

**Ocean Observatories Initiative Facility Board (OOIFB)**  
**National Science Foundation**  
**2415 Eisenhower Avenue**  
**Alexandria, VA 22314**  
**September 26-27, 2017**

***Meeting Minutes***

**Appendices:**

- [1 OOIFB Meeting Participant List](#)
- [2 OOI OverviewSep2017](#)
- [3 OOI PioneerStatus Sept2017](#)
- [4 OOI CabledArray Update Sept2017](#)
- [5 OOI Endurance Update sept2017](#)
- [6 OOI GlobalArrays Update Sept2017](#)
- [7 SouthernOcean TalkingPoints](#)
- [8 OOI CI Update Sept2017](#)
- [9 OOI CI DataTeam Sept2017](#)

**Action Items:** The continuing and new action items resulting from this meeting are available at:  
[http://ooifb.org/wp-content/uploads/Sept\\_2017\\_Meeting/ActionList\\_Update100317.docx.pdf](http://ooifb.org/wp-content/uploads/Sept_2017_Meeting/ActionList_Update100317.docx.pdf)

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**Day-1: Tuesday, September 26th** - Location: NSF Room W-3220

**0830 Welcome, Introductions, Goal of Meeting** - Larry Atkinson, OOIFB Chair, opened the meeting and welcomed everyone. He reviewed the goals of the meeting. Participants introduced themselves. The participant list is included as [Appendix I](#).

**Update from NSF** - Bob Houtman thanked the OOIFB for their participation in the meetings and work on action items. Rick Murray sends his regrets for not being able to attend; he is traveling. Rick appreciates the feedback and perspectives from the facility board (FB).

Although there is information about OOI that NSF cannot discuss, Lisa Clough encouraged the OOIFB to ask questions to NSF.

Larry asked the OOIFB members for their feedback:

- Sarah Gille – It is important to open the lines of communication with the community. Example, discussions regarding the shut down of the Southern Ocean Arrays should be open.
- Sherri White – It has been good for OOI to get feedback from the FB.
- Deb Kelley – It has been a good exercise reviewing the tracability matrices because it revealed that a lot has been accomplished.
- Kendra Daly – She is thrilled by the community enthusiasm.

- Brian Glazer – It takes a lot of momentum to get up to speed on OOI, but it has been a fun exercise. There was a lot of thought that went into the matrices and he was very impressed by the work that went into them.
- Ruoying He – This is a critical juncture for OOI as the community accesses the data and starts to apply it to their research.

### **Status of OOI:**

**Overview** – Greg Ulses (COL) provided a summary of plans for the remainder of 2017, the first months of 2018, and the pending transition from OOI 1.0 to 2.0. Greg made the presentation.

His slides are included as [Appendix II](#) and provide updates on:

- OOI Highlights since May 2017:
  - 5 of 9 planned 2017 “turn cruises” are now complete.
  - Argentine Basin and 55S cruises will be “retrieve only.” The NSF has directed suspension of additional deployments to these stations.
  - Major PMO focus has been on prep for pending transition of OOI Award.
  - Cyber Infrastructure – solid progress on ERDDAP, data integration.
    - New data ingest capabilities in uFrame are off to a strong start
    - Deployment of ERDDAP capability is imminent
- OOI Data in IOOS and Regional Associations
- OOI Way Ahead – Priority Next steps
  - Pending transition of OOI 1.0 through April 2018. They are developing a detailed transition plan and timeline for transfer of OOI to Team 2.0.
  - CI infrastructure upgrades and enhancements are their top priority.
  - Steady state operations
  - Long term budgets
  - Lessons learned.
- Science Oversight Committee
  - members of SOC serve as primary advisors
  - The Science Plan is off of the SOC task plate
  - most current roles and responsibilities overlap with those of OOIFB
  - OOI welcomes feedback on the future relationship with the SOC

### Discussion:

- Larry Atkinson – This is an area that needs more thought. The weekly calls are now only attended by Larry and Annette. We need a better way to communicate between SOC and OOIFB.
- Lisa Clough – The SOC reports to OOI.
- SOC members include:
  - Jack Barth
  - Deb Kelley

- Al Ploudeman
  - Bob Weller
- Participation in the weekly SOC calls include:
  - SOC members
- OOI – Mike Vardaro, Sue Banahan, Greg Ulses
  - OOIFB – Larry and Annette
  - NSF – Lisa and Bob Houtman
- Deb Kelley suggested that we lay out a few topics that can be tackled in these SOC meetings. She will consider how the SOC can engage the OOIFB in a useful manner.
- Ruoying He – As we transition to 2.0, will SOC stay on? Greg Ulses – This will be decided by the new OOI operator.
- Barbara Ransom – What are the plans to make things leaner and more efficient. Greg – efficiencies can be gained by looking at lessons learned. Are there equipments that don't need to be refurbished as frequently? Can shiptime be reduced for service?
- Barbara Ransom – Could there be a third party review of these types of efficiencies? Greg – Possibly.

**Pioneer Update** - Peter Brickley provided the report. His slides are included as [Appendix III](#) and include images of routine operations.

- The Pioneer 8 recovery/deployment cruise was on 30 May to 20 June 2017 on R/V Armstrong and they are relatively happy with the way things are working now.
- The Pioneer 9 cruise is planned for 28 Oct to 12 Nov on R/V Armstrong
- A summary of instrument issues is provided in the slides.
- Peter showed the status of instruments by week since the beginning of the year.
- OOI Core Science Instrument Issues were described.
- Pioneer science activities include inquiries for ancillary activities and publications.
- From the papers, there are collaborations that are interdisciplinary and from other institutions.

