Project Title: “Pioneer Array Workshops – Exploration of Issues and Concerns Connected with the Planned OOI Pioneer Array Project”

Meeting 1 – October 5, 2011, 1:00 PM – 4:30 PM, Meeting Room above Superior Trawl, 55 State Street, Narragansett, RI (Pt. Judith)

Meeting Summary

I. Welcome – P. Parker, CFRF Facilitator

This is the first in a series of four workshops set up to discuss issues/concerns related to the Pioneer Array Project (part of the Ocean Observatories Initiative funded by the National Science Foundation). This series of workshops is being organized, facilitated, and reported on by the Commercial Fisheries Research Foundation (CFRF) through funding received from the Consortium for Ocean Leadership, based in Washington, D.C.

II. Round of Introductions - Workshop participants introduced themselves giving their name, brief statement about background/affiliation. [Note: Each participant has submitted a background information form giving additional contact information and personal background information. These forms have been copied and supplied to all members of the group.]

List of participants in attendance:
- Al Plueddemann, Senior Scientist, Woods Hole Oceanographic Institution (WHOI)
- Norbert Stamps, commercial fisherman, fished in the area since 1980
- David Spencer, offshore commercial lobsterman, Spencer Fish & Lobster, Inc.
- Fred Mattera, offshore commercial trawler, based in Pt. Judith
- Donald Fox, commercial fisherman, owns three boats, based in Pt. Judith
- Bonnie Spinazzola, Executive Director, Atlantic Offshore Lobstermen’s Association
- Bonnie Brady, Executive Director, Long Island Commercial Fishing Association
- Kevin MacGuire, commercial fishermen and restaurant owner, based in eastern Long Island
- Glen Gawarkiewicz, Senior Scientist, Woods Hole Oceanographic Institution
- Dan Farnham, commercial fisherman (long liner), based in Montauk, NY

CFRF Staff:
- Jane Dickinson, Administrative Assistant, CFRF
- Peg Parker, Executive Director, CFRF

Sitting in on the meeting on behalf of other staff following this project for Congressional delegations in New England and New York:
III. Opening Remarks

• Overview of process – P. Parker
  o Explanation of meetings – how they came about, purpose, scope of work, intended work schedule and tasks

Major points:
1. CFRF asked to play the role of organizing, facilitating and reporting on these workshops by both scientists from WHOI and leaders in the fishing industry based in RI. Other forums up to this point have not been conducive to having these types of substantive discussions. Both groups wanted to try this type of small group, representative process to work through some discussions on key subject areas.
2. General purpose of these series of workshops is to provide a forum for scientists and members of the commercial fishing industry to communicate in a non-confrontation setting about key issues and concerns, and to explore options for resolving these issues and concerns.
3. The scope of work centers on the topics of siting of the project, potential gear conflicts, safety issues/hazards, and data collection and possible research applications. Other topics may also be added by the group.
4. A total of four workshops have been scheduled (schedule is Oct. 5, Oct. 26, Nov.30, and Dec. 14. 2011).
5. Major tasks for the workshop participants include: 1) identifying major issues and concerns connected with this project; 2) discussing these issues and concerns and identifying possible solutions or recommended courses of action; 3) recognizing areas of consensus if they develop and areas of disagreement; 4) identifying areas of work remaining, and 5) initiating a discussion on research applications in the area of fisheries if time permits.

   o Description of how meetings will be conducted –[Premises meetings are based on, how agendas will be developed, explanation of facilitator’s role, focus on constructive communication, staying on topic, being succinct in statements made, bringing constructive ideas/suggested solutions to the table, encouragement of ongoing communication in between meetings, generation of final summary report, etc.]

