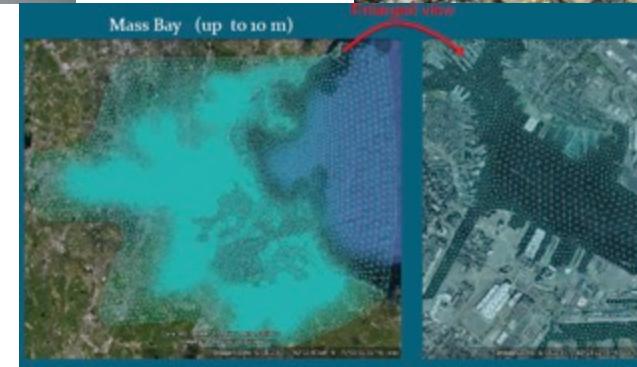
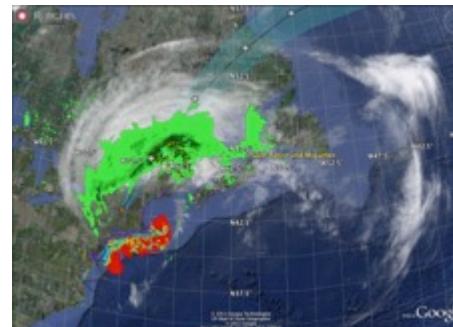


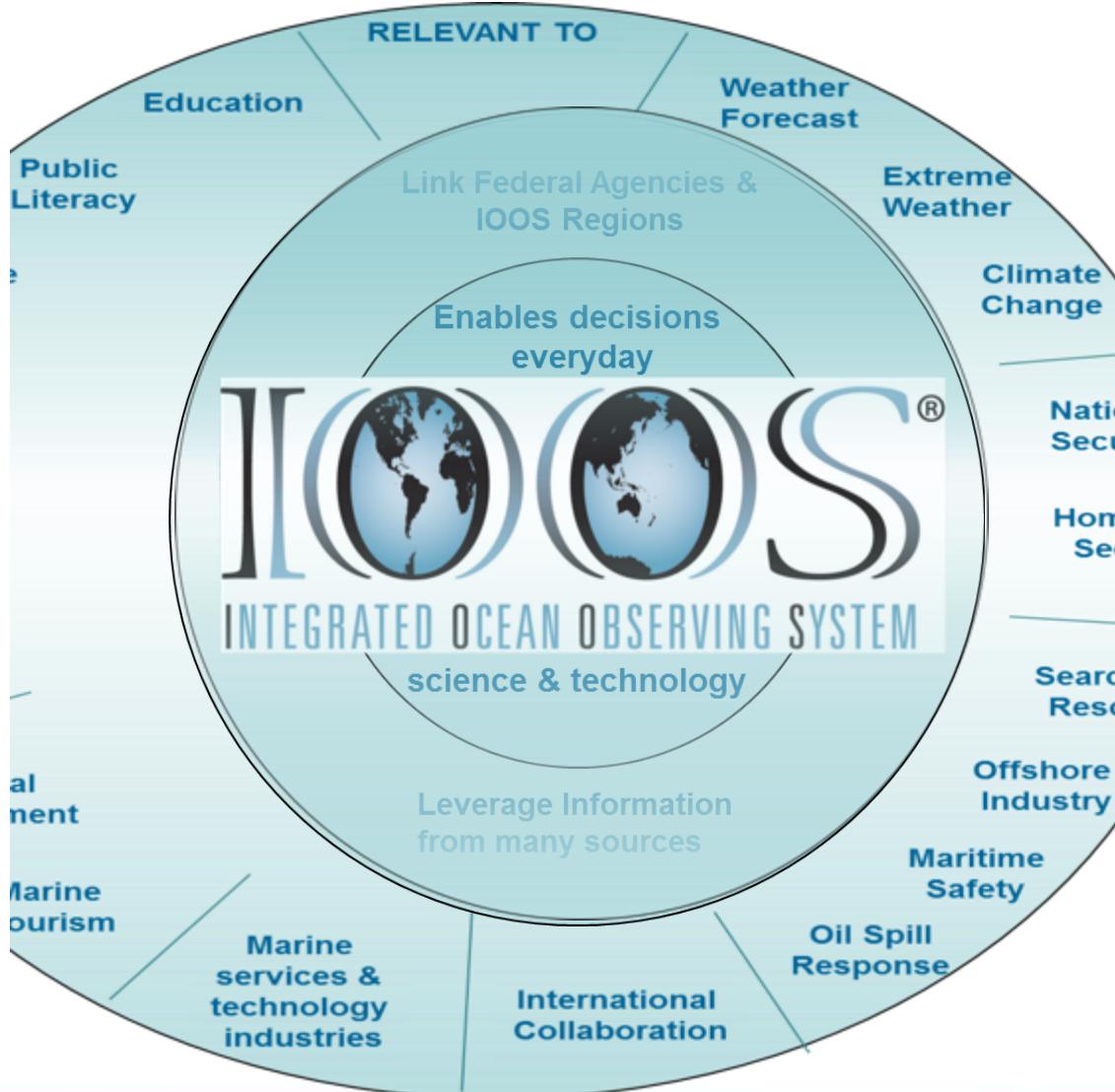
U.S. Integrated Ocean Observing System (IOOS®)



