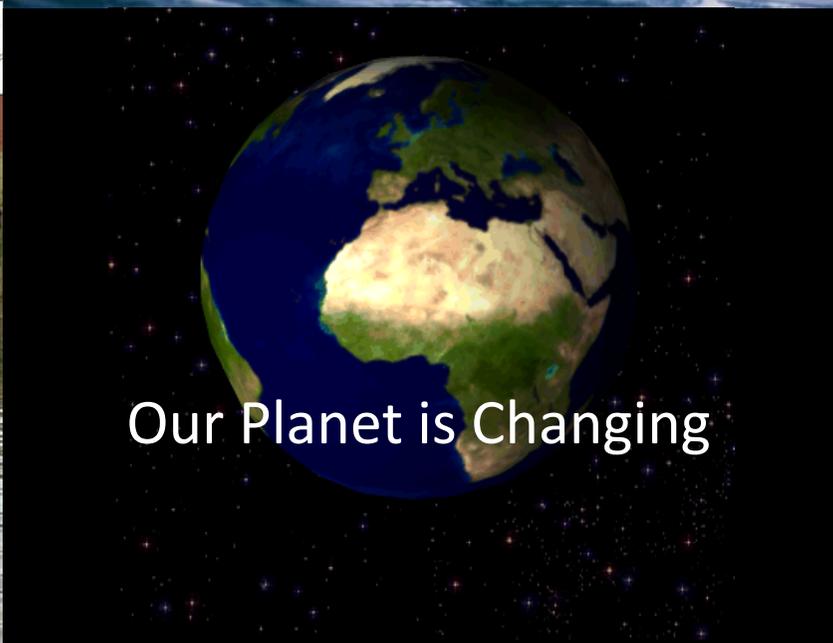


US IOOS[®]: A Partnership for Lives and Livelihoods



Our Planet is Changing



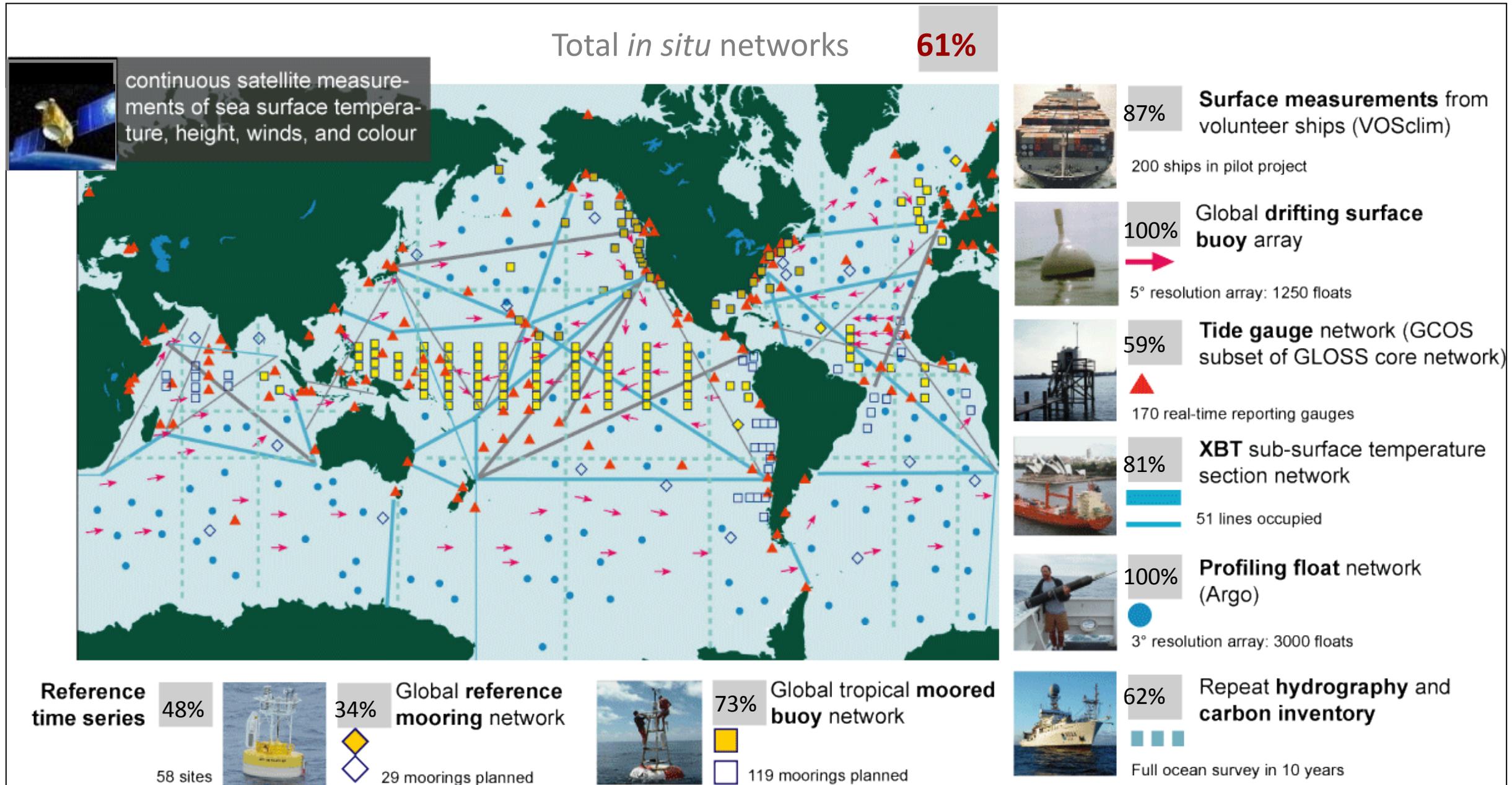
We need advanced tools to understand and monitor our oceans, coasts and Great Lakes

Zdenka Willis
Director, US IOOS Program Office

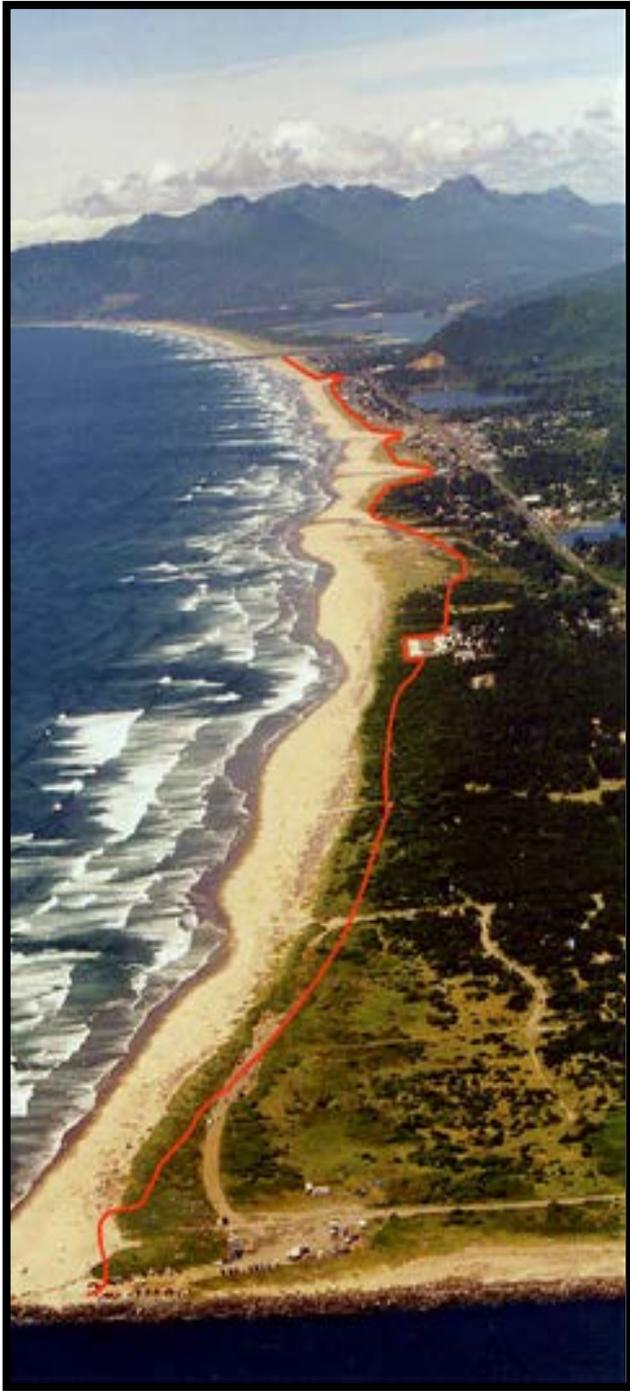


Integrated, Interdependent, Indispensable

Global Component: Global Ocean Observing System for Climate



Coastal Component



- Comprised of federal agencies (National level) and non-federal (Regional level)
- Geographic extent: EEZ to the head of the tide
- Based on 26 variables
- Data Management and Communications (DMAC) is a major focus that is intended to be enterprise wide from National to Regional scales

Integrated Ocean Observing System Program

Director
Zdenka Willis

Program Assistant
Laura Griesbauer

Deputy
Suzanne Skelley

Operations
Division Chief
Charles Alexander

Obs System Manager
Vacant

Physical Scientist
Derrick Snowden

Marine Biologist
Hassan Moustahfid

HF Radar Project Manager
Jack Harlan

Physical Scientist
Rob Ragsdale

**Coastal Ocean Modeling
Testbed Program Manager**
Becky Baltes

Management, Budget & Programming
Division Chief
Carl Gouldman

**Financial Management
Specialist**
Carmen Solis

Physical Scientist
Jessica Snowden

**Regional Grants
Administrator**
Regina Evans

Program Analyst
Kate Lambert

Administrative Assistant
Victoria Kromer

Regional & External Affairs
CAPT Scott Kuester

Regional Project Manager
Gabrielle Canonico Hyde

Regional Grants Coordinator
Dave Easter

Regional Grants Coordinator
Jenifer Rhoades

Communications Specialist
Jennie Lyons

Web Designer
Marina Kraus

**US Army Corps of
Engineers Liaison**
Linda Lillycrop

Project Management
Jack Oliva
(supports Director & Deputy)