Discussion:

- Jim O'Donnell – What is the status of the data that was collected in May? Peter – It takes a month or two to take the data out of the instruments, then put it into a backup sensor. It hasn't been ingested into the CI yet. They are still working on the scripts for ingestion.
- Larry Atkinson – How does LTER relate to OOI? Peter – The primary advantage, the LTER is a near shelf that links together Marthas Vineyard cabled observatory to the Pioneer. The LTER is between the two. There is synergy. Lisa Clough – Hiedi Sosik is the Program Officer for LTER. It is a partnership between NOAA and Fisheries. LTERs are designed as 6 year awards. LTERs are long-term. While they are recompeted, they continue for decades. Some are approaching 30+ years. This is a welcome addition for coastal.
- Kendra Daly – Is there a heat-map? Peter – They haven't had that since 2013. The problem is that if an instrument has a problem or the logger has a problem. It isn't an accurate representation of the status. Sometimes it looks like an instrument has failed, but it

hasn't. It may be due to the logger or other data issues. They don't distribute these and it is highly manual.

- Sarah Gille – On a topic related to data availability, what happened with Hurricane Jose? Peter – They were expecting to see a greater impact.

Regional Cabled Array - Deb Kelley provided the report. Her slides are included as [Appendix IV](#).

- The third operations and maintenance cruise was on July 25 to August 29 and September 9-11, 2017 aboard R/V *Revelle* using ROV *Jason*. There were 45 dives. Operations included:
  - Turned 3 Junction Boxes
  - 3 Shallow Profiler Platform Assemblies, 3 Shallow Profiler Science Pods
  - 2 Benthic Experiment Platforms
  - 116 instruments turned-installed
  - 1 Deep Profiler mooring installed, 1 turned, 1 unplugged (Slope Base)
- Twenty-three undergraduate and graduate students from UW, Western WA University, and Queens College participated as part of VISIONS'17.
- There were *Jason* issues and weather days, so they didn't get everything installed.
- All primary nodes and 18 junction boxes are working.
- Hydrate Ridge – This site is very dynamic with a lot of change from year to year.
  - 100% of installed infrastructure is operational
  - Four instruments funded by Germany-MARUM will be added next year
- OR Offshore
  - On the slide chart, everything green is working, blue is offline, red is failed.
  - The Shallow Profiler Trawl was trawled by a fishing boat. The sensors were still working while being trawled. The fisherman saw the OSU logo. The fisherman was worried about losing his ship, so cut the trawl. It isn't clear whether the gear is on the node.
  - Every 5 years they have to do cable inspection. They are in the process of chartering a boat with an ROV to do an inspection.
  - The good news is that they have equipment for reinstalling.
  - Greg Ulses added that OOI is member of the Oregon Fisherman Cable Committee (OFCC). They pay into this. There is a number that fisherman can call at any time to make a report. There is an insurance fund to pay for lost fishing gear. OOI is working with OFCC to figure out how not to repeat this. Deb – The OFCC has a good leader. They have been in discussions of installing AIS on the equipment.
  - 100% of installed infrastructure is operational
  - Installation was delayed due to *Jason* problems
- Axial Base – 100% installed and operational including 34 sensors and the Deep Profiler.
- Axial Summit – 100% installed and operational (25 sensors)
- At Axial Caldera there were NSF-funded additions installed in 2017
- There is an HD Camera Online
- At Axial Caldera there are three NSF and one ONR funded programs next year.
- Deep Profiler Status – this will continue to be evaluated.

- IRIS Users – There are 342 customers who visit site multiple months and download data. It is a very dedicated program.
- The Cabled Array is capturing near and far-field earthquakes
- Health and status monitoring has been developed for the array (see slides).
- The VISIONS17 Education program - Deb donates her time for this. They have had about 100 undergrads. They have taken a lot of early career students out on cruises.
- Plans for next year were reviewed.

Discussion:

- Sarah Gille – That is the nature of the additional programs? Deb – explained that there is a detailed form that they must complete regarding the milestones and sensors. Sometimes folks don't know the progress (like the ONR project), so we will have to work on this. There has been a lot of communication.
- Greg Ulses – The process is replicated at the other OIs. Deb conducts webinars so the potential user knows the capabilities of the Array. The other arrays do the same thing.
- Ruoying He – is there any engagement with industry? Deb – They may play a stronger role in the future.

**Break**

**Endurance** - Jack Barth provided the report. His slides are included as [Appendix V](#).

- The names of the full Endurance team are provided on the slides.
- The next cruise is planned for October 2<sup>nd</sup>.
- Since May 2017:
  - Two full deployments were completed
  - There were 3 gliders deployed and at sea operating normally
  - Four gliders stopped early
    - Two stuck under Columbia River Plume
    - One forward compartment leak
    - One lost—power failure
- Offshore Washington – wire following profiler – Update since May:
  - Twice stronger stretch hose procured for Fall 2017 deployment to prevent buoy from parting again
  - Oxygen sensor stopped working on deployed unit (June)
  - Telemetry turned off to conserve power (July)
  - Replacement unit received for lost unit (September)
- Coastal Surface Piercing Profiler (CSPP)
  - Two full deployments completed
  - Three units currently operating normally
  - One deployment stopped early due to bad cable
  - Cable vendor acknowledged delivering a bad batch of cables due to redesign
  - No deployment at WA Shelf because solar panels on adjacent surface mooring failed, so it does not have the power to telemeter acoustically to a profiler
  - Failed deployment at OR Shelf

