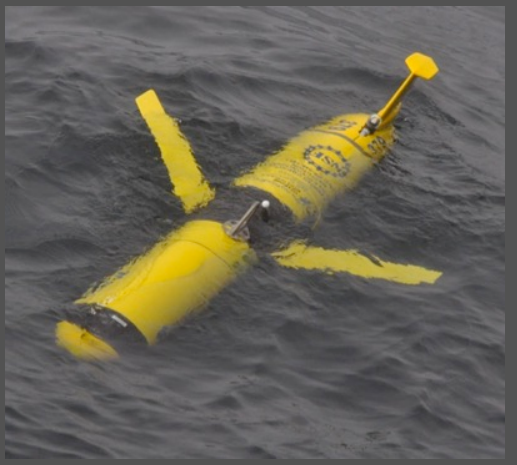
Ocean Observatories Initiative



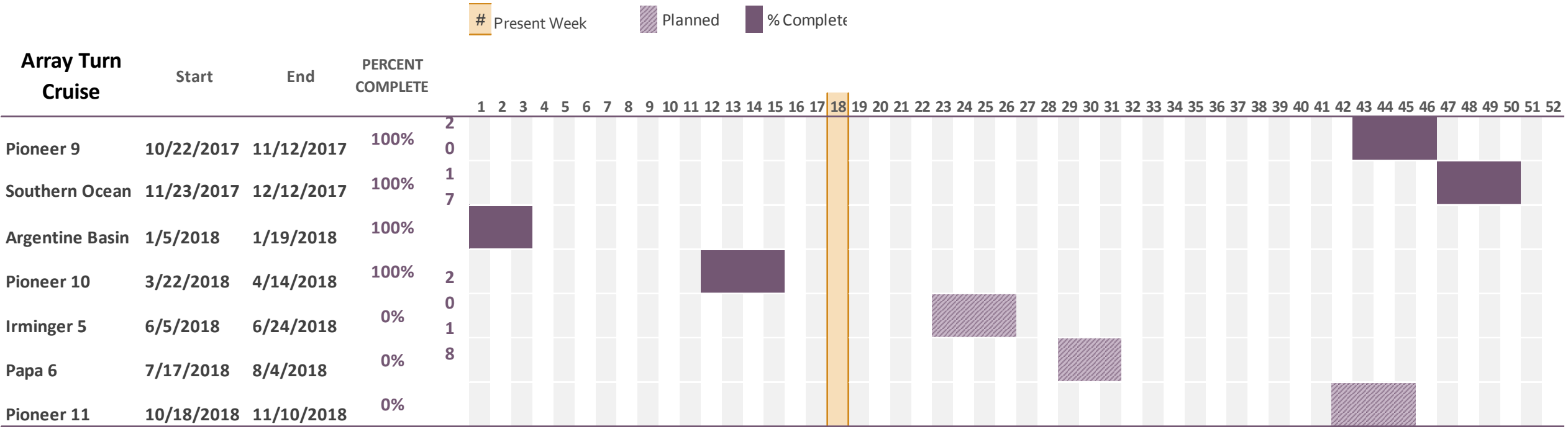
Pioneer Array Status

May 2018

CGSN Staff
Woods Hole Oceanographic Institution

OCEAN OBSERVATORIES INITIATIVE

CGSN WHOI Cruise Schedule Fall 2017–2018



Array Turn Cruise	Start	End	PERCENT COMPLETE
Pioneer 9	10/22/2017	11/12/2017	100%
Southern Ocean	11/23/2017	12/12/2017	100%
Argentine Basin	1/5/2018	1/19/2018	100%
Pioneer 10	3/22/2018	4/14/2018	100%
Irminger 5	6/5/2018	6/24/2018	0%
Papa 6	7/17/2018	8/4/2018	0%
Pioneer 11	10/18/2018	11/10/2018	0%