U.S. IOOS[®]: Program Office

- **Provide Programmatic Leadership:** Build the structure and support necessary to advance implementation and recognition of U.S. IOOS, including participation in the Federal budget process to secure additional resources.
- **Foster Operational Capability:** Lead and coordinate Federal and non-Federal contributions to U.S. IOOS
- **Forge Robust Partnerships:** Initiate and sustain relationships for participation in IOOS by Federal agencies, non-Federal groups and industry
- **Champion Regional and Stakeholder Interests:** Connect Regional products and services to national needs, and connect Federal groups to Regional entities

Line Item Name (\$K)	FY08 Enacted (1st in PB)	FY09 Enacted	FY10 Enacted	FY11 Enacted	FY12 PresBud	FY12 Spend Plan	FY13 PresBud
NOAA IOOS		6,500	6,555	6,588	6,700	6,432	6,533
IOOS Regional Observations		20,000	27,000	22,000	31,055	22,956	29,520
<i>Regional Observations</i>		20,000	20,000		17,555	16,956	14,520
<i>Surface Current Mapping (HF Radar)</i>					5,000	5,000	5,000
<i>Marine Sensor Technology Innovation</i>					8,500	0	10,000
<i>Sensor validation & verification</i>		0	3,000	0	0	1,000	0
<i>Super regional modeling testbed</i>		0	4,000	0	0	0	0
Omnibus	26,300						
Earmark/ Alliance for Coastal Technologies	900	1,000	500				
Earmark/ NE Coastal Monitoring Collab.			550				
TOTAL	\$ 27,200	\$ 27,500	\$ 34,605	\$ 28,588	\$ 37,755	\$ 29,388	\$ 36,053

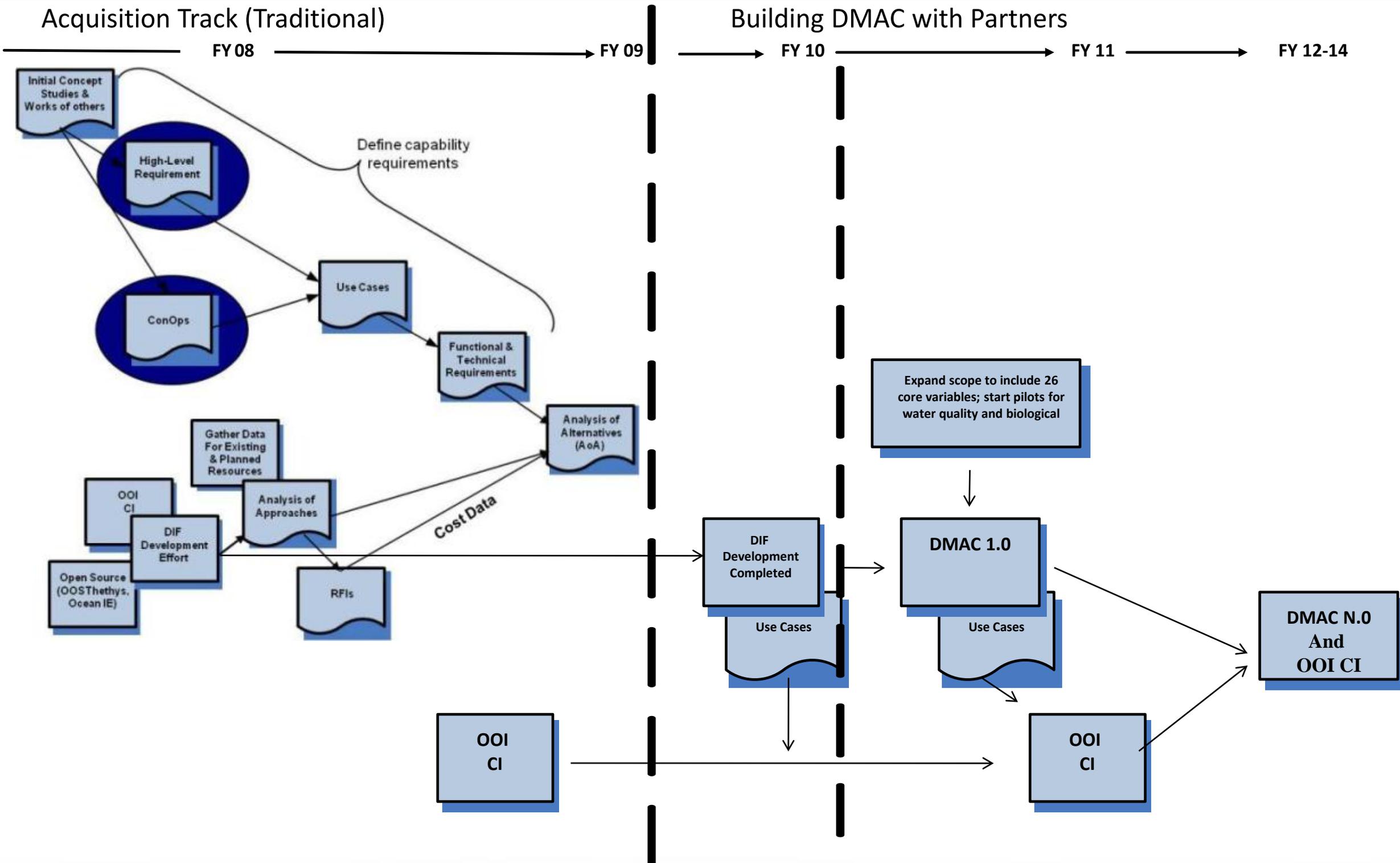


Integration

Interdependent

Indispensible

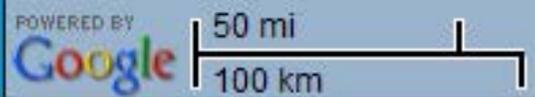
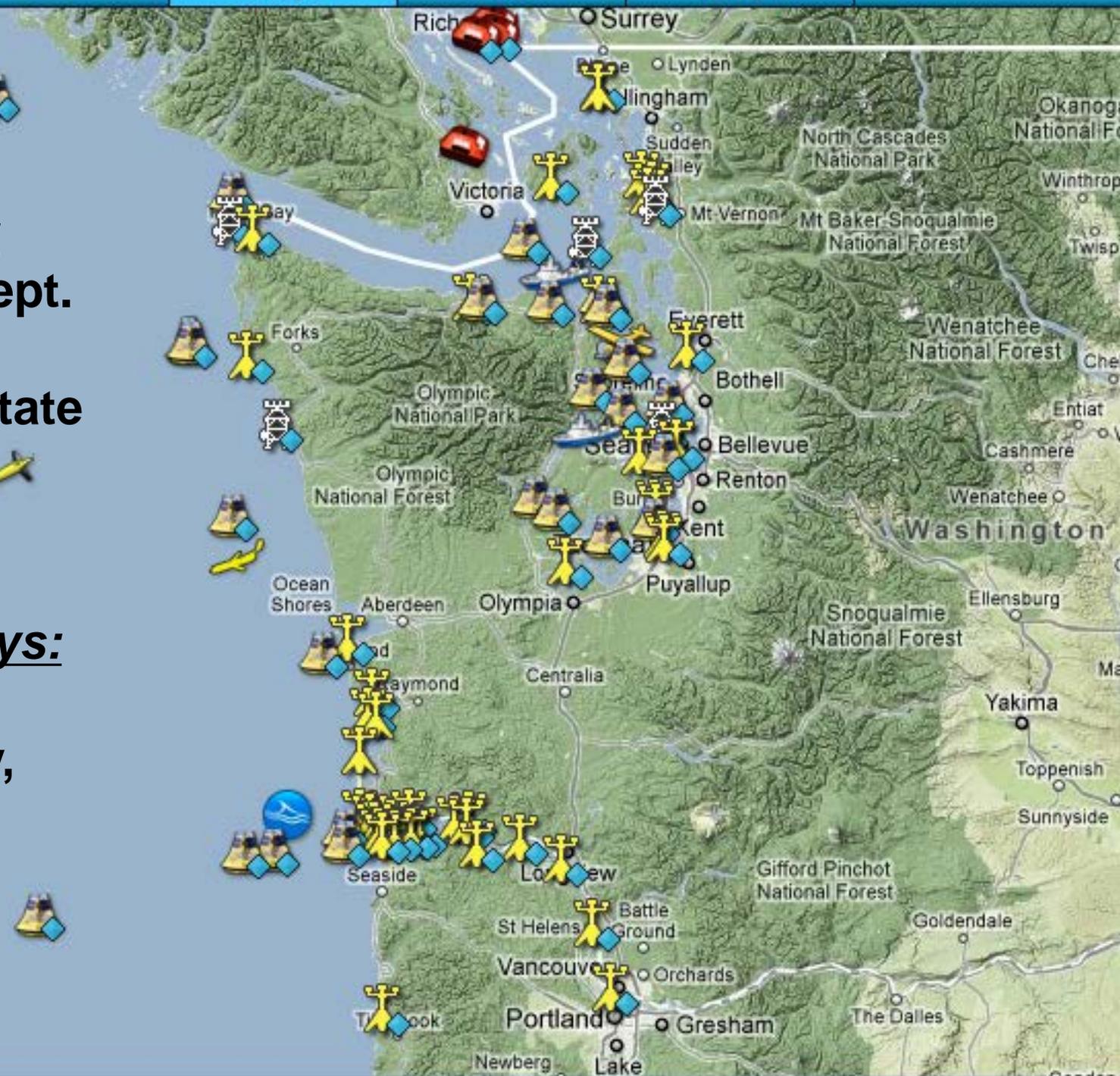
Pathway to a National DMAC