- It should have recognized that the CSPP should have been treated like gliders with servicing every 2-3 months as opposed to 6 months.
- These can't withstand the winter months, so near shore, they pull during the winter months.
- Weekly status logging started in spring 2017.
- Jack highlighted the notable technical progress (see slides).
- Challenges:
  - instruments (CAMDS problems and OPTAA service continues to be slow)
  - heavy lift winch
  - recovery of 3 buried anchors.
  - power constraints.
  - transition.
- Examples of science results were provided (see slide)
  - There will be a student paper to be submitted to Journal of Physical Oceanography.
  - Jack provided a summary of the August 21 Eclipse event observations.
    - credit to Jon Fram for thinking to observe this.
    - great example of ECR process working.
    - the zoo plankton behave as if it is night time
    - there will be articles about the zooplankton getting “punk'd”
  - Hypoxia on the central coast. This year was a particularly severe year. This data is available from OOI

**Consolidated brief on Global Arrays** - Peter Brickley provided the report. His slides are included as [Appendix VI](#).

- They do three major cruises a year. The gray items have been completed.
- Global Array Configuration – It is supposed to have 3 open ocean gliders.
- Global Southern Array
  - It has been in water for 297 days and has some issues
  - They expect to recover them in December.
  - The chart on the right shows realtime status. There are issues with communications.
  - These are very difficult to service due to their remote location. There are very few ships/opportunities to check the mooring.
  - Peter displayed the Weekly Status Indicator – The items highlighted in yellow are cronic offenders. Early this spring, they lost contact. It cannot be repaired virtually. Most of the instruments are on the inductive link.
- Global Argentine – There will be a recovery-only cruise in November. This mooring has been deployed for over 300 days. It continues to chug along. There were gliders deployed. It is very difficult keeping gliders within range of arrays. Additionally there is tremendous biofouling. All 3 vehicles deployed this year are very far east.
- Station Papa Array – There was a deployment turn cruise in July. Ed Dever was the PI. There have been problems with systems. The cruise was mostly successful. There is a tentative plan to deploy an “interrogator” in February 2018.

- Irminger Sea – This is a stormy place. Every year that they have deployed, they have issues. See image of the mooring. It experienced a lot of damage that may have been caused by ice. This year a lot of work went into hardening the systems. They have added a heater to lessen the icing issues.
  - There was a deployment turn cruise on R/V Neil Armstrong in August.
  - They had one glider recovered by a ship of opportunity.
  - An example of the Cape Farewell Storm data was presented
  - It was a violent, rapid onset
  - Icing, turbine, and PV were damaged
  - Power limitations
  - Suspended data xmit Jan-April
  - Core Science Instrument issues (see slides). These are the same instruments that they have been having problems with.
- Inquiries for Global Array ancillary activities
  - NSF proposal
  - NOC 55 South Glider PCO2 sensor
  - NASA EXPORTS 2018

**Southern Ocean Arrays** – Sarah Gille summarized the community feedback received regarding the recovery-only decision. The talking points are included as [Appendix VII](#).

- Southern Ocean is under-sampled; no surface moorings as far south as the Southern Ocean site
- Considerable community interest in Southern Ocean site to support Year of Polar Predictability, which begins in early 2018. Intensive observing period in Southern Ocean in early 2019
- Discussions regarding removal led to question: can we at least have the data on the Global Telecommunications System (GTS)?
- Appendix Air-Sea Flux Observations are sparse. There are only two sites, the circle is Australian and the star is the OOI mooring.
- Recommendations
  - All OOI (near real-time) data should be on GTS.
  - For YOPP (Arctic), Numerical Weather Forecasting groups would like to have Irminger Sea for full Arctic period (starting 1 Feb 2018).
  - For YOPP (Southern Hemisphere), community will campaign to revive Southern Ocean surface mooring for special observing period (Nov. 16 2018 - Feb. 15 2019).

Discussion:

- Lisa Clough – NSF has made the decision to not redeploy, but they are interested in hearing the ramifications of not redeploying. They are going to take a year to think about what to do with the spare equipment. CGN was in the process of refurbishing the equipment. The stuff that gets recovered will not be refurbished.
  - there is a pathway that OOI wants to use all of the spares
  - there is a pathway where folks propose to get the instruments and refurbish

- there is a pathway to allow international use of instruments.
- NSF is interested in hearing about OOIFB on the process and the implications.
- Greg Ulses – They are working with WHOI to determine the costs for refurbishment, etc. If the cost is reasonable, they would like to refurb the retrieved arrays. They will look into the cost for long term storage of the arrays if not used.
- Bob Houtman – FB should develop whatever input they would like to make. No need to wait for NSF.
- Jim O'Donnell – Is there a time planned for meeting with other agencies? Bob Houtman – No plans at this time. It has come up informally. Once the costs are better known, there might be others who are interested.
- Lisa asked the NSF program officers on their thoughts. Eric – Folks don't know what is there.