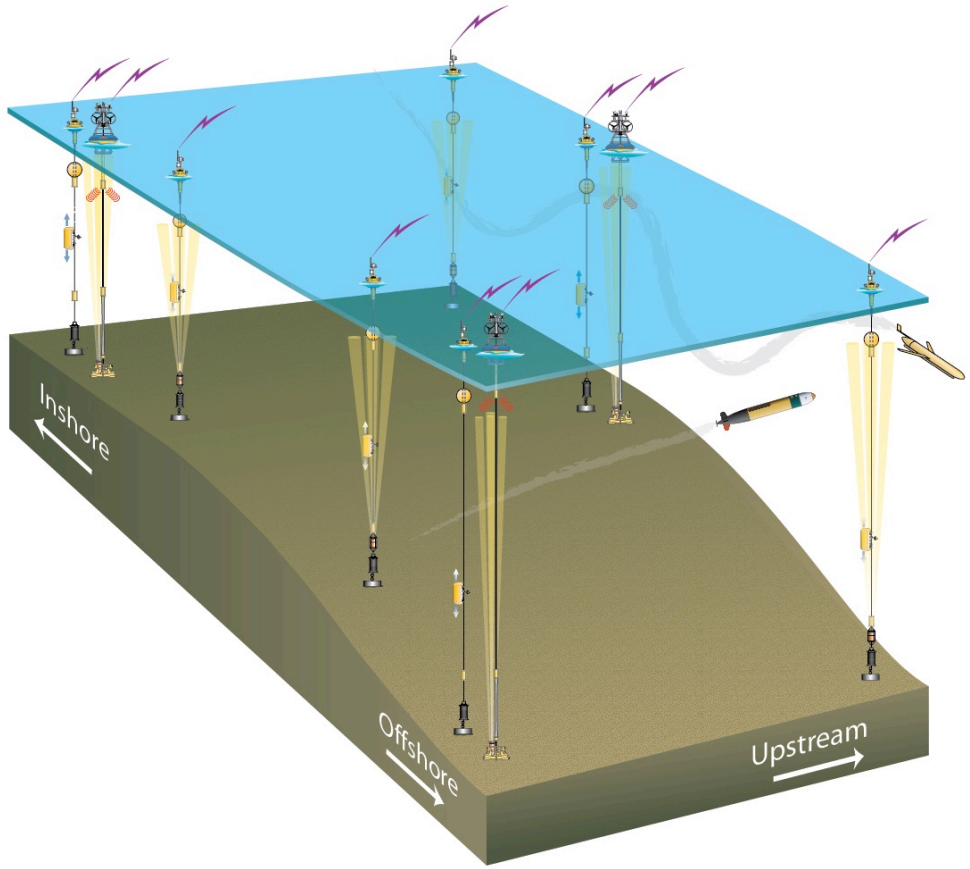
2013-2018 WHOI Cumulative Operations

	Coastal	Global	Total
• Platforms Built and Deployed	73	55	**128**
• Gliders Deployed	67	49	**116**
• Coastal and Global Cruises	20	17	**37**
• *Coastal Mooring Turn*	*10*		
• *Coastal AUV turn*	*10*		

Pioneer Array Status

Pioneer 10 Array Turn April 2018

Platform Deployments	**Operating Status**
• 3 x Surface Moorings	2 at 95% 1 at 45%
• 5 x Profiler Moorings	5 x 100%
• 3 x Gliders recovered	0 gliders deployed
• AUV surveys (on separate cruise)	



Challenges

- Power system controller problem - CNSM
- Surface Mooring SD card issues - ongoing mitigation
- One profiler mooring buoy still adrift - PMUI
- Glider repair backlog - being addressed

Coastal Pioneer Weekly Status

29 April 2018

CP01CNSM

29-Apr-18	%good
Num Inst.	0
Inst. %	0
Data System	0
GPS	100
Power	16v
Battery	50
PV	25
Wind Turbine	50
Telemetry	87.5
Beacon	100

CP03ISSM

29-Apr-18	%good
Num Inst.	21
Inst. %	96
Data System	100
GPS	100
Power	87
Battery	100
PV	100
Wind Turbine	100
Telemetry	100
Beacon	100

CP04OSSM

29-Apr-18	%good
Num Inst.	21
Inst. %	96
Data System	100
GPS	100
Power	96
Battery	100
PV	75
Wind Turbine	100
Telemetry	100
Beacon	100

CP02PMCI

29-Apr-18	%good
Num Inst.	1
Inst. %	100
Profiles	100
Data System	100
GPS	100
Battery	100
Telemetry	100
Beacon	100
Instruments	Flag
mopak	1
adpct	1
velpt	1
dosta	1
ctd	1
flort	1
par	1

CP02PMCO

29-Apr-18	%good
Num Inst.	7
Inst. %	100
Profiles	100
Data System	100
GPS	100
Battery	100
Telemetry	100
Beacon	100
Instruments	Flag
mopak	1
adpct	1
velpt	1
dosta	1
ctd	1
flort	1
par	1

CP02PMUI

29-Apr-18	%good
Num Inst.	7
Inst. %	100
Profiles	100
Data System	100
GPS	100
Battery	100
Telemetry	100
Beacon	100
Instruments	Flag
mopak	1
adpct	1
velpt	1
dosta	1
ctd	1
flort	1
par	1

CP02PMUO

29-Apr-18	%good
Num Inst.	7
Inst. %	100
Profiles	100
Data System	100
GPS	100
Battery	100
Telemetry	100
Beacon	100
Instruments	Flag
mopak	1
adpct	1
velpt	1
dosta	1
ctd	1
flort	1
par	1