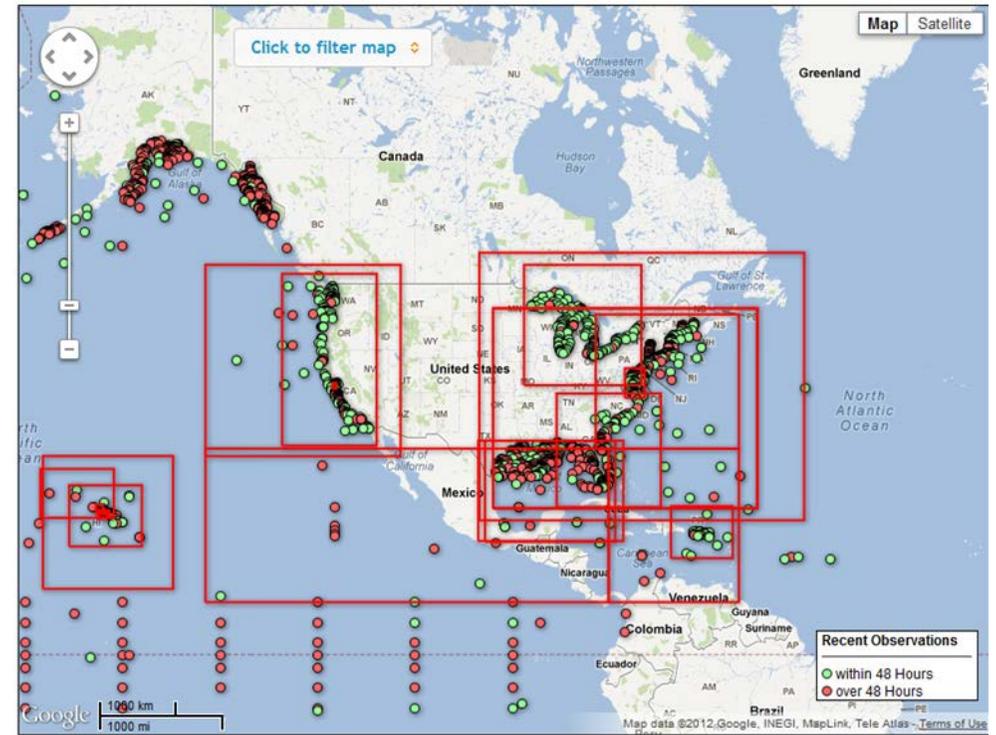
- myNANOOS
- Map
- Regions
- Filters
- Assets
- Overlays
- Places
- Settings
- Legend

NANOOS funds:
 UW, WA State Dept. Ecology, OHSU, OSU, OR Dept State Lands assets, ~19 in total

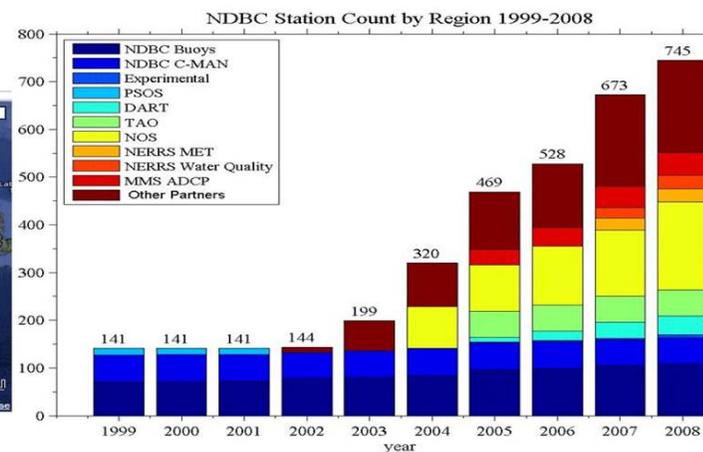
NANOOS displays:
 Federal, Tribal, State, University, Private assets, 167 in total



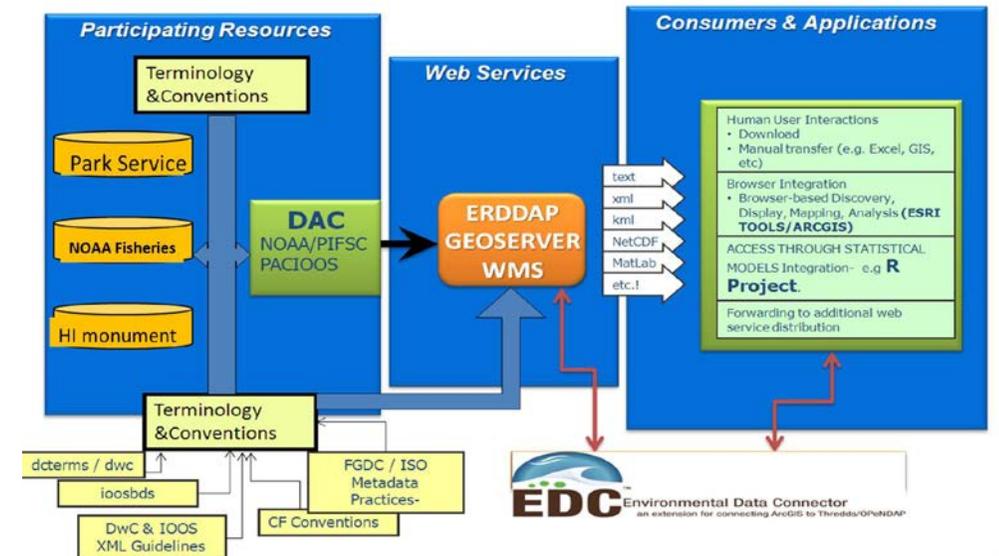
Data Integration – Regional to National



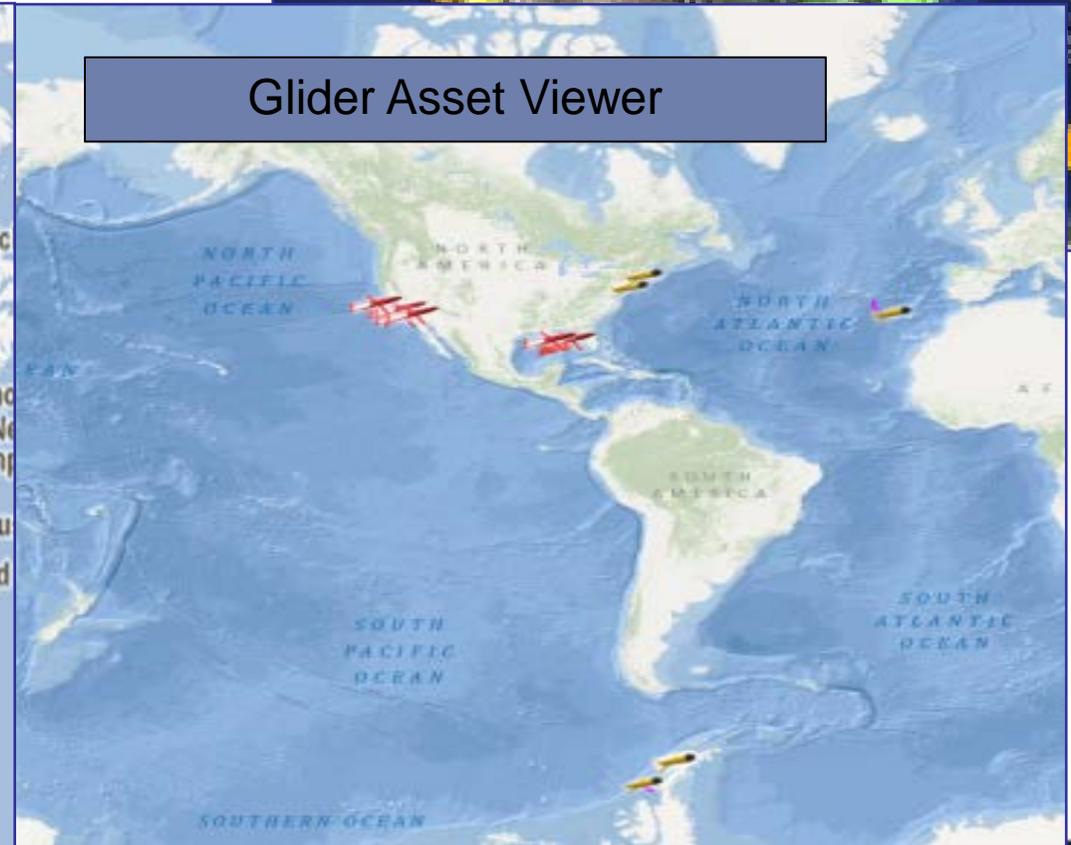
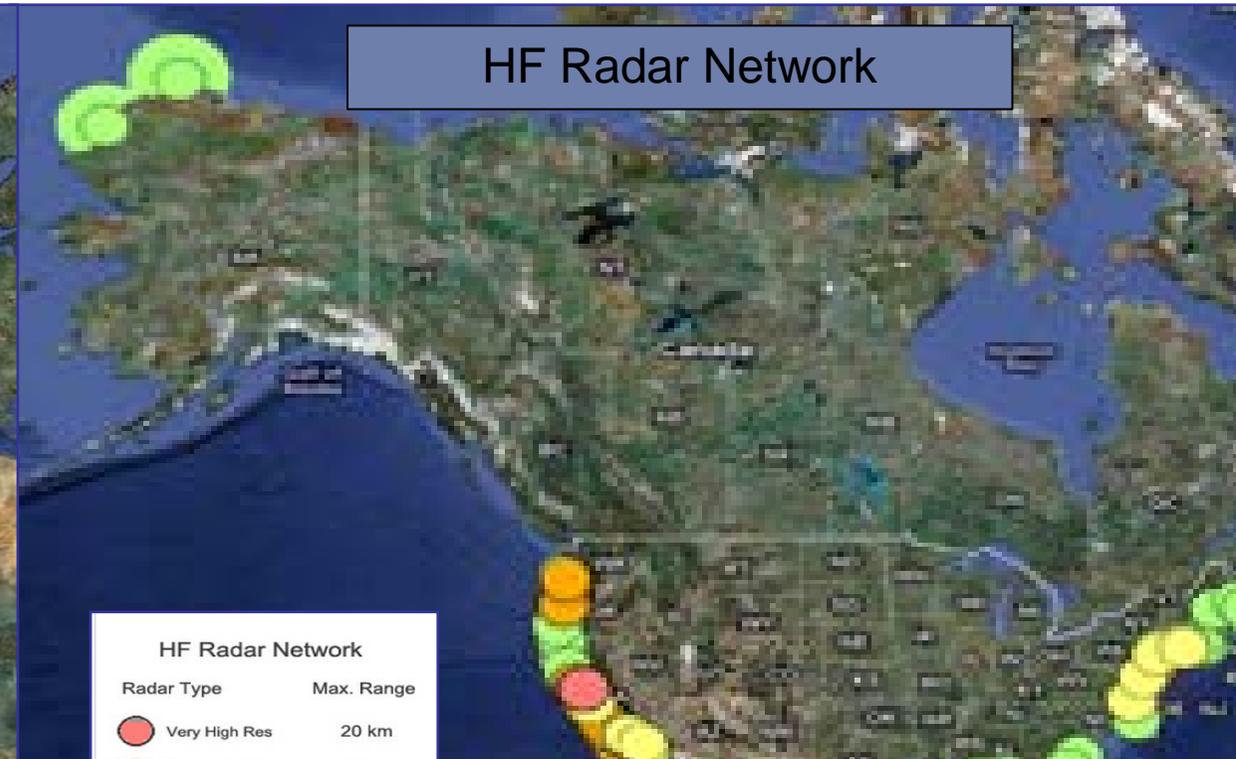
U.S. National Data Buoy Center



Where we are? PacIOOS Region



Observation Networks



HF radar, wave, and glider data are all accessible.

