



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
NEW ENGLAND DISTRICT, CORPS OF ENGINEERS
696 VIRGINIA ROAD
CONCORD, MASSACHUSETTS 01742-2751

June 27, 2013

Regulatory Division
CENAE-R-PEA
File Number: NAE-2010-1283

Monique Foxx
Assistant Director, Contracts and Grants
The Consortium for Ocean Leadership
1201 New York Avenue NW, Suite 400
Washington, DC 20005

Dear Ms. Foxx:

We have reviewed your application to place fixed structures on the outer continental shelf beyond the Massachusetts three mile limit in order to construct the Pioneer Array Project under the Ocean Observatories Initiative. The Pioneer Array will consist of two lines of recoverable moorings running north-south across the Outer Continental Shelf (OCS) south of Martha's Vineyard. Ten moorings will be deployed at seven sites; three sites contain mooring pairs. The Array will utilize three different mooring types supporting sea surface, water column, and seafloor instruments. Satellite telemetry and other wireless technologies will transmit data to shore. The Pioneer Array will extend 25 nautical miles across the OCS in the Atlantic Ocean. The distance from Martha's Vineyard, Massachusetts, to the northern mooring line will be 55 nautical miles. The central mooring of the Pioneer Array will be located at 40°8.2' N, 70°46.5' W at a water depth of 133 meters. The work is shown on the attached plans entitled, "Install Pioneer Array Moorings," on 12 sheets, and dated, October, 2012.

Based on the information you have provided, we have determined that the proposed activity, will have only minimal individual or cumulative environmental impacts on waters of the United States, including wetlands. Therefore, this work is authorized as a Category 2 activity under the attached Federal permit known as the Massachusetts General Permit (GP). This work must be performed in accordance with the terms and conditions of the GP and also in compliance with the following special condition:

1. In cooperation with the United States Coast Guard, First District, the permittee shall develop a final Navigation Safety Plan for the proposed array deployment and operations. The final plan, approved by the Coast Guard and designed to reduce potential risks to maritime safety, security, and Coast Guard missions, must be submitted to the Corps and the Coast Guard for written approval at least two (2) weeks prior to deployment. The Navigation Safety Plan shall be marked

with the words "Permit No. NAE-2010-1283" and shall be submitted to Kevin Kotelly, Regulatory Division, Corps of Engineers, New England District, 696 Virginia Road, Concord, MA 01742-2751; kevin.r.kotelly@usace.army.mil and John Mauro, First Coast Guard District, 408 Atlantic Avenue, Boston, MA, 02110; John.J.Mauro@uscg.mil. Documents which are not marked and addressed in this manner may not reach their intended destination and do not comply with the requirements of this permit.

2. All construction shall be completed in accordance with the enclosed plans entitled, "Install Pioneer Array Moorings," on 12 sheets, and dated, October, 2012. If you change the plans or construction methods for the work associated with this project, please contact us immediately to discuss modification of this permit. The Corps must approve any changes before you undertake them.

The National Marine Fisheries Service has not provided conservation recommendations regarding the effects of your project on Essential Fish Habitat (EFH) as designated under the Magnuson-Stevens Fishery Conservation and Management Act.

You are responsible for complying with all of the GP's requirements. Please review the attached GP carefully, in particular the GP conditions beginning on Page 6, to familiarize yourself with its contents. You should ensure that whoever does the work fully understands the requirements and that a copy of the permit document and this authorization letter are at the project site throughout the time the work is underway.

This GP expires on January 20, 2015. Activities authorized under this GP that have commenced (i.e., are under construction) or are under contract to commence before this GP expires will have until January 21, 2016 to complete the activity under the terms and general conditions of the current GP. For work within Corps jurisdiction that is not completed by January 21, 2016, you will need to reference any reissued GP to see if your project is still authorized under Category 1 (no application required), or Category 2 (application required). If it is no longer authorized you must submit an application and receive written authorization before you can continue work within our jurisdiction. Please contact us immediately if you change the plans or construction methods for work within our jurisdiction. This office must approve any changes before you undertake them.

This authorization requires you to complete and return the attached Work Start Notification Form to this office at least two weeks before the anticipated starting date. You must also complete and return the enclosed Compliance Certification Form within one month following the completion of the authorized work.

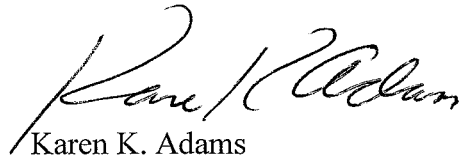
This authorization presumes that the work as described above and as shown on your plans noted above is in waters of the U.S. Should you desire to appeal our jurisdiction, submit a request for an approved jurisdictional determination in writing to this office.

This permit does not obviate the need to obtain other federal, state, or local authorizations required by law, as listed on Page 2 of the GP. Performing work not specifically authorized by this determination or failing to comply with any special conditions provided above or all the terms and conditions of the GP may subject you to the enforcement provisions of our regulations.

We continually strive to improve our customer service. In order for us to better serve you, we would appreciate your completing our Customer Service Survey located at <http://per2.nwp.usace.army.mil/survey.html>

Please contact Kevin Kotelly, of my staff at 978-318-8703 if you have any questions.

Sincerely,



Karen K. Adams
Chief, Permits & Enforcement Branch
Regulatory Division

Attachments

Copies Furnished:

Ed Reiner, U.S. EPA, Region 1, Boston, Massachusetts, reiner.ed@epa.gov

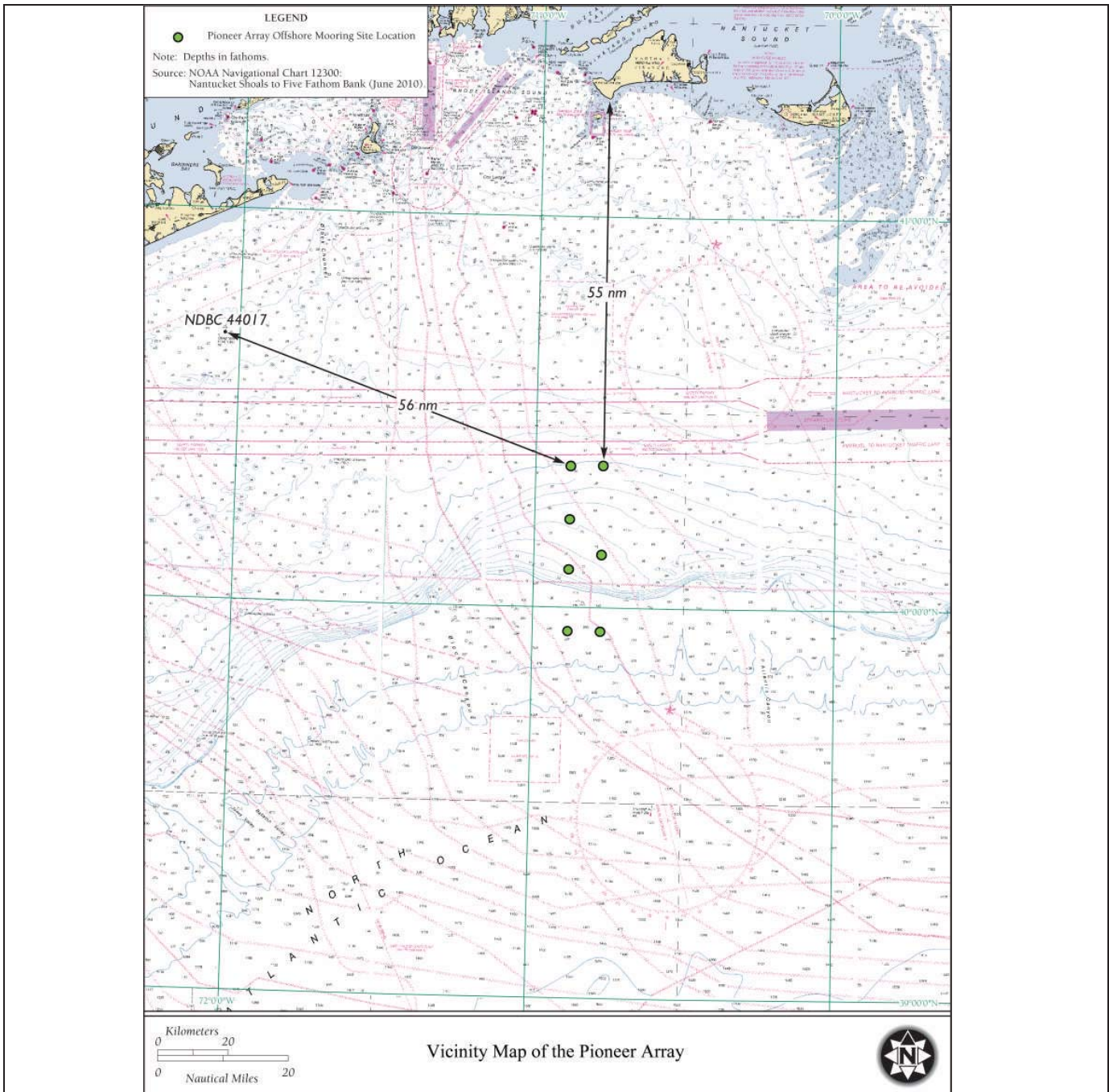
Robert Boeri, Coastal Zone Management, Boston, Massachusetts, Robert.Boeri@state.ma.us

