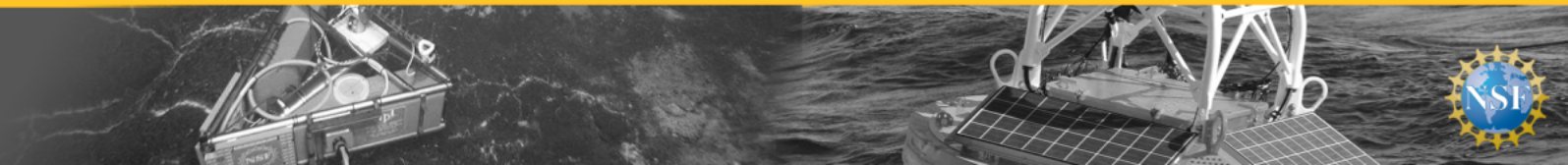
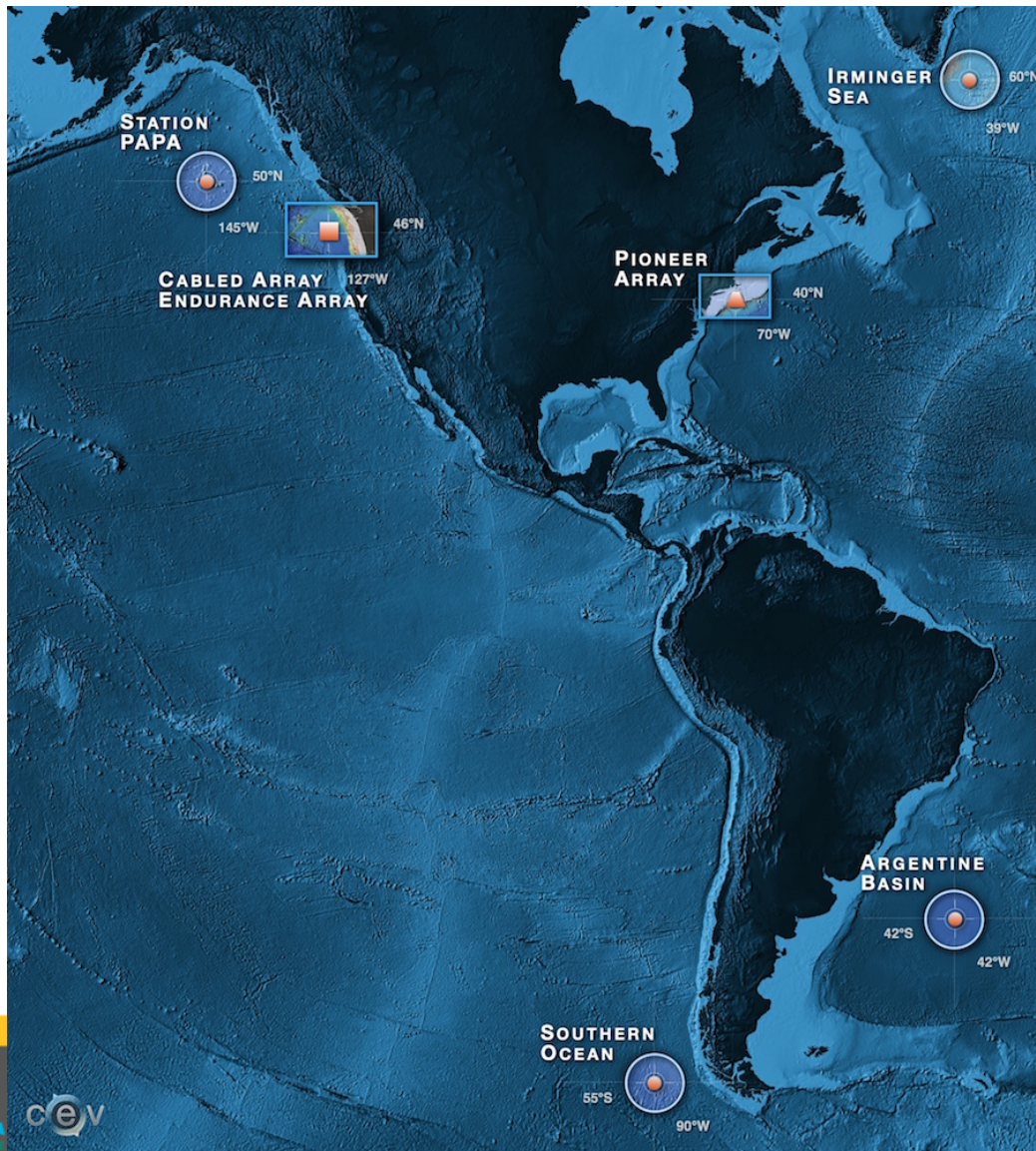