CP04OSPM

29-Apr-18	%good
Num Inst.	6
Inst. %	100
Profiles	100
Data System	100
GPS	100
Battery	100
Telemetry	100
Beacon	100
Instruments	Flag
mopak	1
velpt	1
dosta	1
ctd	1
flort	1
par	1

Load shedding, reduced telemetry schedule, battery powered instruments

Notable improvements

September 2017 - present

- Profiler Moorings
  - Stretch Hose durability
  - Anchor design for optional ROV recovery
  - BRB design improvement to aid recovery
- Surface Moorings
  - GPS Beacon upgraded to Rover
  - Camera to characterize icing/physical state
  - Heating elements to mitigate icing (Irminger)
- AUV
  - Procured spare AUV sensor bays to facilitate sensor calibration
  - AUV sea-going support van completed
- Instruments
  - UV-Light addition to SPKIR and DOSTA
  - Satlantic (now Sea-Bird) ISUS replaced by SUNA
- Platform Firmware v 2.42
  - Automatic code installation and codebase unified across all MIOs
  - Inductive noise mitigation
  - Graceful DCL shutdown/startup of instruments
  - Enabled MFN power cycling independent of DSL
  - “Virtual serial cable” enables vender interface access to instruments
- Facilities
  - Staff Cross-training
  - 3 saltwater tanks for instrument burn-in, winterized, with power and gantry
  - Support van for foreign-port mobilizations

Pioneer Science Activity

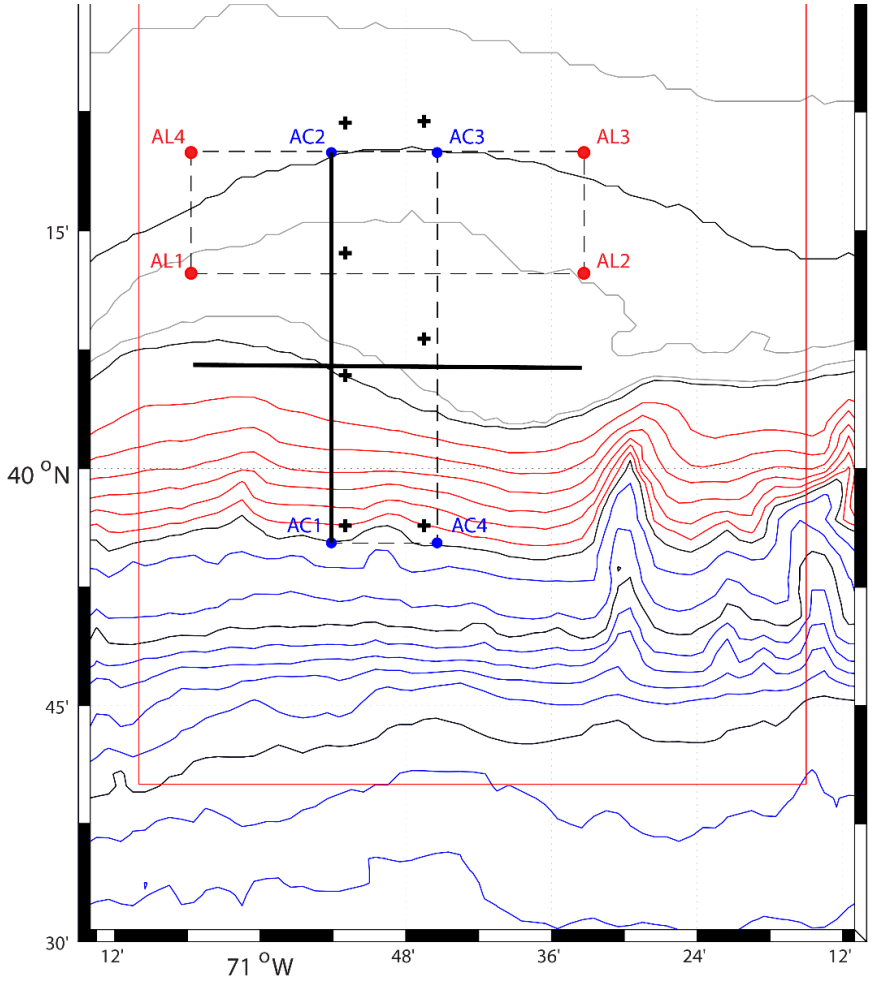
- Inquires for ancillary activities
  - NE Shelf LTER sampling
  - Aleck Wang carbon sampling
  - Gallager particle imaging
  - VPR and vertical net tows
  - Glider recovery
- Pioneer cruises with ancillary activities:
  - Pioneer-7 Legs 1 and 2
  - Pioneer-8 Leg 1
  - Pioneer-9 Legs 1 and 3
  - Pioneer-10 Legs 1 and 2
- Publications
  - TOS special issue
  - WHOI Oceanus Magazine
  - OceanObs-19 abstracts
- Other
  - Continued engagement with commercial fishermen
  - Coordinated sampling with NSF Shelfbreak Frontal Dynamics program during Pioneer 10a

