

# U.S. IOOS Advisory Committee



# U.S. IOOS Priorities

April 19, 2017 | IOOS Advisory Committee

# U.S. IOOS is...



U.S. IOOS is a robust network of people, resources, and technology collaborating to build a comprehensive ocean, coasts, and Great Lakes observing community to serve the needs of coastal communities, the nation, and the world.

# IOOS & National Ocean Service Priorities



Safe & Efficient  
Transportation & Commerce



Preparedness & risk  
reduction



Stewardship,  
recreation, & tourism

# National Lifeline: U.S. Ports & Waterways



Image via The Washington Post  
Dec. 2016

# Local ↔ National ↔ Global

*"We are tied to the Ocean. And when we go back to the sea, whether it is to sail or to watch - we are going back from whence we came."*  
- John F. Kennedy

Alaska – AOOS

Great Lakes – GLOS

Northeast Atlantic – NERACOOS

Pacific Northwest – NANOOS

Mid-Atlantic – MARACOOS

Central and Northern California – CeNCOOS

Southeast Atlantic – SECOORA

Pacific Islands – PacIOOS

Southern California – SCCOOS

Gulf of Mexico – GCOOS

Caribbean – CARICOOS

# From National to Global



**IOOS**  
Integrated Ocean  
Observing System



The Global Ocean  
Observing System



**GEO** GROUP ON  
EARTH OBSERVATIONS

# Economy: U.S. Ocean Enterprise

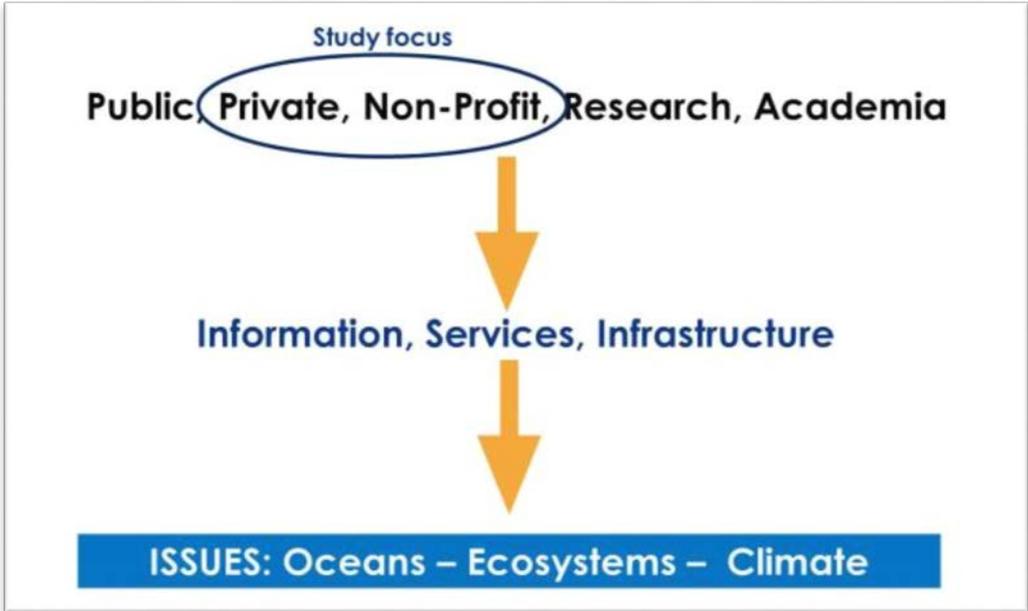


## THE OCEAN ENTERPRISE

A study of US business activity in ocean measurement, observation and forecasting



