Josie Quintrell, Director
IOOS Association Annual Meeting
La Push, WA
October r 2016

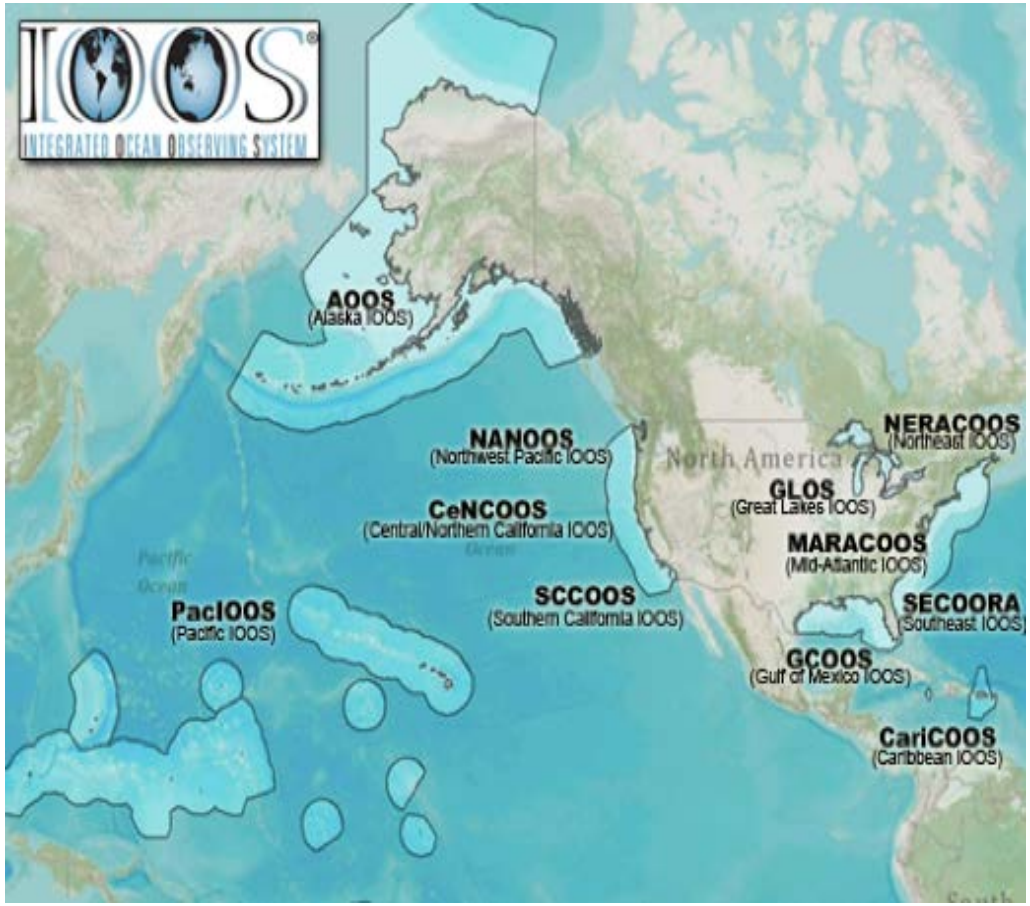
IOOS ASSOCIATION

IOOS | EYES ON THE OCEAN™

IOOS Association

Observing our oceans, coasts and Great Lakes

Providing information to those who need it, when they need it



- Objectives:
  - Advocacy
  - Common Issues
  - IOOS federal/non-federal partnership
    - Administration
    - Congress
    - National Partners
  - Emerging Issues

IOOS | EYES ON THE OCEAN

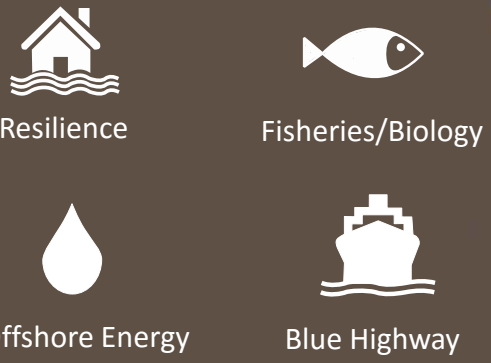
CLOSING THE GAP CAMPAIGN

FY 18 - FY 23 Multiyear Strategy

TECHNOLOGIES

Gliders Moorings HFR

THEMES



Resilience Fisheries/Biology

Offshore Energy Blue Highway

2022, $56M

2021, $51M

2020, $46M

2019, $41M

2018, $36M

New Administration

FY 17 IOOS Appropriations

SURFACE CURRENT MAPPING:

Saving Lives, Protecting Health & Commerce

Search and rescue, oil spill response, harmful algal bloom tracking and forecasting, water quality monitoring, and port and harbor navigation all depend on real-time surface current mapping. IOOS operates our nation's only network of high-frequency radars (HFR) providing this information, but we have critical gaps in coverage.

IOOS Integrated Ocean Observing System

WHERE OUR NATION NEEDS SURFACE CURRENT MAPPING:

Saving Lives off Florida's Coast

Florida's east coast is one of the Coast Guard's most active search and rescue areas. Real-time surface current information dramatically increases the odds of finding lost people or vessels.

2 radars needed

Saving Millions in The Gulf of Mexico

The Gulf lacks surface current monitoring along 90 percent of its coast, including along the heavily traveled Mississippi delta. High-frequency radars provide data on the likely path of surface oil that could be released from any of the more than 300 active rigs in the Gulf, saving time and money.

3 radars needed

Protecting Lives and Public Health in the Pacific Northwest

Surface current monitoring alerts mariners to dangerous conditions and warns tribes and resource managers when harmful algal blooms may come ashore. Coverage is absent in Washington, and is needed to protect lives, economy, and culture.

3 radars needed

Safeguarding the Arctic Marine Highway

As ice recedes, more vessels traverse the dangerous waters of the Bering Strait, including commercial cruise ships. But the Arctic lacks adequate critical surface current mapping to ensure safety.

2 remote radars needed

Cleaning up the Great Lakes

The 645-mile oil pipeline under the Straits of Mackinac is showing serious signs of deterioration. Better monitoring would allow a quicker and more effective response for oil spills that threaten this major source of drinking water for millions of people.

2 radars needed

Who Uses IOOS Data?

- Emergency managers
- Fishermen
- Oil spill responders
- Ports
- Public health officials (e.g. beaches, water quality)
- Recreational boaters
- Researchers
- Seafood safety officials
- Shellfish growers
- Tribes
- Bureau of Ocean Energy Management
- Environmental Protection Agency
- National Oceanic and Atmospheric Administration
- Office of Naval Research
- U.S. Arctic Research Commission
- U.S. Army Corps of Engineers
- U.S. Coast Guard
- U.S. Department of State

REGIONAL SYSTEM REQUEST: $33.9 MILLION

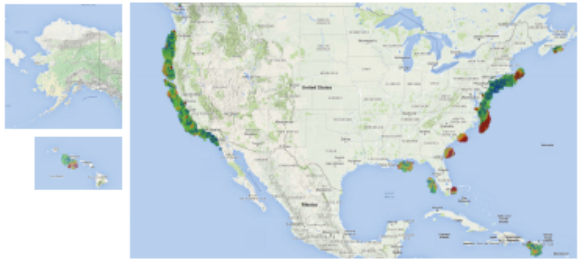
$24.3 million for the national network of 11 regional coastal observing systems

$1.5 million for upgrades and repairs for aging regional systems

$3.1 million to install 12 high frequency radar systems, to close key gaps and make the U.S. surface current mapping system the most reliable, efficient and comprehensive in the world

$5.0 million for research and development, including competitive grants, modeling and verification to develop new products and systems to ensure comprehensive coverage

Map of IOOS high-frequency radars that provide real-time surface currents



NATIONAL SYSTEM REQUEST: $6.7 MILLION

These funds will support the IOOS Program Office, to help:

- integrate federal and non-federal data
- develop the nation's first quality control standards for real-time data
- coordinate across NOAA and the 12 Federal IOOS agencies and
- certify the regional systems.

	FY 10 Enacted	FY 11 Spend Plan	FY 12 Spend Plan	FY 13 Spend Plan	FY14 Enacted	FY 15 Enacted	FY 16 Enacted	Pres. Bud.	FY 17 IOOS Request
Regional IOOS Total	$27m	$21.9m	$23m	$28.5m	$28.5m	$29.5m	$29.5m	$29.5m	$33.9m
Competitive funding for the national network of regional systems, including surface currents	$7m	$20m	$22m	$23m	$24.3m	$24.3m	$24.3m		$28.9m
Marine Sensor Innovation Grants, Modeling Test Bed, Sensor Verification	$7m	$1.9m	$1m	$3m	$4.2m	$5.2m	$5.2m		$5m
US IOOS Program Office*	$6.5m	$6.5m	$6.4m	$6.4m	$6.5m	$6.5m	$6.7m	$6.7m	$6.7m

IOOS Association

Here's what top decision-makers are saying about IOOS data...

