**Alaska Ocean Observing System**

**DMAC Advisory Committee Meeting**

**June 15, 2011 Anchorage**

*In attendance*: Phil Mundy (Chair, NOAA/NMFA/AFSC), Rob Bochenek (AOOS data team lead), Warren Horowitz (BOEMRE), Molly McCammon (AOOS), Peter Olsson (AEFF/State Climatologist), Tom Heinrichs (GINA), Angel Corona (NWS), Darcy Dugan (AOOS), Allison Gaylord (BASC/Nuna Technologies), Steve Lewis (NOAA), Stan Smith (USGS).

*Additional participants:* Jess Grunblatt (GINA/NSSI), James Partain (NOAA Climate Service), Cathy Coon (BOEMRE), Russ Frith (NPS), Cuyler Smith (NPS), Gary Hufford (NWS)

*By phone*: John Payne (POST)

**Follow Up Items:**

* Rob will check to see if GeoSpatial One Stop has the functionality with inputting metadata similar to what AOOS is attempting to do with the Ocean Work Space.
* AOOS will query other regions about their AOOS Distribution and Access Policies to look for ideas of what’s working or necessary
* A working group on AOOS Distribution and Access Policies (established during this meeting) will develop a draft policy that the Board can discuss in September
* There will be an annual review of Axiom in August that Steve and Angel will participate in
* Rob will send committee members a username and password to access the feedback AOOS is receiving from users.
* Darcy will work with other organizations and partners to have the AOOS portal linked to more websites.
* Darcy will send around a doodle poll for a new Sept committee meeting date

**SUMMARY:**

**Director’s Update (Molly McCammon)**

AOOS is delighted to have Axiom in Anchorage, and the working relationship between AOOS and the data management team has gotten off to a strong start.

In the past 6 months, AOOS has submitted 7 proposals in addition to our 5-yr funding proposal. Axiom has participated in the writing and submission of all of these.

Molly has worked with NOAA (Amy Holman) to make sure AOOS was included in NOAA Arctic Vision and Strategy

**AOOS Current Activities:**

* AOOS continues to develop and update the Arctic Research Assets map. We are making an effort to get access to real time weather buoys through a Shell/NOAA data sharing agreement which is in the early stages of development. It looks promising.
* AOOS participated in the NOAA-sponsored workshop this spring to outline the development of an Arctic ERMA (emergency response management application). We are now working on a pilot project with CIRCAC to develop a “Cook Inlet ERMA-lite” which would include ShoreZone imagery.
* AOOS has begun its partnership with ADFG partnership. The goal is to make ADFG fisheries data more accessible to a broader group; and make it easier for fisheries scientist to access ocean data. AOOS has funded ADFG to upgrade their servers, and hire a subcontractor to get escapement data in better shape for sharing.
* AOOS is about to start a 10-year build out plan, required by IOOS. This would detail what a “bare-bones” system would look like to meet stakeholder needs in Alaska. The specifics requirements for the plan (including funding level) have not yet been agreed upon by IOOS and the regional associations.
* The Polar Research Board (of which Molly is a member) will be conducting a review of AON/SAON. NSF has asked the PRB to develop future arctic research priorities.
* AOOS is still an active member of the Alaska Data Integration Working Group

**Data Management Update (Rob Bochenek)**

*Annual regional data management workshop* -- Rob attended the annual regional data management workshop in Silver Spring for 2 days in April where IOOS went over high-level strategies for the future build-out of the national program. IOOS’ data management strategy is currently a little nebulous with respect to standards, certifications, and interactions with regional associations. They would like to provide direction to RAs but realize that due to bureaucratic nature of the IOOS office, they may not be the most effective entity to do that. Issues that were brought up during meeting will be distributed to RA data people to figure out while IOOS office restructures its data program (they just lost their data architect). It seemed that IOOS should act as facilitator, but not to dictate the standards**.** The IOOS data team has 3-4 people.

*Interoperability discussion*: IOOS has looked at core variables are collected and how data should be served up but haven’t worked as closely with the regions. A question is how to work more as a network to be more cost-effective and efficient. Peter Olsson noted that in recent years, we spent effort trying to meet standards and then they would change again, and hoped we don’t keep spending money doing that. It was acknowledged that it is difficult to achieve interoperability because there are so many standards. NOAA is one entity in principle, but in practice it’s a really big entity. Rob Ragsdale and Derek Bridget are the people responsible at IOOS for helping the RAs with standards. Derek is sitting in for Jeff DLB, the former architect. Derek is taking much different approach than Jeff; asking individual managers at RAs to draft new emerging standards.

Rob cited 2 kinds of interoperability: Syntactic which includes data, or semantic which is data *and* understanding. This includes dictionaries, definitions, and ontologies -- what metadata should be associated with a model not so humans can understand but so computers can understand.

