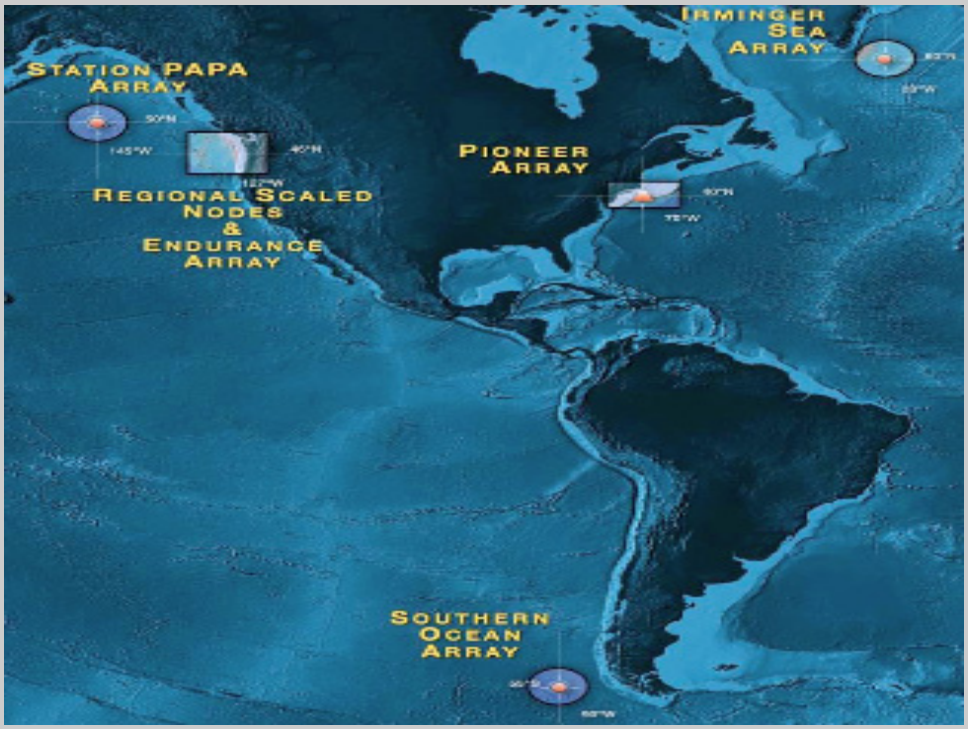
IOOS® INTEGRATED OCEAN OBSERVING SYSTEM

Linking IOOS® to the Ocean Observatories Initiative (OOI)

Understanding our Oceans, Coasts and Great Lakes



OOI will include global moorings, coastal observatories off both U.S. coasts, and a cabled observatory on off the Pacific Northwest. All will be connected for access to OOI data from anywhere in the world. Image: University of Washington

Overview:
Our planet is constantly changing and the connections between these changes and our oceans, coasts and Great Lakes are complex and not fully understood. Unlocking the secrets of our waters requires advanced tools to understand and monitor our marine and Great Lakes environments and improve decision making. But how is this accomplished?

What is IOOS?
The Integrated Ocean Observing System (IOOS) is a federal, regional and private sector partnership providing new tools and forecasts to improve safety, the economy, and our environment.

IOOS is integrating a number of existing and planned independent open ocean, coastal, and Great Lakes observing efforts to form a "system of systems". This means coordinated data for modeling and advanced products providing close to real time forecasts of ocean conditions. IOOS incorporates various tools - such as buoys, satellites, ships, underwater robots, and high frequency radar stations - to collect ocean observations and turn the raw data into useful information. The goal is to arm decision makers with the knowledge they need to respond to management and policy related problems across the nation.

What is OOI?
The Ocean Observatories Initiative (OOI) will construct a networked infrastructure of sensor systems to measure physical, chemical, geological and biological variables in the ocean.

Supported by the National Science Foundation's Division of Ocean Science, OOI is driven by needs of the research community. It is designed to understand and predict diverse ocean processes, ranging from climate change to coastal ecosystems to seafloor dynamics.

Ocean research is expanding from a focus on ship-based expeditions to having a permanent presence in the ocean. New tools in our oceans can communicate instantly with scientists on land. These tools require less power and can provide long-term, real-time understanding of critical ocean phenomena.

OOI will have global moorings in high latitude regions, coastal

observatories off the West and East Coasts, and a cabled observatory on a tectonic plate off the Pacific Northwest coast.

These platforms will support new kinds of instruments and sensors, and be complemented by mobile, autonomous vehicles. Marine assets will be connected through an interactive cyberinfrastucture enabling access to OOI data from anywhere in the world.

In addition to science, education is integral to the OOI, from the development of educational materials to experiments at sea.

IOOS	OOI
Driven by societal goals and must **routinely and continuously deliver data and products in real time and uninterrupted** for decision makers.	Led by the research community, with **inter-disciplinary observational data delivered in near real-time to improve predictability** of ocean processes in areas of societal need.
Depends on **highly reliable observing tools** and data telemetry to ensure critical data streams are not interrupted so predictions can be made with known levels of uncertainty.	Provides a suite of core sensors, the capability to test new, **experimental sensors, and the development of new observing strategies** that IOOS may adopt once reliability is established.
Primarily stationary operational system, designed to provide reliable operational data streams of known quality.	**Highly adaptive**, allowing scientists to respond to ocean events and control and adapt observatory assets and data streams to address new events.

While both IOOS and OOI share a similar fundamental ocean observing objective, there are critical distinctions between the two.

IOOS and OOI:
IOOS will provide sustained and dependable observations in real time on a broad geographic basis, similar to the observations and forecasts of the National Weather Service. This will support needs for resource management, maritime transportation, and a host of other ocean and coastal activities.

OOI will provide infrastructure to enable hypothesis-driven basic research by fostering specialized observations, instruments, and activities to answer research questions. Data will be available as close to real-time as possible.

Although the primary motivation behind both efforts differ, there are critical areas where the two efforts come together and create powerful synergies.

Collaborative efforts between IOOS and OOI enabled the development of new digital tools to access and use ocean observing data through OOI's cyber-infrastructure (CI). Currently, OOI is testing the capabilities of the CI to assess its virtually unlimited capacity to scale computing power and data access to meet user needs.

Eventually, the CI will allow scientists, students, and citizens anywhere to observe and compare ocean phenomena and share ocean observatory resources - such as instruments, networks, computer processing power, and data storage - at new and unprecedented scales.

In addition to the CI's capabilities, improved techniques, sensors and knowledge gained through the OOI will evolve from research to societal applications, and become an integral part of IOOS.

IOOS is the U.S. part of the Global Ocean Observing System and OOI is NSF's contribution to IOOS.

Partnerships:
Both IOOS and OOI rely on partnerships between many organizations. The key to both efforts is bringing together federal, non-federal, and academic partners in expanding our presence in the ocean to serve society's needs and increase our understanding of ocean processes. Both efforts will work together to plan and implement both systems, ensuring the Nation is served in the best possible way.

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