

Pioneer 9 Deployment

Installation Readiness Review
October 16, 2017

Cruise Dates: 22 October – 12 November, 2017



Pioneer 9 Deployment

Inshore

- CP03ISSM
- CP03ISPM

Upstream Inshore

- CP02PMUI

Central Inshore

- CP02PMCI

Central

- CP01CNM
- CP01CNPM

Central Offshore

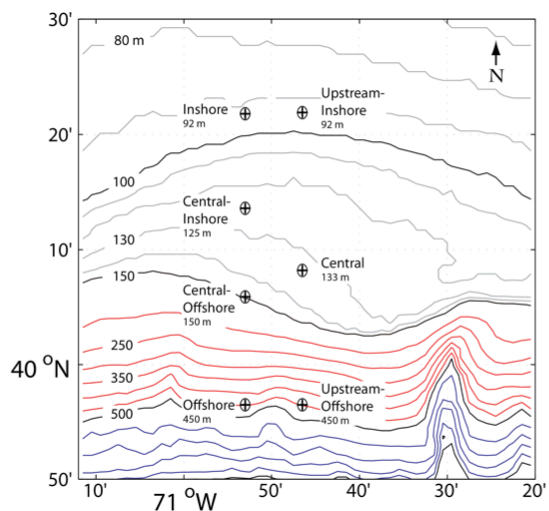
- CP02PMCO

Offshore

- CP04OSSM
- CP04OSPM

Upstream Offshore

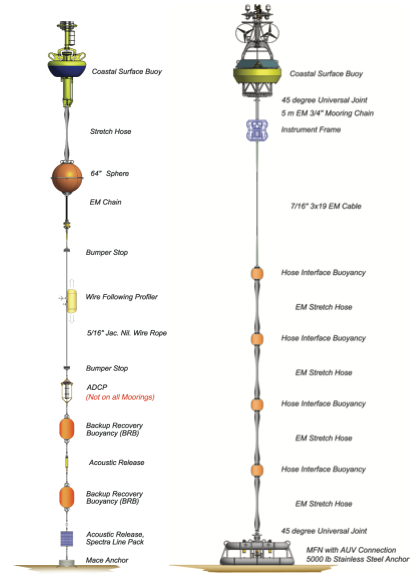
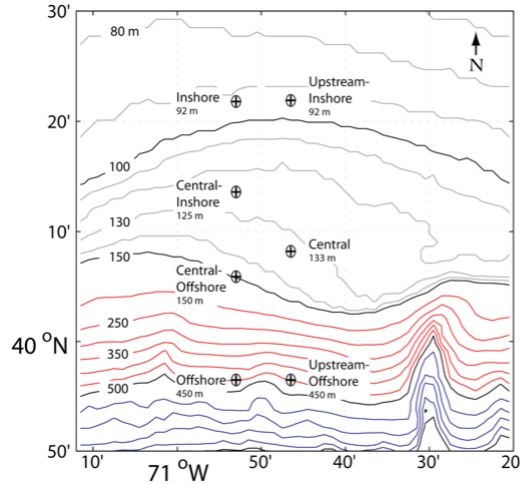
- CP02PMUO



Pioneer 9 IRR



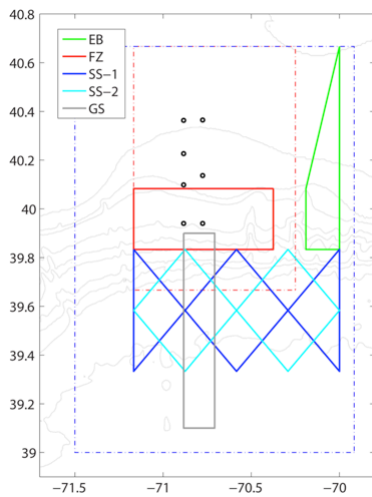
Coastal Mooring Diagram



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Pioneer Glider Lines



Name	Region	Buoyancy Engine	Pioneer-9	Glider
EB	Eastern Boundary	200 m	Planned deployment	339
FZ-1	Frontal Zone	1000 m	Planned deployment	376
SS-1	Slope Sea	1000 m	Planned deployment	387
SS-2	Slope Sea	1000 m	Planned deployment	388
FZ-2	Frontal Zone	1000 m	Planned deployment	380
GS	Gulf Stream	1000 m	Not planned	