Ocean Observatories Initiative (OOI) Coastal & Global Scale Nodes (CGSN)

Sheri N. White

Woods Hole Oceanographic Institution





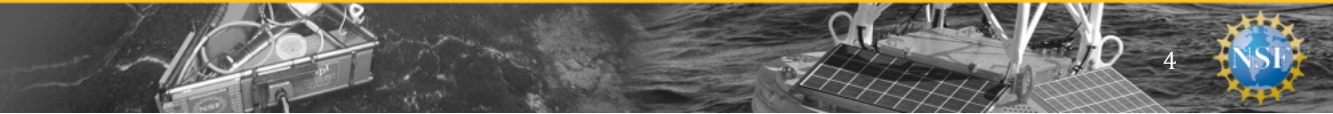
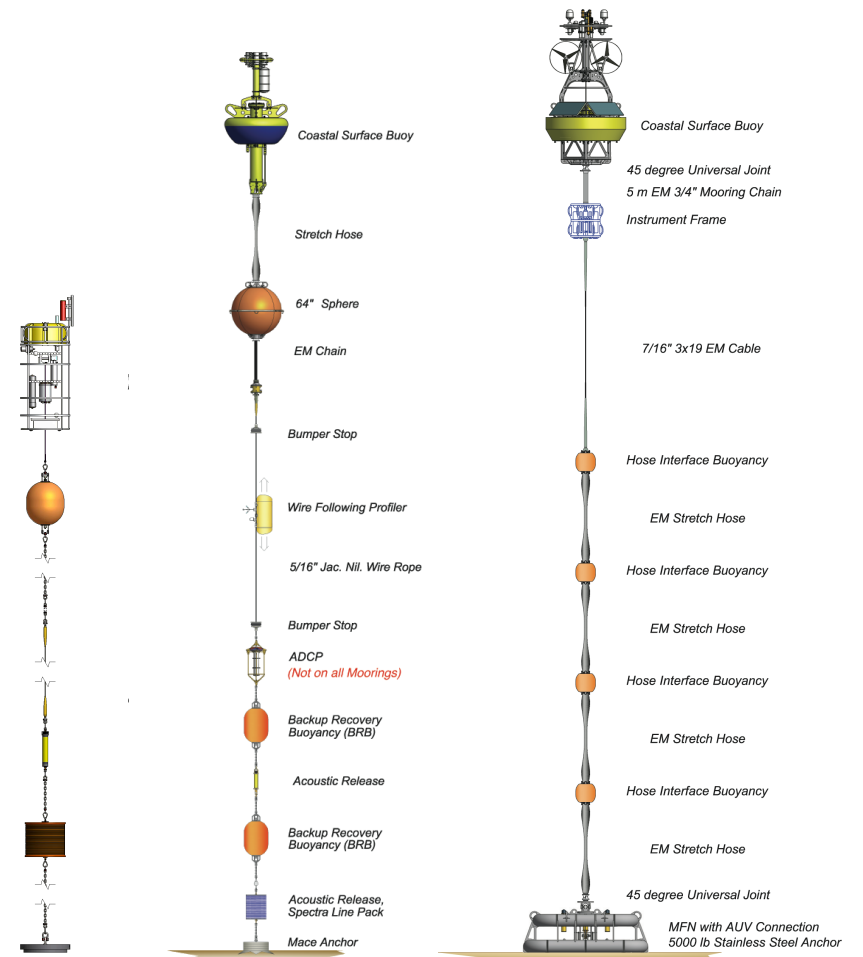
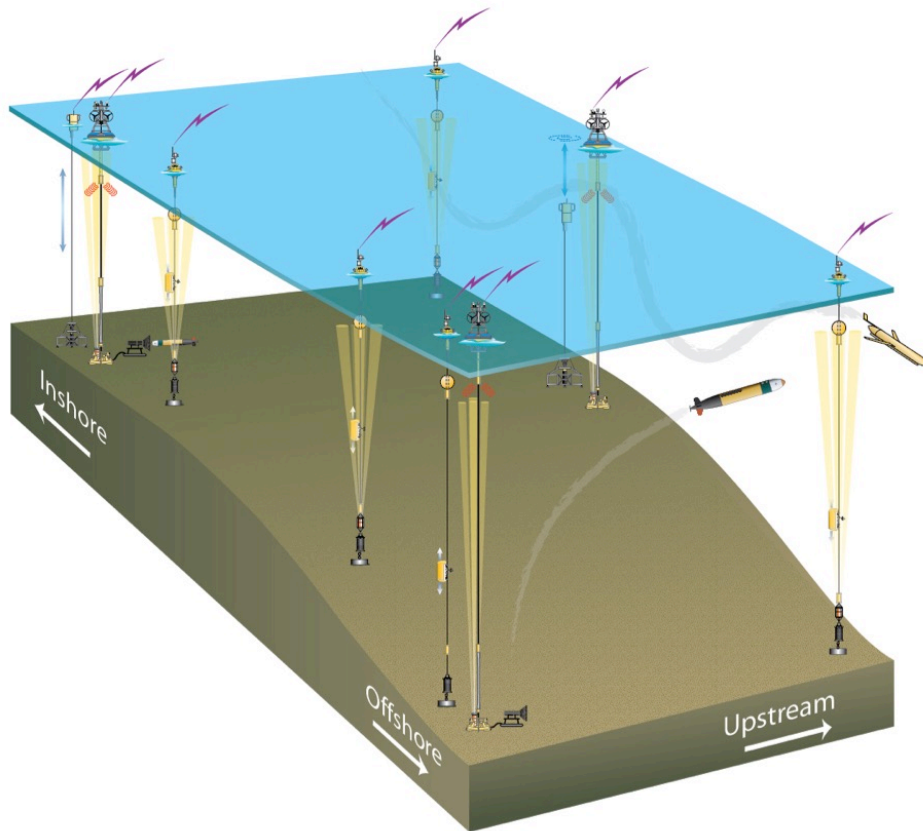
Ocean Observatories Initiative (OOI)