Timothy Feehan, Tetra Tech, Inc., 160 Federal Street, 3rd Floor, Boston, Massachusetts
02110

Robert Hunt, Marine Transportation Specialist, CNRMA Port Operations, US Navy 1510 Gilbert
Street, Norfolk, Virginia 23511

John J. Mauro, Chief Waterways Mgmt(dpw2), Commander First Coast Guard District, 408
Atlantic Avenue, Boston, Massachusetts 02110

Seth Williams, National Ocean Service, Office of Coast Survey, N/CS261, 1315 East West
Highway, Silver Spring, Maryland 20910-3282; seth.williams@noaa.gov



Purpose: Install Pioneer Array Moorings

Inshore	40°21.8'N	70°53.0'W
Central Inshore	40°13.6'N	70°53.0'W
Central	40°08.2'N	70°46.5'W
Central-Offshore	40°05.9'N	70°53.0'W
Offshore	39°56.4'N	70°53.0'W
Upstream Inshore	40°21.9'N	70°46.5'W
Upstream Offshore	39°56.4'N	70°46.5'W

Tetra Tech EC, Inc.
160 Federal Street, 3rd Floor
Boston, MA 02110

VICINITY MAP

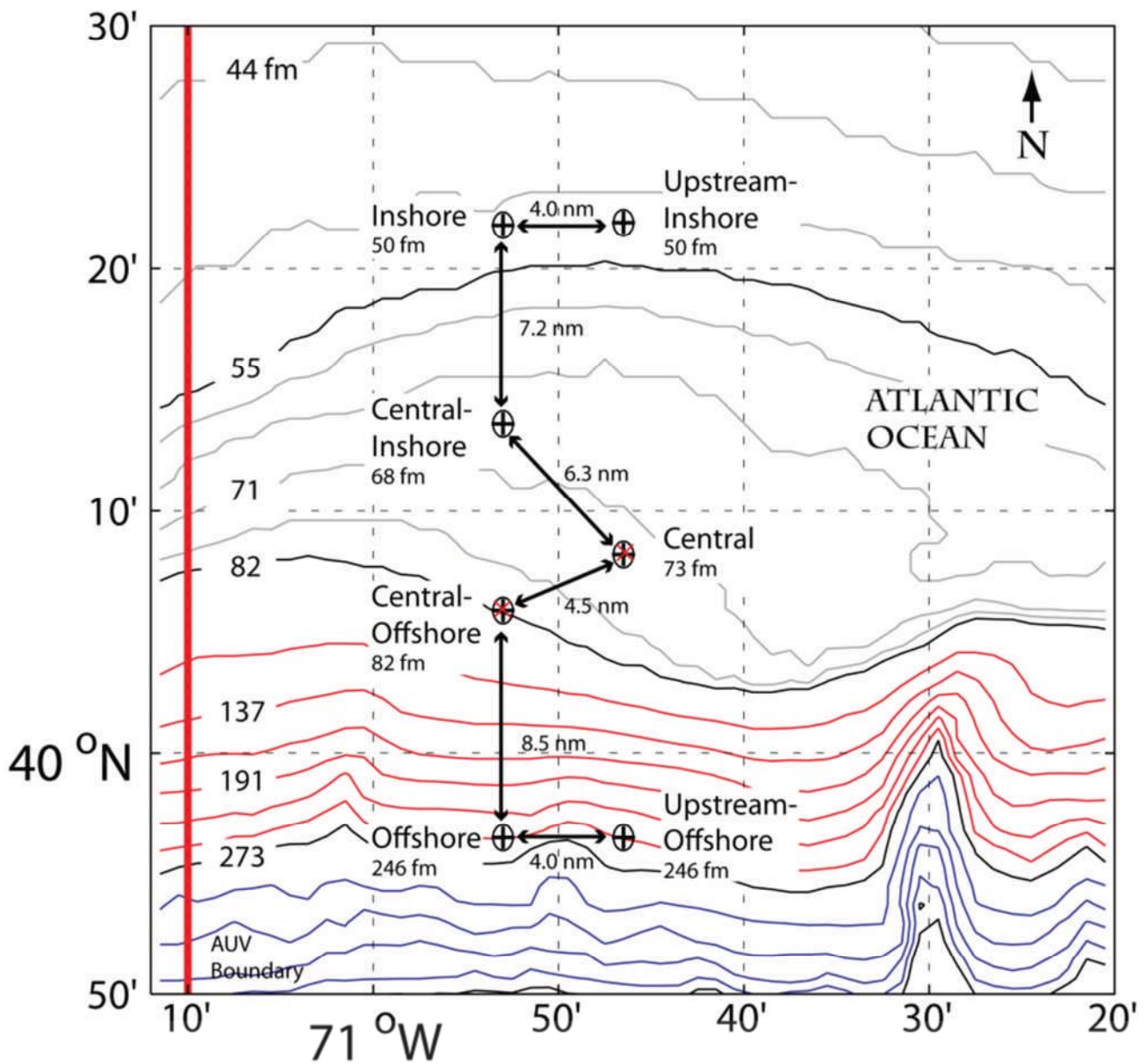
APPLICATION BY:
Consortium for Ocean Leadership – OOI
1201 New York Ave NW, Suite 400
Washington DC, 20005

Proposed: 3 CSMs, 5 CPMs with wire-following profilers, and 2 CSPPMs

In: Northwest Atlantic Ocean approximately 55 nm south of Martha's Vineyard

Date: OCT 2012

SHEET 1 of 12



Purpose: Install Pioneer Array
Moorings

Inshore	40°21.8'N	70°53.0'W
Central Inshore	40°13.6'N	70°53.0'W
Central	40°08.2'N	70°46.5'W
Central-Offshore	40°05.9'N	70°53.0'W
Offshore	39°56.4'N	70°53.0'W
Upstream Inshore	40°21.9'N	70°46.5'W
Upstream Offshore	39°56.4'N	70°46.5'W

Tetra Tech EC, Inc.
160 Federal Street, 3rd Floor
Boston, MA 02110

PLAN VIEW

APPLICATION BY:
Consortium for Ocean Leadership –
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1201 New York Ave NW, Suite 400
Washington DC, 20005

