



Ocean Observatories Initiative

UNOLs Briefing

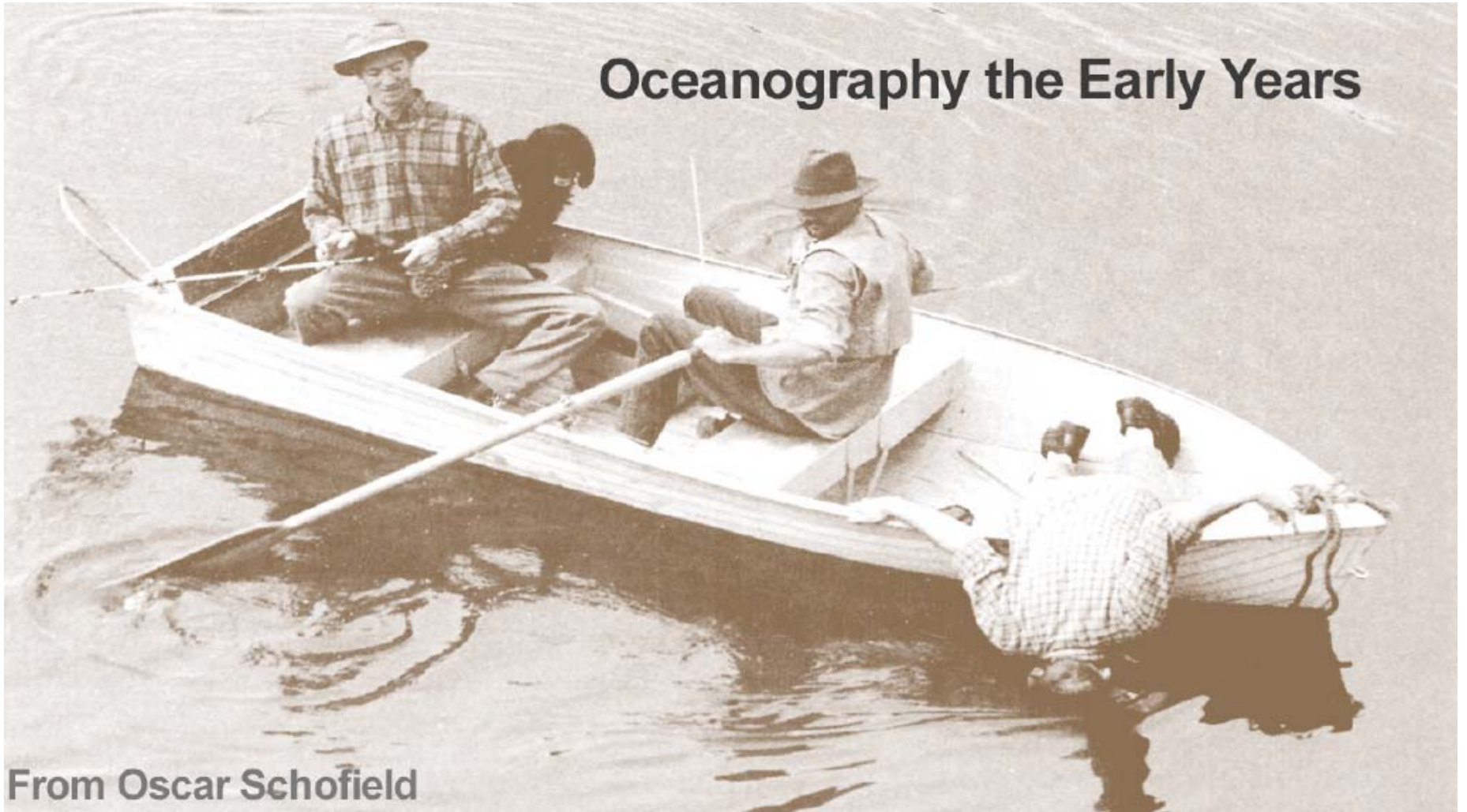
October 14, 2010

Jean McGovern

OOI Program Director, NSF



Oceanography the Early Years

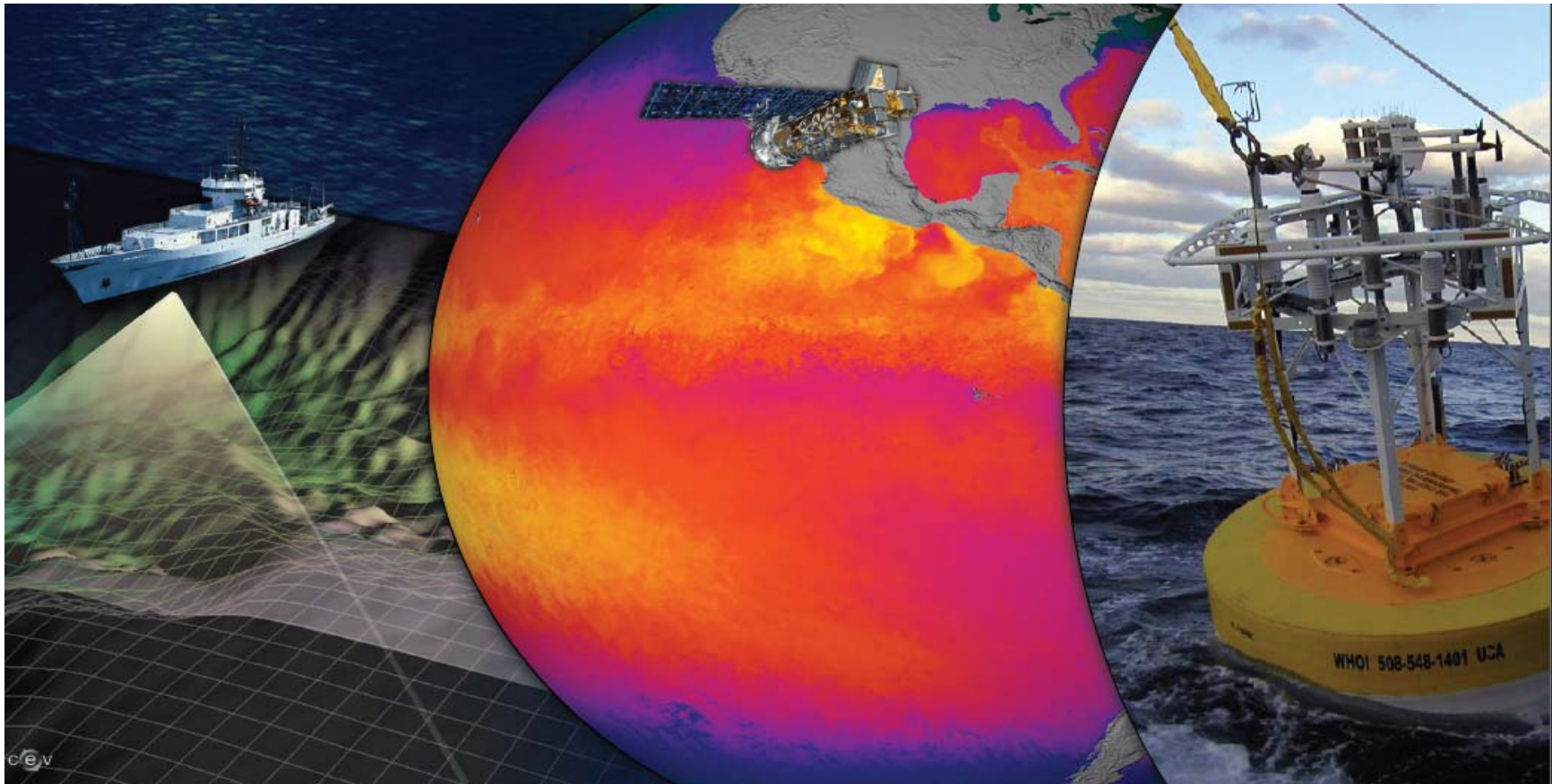


From Oscar Schofield

Current Oceanographic Research Infrastructure



Ocean Observing Data to Shore – Enabled by Technology



OOI Subsystems

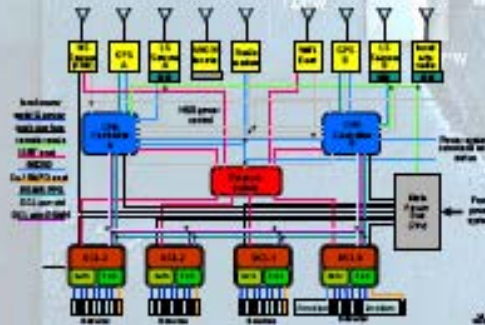
Buoys, Power, Telemetry



AUV/Dock



Platform Control, DCL



Sensors

Moorings

Benthic Nodes



Shore Station



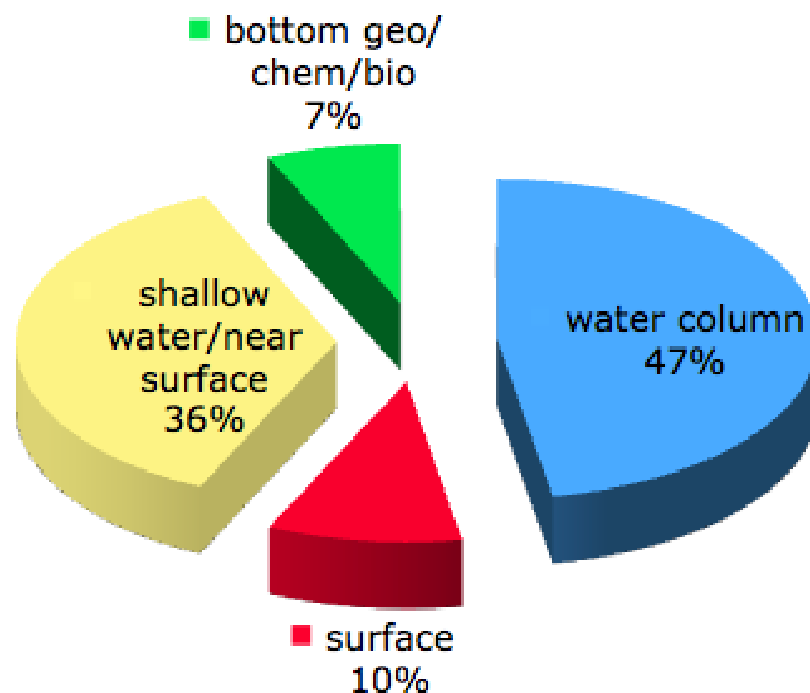
Profilers

Gliders



