

NOAA INTEGRATED OCEAN OBSERVING SYSTEM (IOOS) PROGRAM



STRATEGIC PLAN 2008 - 2014

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NOAA IOOS PROGRAM STRATEGIC PLAN 2008 - 2014

INTRODUCTION

The National Oceanic and Atmospheric Administration's (NOAA's) contributions to the U.S. Integrated Ocean Observing System (IOOS) are distributed across the agency and around the country, presenting significant programmatic and technical integration challenges. Recognizing the need for a more formalized, programmatic structure that can address these challenges and manage the transition toward an integrated, cohesive system, NOAA established a new program within its National Ocean Service to serve as the overall point of contact and to provide a consistent management function for NOAA's IOOS activities.

The NOAA IOOS Program (the Program), in collaboration with partners from all NOAA Line Offices, Office of Program Planning and Integration, and Budget Office, initiated a strategic planning process in May 2007 to establish a long-term vision and mission for the Program, as well as a clear set of goals and objectives to advance NOAA's contributions to the U.S. IOOS. This strategic plan focuses on the NOAA IOOS Program's contributions to the broader U.S. IOOS effort. It serves as a working document for the NOAA IOOS Program to orient programmatic direction and to guide activities within the scope of NOAA's missions and within the context of the larger U.S. IOOS. The plan by design includes more detail than most classical strategic plans. While established programs may not require additional context to explain their goals and objectives, it was important for this strategic plan to articulate the purpose of each goal and specific actions needed to achieve defined objectives.

The strategic plan complements IOOS guidance documents, such as the First U.S. IOOS Development Planⁱ and US Strategic Plan for the Integrated Earth Observation System (IEOS),ⁱⁱ and builds on the Draft U.S. IOOS Strategic Plan developed by the Interagency Working Group on Ocean Observations (IWGOO).ⁱⁱⁱ Because no single agency has the capacity or resources to fully implement U.S. IOOS, this plan does not directly address all aspects of U.S. IOOS development.

The Program will evaluate progress annually and revisit its strategic goals and objectives within 3 years as the distributed program implementation structure and benefits are tested. This mid-term review will allow the Program to align efforts with potential administration and legislative changes, and associated priority shifts, as well as the more comprehensive funding requests advanced through NOAA's annual Planning, Programming, Budgeting, and Execution System (PPBES) process.

VISION

A fully integrated ocean observing system that enables NOAA and its partners to provide service to the nation through improved ecosystem and climate understanding; sustained living marine resources; improved public health and safety; reduced impacts of natural hazards and environmental changes; and enhanced support for marine commerce and transportation.

MISSION

Lead the integration of ocean, coastal, and Great Lakes observing capabilities, in collaboration with federal and non-federal partners, to maximize access to data and generation of information products, inform decision making, and promote economic, environmental, and social benefits to our nation and the world.

GOALS AND OBJECTIVES

- Goal 1:** Improve access to high-quality, integrated data.
- Goal 2:** Enhance data products and decision-support tools.
- Goal 3:** Support NOAA and regional ocean observation capability.
- Goal 4:** Establish a functional management structure that addresses all aspects of NOAA IOOS.
- Goal 5:** Develop and implement cohesive NOAA IOOS Program planning.
- Goal 6:** Maximize societal and economic benefits of IOOS through targeted research, education, and training.
- Goal 7:** Coordinate communications and act as an information broker to facilitate NOAA's distributed implementation of IOOS.

Based on stakeholder input and internal assessments of current commitments, the NOAA IOOS Program has seven, outcome-oriented goals to guide its strategic direction. Each goal includes a description of its strategic context and objectives, and identifies the actions required to accomplish the objectives.

GOAL I: Improve access to high-quality, integrated data.

The integration of observing data enables more comprehensive views of ocean, coastal, and Great Lakes environments, and an increased understanding of their complex environmental conditions and processes. To effectively serve NOAA's broad mission responsibilities and range of constituents, the ocean observing data must be fully integrated, easily accessible, and made available in consistent and useful formats capable of serving a variety of end-user purposes.