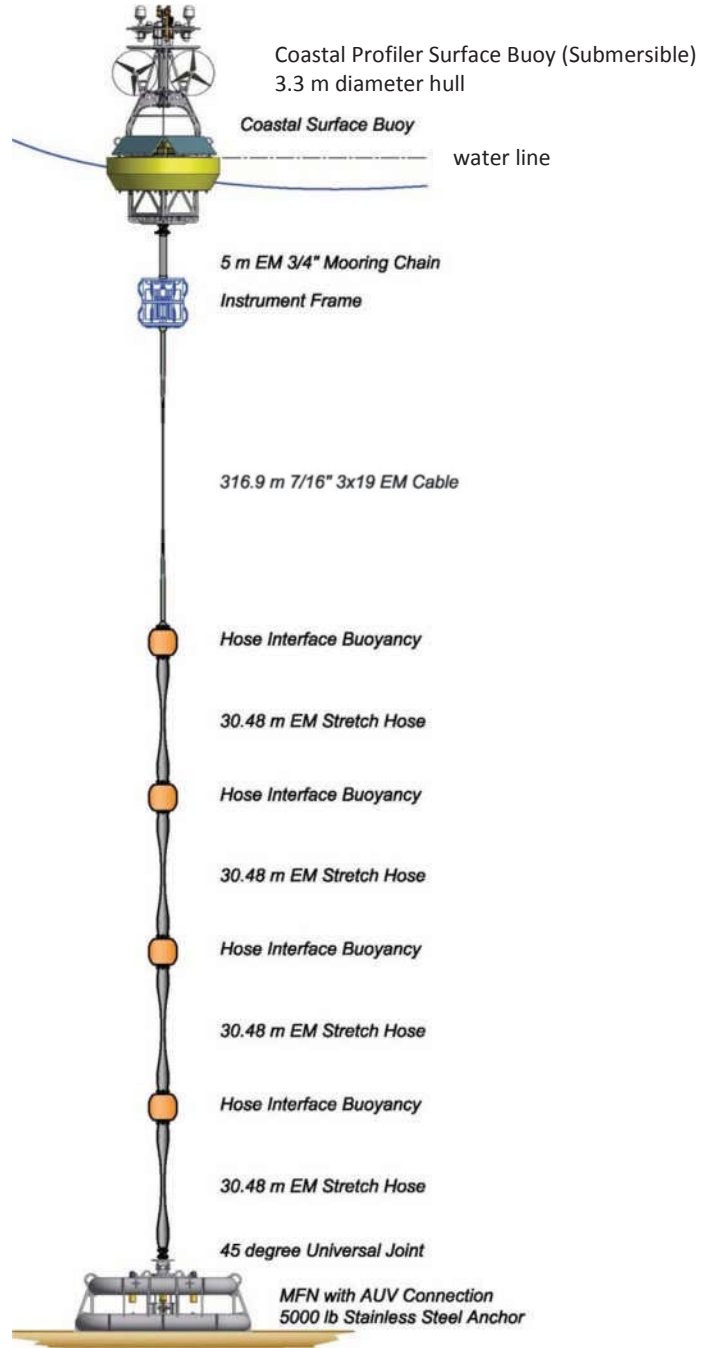
Proposed: 3 CSMs, 5 CPMs with
wire-following profilers, and 2
CSPPMs

In: Northwest Atlantic Ocean
approximately 55 nm south of
Martha's Vineyard

Date: OCT 2012 SHEET 2 of 12

**Ocean Observatories Initiative
Pioneer CSM – Coastal Surface
Mooring Detail**

(All drawing courtesy of WHOI –
OOI Coastal and Global Scale Nodes)



Purpose: Install Pioneer Array
Moorings

Inshore	40°21.8'N	70°53.0'W
Central	40°08.2'N	70°46.5'W
Offshore	39°56.4'N	70°53.0'W

Tetra Tech EC, Inc.
160 Federal Street, 3rd Floor
Boston, MA 02110

**CROSS SECTION OF COASTAL
SURFACE MOORING**

APPLICATION BY:
Consortium for Ocean Leadership –
OOI
1201 New York Ave NW, Suite 400
Washington DC, 20005

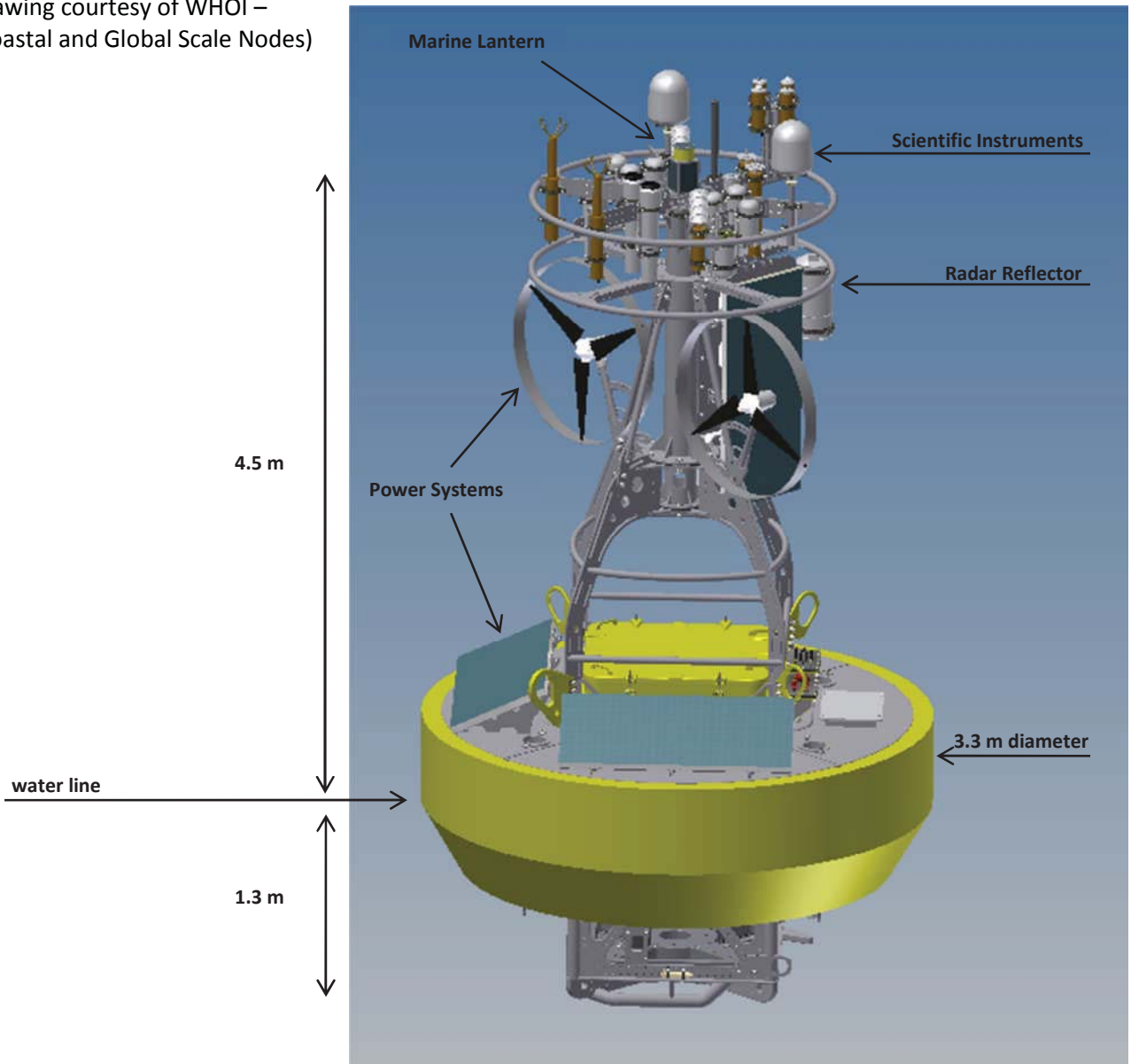
Proposed: 3 CSMs, 5 CPMs with
wire-following profilers, and 2
CSPPMs

