OOI Summary
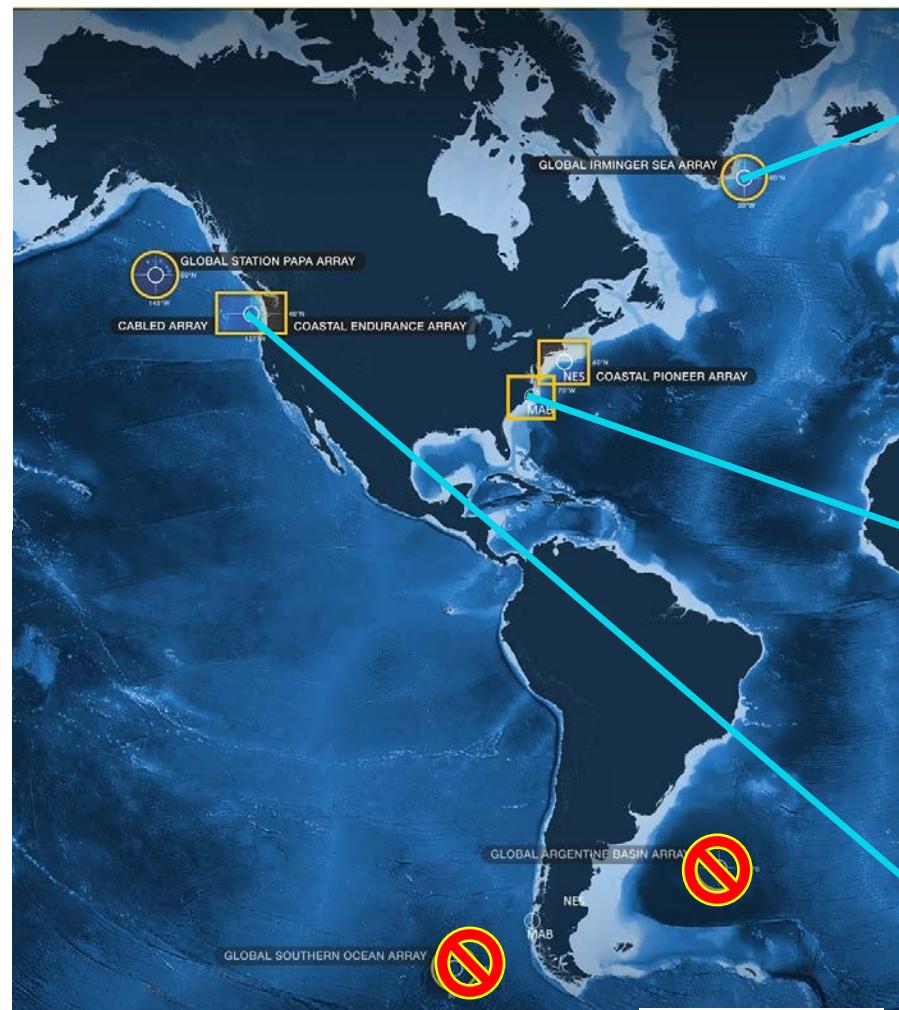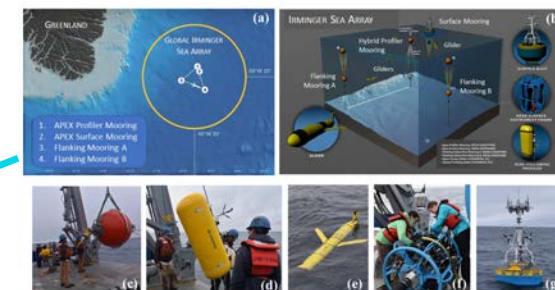
- OOI operates & maintains sophisticated instrumentation in demanding locations.

- Marine arrays at global, coastal & regional scales.

- Real-time data from more than 800 instruments on 80 platforms to enable research & education in Earth, Ocean & Atmospheric sciences

- Six interdisciplinary science themes articulated in the Science Plan:
  - Ocean-Atmosphere Exchange
  - Climate Variability, Ocean Circulation, Ecosystems
  - Turbulent Mixing and Biophysical Interactions
  - Coastal Ocean Dynamics and Ecosystems
  - Fluid-Rock Interactions & Sub-Seafloor Biosphere
  - Plate-Scale Geodynamics.