The NOAA IOOS Program will test the efficacy and value of data integration through the construction of a Data Integration Framework (DIF), which will support the integration of a subset of oceanographic data for five core IOOS variables: temperature, salinity, sea level, currents, and ocean color. Data will be compiled from a variety of sources, including NOAA observing systems, Regional Coastal Ocean Observing Systems (RCOOSs), and other federal agencies and partners assisting in the development of the U.S. IOOS. The intent is to achieve rapid and routine operational access and use by NOAA product developers and other end users, and to establish data integration methodologies that the Program can apply to a broader suite of NOAA and non-NOAA data.

NOAA is committed to demonstrating an initial DIF capability as its first priority. However, to realize fully the value of IOOS, NOAA will need to integrate additional variables from both NOAA and non-NOAA data sources, and identify candidate decision-support tools and models that can be developed or improved through access to integrated data. NOAA continues to evaluate conceptual design studies prepared by industry, as well as work conducted internally within the agency, to determine the most appropriate and cost-effective system design and engineering approaches to advance IOOS beyond the DIF. This larger integration effort requires development of a transition plan with well-defined phases from the DIF to a more comprehensive NOAA contribution to the IOOS Data Management and Communications (DMAC) structure,^{iv} as described in the First U.S. IOOS Development Plan.

The integration of data from NOAA's many observing systems requires standards that will arrest the divergent evolution of legacy systems and enable seamless linkages to the larger U.S. Integrated Earth Observation System (IEOS) and Global Earth Observation System of Systems (GEOSS) data management efforts. Additionally, the data integration efforts must effectively align with the NOAA Global Earth Observation Integrated Data Environment (GEO-IDE)^v and the NOAA Target Architecture, developed by the NOAA Data Management Committee.

Objective 1.1. Advance NOAA IOOS efforts to deliver ocean observations in NOAA IOOS DMAC-compatible, standards-compliant form.

Activities:

- Increase NOAA's participation in open source standards activities, such as the Federal Geographic Data Committee (FGDC), International Organization for Standardization (ISO), Open-source Project for a Network Data Access Protocol (OPeNDAP), and Open GIS Consortium (OGC).

- Support implementation of data standards through coordination with national and international standards bodies within the U.S. IOOS, Global Ocean Observing System (GOOS), GEOSS, and data management communities.
- Work with the larger U.S. IOOS community to identify, evaluate, and implement additional or emerging standards needed to maintain data management system performance.

Objective 1.2. Integrate NOAA data across multiple systems, platforms, and structures.

Activities:

- Prioritize IOOS core variables for integration based on NOAA’s model and data product requirements.
- Identify sources, conditions, formats, and transfer protocols of IOOS variables across NOAA and establish functional and quality requirements to achieve system interoperability and access to distributed data.

Objective 1.3. Utilize systems engineering planning to establish an operational NOAA IOOS DIF.

Activities:

- Build upon industry conceptual designs and internal NOAA efforts to initiate integrated system engineering planning for data management across NOAA and regional partners, including timelines, projected costs, and phased implementation.
- Develop transition plan to advance from DIF Initial Operating Capability to achieve a more comprehensive NOAA contribution to IOOS DMAC.

Objective 1.4. Integrate non-NOAA data into the NOAA IOOS DIF.

Activities:

- Support development and implementation of regional DMAC plans.
- Work through existing regional management structures to identify and enable collection of high-priority, quality-controlled data from sub-regional and regional systems into the NOAA IOOS DIF.
- Establish data sharing agreements with other federal and international partners to advance development of the U.S. IOOS.

Objective 1.5. Adopt a service-oriented architecture and Web services-based approach for access to data by NOAA IOOS partners and the public.

Activities:

- Define user interface requirements (such as search and discovery functionality) to ensure rapid, efficient extraction of subset information from various IOOS data sources.
- Establish a service-oriented architecture that allows seamless integration of various data sources.

- Develop system interfaces to support NOAA's, and its partners,' needs for integrated data and information.
- Coordinate with NOAA Observing Systems Council (NOSC) Data Management Committee to maximize consistency between DIF and implementable GEO-IDE features.

GOAL 2: Enhance data products and decision-support tools.

