**AR34: Dr. Al Plueddemann "OOI Pioneer 12" R/V Neil Armstrong**

Precruise Meeting: Monday 25 February 2019, 1300 EST

3rd Floor Smith Conference Room

Call in: 508.289.3192 ext. 203777

**General Information**

**Mission Objectives**

This is the twelfth major infrastructure deployment and servicing cruise for the Pioneer Array of the National Science Foundation’s Ocean Observatories Initiative (OOI). The Pioneer Array includes a network of moorings and autonomous robotic vehicles to monitor waters of the continental shelf and slope south of New England and, in particular, the shelfbreak front where nutrients and other properties are exchanged between the coast and the deep ocean. Data from the Pioneer Array will provide new insights into coastal ocean processes such as shelf/slope nutrient exchange, air-sea property exchange, carbon cycling, and ocean acidification that are important to the New England shelf, and to continental shelf ecosystems around the world. For further information, see http://www.oceanobservatories.org.

**Science Activities**

The Pioneer-12 cruise will consist of 2 legs with distinct objectives. The main objectives of Leg A are to deploy and recover 3 Coastal Surface Moorings (CSMs), deploy and recover multiple gliders, and deploy 2 AUVs (singly or simultaneously) for ship-attended missions. If time and conditions permit, Leg A will include test deployments of a small ROV (Saab Seaeye Falcon). The main objectives of Leg B are to deploy 5 CPMs and recover 7 CPMs. In addition, Leg B will use the Falcon ROV to recover 1 CSM anchor and 1 CPM anchor and line pack. Both legs will involve ancillary activities, including CTD casts with water sampling adjacent to moorings, gliders and AUVs, comparison of buoy and shipboard data, cross-shelf CTD surveys in the vicinity of the moored array, and surveys using shipboard sensors (ADCP, EK-80, thermosalinograph, multibeam) in the Pioneer moored array region.

Combined 1st leg with gliders and AUV missions; leg 1 is “ recon mission” - will test out ROV systems as able to prepare for leg 2 when it is more fully needed; ROV will be aboard the entire cruise; Same make and model as used last fall (ROV)

2nd leg – 7 recoveries (try for 1 on the first leg b/c deck space limitations)

5 in / 7 out

ROV ops – owned by OOI

Overboarding scheme will be slightly different – don’t plan on anchor recoveries – will be bringing their own pilots – 2nd leg a professional pilot will be hired to recover the 2 anchors left behind – possible to be doing something with the MFN that parted if needed; a lot will come to the integration of nav and USBL tracking for ROV systems for the computers/handling system; require an over the side pole but goal is to integrate the nav system directly to the ships hull transponders; not sonardyne system; get Robbie the specs for the USBL/ROV/integration meeting; potential to have the USBL – Dee gave Robbie the manual for the ROV

**Meet on March 4, Monday 0840 – on the ship in the lab – John, Dee, Al, Derek, Robbie, David, Rob Maurice (ROV pilot)– to discuss USBL and ROV systems**

**Chief Scientist and PIs**

Al Plueddemann: Chief ScientistWoods Hole Oceanographic Institution

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Derek Buffitt: Principal Investigator

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**Financial responsibility:** Please supply a WHOI Project Number for mobilization costs. You will be alerted to any charges prior to them being applied to your project number.

**Science Party**

22 Max – probably 16 total – ask if Rebecca can go to experience the Ship Board Communication

# of OOI Personnel –

# of Ancillary Science Personnel –

Participant list & [berthing diagram](http://www.whoi.edu/fileserver.do?id=241344&pt=2&p=247129) needed

Personnel Forms due to Dan Meiggs (dmeiggs@whoi.edu ) 1 month before departure

Everyone should send new personnel forms

Highlight any food allergies/restrictions as soon as possible

**Ship’s Personnel**

Captain: Kent Sheasley Chief Mate: Logan Johnson Bosun: Pete Liarkos Chief Eng.: Gary McGrath

SSSG: Cris Seaton & Amy Simoneau

*Note:* WHOI SSSG techs do not stand watches, but are available 24/7 to provide support for integrating science party equipment with ship systems, and aiding science party in the use of ship-based instrumentation to meet project objectives. If specialized/dedicated techs are required to run operations or equipment, they must be added to your science party. SSSG techs are not part of the science party.

**Voyage Info:**

Ship transit speed: Max 10 kts. (10kts in inclement weather)

Operation Area: OOI Pioneer Array

Lat/Lon: 40° 0.0′ N / 71° 0.0′ W Depth Range: 60 / 600

Waypoint Spreadsheet: Pioneer12\_waypoints.xls

All arrivals and departures are at WHOI

18 March put the ROV on the ship to work on the integration of the system with the ship, dockside

26 March – ship underway for ½ day sea trial (TBD ETD/ETA)

*AR34-A Schedule AR34-B Schedule*

*CSM + AUV + glider ROV + CPM*

Load: 2 April 2019 Load: 13 April

Dep: 4 April Dep: 14 April

Arr: 12 April Arr: 24 April

Take off the SOO-LARS during turnover Demob: 25 April

\*25 April, Dan Fornari’s team may be aboard to install a gravimeter for a later Armstrong cruise. His team should not be in your way

**Schedule Notes**

Science Personnel can move into their rooms night of 3 April

Local team members will join morning of departure, 4 April

Will there be extensive personnel changes between legs?