Major points:
1. CFRF is to play a neutral role, focusing on structuring and facilitating the discussion, and developing a written summary of the discussion from the four workshops.
2. The workshops are based on the premises that 1) the Pioneer Array project will be implemented; 2) there are key issues and concerns that have not been adequately addressed and need to be; 3) direct, meaningful communication between scientists and fishermen is the best way to try and address these concerns and issues.
3. First agenda was developed with input from representatives of WHOI and the fishing industry – subsequent workshop agendas and priorities will be steered by the group of workshop participants.
4. Four workshops is a tight schedule to cover everything – there is pressure on everyone to stay focused and to try and be productive.
5. Facilitator will seek to provide both structure and flexibility to the discussions. Focus will be on providing adequate and fair opportunity for all participants to speak, and on watching the clock to stay on target.

6. Participants are asked to be succinct in their comments, courteous and professional in the attitudes and demeanor, be recognized by the facilitator to speak, and to use the time in between meetings to become prepared for upcoming sessions.

7. Participants are encouraged to continue to communicate with each other outside of the four scheduled workshops.

   o Comments/questions - Note – None raised at this point.

- Discussion of expectations for this process
  o Roundtable discussion of participants’ general goals for this process- Participants were asked to think about this question ahead of time – why did they agree to participate and what do they hope gets accomplished?

Major points made during this discussion:
1. Participants voiced thoughts that they did not know where these discussions would end up but it seemed appropriate and necessary to have them in order to better understand each other’s perspectives, and to try to work through issues and concerns.

2. Emphasis was placed on building a trusting, working relationship between scientists working on this project and members of the commercial fishing industry. The point was made by the fishing industry that this type of communication process should have occurred much earlier in the project plans. Not having it sooner has led to the lack of trust everyone is now dealing with.

3. Hope was expressed that this type of communication and working on issues will lead to an ability to co-exist in this area of the ocean.

4. It was expressed that in previous meetings the fishing industry was not able to engage in a dialogue about possible alternative sites. There is a hope that this subject can at least be discussed in this forum.

5. Some expressed a general goal of moving this project to a different area where there is the least amount of fishing traffic. This was stated along with the goal of not letting this project negatively impact the livelihoods or lives of fishermen currently utilizing this area.

6. One goal for this process was to learn more about how this area is used by the commercial fishing industry including what type of gear is employed and how fishing operations in this area work.

7. Another goal expressed was to learn how the planned science activities will effect existing fishing operations. This includes knowing more specific details about how the scientific gear will be set up and operated.

8. Goal was to discuss what happens when negative interactions do happen. What can we do to avoid negative interactions but also what do we do when they do happen?

9. A general expectation for this process is that participants could have an honest dialogue without fear that what is said will be misconstrued.

10. Expectation that these discussions will lead to a site placement that diminishes conflicts as much as possible.

11. Expectation is to learn ways to minimize impacts, particularly if there are changes in the science operations that can be made to minimize conflicts. This would include refining locations of the science apparatus and operational protocols.
12. Some expressed hope that this initial process could lead to establishing an ongoing process to resolve conflicts between scientific and fishing activities.

Major points made on process during this part of the discussion included:
1. Questions were raised concerning the COL role in funding the process – it was explained that this organization in Washington, D.C. is seen as a neutral administrator of funds for government entities.
2. A general goal raised by fishing industry representatives was the need to also discuss concerns centered on questions of liability and mitigation.
3. It was noted that representatives from the sport fishing sector were not at the table and they need to be engaged in this discussion at some point as well. Also possibly gillnetters.
4. There was some expression of not trusting this process to fix this situation.
5. Others expressed concern that four workshops will not be enough time – a long term communication process between fishing industry representatives and scientists needs to be established.

IV. Background Information

General overview of Pioneer Array Project – WHOI scientists were asked to review the planned project, the elements of it, gear that they plan to employ, the time table for it, a description of where they want to site it and why.

Workshop participants listed what they would like to know about the project. This included:

1) How many actual buoys are part of this project and what is exactly on the bottom–what is attached and what isn’t attached?
2) How does the equipment they plan to use function? Need summary of the operation, the intent, how is this all going to work.
3) What other equipment will be there and what’s this whole Array made up of–e.g. cables, what’s hanging them, the weight of the anchors–how are scientific apparatus moving, where they are moving, in which direction?
4) What kind of buffer zone do the fishermen need to keep from interacting with the equipment–moorings and total array?