Ocean observing programs within NOAA and its partners are responsible for developing models and other decision-support tools and products to support their missions. Data mining and integration are often first steps for many of these ocean and coastal modeling efforts, and they frequently require considerable time and resources. In addition, user communities may not be aware of, nor have access to, the full suite of ocean observations available to maximize model and other data-product functionality. The NOAA IOOS Program seeks to enhance data product development and operation by providing access to a broad array of integrated data sets (see Goal 1). It will also support the testing and evaluation of integrated data to enhance data products and decision-support tools, and will work with other NOAA programs to sponsor the development of innovative applications that cannot be advanced through existing program structures.

The NOAA IOOS data integration efforts will adhere to a requirements-based approach that prioritizes the broad suite of potential variables to develop critical products and services. Much of this information already exists in the NOAA Observing System Architecture (NOSA), which provides a comprehensive list of requirements from NOAA-owned, -operated, and -funded observation and data management capabilities. The NOAA IOOS Program will extract all relevant requirements and work with the NOSC, NOAA product developers, and end users to gather additional detail to ensure that development efforts are as effective as possible in advancing or improving critical NOAA products and services.

Objective 2.1. Identify, prioritize, and baseline NOAA data products and models to be enhanced through improved access to integrated data.

Activities:

- Work with NOAA IOOS stakeholders to develop a requirements-based process to set priorities on NOAA data products and other decision-support tools for enhancements.
- Identify the data variables and associated requirements (such as temporal, spatial, and quality) needed to improve performance of selected data products and other decision-support tools.
- Support incorporation of new and integrated data streams into existing NOAA products.
- Demonstrate benchmarked improvements of data products and other decision-support tools and increased access to NOAA data to characterize the value added from integration of additional data sources.

Objective 2.2. Sponsor regional development and NOAA partnerships to support integrated data systems, products, and technology applications for operational use.

Activities:

- Work with regional partners to sponsor observing system, data management, and product development activities that meet local needs and contribute to broader NOAA and U.S. IOOS efforts.
- Sponsor applied research in NOAA Research Laboratories, NOAA-supported Cooperative Institutes, and other partners to resolve IOOS technical and data challenges that impede regional product development.
- Utilize existing programs (such as Small Business Innovation Research and National Oceanographic Partnership Program proposals) to support IOOS “research to operations.”
- Coordinate transition of research to operations for proven technologies, including documentation, reviews, and current and future funding requirements.

GOAL 3: Support NOAA and regional ocean observing capability.

NOAA’s observing system contributions to the U.S. IOOS include capabilities developed and maintained by programs across the agency and 11 IOOS Regional Associations. The NOAA IOOS Program is uniquely positioned to look across NOAA’s IOOS contributions to monitor status and interactions among agency-wide observing systems and data centers, and to synchronize development of NOAA IOOS with non-NOAA contributions through common data standards and improved data access. In addition, the Program will add value to NOAA’s ocean observing investments by increasing the availability and utility of resulting data and information resources. By supporting development of national and regional gap analyses, the Program will provide additional information to validate observing requirements. This information will be used in future budget requests to justify high-impact investments that will advance NOAA and regionally based ocean observing capability.

These analyses of NOAA’s IOOS contributions will balance the need to address critical gaps in coverage and promote innovation with the need to sustain operation and maintenance of existing systems. The NOAA IOOS Program will advocate for focused, observing system enhancements and maintenance through NOAA’s annual PPBES process, in conjunction with other partners charged with NOAA IOOS implementation responsibilities. The Program will also support the evaluation of new observing technologies that can complement or expand coverage of existing NOAA or regional observing systems to serve NOAA mission priorities.

Objective 3.1. Support the continued advancement of NOAA’s IOOS capability.

Activities:

- Conduct comprehensive, agency-wide and regional observation gap analyses to characterize current ocean observation conditions and direct future investments.
- Conduct competitive selection activities and other transparent procurement processes to build and sustain ocean observation capabilities that address identified gaps.
- Support methodologies, such as Observing System Evaluations (OSEs) and Observing System Simulation Experiments (OSSEs), to identify data and observation gaps and determine the optimal infrastructure.

Objective 3.2. Monitor and manage development of NOAA IOOS observation, DMAC, and modeling and analysis sub-systems^{vi} to ensure they operate as a cohesive system.

Activities:

- Implement the standards identified and vetted through the U.S. IOOS DMAC process.
- Coordinate, in partnership with the IWGOO and Ocean.US, with NOAA and non-NOAA observing communities and partners to develop and implement data standards and data-access mechanisms for incorporating data streams and promoting development of a U.S. IOOS.
- Coordinate with NOAA and non-NOAA instrument developers to identify standards for incorporating new sensors into existing and emerging observing systems.