- Global Arrays (WHOI)
 - Moorings, Gliders
- Coastal Pioneer Array (WHOI)
 - Moorings, Gliders, AUVs
- Coastal Endurance Array
 - Moorings, Gliders (OSU)
 - Cabled infrastructure (UW)
- Cabled Array (UW)
 - Cabled infrastructure

CGSN Transformative Infrastructure

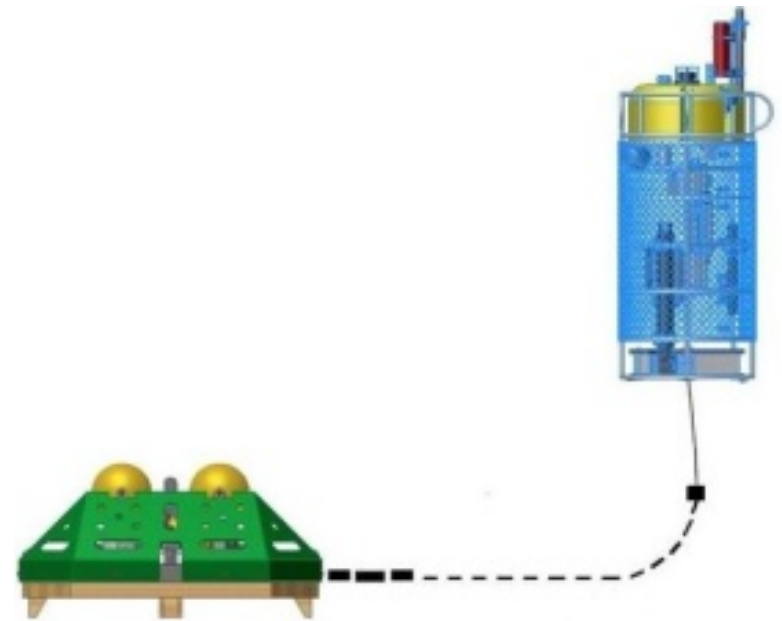
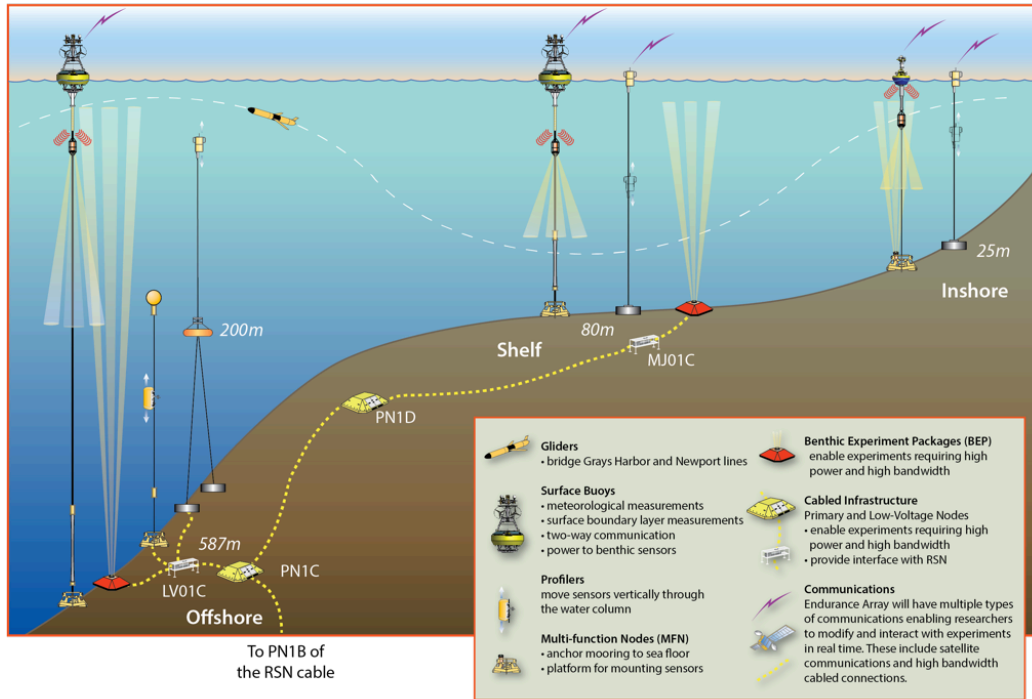
- Power
 - Power generation by wind turbines and solar panels; fuel cells
 - Transmission of “high” voltage power to the seafloor
- Communications
 - High-bandwidth (INMARSAT) communications to shore
 - Multiple comms channels (Line-of-sight, satellite, acoustic, inductive)
 - Bi-directional communications
- Instruments
 - COTS instruments but integrated with infrastructure for power and bi-directional comms
- Vehicles
 - Multi-glider fleet (26 total)
 - Gliders serving as data mules at Global sites
 - Multi-AUV surveys
 - AUV-Dock for unattended operations & recharging