"Ocean information matters if you want to eat seafood, or buy anything that comes from shipping."

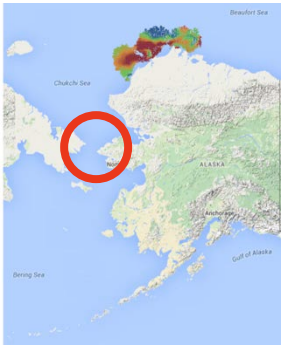
"HFR is really important for Coast Guard search and rescue efforts. We cover 22 million nautical miles of ocean. We save about 10 lives a day."

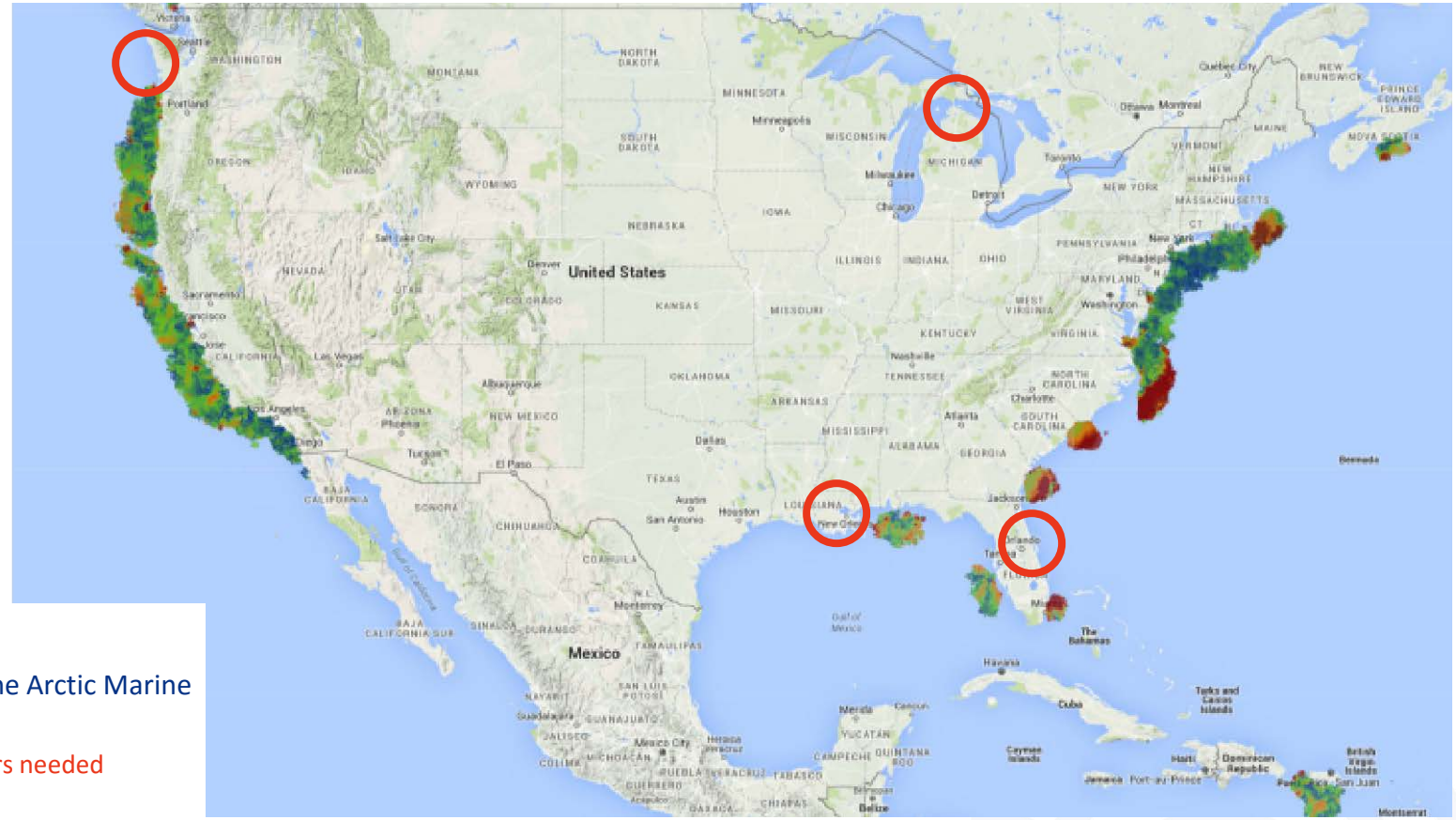
"IOOS is like putting your headlights on when you're on a dark road."

For more information, contact Josie Quintrell, Executive Director, IOOS Association | 207-798-0857 Josie@ioosassociation.org

US IOOS FY 17 High Frequency Radar Request

$3.1 million to install 12 high frequency radar systems





Safeguarding the Arctic Marine Highway

2 remote radars needed

Protecting Lives and Public Health in the Pacific Northwest

3 radars needed

Cleaning up the Great Lakes

3 radars needed

Saving Lives off Florida's Coast

2 radars needed

Saving Millions in the Gulf of Mexico

3 radars needed

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Appropriations

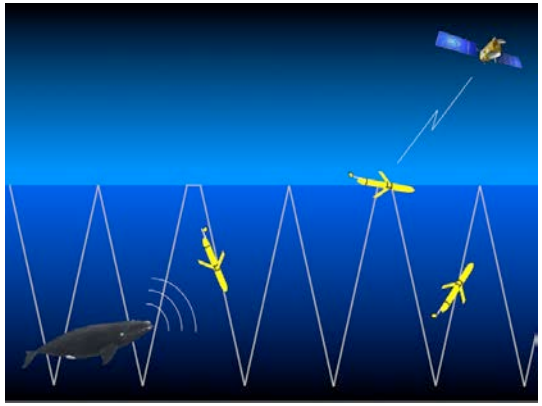
IOOS Appropriations	FY10 Enacted	FY11 Spend Plan	FY 12 Spend Plan	FY 13 Spend Plan	FY 14 Enacted	FY 15 Enacted	FY 16 Enacted	FY 17 Pres Bud	FY 17 Request	FY 17 Pending
Regional IOOS Total	**$27m**	**$21.9m**	**$23 m**	**$26.5m**	**$28.5m**	**$29.5m**	**$29.5m**	**$29.5m**	**33.9m**	**$31.5 m**
Competitive funding for the national network of regional systems, including surface currents	*$20m*	*$20m*	*$22m*	*$23.5m*	*$24.3m*	*$24.5 m*	*$24.5m*		*28.9m*	
Marine Sensor Innovation Grants, Modeling Test bed, Sensor Verification	*$7m*	*$1.9m*	*$1m*	*$3m*	*$4.2m*	*$5 m*	*$5m*		*$5m*	
U.S. IOOS Program Office*	**$6.5m**	**$6.5m**	**$6.4m**	**$5.9m**	***$6.6m***	***$6.6m***	***$6.6m***	**$6.6m**	**$6.6m**	**$6.6m**
Total U.S. IOOS	$33.5m	$28.4m	$29.4m	$32.4m	$35.1m	$ 36.1m	$36.1 m	$36.1 m	40.6m	$38.1m

* Starting in FY 14 included in the Navigation, Observations and Predictions budget line

FY 17 Continuing Resolution (CR) to Dec. Lame duck session in Dec is expected to take up omnibus appropriations bill.

FY 18 Request - Draft

- 2 Scenarios for Congress:
  - Scenario 1: Assume no new $2m
    - $3.1 m for 12 radars (same as FY 17)
    - $3.3m for 17 glider missions in 11 regions
    - Total: $6.4m
  - Scenario 2: $2m in FY 18
    - Continue HFR build out $3m - 10 radars plus O&M on 8 radars
    - Gliders $3.3 m for 17 glider missions
    - Total: $6.3m
  - *May adjust glider request - focus on high priority needs*



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ICOOS Reauthorization

Sen Wicker
R-MS

Sen Cantwell
D- WA

PASSED the Senate

114TH CONGRESS
1ST SESSION

S. 1886

To reauthorize the Integrated Coastal and Ocean Observation System Act of 2009 and for other purposes.

IN THE SENATE OF THE UNITED STATES

JULY 29, 2015

Mr. WICKER (for himself and Ms. CANTWELL) introduced the following bill; which was read twice and referred to the Committee on Commerce, Science, and Transportation

---

A BILL

To reauthorize the Integrated Coastal and Ocean Observation System Act of 2009 and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "Coordinated Ocean Monitoring and Research Act".

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Now, the House….