Objective 3.3. Sponsor applied research and testing of emerging ocean observation technology to meet NOAA mission requirements for IOOS.

Activities:

- Characterize requirements and gaps in observing technologies to guide NOAA's investments in innovative research and technology.
- Support verification and validation of existing and emerging technologies that address gaps, including those in information technology.
- Transition proven technologies from research into the U.S. IOOS operational system.

GOAL 4: Establish a functional management structure that addresses all aspects of NOAA IOOS.

NOAA's institutional structures (programs, Line Offices, mission goals, and NOAA Regional Teams) result in a complex distribution of coastal and ocean observing, data management, and modeling and analysis activities across the agency. In addition, its investments in regional coastal ocean observing systems and support services represent another level of distributed activities that are external to the agency, but must be accommodated within NOAA's IOOS management structure. The distributed nature of NOAA's IOOS-related activities requires a functional management structure to coordinate across institutional lines and with regional partners; assimilate NOAA's IOOS contributions into a seamless, cohesive system; and plan for future IOOS development.

Regional observing systems and corresponding regional management structures provide a vital and vast network for expanding the geographic coverage of NOAA's IOOS contributions, ensuring a strong end-user focus and connection, and identifying and prioritizing local needs for ocean and coastal data and products. Regional observing systems will retain a level of autonomy to define and target requirements specific to their areas of the country, but they will be expected to adhere to national guidelines and standards to ensure a seamless contribution to the U.S. IOOS. The NOAA IOOS Program will support the development of regional observing systems and management structures by providing clear statements of requirements, administering regional funding, and sharing some long-term sustainment costs.

To ensure an effective contribution to U.S. IOOS, as well as other national and global observation systems, the NOAA IOOS Program will maintain strong connections to and understanding of other federal agency contributions and related international efforts. NOAA will continue to work through existing bodies charged with coordinating across the participating federal agencies (such as IWGOO, U.S. Group on Earth Observations (US GEO), and Ocean.US) to facilitate the necessary communication and partnerships. It will also work closely with NOAA's Climate Program Office to maintain connections to and consistency with global efforts to advance the Global Ocean Observing System (GOOS) and GEOSS.

Objective 4.1. Define roles and responsibilities to facilitate coordinated evolution of IOOS in NOAA.

Activities:

- Define and formalize the roles, responsibilities, and management structure associated with NOAA's distributed IOOS implementation structure.
- Determine required connections to and coordination with NOAA's other, cross-agency integration efforts, such as NOAA Integrated Ocean and Coastal Mapping and Integrated Ecosystem Assessments.

Objective 4.2. Sustain regionally based management of sub-regional observing systems to maximize contributions to the U.S. IOOS.

Activities:

- Establish a process to support sustained management of regional observing systems.
- Implement a competitive, performance-based funding process for sub-regional observing systems that meets priority NOAA, regional, and U.S. IOOS needs.
- Support establishment of guidelines to RCOOSs to increase collaboration and establish common operating practices, where necessary.
- Provide guidelines and technical assistance to regional observing systems to implement the standards and protocols required to contribute data to the NOAA IOOS DIF.

Objective 4.3. Coordinate NOAA's interagency and international IOOS activities.

Activities:

- Maintain consistent participation in established governance bodies charged with oversight of the U.S. IOOS and international IOOS activities, such as the IWGOO, Ocean.US, and US GEO.
- Continue to lead the IWGOO and provide support to the Ocean.US interagency planning office.

GOAL 5: Develop and implement cohesive NOAA IOOS Program planning.

The distributed nature of IOOS activities across NOAA increases the risk of uncoordinated planning and development, primarily because of varied priorities and timelines associated with NOAA partners (such as Line Offices, other programs, and regions), as well as other federal, regional, academic, and private-sector partners. It is often difficult for internal and external resource analyses or oversight functions to identify critical connections among such distributed efforts. Amplifying this difficulty are inevitable changes in the technical, budgetary, and environmental climates, as well as updated legislative and fiscal guidance that frequently occur between program development and the execution of appropriated funding. These changes can affect NOAA's ability to deliver on planned activities in a given year, and require flexibility and close coordination with NOAA's IOOS partners to revise initial approaches and coordinate milestones and performance metrics that demonstrate progress to NOAA's and other federal agencies' leadership and budget examiners.