In: Northwest Atlantic Ocean
approximately 55 nm south of
Martha’s Vineyard

Date: OCT 2012 SHEET 3 of 12

**Ocean Observatories Initiative
Pioneer CSM – Coastal Surface
Mooring Buoy Detail**

(All drawing courtesy of WHOI –
OOI Coastal and Global Scale Nodes)



Purpose: Install Pioneer Array Moorings

Inshore	40°21.8'N	70°53.0'W
Central	40°08.2'N	70°46.5'W
Offshore	39°56.4'N	70°53.0'W

Tetra Tech EC, Inc.
160 Federal Street, 3rd Floor
Boston, MA 02110

CSM BUOY DETAIL

APPLICATION BY:
Consortium for Ocean Leadership –
OOI
1201 New York Ave NW, Suite 400
Washington DC, 20005

Proposed: 3 CSMs, 5 CPMs with wire-following profilers, and 2 CSPPMs

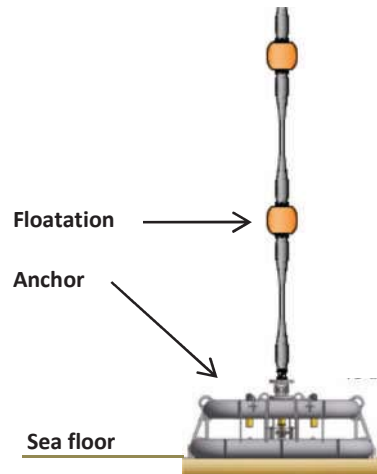
In: Northwest Atlantic Ocean approximately 55 nm south of Martha's Vineyard

Date: OCT 2012 SHEET 4 of 12

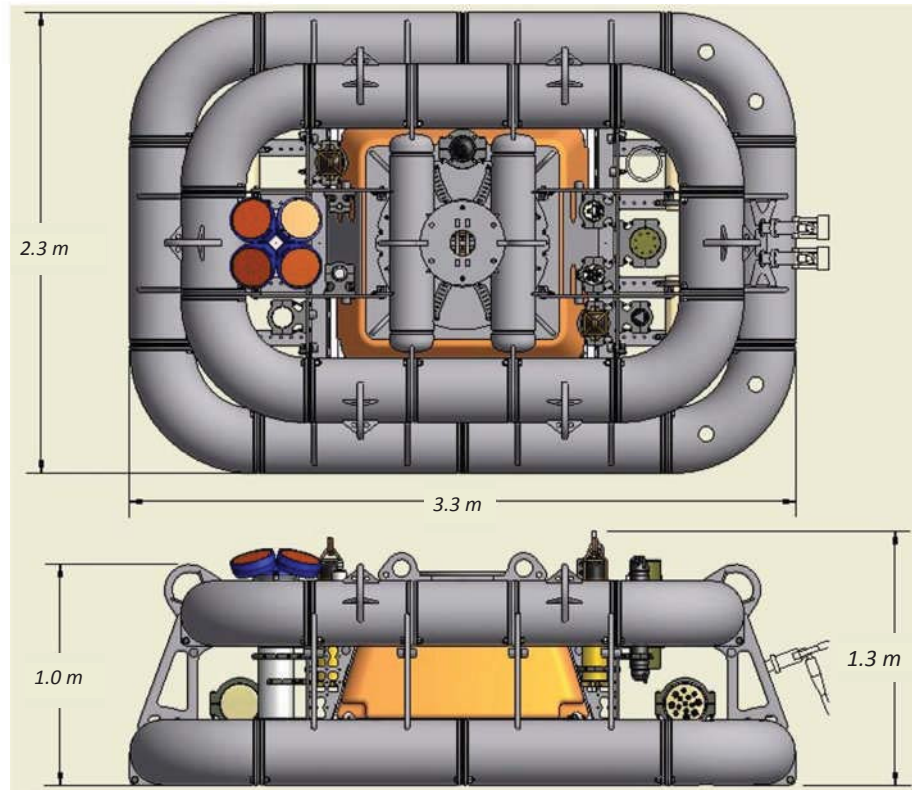
**Ocean Observatories Initiative
Pioneer CSM – Coastal Surface
Mooring Anchor Frame
Multi-function Node (MFN) Detail**

(All drawing courtesy of WHOI –
OOI Coastal and Global Scale Nodes)

Frame: 1150 kg (2500 lbs)
Configured: 4200 kg (9250 lbs)



Top View – Side View



Purpose: Install Pioneer Array
Moorings

Inshore	40°21.8'N	70°53.0'W
Central	40°08.2'N	70°46.5'W
Offshore	39°56.4'N	70°53.0'W

Tetra Tech EC, Inc.
160 Federal Street, 3rd Floor
Boston, MA 02110

CSM ANCHOR DETAIL

APPLICATION BY:
Consortium for Ocean Leadership –
OOI
1201 New York Ave NW, Suite 400
Washington DC, 20005

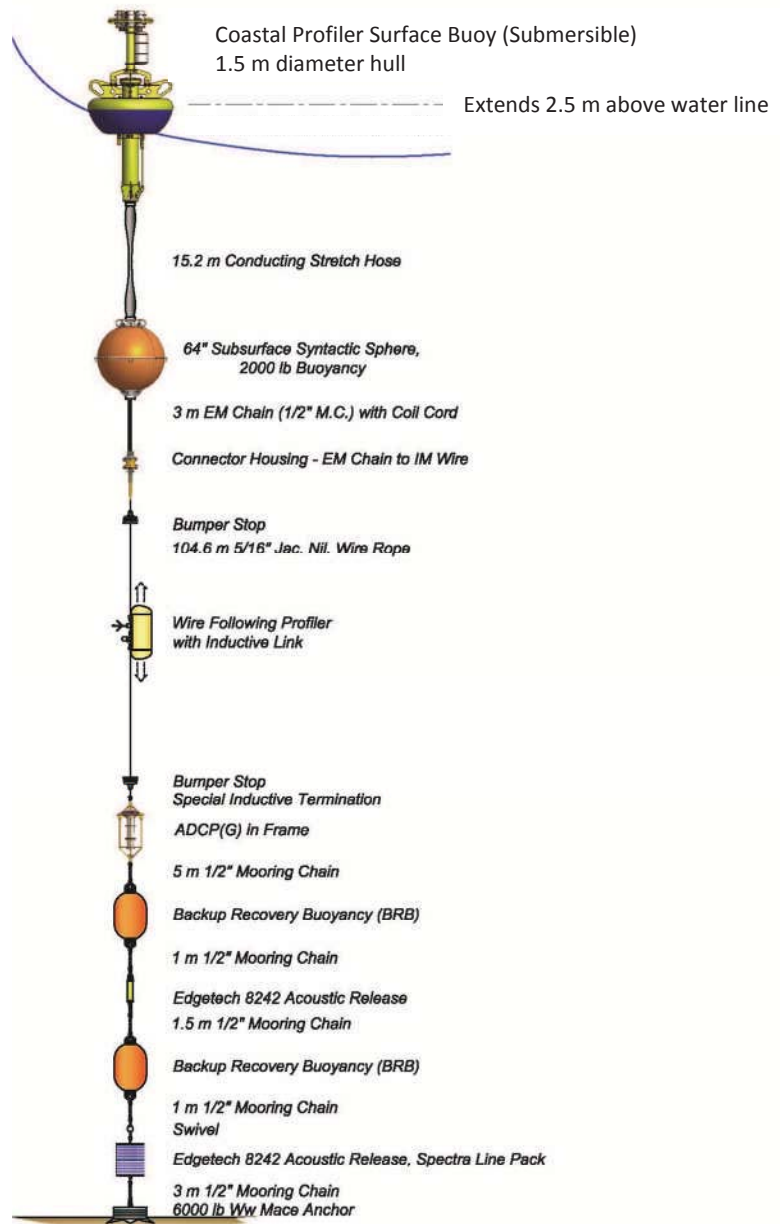
Proposed: 3 CSMs, 5 CPMs with
wire-following profilers, and 2
CSPPMs