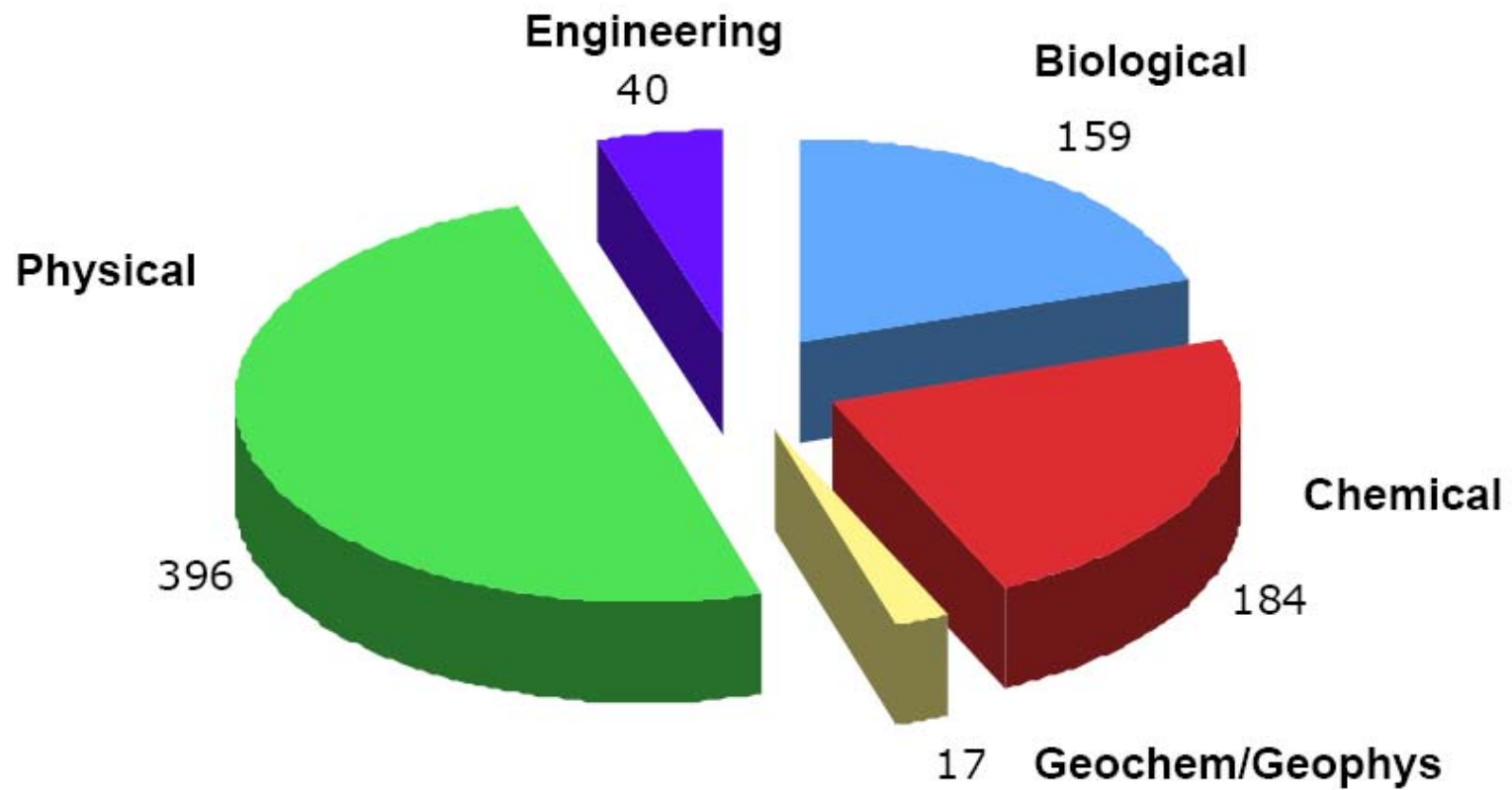
Water Column	Sensor Type	#
	Acoustic Doppler Current Profiler	39
	Conductivity/Temp.	210
	Hydrophone	10
	Inverted echo sounder	5
	pH	37
	Velocity, single point	53
Surface		
	Waves	10
	Meteorology	18
	pCO2	36
	Direct covariance flux	10
Shallow water		
	Fluorometer	81
	Nutrients	25
	Dissolved oxygen	82
	Spectral irradiance	22
	Photosynthetically available radiation	20
	Optical absorption	31
	Zooplankton sensor	13
Bottom		
	Mass spectrometer	2
	Seafloor temperature	1
	Seismometer	13
	Camera	13
	Benthic flow	1
	Particulate DNA	1
	Vent chemistry	2
	Chemical sampling	3
	Seafloor pressure	15