Because funding for the IOOS regional component is contained within the NOAA IOOS Program's budget, the region's needs and contributions must be well understood and articulated within NOAA planning documents. The IOOS Regional Associations and RCOOSs are in the process of preparing business plans, conceptual designs, and DMAC plans to advance more structured and cohesive development strategies in the regions. The National Federation of Regional Associations (NFRA) will work with the regions to transform these documents into regional implementation plans that can inform NOAA planning efforts and communicate needs and priorities to other federal agencies via Ocean.US and IWGOO. The NOAA IOOS Program will work with NFRA to ensure that these plans are considered in NOAA IOOS planning, both to assist NOAA IOOS system engineering and DMAC efforts, and to ensure that internal and external oversight bodies can easily trace connections between the regional requirements and activities and NOAA's internal IOOS contributions.

The NOAA IOOS Program will provide a structure that accommodates and coordinates across internal and external planning structures and timelines, both for long-term planning and annual execution activities. This structure will include the establishment of shared performance goals, measures, and reporting activities, which will highlight the distributed nature of this undertaking and interconnectedness of the various components. The development of shared performance goals and reporting will also facilitate communication and coordination with NOAA's IOOS goals and programs, and regional ocean observing activities.

Objective 5.1. Coordinate and align NOAA's IOOS-related inputs into the PPBES process.

Activities:

- Establish processes and timelines to coordinate advanced planning for NOAA PPBES to ensure IOOS priorities are captured in planning and guidance documents, make the best use of distributed capacities and capabilities, and maintain traceable connections across programs and goals.
- Develop integrated program planning, programming, and budget narratives that support a unified approach to NOAA IOOS development.

- Incorporate input from regional planning and interagency collaboration into NOAA planning efforts, ensuring that significant relationships and contributions are reflected in the PPBES process.
- Synchronize annual execution and reporting activities with NOAA IOOS partners by coordinating development of IOOS-related milestones and performance measures captured in Line Office and program Annual Operating Plans.

Objectives 5.2. Establish shared performance goals and achievable measures with NOAA IOOS contributors and other federal and regional partners.

Activities:

- Develop a common set of performance goals and measures with NOAA IOOS and other federal and regional partners.
- Create a process for integrating performance measures into the annual and PPBES reporting structures, and report progress consistently in both the Line Office and program Annual Operating Plans.

GOAL 6: Maximize societal and economic benefits of IOOS through targeted research, education, and training.

NOAA’s IOOS Program will support efforts to characterize the benefits of IOOS, as a means of gauging overall impact, benefit, and return on investment. NOAA’s partnership with the National Ocean Economics Program (NOEP), for example, provides valuable baseline data for measuring the economic and socio-economic impact of NOAA IOOS investments. This information is critical for measuring performance. However, societal benefits cannot be fully realized if stakeholder communities do not understand how to apply the data and information to support decision making. It is important that the NOAA IOOS Program develop and maintain a strong linkage to NOAA’s education program to develop activities that utilize IOOS data.

The America COMPETES Act (Public Law 110-69) gives broad authority to NOAA for education. The NOAA IOOS Program will develop targeted partnerships and funding strategies with other NOAA offices and programs to address NOAA’s formal and informal education needs for IOOS. For example, the NOAA Office of Education and other programs, such as the National Estuarine Research Reserve System (NERRS), National Marine Sanctuary Program (NMSP), and NOAA Sea Grant, have significant expertise in the design and delivery of education and training. NOAA IOOS will partner with these and other NOAA education programs to understand the needs of users and educate user communities on the application of IOOS products and services. The Program will also work with these groups to develop products, services, and training modules needed to develop and sustain a skilled workforce that can maintain and enhance NOAA’s ocean observing systems.

Objective 6.1. Support socioeconomic studies to document benefits derived from IOOS implementation.

Activities:

- Identify socioeconomic research needed to characterize and monitor benefits of IOOS development.
- Initiate studies to determine the benefits and economic value of IOOS data integration, tools, and applications.