Background information –

Description of Moorings and Position:
- WHOI scientists referred the group to Page 3 of the Pioneer Array Brochure–there are 3 rectangles here- the yellow rectangle (roughly speaking) is the bounding box of where the moorings will be. The red box shows the operating area of the AUVs. The white box shows the operating area of the gliders (Note, the glider box on the brochure circulated at the first meeting was outdated. A new version with the correct glider box will be provided.) There will be 10 science moorings at 7 locations within that yellow rectangle. And there is a proposal for additional moorings that are guard buoys which are visual aids to the locations of some of the gear. Although there are 10 moorings, there are not 10 sites–some sites have one mooring next to another mooring very close in proximity. So 7 sites, 10 moorings total, 3 of those sites have 2 moorings.
Questions and Comments:

- A question was raised about whether the EA only identified 7 or 8 moorings, and now there is more planned. The response was that the EA evaluated a larger number of moorings than is in the present science mooring design. Specifically, the Programmatic EA evaluated 12 moorings, 10 gliders and 3 AUVs. For the Site Specific EA, this was reduced to 10 moorings, 6 gliders and 3 AUVs (consistent with the present design). The proposed guard moorings are additional, an attempt to aid navigation arising from input about navigation safety at the public meetings. The WHOI scientists are open to suggestions on the type and quantity of guard buoys.
- Fishing industry representatives raised the point that the fishing industry needs to know what is being proposed, be kept in the loop and what the scientists are looking at, especially for safety, even if it is not science oriented. [Note: The point about guard buoys being a good idea as an aid to navigation and safety will be revisited in future discussions.]
- Fishing industry representatives also raised the point that almost doubling the amount of buoys is just about doubling the chances of someone hitting one of them.
- Another question came up asking which 3 locations do the scientists anticipate having 2 moorings in close proximity. WHOI scientists referred the group to the table pages (showing an attempt to lay out every mooring and its location, exactly what's there) in the back of the binder-Answer: the Inshore site (2), central site (4) and offshore (6) site have mooring pairs. The same table shows the suggested location—what guard buoy would go where—there will not be a guard buoy at every location.

Description of AUVs (Autonomous Underwater Vehicles) and their position:

- The AUV box, the smaller of the 2 rectangles, is a region within which 2 propeller driven vehicles would operate— the red box on most of the figures.
- Operation— these two vehicles (because of battery capacity) can only operate for 20-40 hours at a time and they have to go back for more power some way or another—the proposed way is for the AUV to physically attach to a docking station that would be at the base of one of the moorings to recharge and then go do another mission. Within the AUV operating region (red box in Pioneer Array brochure), there will be two vehicles running for 20-40 hours every 5-7 days, therefore it will not be a continuous occupation of that area by multiple vehicles.
- A third AUV would be periodically operated from research vessels during periods when the vessel was in the region for mooring service cruises and/or glider deployment and recovery.

Questions and Comments:

- The point was made that there are ways to refine the Pioneer Array operational strategies—how to minimize interactions. They have some control (not total control) of these devices of what they do and when they do it.
- A question was raised regarding the science need dictating when these AUVs are out there. Answer: Nutrient flux—one of the central science questions is whether the nutrients are going from the continental shelf to the deep ocean or vice versa. The vehicles will be able to measure nitrate (which is one of the major nutrients there) and it will also be equipped with fluorometers so they will have an estimate of the amount of phytoplankton the vehicle is going through. The Array spans the water mass boundary between the waters of the continental shelf and the continental slope and they have discovered that this is really a dynamic boundary. They want to understand how the boundary reacts to all sorts of different forcing mechanisms (wind, currents, etc.). In particular, the exchange between Continental Shelf and Continental Slope seems to occur in smaller scale motions on the order of several miles and that is what they want
to map out. There is a current jet near the edge of the Continental shelf. They want to see how the water mass distribution relates to the strength of that jet seasonally as the Gulf Stream interacts with it and the warm core rings come up. They want to understand the scales of filaments going back and forth. The nutrient distribution is of key interest – a broader understanding of how the ecosystem works from the base right on up. They think there is an upwelling cell coincident with the front that should bring nutrients up in that area and they want to test hypotheses related to that. Scientists are very interested in the cross shelf distribution of properties, including temperature, salinity, nutrients and chlorophyll.

