Have a Question?
Ask the OOI Help Desk!

help@oceanobservatories.org

The OOI is managed and coordinated by the OOI Program Management Office (PMO) at the Consortium for Ocean Leadership, in partnership with WHOI, OSU, UW, Rutgers, Raytheon, and others.

The Consortium for Ocean Leadership is a Washington, D.C. nonprofit organization that represents the leading public and private ocean research education institutions, aquaria, and industry with the mission to shape the future of ocean science and technology. In addition to its advocacy role as the voice of the ocean research and education community, Ocean Leadership manages a variety of community-wide research and education programs in areas of ocean observing, ocean exploration, and ocean partnerships.

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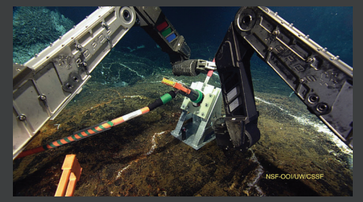
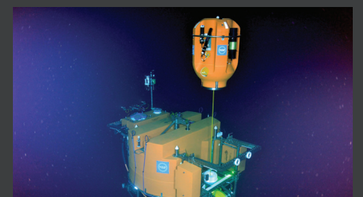
Learn how to become involved in the OOI at:

www.oceanobservatories.org

OCEAN OBSERVATORIES INITIATIVE





Ocean Leadership

NSF

What Is the Ocean Observatories Initiative?

- The OOI is a National Science Foundation major research facility operated as a community resource, providing continuous delivery of ocean and seafloor data from coastal to open ocean areas in the Atlantic and Pacific.
- The OOI is composed of an integrated infrastructure of science-driven platforms and sensors, measuring physical, chemical, geological, and biological properties at scales of centimeters to kilometers and seconds to decades. The system was designed to provide data to address large-scale scientific challenges from climate to ecosystem health, to seafloor dynamics and full water column processes.
- Using moorings, fiber-optic cables, and autonomous vehicles, the OOI combines advanced technology and engineering capabilities with a cyberinfrastructure to bring ocean observing data to the global user community.
- Data from the OOI are freely available to interested user communities, including oceanographers, scientists, educators, and the public. Where practical, data are provided in real- to near-real time.

The OOI infrastructure consists of seven arrays located in the Atlantic and Pacific Oceans.

Cabled Array: Fiber-optic cables provide unprecedented power, bandwidth, and communication to seafloor instrumentation and profiler moorings, enabling monitoring of volcanic and hydrothermal activity, methane seeps, earthquakes, and ocean processes on the Juan de Fuca plate and Cascadia Margin.

Coastal Arrays: Cross-shelf moored arrays and mobile assets observe the dynamic coastal environment enabling examination of upwelling, shelf break fronts, and cross-shelf exchanges. (Endurance & Pioneer Arrays).

Global Arrays: Moored arrays and mobile assets provide time-series observations and mesoscale spatial sampling at sparsely sampled, high-latitude regions critical to our understanding of climate, carbon cycle, and ocean circulation. (Argentine Basin*, Irminger Sea, Southern Ocean* & Station Papa).

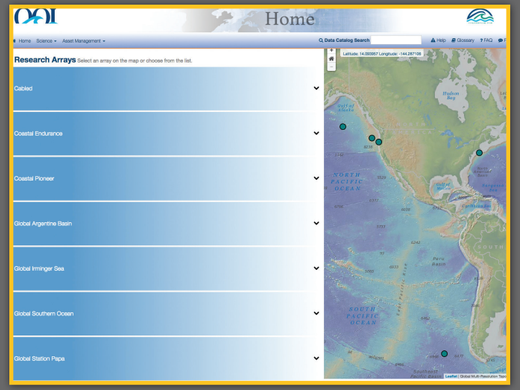
The OOI Cyberinfrastructure (CI) manages and integrates data from approximately 760 instruments deployed across the 7 arrays, linking the marine infrastructure to the global community of users. The CI manages the hardware and software tools necessary to provide data management, processing, and quality control of the collected datasets. All raw and processed datasets are made available online to users and a full archive of all datasets are stored in multiple locations.

OOI data quality control procedures were designed with the goal of meeting the IOOS Quality Assurance of Real Time Ocean Data (QARTOD) standards.

OOI Education and Public Engagement software and tools provide easy access for the development of educational data visualizations and translation of OOI science into educational resources.