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Variations from the Baseline

Moorings

- No OPTAA on Inshore and Offshore MFN
- CSPP Plan B Coastal Profiler Moorings deployed for the first time at Inshore and Central
- No ACOMMs deployed on Inshore and Central NSIFs (because no CSPPs)

Gliders/AUVs

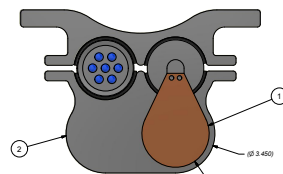
- Deploying 5 of 6 Coastal Gliders
- Only 1 of 2 AUVs being deployed



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Design Upgrades



Coastal Surface Moorings

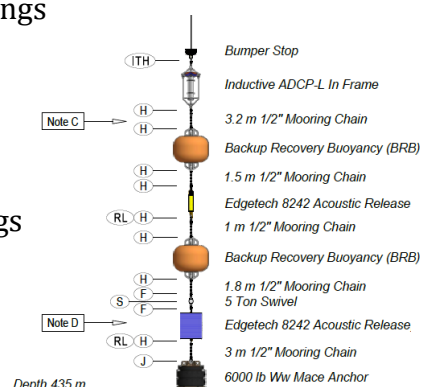
- New Stretch Hose design on Coastal Surface Moorings
- New OPTAA and SPKIR clamps
- Copper Guards on METBK-CT, CTDBP

Coastal Profiler Moorings

- New BRBs and ADCP added to CP04OSPM
- New crown anchors on all Coastal Profiler Moorings

Vehicles (AUV/Gliders)

- New AUV fast response CTD
- New AUV cart



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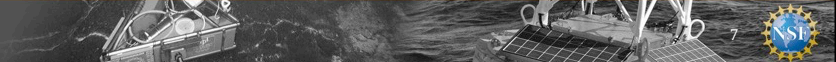
Cruise Objectives

Primary Objectives

- 01-3.* Recover 3 Coastal Surface Moorings/Anchors (ISSM, OSSM, CNSM)
- 04-8.* Recover 5 Coastal Profiler Moorings (PMUI, PMUO, PMCI, PMCO, OSPM)
- 09-11.* Recover 3 anchors from previous deployments (PMCO-6, PMCO-7, PMUO-4)
- 012-13.* Recover 2 Coastal Gliders - 1 deep (FZ-1) and 1 shallow (EB)
- 014-16.* Deploy 3 Coastal Surface Moorings (ISSM, OSSM, CNSM)
- 017-23.* Deploy 7 Coastal Profiler Moorings (PMUI, PMUO, PMCI, PMCO, OSPM, CNPM, ISPM)
- 024-25.* Deploy 5 gliders: 4 deep (FZ-1, FZ-2, SS-1, SS-2) and 1 shallow (EB)
- 026.* Conduct multiple AUV missions in vicinity of moored array
- 027.* Conduct CTD casts with water sampling at the deployment and recovery sites
- 028.* Conduct ship vs. buoy meteorological comparisons at each surface mooring site



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Cruise Objectives (continued)

Additional Objectives

- A1.* Carry out shipboard underway sampling in support of field calibration/validation
- A2.* Conduct CTD surveys (no bottle samples) in the vicinity of the moored array
- A3.* Conduct underway surveys (ADCP, EK-80) in the vicinity of the moored array.

Ancillary Activities

- 1. EK-80 Surveys, and shipboard Imaging FlowCytoBot during Leg 1
- 2. Plankton analysis of water samples during Leg 2
- 3. Conduct LTER CTDs during Legs and 3 transits to/from Pioneer Array.
- 4. DIC sensor added to the CTD rosette on Leg 3