### **OOI Cyber-Infrastructure (CI) and Data:**

**CI** - Ivan Rodero provided the presentation. His slides are included as **Appendix VIII**. He described the:

- CI Overall Architecture
- Integrated Software Stack
  - OOI Data Portal + M2M
  - Thredds and Raw Data
  - ERDDAP
  - Alfresca
- Uframe Update
  - Uframe/source code is available to OOI program without any limitation.
  - Uframe-based OOINet expertise/docs exists
  - Rutgers is ready for U-Frame based OOINet operation and maintenance.
- Uframe Ingestion Functionality
  - Uframe ingestion functionality developed, tested and delivered
  - demonstration delivered with easy-to-use capabilities
  - extensive training and support provided to data team
- Ingestion coordination spreadsheet – Provided access to ingestion functionality via M2M
- Overall CI software schedule – they have demos after each sprint.
- Software Schedule - Updates
  - enhancement efforts – focused on data delivery
  - CI system issues have been moved to Rutgers CI scope of work
  - SW schedule until end of 2017
  - Current status of Redmine tickets was provided
- Support for ERDDAP development status was reviewed
- CI Operations Update
  - CI availability - In 2017, OOI CI availability exclusive of scheduled downtime has been 100%.
  - Cyber security – 1250 attacks mitigated between January and June 2017



- Data Download Statistics – Increasing significantly over time.
- OOI CI Team members were presented.

**CI Data** - Mike Vardaro provided the report. His slides are included as [Appendix IX](#).

Mike reviewed the major activities from the past year.

The slide deck includes a lot of information that should be reviewed. Major topics covered include:

- Introduction
  - OOI by the Numbers
  - Rutgers CI Team
  - Timeline context - CI Data came on line in 2015. There was a backlog of several years of data with CI became functional.
  - Data Team Primary Goals
    - Monitor the operational status of data flowing through the OOI system
    - Ensure the availability of OOI datasets in the system (raw, processed, derived, and cruise)
    - Ensure that data delivered by the system meets quality guidelines
    - Identify availability and quality issues and ensure they are resolved
    - Communicate known data issues with end users
    - Report operational statistics on data availability, data quality, and issue resolution
  - Day in the life on an OOI data evaluator.
- Data Flow and Products
  - Data Flow example: Pioneer profiler
  - Current data processing flow chart
  - Data types include:
    - Telemetered Data
    - Recovered Data
    - Streamed Data
    - Shipboard Data
    - Metadata
  - OOI Data Product Levels
  - Web Portals
- Data Review Procedures.
  - Data annotations – these are the primary means of communication between data team and user.
  - Current “Rest-in-Class” reviews and workflow
  - OOI Automated QC
    - 6 automated QC algorithms can produce 7 flags which are plottable and are included in downloaded files
    - Coded based on specifications written by OOI Project Scientists, derived from QARTOD manuals and other observatory experiences
  - Data Availability –
    - 87.5% of all actively deployed platforms are providing all available data

- Recovered data and backlogged telemetered data are currently being ingested into the system sequentially.
- Ingestion - testing purge/ingest for complete deployments to generate estimated ingest schedule for all data sets.
- Current Status – Data review interrupted while the team focuses on ingest. Previously run reviews resulted in annotations that largely deal with unexplained data gaps, which we hope will be filled in by the purge and re-ingestion process.
- Annotations
- ERDDAP - There are currently 846 streams available on the production server. currently a password protected site. You can now see the code (read-only). You can use search to find the data sets that you are interested in. Only recent deployments, non-cabled data are available.
- Mike showed the data portal and some of the improvements since the last meeting
- Data timelines are now available to the public.
- Periodic Reviews and Documentation (including QC)
- Next steps:
  - Data products are still being added.
  - Adding capability to OOINet experience
  - Outreach and communiyt efforts
- Conclusions
  - A large amount of high quality data has been and is being collected, with high science value
  - Data review is finally our primary focus, given maturation of the system
  - Data team accelerating RIC review via development of specialized tools
  - Short-term, medium-term, and long-term goals for improving data quality and delivery
  - OOI is providing a curated, consistent data system that is delivering data and metadata to the community

#### Discussion:

- Tim Crone – in the CI presentation it said that Data has full access to the production system, but Data slides say that they don't have access. Greg – Still working through these processes. Mike – there are still issues about how to process.

#### **Lunch**

**Data Dissemination and Cyber Infrastructure (DDCI)** - Tim Crone presented the draft DDCI Initial report. They had quite a few conversations, a meeting, and lively discussions. This draft report provides there initial recommendation.

The report has near term recommendations addressing OOI 1.0. The other part of the report has long term recommendations for OOI 2.0. The report is on Github. It has gone through a lot of changes. Hopefully it will continue to evolve.

The near-term DDCI recommendations regarding ERDDAPP:

- DDCI recommends to expedite the process of ERDDAP development – it is a system for interacting with a lot of data. ERDDAP sits on top of Uframe. Tim provided a few examples of how ERDDAP could be used.
- Another recommendation is for the IOs to interact with the ERDDAP developer, John Kerfoot. Users can build their own interface.
- If ERDDAP is picking up the data from Uframe or Cassandra, it won't be realtime. However if the ERDDAP interacted directly with Cassandra it could be real-time.
- ERDDAP does not include the cabled data. This was due to the size of the data sets. So there is the issue of back ingesting the data from cabled. But once that is ingested, the one-time problem is solved.