Zdenka Willis, Director, U.S. IOOS Program

March 24, 2014

IOOS Works!



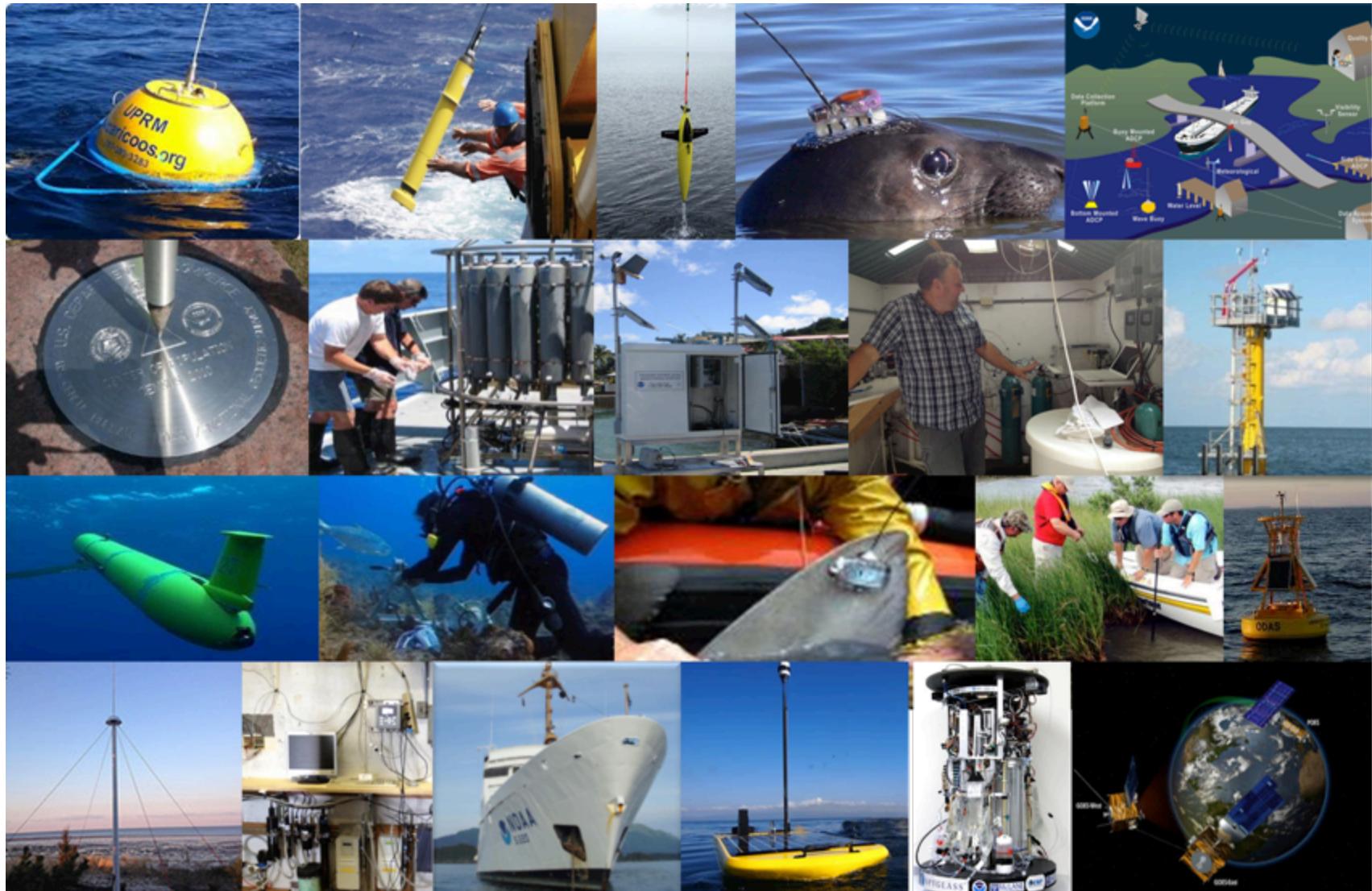
Operated By:
Federal Component:



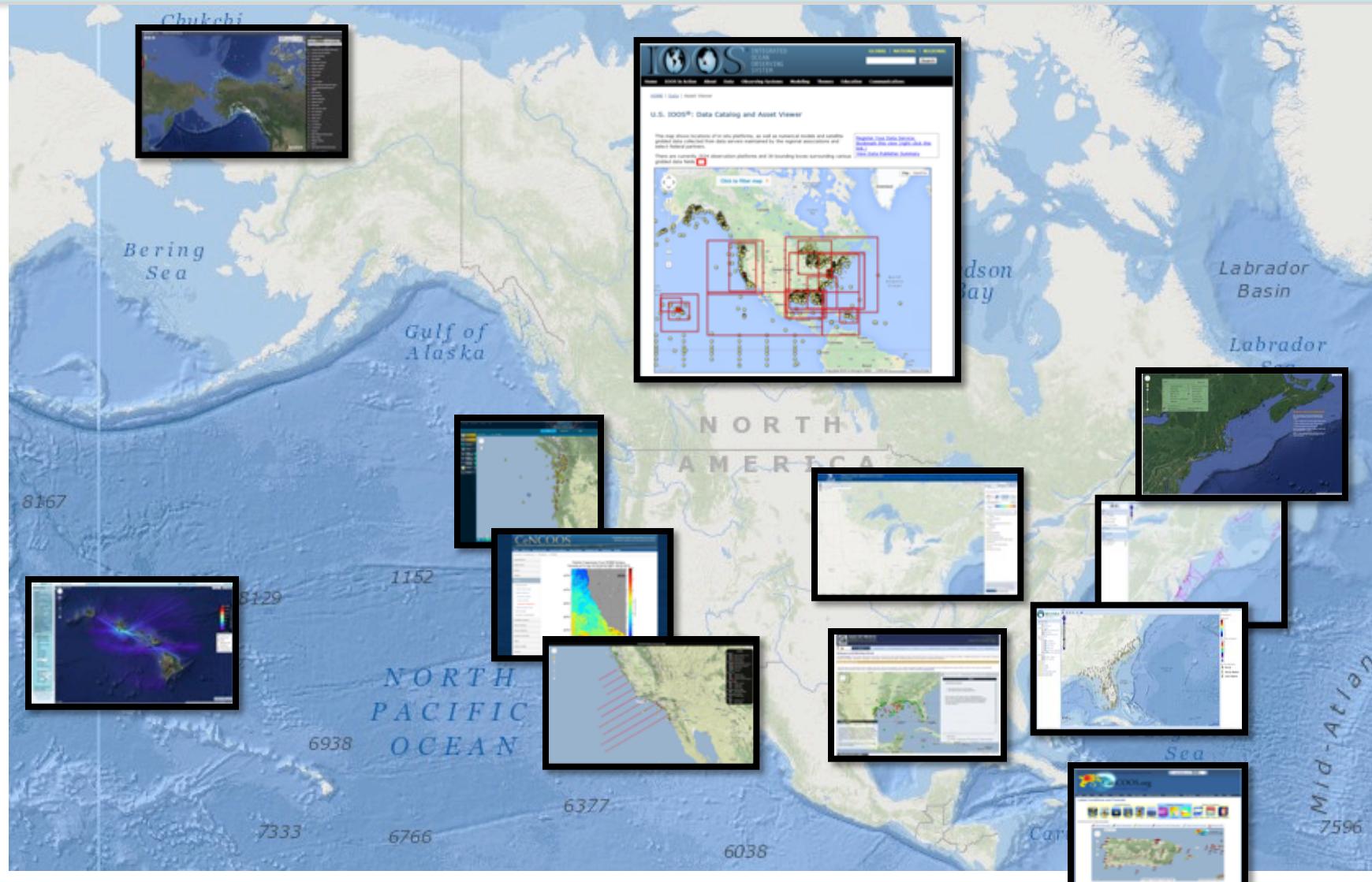
Regional Component:



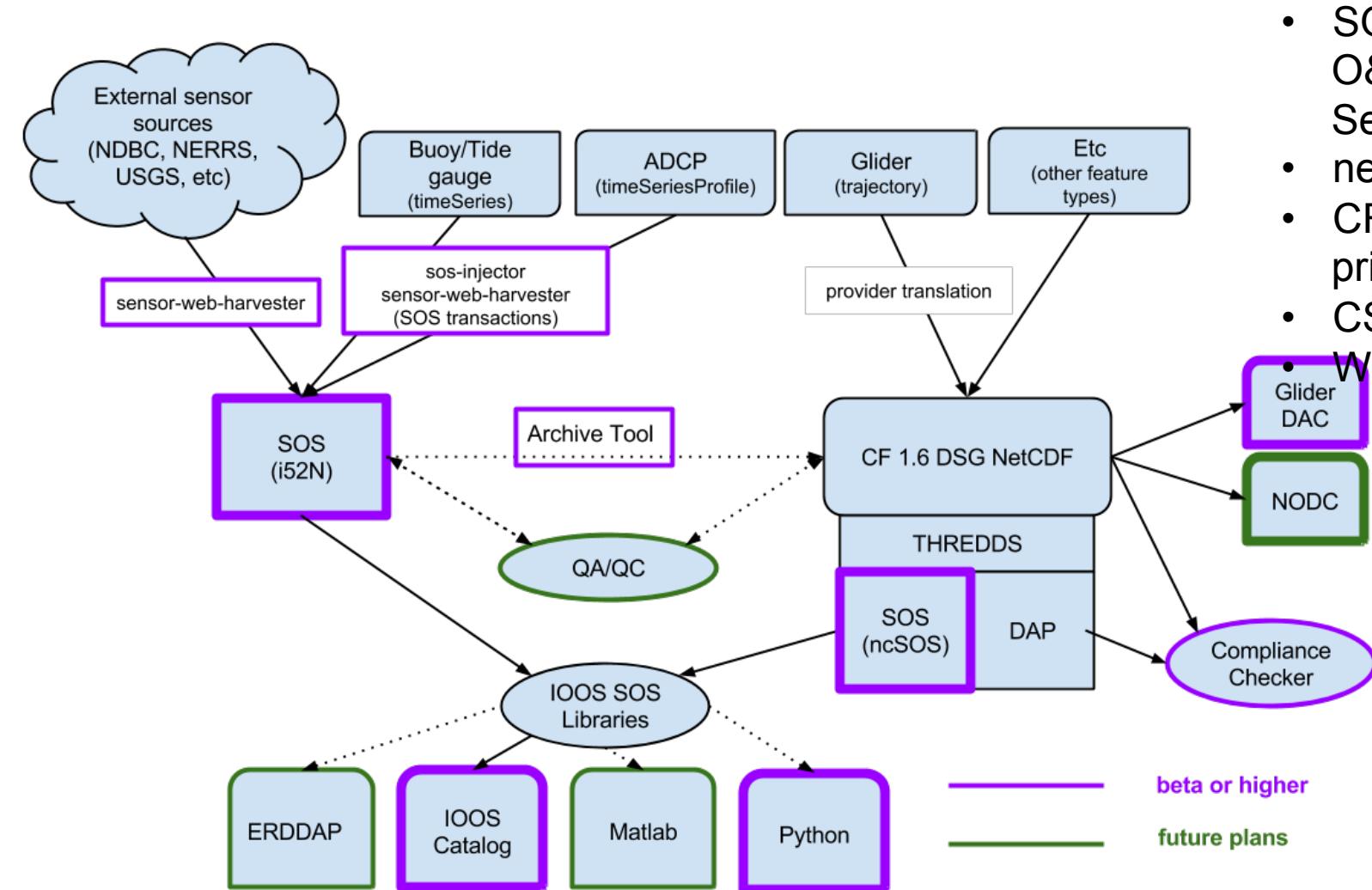
Eyes on!



Exposing Data!