U.S. IOOS[®]: Modeling Testbed

- **5 teams, 64 scientists/analysts**
- **Began in June 2010; now in the second year**
- **Multi-sector engagement (federal agency, academia, industry)**
- **Goals:**
 - **Less about model than process**
 - **Focus is on stable infrastructure (testing environment, tools, standard obs) and transition to operations**
 - **Enable Modeling and Analysis subsystem**

Coastal Inundation
Gulf & Atlantic Coast
Rick Leuttich, UNC-CH

Shelf Hypoxia
Gulf of Mexico
John Harding, USM

Estuarine Hypoxia
Chesapeake Bay
Carl Friedrichs, VIMS

Cyber Infrastructure
Eoin Howlett, ASA

Testbed Advisory
Evaluation Group
Rich Signell, USGS

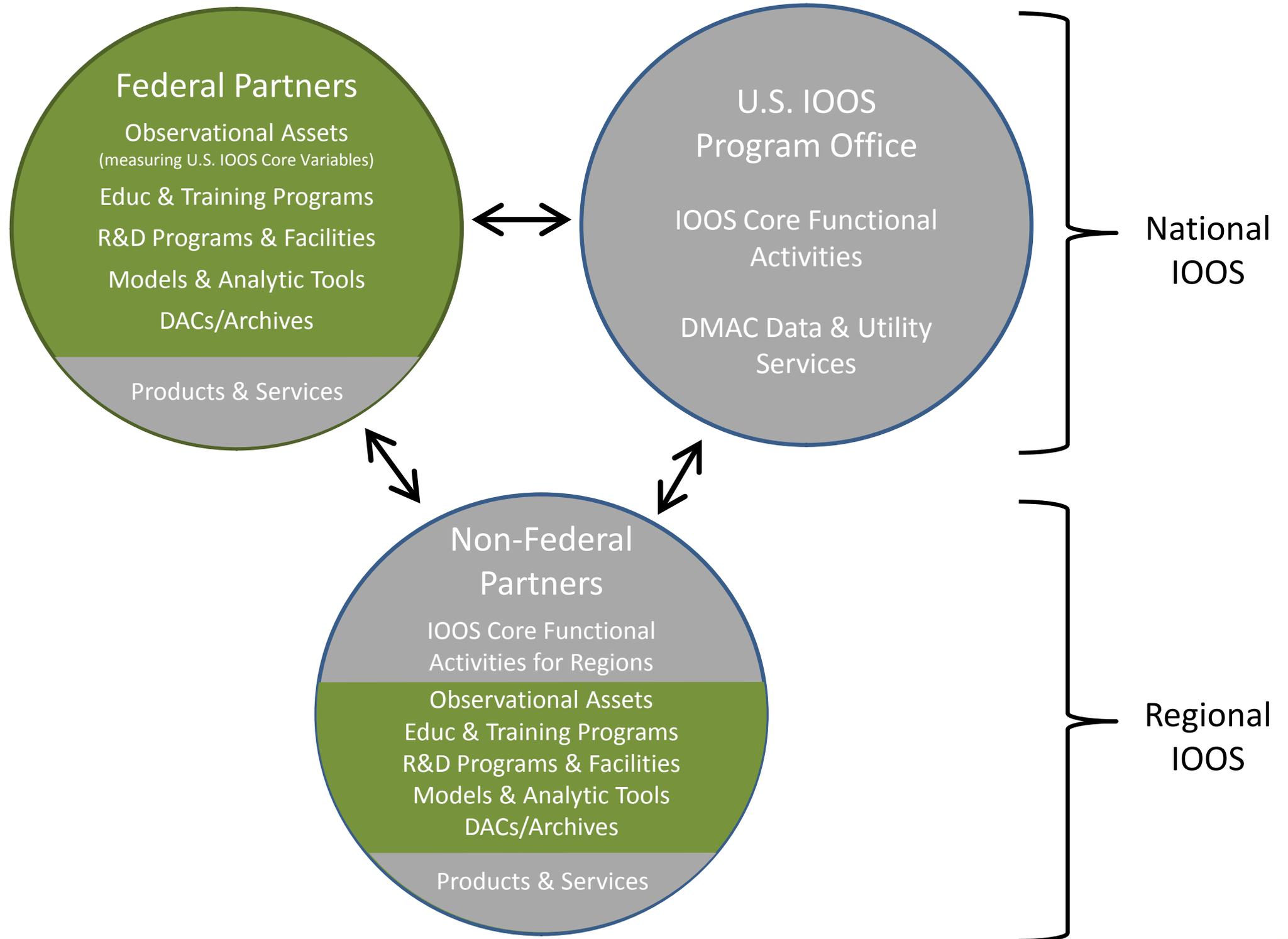


Integration

Interdependent

Indispensible

U.S. IOOS Partner Roles



Core Functional Activity Findings: Federal Partners

U.S. IOOS capability can be improved with Federal partner cooperation

	U.S. IOOS Program Office Functional Capabilities (Current)	Federal Partners with Gap-Filling Capabilities in These Core Functions	Composite Across All Federal Partners (Possible)
A.1 Governance and Management (8 core functions)			
B.1 Observing Systems Subsystem (4 core functions)		USACE, Navy/ONR	
B.2 DMAC Subsystem (9 core functions)		USACE, USGS, NOAA	
B.3 Modeling & Analysis Subsystem (4 core functions)		USACE, USGS	
C.1 Research & Development (6 core functions)		USACE, USGS, NOAA, Navy/ONR, BOEM	
D.1 Training and Education (6 core functions)			

Internal U.S. IOOS use only

 No capability
  Some capability/less than half
  Some capability/ more than half
  Some capability in all
  Full capability in all

Core Functional Activity Findings: Non-Federal Partners

U.S. IOOS Subsystem	Minimum Regional Capability	Maximum Regional Capability
A.1 Governance and Management		
B.1 Observing Systems Subsystem		
B.2 DMAC Subsystem		
B.3 Modeling and Analysis Subsystem		
C.1 Research and Development		
D.1 Training and Education		

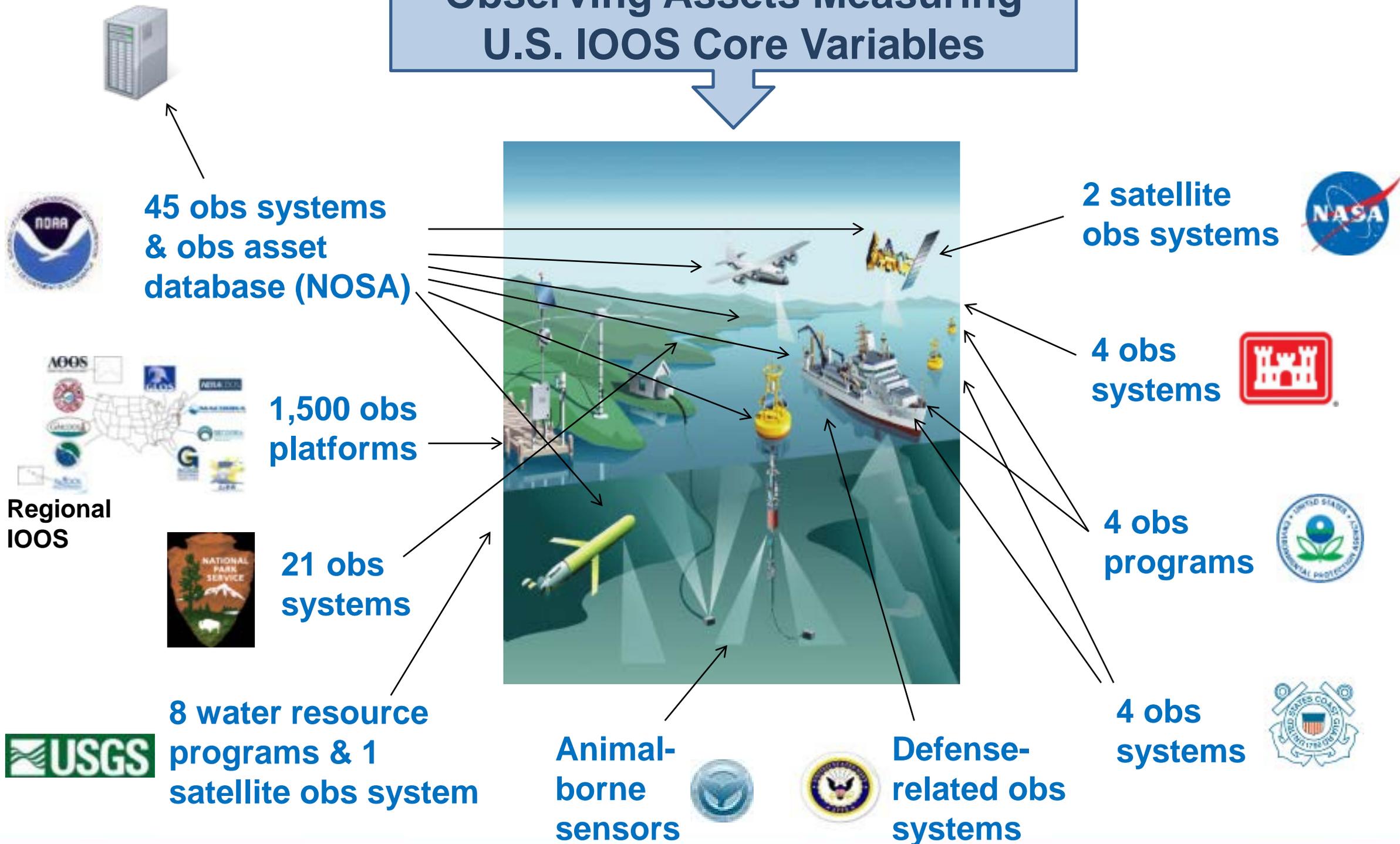
- No Region has full capability in each subsystem
- There is variation in the level of capability among the Regions
- Regions collectively display solid foundation of U.S. IOOS capability
- ACT displays capability in 4 R&D CFAs

