# Science Verification Cruise VI on R/V Neil Armstrong

Tuesday April 21th at 10:00 AM @ Smith Conference Room

Agenda Items

**Mission Objectives:**

The overall objective of this inter-disciplinary cruise is to collect acoustic, biological, and physical data in order to examine bio-physical interactions near the Pioneer Array and adjacent survey locations at the New England shelf break and slope. Specifically we propose to address the following objectives: - Characterize the abundance, distribution, and vertical movements of zooplankton and micronekton relative to physical processes (especially the shelf-slope front and internal waves), with particular focus on krill, meso-pelagic fish, and ichthoplankton (i.e., larval fish). If the opportunity presents itself, the biophysical effects of a warm-core ring and/or highfrequency solitary internal waves will also be examined. - Resolve sub-tidal flow and variability in the position of the shelf-slope front and jet. - Concurrently collect samples with multiple types of net systems and acoustic instruments to cross-compare these sampling methods and ground-truth Pioneer Array echosounders. - As feasible, incidentally assess the utility of acoustics for surveying methane seeps

**The R/V Neil Armstrong is a new vessel, and it’s capabilities for science have not been fully tested. The primary objective of this cruise is to test and evaluate the ship. While WHOI wants to see all participants gain usable data and/or samples from our Science Verification Cruises, science personnel must understand that the ship and her systems may not function as intended.**

## Science Activities

The study region spans a large range of depths and thus presents a useful and challenging test of the Armstrong's sampling capabilities. Surveys will be conducted along a series of cross-isobath transects during which a variety of the vessel's acoustic instruments will be employed, including the Simrad EK80, ADCPs, EM122 and EM702 multi-beams, and Knudsen. This will provide an assessment of the ability to operate these simultaneously while maintaining sufficient data quality and without interference. Underway data on carbonate chemistry will also be collected using science party-supplied systems and the vessel's seawater supply.

Surveys will be punctuated by over-the-side operations at stations along these transects, operating over the full 24-hr day, and providing an assessment of deployment capabilities. This will include 1-m2 and 10-m2 mouth opening MOCNESS nets and a single-warp midwater fish trawl. Hydrographic casts and water sample collection will also be conducted with a CTD rosette package with VPR attached and potentially an LADCP.

**Agenda Items:**

1. Chief Scientist:

Gareth Lawson: Chief Scientist

Woods Hole Oceanographic Institution

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1. Identify operating area:

OOI Pioneer Array and surrounding waters

Depth Range 80m/3000m

1. Voyage Info:
	1. **NUMBER**: AR05
	2. **MOB**: 15 June 2016
	3. **DEPARTURE**:17 June 2016 from Woods Hole, MA
	4. **ARRIVA**L: 23 June 2016 at Woods Hole, MA
	5. **DEMOB END**: 25 June 2016
2. Schedule Notes:
* Science Personnel can move into their rooms June 16th
1. Science party (size) : XX 22 Max

**Pre-cruise and Administrative:**

1. Financial responsibility: Purchase order: to be set up with WHOI

1. Personnel forms: Due: **May 17th** to kgrodzki@whoi.edu
2. Berthing Plan: Complete and remit to csmith@whoi.edu
3. Any Special Food Requirements? (Kosher, Allergy, Vegetarian, etc)

**Instrumentation & Technician Support**  ***:***

1. **General Duties of Marine Technician :**

SSSG Technicians (WHOI SSSG) x2, Individuals TBD

WHOI sssg techs do not stand watches. But are available 24/7 to train and to assist in operations.