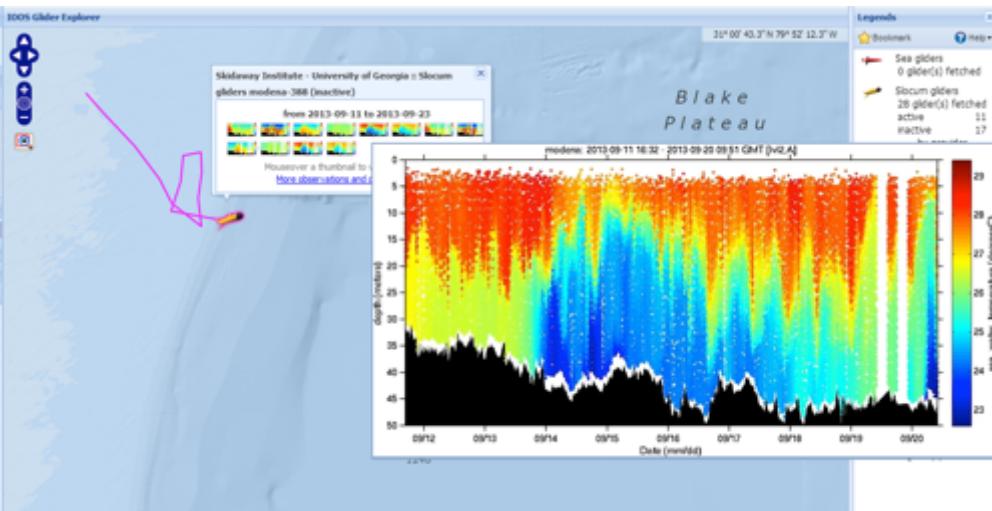
Select OGC technologies in use by IOOS



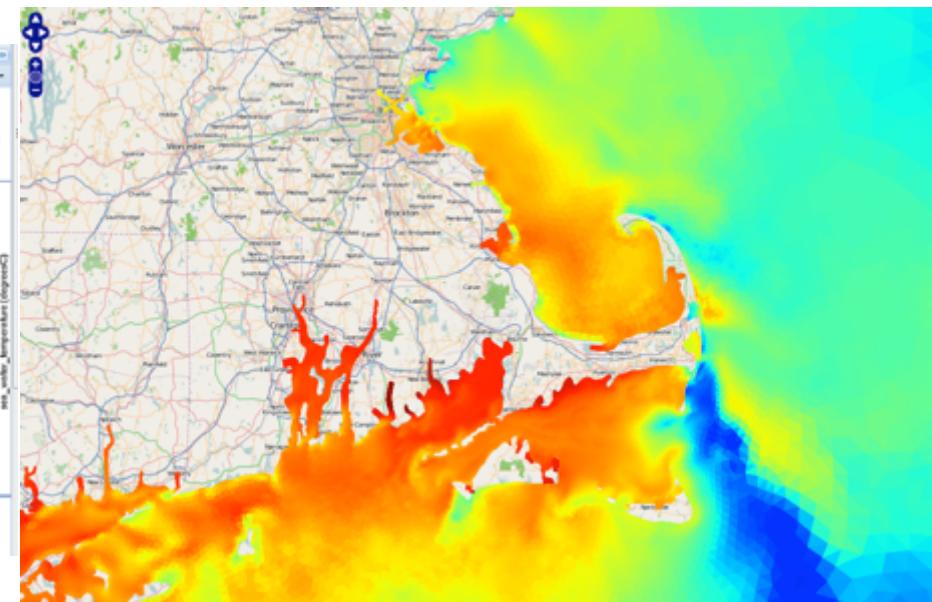
- SOS/SWE/
O&M/
SensorML 1.0
- netCDF
- CF-netCDF
primer
- CS/W
- WMS

Use Case: Model Data comparison as a web service

Ocean profiling glider measuring 5000 individual profiles over 3 months along a 4D trajectory through space/time



33 Tb 4D model output on a triangular mesh grid



Plot the time series (or time-depth) glider sampled temperature on the same axis as the model simulation via web services.