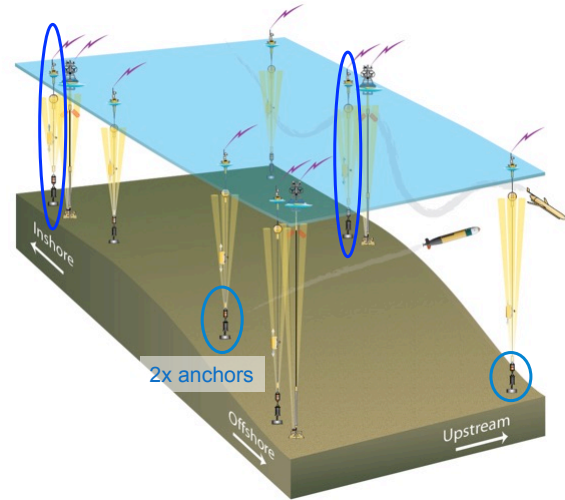


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Pioneer 9 Leg 1

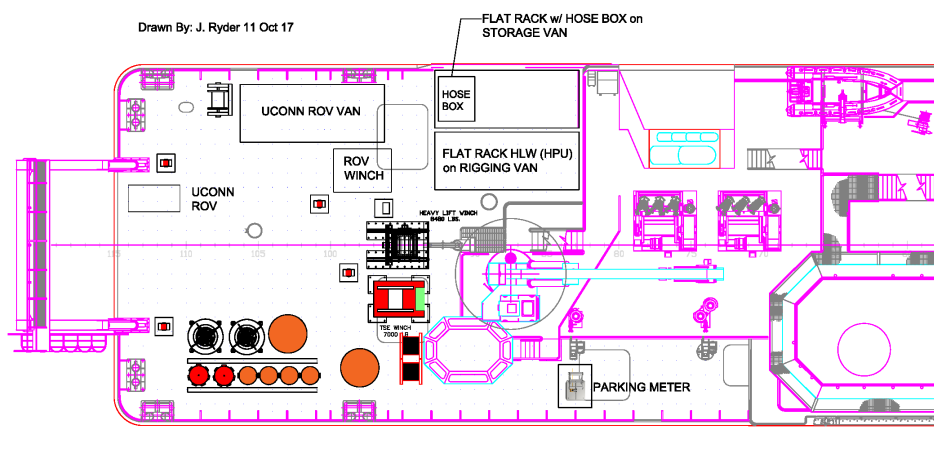
- Recover 3 Coastal Profiler Mooring Anchors:
 - CP02PMCO-00006
 - CP02PMCO-00007
 - CP02PMUO-00004
- Deploy 2 Coastal Profiler Moorings
 - CP01CNPM-00001
 - CP03ISPM-00001



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Pioneer 9 Leg 1 Deck Plan



Pioneer 9 IRR



Pioneer 9 Leg 1 Cruise Schedule

19-21 October

- In-port WHOI
- Staging and Loading for Leg 1

22 October

- Complete loading, depart WHOI (13:00)

23 October

- ROV test dive
- Recover [CP02PMUO-00004 anchor](#)

24 October

- Recover [CP02PMCO-00006 anchor](#)
- Recover [CP02PMCO-00007 anchor](#)

25 October

- Deploy [CP03ISPM-00001](#)
- CTD cast
- Deploy [CP01CNPM-00001](#)
- CTD cast

26 October

- Arrive WHOI (08:30), offload



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Pioneer 9 Leg 1 Science Party

Name	Nationality	Affiliation	Key Roles
Al Plueddemann	USA	WHOI/Chief Sci	Chief Scientist
Jim Ryder	USA	WHOI	Operations Lead
John Kemp	USA	WHOI	Operations Lead
Carmen Greto	USA	UNOLS	Deck Ops
Eric Hutt	USA	UNOLS	Deck Ops
Nico Llanos	USA	WHOI	Deck Ops
James Kuo	USA	WHOI	Subsurface Mooring Lead
Jennifer Batryn	USA	WHOI	Instrumentation, Mooring Assist.
David Wellwood	USA	WHOI	Hydrographic Sampling
Rebecca Travis	USA	WHOI	Documentation Lead
Eric Benway	USA	WHOI	Documentation
Lauren Kowalski	USA	UNOLS MATE	Documentation
McKee, Joy, Arbige	USA	UCONN	ROV Ops Team
Elizabeth Crockford	USA	WHOI	Guest
Gordon Zhang	USA	WHOI	Guest
Timothy Duda	USA	WHOI	Guest