Natural Resources Committee, Subcommittee on Water, Power and Oceans

Fleming – Ch
R-LA 4

Graves
R-LA 6

25 Co-Sponsors – 14 D, 10R, 1

Young - Lead

Sablan –co-sponsor

Guinta R-NH1
Sablan R-MPO
Crenshaw R-FL4
Amata R- AS0
Clawson R-FL19
Jones R- NC3
Kilmer D- WA6
Larsen D-WA2
Lowenthal D- CA47
Peters D- CA 52

Pierluisi D-PR0
Rooney R-FL 17
Rouzer R-NC 7
Thompson D-CA5
Bordolla D-GU0
Huffman D-CA2
Jolly R-FL13
Takai D-HI1
Honda D-CA17
Rohrabacher R-CA48

Davis D-CA53
Herrer Beutler R-WA3
Bonamici D-OR10
Heck D-WA10
Pingree D-ME1

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Natural Resources Committee, Subcommittee on Water, Power and Oceans

John Fleming, R
LA 4 Chair

Jarred Huffman
RM*
CA 2

Madeleine Bordallo D- Guam*
Jim Costa – D – CA 15
Jeff Denham – D CA-10
Debbie Dingell D MI-12
Jeff Duncan R SC-3
Garrett Graves R LA 6
Doug Lamalfa R CA 1
Alan Lowenthal D CA 47*

Tom MacArthur R NJ 3
Tom McClintock R CA-4
Grace Napolitano D CA 32
Dan Newhouse R WA-4
Paul Ruiz D CA-36
Gregorio Sablan I N MI
Norma Torres D CA-35
Robert Wittman R CA-1
Don Young R Ak *

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Opportunities for New Administration

- Complete the nation's only network to track surface currents
- Fully fund the existing 5-year IOOS regional agreements to:
  - Expand our ability to see underwater.
  - Bring observations inshore.
  - Enhance access to tailored information
- Spur technology innovation by expanding the IOOS Ocean Technology Transfer (OTT) program through public-private partnerships. *Double this $5 million grant program*
- Address critical national needs, including:
  - Create deep-water observing network in the Gulf of Mexico.
  - Develop baseline observing capacity in the Arctic.
- Total Investment: $10m/year (new) for 5 yrs

Certifiable….

Certified
PacIOOS
GLOS

Submitted
GCOOS
MARACOOS
SCCOOS
AOOS

On Deck..
SECOORA
NERACOOS
CaRICOOS
NANOOS
CeNCOOS

Fall IOOS Meeting - Sept

- New approaches to addressing need for information on HABs
  - NOAA/regional partnership
  - Forecast models
  - Operations
- Inundation
  - CO-OPS
  - Tailoring national products to region – Dashboard
  - Flexible approach to getting needed observations
- Navigation
  - Next Gen - Panama Canal, Arctic
  - Under Keel Clearance
- Ocean Acidification
  - Regional Networks
  - Global to Regional Data

- Regional Integration of National Plans
  - Moorings, Radars, Gliders
- Data Management - roles and responsibilities - Where are we going?

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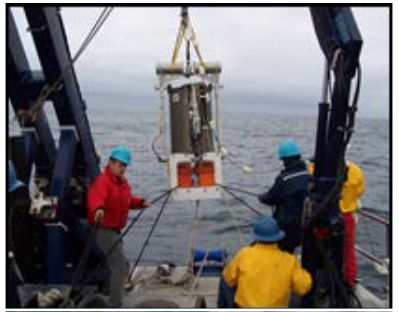
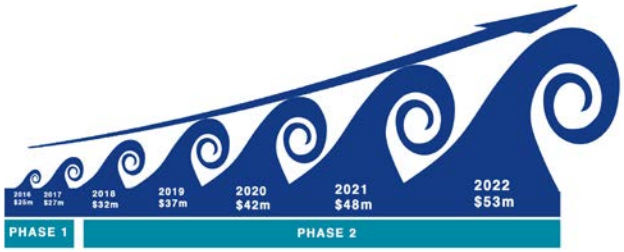
Advocacy

- October
  - Members and staff will be in district to campaign
- November 8 - National Election
- December -– Lame Duck Congress
  - Week of Nov 11th - DC Meetings to support for FY 17 appropriation, reauthorization
- January - Week of Jan 23
  - Preliminary meetings with Authorizers and Appropriators
  - Meeting with new Administration
- February
  - GCOOS Briefing and Hill Visits, GLOS Congressional Week
  - OMB, New Administration
- March
  - IOOS Spring Meeting
  - Hill Briefing - Ecological (HAB, OA)
  - Congressional appropriation requests, Dear Colleague Letters
- April
  - Hill Briefing



Upcoming

- Filling the Gaps
  - FY 18 Request
  - 5-yr strategy –flesh out gaps for themes
- Message IOOS - Commentary, editorial, article.
- Celebrate and leverage certification
- Community workshop on (possible topics)
  - Gaps
  - Integrated regional systems
  - Preparing for Ocean 2019
  - Other
- Transitions.. Administration, Office
- Interagency - BOEM/BESSE, NFWF, EPA…



Thank you

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CLOSING THE GAP CAMPAIGN
FY18-FY23 Multiyear Strategy

TECHNOLOGIES

Gliders Moorings HFR

THEMES

Resilience

Fisheries/Biology

Offshore Energy

Blue Highway

2022, $53M

2021, $48M

2020, $42M

2019, $37M

2018, $32M

Change in Administration

IOOS Spring Meeting 2016: Closing the Gaps

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RA Directors Retreat SWOT Assessment

Strengths

- Collaborative
- Data services, interoperable
- Nimble
- Locally connected at regional scale - not regulatory
- Sustained
- Regional conveners

Opportunities

- New administration
- Real issues that need observations- HABs, SAR, navigation, spills, etc
- Certification
- Grow system to address evolving needs

Weaknesses

- Regionally driven but all different
- Lack of engagement with Fed agencies
- Broad mission
- Closed club
- Resources

Threats

- Changes - Adm, PO
- Burn out – small staff
- Growing competition
- Limited Resources

Closing the Gaps: Water Levels

- Coastal counties contribute $6.6 trillion, or just under half of the country's GDP
- Home to almost 40 percent of the U.S. population.
- Vulnerable to extreme events and climate hazards.
- Natural Hazards losses between 2010-2014 >$1 billion (68% coastal)
- Coastal population rise 8% by 2020

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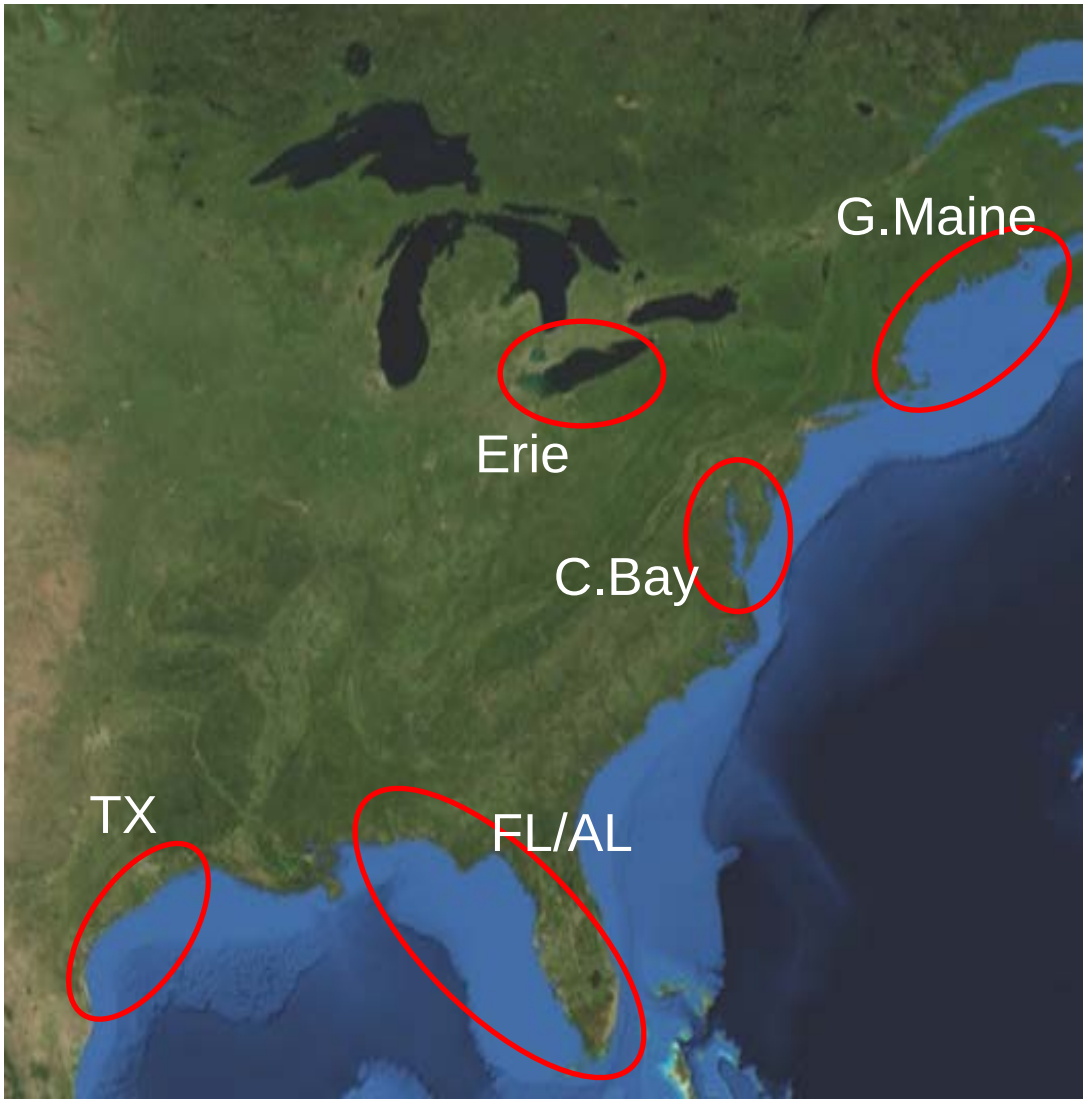
Regions with chronic severe HABs