Demob/Mob days between legs will be fluid

**Scientific Support**

*\*Please highlight mission critical sensors*

**Shipboard Equipment**

12 kHz Pinger for Wire Use – only in the unlikely event of dragging

A-Frame
ADCP 38 kHz – often this has been requested to be off to not interfere with other coms

ADCP 150 kHz
ADCP 300 kHz

Bathymetry System 12 kHz

Crane
Dynamic Positioning System

Deionized Water System

EK80 Sonar – used intermittently, a few hrs to overnight, off for the majority (20% of the time)

EM710 MkII (40 to 100 kHz) Multibeam Echosounder

Fume Hood
K-Synch System – have used in the past but not this time?
Science Underway Seawater System – any additional instruments to be incorporated? IFCBs etc? LTER sensors similar to what has been done in the past – technically on the 2nd leg, but will be set up for the entire cruise

USBL Nav – for ROV use

WAMOS

New ship’s Flourometer underway system – taking up some lab space

*Items NOT selected as needed:*

Magnetometers

Gravimeters

Bathymetry System 3.5 kHz

EM122

XBTs

Incubation area

**CTD/Water Sampling**

911+ Rosette 24-position, 10-liter bottle Rosette with dual T/C sensors

Biospherical underwater PAR (1000m depth limit) with reference Surface PAR

SBE43 oxygen sensor
Wet Labs C\*Star transmissometer (660nm wavelength)
Wet Labs FLNTURTD Combination Flourometer and Turbidity Sensor

Any additional instruments to be added? Need to involve Marshall if yes

Desire to attach a SUNA nitrate sensor (NO CPICS – SUNA instead) – working with Taylor Crockford and LTER – want to put the SUNA on the rosette to compare nitrate sensor to bottle analysis

Need a mounting bracket and cable – Taylor is working on it (also being used on the Brown)

Y-cable – 2 pin leg to provided battery pack (power source) single analog connection with ISIS, 1 second update rate; SUNA signal should be part of the CTD data stream – will need interpretation of the voltage readout

Battery – sealed alkaline (lithium has been discouraged & pressure cert needs) – Taylor is the person to ask;

Bracket holds (Chris lumping) will be at 16” elevation at ring and will hold battery and SUNA – don’t have a final sketch (this is all on leg 2 for LTER, but Leg 1 OOI has their own SUNA that will want to use the same bracket – Marshall will help sort this out with Al directly – Peter Brickley is the OOI contact; OOI has put them on the AUV and “have difficult to interpret results” hence why they need to be on the rosette)

**Hydrographic Analysis Equipment –** Dave Wellwood point person? yes

Salinometer
Salt Bottles (2 cases of 125 ml provided)

On both legs

**MET Sensors**

Air temperature

Barometric Pressure

Precipitation
Relative Humidity
Short Wave Solar Radiation

Long Wave Solar Radiation

Wind speed and direction

Any additional sensors to be added? None

**Shipboard Communication**

Basic Internet access via HiSeasNet

**Monitoring of mooring function by connecting to shore-side servers has been found to require more than the normal captive portal data allocation.** This was a limiting function last time – to get highest degree of confidence and see how its working – need all day VPN access, doesn’t work within the constraints of the captive portal – could bump up the rate, but that would be a cost if it’s the FX system (need 7 days notice – as suggested by Pam) – put Al in direct contact with Laura about how to increase the comms – include Al, Laura, Robbie, Pam, al will include the others needed; need to decide how we want to implement

**Navigation**

GPS

USBL & Nav feeds needed for ROV ops – will be discussed in March 4 meeting
Serial GPS feed for Chief Sci laptop navigation application.

**Sample Storage**

Freezer -70°C 25 cu. ft. ea.

Main Lab walk-in Refrigerator needed at room temperature for storage space

Walk-in Refrigerator @ 4’C for post recovery calibration of nutrient sensors?

Freezer for chl-a & nutrient samples?

**Winches, Wire, & Deck Equipment**

Trawl Winch with 9/16th (possible dragging operations & ROV use & lower MFN – big anchor; what is the load limit? 13k is what they have been using before – Follow up with Eric & Mike)

CTD Winch with 3/8th hydrowire on SSHD (

TSE reserved from Winch Pool

* For mooring deployment/recovery

Lantec Heavy Lift Winch brought by science party

* For anchor deployment/recovery

ROV group will supply ROV winch – unsure as of now

AUV handling equipment (SOO-LARS) to be installed on starboard aft arm for Leg 1.