- How does that need relate to the logistics of when this equipment needs to be out there? Answer: AUVs will be looking for sharp temperature gradients. Scientists want to track that gradient region through the year on a 5-7 day time scale. The speed that these vehicles go across and the timing that they do it once a week, is their attempt to get well resolved “pictures” as the frontal system changes in time.
- How fast do they go? 4 knots maximum, 3.0 to 3.5 knots typically
- Are they hard bottom vehicles on the bottom? No they will typically be going through the water column. Because of their design, the gliders must always be moving up and down through the water column (undulating) as they move forward. The AUVs can be programmed to undulate, but can also run at a constant depth or a constant altitude above the bottom.
- What is the purpose of capturing data? To understand frontal processes and eventually to be able to use computer models for prediction. The Pioneer Array Project is an infrastructure project and the science gets built back onto it. Further analysis will be done by the scientific community in general, not by the OOI project specifically.
- A question was raised concerning the use of the data collected to establish a Marine Protected Area in the future. WHOI scientists responded that this project was not conceived for that purpose. Scientists working on this project are trying to better understand the interactions of the ecosystem. No one associated with the OOI Project, or at the Pioneer Array science workshop, has interest or intent relating to commercial fisheries regulation or establishment of protected areas. However, it should be noted that OOI data will be freely available to anyone.

Length of Project:
- How long is this project going to be? 5 years- After that time the project is set to move anywhere on the US Coastline. There will be a competitive proposal process to determine the new location. There is a low likelihood that it will continue in the Mid-Atlantic region.
- Scientists are trying to build from the smallest scale processes that they can reliably measure, from meters, minutes to hours and to a timescale of all the way to climate change that happens on the whole Mid-Atlantic. To get to that 2nd goal and to understand how the ecosystem is responding on long time scales, scientists need to build the snapshots over and over again to create a movie. In fact, from the scientists’ perspective, 5 years is too short. They noted a 9 year cycle in the Gulf Stream. The Arrays on the West Coast proposed timeframe is 30 years.
- Warm l salty layers near the seafloor, associated with the base of the front, can move miles onshore in a day or two. Understanding this phenomenon is part of the project. There is also interest in bottom temperatures. These changes happen on time scales from days to seasons. Understanding their causes requires many events, so many years of data.
- Bottom stress- Many times a computer model is run that is outdated, for example may be using an incorrect value of bottom stress. Scientists will collect a lot of integrated
information as part of the project and identify the important factors governing the shelf break frontal system.

- Scientists want to create a 3D picture over this 5 year time frame; an example of why 5 years are needed would be a higher frequency of hurricanes in some years vs. years where the winter storms were stronger.
- Another important process is meandering. They want to understand how the fronts determine the upwelling.

Future of Project:

- Once the Pioneer Array moves, will another set of moorings stay in place to continue? The scientists were uncertain of this because the ultimate long term plan of the OOI is to characterize the continental shelves around the country. It would be possible for a scientist not associated with OOI, or even with NSF, to propose moorings in the Pioneer region. Note: On this point a discussion followed regarding a hypothetical example of using one mooring next to a shipwreck that really characterized the system well, and with the combination of the computer models with the data from this one mooring there could be a possibility that this one mooring could remain, but there are no concrete plans for this currently. A lot depends on what happens with the Pioneer Array - there are a lot of technical challenges.