Closing the Gaps: Next Generation Navigation

Lessons Learned from Long Beach:

- Precision navigation needs for an area vary
- Similar needs will exist in other areas but will require both national as well as tailored solutions
- Need to identify gaps as well as specialized needs in partnership with RAs and others
- Need to integrate data streams and improve delivery of them
- Need a systematic approach to soliciting precision navigation needs for other areas

US IOOS FY 17 Request

- **Regional System Request: $33.9 million**

$24.3 million	for the national network of 11 regional coastal observing systems
$1.5 million	for upgrades and repairs for aging regional systems
$3.1 million	to install 12 high frequency radar systems, to close key gaps and make the U.S. surface current mapping system the most reliable, efficient and comprehensive in the world
$5.0 million	for research and development, including competitive grants, modeling and verification to develop new products and systems to ensure comprehensive coverage

National System Request- $6.7 million

These funds will support the IOOS Program Office, to help:

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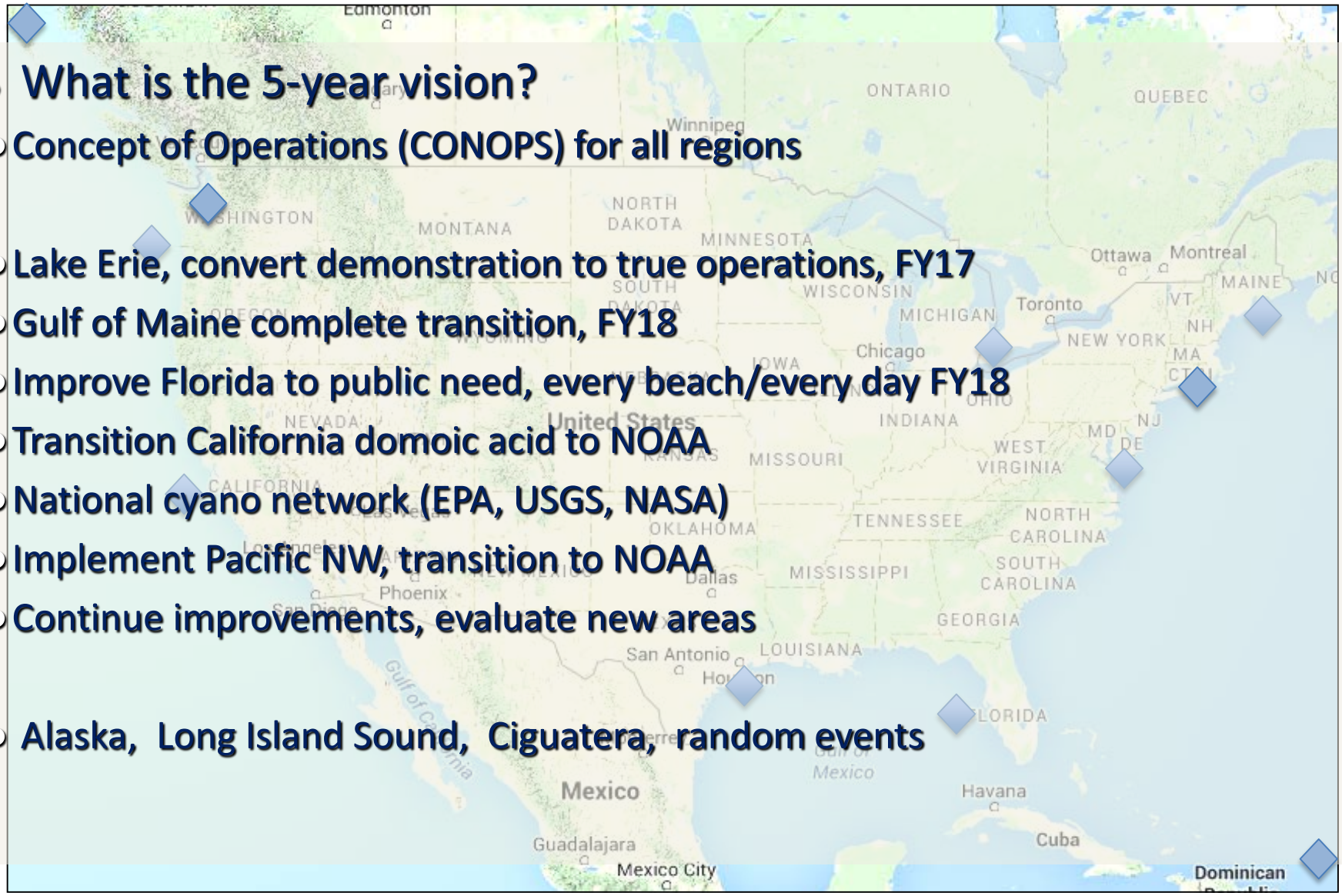
NOAA Next Steps



- What is the 5-year vision?
- Concept of Operations (CONOPS) for all regions
- Lake Erie, convert demonstration to true operations, FY17
- Gulf of Maine complete transition, FY18
- Improve Florida to public need, every beach/every day FY18
- Transition California domoic acid to NOAA
- National cyano network (EPA, USGS, NASA)
- Implement Pacific NW, transition to NOAA
- Continue improvements, evaluate new areas
- Alaska, Long Island Sound, Ciguatera, random events

Closing the Gaps: Next Steps

- HFR Scoping Committee
  - O&M cost, recapitalization of the system, new radars, metrics, communications
- Water Levels
  - Convene working group with NOAA and RAs
- HAB
  - Better define “the gap”
  - Id specific needs to support forecasting - strategy for cells and toxins
  - Prioritize operational forecasting needs by region
  - Blended approach of human and autonomous sensing
- Navigation
  - Mississippi
  - Define role of regions
- Ocean Acidification

Side-by-Side Comparison of ICOOS Act of 2009, HR 2744 and S 1886

Title/Section	ICOOS Act of 2009	HR 2744	S 1886
Short Title	Integrated Coastal and Ocean Observing System Act of 2009	No change	Coordinated Ocean Monitoring and Research Act
Definitions	Creates RICEs	No change	Changed to Regional Coastal Observing Systems
Lead Federal Agency	NOAA established as Lead and it's responsibilities for developing policies and protocols, certification guidelines, oversee contracts, periodic reviews, DMAC, etc.	No change	*Deletes public education on climate change *Adds product development for weather forecasting, SAR, corrosive seawater forecasts, water quality forecasts, and HAB forecasts
System Advisory Committee	Reports to the IOOC and NOAA Administrator	No change	Reports to the Council and the NOAA Administrator
System Advisory Committee	No provision for staggered terms	Allows for staggered terms	Allows for staggered terms – different language
System Advisory Committee	Purpose is to provide advise on administration and operation of the program, expansion of the system, end user communities and other purposes identified by NOAA or the IOOC	No change	* National surface current mapping * Fleet acquisition strategy for AUVs * Survey program for biological, chemistry, geology, physics and hydrology * New analytical methods for data assimilation * Integrated sediment monitoring * Multi-region marine sound monitoring
Interagency Financing	Allows for interagency financing	Clarifies language	Clarifies language to address NOAA's concerns
Reports to Congress	Requires reports every 2 years	No change	Changes to 3 years after the initial 2 years, adds gaps in the surface current mapping, coastal buoys, and ocean chemistry monitoring
Authorization of Appropriations	Such sums as necessary	$36,151,000 FY15 to FY19	Such sums as necessary
Reports and Research Plans			Amends Federal Ocean Acidification Research and Monitoring Act of 2009 by adding: 1) Economic vulnerability report 2) Monitoring prioritization plan 3) Strategic research plan 4) OA program expanded to included research to understand the combined effects of changes in ocean chemistry and applied research to identify adaption strategies. 5) Stakeholder input mechanism 6) Directs NSF to support merit-based, peer-reviewed OA research