- Served by a united Cyberinfrastructure

- Data freely available online
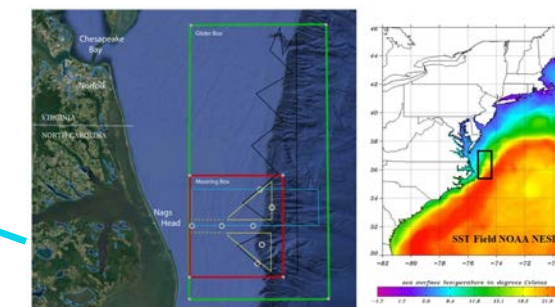
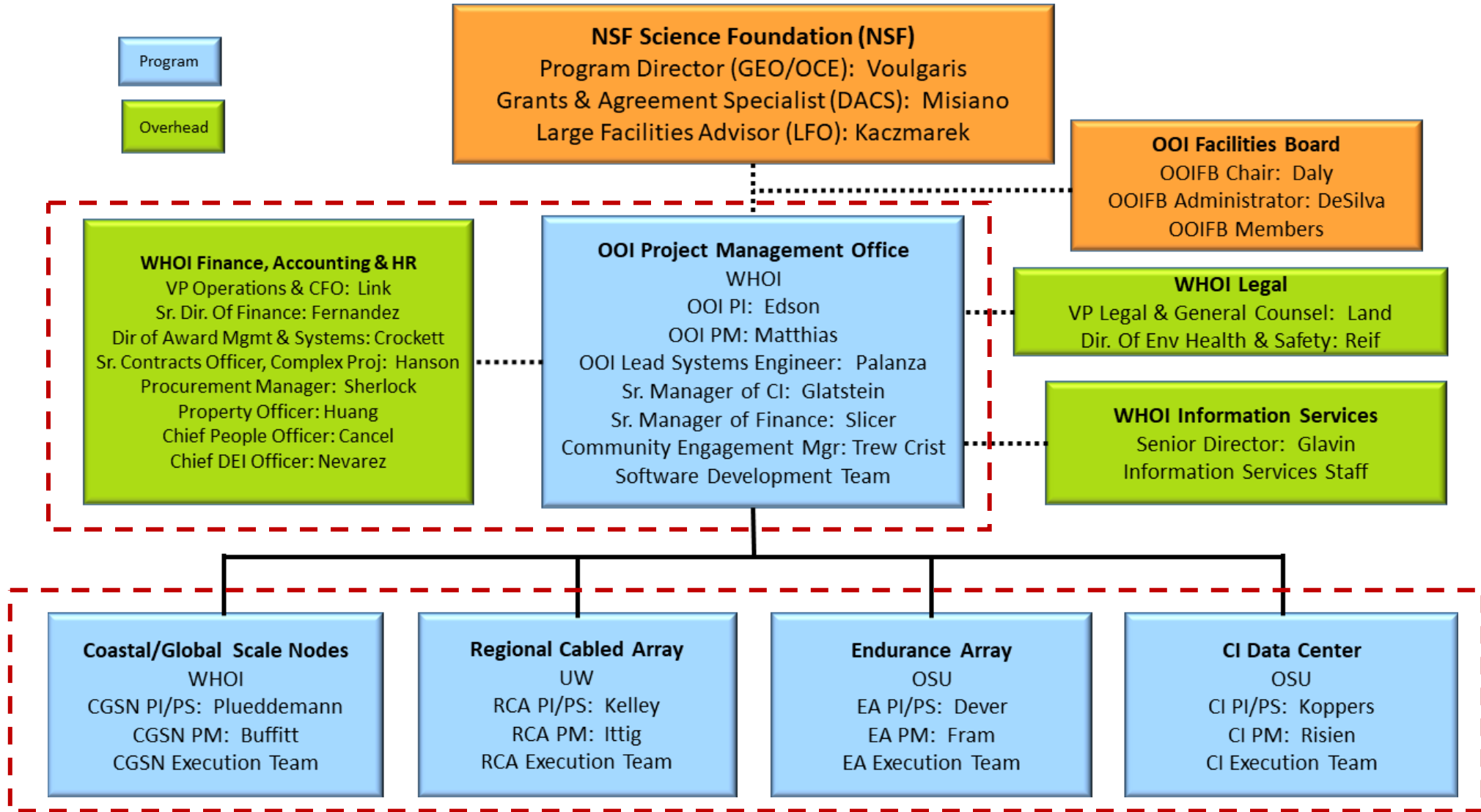- 30-year lifetime starting from 2016.
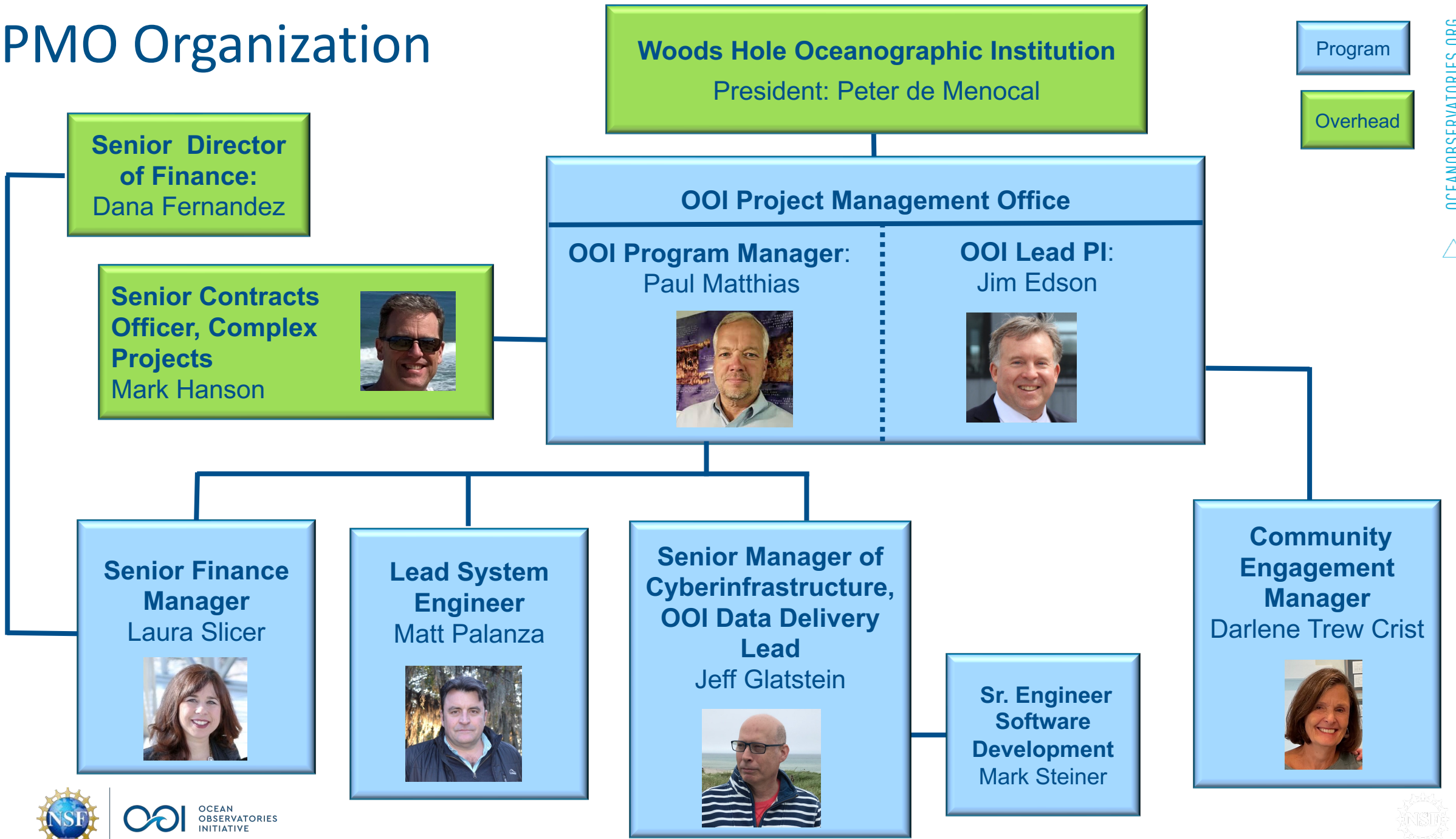