In: Northwest Atlantic Ocean
approximately 55 nm south of
Martha's Vineyard

Date: OCT 2012 SHEET 5 of 12

**Ocean Observatories Initiative
Pioneer CPM – Coastal Profiler
Mooring Detail**

(All drawing courtesy of WHOI –
OOI Coastal and Global Scale Nodes)



Purpose: Install Pioneer Array
Moorings

Central Inshore	40°13.6'N	70°53.0'W
Central-Offshore	40°05.9'N	70°53.0'W
Offshore	39°56.4'N	70°53.0'W
Upstream Inshore	40°21.9'N	70°46.5'W
Upstream Offshore	39°56.4'N	70°46.5'W

Tetra Tech EC, Inc.
160 Federal Street, 3rd Floor
Boston, MA 02110

**CROSS SECTION OF COASTAL
PROFILER MOORING**

APPLICATION BY:
Consortium for Ocean Leadership –
OOI
1201 New York Ave NW, Suite 400
Washington DC, 20005

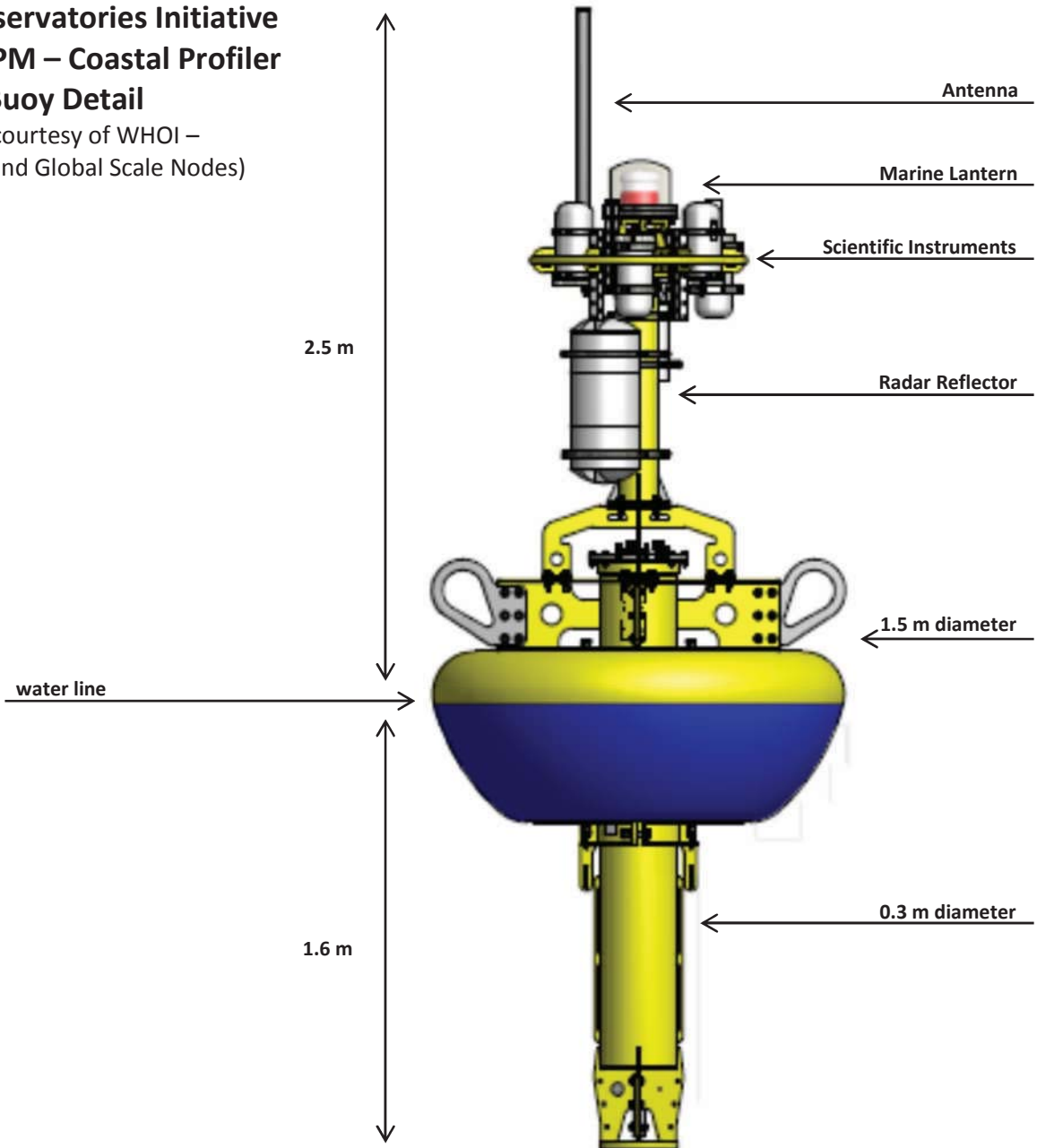
Proposed: 3 CSMs, 5 CPMs with
wire-following profilers, and 2
CSPPMs

In: Northwest Atlantic Ocean
approximately 55 nm south of
Martha’s Vineyard

Date: OCT 2012 SHEET 6 of 12

**Ocean Observatories Initiative
Pioneer CPM – Coastal Profiler
Mooring Buoy Detail**

(All drawing courtesy of WHOI –
OOI Coastal and Global Scale Nodes)



Purpose: Install Pioneer Array
Moorings

Central Inshore	40°13.6'N	70°53.0'W
Central-Offshore	40°05.9'N	70°53.0'W
Offshore	39°56.4'N	70°53.0'W
Upstream Inshore	40°21.9'N	70°46.5'W
Upstream Offshore	39°56.4'N	70°46.5'W

Tetra Tech EC, Inc.
160 Federal Street, 3rd Floor
Boston, MA 02110

CPM BUOY DETAIL

APPLICATION BY:
Consortium for Ocean Leadership –
OOI
1201 New York Ave NW, Suite 400
Washington DC, 20005