Preparing for …

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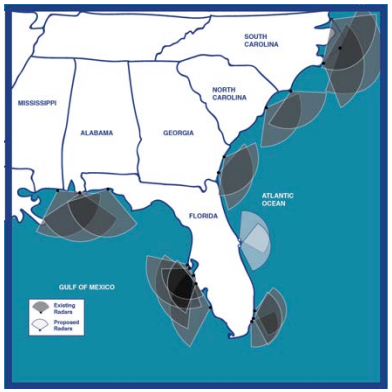
- Back up slide

US IOOS FY 17 High Frequency Radar Request

Saving Lives off Florida's Coast

2 radars needed



Safeguarding the Arctic Marine Highway

2 remote radars needed

Protecting Lives and Public Health in the Pacific Northwest

3 radars needed

Cleaning up the Great Lakes

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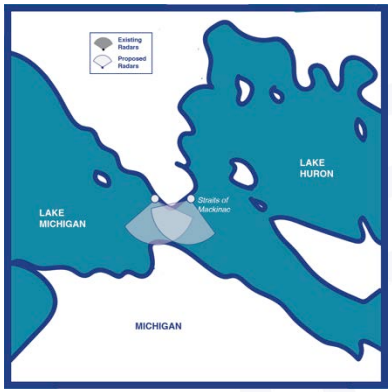
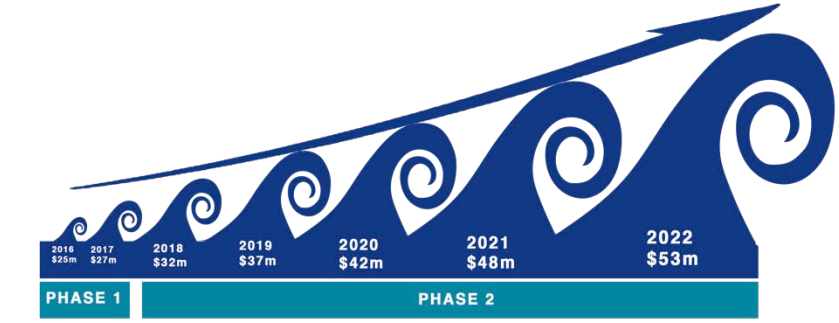
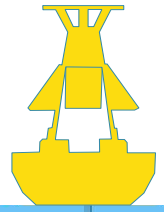


CLOSING THE GAPS CAMPAIGN

- Scalable campaign
- Tangible outcomes
- Initial focus
  - Water levels
  - Precision navigation
  - HAB forecasting
  - Ocean acidification
- Defining IOOS niche - Federal/Non-federal partnership



Double IOOS funding in 5 years to fill key gaps in the nation's coastal, ocean and Great Lakes observing systems.



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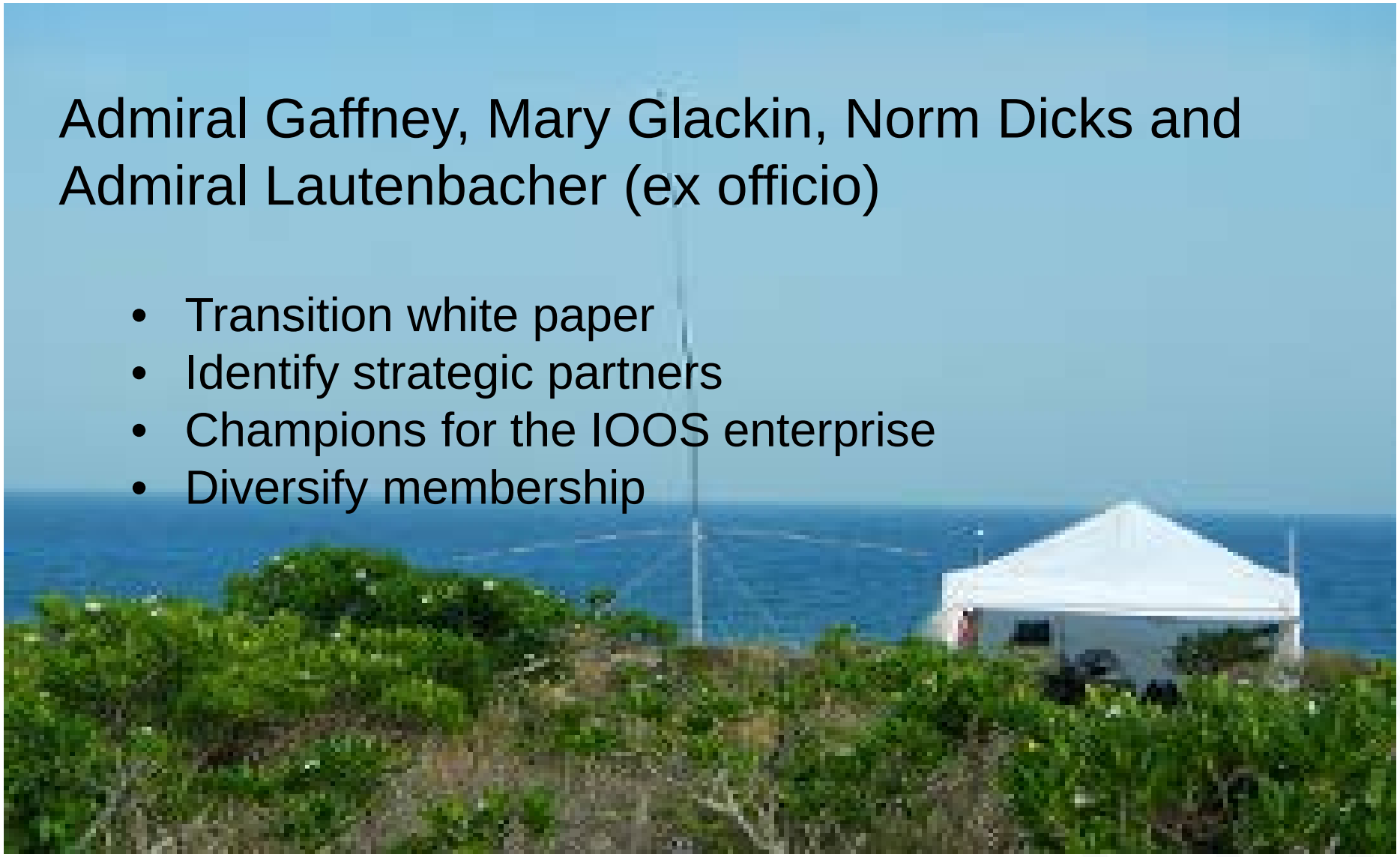
2018, $32M

Transition Paper



Admiral Gaffney, Mary Glackin, Norm Dicks and Admiral Lautenbacher (ex officio)

- Transition white paper
- Identify strategic partners
- Champions for the IOOS enterprise
- Diversify membership

RA Certification

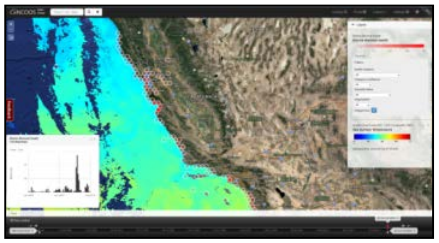
- PacIOOS certified
- GLOS submitted
- All RAs Planning to submit this year
- Opportunity to engage federal agencies
  - Regional data sharing
  - Outreach
  - BOEM/BESSE