Global Irminger Sea

Coastal Pioneer Relocation

Regional Cabled Array & Coastal Endurance Array

OOI Organization

Program

Overhead

NSF Science Foundation (NSF)
Program Director (GEO/OCE): Voulgaris
Grants & Agreement Specialist (DACS): Misiano
Large Facilities Advisor (LFO): Kaczmarek

OOI Facilities Board
OOIFB Chair: Daly
OOIFB Administrator: DeSilva
OOIFB Members

WHOI Finance, Accounting & HR
VP Operations & CFO: Link
Sr. Dir. Of Finance: Fernandez
Dir of Award Mgmt & Systems: Crockett
Sr. Contracts Officer, Complex Proj: Hanson
Procurement Manager: Sherlock
Property Officer: Huang
Chief People Officer: Cancel
Chief DEI Officer: Nevarez

OOI Project Management Office
WHOI
OOI PI: Edson
OOI PM: Matthias
OOI Lead Systems Engineer: Palanza
Sr. Manager of CI: Glatstein
Sr. Manager of Finance: Slicer
Community Engagement Mgr: Trew Crist
Software Development Team

WHOI Legal
VP Legal & General Counsel: Land
Dir. Of Env Health & Safety: Reif

WHOI Information Services
Senior Director: Glavin
Information Services Staff

Coastal/Global Scale Nodes
WHOI
CGSN PI/PS: Plueddemann
CGSN PM: Buffitt
CGSN Execution Team

Regional Cabled Array
UW
RCA PI/PS: Kelley
RCA PM: Ittig
RCA Execution Team

Endurance Array
OSU
EA PI/PS: Dever
EA PM: Fram
EA Execution Team

CI Data Center
OSU
CI PI/PS: Koppers
CI PM: Risien
CI Execution Team

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Science Impacts
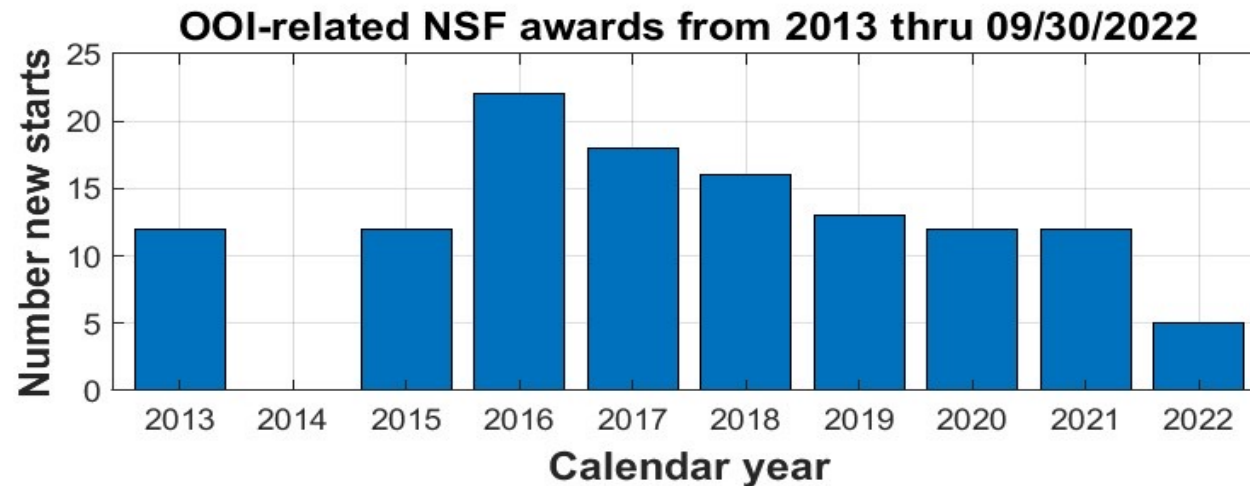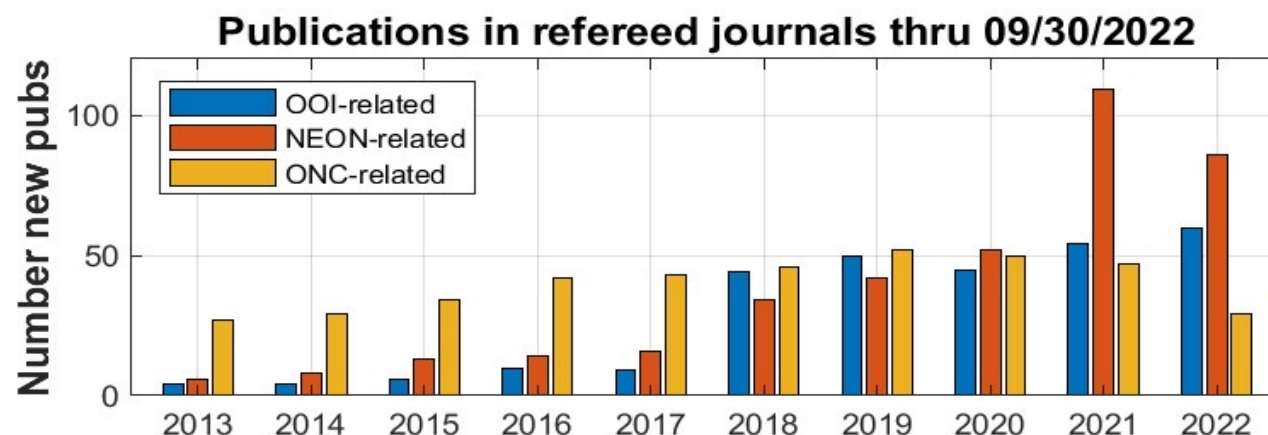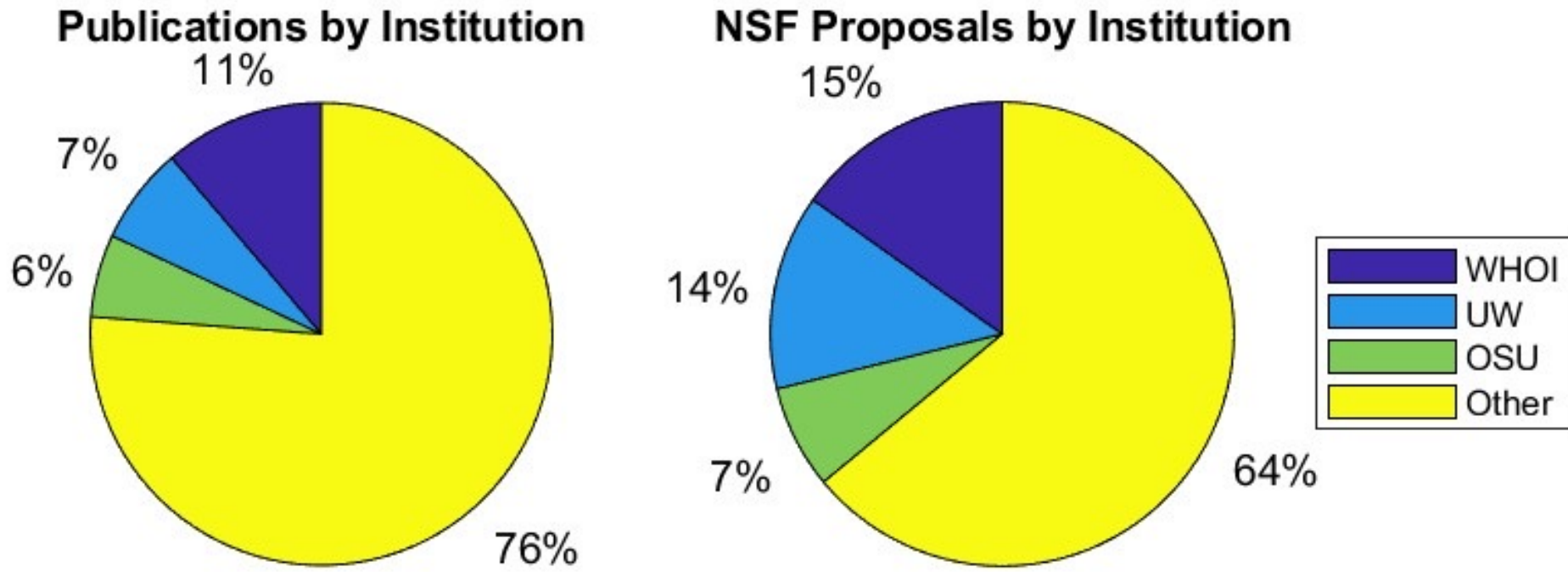
- 294 OOI-related publications in refereed journals thru 30 Sept 2022