*Update on the DIF (Data Integration Framework:* The DIF was an exercise undertaken by IOOS office 2-3 years ago to establish syntactic and semantic interoperability for RA nodes. It focused on 5 core variables and was successful in allowing RA’s to share and stream data that existed in these core variables. The formats were netcdf and sensor observations. While successful, the project was just an initial pilot and now those 5 core variables need to be expanded to the 26 core variables. The new emerging standards and certifications are somewhat nebulous in terms of IOOS, and regions recommended developing implementation specifications. Rob felt that IOOS needs to say: “Here’s the reference specification for core variables for threads server…. now compare what you have to that. “

Phil noted he didn’t think we should expect guidance from IOOS. AOOS can go forward and set standards for visualization for IOOS core variables the way that works best for our region. However, we must use common dictionaries to use each other’s products in different regions. Right now at AOOS, sea surface temp might be labeled differently than at NANOOS (sst, temp at 0 depth, etc.). Once a dictionary gets adopted, regions should be able to make headway.

Color schemes/symbologies are difficult to conform because what’s marked red for our wave height max will probably never occur in east coast waters. It would be good to be able to modify the legend for the current distribution the viewer is viewing. Allison Gaylord suggested letting the user pick from a set of 3 legends. IOOS hasn’t done that but Rob is going down that path. For example, if a user wants to view all currents between 1 and 2 m/s and none of the others, that will soon be possible.

*OOI Cyber infrastructure update:* This is a parallel effort to IOOS, but in the realm of $600 million. The OOI program includes the Pacific NW cabled observatory initiative + mooring array and gliders (Oregon and Jersey are 5 year deployments; people bid on them.) There are also 4 permanent stations around the world including Ocean Station Papa. OOI involves physical and biological academics, and systems-level informatics experts. It’s difficult to differentiate how IOOS and OOI are different in terms of some of the goals, but there is a concerted effort for the IOOS office to coordinate with OOI cyber infrastructure initiative and use similar interoperability standards. It appears that both systems have similar data communication and data transfer. OOI is much more ambitious and theoretical where IOOS is much more pragmatic: OOI talks about 5 year future rollouts while IOOS is looking at annual or semi-annual (it is hard to have 5 year plan since technology is changing so quickly). Charly Alexander at IOOS is working with OOI so IOOS doesn’t duplicate efforts, and the two programs potentially support each other. OOI is much better funded with a lot more capabilities, but strictly research focused. They will provide some good lessons learned if we ever had a cabled observatory in Alaska. Right now OOI doesn’t have anything in our region.

**Tagged Animal Telemetry Workshop Update (John Payne from POST)**

On national scene, many groups are doing animal telemetry. Sometimes equipment is compatible and people don’t know it. He cited some examples of large animal tagging projects such as POST (Pacific Outer Shelf Tracking) which is the largest on the west coast. Their receivers are set up in lines that stretch from shore line to edge of continental shelf. One of these lines is in Prince William Sound (working with PWSSC) and there will soon be another line deployed in the mouth of PWS.

There was a meeting in March in Santa Cruz bringing together 40 scientists and technical managers, including program leaders from the telemetry networks and IOOS representatives. The explicit goal was to establish a sustainable US telemetry network, and link the data to the IOOS system. Telemetry community is self organized so far. At workshop, major questions included who the major customers are, why the data should be pulled into IOOS, and what should the role of IOOS be in helping organize the network. Major customers include federal and state agencies in fisheries management, tribal communities, the energy industry sector, tourism, general public, education & schools. They will start a dialogue with telemetry data managers in the regions about how to integrate the data which is a huge hurtle since some people want to publish before it goes public.

Currently IOOS is conducting an inventory of telemetry research in the US. A report will come out but not sure when. Next steps will be establishing a way to standardize tag, coordinating and support maintenance of infrastructure, and streamlining metadata (with help from IOOS data managers)

**Review of January Committee Meeting (Chair Phil Mundy)**

Chair Mundy looked over items from the last meeting to make sure recommendations had been satisfied. The only outstanding item was to send the committee a username and password to access feedback provided by data portal users.

**NOAA Climate Service Update (James Partain)**

James gave an overview of the goals and status of the NOAA Climate Service. It was deemed that NOAA couldn’t adequately cover climate needs without a new line office which was moving forward into the House Science committee squashed the initiative earlier this year. Six regional directors have been hired using other funding and will remain in their positions despite no staff.