Objective 6.2. Partner with NOAA’s Education Council to deliver IOOS-related education programs and activities that meet NOAA and U.S. IOOS education goals.

Activities:

- Identify existing, IOOS-related education products and services to gauge current capacity and frame future IOOS needs and priorities for education.
- Partner with the NOAA Office of Education to identify collaborative approaches and available mechanisms (such as NERRS and NMSP) to address IOOS education needs.
- Create an IOOS Education Plan that clearly articulates the role and future direction of education efforts within the NOAA IOOS Program and the regions.

Objective 6.3. Build capacity and support training elements within NOAA and external partner communities to apply IOOS data and products.

Activities:

- Conduct focused stakeholder needs assessments to determine priorities for IOOS products and services.
- Support the development of training materials needed to support full application of IOOS data products and tools.
- Partner with the Regional Associations, Sea Grant, NOAA Coastal Services Center, and other groups to train NOAA staff and partners to access and apply IOOS data and decision-support tools.
- Provide access to training opportunities to ensure operational observing technical staff understand how to fully utilize newly implemented observing technologies.

GOAL 7: Coordinate communications and act as an information broker to facilitate NOAA's distributed implementation of IOOS.

The NOAA IOOS Program is uniquely positioned to function as an information broker that ensures IOOS requests will be properly addressed by NOAA or external IOOS partners. The Program will develop a communications plan that includes core messages to be conveyed to partners and end-users, both internal and external to NOAA, as well as a description of planned delivery mechanisms and other outreach activities.

To effectively serve in the role of information broker, the Program will need to include a comprehensive effort to remain informed on all NOAA IOOS-related activities, including regional and international. Stakeholder needs assessments will also be required to understand the current and future needs of NOAA’s user communities and to communicate those needs to offices across the agency. NOAA’s approach to IOOS development will be sufficiently flexible

to accommodate these future needs and to build on significant state and local observing investments, thereby promoting a more effective contribution to the national system.

Objective 7.1. Initiate comprehensive and continuous communication efforts, both internal and external to NOAA.

Activities:

- Communicate roles and responsibilities of the NOAA IOOS Program to NOAA, regional, and external IOOS communities.
- Develop a communications plan, including core messages and target audiences, to guide how the NOAA IOOS Program and partners communicate with key internal and external stakeholder groups.
- Work through the NOAA Office of Legislative Affairs, Budget Office, and NOS Program Planning and Analysis Division to facilitate communication with the U.S. Congress.

Objective 7.2. Provide consistent liaison between NOAA and non-NOAA providers and users of IOOS data and products to develop necessary connections and address user requests for data, products, and services.

Activities:

- Initiate targeted discussions with partners at meetings and conferences to ensure information on products and services is widely disseminated.
- Develop Web-based tools to facilitate information dissemination.

CONCLUSION

The NOAA IOOS Program's Strategic Plan is the result of a cross-NOAA collaboration to orient programmatic direction and guide activities toward seven, high-level goals that advance NOAA's contributions to the U.S. IOOS. The strategic plan will be used to communicate the Program scope and major activities to U.S. IOOS partners, and provide the overall direction from which NOAA will develop more detailed, annual implementation plans. The Program will evaluate progress annually and revisit its strategic goals and objectives within 3 years as the distributed program implementation structure and benefits are tested.

The vision of IOOS is to provide continuous, integrated data on our open oceans, coastal waters, and Great Lakes in the formats and at the rates and scales required to support the information needs of government, environmental managers, scientists, business, and the public. The data will provide a broad and synoptic view of our ocean and marine environments. By working across NOAA and its partners to integrate data and improve data accessibility, the NOAA IOOS Program will contribute to increased knowledge of complex environmental phenomena that will enable more informed management and policy decisions that support a healthy and sustainable U.S. environment and economy.