  - 249 lead authors
  - 132 lead institutions
  - 23 countries

- **32 publications from Q4 PYIV with 3 months to go.**

- 124 NSF awards using OOI data or infrastructure thru 31 Mar 2022

  - $65.2M total
  - 94 lead PIs
  - 46 lead institutions

- The data is freely available, i.e., you don't need a proposal to use it.

- The OOI will continue efforts to encourage on colleagues, especially young scientists, to write external proposals using OOI data and infrastructure.

- We will continue to promote the OOI to peer institutions, community colleges, other NSF divisions, federal agencies, MSI, etc.
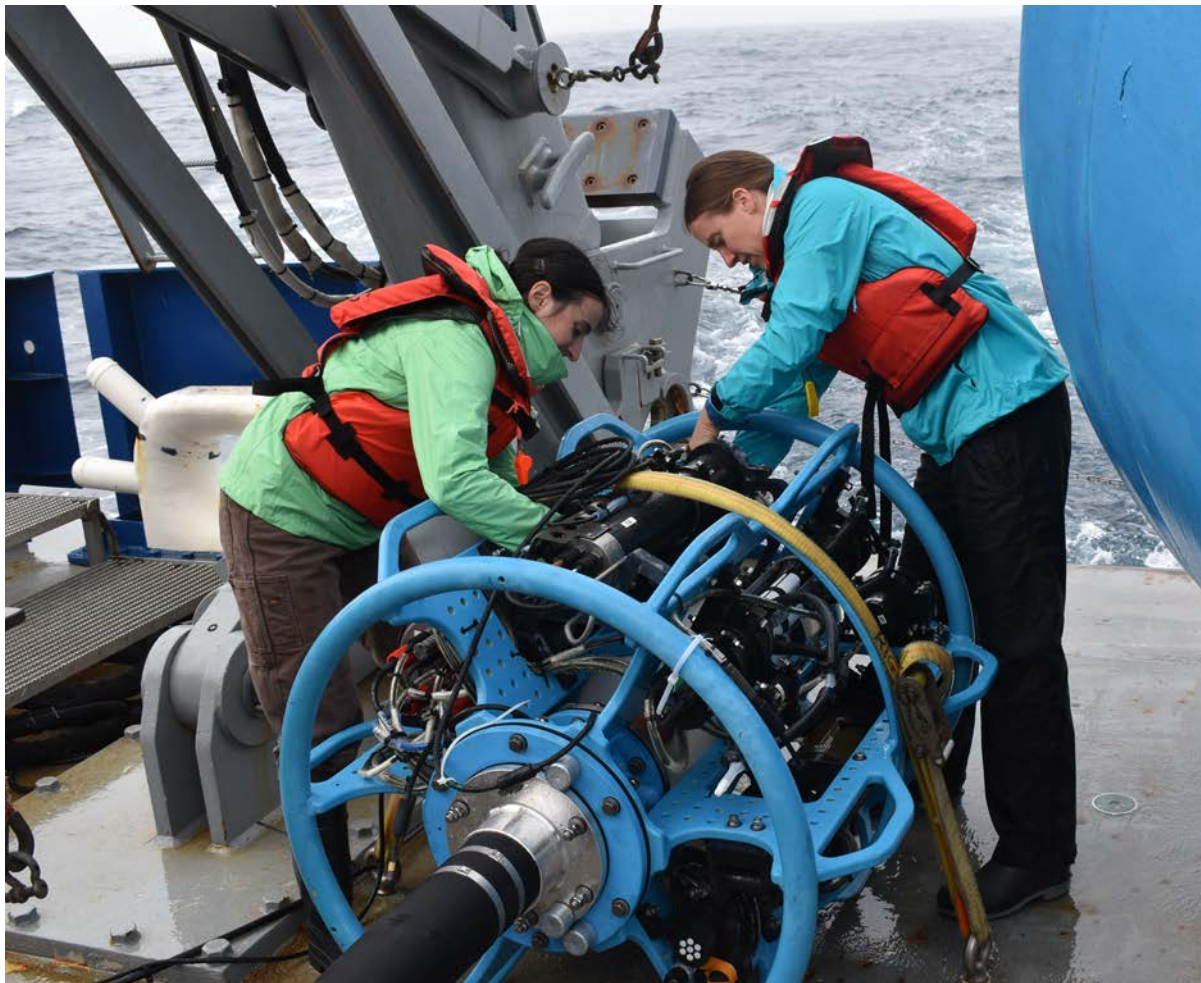