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Pioneer 9 Leg 2

Turn Coastal Surface Moorings

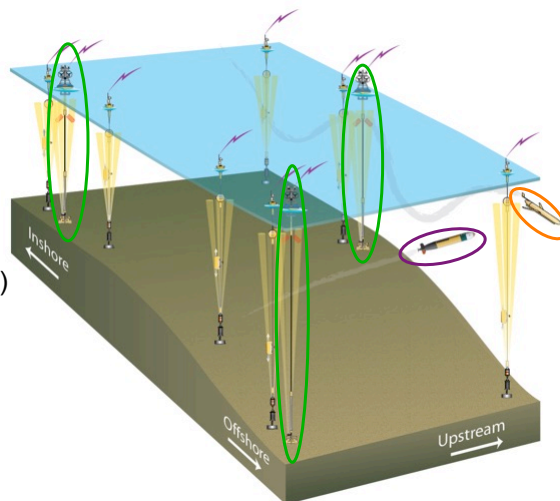
- CP04OSSM
- CP01CNSM
- CP03ISSM

Turn Coastal Gliders

- Deploy 4 deep Gliders 376,387,388,380 (FZ, SS)
- Deploy 1 shallow Glider 339 (EB)
- Recover 1 deep Glider (FZ)
- Recover 1 shallow Glider (EB)

AUV

- Expeditionary missions

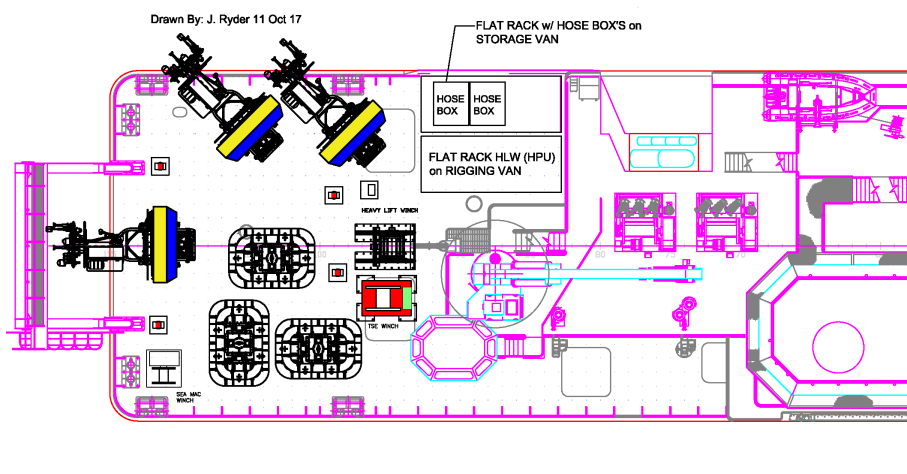


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Pioneer 9 Leg 2 Deck Plan



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Pioneer 9 Leg 2 Cruise Schedule

- 27 October
- In-port WHOI, loading for Leg 2
- 28 October
- Complete loading, depart WHOI
 - LTER CTDs during transit
 - Turn **EB Glider**
- 29 October
- Deploy **CP04OSSM-00007**
 - CTD cast
 - Deploy **FZ Gliders** (FZ-1, FZ-2)
 - CTD cast
- 30 October
- Deploy **CP01CNSM-00008**
 - CTD cast
 - Deploy **Shelf Gliders** (SS-1, SS-2)
 - CTD cast
- 31 October
- Deploy **CP03ISSM-00007**
 - CTD cast
 - Recover **CP03ISSM-00006**
 - Recover **FZ glider**
- 1 November
- Recover **CP04OSSM-00006**
 - Recover **CP01CNSM-00007**
 - **AUV Test Mission**
- 2 November
- Start dual **AUV survey**
 - Cross-shelf CTD survey
- 3 November
- Complete dual **AUV survey**
- 4 November
- Arrive WHOI (11:00)
 - Offload CSMs, load CPMs for Leg 3



Pioneer 9 IRR



Pioneer 9 Leg 2 Science Party

Name	Nationality	Affiliation	Key Roles
Al Plueddemann	USA	WHOI/Chief Sci	Chief Scientist
Alison MacDonald	USA	WHOI	Co-Chief Scientist
John Kemp	USA	WHOI	Operations Lead
Greto, Hutt	USA	UNOLS	Deck Ops
Chris Basque	USA	WHOI	Deck Ops
Jennifer Batryn	USA	WHOI	Instrumentation Lead
Neil McPhee	USA	WHOI	Instrumentation
Alex Franks	USA	WHOI	Surface Mooring Lead
Matt Palanza	USA	WHOI	Surface Mooring trainer
John Reine, Matt Latvis	USA	WHOI	Surface Mooring trainees
Jared Schwartz	USA	WHOI	AUVs
Diana Wickman	USA	WHOI	Gliders
Collin Dobson	USA	WHOI	Gliders
David Wellwood	USA	WHOI	Hydrographic Sampling
Rebecca Travis	USA	WHOI	Documentation Lead
Lauren Kowalski	USA	UNOLS MATE	Documentation
Kristen Hunter-Cevera	USA	WHOI	Guest