A national network of regions…

AOOS

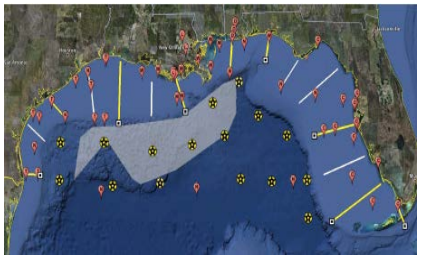
CariCOOS

CeNCOOS



GLOS

GCOOS



MARACOOS

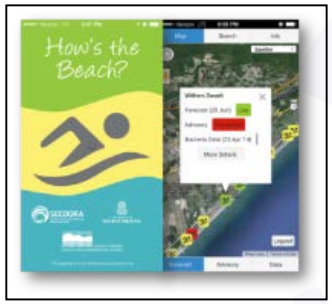
NANOOS

NERACOOS

PacIOOS

SCCOOS

SECOORA



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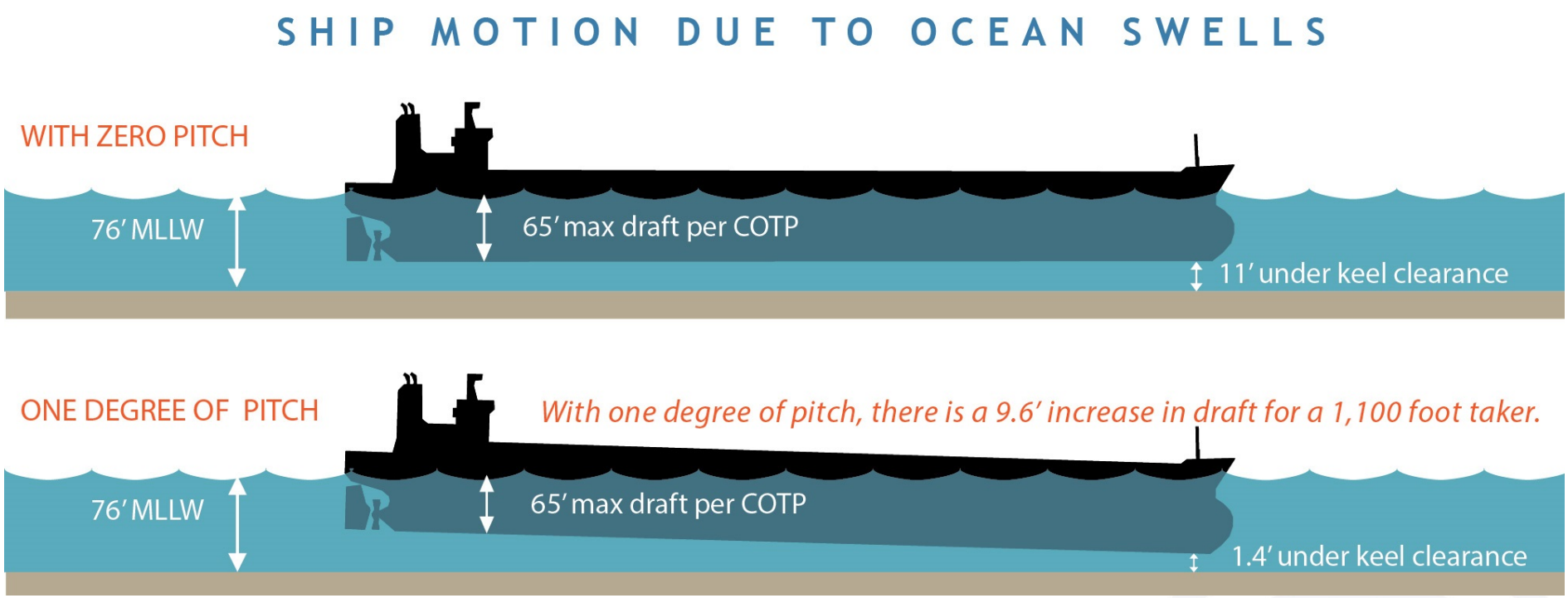
Closing the Gaps: Port of LA/Long Beach Project



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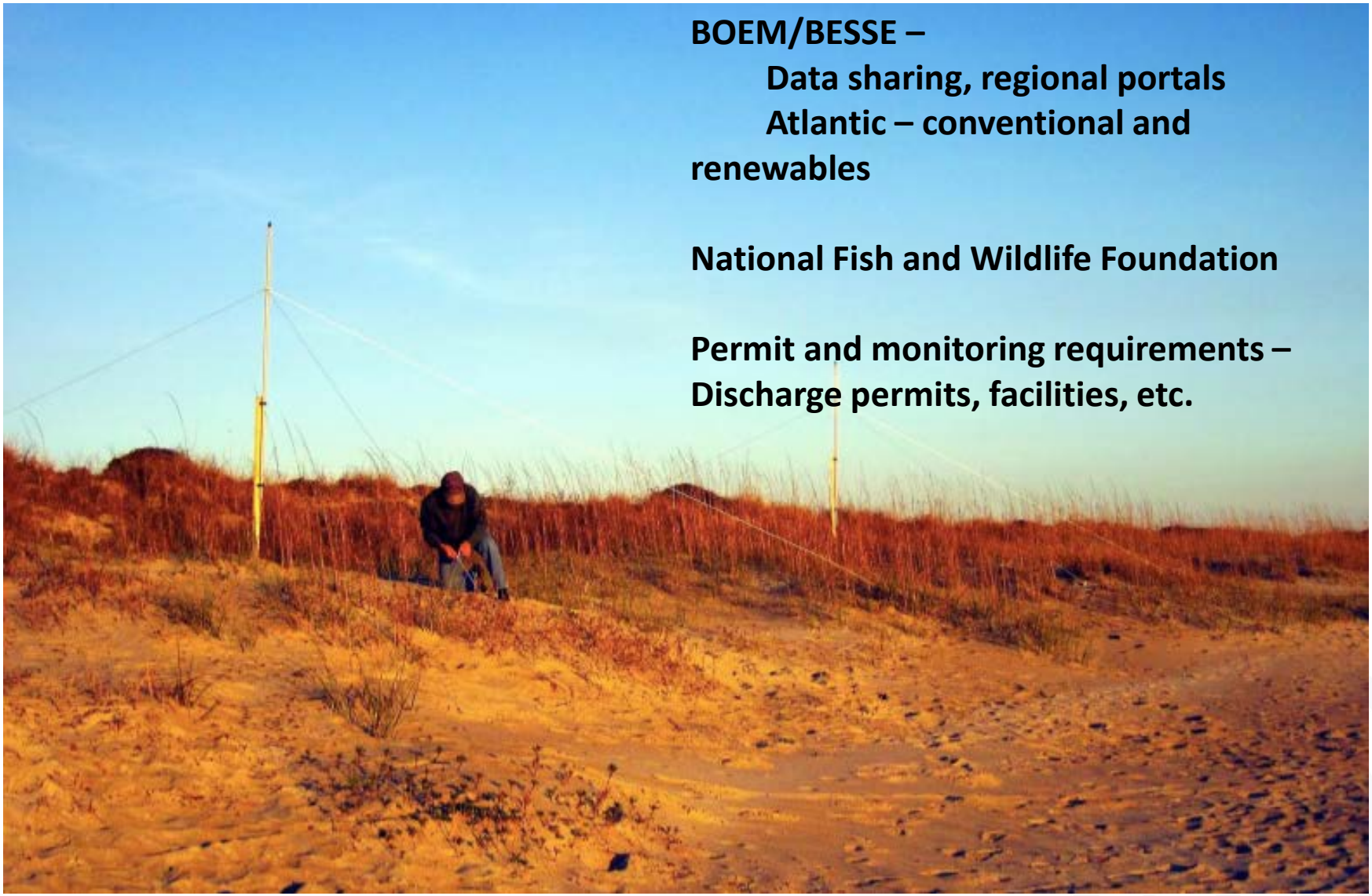
…. beyond NOAA



BOEM/BESSE –

Data sharing, regional portals

Atlantic – conventional and renewables

National Fish and Wildlife Foundation

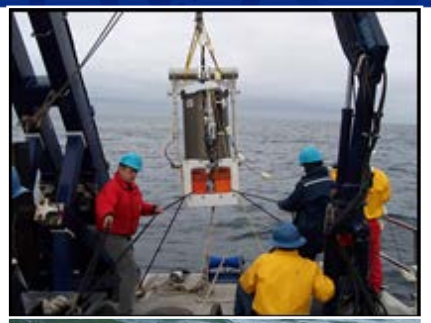
Permit and monitoring requirements – Discharge permits, facilities, etc.

HAB Observing Networks: Development & Transition

Objective: promote development & transition to operations of regional & national HAB observing networks

Rationale: observations & measurements of HAB species & toxins are important for:

- support of forecasting
  - validate satellite/airborne observations
  - data assimilation for model correction
- early warning of HAB events
- assessing bloom toxicity (potential impacts)
- identifying drivers of HAB growth & toxicity