Publications in refereed journals thru 09/30/2022

OOI-related NSF awards from 2013 thru 09/30/2022

Publications & NSF Starts by Institution

Publications by Institution

11%

7%

6%

76%

NSF Proposals by Institution

15%

14%

7%

64%

Legend:
- WHOI
- UW
- OSU
- Other

- The OOI doesn't conduct research, is provides research quality data to an ever-expanding user base.

- NSF funding is going to a wide range of universities, collages, and research institution.

- The OOI infrastructure had supported the research of numerous PIs using diverse funding sources.

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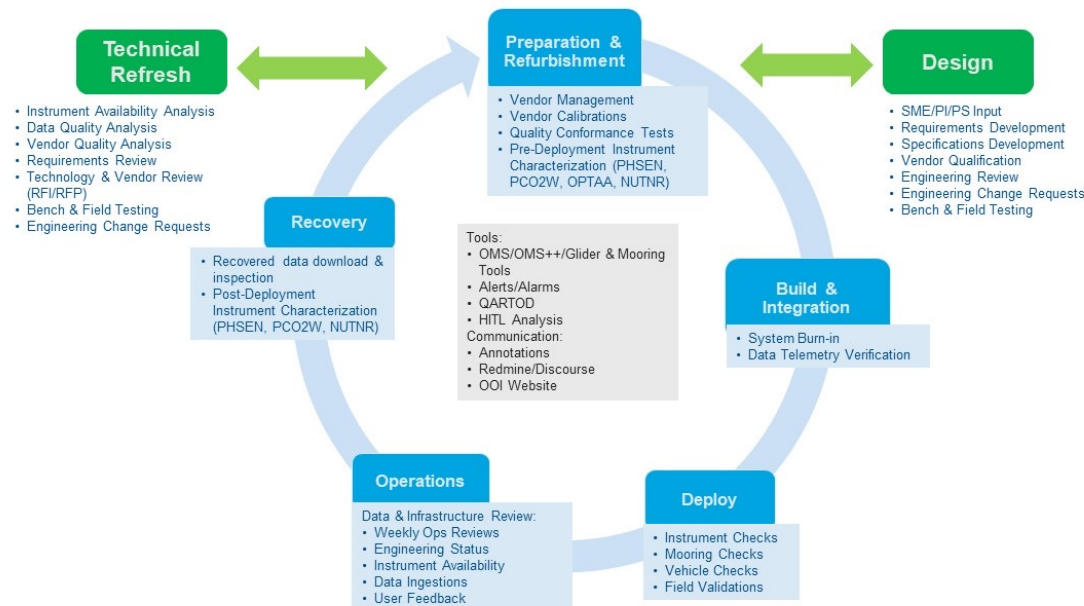
OOI AWP V

Data Advancement

- Improved processing & QA/QC
  - QARTOD
  - Humans in the loop
- Improved data delivery and accessibility
  - Eye on FAIR principles
  - Continued improvements to Data Explorer
  - External PI data sets
  - Curated data sets (education)
  - Additional data sites, e.g., NDBC
  - DOIs to improve acknowledgement & help with updates
  - **Data Ambassadors**
- Growing User Base
  - Enhancing research
  - More publications and grants
  - More external PIs
  - Early career scientists engagement
  - More educational opportunities (OOIFB & NSF Edu)
  - Quantified by metrics

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Data Workflow and QA/QC

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- All three MIOs have detailed and effective data workflow processes in place.

- Common elements include:

  - Data Ingestions
  - Metadata Delivery
  - Data Annotations
  - HITL Data Reviews
  - QA/QC Process & Tool Development
  - QARTOD
  - User Requests and Data Questions
  - You will see more details in the MIO presentations.

- Implementation of QARTOD testing and data deep dives are a significant cross-MIO effort.