Pioneer Array

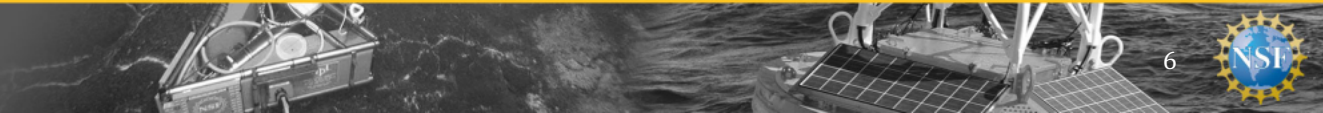
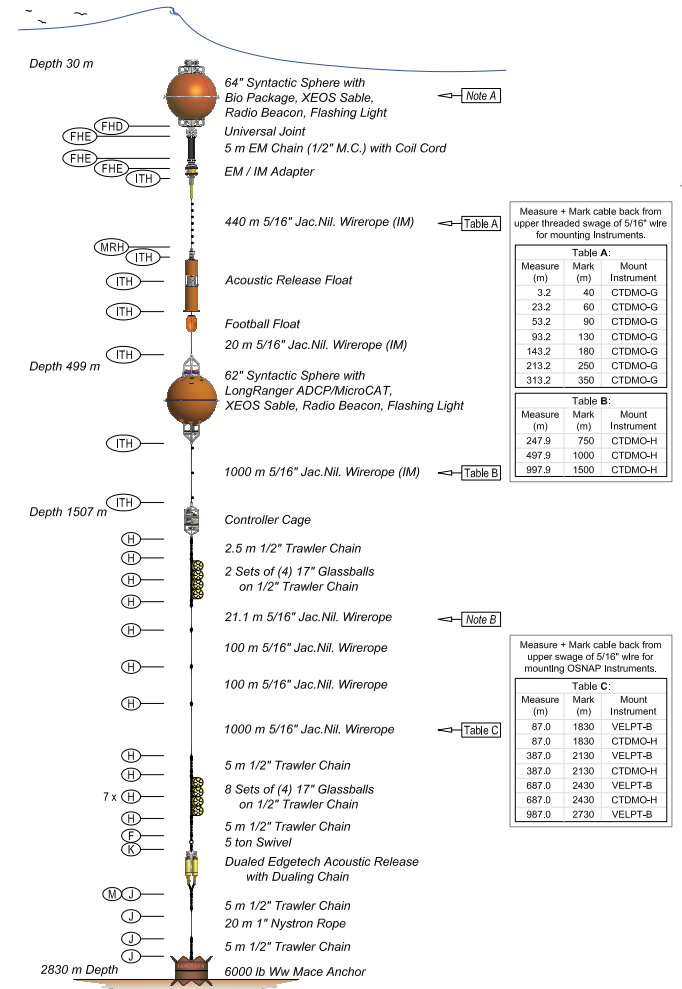
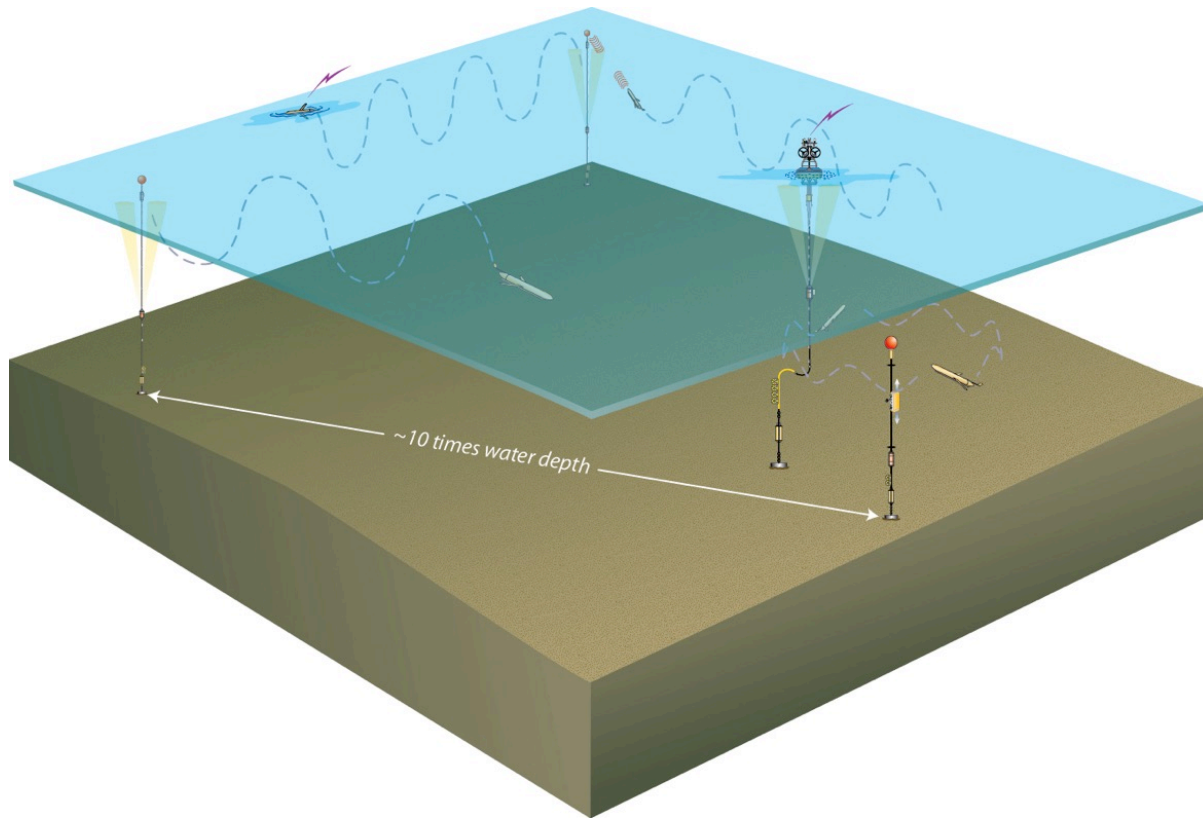