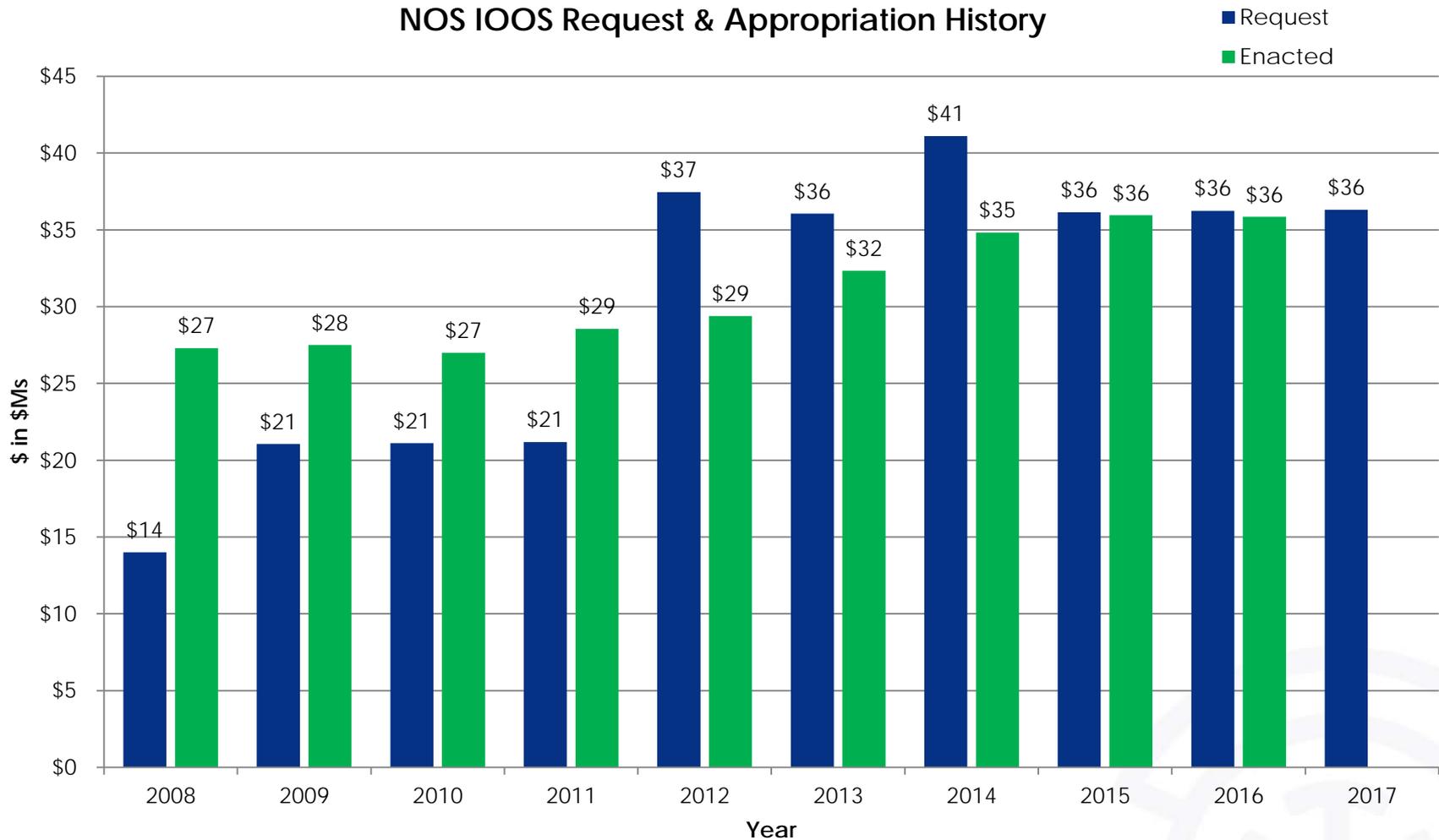
Prepared by  
ERISS Corporation  
The Maritime Alliance  
February, 2016