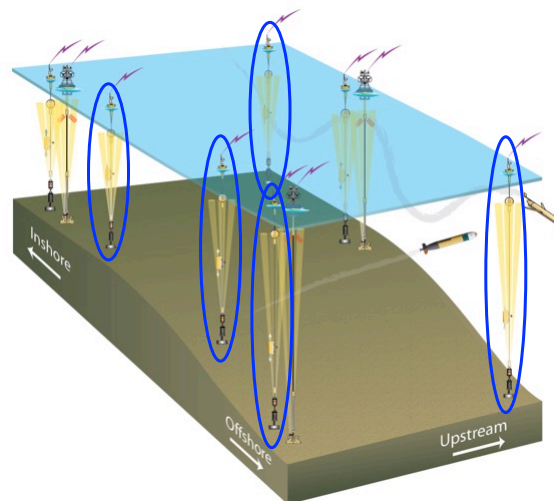
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Pioneer 9 Leg 3

Turn 5 Coastal Profiler Moorings

- CP02PMCO
- CP02PMCI
- CP02PMUO
- CP02PMUI
- CP04OSPM



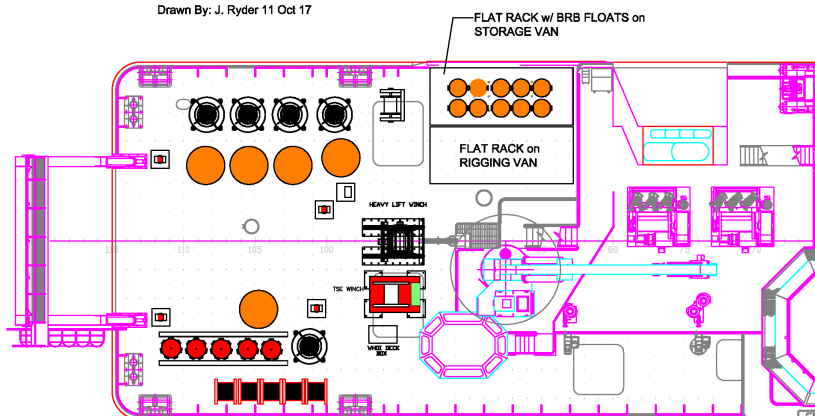
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Pioneer 9 Leg 3 Deck Plan

Drawn By: J. Ryder 11 Oct 17



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Pioneer 9 Leg 3 Cruise Schedule

5 November

- Complete loading
- Depart WHOI (10:30 or 15:30)
- LTER CTDs during transit

6 November

- Recover [CP04OSPM-00007](#)
- Deploy [CP04OSPM-00008](#)
- CTD casts (Wang samples)

7 November

- Recover [CP02PMUO-00009](#)
- Deploy [CP02PMUO-00010](#)
- CTD casts (Wang samples)

8 November

- Recover [CP02PMCO-00008](#)
- Deploy [CP02PMCO-00009](#)
- CTD casts (Wang samples)

9 November

- Recover [CP02PMCI-00008](#)
- Deploy [CP02PMCI-00009](#)
- CTD casts (Wang samples)

10 November

- Recover [CP02PMUI-00009](#)
- Deploy [CP02PMUI-00010](#)
- CTD casts

11 November

- Cross-shelf CTD survey
- Complete primary objectives as needed

12 November

- Arrive WHOI (10:00), offload



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Pioneer 9 Leg 3 Science Party

Name	Nationality	Affiliation	Key Roles
Al Plueddemann	USA	WHOI/Chief Sci	Chief Scientist
John Kemp	USA	WHOI	Operations Lead
Carmen Greto	USA	UNOLS	Deck Ops
Eric Hutt	USA	UNOLS	Deck Ops
Chris Ross	USA	WHOI	Deck Ops
John Lund	USA	WHOI	Subsurface Mooring Lead
Allen Smith	USA	WHOI	Instrumentation Lead
David Wellwood	USA	WHOI	Hydrographic Sampling
Rebecca Travis	USA	WHOI	Documentation Lead
Lauren Kowalski	USA	UNOLS MATE	Documentation
Mallory Ringham	USA	WHOI	Guest
Sarah Fuller	USA	WHOI	Guest