Without



We wouldn't have



We wouldn't sell



Soybeans \$23b



Skin care & perfumes \$2b



Dumpers \$ 4b



Bus tires \$1b

We couldn't move

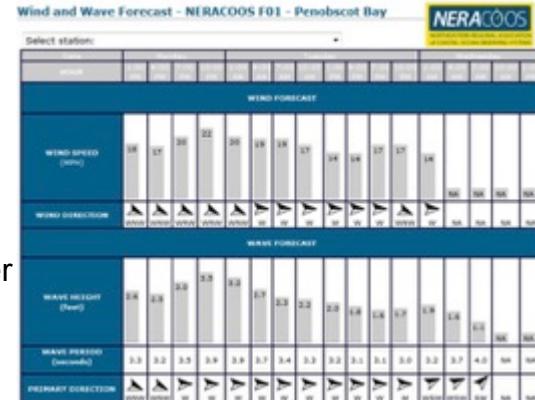


Without: Ocean Observations and Forecasts

IOOS – Regional Funded by NOAA

"The coast of Maine supports multi-million dollar fishing and tourism industries so when making decisions about bringing a 700 foot tanker full of fuel into port we need the best ocean and weather information possible, which is why we depend on IOOS buoy observations and forecasts to ensure safety and efficiency of these critical operations."

Captain David Gelinas, Penobscot River and Bay Pilot



NOAA's PORTS®

- 22 States
 - Purchases equipment from 43 manufacturers



Oysters on the Half Shell



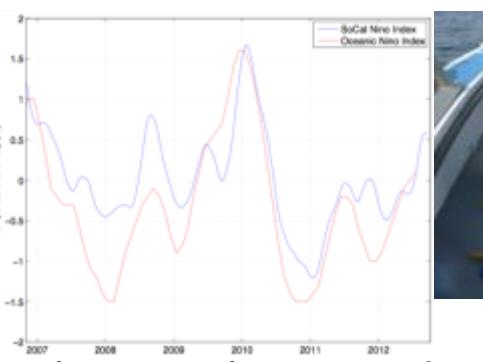
Little wild set of oysters on US northwest
2008 Whiskey Creek Hatchery lost 100% of oyster larvae
Ocean Acidification determined the cause
Real-time Observing System established with industry partnership
By 2010 productivity was back to 70%
Industry full participant in observing advancements and uses
industry assets to help maintain the system