Endurance Array

Endurance Array - Newport Hydrographic Line



Global Arrays



Issues/Challenges

- Hydrogen generation in the surface buoy well [venting]
- Transmission of power/comms to the seafloor [cable testing]
- “Sleepy” persistor board [watchdog circuits]
- SD card corruption [careful selection & testing]
- Instrument issues
 - Consistency in FW/SW (interface & data format)
 - Connector failures
 - Quality/testing
 - Biofouling [working closely with instrument vendors]

Issues/Challenges

- Ruggedness in challenging environments
 - Icing/Ice Bergs
 - Burial by sediment
 - Corrosion
- Configuration control of software & hardware components
- Refurb delivery schedules
- Instrument challenges
 - Communications (inductive, serial and Ethernet) – not designed for interactivity
 - Power
 - Ruggedness for long-term, open ocean environments
 - Quality data vs. protecting instruments
 - Refurb/recalibration time

General Lessons Learned for Large/Long-term Programs

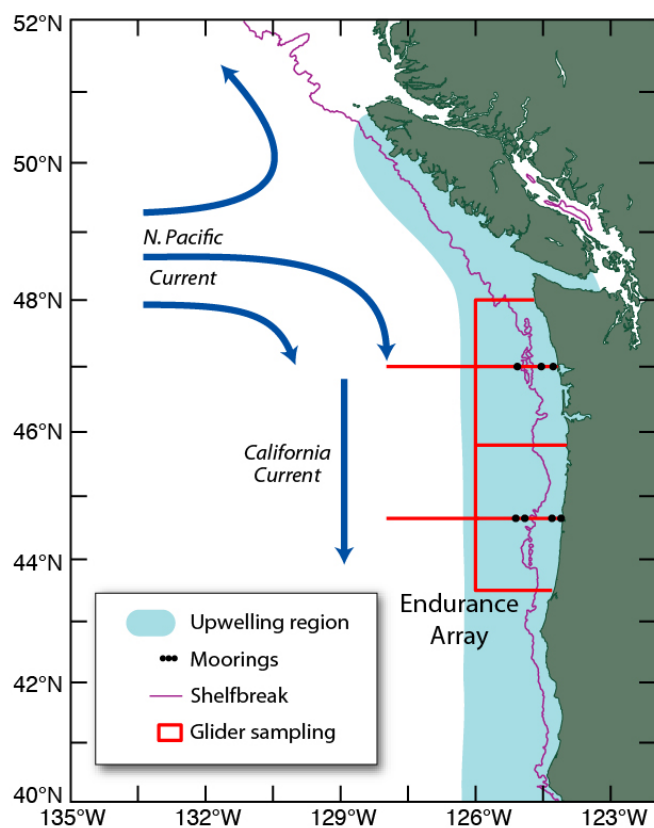
- Importance of good facilities and logistics (storage, integration & test facilities, etc.)
- Importance of long burn-in times to identify problem areas
- Importance of having sufficient material on-hand (both at institutions and vendors) to meet tight deployment schedules
- Importance of detailed and controlled drawings/documentation (for HW and SW)
- Importance of managing resources & leveling effort