Discussion:

- Lisa – In the report, will the recommendation be just for uncabled data. Jim O'Donnell – The recommendation will be for all data. They recognize there is resource issues.
- Bob Houtman – Should there be layered recommendation approach. Is new current data more important than the ingested data? Jim – If you want to look at large data sets, then you really need all of the data.
- Tim Crone – if everyone was is on line for ERDDAP, you can get it going fairly easily. Mike Vardaro – he agrees.
- Greg Ulses – It is a resource allocation issue. It wasn't part of the initial push. There are manpower issues and it isn't unsurmountable.
- Deb Kelley – There isn't much regarding M2M. Tim –The M2M is working, but it hasn't been publically released.
- Ivan – They are working on the M2M release for the Sprint 10 if not 10, Sprint 11. Anything you can get from ERDDAP you can get from M2M.
- Tim Crone – Technically that is true, but you would have to write a lot of code for M2M to interface. He learned how to use M2M, he went on Friefdrich's site.
- Bob Houtman – When is the public release of M2M documentation? Ivan – It is about 4 weeks. The document needs to be made specific. Tim learned how to use M2M from the Raytheon pdf.

Data Ingestion Recommendation – This recommends is on the Rutgers plate. It probably won't work putting this on the MIOs because of the concern about two IOs ingesting at the same time.

- Mike Vardaro – When they tried to multiple ingestions at the same time, it stressed the system. Ivan – It is something that can accelerate the ingest.
- Mannish – there were basic things that the CI was built to. ERDDAP must be administered properly. There are concerns over robustness, security, etc. If it becomes a priority, it must be resourced adequately to reach production. This is important for the community. There are two parts of Rutgers – CI and Data. One cannot speak for the other.
- Tim Crone – The DDCI task was to identify a robust way to get the data to the community and that is what they have done. Mannish – the priority must come from NSF, OOI, and Rutgers.

## DDCI Recommendation - Establish an OOI Data Delivery Manager Position

Jim O'Donnell – They came up with this recommendation based on things that they discovered while researching this task. The backlog of data helped to identify the need for this manager position.

Greg Ulse – He was pleased to see this recommendation. It is an issue that has been a known challenge. It was an artifact of the actions taken in 2014. Some of the issues have persisted.

Jim O'Donnell – It is impressive what has been accomplished by the OOI program. The only limitation is getting access to the data.

Tim Crone – It is important to know that this report is not criticizing past actions, it is not looking back. It is focused on getting the community access to the data.

## Documentation Recommendation

- Tim Crone - There should be a move by CI to increase the available documentation. He received a lot of input on this.

## Longer term DDCI Recommendations:

Recommendation regarding U-Frame – There are not a lot of people who don't like Uframe. However, some people value the Cassandra/U-Frame model.

- Tim Crone – From his view, it perhaps shouldn't be scrapped, but it should be evaluated.
- Jon White – He thinks the report is great, but why should the assessment of U-Frame wait until 2.0?
- Tim Crone – DDCI felt that it should start now.
- Tim Crone – Going forward, the focus should be on the science use and how the scientists use the data. What is available, metadata, quality, etc? Scientists have a very different process of how they use the data.

Consider partnerships for providing remote compute capability for larger OOI datasets (XSEDE, Calit2, Private entities, etc.)

- Mannish – They have a pilot effort using XSDDED. They have a person, not on OOI, exploring this. If you send him emails, they are happy to work on this. They are working with Amazon, but not Google.
- Ivan – they are looking into a variety of these things, with non-OOI data.

Support operational centers by disseminating data in real-time via systems such as the Global Telecommunication system

## DDCI Next Steps:

- Tim Crone – They would like to make minor changes to the documentation section.
- Lisa would like the report as soon as possible. Next week would be optimal. No later than a week from Friday.
- The DDCI will finalize their report and send it to OOIFB for approval (2 days for approval).

- Conversion of DDCI to a standing committee. This will be readdressed after the OOIFB Charter is established.

**Lisa Introduced Scott Borg**, Acting Director of NSF Geosciences. Scott – OOI is an important activity at NSF. OOIFB is important because it shows that there is community input. The OOI will be a useful enterprise in understanding the oceans.

**Traceability Matrices Refresh Effort:** Larry reviewed the goal of the matrices refresh effort: OOIFB is reviewing the matrices to gain an understanding of the original goals of OOI, to understand how the status of sensors and platforms affects the original science goals, and, finally, to assess the desired information required about sensors/platforms in the future.

- Lisa Clough – There was an OOI science plan dated 2005. There are also the 2007 Traceability Matrices. SOC was charged with updating, but it was realized this wasn't the right group. It was recognized that perhaps OOIFB should do the refresh and if they did this, it could serve as the science plan. Internally at NSF, there is discussion on the need for a science plan. They are not sure what the science plan would be. Once the refresh is complete, should there be a 2.0 update.
- Bob Houtman- NSF might have to make decisions about infrastructure in the future, so a science plan could be helpful. OOI is a facility like a ship and is funded out of core.
- Lisa Clough – In the absence of a plan, other documents take preference. She gave the example of the *Sea Change* report.
- Larry Atkinson – Maybe it isn't a "Science Plan." Perhaps it should be considered a science perspective, or science opportunities.
- Sheri White - In review of the Matrices, it wasn't clear what to do with the things that were never implemented.
- Lisa Clough – Perhaps there should be a Matrices 1.0, but another set for Matrices 2.0. OOI 2.0 will be Operations and Management.
- Kendra Daly – Should we have version control on the Matrices?
- Bob Houtman – Let the past matrices stand alone, then have Matrices that have the 1.0 capabilities and then have matrices for looking forward.
- Sue Banahan – The initial exercise should be a refresh of the capabilities. When you come into the future, if you have to eliminate a sensor, you should be able to look back to see if you eliminate a sensor, what the implications will be.