Difference in equipment:

- How the AUVs work and how are they different from gliders?
  Answer: Gliders do not have propellers and can only go about half a knot. Scientists task the gliders to “fly” from one waypoint to the next, but are not in complete control of their location due to currents. AUVs are propeller driven, can be more precisely controlled, and can power their way through most currents. No one has had the opportunity to use AUVs over long periods before. Repeat tracks were discussed for predictability. One will go across the shelf along the mooring line and one will run along one isobath to measure nutrients. There is a 3rd one as a backup, but might go out during mooring and glider maintenance cruises or for outreach missions (capture video for school groups, community generated mission, etc.). Scientists raised the possibility of having them run on predictable paths which could be broadcast to the fishing community.
- The AUVs can be programmed to travel within 2 meters of the surface to within 2 meters of the bottom- control surfaces like an airplane which will be programmed to turn the rudders back and forth – preset. The front of the AUV persists at an angle to the bottom (column). Note: Fishermen raised the possibility of determining a route and programming the AUV such that it can avoid gear, and possible damage to the bottom of fishing vessels. This will be discussed further at subsequent meetings.
- Gliders are typically dispersed before randomly, not used in this mode with a remote dock. Gliders have been used hundreds of times from research expedition ships out there for a few days to a few weeks. AUVs have been used less often and for shorter durations – their experience with interactions of fishing gear is limited.
- Scientists have substantial experience with both gliders and AUVs, but have not deployed multiple gliders and multiple AUVs in a sustained observing system before.

Specifications of Equipment:

- Weight of the AUV? 500lbs
• Scientists can get the draft of the vessels and they can refine the operations of the AUVs to operate deeper to avoid interactions. Note: This is a technical question regarding the programming of equipment for the group to go back to.

Miscellaneous comments:
• AUVs Will only go to about 500 meters (275 fm) total depth.
• Gliders will go to 1000 meters (550 fm) total depth
• Both gliders and AUVs can operate in shallower water (e.g. 50 meters (27 fm))
• Capability to put sensors on AUVs to avoid impact? - It’s an engineering research question to put forward looking at sonar. No operational solution to that problem at this point.
• Recommendations were presented on design of AUV, to prevent any snags or bypass gear
• Refinements of the AUV mission plan may be possible so that they are not to be within 2 meters of the bottom when the trawl gear is in the area & to avoid lobster gear- design AUV to roll off- if they know the depth range they can refine the AUVs missions.

Discussions continued into the break on time of year certain gear types fished, concentration of gear in the designated area, break way system, safety concerns, etc.

• Gliders- upper and lower turning depths can be adjusted.
• Moorings and docking stations- AUV will have a mooring (not additional) with a docking station for recharging. Note that three sites have both Surface and sub-surface moorings.
• Guard Buoy Set Up – 1 mile diameter of just buoys, fixed gear needs a scope, boats will need to know where the anchor is in relation to the buoy. A few hundred meters will be the watch circle- refinable and watch circle is taken into account. Rule of thumb is to use 50% of the water depth for the scope.
• Can the moorings be pulled under? This is a possibility.
• How will fishermen see the moorings? They are lit with marine lanterns that emit light in intervals. They also have passive radar reflectors. Some have active radar pingers.
• Going into the meetings did the scientists have in their mind some flexibility as far as moving these moorings? Possibly- they would like to minimize moving and talk more about siting(Issue at the top of the agenda at the next meeting)
• Other baseline information about the project: They will come back with more detailed information about the specs of the moorings/anchor chains (breaking strength, etc.)
• There are proposals that can be written down the road- for example, for the use of scientific tools on fishing vessels
• General overview of fishing activities in the planned study area – Industry Representatives (See below)

General Overview of Fishing Activity in Area:

Representatives from the fishing industry presented the following summary:

Fisheries time of year and depth fished

1. Pelagic Longline – Tuna, sword, mahi mahi
2. Bottom Longline – Tilefish
   a. Year round
   b. 150F – 600F
3. Lobster Gear - Lobster
   a. May – Nov. 29
   b. 150F – 30F (70F – 90F Concentration of gear)
      a. Dec – April 31
      b. 200F – 150F (50F and shoaler year round crab fishing)
4. Red Crab Gear – Red Crab
   a. Year round
   b. 250F – 400F
5. Sport Fishermen (rod & reel) – Sword, tuna, marlin, mahi mahi
   a. May - Nov
   b. 200F - 70F
6. Gillnet Gear - Monkfish
   a. Year round
   b. 30 F - 200F
7. Trawl Gear – Mixed species
   a. Sep – April
   b. 55F – 120F
      a. Sep – April
      b. 200F & deeper (whiting)
         a. June - Nov (monkfish)
         b. 150F - 200F
      a. Nov – May (monkfish)
      b. 150F – 50F