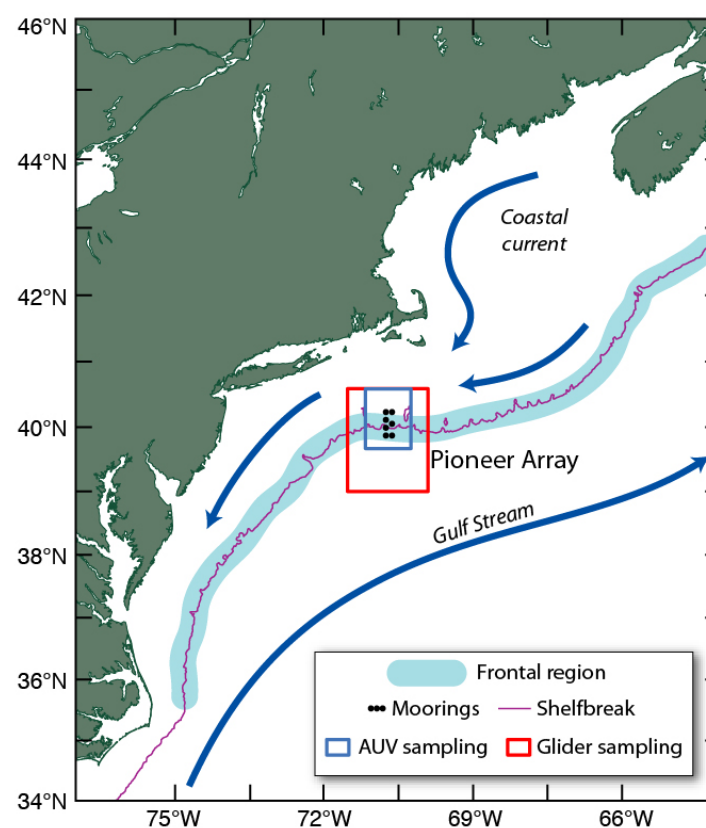
NSF Ocean Tech Lessons Learned
Workshop, September 2016