Sensor Distribution



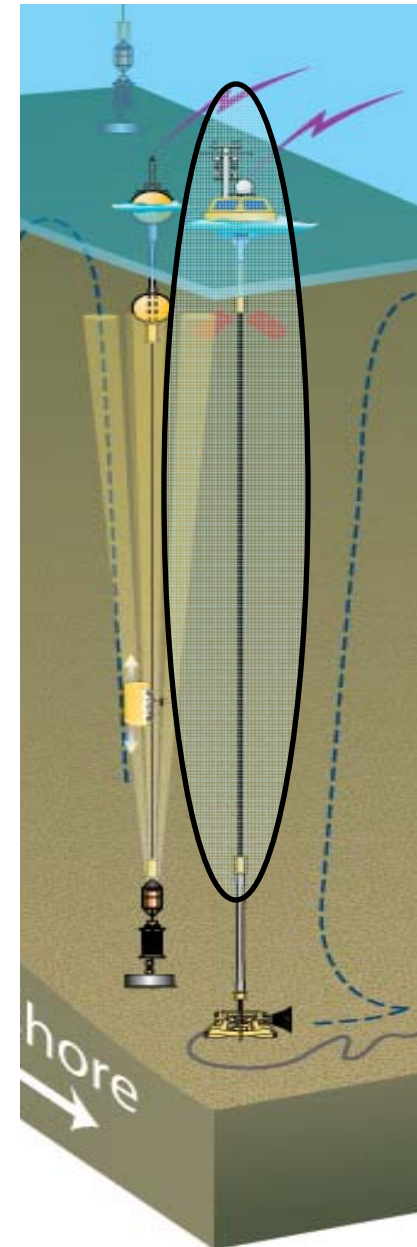
Core Sensors

Sensor Numbers by Primary Discipline



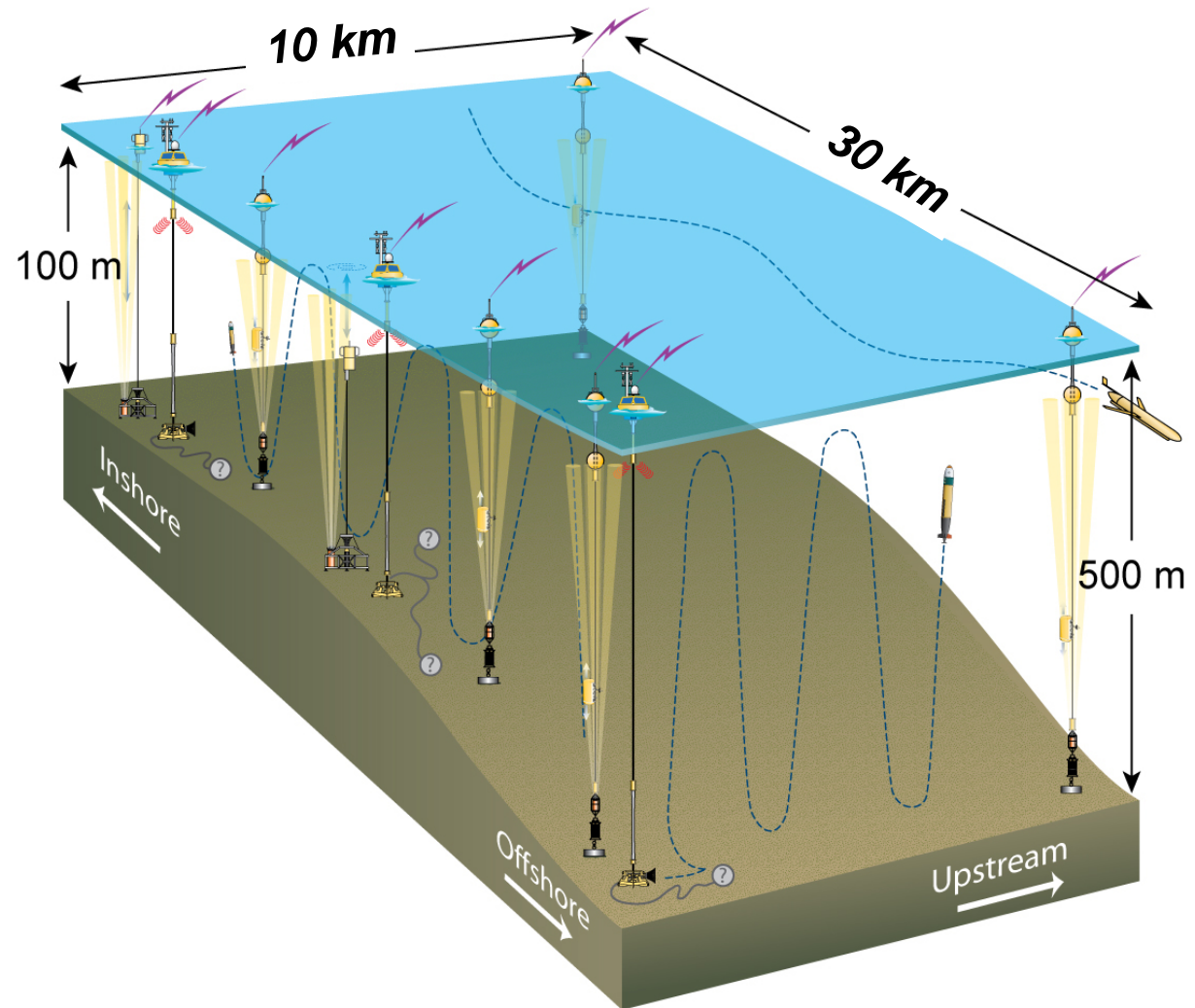
Surface Mooring

- Buoy (with telemetry to shore)
 - Surface meteorology
 - Waves
 - pCO₂ (air and sea)
- Subsurface
 - Temperature and salinity
 - Dissolved oxygen
 - pH
 - Water velocity
 - Turbidity
 - Optical properties
 - Chlorophyll, organic matter
 - Nitrate



Pioneer Array

- Full water column
- Cross-front resolution
- Power-generating buoys
- Multi-function nodes
- AUV docks