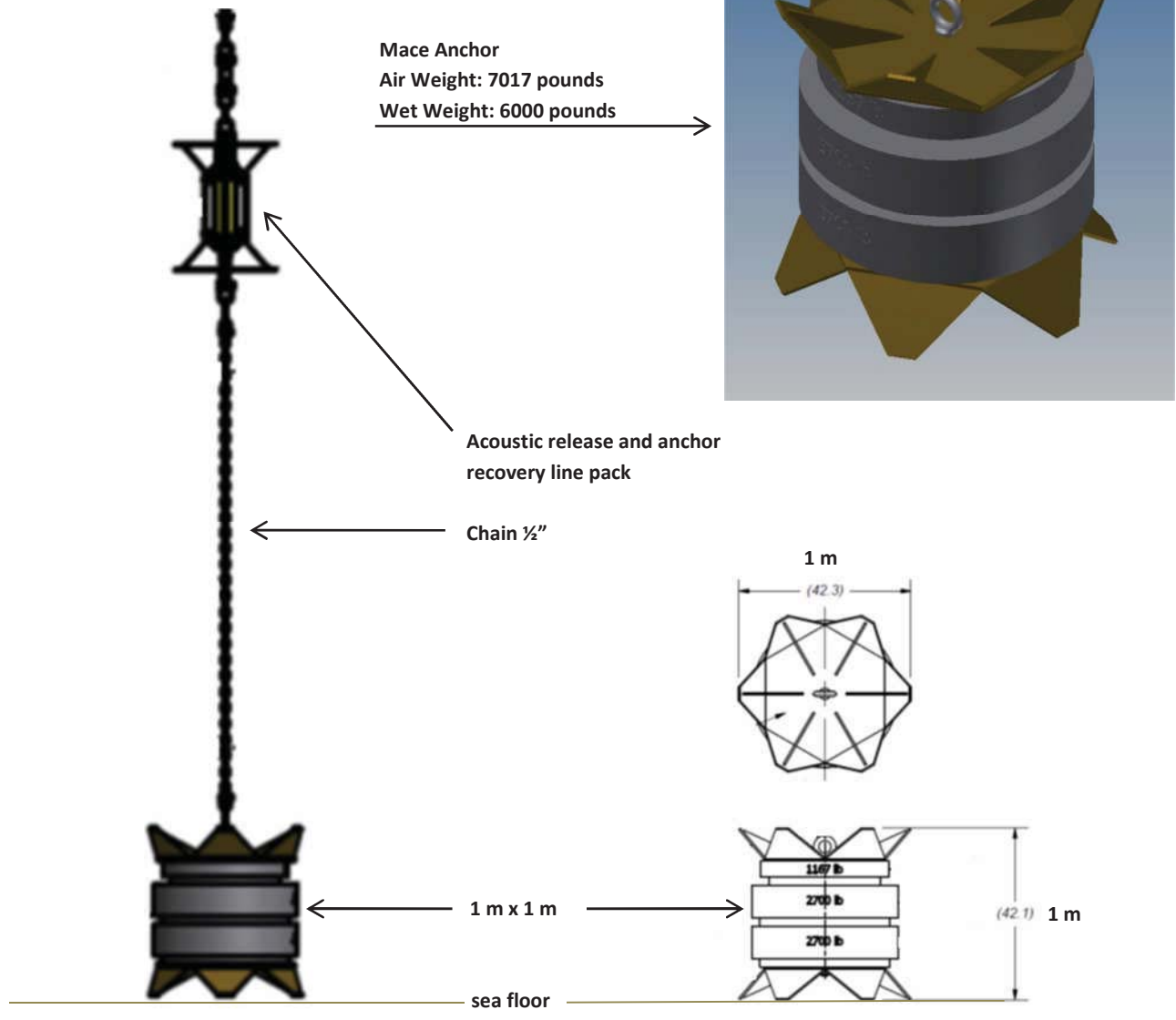
Proposed: 3 CSMs, 5 CPMs with
wire-following profilers, and 2
CSPPMs

In: Northwest Atlantic Ocean
approximately 55 nm south of
Martha's Vineyard

Date: OCT 2012 SHEET 7 of 12

**Ocean Observatories Initiative
Pioneer CPM – Coastal Profiler
Mooring Anchor Detail**

(All drawing courtesy of WHOI –
OOI Coastal and Global Scale No



Purpose: Install Pioneer Array Moorings

Central Inshore	40°13.6'N	70°53.0'W
Central-Offshore	40°05.9'N	70°53.0'W
Offshore	39°56.4'N	70°53.0'W
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Upstream Offshore	39°56.4'N	70°46.5'W

Tetra Tech EC, Inc.
160 Federal Street, 3rd Floor
Boston, MA 02110

CPM Anchor DETAIL

APPLICATION BY:
Consortium for Ocean Leadership –
OOI
1201 New York Ave NW, Suite 400
Washington DC, 20005

Proposed: 3 CSMs, 5 CPMs with wire-following profilers, and 2 CSPPMs

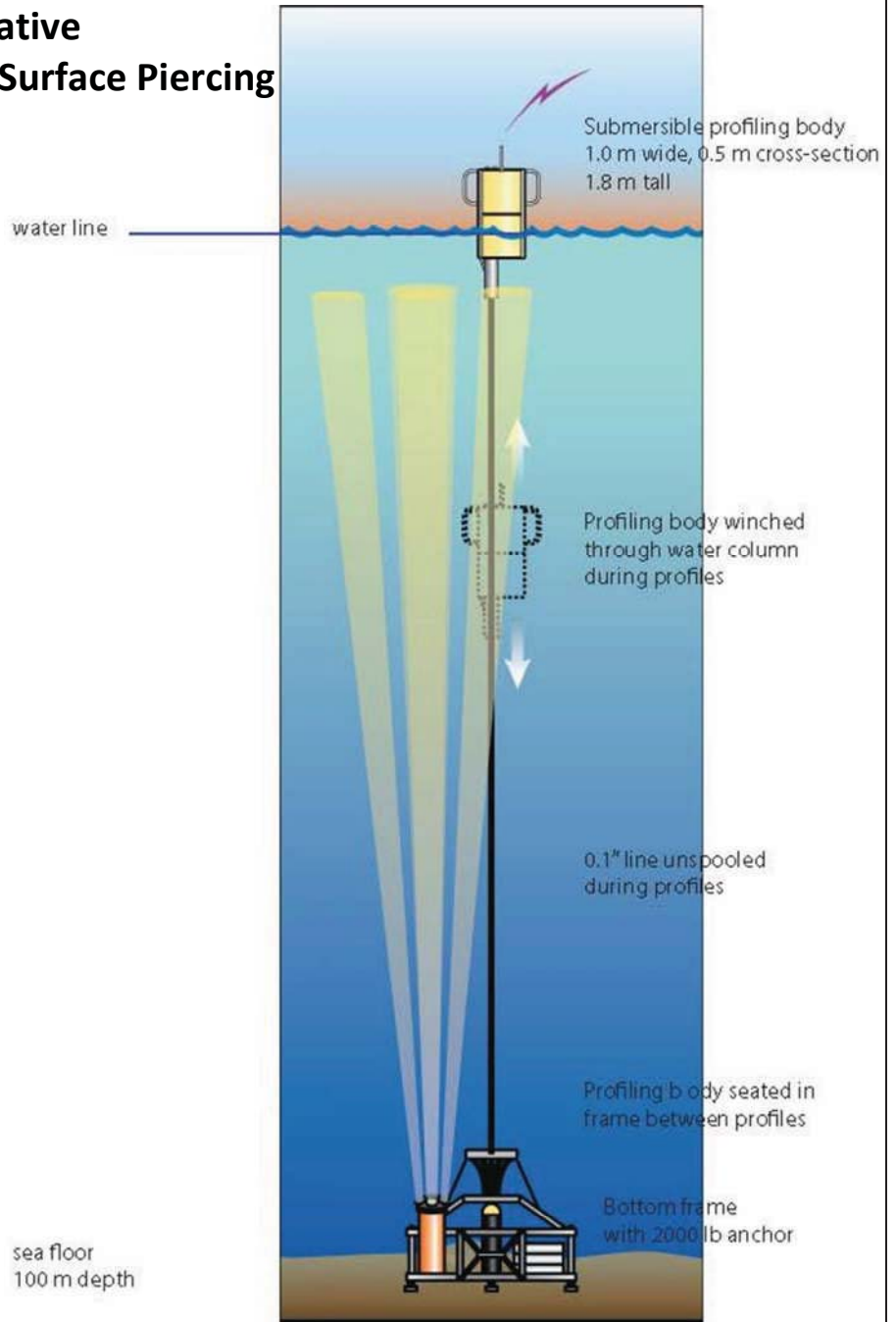
In: Northwest Atlantic Ocean
approximately 55 nm south of
Martha's Vineyard

Date: OCT 2012 SHEET 8 of 12

**Ocean Observatories Initiative
Pioneer CSPPM – Coastal Surface Piercing
Profiler Mooring**

(All drawing courtesy of WHOI –
OOI Coastal and Global Scale Nodes)