1. **WHOI general use equipment required for cruise** **:**

**Shipboard Equipment**

**Cargo Handling Equipment**

* A-Frame
* Crane

**Acoustics**

* ADCP 150 kHz
* ADCP 300 kHz
* ADCP 38 kHz
* Bathymetry System 12 kHz
* Bathymetry System 3.5 kHz
* EM122 Multibeam Echosounder
* EM710 Multibeam Echosounder
* EK80 Sonar
* K-Synch Transducer
* Multibeam

**Shipboard Communication**

* Basic Internet access via HiSeasNet
* Computer Network

**Water Sampling & CTD**

* 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
* Deionized Water System
* Science Underway Seawater System
* SBE43 oxygen sensor
* Wet Labs C\*Star transmissometer (660nm wavelength)
* Wet Labs ECO-AFL fluorometer
* Seapoint STM turbidity sensor
* Lowered Acoustic Doppler Current Profiler (LADCP)
* Sippican XBT System (Mark 21)
* XBT

**MET / Wx Equipment**

* Air temperature
* Barometric Pressure
* Precipitation
* Relative Humidity
* Short Wave Solar Radiation
* Wind speed and direction

**Ship’s Equipment**

* DP System
* Fume Hood
* Printers/Plotters
* GPS Position

**Sample Storage**

* Chest Freezer (Household type) 0°F
* Freezer -70°C 3.2 cu. ft. ea.

**Winches**

* CTD Winch with .322" Electro-mechanical wire
* Trawl Winch with .681 fiber optic

**Winch Notes**: We plan on using the following instruments for over the

side work:

**1. CTD** with minimally a 24-bottle rosette and ideally 36-bottle, with Video Plankton Recorder attached via a science party-supplied substand. Maximum depths sampled will be 1000m with VPR attached and 3000m without VPR. VPR adds ca. 85 lbs in water and 110 lbs in air. Ideally we would also like to attach the SSSG LADCP to the CTD package. Will be deployed with the CTD winch.

2. **1-m2 MOCNESS** net system. Ideally this would be deployed over the side using the oceanographic winch with 0.322 wire but we understand that towing instruments over the side is presently not feasible. We therefore would plan to deploy over the stern using the trawl winch with 0.680 EM wire -- note that we selected the 0.681 fiber optic option above but only because the regular 0.680 EM wire wasn't given as an option. We will also need slip rings.

3. **10-m2 MOCNESS** net deployed over the stern with the trawl winch with 0.680 EM wire. This is a large net system and we would like to discuss options and needs in terms of deploying/recovering and storing it.

4. Non-rigid mouth-opening 36-m2 midwater trawl. This is a large trawl (although small by fisheries standards) involving two doors. Although it is most often deployed using two warps it is designed to be deployed alternately using a single warp, which we would like to test here using the trawl winch with 0.680 EM wire.

**Ship** ***[Other Requirements][Shipboard Equipment/Nav] :***

1. Science/Ship Operations ***:***
	1. Instrument Deployment / Recovery Procedures: Over boarding Equipment (ISM) for MOCNESS and Mid Water Trawl
	2. Vans: ?
	3. Night Operations: Yes
2. Deck Safety – Safety Shoes
3. Lab Safety – PPE
4. Hazardous Material**:** Yes
* Flammable?
* Radiological?
* Other?

\*Complete Radiological authorization with WHOI Safety Department

Please Submit MSDS electronically to csmith@whoi.edu and provide 3 hard copies of each MSDS to the R/V Neil Armstrong’s Chief Mate.

1. Policies: (speed, departure/arrival times, moving aboard, etc.)

11kts

1. Communication (voice, fax, e-mail, Blog)

## Logistics *[Notes]*

1. Shipping gear to and from vessel

Load list

* 1. No Customs
	2. Berthing plan:
		1. bunks available for the science party
	3. Use of ship’s agent or local facilities

Shipping Address:

Master R/V Neil Armstrong
Attn: Gareth Lawson
Woods Hole Oceanographic Institution

266 Woods Hole Rd

Woods Hole, MA

02543

**Ship’s Agent:**

Chad Smith

Cell: 617-999-4163

Office: 508-289-3811

csmith@whoi.edu

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**Post-Cruise**:

1. Actions departing ship (Clean rooms, remove items from the ship)
2. UNOLS cruise evaluation [Chief Scientist & Master]
3. Reports to foreign government/State Department [required for work in EEZs]
4. Data delivery [shipboard] USB Hard drive.
5. 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

WHOI Data Library and Archives at dla@whoi.edu, or the SSSG Data Manager at

sssgdatamgr@whoi.edu