OOI Network Design

Multi-scale Observatory

Global Arrays

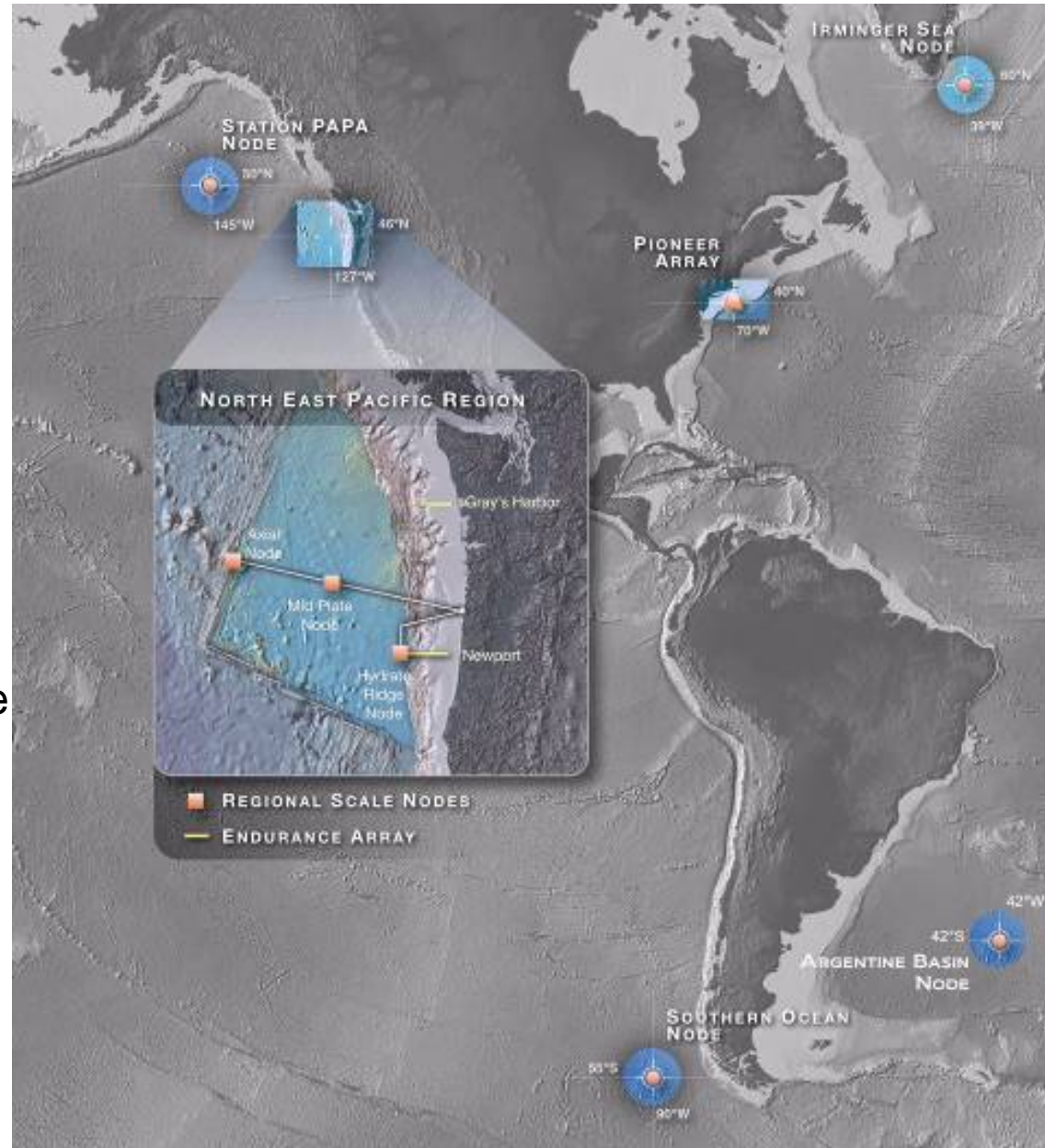
- Gulf of Alaska
- Irminger Sea
- Southern Ocean
- Argentine Basin

Regional

- Cabled
- Juan de Fuca Plate
- Oregon

Coastal Arrays

- Pioneer
- Endurance



OOI Data Policy



- Rapidly disseminated, open, and freely available
- Near-real-time with latencies as small as technically feasibility allows
- PI data shall be publicly available*
 - * PIs may request exclusive access (up to 1 year)
 - * Requests on a case by case basis
 - * All data public when exclusivity expires



OOI Project Team



Organization

Project Role

Consortium for Ocean Leadership

NSF Awardee &
Systems Integrator

Woods Hole Oceanographic Institution

Coastal and Global

- Oregon State University
- Scripps Institution of Oceanography
- Raytheon

University of Washington

Regional

UC San Diego

Cyberinfrastructure

Soon to Be Selected

Education &
Public Engagement



OOI Network Design

Multi-scale Observatory

Global Arrays

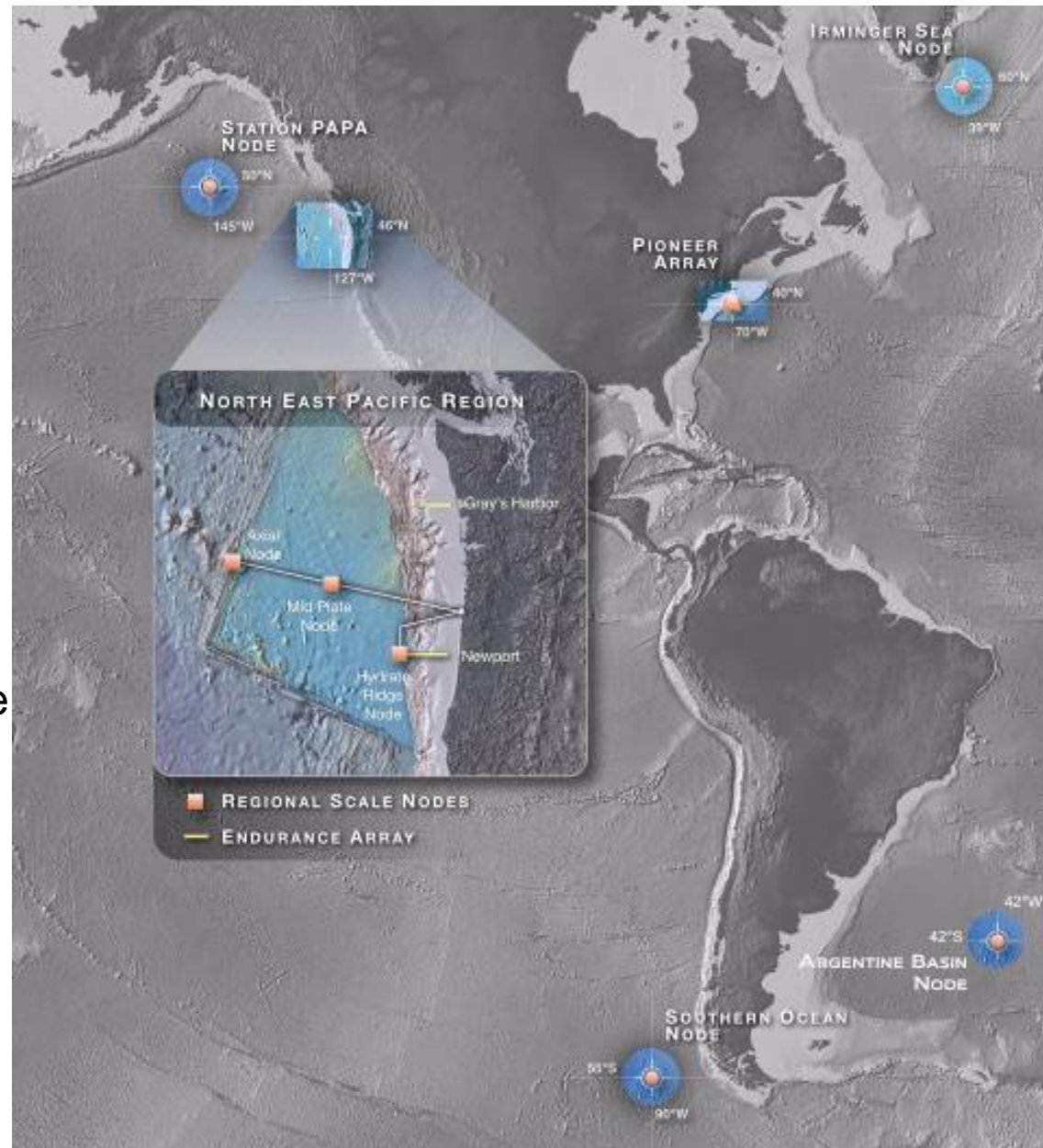
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Regional