# U.S. IOOS Enacted and President's Budgets FY08-17

## NOS IOOS Request & Appropriation History



NOAA National Ocean Service

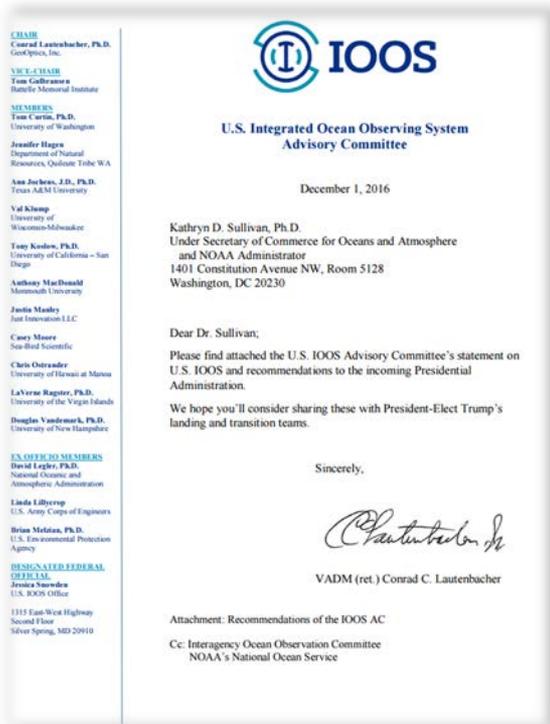
- Navigation, Observations, and Positioning: 'National IOOS' component & 'Regional IOOS Observations' line item
- Estimated Enacted levels are 'post rescission' totals for each year
- 'Request' = the President's Budget Request



- Observe and Predict as essential role of IOOS
- Customer Focus at all levels
- Continued high-quality data delivery thru DMAC architecture
- Infusion of technology & science into the System

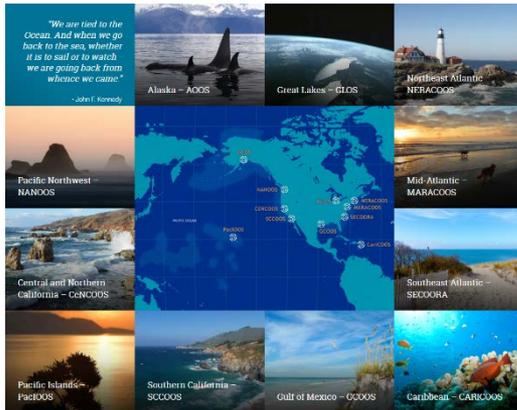
# U.S. IOOS Advisory Committee Priorities

## IOOS AC Recommendations December 2016



- "...sustain critical observations in coastal, estuarine, and deep-water environments..."
- "Support... high priority ocean observation infrastructure needs"
- "Support reauthorization of the ICOOS Act of 20019"
- "...invest in tech development and transfer in collaboration with private sector partners."
- "Support interagency ocean observations efforts and the IOOC."

# Discover and Access Data



*Regional Portals: 11 RA portals integrate data at a local level and provide tailored products for stakeholders*



**www.ioos.us**  
a central  
portal of portals



*Sensor Map: a 2 week cache of real-time observations from 108 providers*



Blizzard 2016: CBOFS winds at 1/23 17:00 EST. Time-series of model output and buoy observations (1/20 - 1/23)

*EDS: Visualize and access model hindcast/forecast information and compare to observations*



*MBON: Marine Biodiversity portal – data supporting ecosystem monitoring*

# IOOS Enterprise



The Global Ocean Observing System







# Support for every decision



# IOOS and National Estuarine Research Reserves

Partnership example | IOOS Advisory Committee

# National Estuarine Research Reserves



## LIST OF RESERVES

### Great Lakes

1. Lake Superior, Wisconsin
2. Old Woman Creek, Ohio

### Northeast

3. Wells, Maine
4. Great Bay, New Hampshire
5. Waquoit Bay, Massachusetts
6. Narragansett Bay, Rhode Island
7. Connecticut (*Proposed*)

### Mid-Atlantic

8. Hudson River, New York
9. Jacques Cousteau, New Jersey
10. Delaware
11. Chesapeake Bay, Maryland
12. Chesapeake Bay, Virginia

### Southeast

13. North Carolina
14. North Inlet-Winyah Bay, South Carolina
15. ACE Basin, South Carolina
16. Sapelo Island, Georgia
17. Guana Tolomato Matanzas, Florida

### Gulf of Mexico

18. Rookery Bay, Florida
19. Apalachicola, Florida
20. Weeks Bay, Alabama
21. Grand Bay, Mississippi
22. Mission-Aransas, Texas