- Workflow is becoming routine, with more and more tools becoming available to help speed up the processing

Technical Refresh
- Instrument Availability Analysis
- Data Quality Analysis
- Vendor Quality Analysis
- Requirements Review
- Technology & Vendor Review (RFI/RFP)
- Bench & Field Testing
- Engineering Change Requests

Preparation & Refurbishment
- Vendor Management
- Vendor Calibrations
- Quality Conformance Tests
- Pre-Deployment Instrument Characterization (PHSEN, PCO2W, OPTAA, NUTNR)

Design
- SME/PI/PS Input
- Requirements Development
- Specifications Development
- Vendor Qualification
- Engineering Review
- Engineering Change Requests
- Bench & Field Testing

Recovery
- Recovered data download & inspection
- Post-Deployment Instrument Characterization (PHSEN, PCO2W, NUTNR)

Tools:
- OMS/OMS++/Glider & Mooring Tools
- Alerts/Alarms
- QARTOD
- HITL Analysis

Communication:
- Annotations
- Redmine/Discourse
- OOI Website

Build & Integration
- System Burn-in
- Data Telemetry Verification

Operations
Data & Infrastructure Review:
- Weekly Ops Reviews
- Engineering Status
- Instrument Availability
- Data Ingestions
- User Feedback

Deploy
- Instrument Checks
- Mooring Checks
- Vehicle Checks
- Field Validations

Deep Dives and QARTOD Status

Class	Deep Dive	Annotations	QARTOD	Production
ADCP	Complete	Draft	–	–
WAVSS	Complete	Draft	–	–
VEL3D	Complete	Draft	–	–
METBK	Complete	Draft	Draft	–
DOSTA	Complete	Complete	Complete	Pending
DOFST	Complete	Complete	Complete	Pending
FLORT	Complete	Complete	Complete	Pending
PARAD	Complete	Complete	Complete	Pending
CTDBP	Complete	Complete	Complete	Complete
PCO2A	Complete	Complete	Complete	Complete
PCO2W	Complete	Complete	Complete	Complete
PHSEN	Complete	Complete	Complete	Complete
PRESF	Complete	Complete	Complete	Complete

Deep Dives (HITL)
- Part of the QARTOD process to ensure bad data is removed prior to calculating test limits
- *Focused on data availability and obvious data issues*
- Used to develop new, or correct/refine existing annotations
- Surged effort, slowed down by other tasking

QARTOD
- Current process focused on building tables for the Gross Range and Climatology tests
- Code used is published to the python section of the ooi-data-explorations GitHub repo.
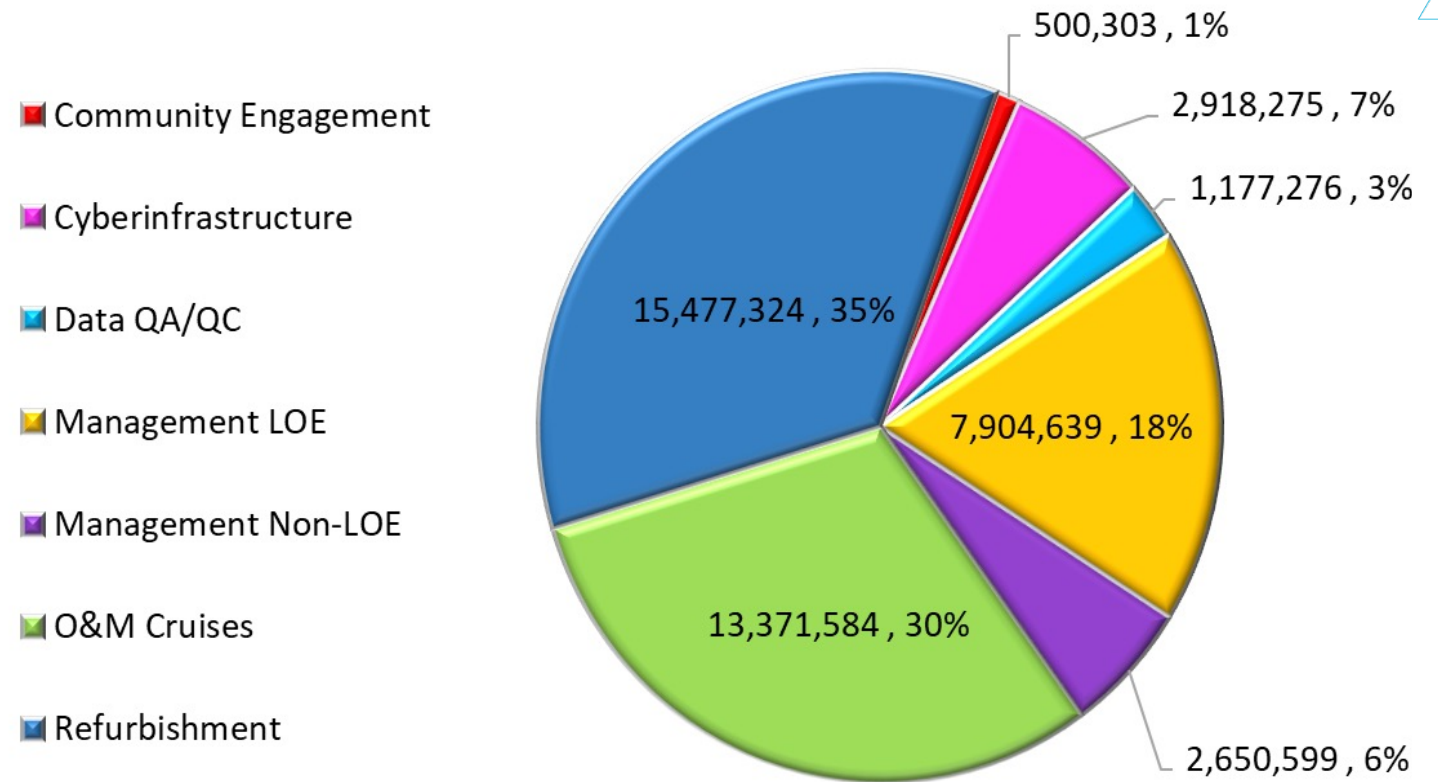
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Our Mission

The **mission** of the OOI is to operate and maintain sophisticated arrays of instruments that collect, distribute, and archive oceanic data for 30 years. The data are freely distributed over the internet to researchers, students, and educators in real-time via a common integrated Cyberinfrastructure.