Internal U.S. IOOS use only

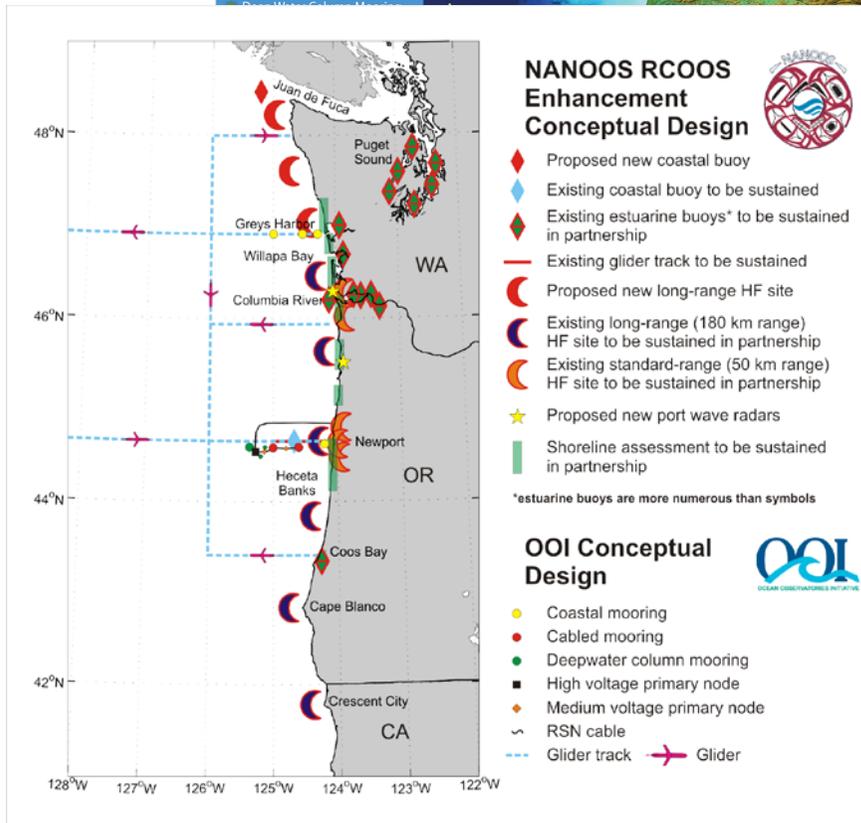
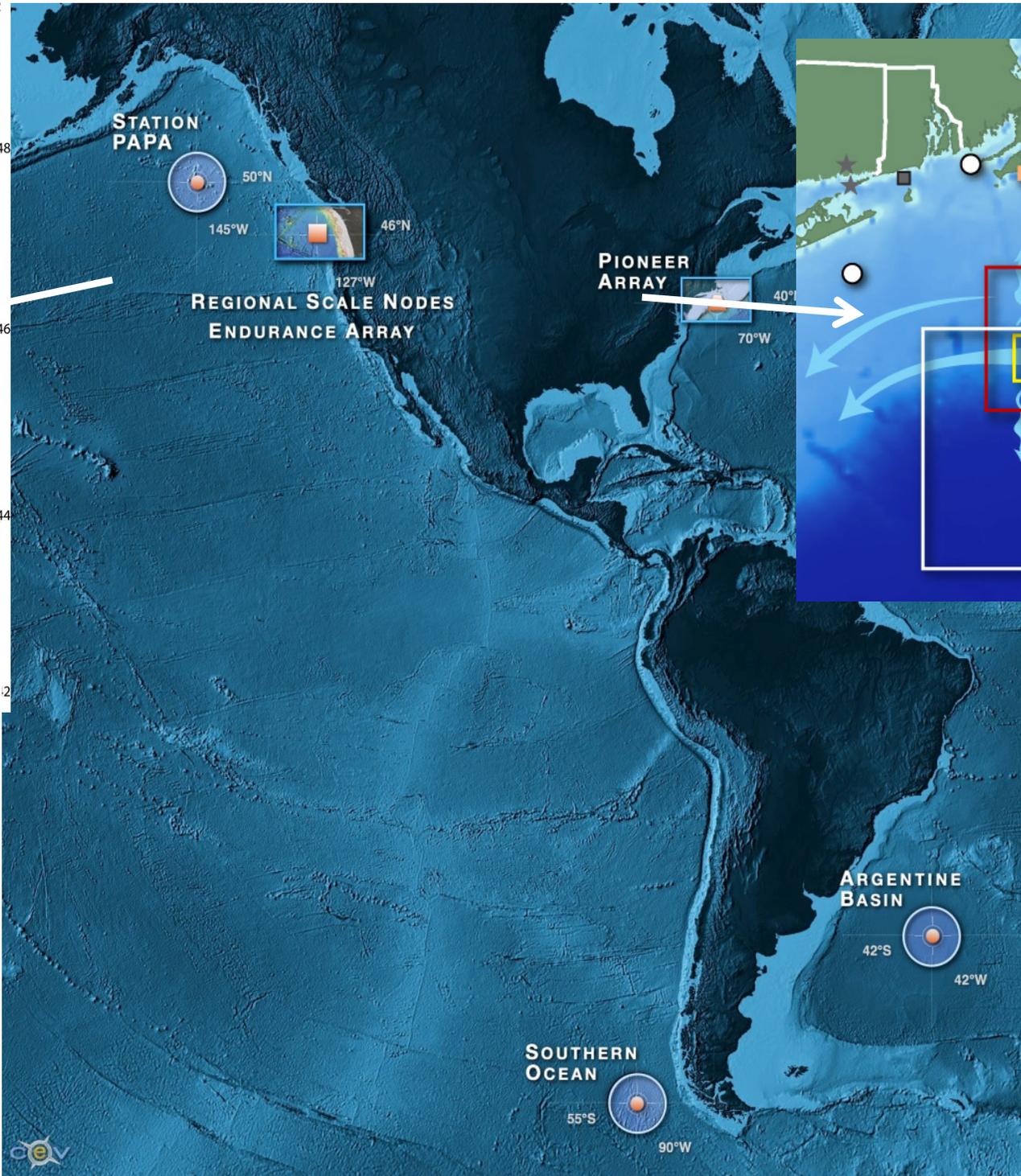
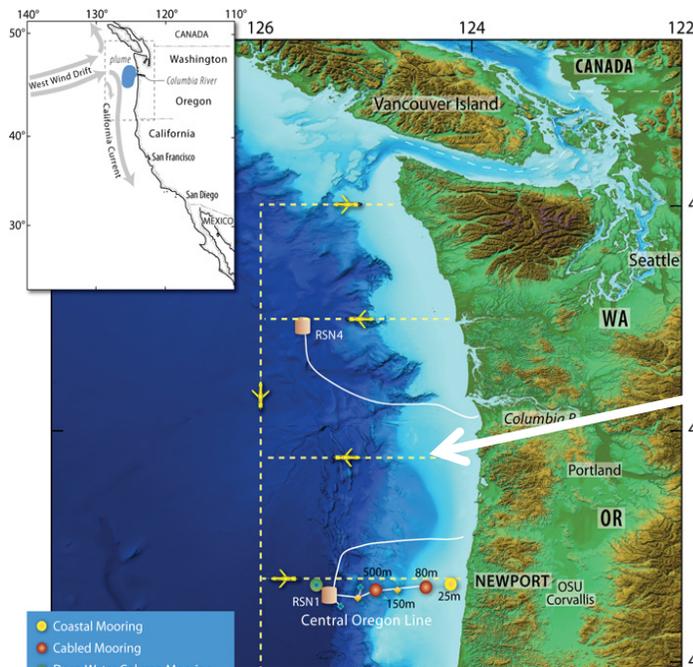
 No capability
  Some capability/less than half
  Some capability/ more than half
  Some capability in all
  Full capability in all

