US IOOS®

Zdenka Willis
Director, US IOOS
• Improve predictions of climate change and weather, and their effects on coastal communities and the nation
• Improve the safety and efficiency of maritime operations
• More effectively mitigate the effects of natural hazards
• Improve national and homeland security
• Reduce public health risks
• More effectively protect and restore healthy coastal ecosystems
• Enable the sustained use of ocean and coastal resources.
Global Earth Observation System of Systems (GEOSS)

Global Ocean Observing System (GOOS)

National Ocean Council (NOC)

Subcommittee on Ocean Science & Technology (SOST)

Interagency Ocean Observation Committee (IOOC)

U.S. IOOS Enterprise

Federal Agencies

IOOS Coastal and Ocean Modeling Testbed (COMT)

11 Regional Associations (RAs)

NOAA

Alliance for Coastal Technologies (ACT)

IOOS Advisory Committee

IOOS Association

US IOOS Program Office (within NOAA)

IOOS Advisory Committee

Direct Relationship

Advisory

Coordination

http://www.ioos.noaa.gov/about/governance/summit2012/ioos_summit_report.html
IOOS: Advancing Communities

HF Radar:

Gliders:

Biological Variables & BIO TT:

Wave Measurements:

Animal Telemetry:
IOOS - National Backbone

Satellites

Buoys, Water Level Gauges, Coastal and Estuary stations

PORTS®

Stream Gauges

Water Quality

Research Infrastructure
IOOS – Regional Component

Buoys, Water Level Gauges, Coastal and Estuary stations

High Frequency Radar

Tagging

Waves

Gulper
Slocum
Wave
 Spray
Seaglider
Gliders
Access to Data

Global Telecommunications System (GTS)

Access to model output

Quality Assurance

Access on 1 page: Ioos.us

2 week cache of real-time observations

Standards
IOOS Regions

Who
• State, Local, Tribal Government
• Profit & non profit industries
• Academia

Produce | Integrate | Communicate
Certification

Integrated Coastal and Ocean Observation System Act of 2009 (ICOOS Act)

1. Formal recognition of IOOS Regional Associations
2. Extends civil liability coverage for data use
3. Establish minimum criteria for how a RICE operates
4. Adherence to data management best practices
5. Enhance delivery and quality of data and information

Credible – recognize NOAA’s responsibility for ensuring data quality and assumption of liability risk

Reasonable – develop program guidelines in accordance with RA capabilities as supported by IOOS Program funding
Alliance for Coastal Technologies (ACT)

Technology Evaluations, Technical capacity building, and information clearinghouse

**Nutrient Sensor Challenge**
(FY2015/2016)

Coastal & Ocean Modeling Testbed (COMT)

Testing model skill, transition to operations, and applied science for hypoxia, inundation, and ocean forecasts
Ocean Technology Transition

Fostering the transition of advanced observing technologies to operations mode.

West Coast Ocean Acidification

Detecting Arctic Freeze Up Real-Time

Imaging Flow CytoBot in SF Bay – Industry

Harmful Algal Bloom
Gulf of Maine
North west United States

Operational Nutrient Observatory for the Northeastern United States – Industry Partner: WetLabs

The “Burk-o-lator” – developing low cost OA sensors
Marine Biodiversity Observation Network (MBON)

Interagency support:
$15M from NASA, NOAA (IOOS and OER), and BOEM for 5 years (FY14-18)
$2M from Shell to launch Arctic MBON

Demo projects are:
• Integrating existing monitoring
• Filling spatial, taxonomic gaps
• Monitoring “microbes to whales,” “in-situ to satellites”
• Exploring technology applications
• Addressing data management
• Building MBON for the Nation
• Creating global MBON (with GEO, GOOS)
• Connecting with the Animal Telemetry Network

Credit: MBARI
MBON Technology Applications

New technologies and methods will lower the cost of observing while increasing space and time and space resolution. MBON is:

- Refining eDNA methods - large, multi-institution partnership
- Leveraging OAR ‘omics work with MBON funds and in-kind (corals, ESP)
- Evaluating technologies for MBON: genomics, acoustics, bio-optical informatics and images, animal tagging, ESP

<table>
<thead>
<tr>
<th></th>
<th>Microbes / Phyto</th>
<th>Zooplankton</th>
<th>Fish</th>
<th>Top Predators</th>
<th>Benthos, habitat forming</th>
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<td>AUVs, moorings</td>
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<td>Data and visualization</td>
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• MBON observes marine life – how it’s changing, how it affects us.
• MBON is establishing long-term species status and trends and merging that with environmental information.
• MBON informs understanding of impacts from climate, ocean acidification, and human activity to species we depend upon.
• MBON directly supports:
  ➢ Understanding biological impacts from ocean acidification, climate change
  ➢ Management of National Marine Sanctuaries and marine protected areas
  ➢ Protection of shallow and deep-water corals
  ➢ Ecosystem-based science and management, including Integrated Ecosystem Assessments

Private and federal funding is needed to sustain MBON.
Global Participation

Integrated Ocean Observing System (IOOS) to The Global Ocean Observing System (GOOS) and GEO Group on Earth Observations (GEOEO)
Questions

Enables decision making
Fosters Advances in Science and Technology

https://ioos.noaa.gov
https://www.facebook.com/usioosgov
@usioosgov
### Budget History FY10-FY16

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<th>Year</th>
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<th>Other NOAA</th>
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**IOOS Office Primary Roles:**

- Provide Programmatic Leadership
- Foster Operational Capability
- Forge Robust Partnerships
- Champion Regional and Stakeholder Interests
IOOS is a Team Sport

Interagency Oversight IOOS Task Teams

Programmatic Operational Capacity Partnerships Champion Regional

IOOS Office

IOOS Advisory Committee

IOOS Association

Congress OMB Sponsor Events RA Coordination

Official Advice Recommendations
U.S. Integrated Ocean Observing System (IOOS®)

Policy Neutral, Stakeholder driven, Scientifically based