### West

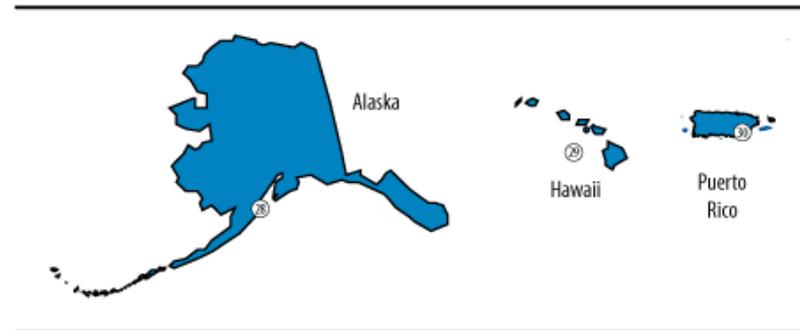
23. Tijuana River, California
24. Elkhorn Slough, California
25. San Francisco Bay, California
26. South Slough, Oregon
27. Padilla Bay, Washington
28. Kachemak Bay, Alaska

### Pacific

29. Hawaii

### Caribbean

30. Jobs Bay, Puerto Rico

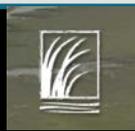
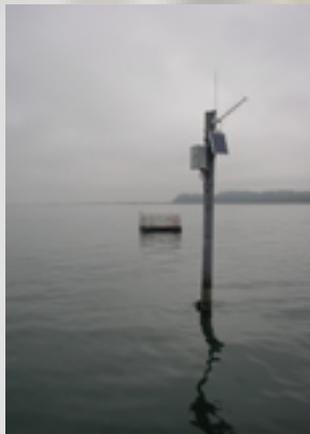


# NERRS – IOOS Data Application Opportunities

## Example: Support of water based industry – Pacific Northwest Commercial Shellfish Growers

Provides critical information about water temperature, chlorophyll levels, salinity, turbidity, and DO so that better decisions can be made about managing mariculture operations.

1. Data collection
2. Data integration and fusion
3. Decision support

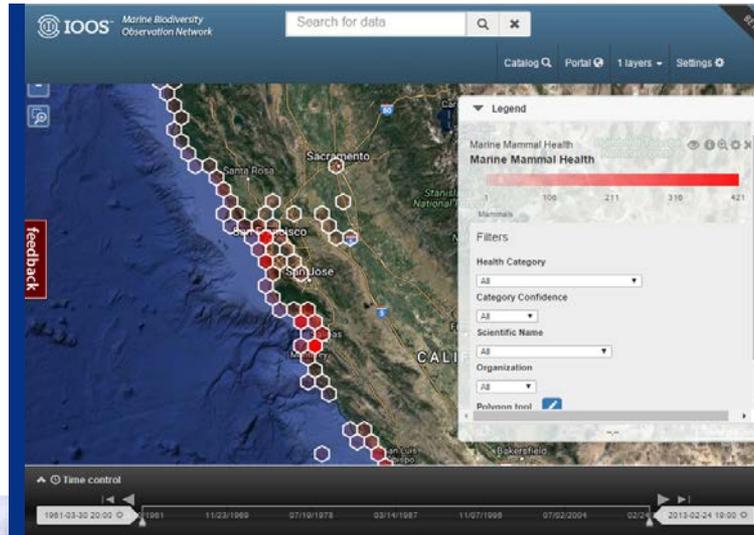


# Extras

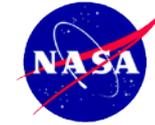
# The IOOC and Interagency Success



Pompeo Moschetta of Systea, S.p.A, makes adjustments to their prototype during testing in the Nutrient Sensor Challenge.