Glider Missions

Climate/Ecosystem/Fisheries Management/Water Quality



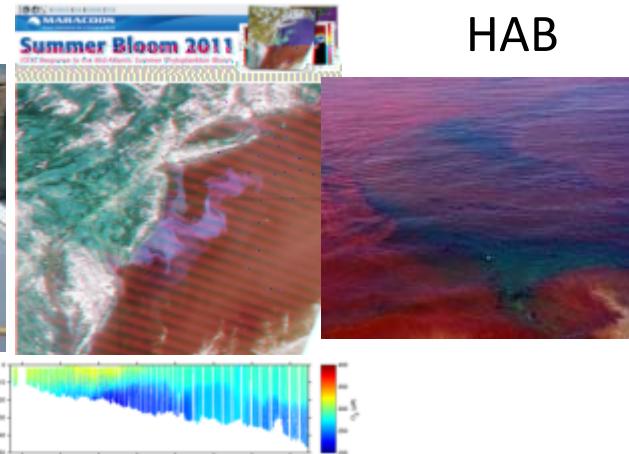
CalCOFI



The SoCal Niño Index

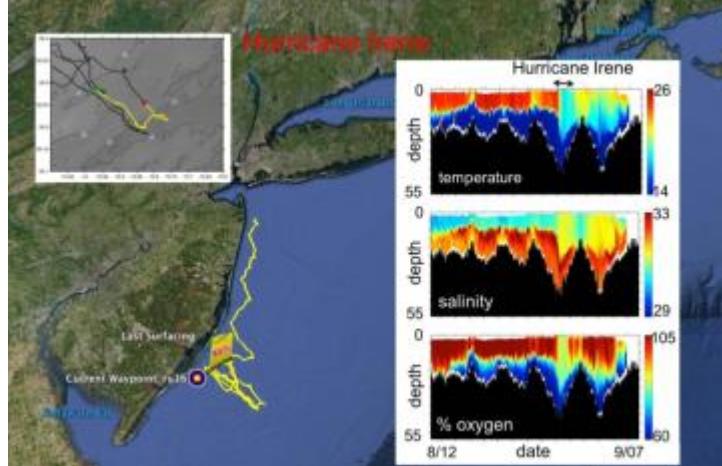


Fish Tracking

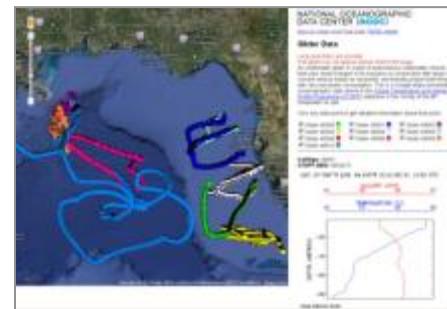


HAB

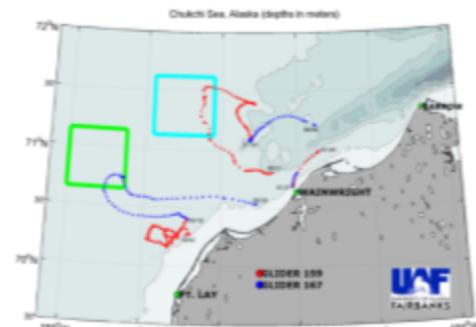
Hurricane Forecasting



Response to Oil Spill



Deep Water Horizon



Alaska

US IOOS - Gliderpalooza



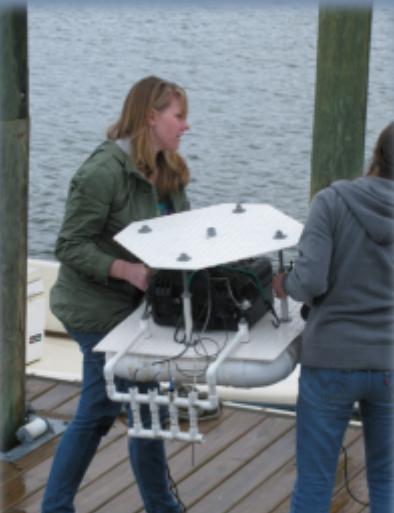
- 15 gliders
- 15 Partners:
 - Ocean Tracking Network, Canada;
 - 9 U.S. Universities
 - Teledyne Webb Research Corporation
 - State Agency
 - National: IOOS, NOAA, US Navy and NASA
- >25,000 profiles to date
 - NOAA's Buoy Center sent data to the Global Telecommunications Systems (GTS)

Education and Outreach – Ocean Literacy

Graduate and Undergraduate students are integrated – good for IOOS now and good for industry for future employees



Teaching the next generation –
Puerto Rico Weather Camp 2012



Education, Outreach and Training

This site is designed for formal and informal educators, students, and anyone interested in ocean observing, observing technology, ocean physics, climate, geology, and ecosystem changes in our oceans, coasts, and Great Lakes.

Home: Training Resources

Training resources will help educators teach ocean observing concepts and information to students in science, math, and technology subjects. Resources are free or low cost.

Education Webinars | **Lesson Plans** | **Using Real Data** | **Multimedia**

Regional Education Webinars

Webinars (2012)

- The GO-SHIP program uses ship-based data from ocean observations to design and test coastal weather stations for use in the Arctic, Antarctic, and Great Lakes.
- Training for coastal managers, citizen scientists, and others involved in coastal ecosystems, weather, resources, and the public.

Conferences (GO-SHIP)

- The GO-SHIP program organized several education workshops for the Gulf of Mexico. The workshops were held in Galveston, Texas; New Orleans, Louisiana; and Pensacola, Florida, during October 2012.



Basic Observational Buoy (BOB)
Educational project for universities
and high schools to address STEM
disciplines

Gulf of Mexico Coastal Ocean Observing System Education and Outreach Office

- The GO-SHIP program provides educational products for groups of all ages. These include K-12 and general interest products for the Gulf of Mexico.

Gulf of Mexico (GO-MEX)

- Gulf of Mexico Coastal Ocean Observing System Education and Outreach Office (GO-MEX) works with schools and institutions by ocean observing the Gulf Coast - Free Grants for Teachers

Great Lakes (GL-MEX)

- Gulf of Mexico Coastal Ocean Observing System Education and Outreach Office (GO-MEX) makes available online and print-based lessons and activities for teachers and students.

Mid-Atlantic (MA-MEX)

- Mid-Atlantic Education makes available online and print-based lessons and activities for teachers and students.

Northwest Atlantic (NWA-MEX)

- Northwest Atlantic Ocean Observing System Education and Outreach Office (NWA-MEX) makes available online and print-based lessons and activities for teachers and students.