The matrices assignments were as follows:

- [A01 - Global Carbon Cycle](#) - Kendra Daly
- [A02 - Air-Sea Exchange](#) - Sarah Gille
- [A03 - Ocean Circulation](#) - Sarah Gille and Ruoying He
- [A04 - Subsurface Biosphere](#) - Brian Glazer and Deb Kelley
- [A05 - Plate Scale Seismic](#) - Deb Kelley
- [A06 - Gas Hydrates](#) - Deb Kelley
- [A07 - Climate Variability](#) - Kendra Daly

[A08 - Mixing and Topography](#) - Sarah Gille

[A09 - Endurance Low Oxygen](#) - Brian Glazer

[A10 - Pioneer Array](#) - Sheri White and Ruoying He

General discussion on the matrices refresh effort:

- Kendra reviewed the markups of A01. It isn't totally clear what the status of all systems are. There are some platform issues as well.
- Lisa Clough – There are annual reviews at NSF with subject matter experts. They need recommendations regarding which systems to remove. NSF would welcome input from OOIFB.
- Kendra – While not all of the requirements can be met if there are no surface profilers, we could do some things.
- Kendra – she has heard that there were new instruments that have been added that we have not captured.
- Lisa – NSF is funding projects that put instruments on OOI for the duration of the award with a recovery plan. Users can petition to be added to the core.
- Kendra - Some instruments don't work well.
- Greg - Changing sampling, refresh, etc. are all resource allocation issues.
- Kendra – we need to insure to the community that we are providing the best instruments possible.
- Jim O'Donnell – It would be good to advertise the OOI sensor problems because others might be having similar issues.
- Greg Ulses– the Lessons learned meeting is still outstanding and has to happen.
- Sheri White – the workshop at MBARI was fabulous for learned about what didn't work.
- Kendra – They can clean up the A-01 Matrix. What would NSF like? Lisa – keep working on this. Something more recent than the science plan for 2005 is needed. Update the 2007 plan with refreshed Matrices and post on the OOIFB.org site. This would be helpful for NSF's presentations to NSB.
- Lisa – For people who are submitting a proposal, they should confirm that the past OOI data is available and indicate that in their proposal (could be a letter attached to the proposal).
- Lisa – we don't want to lose the original matrices. We would want a version that locks in OOI 2.0. Maybe there should be updates every 5 years.
- Deb asked about the forward looking input that was on her chart. Lisa – this is important and was suggested during 1.0., as long it is clearly stated.
- Ruoying – perhaps we should state that what we have now and what science can be addressed now.
- Jim O'Donnell – OOI would be the core and the PI installed instruments would augment. Some of these questions cannot be answered with the existing questions. Whose responsibility is it to see that the OOI science questions can be answered?
- Lisa – What if we go with Deb's model and add inspirational questions. These should be added with the dashed lines.
- Lisa – How long are the refresh efforts taking and are they worthwhile?
- Sarah Gille – The questions are good and the matrices can be reviewed easily, but she gets stuck. She suggests feedback from the science community would be good. She reviewed A-08.

- Lisa – These are useful documents and they are open to the public. If OOIFB would like to go out to experts in the community, they should.
- Larry – Are these matrices useful to more than just NSF. Lisa – yes, so external help is fine.
- Sarah – is happy to start the progress of engaging the broader community.
- We would like to post one or two of these to the community soon. Deb’s is almost ready. She will look it over and send it to Larry.
- Mete – Most science users just want access to the data.
- The Pioneer matrix is close to complete
- A-01 is close is close to complete.
- It shouldn’t take long to finish up endurance.
- Mete – If we are thinking about expanding or descoping, these are difficult questions. Larry – the matrices should be able to make informed decisions.
- Ruoying – This information on the matrices is useful to investigators. Make these available.
- Larry – We can have a little narrative about the history of the matrices and then the task that was carried out.
- Kendra – She pointed out that we may have to add the Southern Ocean back in since there is 2 years of data.
- We can make the matrices look pretty after the google sheet is done.

Action item – Prepare a consensus statement(s) on the way forward for refresh of the traceability matrices and sensor/platform status.

### **Informational Topics :**

**Surplus Equipment statement:** Garah Gille gave an update on the history of how the statement regarding “Supporting Science with NSF-Owned Equipment Purchased for OOI came to be. When it was announced by NSF that OOI will remove its two Southern Hemisphere moorings, community members recognized that this change would open new opportunities for PI-led science initiatives that might be able to make use of equipment purchased by OOI and owned by NSF in order to carry out cost-efficient and well-targeted science objectives. In turn, OOIFB recommends that equipment that is still operating and no longer needed by OOI should be managed by NSF, with the specific aim to support PI-led core science proposals focused on ocean sciences and on processes at the air-sea interface.

### Discussion:

- Paul from WHOI – He would like the surplus materials at WHOI so that they can be used to help with the tight turnaround schedule of the arrays.
- Sheri – There are two types of moorings – surface and subsurface. They are having a hard time getting instruments back from the vendors. Having an extra set would be a big help.
- Lisa - NSF has put a moratorium on the surplus equipment for one year. They could potentially say that OOI gets first dibs and then the rest is up for bids. NSF is not looking for OOIFB to solve this, instead they are looking for OOIFB’s suggestions. Other countries and agencies might be interesting. They will be getting multiple inputs on this.
- Bob Houtman – the statement has the right level of detail.

- Jim O'Donnell – Should we state that high latitude measurements were transformational and these equipment should be maintained. The first recommendation would be importance of high latitude measurements. The original design was a good one that was supported.
- Sarah – These systems were designed for high latitudes.
- Jim – Who is coordinating the Polar Year. Sarah – YMO and participants include Canada. In the US, there is no designated funding. It is proposal driven. The Southern Ocean is November 2018.