Preliminary Design



Purpose: Install Pioneer Array
Moorings

Inshore 40°21.8'N 70°53.0'W
Central 40°08.2'N 70°46.5'W

Tetra Tech EC, Inc.
160 Federal Street, 3rd Floor
Boston, MA 02110

**CROSS SECTION OF COASTAL
SURFACE PIERCING PROFILER**

APPLICATION BY:
Consortium for Ocean Leadership –
OOI
1201 New York Ave NW, Suite 400
Washington DC, 20005

Proposed: 3 CSMs, 5 CPMs with
wire-following profilers, and 2
CSPPMs

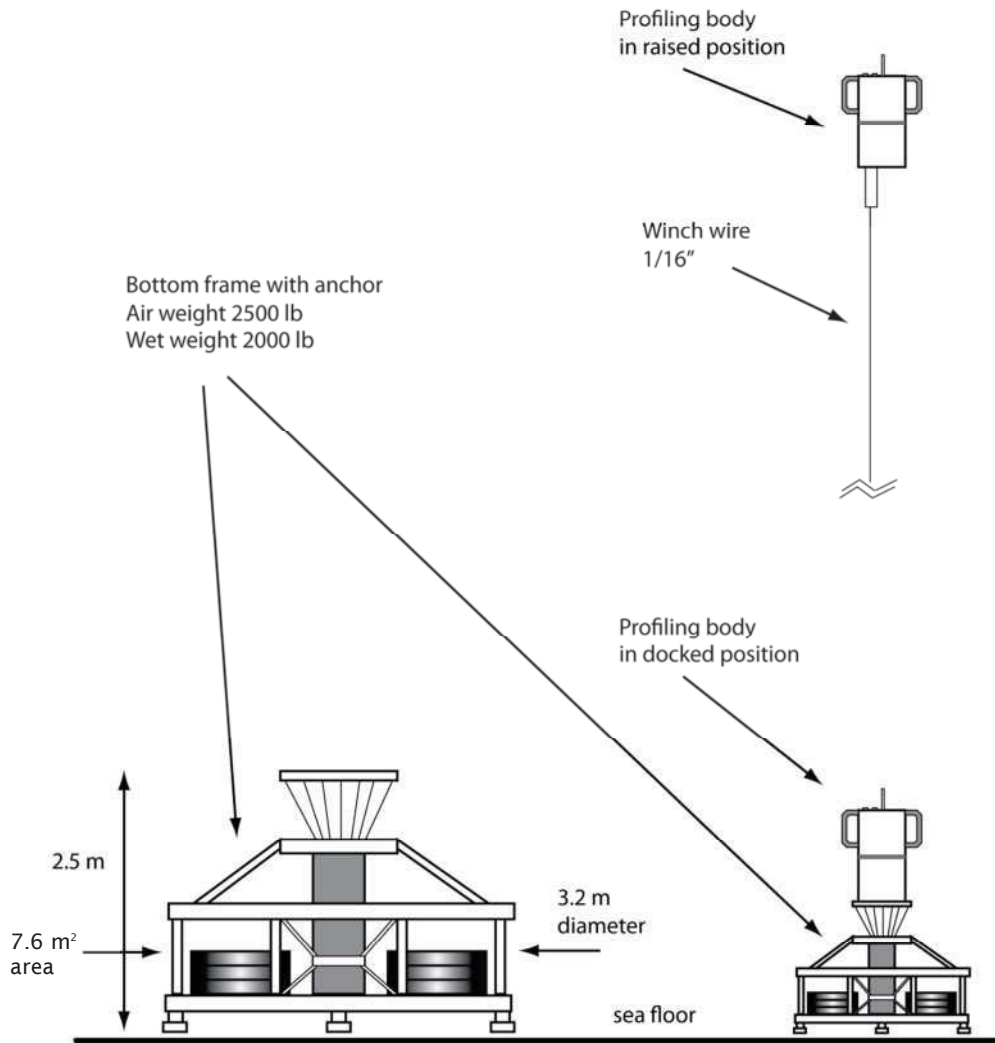
In: Northwest Atlantic Ocean
approximately 55 nm south of
Martha's Vineyard

Date: OCT 2012 SHEET 9 of 12

**Ocean Observatories Initiative
Pioneer CSPPM – Coastal Surface Piercing
Profiler Mooring Detail**

(All drawing courtesy of WHOI –
OOI Coastal and Global Scale Nodes)

Preliminary Design



Purpose: Install Pioneer Array
Moorings

Inshore 40°21.8'N 70°53.0'W
Central 40°08.2'N 70°46.5'W

Tetra Tech EC, Inc.
160 Federal Street, 3rd Floor
Boston, MA 02110

CSPPM PROFILER DETAIL

APPLICATION BY:
Consortium for Ocean Leadership –
OOI
1201 New York Ave NW, Suite 400
Washington DC, 20005

Proposed: 3 CSMs, 5 CPMs with
wire-following profilers, and 2
CSPPMs

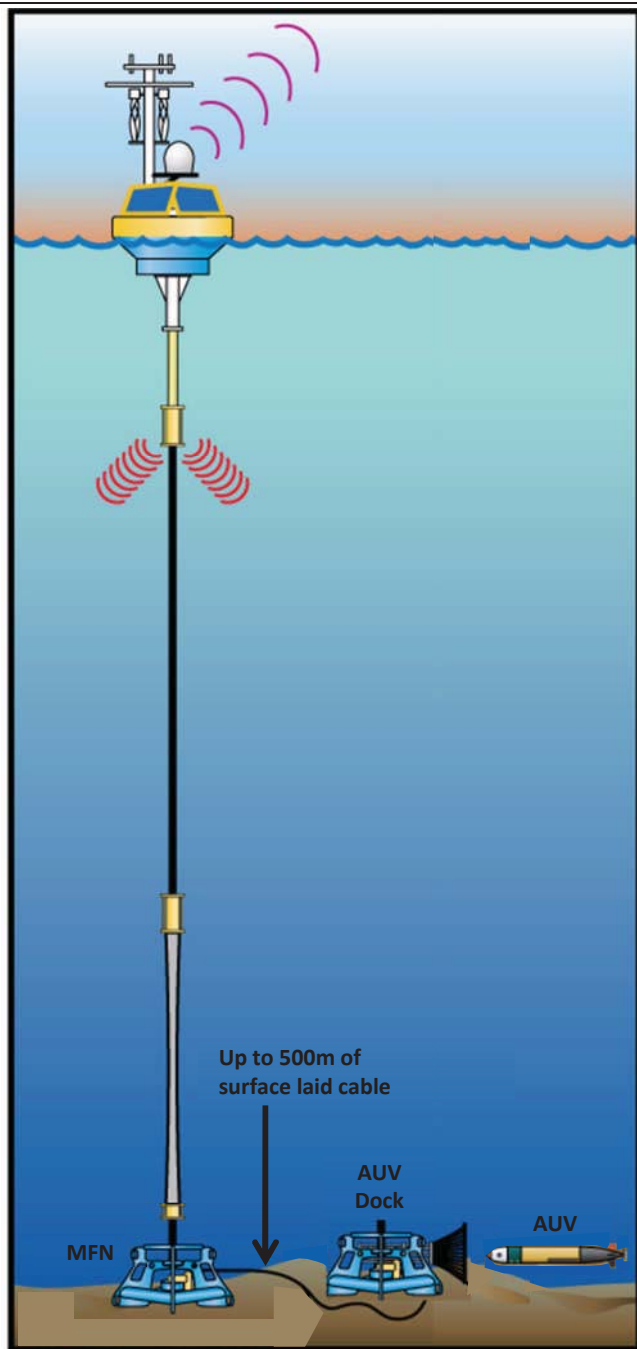
In: Northwest Atlantic Ocean
approximately 55 nm south of
Martha's Vineyard

Date: OCT 2012 SHEET 10 of 12

**Ocean Observatories Initiative
Autonomous Underwater Vehicle (AUV)
Dock Detail**

(All drawing courtesy of WHOI –
OOI Coastal and Global Scale Nodes)

Schematic diagram of the Pioneer Array CSM mooring with cabled autonomous underwater vehicle (AUV) dock (not to scale). The AUV dock sits on the seafloor, separate from the Multi-function Node (MFN), and electrically connected to the MFN by a surface laid marine cable of 0.7-1.2 inch diameter and up to 500 meters (m) length.