Congressional Reauthorization Briefings

House Ocean Caucus Briefing: Feb 2015

Senate Ocean Caucus Briefing: July 2015

Full House - Over 75 attendees at both

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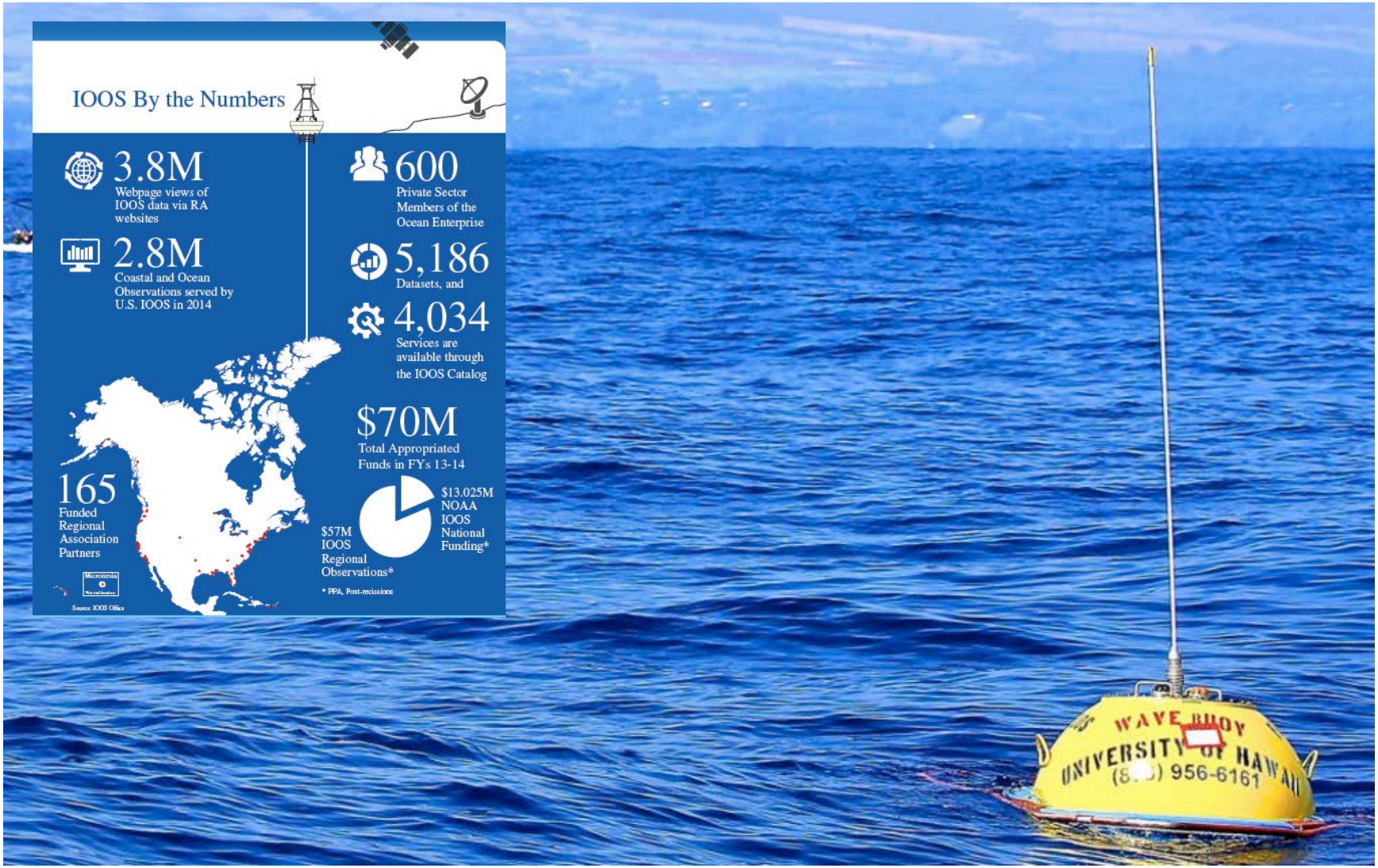
Next Steps

Messaging: IOOS by the Number



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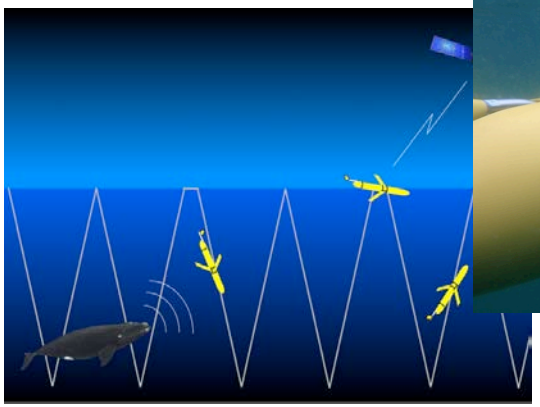
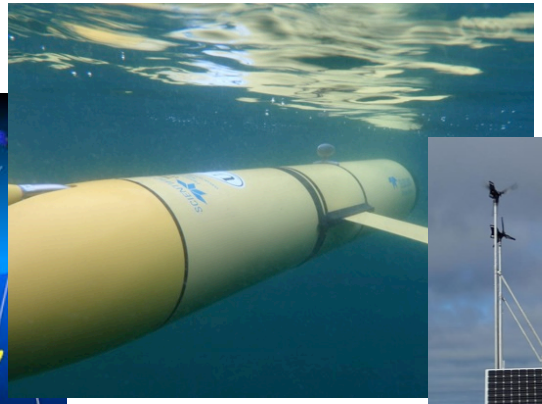
AOOS Observing Assets

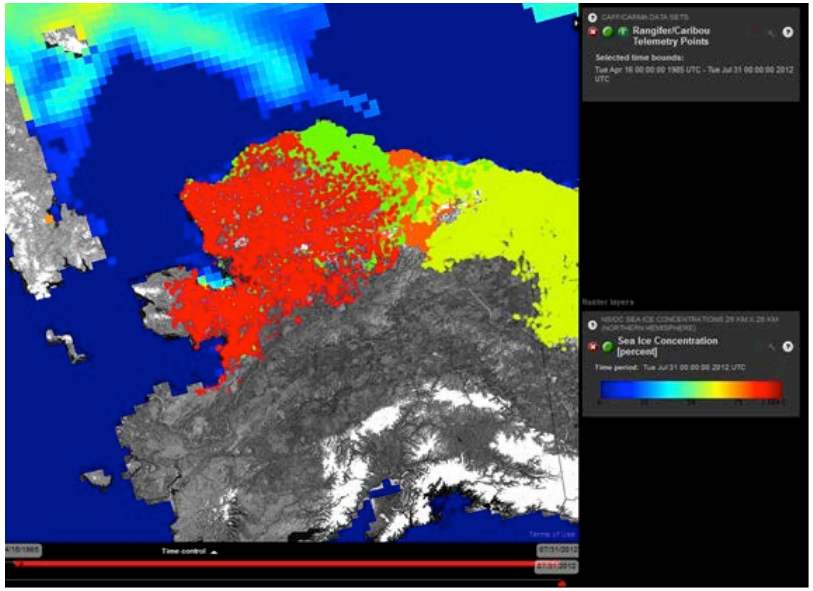
- Chukchi Mooring (UAF, Conoco-Phillips, Shell, Ogloonik-Fairweather, AOOS, NPRB)
- HF Radar (UAF, BOEM, AOOS) – Point Lay, Wainwright, Point Barrow, Cape Simpson
- Autonomous Glider (UAF, UW, Rutgers, AOOS)
- Wave buoys
- AIS/weather

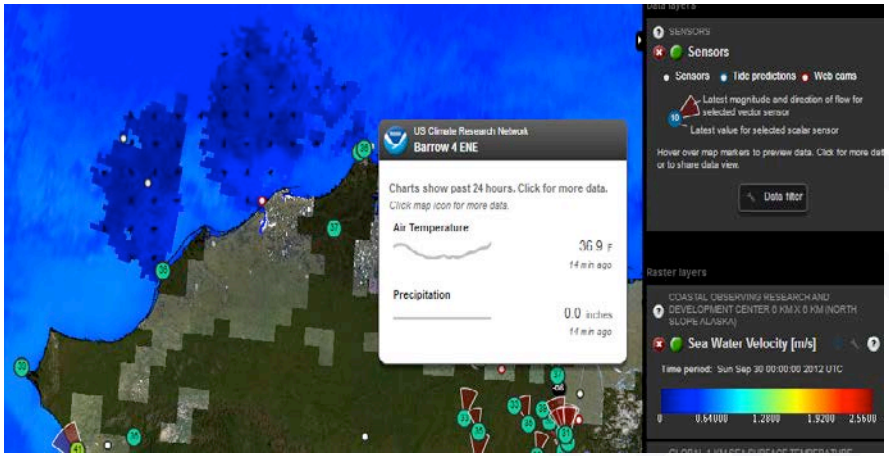




AOOS Arctic Portal

- Polar projection
- Handles many data types
  - GIS/project type data
  - Satellite imagery
  - Real-time sensors
  - Forecast models
  - Infrastructure & Transit
  - Habitat & Sensitivity
- Visualize data stacks
- Explore by time
- Data downloads