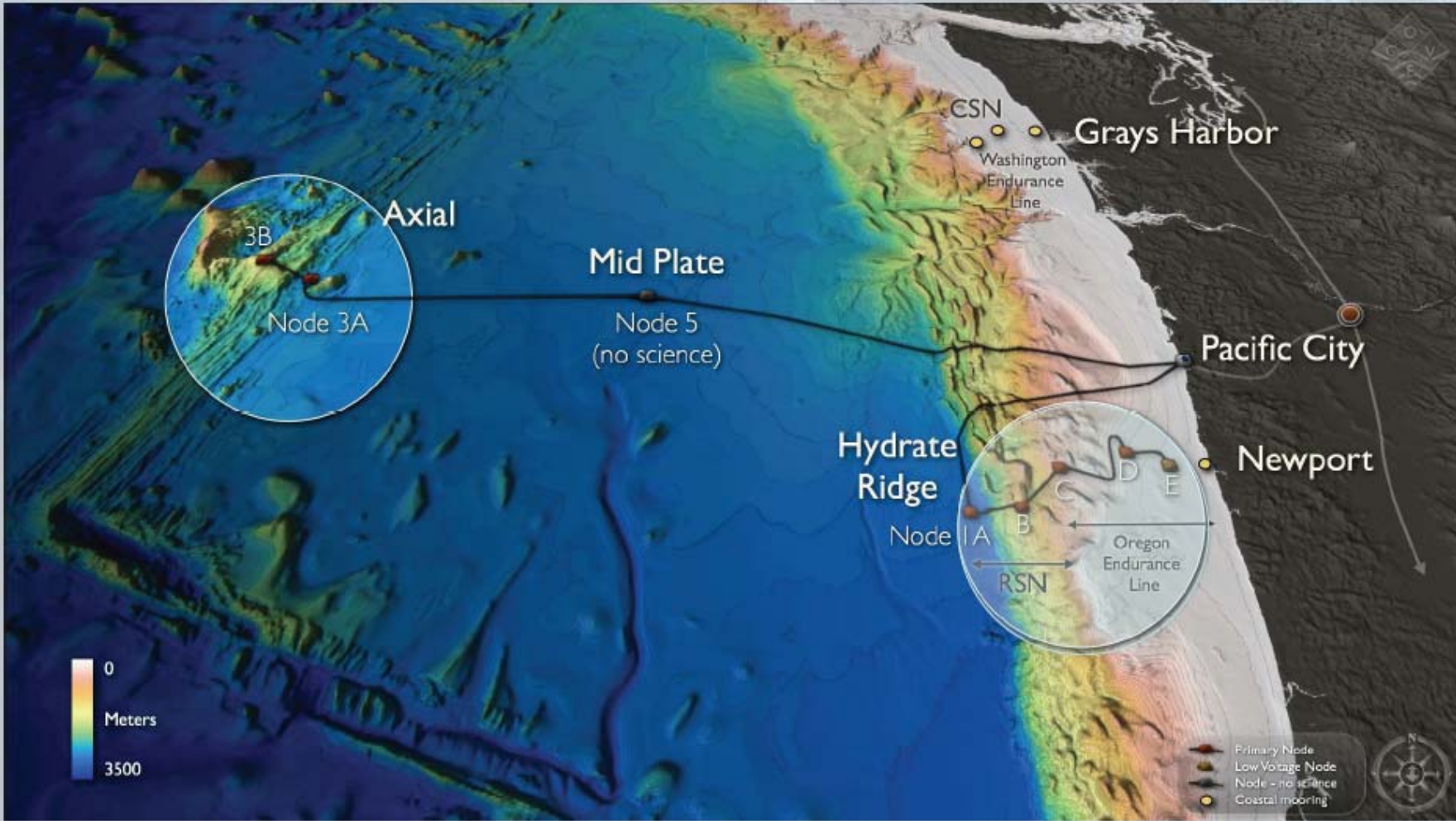
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Coastal Arrays

- Pioneer
- Endurance

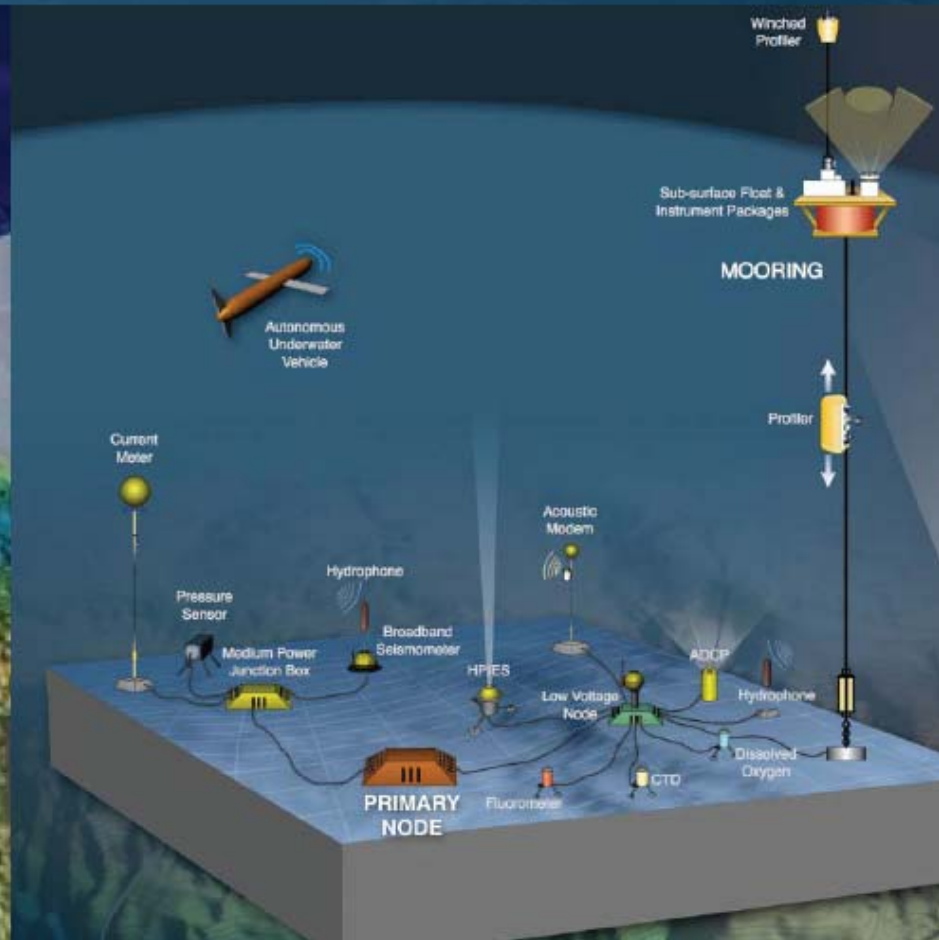
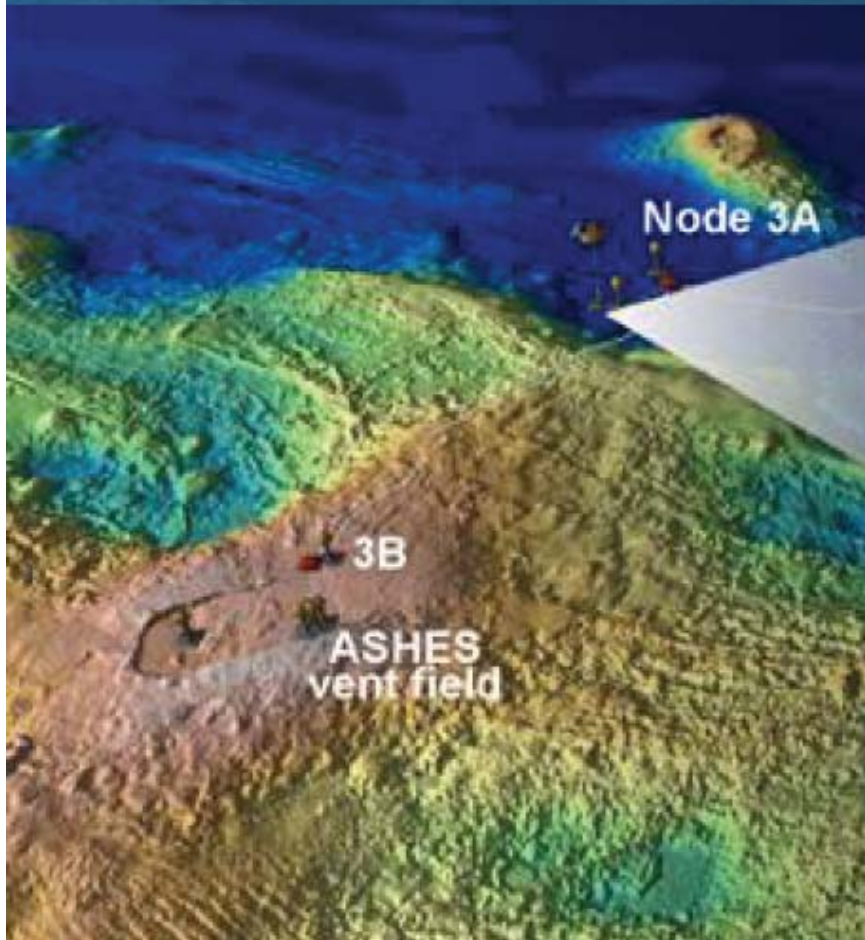