Purpose: Install Pioneer Array
Mooring

Inshore 40°21.8'N 70°53.0'W
Offshore 39°56.4'N 70°53.0'W

Tetra Tech EC, Inc.
160 Federal Street, 3rd Floor
Boston, MA 02110

CROSS SECTION OF AUV DOCK

APPLICATION BY:
Consortium for Ocean Leadership –
OOI
1201 New York Ave NW, Suite 400
Washington DC, 20005

Proposed: 3 CSMs, 5 CPMs with
wire-following profilers, and 2
CSPPMs

In: Northwest Atlantic Ocean
approximately 55 nm south of
Martha's Vineyard

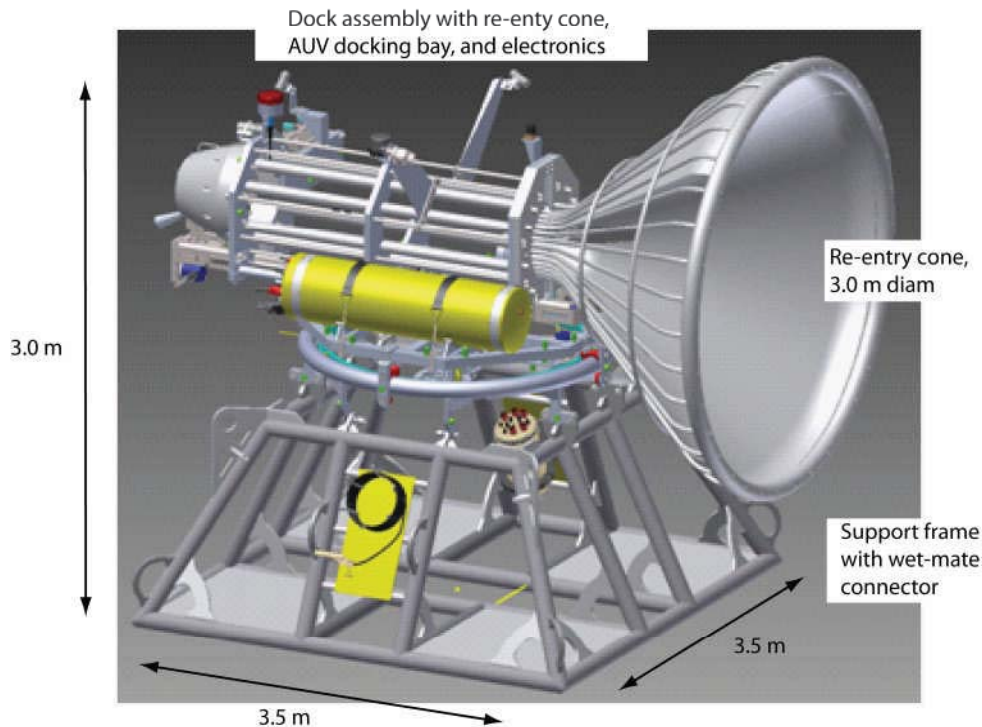
Date: OCT 2012 SHEET 11 of 12

Ocean Observatories Initiative

Autonomous Underwater Vehicle (AUV) Dock Detail

(All drawing courtesy of WHOI –
OOI Coastal and Global Scale Nodes)

Preliminary design



NOTES:

Wet weight (air weight) of AUV dock and frame assembly: 4000 lb (7000 lb)

Frame will rest on the sea floor adjacent to a CSM, water depths will range from 100 to 500 m

Not shown: Ground line, 0.7" - 1.2" diameter fluid-filled hose with multiple conductors, composite construction with inner elastomeric tube, braided synthetic radial reinforcement layers, and outer elastomeric cover, up to 500 m length, connecting dock to base of CSM

<p>Purpose: Install Pioneer Array Moorings</p> <p>Inshore 40°21.8'N 70°53.0'W Offshore 39°56.4'N 70°53.0'W</p> <p>Tetra Tech EC, Inc. 160 Federal Street, 3rd Floor Boston, MA 02110</p>	<p>AUV DOCK DETAIL</p> <p>APPLICATION BY: Consortium for Ocean Leadership – OOI 1201 New York Ave NW, Suite 400 Washington DC, 20005</p>	<p>Proposed: 3 CSMs, 5 CPMs with wire-following profilers, and 2 CSPPMs</p> <p>In: Northwest Atlantic Ocean approximately 55 nm south of Martha's Vineyard</p> <p>Date: OCT 2012 SHEET 12 of 12</p>
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**US Army Corps
of Engineers**®
New England District

**GENERAL PERMIT
WORK-START NOTIFICATION FORM**
(Minimum Notice: Two weeks before work begins)

* MAIL TO: U.S. Army Corps of Engineers, New England District *
* Permits and Enforcement Branch *
* Regulatory Division *
* 696 Virginia Road *
* Concord, Massachusetts 01742-2751 *

Corps of Engineers Permit No. NAE-2010-1283 was issued to the Consortium for Ocean Leadership, in June, 2013. The Pioneer Array will extend 25 nautical miles across the Outer Continental Shelf (OCS) in the Atlantic Ocean. The central mooring of the Pioneer Array will be located at 40°8.2' N, 70°46.5' W at a water depth of 133 meters. The permit authorized the permittee to place fixed structures on the outer continental shelf beyond the Massachusetts three mile limit in order to construct the Pioneer Array Project under the Ocean Observatories Initiative.

The people (e.g., contractor) listed below will do the work, and they understand the permit's conditions and limitations.

PLEASE PRINT OR TYPE

Name of Person/Firm: _____

Business Address: _____

Telephone Numbers: () _____ () _____

Proposed Work Dates: Start: _____ Finish: _____

Permittee/Agent Signature: _____ **Date:** _____

Printed Name: _____ **Title:** _____

Date Permit Issued: _____ **Date Permit Expires:** _____

FOR USE BY THE CORPS OF ENGINEERS

PM: Kevin Kotelly **Submittals Required:** Yes

Inspection Recommendation: _____



**US Army Corps
of Engineers** ®
New England District

(Minimum Notice: Permittee must sign and return notification
within one month of the completion of work.)

COMPLIANCE CERTIFICATION FORM

Permit Number: NAE-2010-1283

Project Manager Kevin Kotelly

Name of Permittee: The Consortium for Ocean Leadership

Permit Issuance Date: June, 2013

Please sign this certification and return it to the following address upon completion of the activity and any mitigation required by the permit. You must submit this after the mitigation is complete, but not the mitigation monitoring, which requires separate submittals.

 * MAIL TO: U.S. Army Corps of Engineers, New England District *
 * Permits and Enforcement Branch A *
 * Regulatory Division *
 * 696 Virginia Road *
 * Concord, Massachusetts 01742-2751 *

Please note that your permitted activity is subject to a compliance inspection by an U.S. Army Corps of Engineers representative. If you fail to comply with this permit you are subject to permit suspension, modification, or revocation.

I hereby certify that the work authorized by the above referenced permit was completed in accordance with the terms and conditions of the above referenced permit, and any required mitigation was completed in accordance with the permit conditions.

Signature of Permittee

Date

Printed Name

Date of Work Completion

() _____
Telephone Number

() _____
Telephone Number