- The efficient operation and maintenance of the OOI has led to the previously mentioned efforts to improve QA/QC and data accessibility.
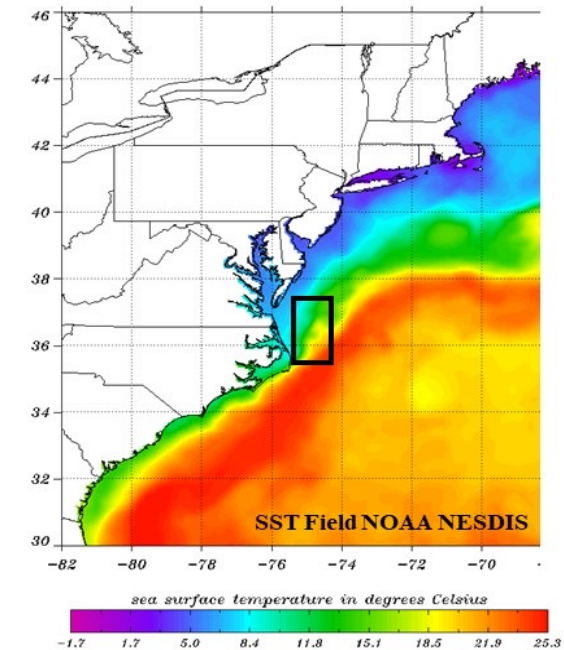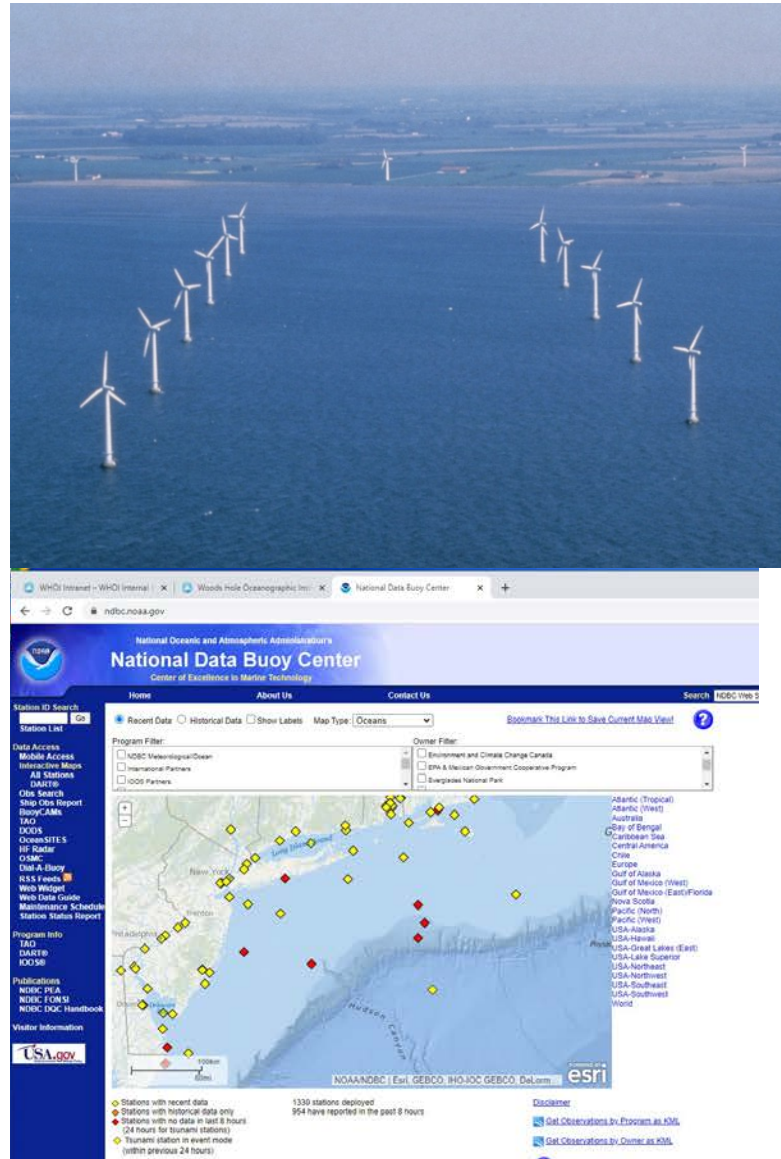
"Surged Effort" - Chris Wingard

PYV OOI Budget by Activity

- Community Engagement
- Cyberinfrastructure
- Data QA/QC
- Management LOE
- Management Non-LOE
- O&M Cruises
- Refurbishment

500,303 , 1%

2,918,275 , 7%

1,177,276 , 3%

15,477,324 , 35%

7,904,639 , 18%

13,371,584 , 30%

2,650,599 , 6%

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Continued and new partnerships opportunities