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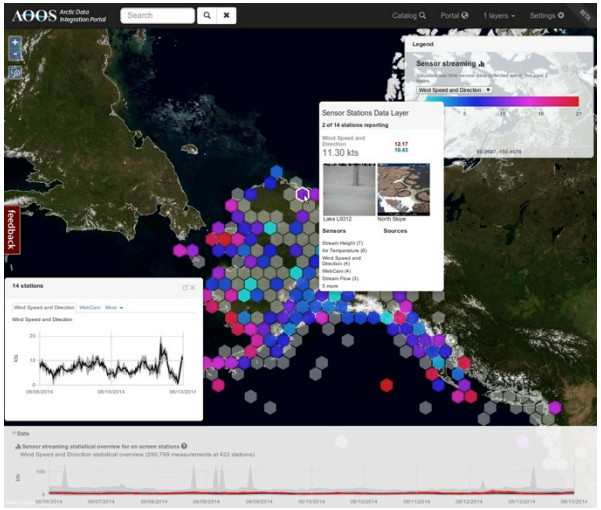
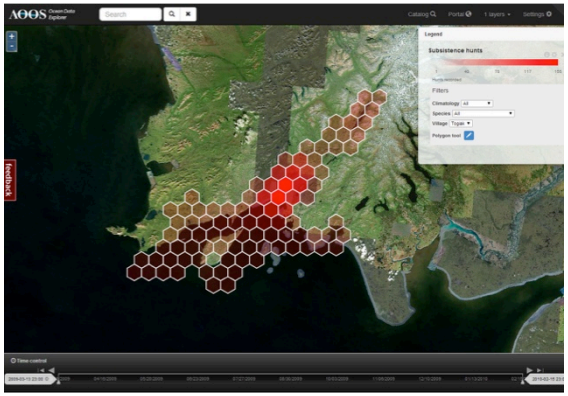
Power of the Data Portal

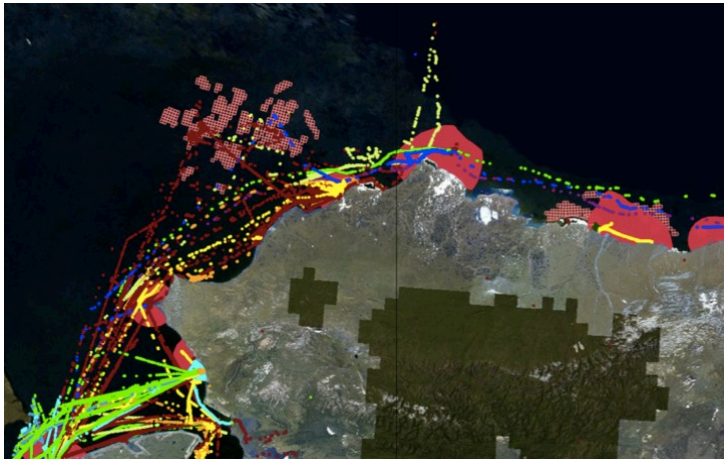


Real-Time Sensors

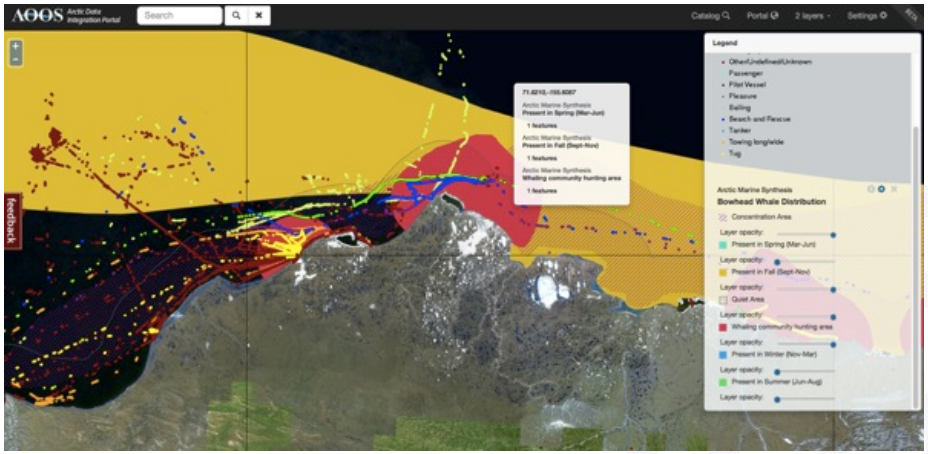
Shell Sea Ice Map



Traditional Knowledge



Vessel tracks (Alaska Marine Exchange), community use areas (Arctic Marine Synthesis), and offshore wells (BOEM)



Fall bowhead whale distribution (Arctic Marine Synthesis) with fall vessel traffic in 2012 (Alaska Marine Exchange)

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Challenge

“ *Investing in key observational platforms sustains the vital environmental intelligence our citizens and businesses rely upon.*” -- Dr Kathy Sullivan, NOAA Administrator 8/24/15

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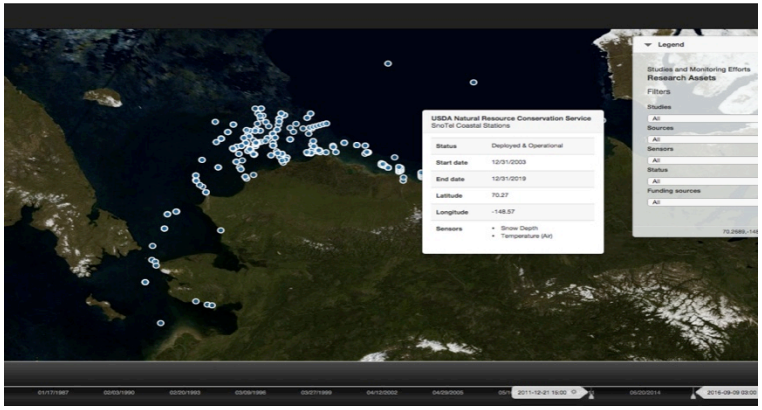
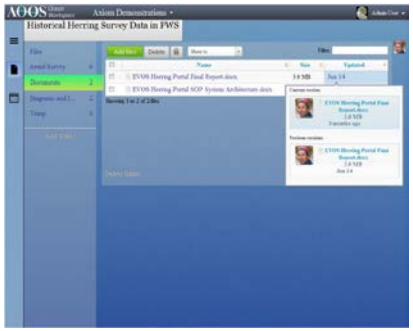
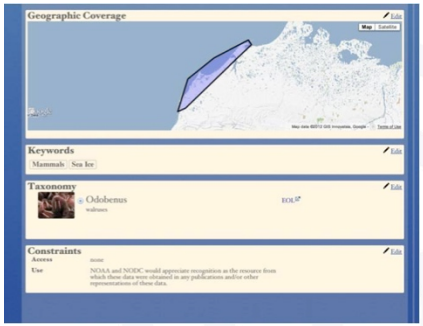
Research Support

- Research Asset Portal: What instruments are deployed and what are they collecting?
  - Assist planning
  - Reduce Duplication
  - Avoid collisions
  - Holistic picture



- Research Workspace
  - Web-based data management system for assembling, storing, and sharing data between members of biological and physical oceanography communities





International Partnerships

- Protection of the Marine Environment Working Group of the Arctic Council – Norway, Russia, Canada, Iceland, US
- Pacific Arctic Group (PAG) – Canada, China, Japan, Republic of Korea, Russia, US
- Distributed Biological Observatory (DBO) – Canada, China, Japan, Republic of Korea, Russia, US
- Marine Arctic Ecosystem Study (MARES) – Canada, US
- Canada Department of Fisheries and Oceans – Canada, US
- Russian-American Long-term Census of the Arctic (RUSALCA) – Russia, US
- Industry Arctic Data-sharing Agreement – Shell, ConocoPhillips, Statoil

Interior Title Page

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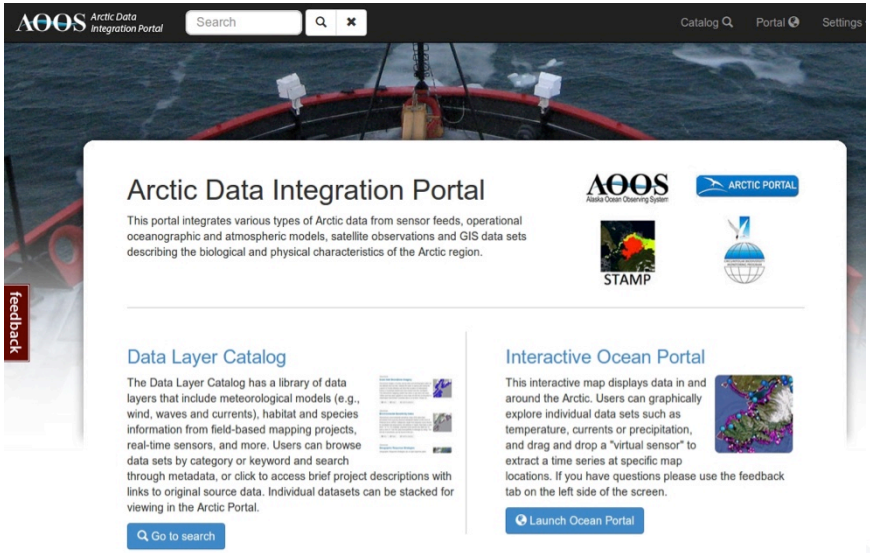
Data Management & Products

- Maintain AOOS website and data portal
- OCEAN DATA EXPLORER
- Real-time Sensor Map
- Model Explorer
- Research Assets Map
- Arctic Portal
- Industry Arctic Data
- Research Workspace
- Seabird Portal



March 2016 Hill Visits

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