ACRONYMS AND GLOSSARY

ACRONYMS	
Acronym	Description
CIO	Chief Information Officer
DIF	Data Integration Framework
DMAC	Data Management and Communications
FGDC	Federal Geographic Data Committee
GEO-IDE	Global Earth Observation Integrated Data Environment
GEOSS	Global Earth Observation System of Systems
GOOS	Global Ocean Observing System
IEOS	Integrated Earth Observing System
IOOS	Integrated Ocean Observing System
IT	Information Technology
ISO	International Organization for Standardization
IWGOO	Interagency Working Group on Ocean Observations
NERRS	(NOAA's) National Estuarine Research Reserve System
NFRA	National Federation of Regional Associations
NMSP	(NOAA's) National Marine Sanctuary Program
NOAA	National Oceanic and Atmospheric Administration
NOEP	National Ocean Economics Program
OGC	Open Geographic Information System Consortium
OPeNDAP	Open-source Project for a Network Data Access Protocol
OSes	Observing System Evaluations
OSSEs	Observing System Simulation Experiments
PPBES	Planning, Programming, Budgeting, and Execution System
RCOOSs	Regional Coastal Ocean Observing Systems
US GEO	U.S. Group on Earth Observations

GLOSSARY	
Term	Definition
Data integration	The process of combining data residing at different sources and providing users with unified access to the data. It involves the extraction, consolidation, and management of data from disparate systems to achieve broader capability by (functionally or technically) relating two or more data streams for the purposes of manipulation, analysis, and distribution. (Source: Wikipedia)
Integrated System	A system that (1) efficiently links environmental observations, data management and communications, data analyses, and models; (2) provides rapid access to multi-disciplinary data from many sources; (3) serves data and information required to achieve multiple goals that historically have been the domain of separate agencies, offices, or programs; and (4) involves cross-cutting partnerships among federal and state agencies, private sector, and academic institutions. (Source: First Annual IOOS Development Plan)
Interoperable	The ability of two or more systems to exchange and mutually use data, metadata, information, or system parameters using established protocols or standards. (Source: NOAA Observing Systems Council, February 2005 meeting)
Operational	An activity in which the provision of data streams and data products of known quality is routine, guaranteed, and sustained (in perpetuity or until no longer needed) at rates and in forms specified by user groups. (Source: First Annual IOOS Development Plan)
Partner	Individuals or organizations that support IOOS development and supply data required by user groups. They include research and operational communities from federal, state, and local government, academia, private enterprise, and non-governmental organizations.
Service-Oriented Architecture	An approach to organizing and utilizing distributed data resources operated by independent organizations. The architecture establishes standard procedures for interactions (services) among these resources. Resources offer services that wait in a state of readiness. Other resources may invoke those services by a request that complies with the IOOS procedure. (Source: Organization for the Advancement of Structured Information)
Stakeholders	Government agencies (local, state, and federal), private enterprise, public, non-government organizations, and science and education communities that use, benefit from, manage, or study ocean and coastal systems.
Standard	A document approved by a recognized body that provides for common and repeated use, rules, guidelines, or characteristics for products, processes, or services. (Source: International Organization for Standardization)

ⁱ Ocean.US, *The First U.S. Integrated Ocean Observing System (IOOS) Development Plan*, Ocean.US Report No. 9, 2004. Retrieved on October 5, 2007, from http://www.ocean.us/oceanus_publications.

ⁱⁱ Interagency Working Group on Earth Observations and NSTC Committee on Environment and Natural Resources, *Strategic Plan for the US Integrated Earth Observing System*, 2005. Retrieved on October 10, 2007, from http://usgeo.gov/docs/EOCStrategic_Plan.pdf

ⁱⁱⁱ Interagency Working Group on Ocean Observations, *Draft Interagency Working Group on Ocean Observations Integrated Ocean Observing System Strategic Plan, 2007*. This draft is currently in final review by the Interagency Committee on Ocean Science and Resource Management Integration.

^{iv} Ocean.US, *Data Management and Communications Plan for Research and Operational Integrated Ocean Observing Systems*, 2005. Retrieved on October 5, 2007, from http://dmac.ocean.us/dacsc/imp_plan.jsp.

^v NOAA Data Management Committee, *NOAA Global Earth Observation Integrated Data Environment (GEO-IDE) Concept of Operations*, 2006. Retrieved on October 5, 2007, from http://nosc.noaa.gov/docs/products/NOAA_GEO-IDE_CONOPS-v3-3.doc.

^{vi} Ocean.US, *The First U.S. Integrated Ocean Observing System (IOOS) Development Plan*, Ocean.US Report No. 9, 2004. Retrieved on October 5, 2007, from http://www.ocean.us/oceanus_publications.