James said the US Climate Reference Network (USCRN) is the gold standard for observations used for climate purposes. There are 114 field stations in the contiguous US as of 2008, as well as 8 stations in Alaska and 2 in Hawaii. There is a plan for a total of 29 stations in AK by 2018. Tetlin, Gustavus, and Katmai will go in this year. Gary Hufford is the USCRN contact for Alaska. James has a map of current, future, experimental sites, where they are trying to roughly populate the state (i.e. get a station within 200 miles of the dots!) They will survey this year for next year’s installations: Metlakatla, Thompson pass, Wrangell/St. Elias, south of Prudhoe, and near Aniakchak National Park. CSRN stations report hourly and can be streamed through the AOOS data portal. Funding for the CRN is solid. These sites cost $75K - $200,000 per station including maintenance. Remote power sources are a challenge, but once up and running, other sensors can be placed on them. Gary’s team helped NWS place the Alaska sites so that they would optimize their system.

James expressed interest in coordinating with AOOS on climate and data issues.

**Data Management Update CONT’D (Rob Bochenek)**

AOOS will soon have a Portland mirror site in case something happens to the system in Anchorage. This will start in July and will be fully functional by January.

Rob described two upcoming additions to the AOOS data portal:

* 7/01/2011 –AOOS integrated data portal beta codenamed (AOOS Ocean Portal). This system will allow users to visualize, query and integrate data from multiple source types (sensors, models, remote sensing, GIS data layers and in situ observations) on a single platform.
* 10/01/11 –AOOS project level data management system beta codenamed (AOOS Ocean Workspace). This system will provide a secure web based interface for storing and sharing project level data sets in addition to tools for authoring standardized metadata.

These applications are meeting needs that have been voiced by AOOS users on visualization and housing project level marine data. The Workspace platform would register datasets and make them available to larger community. Some historical datasets will lack metadata, but researchers can view them and help complete ones that have gaps. The Ocean Work Space application will also be leveraged for EVOS data management also. It will also be used as a data archive for homeless data.

Alison noted that GeoSpatial One Stop can do what Rob is attempting to do with Ocean Work Space

Rob will investigate this, but had done a serious assessment of what was available and didn’t find it.

**Model Explorer and Sensor Map Updates**

*Model Explorer*

Rob gave a quick demonstration of the Model Explorer and Sensor Map. The data disclaimer is now on the web. There are also 11 models and 90 parameters currently in the Explorer. The new AOOS High Performance Computing Cluster (HPCC) has helped them expand system functionality by 20 fold, and they are optimizing IOOS core code to help it work more smoothly. Display layers include sea ice extent (MASIE) and SNAP climate models (precip and air temperature on 3 climate scenarios from 1960-2100 time series.) In the future, users will be able to draw polygon around an area and see max/min time series data. You can also do real time sensor/model comparison.

There was discussion about better advertising these capabilities to users. Ideas included workshops, visits, and presentations to fishery managers. A workshop for ADFG supervisors would be particularly useful. Rob wants to go after historical archives of monthly mean satellite observations. Tom Heinrichs said GINA gets passive microwave data from MODIS and will talk to Rob about it.

*Sensor Map*

There will soon be a new version of the sensor map that will allow data streams to be archived and accessed. For data providers that do QA/QC , we will make sure to get the most updated data. There will be a graph on the bottom of the screen showing what years the sensor data is available.

What do PIs need to provide Rob to get seasonal sensors up fast? Rob plans to put something online for people to upload sensor feeds themselves. AOOS should be able to do fast turnaround if people let us know ahead of time.

Suggestion from Warren: it would be helpful to be able to pull data from multiple stations at once and see how they were doing over a period of time (polygon over an area). It would also be helpful to get something on the Russian coast and the Canadian coast. Warren has 30 year climatology from Russia to Canada for 1979-2009 in an Oracle database that will hopefully be ready this fall. There will also be a gridded model with netcdf files. It’s been complicated due to different sensors and different systems on different sides of stations. In 2012, there will be a netCDF WRF model for the whole area from Russia to Canada, and a climatological domain for the same period. Peter Olsson is on the scientific review board for that project.

*AOOS Ocean Portal*

This application will combine GIS data, model layers, real time sensors, and satellite images. Rob showed a draft view. Data can be extracted out as a file, and Rob ultimately wants to be able to request data from the system and have it go into the user’s AOOS Workspace account. Perhaps every user will get 5 GB of space (going into the cloud instead of onto your pc). The user could then store, delete, and share data with other, as well as pull them as shape files in ArcGrid through your interoperability system as a ‘local data source.’ This system will be released in July but will continue to develop over the next several years. Rob sees this as the biggest potential system in the AOOS data strategy.

*SEA BIRD PORTAL*

The Sea Bird Portal will soon be integrated into ocean portal. USFWS contributed money in past, and the Northern Forum is currently providing money. Axiom has leveraged AOOS infrastructure to support it. The portal includes known sea bird colonies and historic data and information. It allows researchers to add to the database, requiring user name and password. David Ironsat USFWS holds the keys to those services.