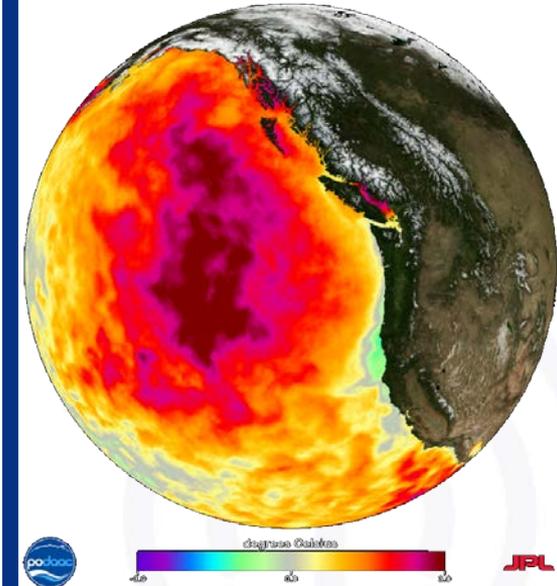


Prototype web-interface from Axiom Data Science for some pilot project Marine Mammal Health MAP data on marine mammal strandings on the West Coast.



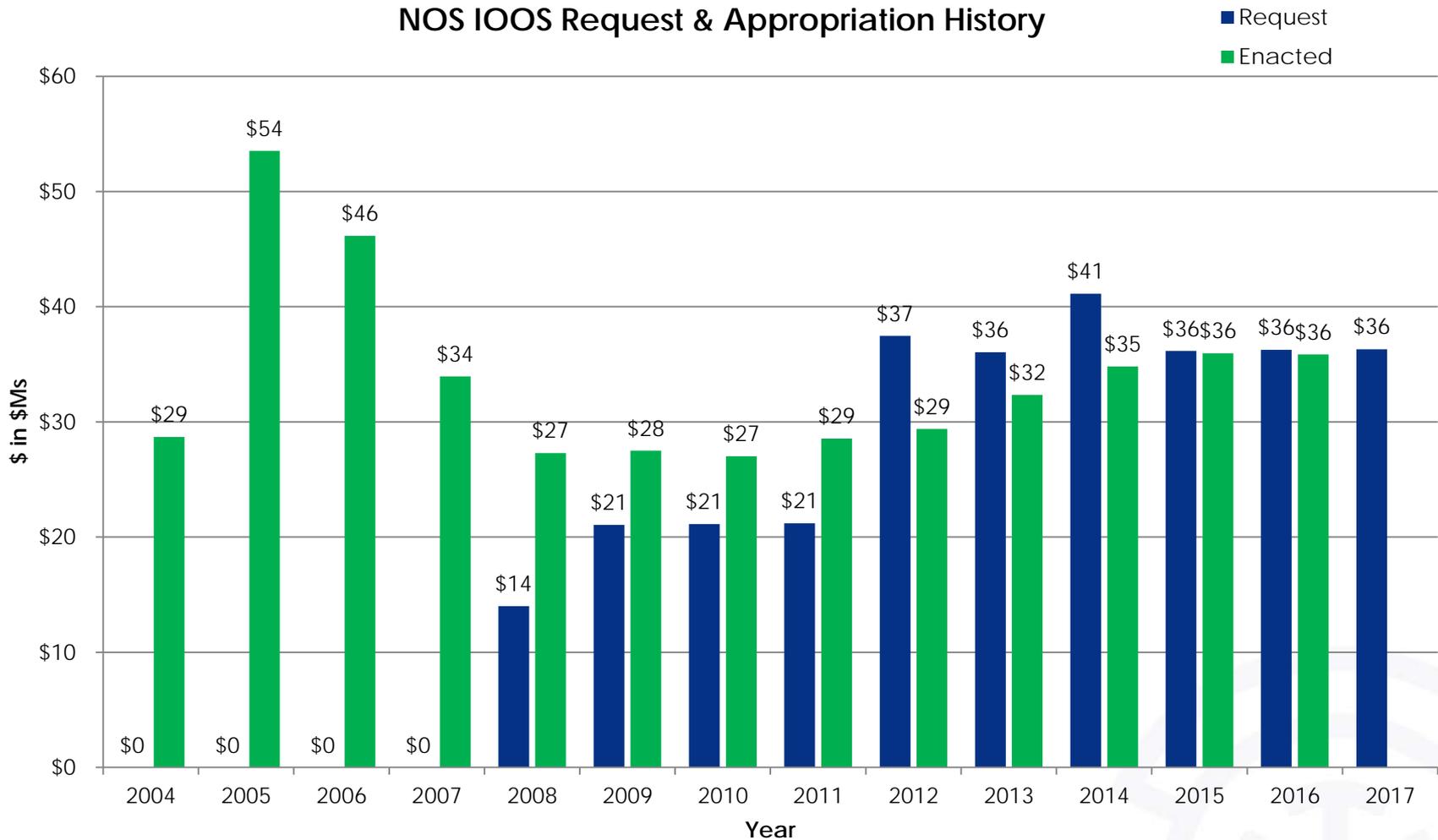
MISST SSTs used to study the 2014-16 Pacific warm blob which resulted in a record HAB, the closure of commercial fisheries, and UMEs for large whales, Guadalupe fur seals, Cassin's Auklet, and Common Murre.