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OOI IRR Checklist

	Item	Ready
1	All instruments planned for the deployment are integrated onto the platforms or are ready to be integrated at sea	✓
2	All instruments have been tested successfully	✓
3	All platforms have been tested successfully	✓
4	Emergency process, procedures, and contacts are ready	✓
5	Safety training is complete	✓
6	Operations training is complete	✓
7	Cruise staffing is in place	✓
8	The associated shore facilities (OMCs and/or shore station) are ready	✓
9	System for sea-to-shore data communication is ready	✓
10	Data from all Instruments can be captured by CI. (If not, attach a document detailing the alternate plan.)	✓
11	All platforms can be commanded and controlled	✓
12	Initial mission plans are developed and documented for mobile assets	✓
13	Initial sampling strategies are developed and documented for all instruments to be deployed	✓
14	All permits, clearances, and authorizations are in place	✓
15	All PATONs are in place	✓
16	The property management system has been updated for those items that are covered by the Property Management Plan	✓

To be completed prior to deployments

To be posted following deployments

To be done following deployment



Pioneer 9 IRR



OOI IRR Checklist

OL IRR Checklist Item

#1 *All instruments planned for the deployment are integrated onto the platforms or are ready to be integrated at sea*

#3 *All platforms have been tested successfully*

#11 *All platforms can be commanded and controlled*

CGSN Evidence

- Moorings
 - Initial checklists for mooring integration
([Operations > Coastal Pioneer Cruises > Pioneer 9 Deployment Mooring folders in Vault](#); and to [\(CG EA\) Moorings in Alfresco](#))
- Coastal Gliders
 - Functional Checkout Test Results
([To be completed and posted to Vault and OOI > ARCHIVE > Test Documents > \(CG EA\) Gliders folder in Alfresco](#))



Pioneer 9 IRR



OOI IRR Checklist

OL IRR Checklist Item

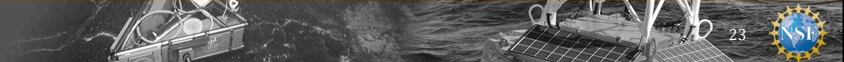
#2 All instruments have been tested successfully

CGSN Evidence

- Fixed Instruments
 - Quality Conformance Test Results
 - Pre-deployment Test Results - **OPTAA & NUTNR to be done after burn-in**
(OOI > ARCHIVE > Test Documents > (CG EA) Instruments folder in Alfresco)
- Wire Following Profiler
 - Quality Conformance Test Results - **To be posted**
(OOI > ARCHIVE > Test Documents > (CG EA) Profilers folder in Alfresco)



Pioneer 9 IRR



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OOI IRR Checklist

OL IRR Checklist Item

#4 Emergency process, procedures, and contacts are ready

CGSN Evidence

- OL Notification/Reporting Procedures
 - Equipment_Notification_Escalation_Process_OOI_09_20_12_Rev -1.2.doc
 - Incident_Reporting_Process_OOI_2012_09_21_ver_1-1.doc
(OOI > REFERENCE > Process Library > Environmental, Health, and Safety folder in Alfresco)
- Emergency Contact Lists
(Operations > Coastal Pioneer Cruises > Pioneer_Operations folder in Vault)
- DISA Card Procedure (3312-10000)
(OOI > CONTROLLED > 3000 Coastal Global folder in Alfresco)
- Surface Mooring Recovery Procedure (3350-00001)



Pioneer 9 IRR



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OOI IRR Checklist

OL IRR Checklist Item

#5 Safety Training is complete

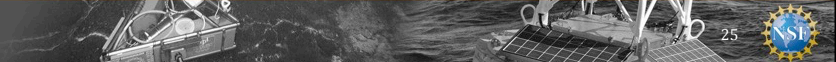
#6 Operations training is complete

CGSN Evidence

- Cruise participants up-to-date on WHOI EH&S training
([Project_Files > Operations > 04-Deployments > Deployments Notebook > Cruise Staffing](#) in Vault)
- UNOLS safety procedures, hydrogen safety procedures will be covered on the cruise
(Initial safety meeting, Research Vessel Safety Standards and RVOC Safety Training manual available on-board and on-line)
- Glider piloting training (at TWR) complete
([Project_Files > Documentation > Program > Program Notebook > Training > CGSN_Training_Record.xls](#) in Vault)
- AUV piloting training (at Hydroid and with OSL) complete