Regional Scale Nodes

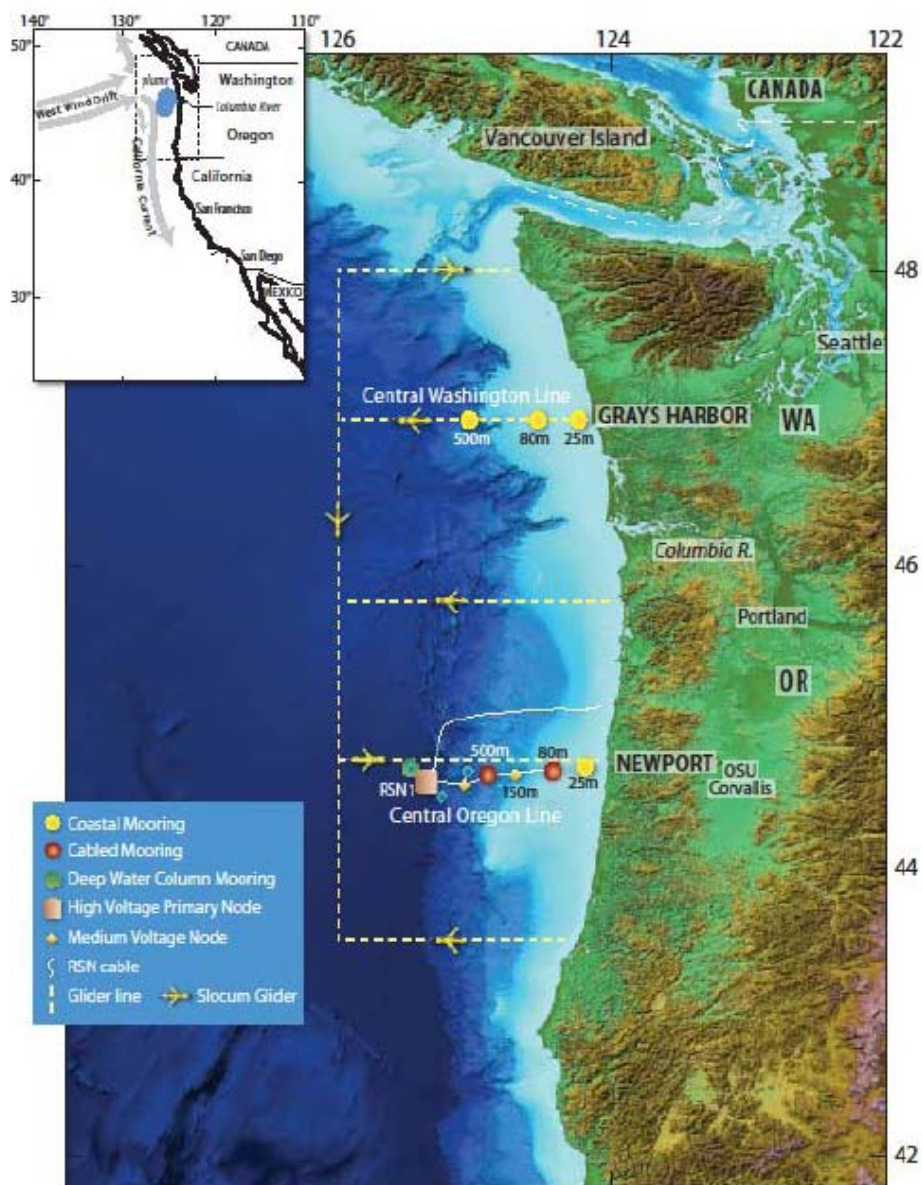




Axial Seamount

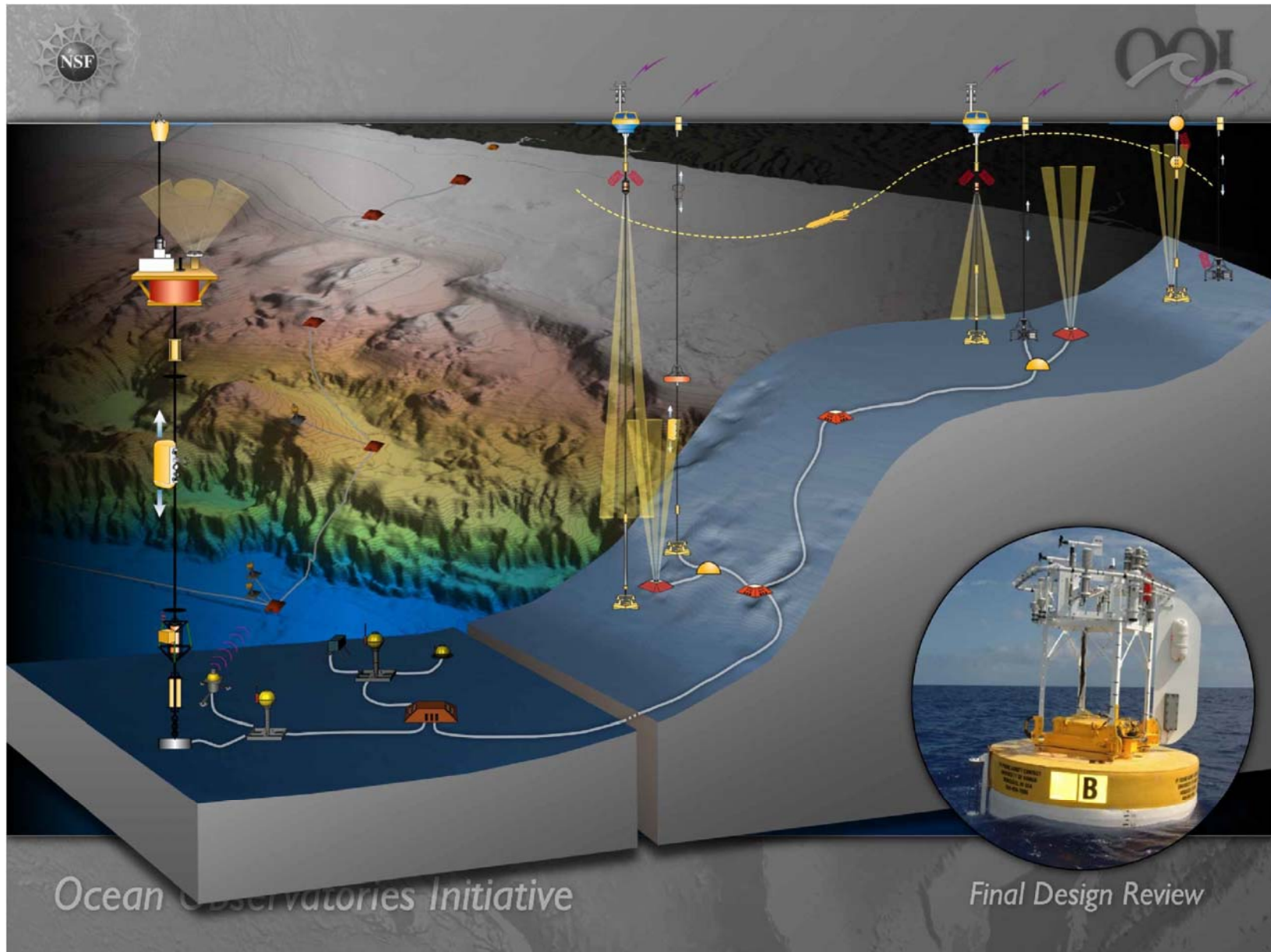


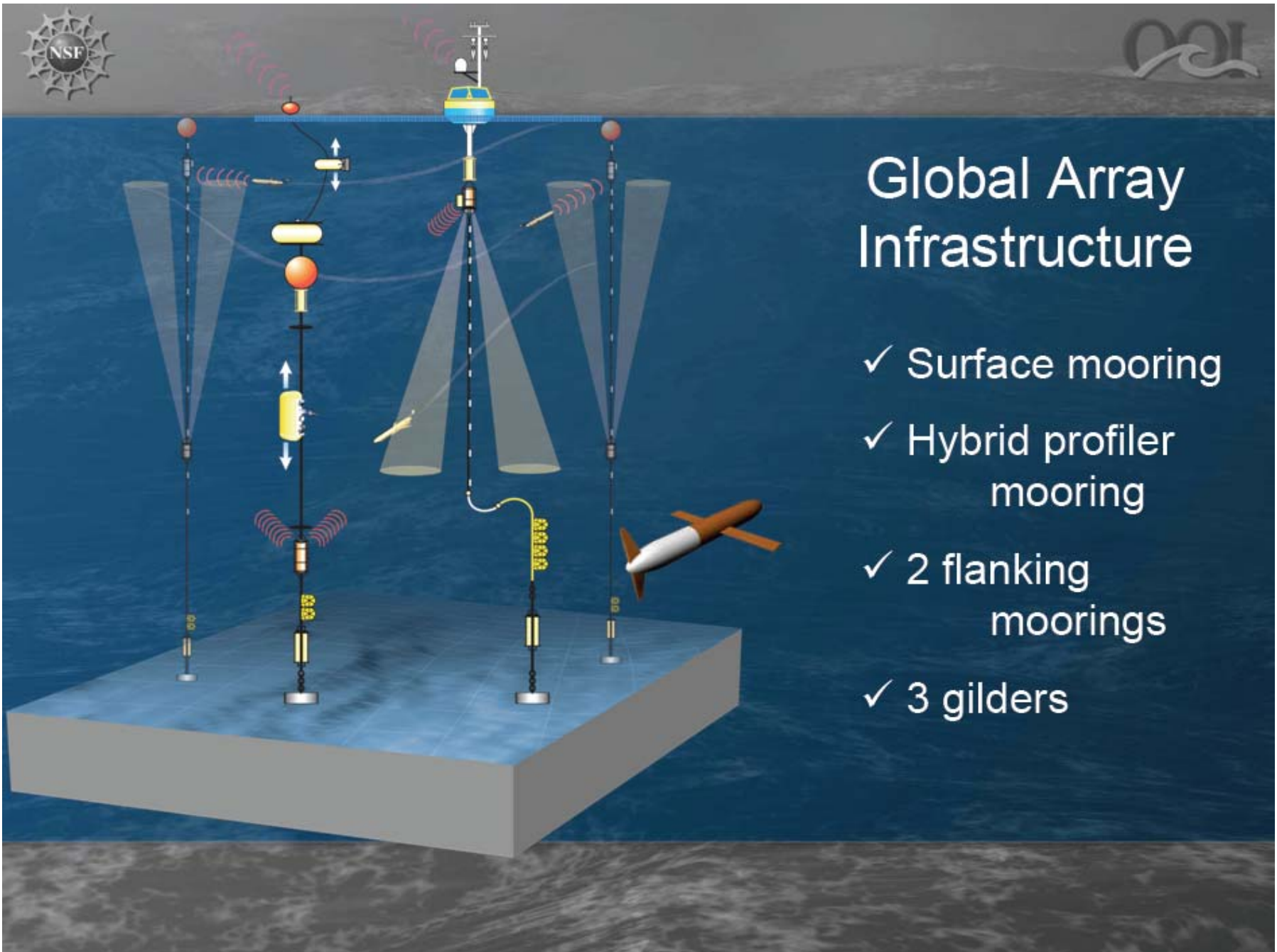
Endurance Array



- ✓ 2 cross-shelf lines
- ✓ Moorings on inner shelf, mid-shelf, and slope
- ✓ Air-sea, water column, and benthic observing
- ✓ 6 Gilders
- ✓ Oregon Line connects to Regional cable; continuity with RSN mooring and PAPA
- ✓ Coastal to deep ocean observing