No sliprings required

Mooring deployment/recovery equipment

* Winches, tuggers, cleats
* plan attached to synopsis

**Vans** -

Rigging Van – port side main deck (will need power)

Storage Van – port side main deck

Flat Rack #1 – above Rigging Van w/ heavy lift winch power pack

Flat Rack #2 – above Storage Van

Will there be an ROV van? No ROV Van; fairly compact system for the ROV; winch will want to be set up in the hangar faces aft; ROV operator will be in the aft of the main lab (same place where the AUV operators set up)

Overboard through the A-frame – use trawl wire

DECK PLAN PROVIDED – 2/25, can’t see the ROV winch in the hangar in the layouts

**Power Requirements:**

Electrical Power for TSE, Rigging Van: 440V 60A 3ph

Electrical Power for Lantec: 480V 160A

Power for ROV winch? - TBD

OOI team will bring with own cables for power

**Hazardous Material**

Hazmats list for CTD and batteries are linked in synopsis

Make sure to bring own spill kits

Be prepared to remove all Hazard Waste and unused chems during demob

Bring 1 printed copied of all MSDS sheets for binders. Electronic copies are linked in the synopsis.

**Other Special Requirements**

Small Boat Operations in Rescue Boat if needed

 Work Boat needed to be removed from deck to accommodate vans? – has to stay ashore for OOI

Night time work

 Sonardyne USBL navigation

Buoy Recovery Procedure with MSDS is linked in synopsis

**Requirements for ancillary science objectives?**

**Safety**

**Deck Safety**

Closed toe/heel shoes must be worn at all times on deck, and in labs/common areas.

Steel toe shoes required for movement of heavy equipment.

Open toe/heel only allowed in personal cabins.

Launch & Recovery: Safety Shoes, hard hats and vests must be worn; safety plan required

On the dock or at sea: hard hats for overhead lifts, fall protection for working on top of vans or for attaching gear on railings or towers.

We will have some hard hats, but bring one if you have one.

**Lab Safety – PPE**

Science party is responsible for laboratory PPE including lab goggles, coat, gloves, storage containment and cleanup kits for working with all hazardous materials brought onboard the vessel.

Battery & CTD Hazmat lists with MSDS are linked on synopsis

**Shipping & Loading Logistics**

For shipments to arrive at WHOI pre cruise, address shipments with the following:

*Master R/V Armstrong: [Cruise Voyage # : PI name listed here]*

*c/o Sarah Fuller*

*Woods Hole Oceanographic Institution*

*266 Woods Hole Rd*

*Woods Hole, MA 02543*

Please share manifests, shipment ETA and tracking information with Sarah at sfuller@whoi.edu.

All received shipments will be stored in the WHOI warehouse until your mobilization starts. If it needs to be kept in special conditions you are responsible for communicating your needs to Sarah. WHOI can not guarantee long term storage of sensitive materials precruise.

**Post Cruise Responsibilities**

**Actions departing ship**

All scientists are responsible for cleaning their cabins & heads.

Remove all scientific samples, chemicals, waste, gases, and cylinders, unless specific permission has been given to leave them aboard. If items are left aboard, plan on sending a representative from your group to remove these items from the ship at the designated time & port. WHOI is not responsible for items left aboard outside of your designated cruise time.

Any materials staying aboard must be *redundantly* labelled with owner’s name, contact information, and cruise Id.

**UNOLS cruise evaluation**

To be completed by both Chief Scientist & Master[**Post Cruise Report Link**](http://strs.unols.org/Public/diu_pre_pcar.aspx)

**Reports to foreign government/State Department:** required for work in EEZs; send to Kerry Strom, kstrom@whoi.edu

**Reports to R2R:** <https://www.unols.org/document/cruise-personnel-manifest>

Chief Scientist should fill this out and send to dropbox@rvdata.us at some point during the cruise

**Data delivery [shipboard]:** USB Hard drive

**Data archiving policy**

All data on a WHOI Cruise Data Distribution (which includes all underway data) will, by default be considered publicly available once a copy of it has been delivered to the chief scientist at the end of the cruise. Please review the [Cruise Assignment of Data Access Protection](http://www.sssg.whoi.edu/sssg/pdf/cruiseData_v3.pdf)

As of January 1, 2011, the default treatment for underway data from Woods Hole Oceanographic Institution (WHOI) research vessels is:

1. Cruise data files are copied by a WHOI SSSG Technician to the distribution media. One copy is delivered to the cruise Chief Scientist, the other is delivered to WHOI's Data Library and Archives. Please note that the distribution of cruise data to other scientist is the responsibility of the Chief Scientist.
2. The **default** access status for the cruise instrument datasets is that they will be immediately accessible by the public. If something other than this default protection is desired, the Chief Scientist must assign alternate protection as indicated below. For cruises funded by the National Science Foundation, the maximum protection is two years, for non-NFS cruises, other guidelines may apply.
3. WHOI maintains a local copy of the cruise shipboard data distribution at its Data Library and Archives, which also honors access moratorium periods. If the cruise Chief Scientist wishes to modify the data protection assignments made in this pre-cruise document upon cruise completion, they should contact the
4. WHOI Data Library and Archives at dla@whoi.edu, or the SSSG Data Manager at sssg@whoi.edu