Larry proposed the following tasking:

- Jim writes introduction for the statement.
- Sarah finalizes the statement.

**Ancillary activities on OOI cruises** – This task was initiated from an announcement from Al Pleuddeman regarding opportunities on OOI cruise with berth space. There is concern that these opportunities should be announced more broadly, beyond the IO institutions.

- Annette – UNOLS has a cruise opportunity site on the UNOLS Page.
- Barbara Ransom – This should be open to assistant professors/early career.
- There is no action item. Future cruise opportunities can be sent to the UNOLS Office.

## Adjourn Day 1

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**Day 2: Wednesday September 27th - Location:** NSF Room W-3220

### **Annette reviewed the action Items:**

- DDCI Recommendations Document.
  - DDCI should hold a phone meeting to finalize their recommendations document.
  - The document should then be send to the OOIFB for a 2 day review.
  - Following the review, OOIFB will send the document to NSF.
- Traceability Refresh – ongoing. OOIFB will futher consider next steps.
- Surplus OOI equipment:
  - Jim O'Donnell provided an inspirational opening statement.
  - All agreed with the statement/recommendation
  - OOIFB will send it to NSF and post it on the OOIFB website
  - Equipment title is held by NSF
  - Lisa Clough – the 1-year moritorium for the Southern Ocean equipment starts now, so next fall could be the earliest redeployment. NSF has inquired from WHOI about the cost and timing of the surface mooring. The associated costs for refurb, storage, assembly, shipping = \$3M ship + \$3M refurb.
- OOIFB and SOC Discussion Topics – Deb Kelley is coming up with a list of discussion topics.



**OOI User Metrics** - Lisa Clough reported that NSF is working with COL and Rutgers to pull together metrics to that they can learn more about the community of OOI users.

- IRIS started with a password approach, but then they got rid of it to make it easily accessible.
- If you are a science user, you get the data via FTP. So this is a hybrid
- NSF is thinking about the metrics for success that they need to know for 2.0.
- OOI can only follow Facebook followers
- For IP hits they can only get country.
- It would be good to be able to get forensics on the users.
- We don't want to create barriers, but we do want to collect metrics. This would mean password protected, where they can ask demographics.
- NSF would like OOIFB feedback.

Discussion:

- Kendra Daly – Now everyone requires a password. It would be good if data could be explored, but if you want to download it you would have to get a password.
- Sarah Gille – For class work, she would probably just download data and share with her class. Or give them all the same password.
- Jim O'Donnell – He has dealt with this in IOOS. The important metrics are: How many proposals are asking to interact with OOI data? How many papers are based on OOI data? We need to be able to track these. There should be a check off box on the NSF proposal.
- Lisa Clough – We are getting the proposal metrics, but it is the use by non-NSF users that is also needed.
- Deb Kelley – ONC no longer has a log-in. IRIS would get weekly email addresses.
- Tim Crone – De just downloaded data from IEDA. Folks are moving away from passwords.
- Kendra – ONC is documenting everything and really need the metrics.
- Tim Crone - To increase use, don't require passwords.
- Lisa – The Sea Change report said, “there is no OOI community”
- Ruoying He – it is important to get a sense of the volume and the only way to do it is through log-in.
- Tim Crone – There are other (sneaky) ways of doing it.
- Larry – we need to identify the community.
- Lisa – Tt takes many years before a paper can get written without DOIs.

**ACTION ITEM** – Identify strategies for collecting User Metrics.

- Jim O'Donnell – this could be a task for DDCI.
- Tim Crone – DDCI can bring in experts to address this.
- This will be on the agenda for the next meeting.
- This DDCI tasking is for 2.0.

**Introduction of Kristen** – Lisa Clough asked Kristen to explain why she is at the meeting. OOI/COL was asked to submit a supplement. Kristen is the co-PI. There is a lot that can be

done before 2.0. Kristen is VP for Education and Outreach for COL. They run the peer review process for proposals. GOMRI, IOC, NOOP office, National Ocean Science Bowl, etc. are some examples of programs. Because of that experience, COL was asked how they could provide additional bandwidth for 1.0 activities and address activities that had not been done. They will work with the SOC.

- Larry Atkinson – It is only 6 or 7 months until 2.0, what does COL plan to do? Kristen:
  - identify what papers are out there.
  - Lessons Learned workshop
  - help support DDCI recommendation as best possible
  - support matrices refresh effort combined with the sensor status.
  - support some SME reviews.
  - assist early career advancement.
  
- Larry – Who is the contact person at OOI? Kristen – it is still Greg.
- Lisa – They are not adding anything new.
- Bob Houtman – When communicating with Greg, copy Kristen.
- Jim – what is the relationship of education at Rutgers and COL. Lisa Rom – Rutgers has been funded for working with educators and providing workshops, etc.
- Lisa – Outreach has multiple owners.
- Larry – We have had workshops with OOSC.
- Kendra – are there specific things that Kendra would like help with.