U.S. IOOS Partner Reported Observing System Assets

Observing Assets Measuring U.S. IOOS Core Variables

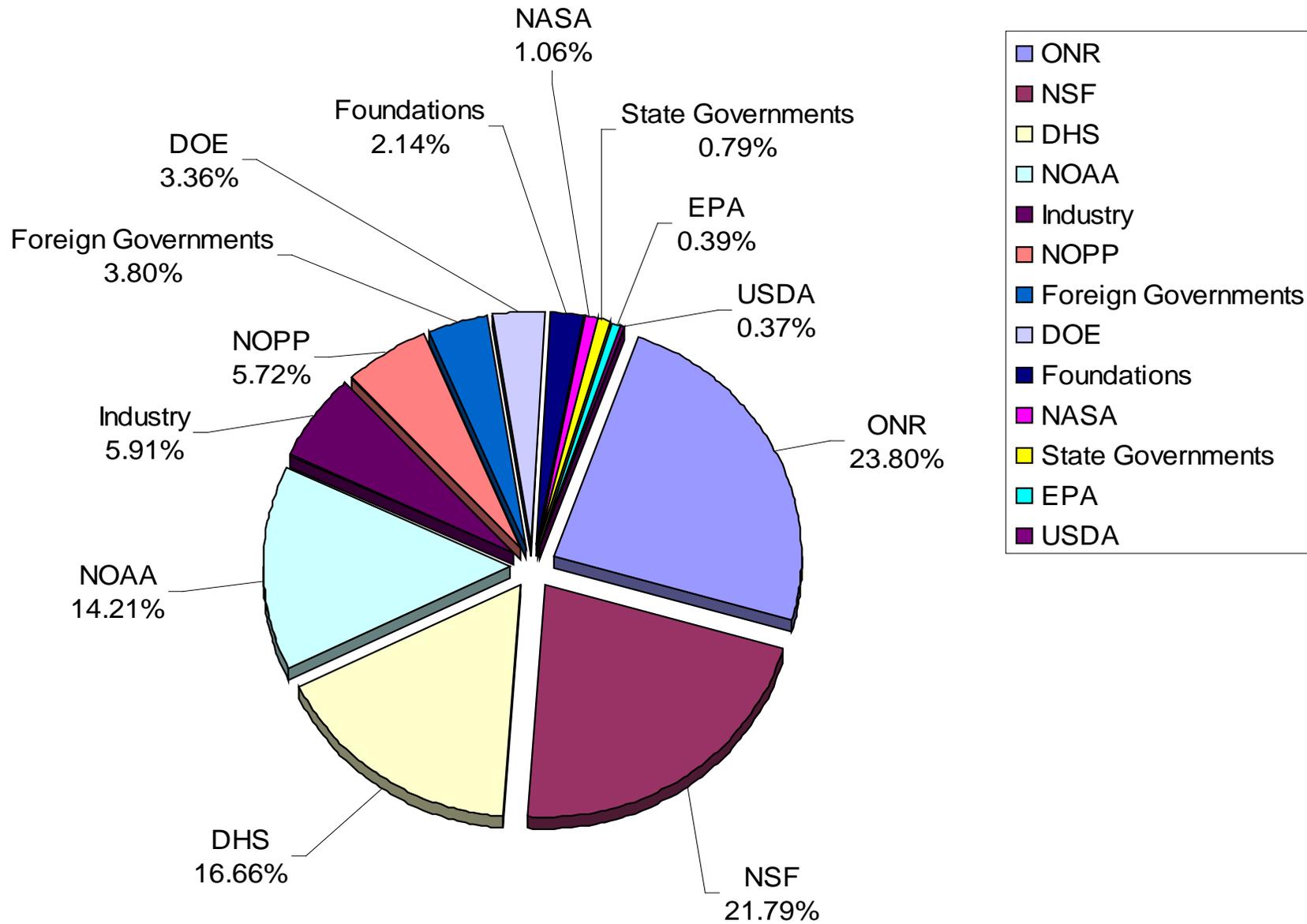


OOI – Research and Development Component



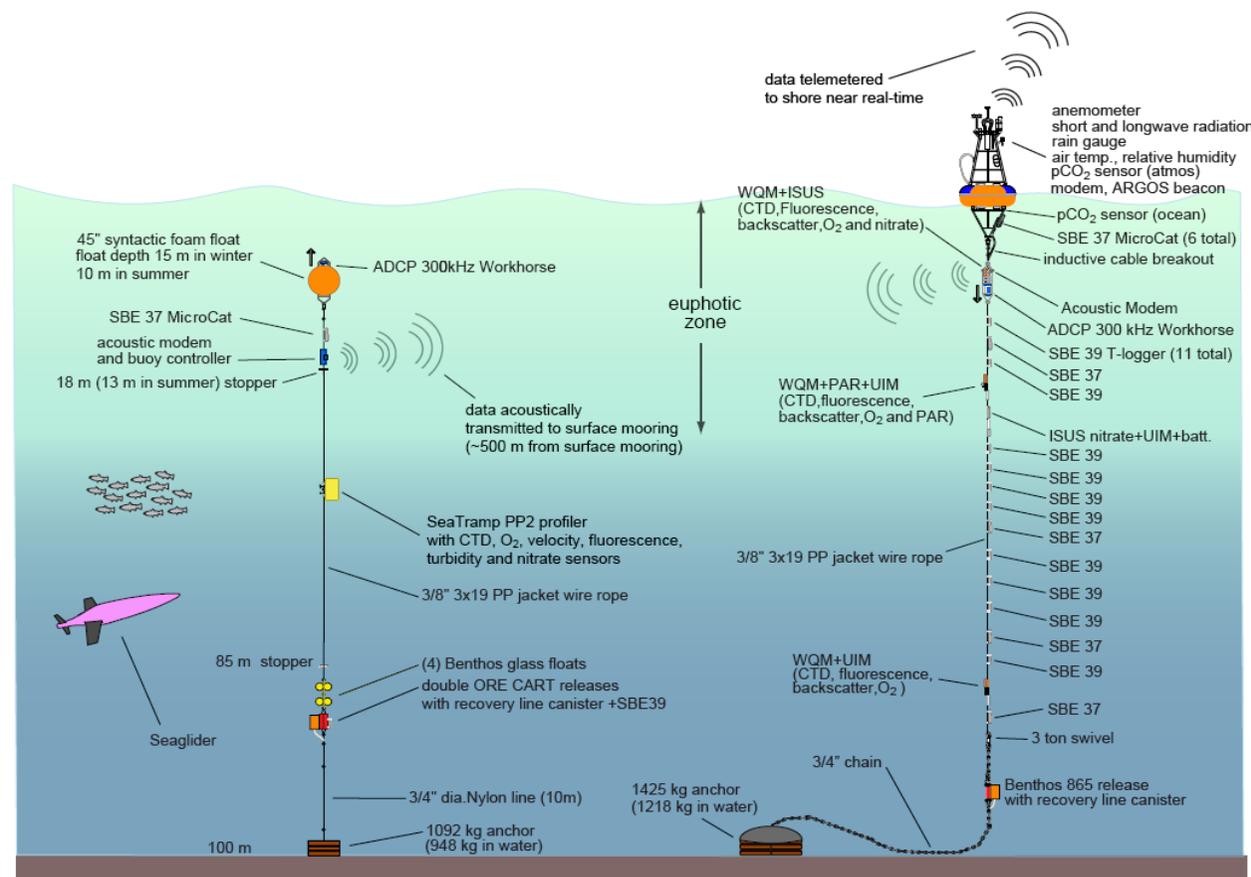


Funding Distribution

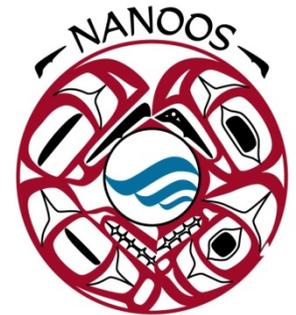


U.S. IOOS®: Working with NGO community

M. J Murdock Trust: seeks to enrich the quality of life in the Pacific Northwest by providing grants and enrichment programs to non-profit organizations that seek to strengthen the region's educational, spiritual, and cultural base in creative and sustainable ways.



IOOS®
INTEGRATED OCEAN OBSERVING SYSTEM

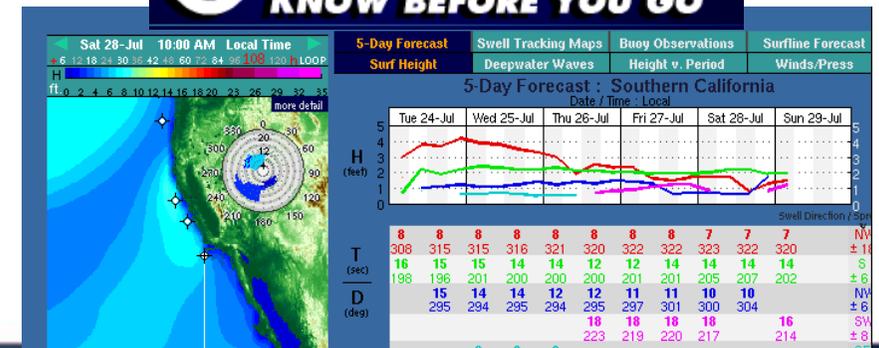
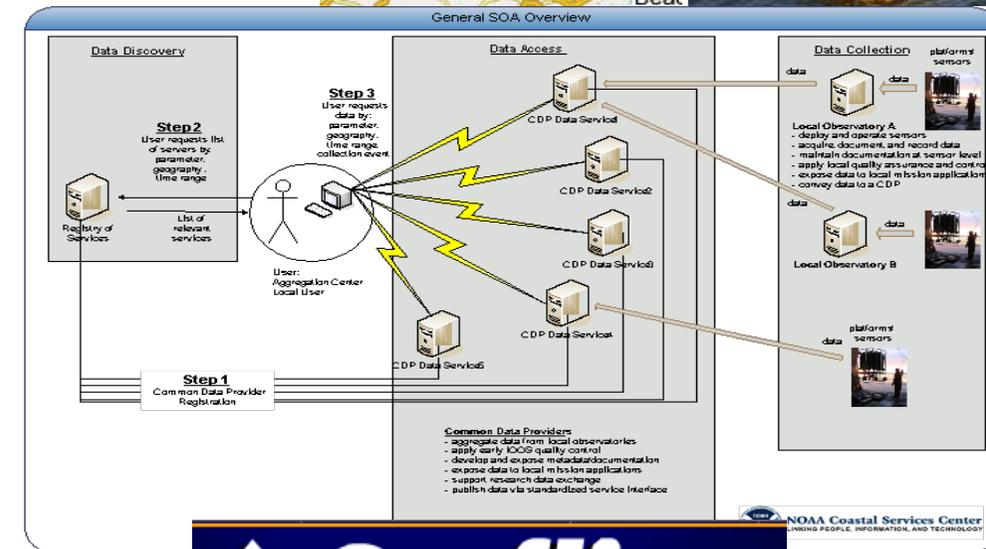


A tool that enables the Nation to track, predict, manage and adapt to changes in our marine environment and delivers critical information to decision makers to...

Industry Participation

Examples of industry partnerships

- Observing Subsystem
 - Buoys, Gliders, Gauges,
- DMAC Subsystem
 - Boeing, SAIC, ASA, Axion, Limnotech working with NANOOS, CeNCOOS, MARCOOS, AOOS, GLOS
- Modeling and Analysis Subsystem
 - Noblis, Inc. - Chesapeake Bay Inundation Prediction System (CIPS)
- Partnerships
 - Oil and gas companies provide data to the National Data Buoy Center
 - Shell Fishgrowers
 - Shell and NOAA
- Value Add Companies
 - Surflines
 - ROFFS™ - Roffer's Ocean Fishing Forecasting Service, Inc.