OOI Instrumentation

Instrument	Array			
	Endurance	Pioneer	Cabled	Global
ADCP	▲	✖	■	●
Bottom Pressure and Tilt			■	
Digital Still Camera	▲		■	
HD Video Camera			■	
CTD	▲	✖	■	●
Dissolved Oxygen	▲	✖	■	●
Direct Covariance Flux	▲	✖		●
Fluorometer	▲	✖	■	●
Benthic Fluid Flow			■	
HPIES			■	
Hydrophone	▲		■	
Bulk Meteorology	▲	✖		●
Hydrothermal Vent Chemistry			■	
Seismometer			■	
Spectrophotometer	▲	✖	■	●
PAR Sensor	▲	✖	■	●
Nitrate Sensor	▲	✖	■	●
pCO2 Air-Sea Interface	▲	✖		●
pCO2 water	▲	✖	■	●
pH Sensor	▲	✖	■	●
Seafloor Pressure	▲	✖	■	
Spectral Irradiance	▲	✖	■	●
Vent Fluid Sampler			■	
Vent Fluid Temperature			■	
Velocity Meter	▲	✖	■	●
Surface Wave Spectra	▲	✖		●
Bio-Acoustic Sonar	▲	✖		●



Accessing OOI Data

The OOI provides users with direct, continuous, and free access to its archive of ocean observing data. Anyone with an Internet connection can access OOI data. There are several avenues through which data are available:

OOI Data Portal *(ooinet.oceanobservatories.org)*

- Search through OOI sites and platforms, by location and depth
- View quick look plots of data streams
- Plot and download data and associated metadata in NetCDF, CSV, or JSON formats

OOI ERDDAP Server *(oceanobservatories.org/erddap-server/)*

- Simple, consistent access to downloadable subsets of OOI datasets in common file formats
- Easily create your own quick graphs and maps
- RESTFul API for creating scripted data requests

Raw Data Archive *(rawdata.oceanobservatories.org/files)*

- Raw datasets as received directly from an instrument, in instrument-specific format
- Users can perform their own analyses using their own scripts or software
- The archive is a mirror of the repository where all raw data enter the system

Analytical Data *(oceanobservatories.org/core-instrument-analytical-results)*

- Contains processed analytical data and metadata for a subset of Cabled Array instruments that collect fluid or particulate samples that are brought back to shore and analyzed in a laboratory

Proposals and Research

The OOI is an open community resource. Any interested user can use OOI data to address specific scientific hypotheses, or to augment existing research projects. Additionally, scientists are encouraged to seek funding to test hypotheses or explore questions based on OOI data.

Proposals: OOI-related proposals are now being accepted through the NSF core programs. Scientists are encouraged to propose new applications and approaches, including, but not limited to 1) connection of new instruments and platforms onto the observatory; 2) modification of sampling rates and missions for existing instrumentation; 3) execution of ancillary work during normally scheduled OOI cruises, including supplemental analysis of collected water samples; 4) testing specific hypotheses with OOI data; and 5) creation of educational programs using both OOI infrastructure and data.

For more information on the NSF proposal process, visit:
oceanobservatories.org/information-for-researchers/

Staff Consultations: Investigators seeking to submit proposals can schedule an appointment to meet virtually or in person with OOI Operations Staff to discuss technical requirements, testing, and answer any questions regarding the addition of instrumentation and platforms onto the OOI arrays.

Connect with the OOI Operations Staff about proposals:
oceanobservatories.org/staff-consultations/

User Resources

Community Developed Tools

The OOI website includes an ever-expanding set of resources developed and shared by the OOI user community. Shared resources include Python scripts and libraries to help users transform raw OOI data into more usable forms, create plots of OOI datasets, and process netCDF files. Tools are also available to convert Broadband Hydrophone files, or download specific subsets of raw HD video data. A number of links to community-developed derived datasets are also provided. *oceanobservatories.org/community-tools/*

Open Source Sensor Algorithms

Sensor algorithms for derived data products were developed using community standard code and/or information from instrument vendors and external experts. These modules, and the functions therein, represent the transforms and calculations used to provide the various OOI data products (*https://github.com/oceanobservatories/ion-functions*). The algorithms are free for the community to download and use, or to adapt for their own observational data.

Video Tutorials and Knowledge Base Articles

Users looking for more information about the OOI, its instruments, and how to access and use OOI datasets should check out the OOI Knowledge Base and introductory video tutorials on the OOI website. *oceanobservatories.org/knowledgebase/*