V. Setting the structure for subsequent meetings - Discussion of general topics to be covered
   • Feedback on suggested topics areas:
     o Potential Gear conflicts
     o Safety issues
     o Siting decisions
     o Data collection and possible research applications

During this last section of the meeting, participants agreed that the list above should be covered at subsequent meetings. The priority to begin with is the discussion on siting (both macro and micro siting of the project). Once the exchange of additional background information on the science equipment and operations, and fishing activities in the area are completed, the group will return to discuss siting of the project in more depth.
Additionally, over the course of the discussions during Workshop #1, two other major topic areas were raised and requested to be covered. These included:

- Liability issues and methods of mitigation
- Ongoing communication between scientists and fishermen – How should this be established after these workshops are concluded?

A list of general issues/concerns to be discussed was presented on behalf of the industry representatives at the table. These included the following:

1. Possible gear conflict solution – Will it be possible to install a weak link in the anchor line for moored buoys to help with safety hazards for mobile fishing gear?
2. Can buoys have electronic signals on them (transponders) to help the fishing industry see them in poor visibility conditions?
3. What will be the buffer zone around buoys? How can fishing take place around these moored buoys?
4. Can we think about following the example of the Transatlantic Cable Company that worked with the fishing industry to supply them with marked charts, etc.? There were also mitigation means established to handle gear problems.
5. Gear conflicts – may need to consider establishing a process where the U.S. Coast Guard is involved in verifying at the dock any lost or damaged gear claims. Also need to establish a means for compensation in these cases. There may be examples in the Gulf of Mexico and the North Sea to follow.
6. Construction phase – Will the scientists at WHOI use fishing vessels to install their science equipment? Working with the fishing industry during construction phase could help build a working relationship between the two user groups.
7. What happens when fishing vessels capture an AUV or Glider? What will be the process to be followed?
8. Need to establish a communication process with all mariners in the area when science equipment is being deployed. Information on these operations will be helpful to communicate on an ongoing basis through the 5 year project. Using fishermen associations for this communication process could be useful.
9. Establishing a routine to how science equipment is deployed and utilized could aid in avoiding potential conflicts.

Siting suggestion:

Near the close of this meeting a representative from the fishing industry put forward a suggested alternative site. This site was described as:

“An area that would be extremely benign, where most of the mobile gear conflicts go away-typically fishing stops at Atlantis canyon – if you go 70 degrees 12 minutes 70 degrees 15 and draw a line straight north from there they stop. They go to about the 290 line on the 14 bearing- some guys go over there, but most guys stop and jump over to the other side of Atlantis and work right down the face east and the southeast face and go back to the east. That is an area where there would be very little interaction. The contour of the edge is more east and west as opposed to being the southeast trough. It’s about 25 miles moving over to the east.”
It was noted that the fishing industry had not necessarily reached a consensus that this alternative site suggestion would be the best one. From the trawl view it may be a good alternative but may not be a good alternative for other gear types. Other suggestions may be presented at future meetings for discussion purposes in terms of both fishing activity and science needs.

VI. Closing comments: P Parker –

- Next meeting will be held on Oct. 26, 2011, 1:00 PM – 4:30 PM, Meeting Room above Superior Trawl, 55 State Street, Narragansett, RI (Pt. Judith)
- Contact and background information on workshop participants will be updated and distributed.
- Communication in between workshops is encouraged.
- Participants will be reminded of additional information that should be brought back to the group.
- A meeting summary outlining the major points made during this workshop will be drafted and distributed before the next meeting.

Meeting was adjourned at 4:40 PM. Discussion continued on an informal basis for an additional 30 minutes or so.