Endurance Array



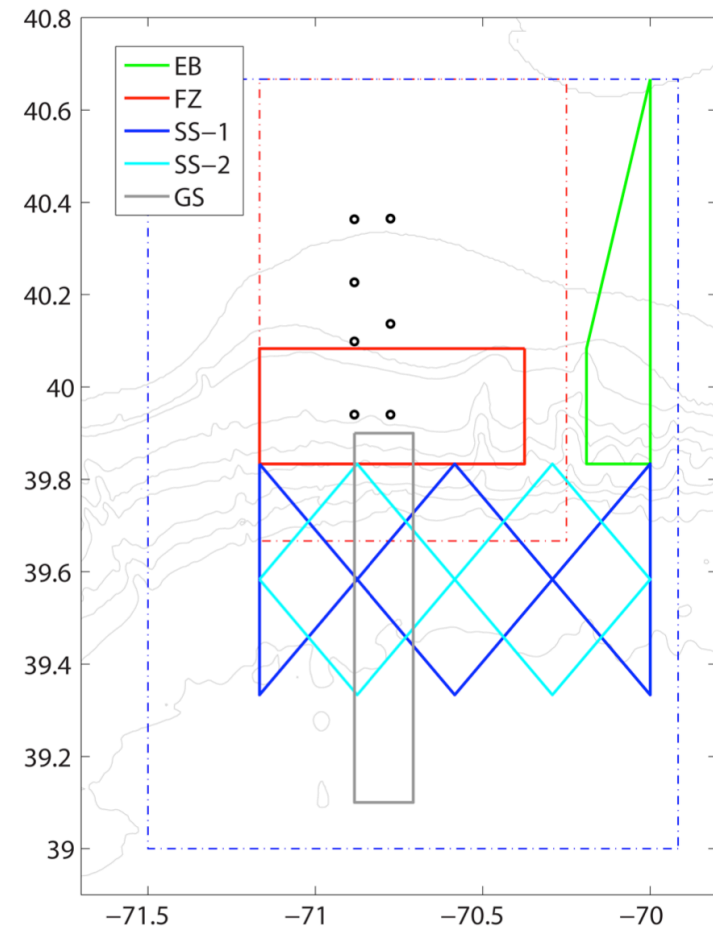
Pioneer Array



Pioneer Gliders



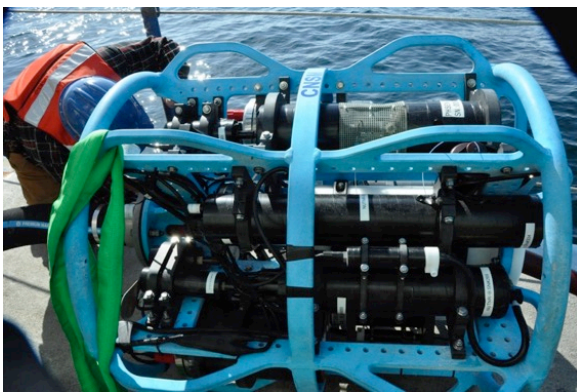
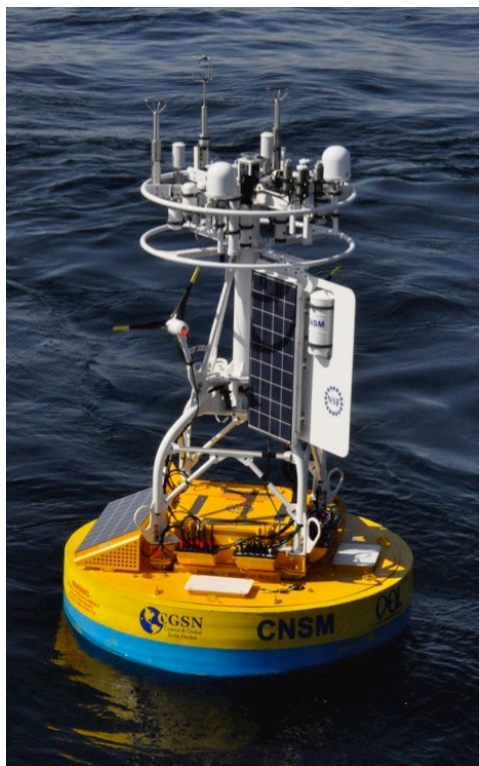
Name	Region/Track Line	Buoyancy Engine
EB	Eastern Boundary	200 m
FZ-1	Frontal Zone	1000 m
SS-1	Slope Sea	1000 m
SS-2	Slope Sea	1000 m
FZ-2	Frontal Zone	200 m
GS	Gulf Stream	1000 m



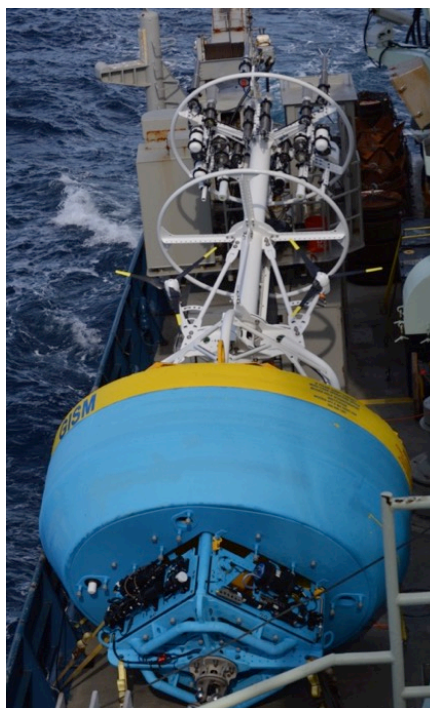
Coastal Profiler Moorings



Coastal Surface Moorings



Global Surface Moorings



Global Subsurface Moorings