### **Outreach:**

From the NSF mandate to OOIFB:

*Serve as the prime scientific and technical conduit between the oceanographic community, NSF, and the OOI Operator.*

- **Develop and implement strategies to expand scientific and public awareness of the unique scientific and technological opportunities of the OOI, and ensure that the oceanographic community is kept informed of developments in the OOI.**
- *Identify existing and potential end-user communities, their needs for data and meta-data information from the OOI, and provide guidance on the OOI's effectiveness in disseminating this information to end-user communities and the general public.*

Lisa Clough – This is the task statement, but it applies for more than OOIFB

Outreach Brainstorming Activities:

- Deb Kelley - OOI Hackathon will be focus on the cabled array at UW.
- Deb Kelley suggested a community meeting at Ocean Sciences 2018. Jim O'Donnell – he is worried about a lack of available OOI data at the time of Ocean Sciences

- Barbara Ransom – Include an informational item at the UNOLS DeSSC meeting about OOI and at the DeSSC new user meeting. Annette – We can include this on the agenda.
- Lisa – They would like 2.0 poised for success.
- Tim Crone – ERDDAP could be another layer on what has already been built.
  - Larry – Let's explore having a webinar on ERDDAP.
  - Jim – We could ask 1.0 team to get 80% data into the ERDDAP within a couple months.
  - Larry – What data will be available by March?
  - Tim – All data should be ready by March.
  - At the Ocean Sciences OOI Booth there should be an ERDDAP station for tutorials.
- Annette – We should start getting the community listserv started.
- Lisa – The OOI listserve is run by Leslie. They have about 1400 addresses.

**OOIFB Townhall at Ocean Sciences:** Larry Atkinson– An effective Town Hall includes an agenda with engaging discussion topics, food, and beverages. What should be the focus?

Brainstorming suggestions:

- What's working and OOI data.
- Some success stories:
  - Eclipse
  - One-minute talks
  - Invite success story speakers (out of the IO)
  - Students / Early Career
- Eric Istweire – Hold the town hall on Monday. If OOI data is easily available, then there could be workstations in the town hall room.
- Bob Houtman – What would be the most interesting data sets that the community would want to see. Highlight five things that are of great interest.
- Barbara Ransom – snazzy demos and then go to hands-on stations.
- Eric Istweire – If you want to engage the community, engage Coastal and Global (more likely to be Ocean Sciences).
- Sarah – Explain how do you do science with OOI.
- Deb Kelley – Freidrich give a great tutorial.
- Ruoying He – He suggested that there be an OOI tutorial.
- Mete – there is still the question of what will be ready at the time of Ocean Sciences.
- Jim O' Donnell:
  - What is working
  - What data is available
  - Can it be accessed.
  - The heat maps are good to show how things are available. These provide good summaries.
- Ruoying – Show user friendliness
- Lisa – Show success stories and then here is how you can get the data.

- Show people how to navigate ooi.org site to find the status of instruments.
- We want a summary of sensor status
- We would like the Town Hall to be on Monday.
- Lunch will be provided
- We will broadly advertise and send out a Kandy gram.
- Everyone was asked to send success story speaker suggestions
  - Scott Nooner
  - Karen Bemis
  - disciplinary range of topics.

**OOIFB Annual Report** – Larry reviewed the report [outline](#). The report is due December 31, 2017. Per the OOIFB Mandate: “At the end of each calendar year, the OOIFB will provide a public summary of that year’s external OOI Advisory Structure activities to be distributed widely in the public domain.” Larry and Annette will draft the report. It can be brief.

**Plans for 2018:**

**Membership** – The initial one-year terms for Kendra Daly, Jim O’Donnell, and Ruoying He will end before the next meeting. All agreed to serve another 3-years. A motion was made (White/Gille) and passed to reappoint Kendra Daly, Jim O’Donnell, Ruoying He for a 3 year term.

**OOIFB Charter** - Annette explained that procedures need to be added to the OOIFB mandate for membership, voting, standing committees, and general operating procedures. Larry and Annette will work on these and distribute prior to the next meeting.

**Strategic Planning** - Deb Kelley stated that there hasn’t been an updated network plan since 2010. The plan describes the OOI system just before construction. It was agreed that it should be taken off the OOIFB site.

Larry – The OOIFB recommends an updated document of the deployed platforms and sensors with a common visual format across all arrays. A brief introductory paragraph should be included. This will be needed for Ocean Sciences. It must include a decoder key for sensor labels.

**Meeting plans** - Larry suggested a May meeting in Seattle. It would provide an opportunity to see the OOI facility.

**Wrap-up** - Larry Atkinson invited comments from around the table:

- Jim O’Donnell – It would be interesting to hear more about the SOC. Lisa – The SOC is owned by COL. Members include Deb Kelley, Al P, Jack Barth, and Bob Weller. OOIFB won’t need to meet with SOC unless there is a specific topic. Jim suggested a 1-hour meeting of OOIFB, the SOC and CI/Data.

- Tim Crone – When the DDCI recommendation goes forward regarding a manager, it is understood that this will be a challenging position to fill.
- Sheri White – She would still like to dive into the instrument refresh. They have already had an instrument go obsolete. Some things are not as robust as needed. So what is the process of selecting new equipment and going out competitively? Lisa – This is a challenging issue. We want the operator to have some flexibility There is the ECR process now, but is it okay. Bob Houtman – The IOs and the COL team have to identify the instruments that are not working and identify solutions. Then come forward to NSF with recommendations. NSF will take it from there. There is not a perspective on refresh. This will be an instrument, by instrument evaluation. It would be part of the annual workplan and consider budgets. OOI is not a technology program. Refresh will be on a sensor basis and these are commercially available.
- Ruoying He – What is the status of relocation plans for the Pioneer Array? Bob Houtman – This will not occur in the next 5 years. Lisa Clough – May 1, 2018 will be the start of the 5-year clock.

**Adjourn** – A motion was made and passed to adjourn (O'Donnell/Daly). The meeting adjourned at 11:50 am.