SEA SURFACE TEMPERATURE ANOMALY (SSTA) MAY 2015



# U.S. IOOS Enacted and President's Budgets FY04-17

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# U.S. Animal Telemetry Network (ATN)

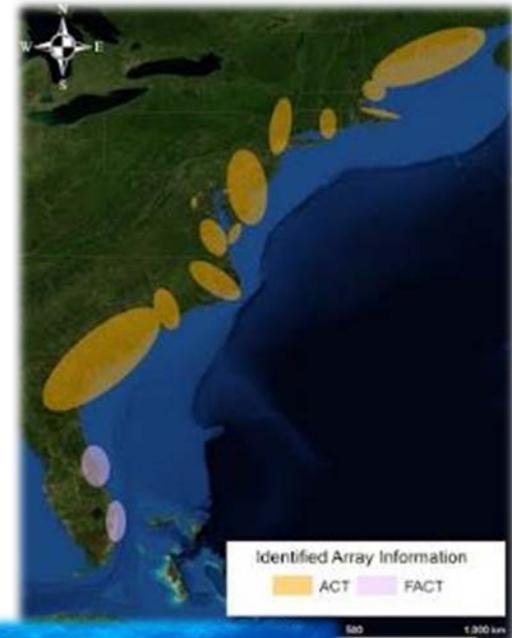
SERVING  
NATIONAL  
NEEDS  
THROUGH  
REGIONAL  
ACTION



**Vision:** That the U.S. National needs for biological and environmental monitoring can be more completely and permanently satisfied by an ATN that will provide integrated data on aquatic ecosystems from species to environment

**Progress:**

- ✓ Network Coordinator on the Job May 2016
- ✓ Dialog Underway with the IOOS Regional Directors to define Specifics of ATN and RA Intersection
- ✓ Engagement and Evolving Partnerships with Existing Regional Telemetry Networks – FACT, ACT, iTAG, CAN, OTN, NART – Two New Acoustic Data Nodes Implemented
- ✓ Regional ATN Workshops with Stakeholders & Telemetry Practitioners scheduled for early 2017 at MARACOOS and SECOORA/CARICOOS; Assessment Underway for Next One at AOOOS
- ✓ ATN DAC Operational End of 2016-Early 2017
- ✓ ATN Implementation Plan Approved/Released by OSTP December 2016
- ✓ Steering Group in Place March 2017