Shelfbreak Frontal Dynamics (SFD) Study

- NSF-funded research proposal
  - 7 PIs at 4 institutions
  - Investigating productivity and upwelling at the shelfbreak front
  - Process study concept explicitly tied to Pioneer Array
- Ancillary sampling request
  - Accommodated on Pioneer-10
- Sampling change request
  - Completed ECR process, which included OOIFB review
  - Modifications to AUV cruise timing and track line location
- Operations
  - Significant coordination activities
  - Development of “run rules”
  - Development of two-ship field operations plan
- Data exchange
  - Transfer of data from AUV support ship to CGSN shore server
  - Synced to CI raw data server
  - Accessed by SFD PIs aboard R/V Armstrong

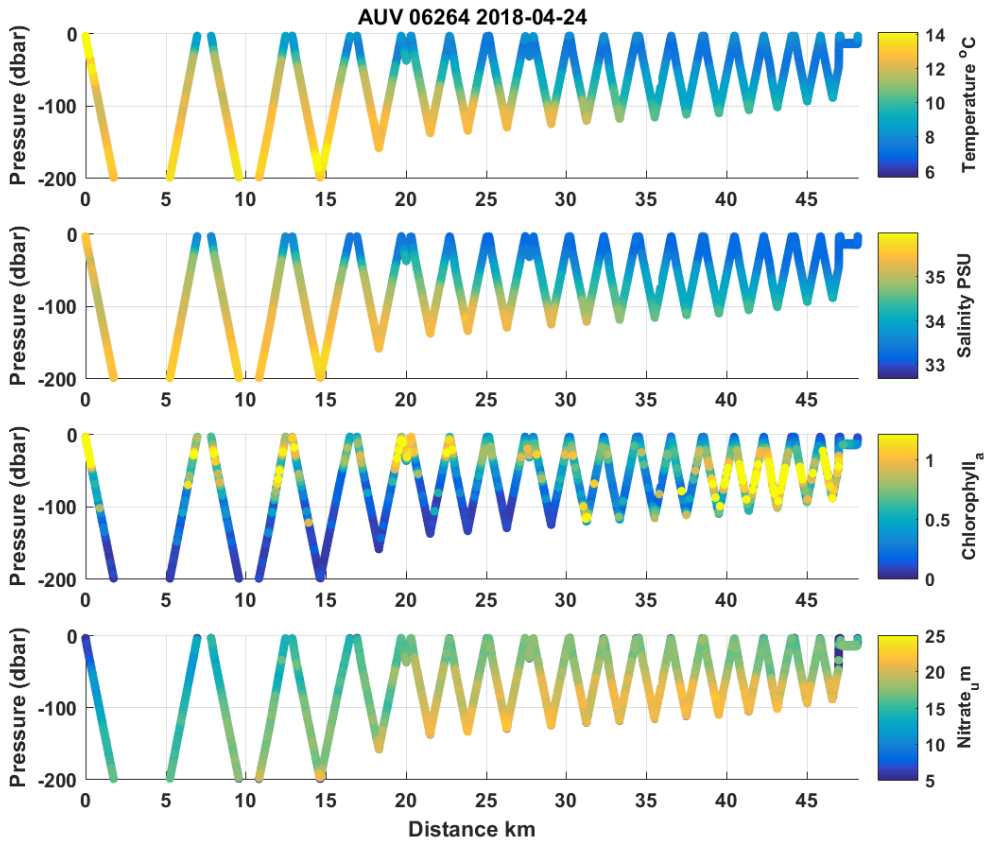
Shelfbreak Frontal Dynamics (SFD) Study

- Successfully completed 2 AUV lines in coordination with SFD
- Along-shelf line was shifted ~10 km south per recommendation of SFD PIs
- Weather precluded full missions
- AUVs operated from chartered boat – Warren Junior
- Field validation CTDs done from R/V Armstrong



Shelfbreak Frontal Dynamics (SFD) Study

- Data transfer to CI server was a partial success
  - Attempted to send full data set - too slow and too costly
  - Overall time from AUV recovery to data availability was ~5 hr
- The CGSN team was excited by the challenge, and the SFD PIs were pleased with the results



Issues for OOIFB

- See feedback to OOIFB from Lessons Learned Workshop