 1.0.1