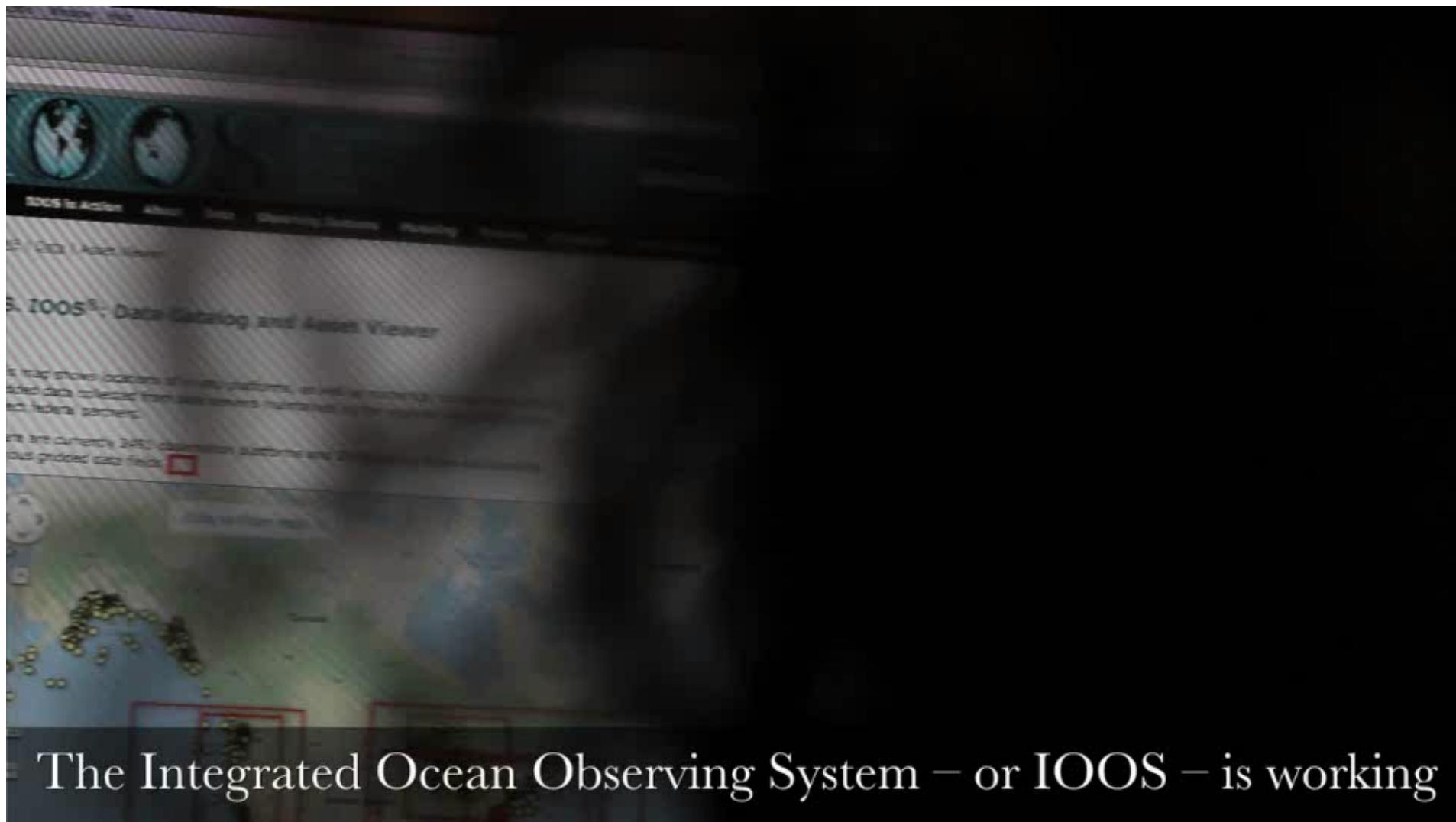
North Pacific (NP-MEX)

- North Pacific Ocean Observing System Education and Outreach Office (NP-MEX) makes available online and print-based lessons and activities for teachers and students.

Mid-Atlantic (MA-MEX)

- Mid-Atlantic Education makes available online and print-based lessons and activities for teachers and students.

Enabling Decisions



The Integrated Ocean Observing System – or IOOS – is working

Thank You

Please Visit the U.S. IOOS Website
ioos.noaa.gov