**DMAC Review**

Molly will facilitate a review for Axiom in August. Steve Lewis and Angel Corona offered to be part of the review team. Phil will be in DC from July 18 – Sept 2nd, but can participate if it is after that.

**AOOS Distribution and Access Policies**

The question was brought up about whether AOOS needs a signed form for people submitting data to us – saying we are not responsible if data is abused, and that they realize its going into the interoperable world. The committee had different thoughts. Angel said as long as there’s a disclaimer that says we can’t guarantee the validity of the data, it’s probably okay and a release form may not be necessary.

The term “abuse” data usually means “use against” or “scoop on a publication”. There’s still a culture among a lot of researchers that even though research is funded by public dollars, it’s still private data.

Warren said he wouldn’t send out real-time HF radar data (for download) until after the project is over since researchers go through the data afterward and it up. Many entities will make their data available for browse access but not download or distributing.

Rob noted that data can be provisional, private, or public. Rob is pushing hard against that -- if you’re going to put data into the system, it should be public. He thought it unlikely that people would switch their data from private to public if they had inputted it into the system as private.

*(Note: current meeting participants now include: Phil, Allison, Jess, Angel, Warren, Cuyler, Steve, Rob, Molly, Darcy)*

Molly is interested in a formal data policy that can be signed off by the AOOS Board in September. She asked for a group to write policy. Allison, Phil, Jess volunteered, and will have a draft policy by then that won’t be less restrictive than federal and state regulations. The scope for the committee is to develop a data access and distribution policy that is consistent with, and no less constrictive than, applicable federal and state regulations. Phil believed we shouldn’t waste time with data that has caveats and access codes. It was recommended that AOOS query other regions and federal/state policies to see what they are doing.

**Private Company Perception**

Molly brought up a concern that had been raised about Axiom being a private company handling public data and leveraging resources of different groups. Axiom is currently working with non-profits and government agencies that with similar missions and functions as AOOS, however there could be a time in the future when they are working on other types of projects and using these pooled resources for profit. She asked whether that could lead to a negative perception in future about the use of software or hardware that’s paid for by AOOS. It was clarified that there is a policy stating if Axiom no longer has the AOOS contract, they must give all AOOS hardware back.

Rob said AOOS currently takes up 60% of Axiom’s capacity. Right now they could take 40% of their capacity and find work in other disciplines, but are interested in environmental informatics. So far their other partners have come with amounts of money that can only make the end product possible if they leverage their existing data system (such as the freshwater based salmon integrated tool for Ecotrust). Rob is leveraging different infrastructure and pushing each a little further, so both benefit.

Phil’s felt that if Axiom isn’t violating their contract, this leveraging is fine. Angel also said he didn’t

have a problem with the software aspect and the intellectual property still belongs to Axiom. However, the problem he saw was using hardware that AOOS paid for to benefit another client without AOOS getting credit for a portion of the bill.

The committee discussed how computing clusters are used. Rob noted that that there aren’t axiom computers and AOOS computers right now. AOOS has 8 blades and axiom has 8 blades. But when they do projects, they system hits all 16 blades. It was discussed that maybe a formal partnership needs to be made between Ecotrust and AOOS. Warren thought it was more of a board decision. Molly was concerned about perception. There’s a legal aspect and also a perception aspect.

It was also noted that technology goes obsolete very quickly. In two years, half the resale value of the cluster may be gone. This could make this concern less relevant as far as economic value of the computer systems and resale.

This may be a question for the board: how do you want to purchase these kinds of data management services? Phil assumed Rob wants to be purchasing capabilities, not specific hardware (in terms of offering and pricing the services, not hardware.) Rob said if an opportunity arises to extend the hardware further, it would be wise to run it by the executive directors of the organizations who have chipped in funding.

**ShoreZone Incorporation**

The ShoreZone project produces Flash high definition video. Rob wants people to be able to select a location on the shore and fly the shoreline and stream the high def video. The only solution so far is to post the videos to Amazon Web Services where a specific media stream server capacity takes the flash video, creates a connection between the server at Amazon and the user, and modifies the imagery streaming.

At present, the ERMA application can’t incorporate ShoreZone. The client must be Flex, and ERMA isn’t (its java script which is old). The biggest problem with ERMA is its platform is 2-D (doesn’t include time or depth). Neither does the Marine Cadastre.

However, the Cook Inlet ERMA-lite that Rob is developing will have a customizable app with various modules, and will be able to do so. It is one of the first manifestations of the integrated application that Rob is working on already.

**Next Meeting**

Darcy will send out a doodle poll for a new September date for the next meeting.