Credit: Michael Cameron  
NMFS AFSC



Courtesy U. of Miami Shark Research & Conservation Program

ANIMAL TELEMETRY NETWORK  
IMPLEMENTATION PLAN 2016-2021

IMPACT OF THE  
NATIONAL OCEANIC ADMINISTRATION



December 2016

# Multi-sensor Improved Sea-Surface Temperature for IOOS

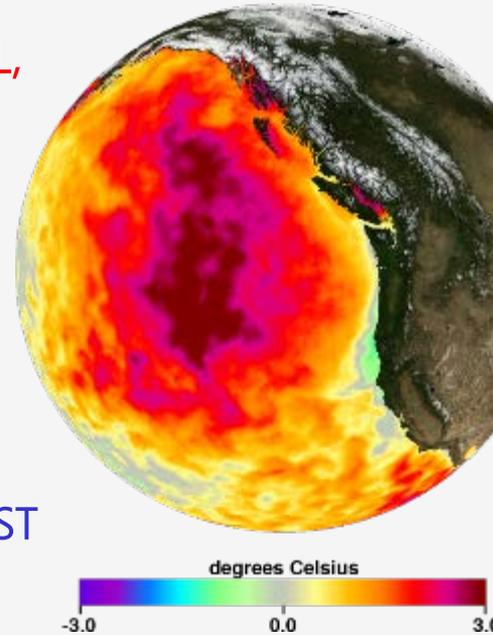
MISST project partners: 28 scientists from Navy, JPL, NOAA, academia, and private industry.

Through international cooperation, MISST is providing 12 satellite SSTs in NRT at their native sampling (L2 data) and gap-free NRT data at 1 km, daily resolution (L4 data).

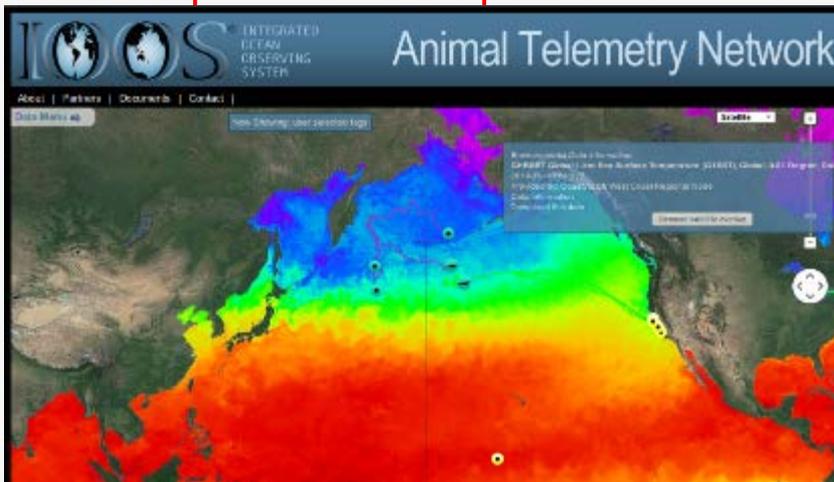
NRT data are available from the PO.DAAC and NOAA ERDDAP, with a historical archive at NOAA NCEI (NODC).

Environmental Data Connector (EDC) includes MISST data, enabling many IOOS RAs to integrate MISST SSTs into their applications.

Over 40 peer-reviewed publications so far....



MISST SSTs used to study the 2014-16 Pacific warm blob which resulted in a record HAB, the closure of commercial fisheries, and UMEs for large whales, Guadalupe fur seals, Cassin's Auklet, and Common Murre.



MISST SSTs are being used by IOOS RAs and partners for ecological research and decision making. The ATN Portal has integrated MISST SSTs with animal telemetry (cetacean, fish, pinniped, seabirds, sharks, and turtles). Turtle watch provides NRT information on where to avoid fishing to reduce loggerhead sea turtle interactions.



# Marine Mammal Health Monitoring and Analysis Platform

Health MAP vision: For everyone to understand interactions between marine mammal health, ocean health, & humans

## CY16 Activities and Accomplishments:

- o Development of a prototype data platform in the Gulf of Mexico (Gulf MAP)
  - Gulf Environmental Benefit Fund through NFWF
- o Finalized the standardized basic data fields
- o Continued implementation of strategic plan via four working groups
- o Initiated two build out projects to be completed in FY17
  - System design and architecture (GCOOS): Review existing system and other options, develop a systems design and architecture and report out on options to NOAA, MMC and IOOS for decision making. Funded by MMC
  - Visualization & Data Exploration (Axiom Data Science): Develop the west coast pilot project to visualize and allow interactions with data focused on GulfMAP initially but with national platform in mind. Funded by SeaWorld (via NFWF)