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OOI IRR Checklist

OL IRR Checklist Item

#8 The associated shore facilities (OMCs and/or shore station) are ready

#9 System for sea-to-shore data communication is ready

#10 Data from all Instruments can be captured by CI

CGSN Evidence

- OMC is online and functional and receiving data from deployed platforms at Pioneer and all Global Arrays
- Burn-in data is being received by the OMC
- All data is on the Data Server and accessible by CI



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OMC Platform Status



OMC Glider Fleet Status



OOI IRR Checklist

OL IRR Checklist Item

#12 Initial mission plans are developed and documented for mobile assets

#13 Initial sampling strategies are developed and documented for all instruments to be deployed

CGSN Evidence

- 1102-00200 OOI Sampling Strategy Document
(Released to *Alfresco*)
- Mooring Configuration Spreadsheets
(*Pioneer 9 Deployment* folder in Vault & *Alfresco*) - Finalized post-deployment
- Mission Files for Profilers and Gliders
(*Pioneer 9 Deployment/Mission Files* folder in Vault) - To be posted



Pioneer 9 IRR



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OOI IRR Checklist

OL IRR Checklist Item

#7 Cruise staffing is in place

#14 All permits, clearances, and authorizations are in place

#15 All PATONs are in place

CGSN Evidence

- Cruise Plan indicates cruise participants
(3204-00801 Coastal Pioneer 9 Deployment Cruise Plan in Vault; will be released to *Alfresco* prior to ship departure)
- Permits and PATON in place
(UACE Permit NAE-2010-1283; *Program Notebook* > *Field Ops* > *Pioneer Permit* folder in Vault)
(PATON - <http://www.usharbormaster.com>)
- Navy Fleet Surface and Subsurface checked
- USCG notified
- Boatracs notified (fishing fleet)



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OOI IRR Checklist

OL IRR Checklist Item

#16 *The property management system has been updated for those items that are covered by the Property Management Plan*

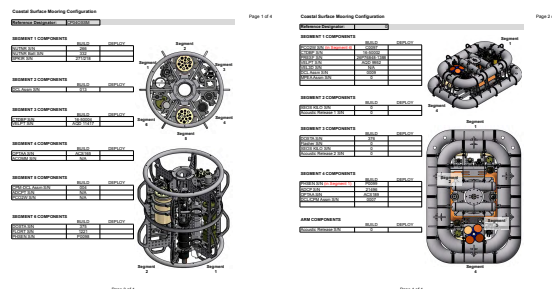
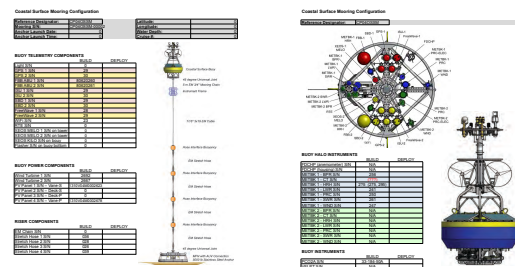
CGSN Evidence

- Configuration Spreadsheets for Asset Tracking and Property Management are drafted
 - Will be completed during the deployment and submitted to the WHOI Property Office ([Pioneer 9 Deployment folders in Vault](#))
- As-Built TDP index drafts posted to Alfresco
 - Indices will be completed and all documents posted Alfresco ([OOI > Technical Data Package \(TDP\) Repository > As-Built > Array folders in Alfresco](#))



OOI IRR Checklist

- Mooring Configurations
 - Captured in spreadsheets for deployment check-offs and Asset Tracking
- As-Built TDP items
 - Deck Drawings
 - Drawing Trees
 - Assembly Drawings
 - Design Drawings
 - BOMs

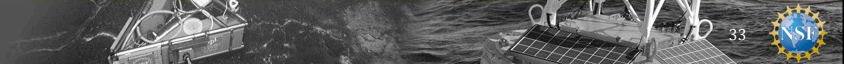


OOI IRR Checklist

- Calibration Info Spreadsheets to CI
 - Instrument calibration information provided to CI prior to deployment of platforms
 - Updated spreadsheets will be provided after the cruise (w/ deployment times/locations/etc.)



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Questions?



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