Integration



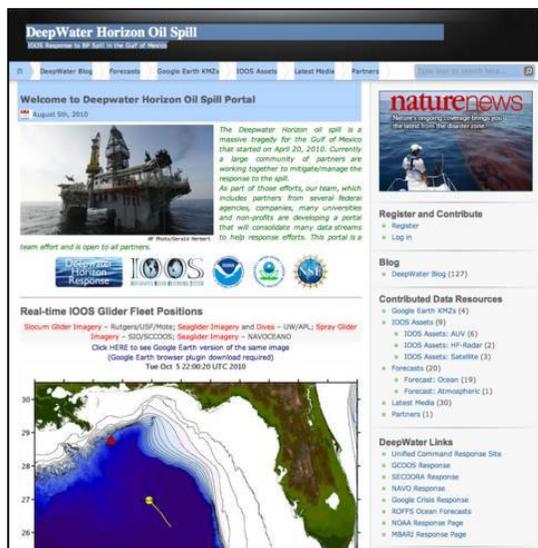
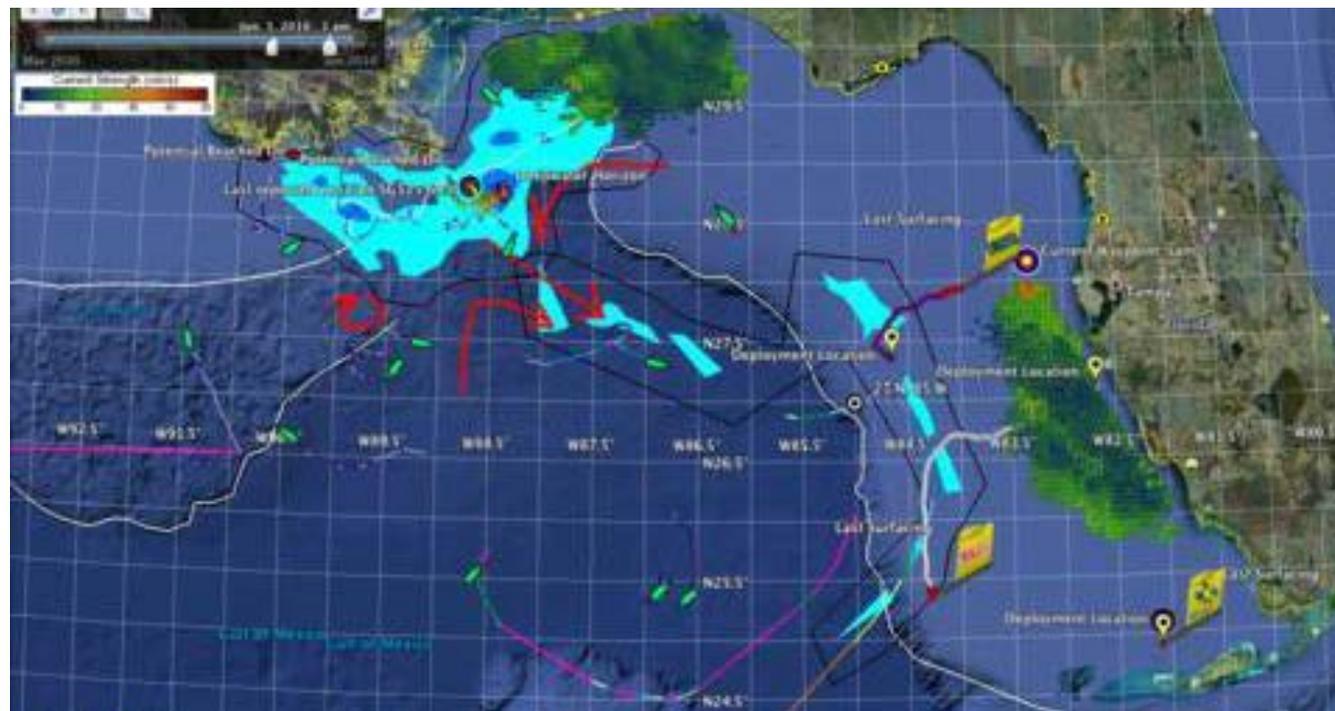
Interdependent

Indispensible

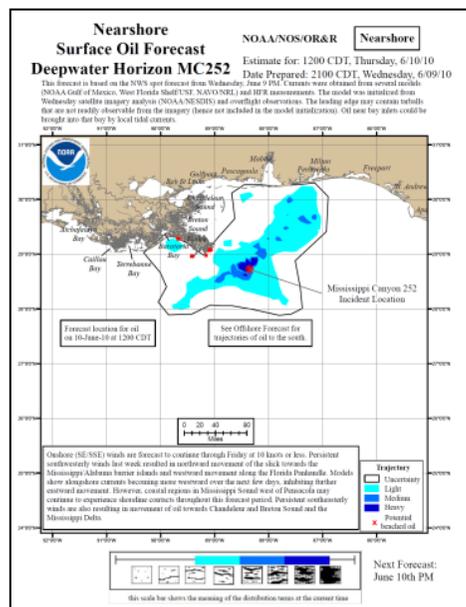
Regional Support in a Crisis: Deepwater Horizon

Demonstrated ability to:

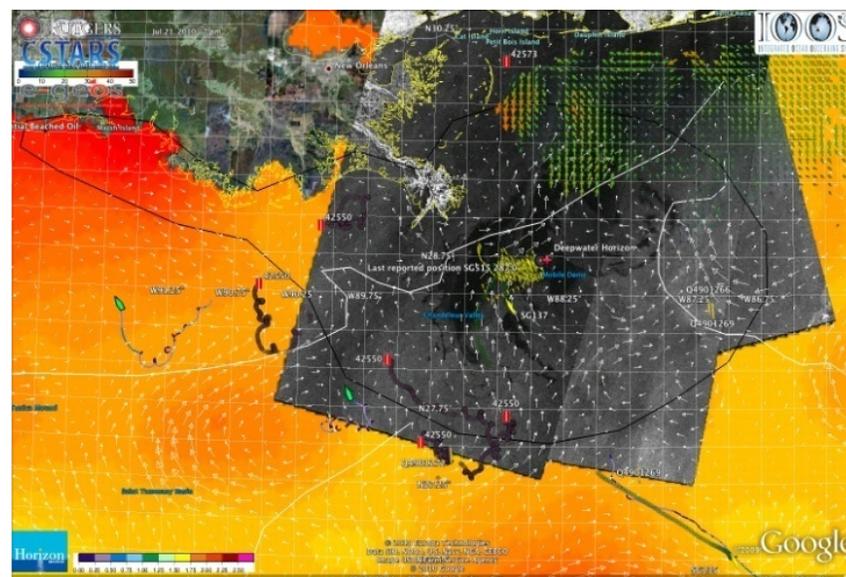
- Quickly deploy technologies: Gliders and HF radar, saving resources/improving safety
- Models/Imagery ingested into NOAA/Navy models
- Data assimilation improved spill response decision-making and public understanding