- **GOOS (Frank Muller-Karger**
- **OBPS (Jay Pearlman)**
- **OASIS (Meghan Cronin)**
- **COP27 (Ocean Obs panel)**
- IOOS
- **ONC (Richard Dewey)**
- **Offshore Wind (Eric Hines)**
- Pioneer Relocation
- US CLIVAR
- **NOAA Labs (PMEL Papa)**
- NDBC
- Ocean Sites
- NCAR
- NEON
- GAGE
- **SOOS (Seb Swart)**
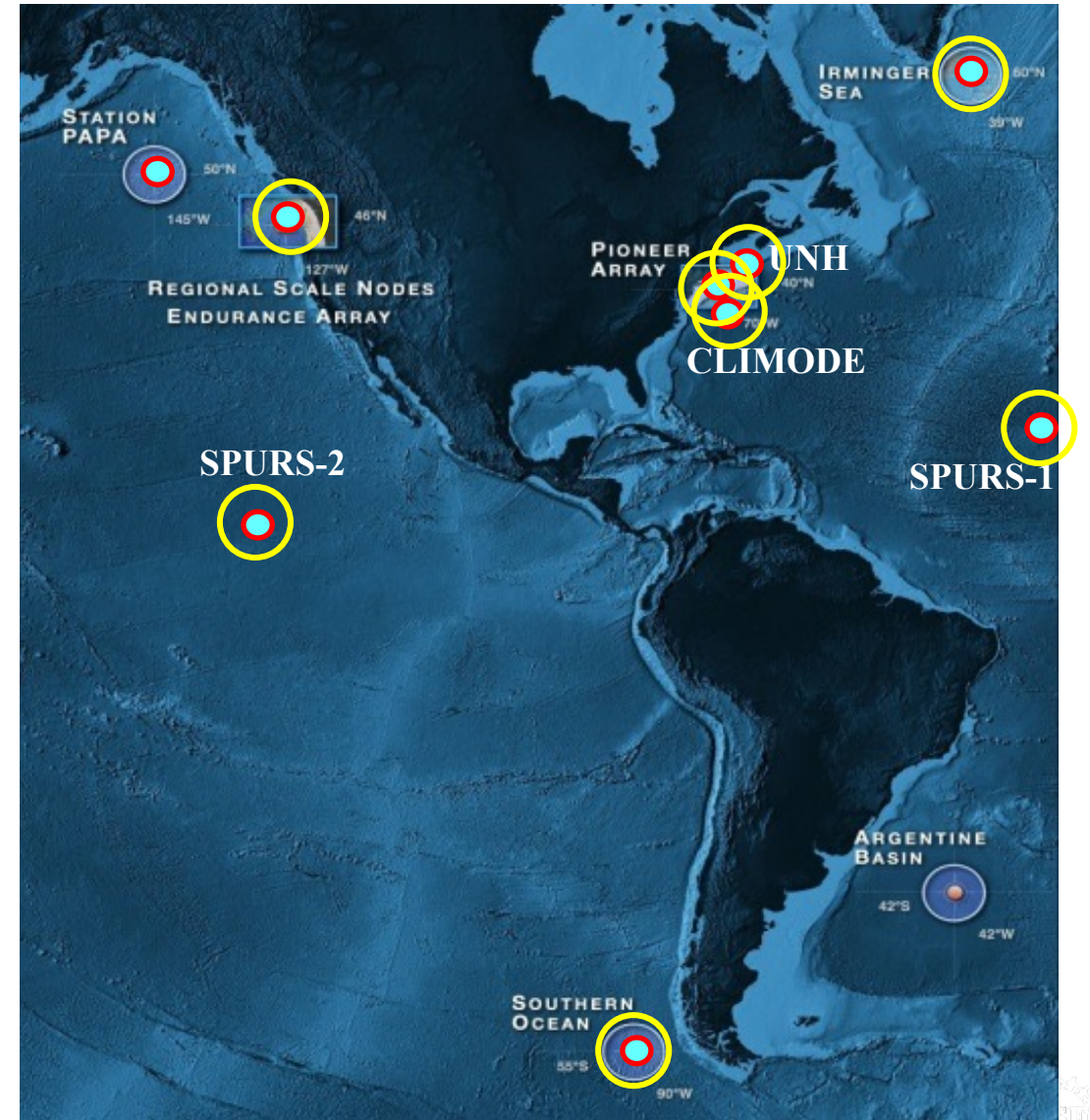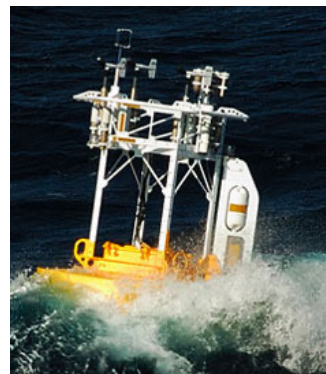- **IMOS/SOFS (Steve Rintoul)**
- ECWF/International

Additional Slides

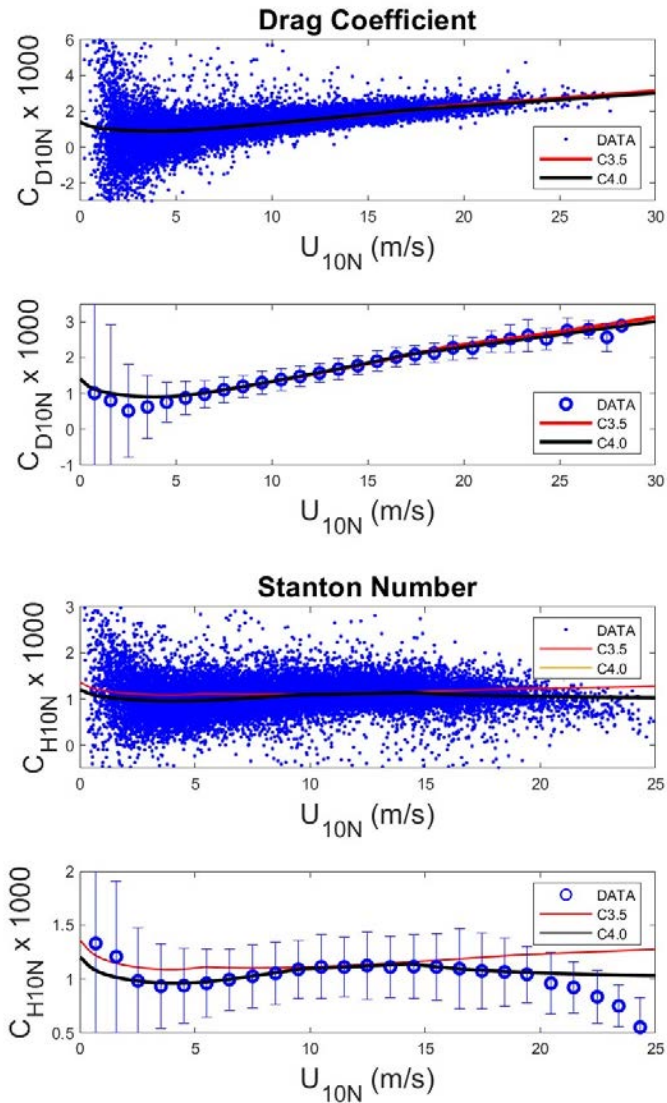# Science Highlight: Improved Fluxes from a Global Array

COARE 4.0