## Partners:



**IOOS**  
Integrated Ocean  
Observing System



Photo: Marine Mammal Care Center At Ft McArthur

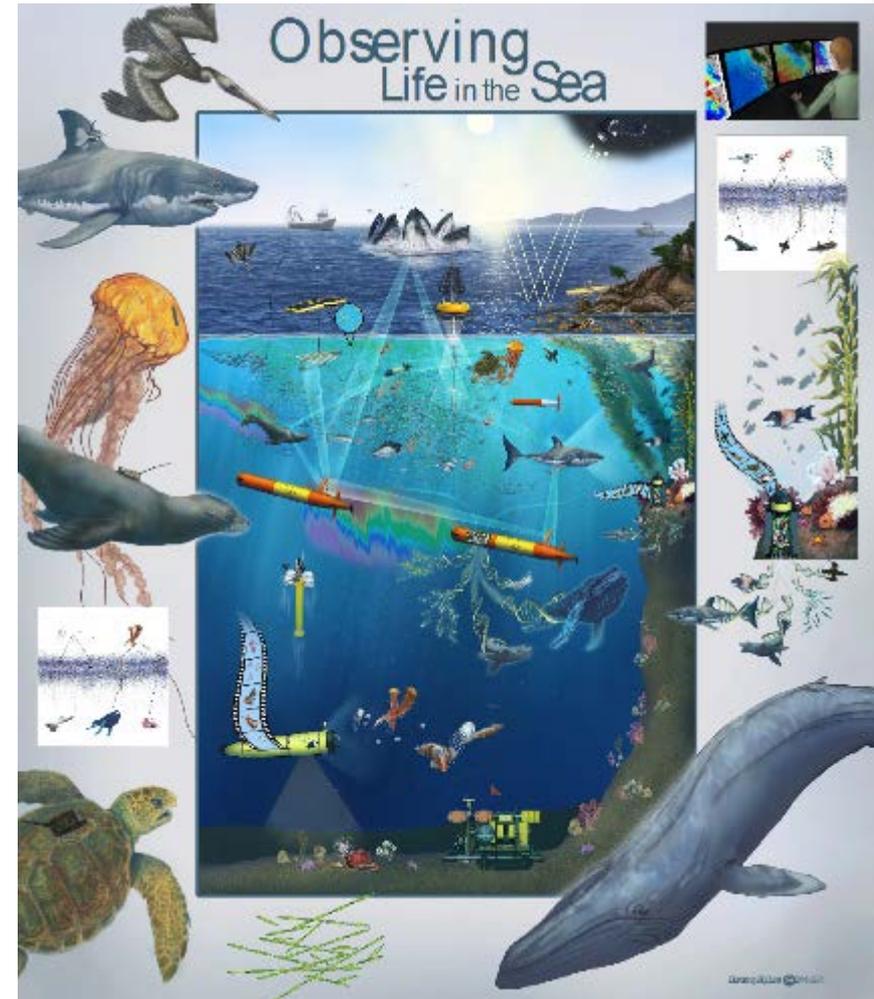
# Marine Biodiversity Observation Network (MBON)

## Progress:

- Integrating existing monitoring
- Filling spatial, taxonomic gaps
- Monitoring “microbes to whales,” “in-situ to satellites”
- Addressing data management
- Building MBON for the Nation
- Creating global MBON (with GEO, GOOS)
- Connecting with ATN

## 2016 Highlights:

- MBON Website Launched in April 2016  
<http://www.marinebon.org/>
- New funding partner identified - NSF Polar Programs
- Connecting with OAR ‘Omics activities in Florida Keys to work on coral genomics
- MBON portal tests to integrate biodiversity indices
- Education and Outreach efforts



Credit: MBARI

# US Clean Water Act: Biocriteria for Coral Reefs



## US Clean Water Act Objective:

*"To restore and maintain the chemical, physical and biological integrity of the Nation's waters"*

**Biological Criteria (Biocriteria):** Numeric values or narrative descriptions that are established to protect the biological condition of aquatic life inhabiting waters that have been given a certain designated aquatic life use.



# U.S. IOOS Program Office Org Chart