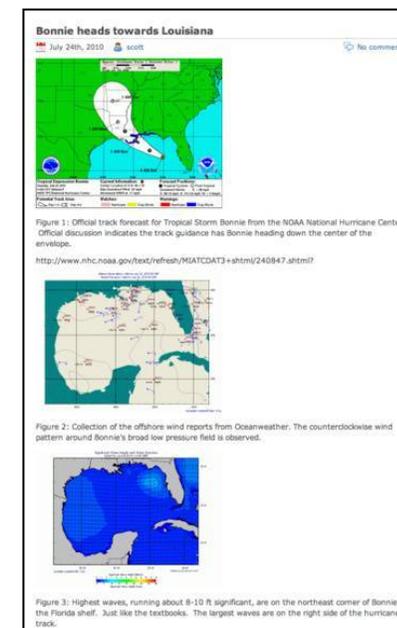
Web Portal



HFR data informed NOAA trajectory forecasts

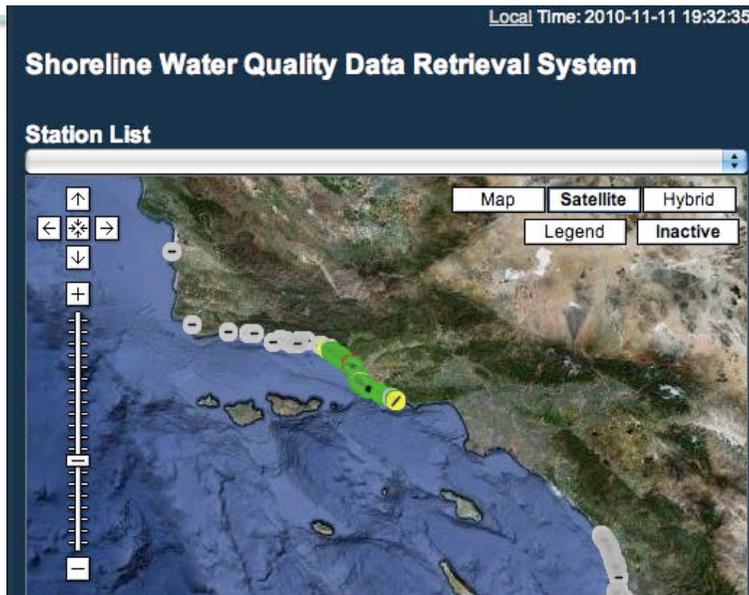


HFR validation of SABGOM Forecast with satellite detected oil slicks



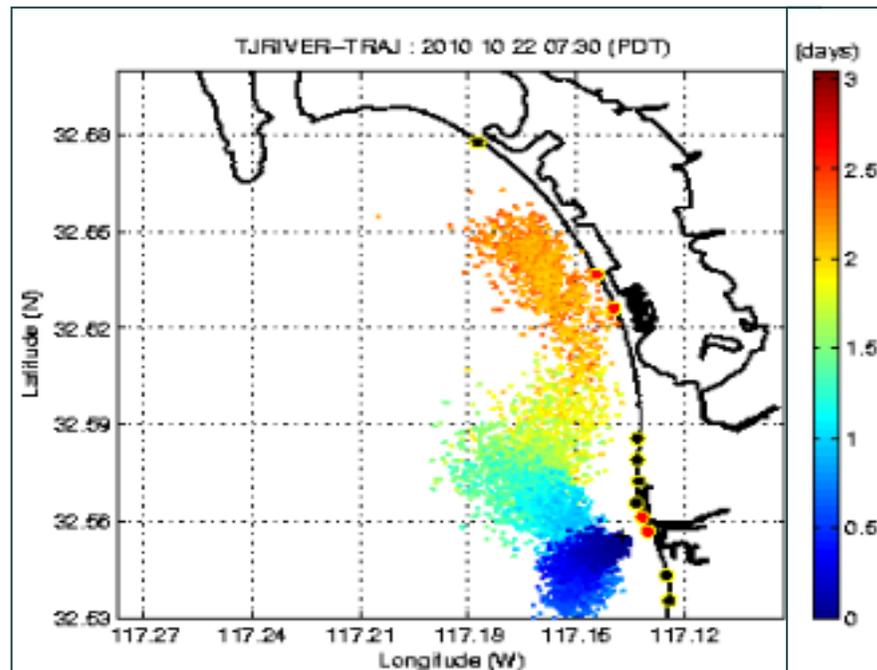
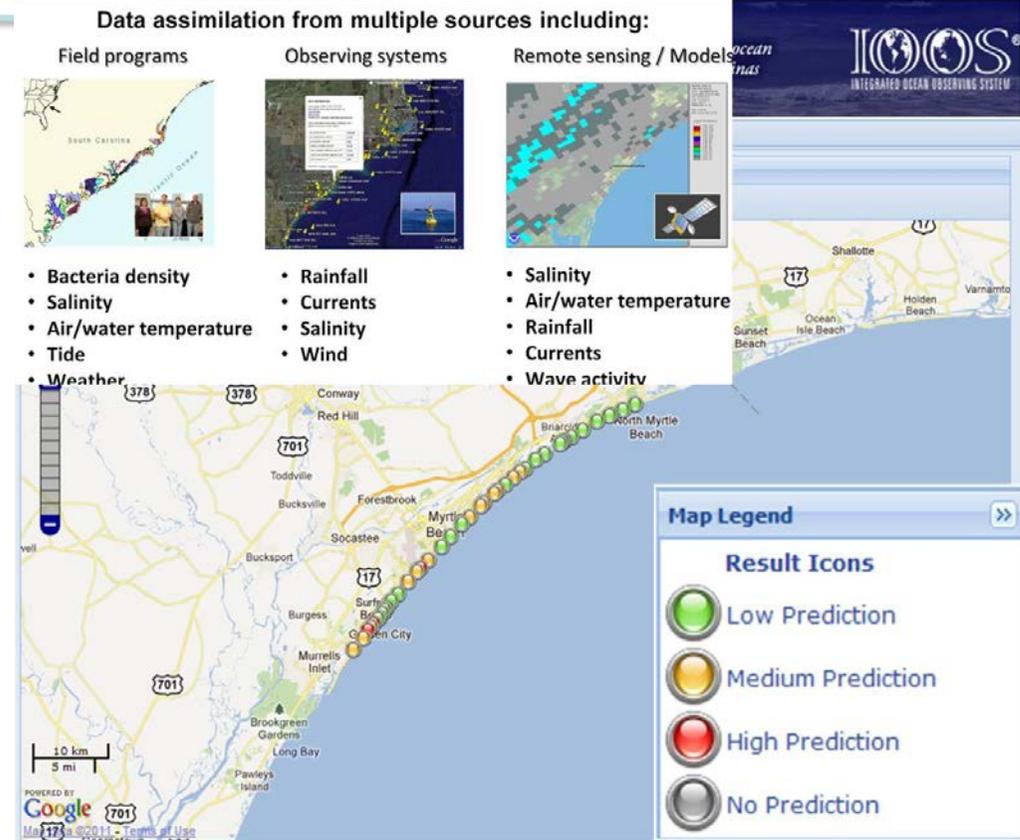
Briefing Blog

IOOS RA's & Water Quality

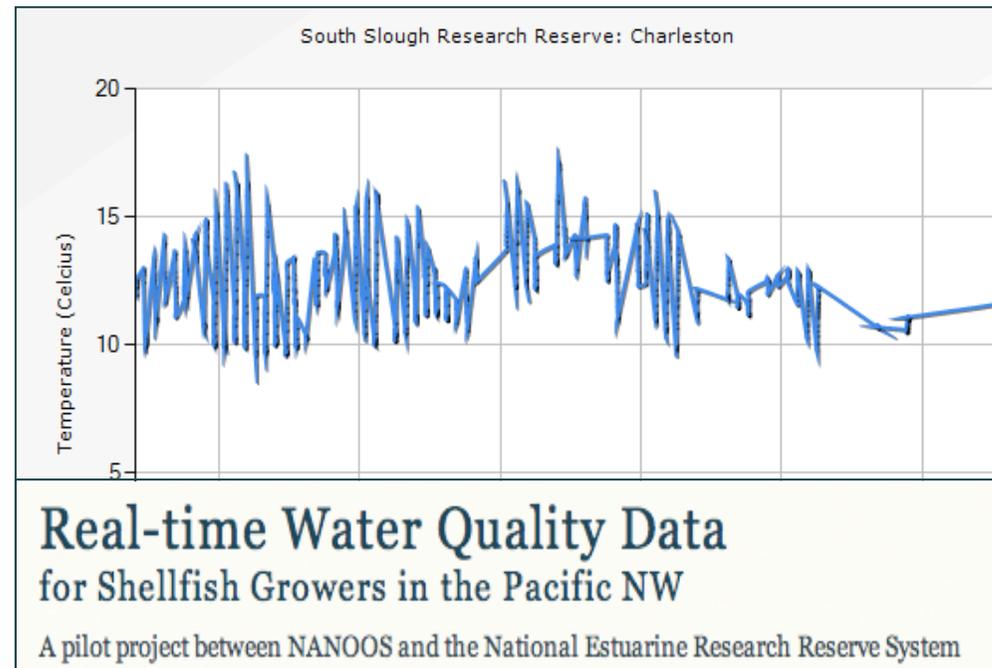


**Data Services:
Simplifying access to data**

**Beach
Condition
Forecasts**

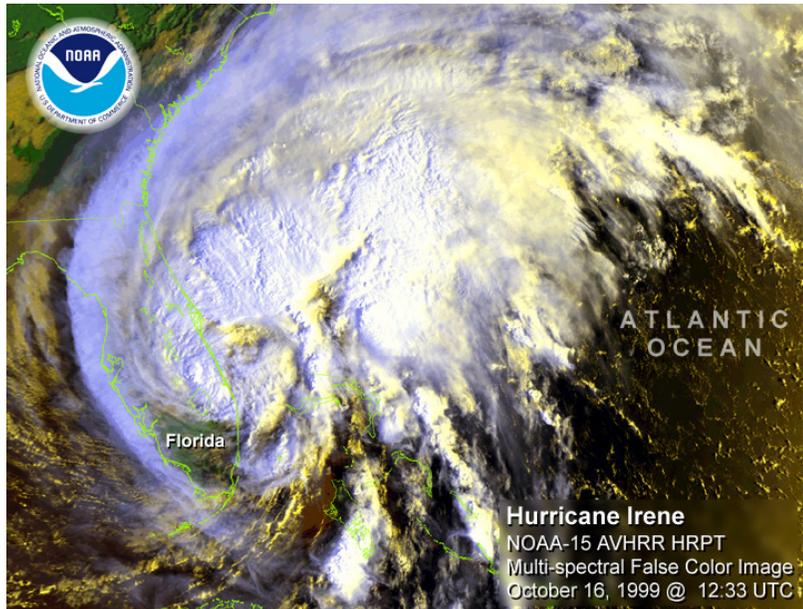


Plume Tracking

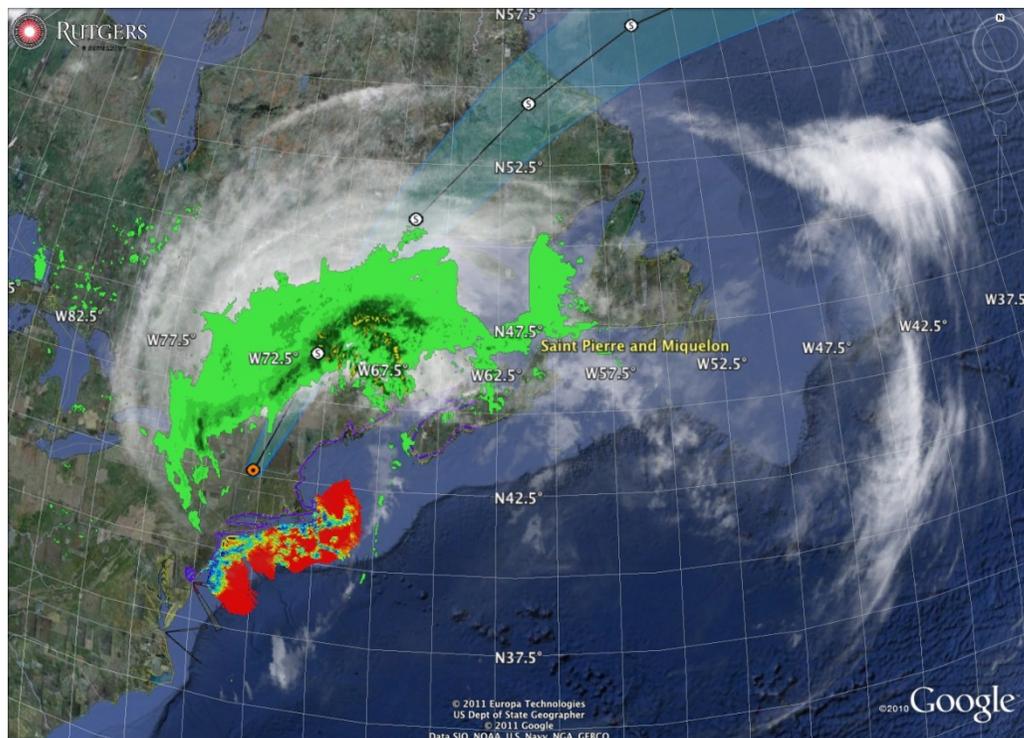


Customized Products

Regional Support in a Crisis: Hurricane Irene



Around-the-clock data and other information before, during and after hurricanes



- **CaRa:**
 - 4 buoys provided real-time observations
- **SECOORA:**
 - Buoys used to initialize models/verified forecasts.
 - Forecast system used by Coast Guard, North Carolina Division of Emergency Management, National Hurricane Center, USACE, and multiple National Weather Service Forecast Offices
- **MARACOOS:**
 - Surface currents by the High Frequency Radar
 - Delivered forecasts to New Jersey Board of Public Utilities, Connecticut governor's office and Delaware River Basin Commission
 - Underwater glider collected data
- **NERACOOS:**
 - Buoys critical to the National Weather Service
 - Local television stations in Connecticut reported conditions from the NERACOOS buoy
 - Northeast Coastal Ocean Forecast System (NeCOFS) provided to the National Weather Service

The U.S. IOOS Challenge

- Leveraging resources yields positive results
- Multi-sector approach is a hallmark of IOOS but adds complexity
- As we are now interdependent both from a fiscal, science and operational perspectives loss of any 1 funding stream means significant risk to the entire enterprise

What is needed?

- Unified portrayal of why ocean observing is critical
- Coordinated message
- Continued mutual engagement