Endurance Array



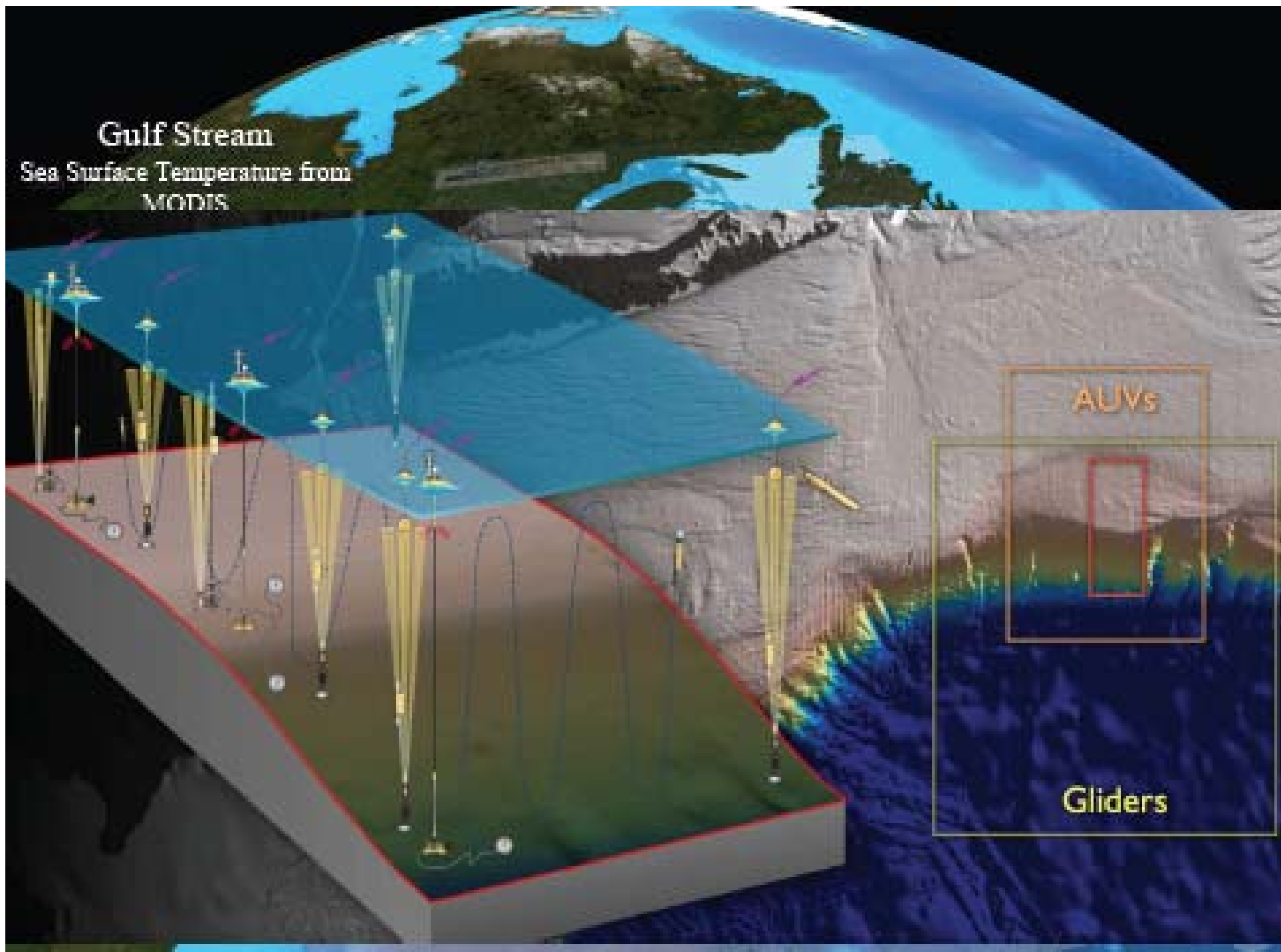


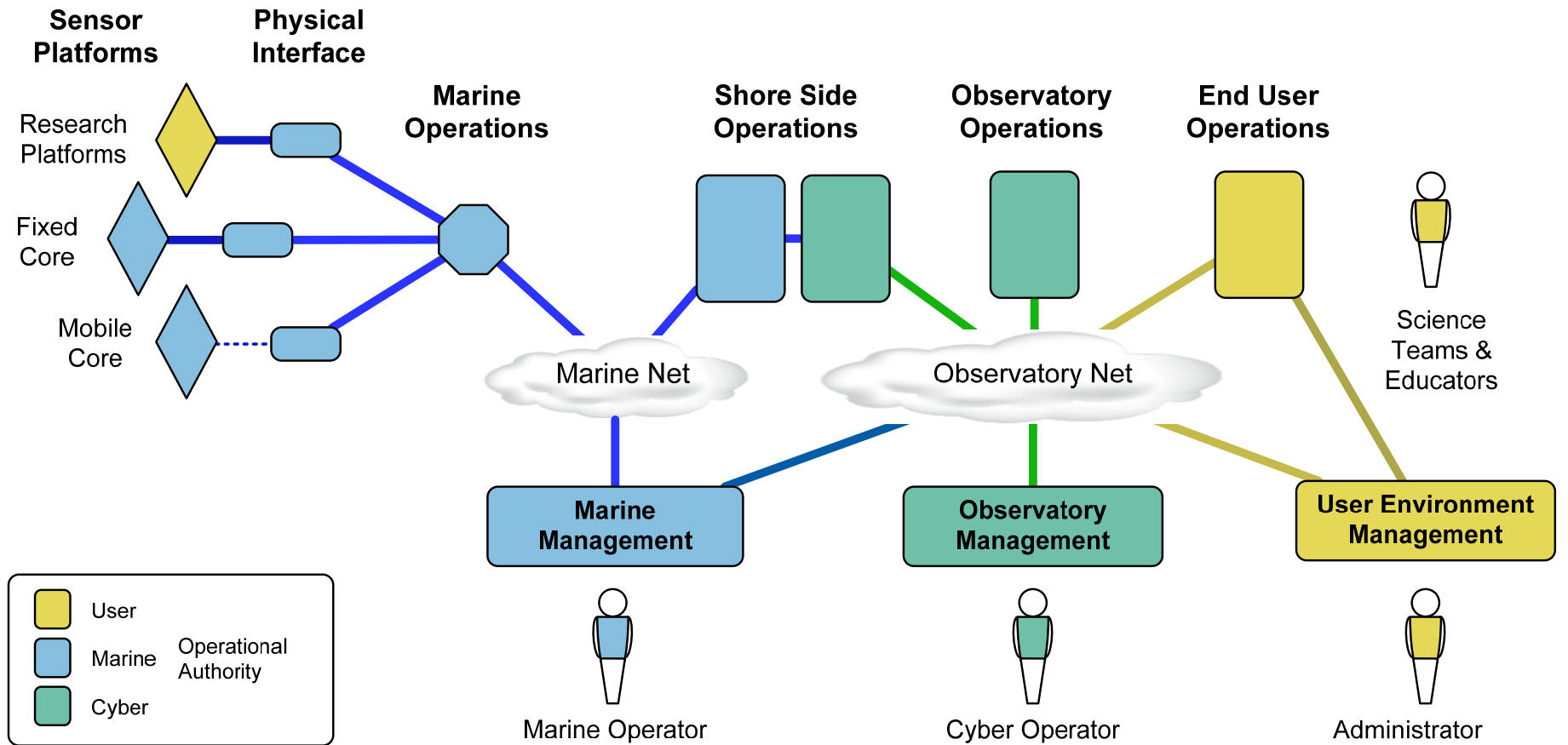
Global Array Infrastructure

- ✓ Surface mooring
- ✓ Hybrid profiler mooring
- ✓ 2 flanking moorings
- ✓ 3 gliders

Gulf Stream

Sea Surface Temperature from MODIS





Integrated Observatory Operational Domains



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Proposed OOI Installation Schedule		2011				2012				2013				2014					
		Q1 J F M	Q2 A M J	Q3 J A S	Q4 O N D	Q1 J F M	Q2 A M J	Q3 J A S	Q4 O N D	Q1 J F M	Q2 A M J	Q3 J A S	Q4 O N D	Q1 J F M	Q2 A M J	Q3 J A S	Q4 O N D		
Global Sites	Argentine Basin																		
	Irminger Sea																		
	Southern Ocean 55 S																		
	Station Papa																		
Coastal Arrays	Endurance																		
	Pioneer																		
Regional Arrays	Primary Infrastructure																		
	Secondary Infrastructure																		

Legend
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 Installation

 Data Flow

 Commissioning

 Gliders Deployed

 AUVs Deployed

Cruises: the Jiffy-Pop Diagram

