

Final DMAC Meeting Summary
March 11, 2016 10:00 – 15:00
AXIOM OFFICE: 1016 West 6th Ave., Suite 105, Anchorage, AK

Started Meeting 10:05 Introductions, as we have a new member (Couch)

Attending in person: Carol Janzen (AOOS Operations Director, Oceanographer), Rob Bochenek (AXIOM information architect), Peter Olsson (AK State Climatologist, UAA), Michael Couch (Acting branch chief for National Weather Service, Regional Coop Observing Manager), Steve Lewis (Information Technology, NOAA Fisheries).

Attending by Phone: Warren Horowitz (BOEM, Environmental Studies, Numerical Modeling, Sea Ice, Oceanography), Scott Pegau (Oceanography, PWSSC), Phil Mundy (DMAC Chair, Director NOAA Auke Bay Labs).

Tabled approving the minutes from the November 2015 DMAC meeting until more people could get on the call.

10:15 Programmatic update - Carol Janzen, AOOS

Pacific Anomalies Workshop II (PAWs): January 2016 meeting in Seattle. Focus groups were convened to drill down on the atmosphere-ocean interactions, coastal and open-ocean interactions and the ecosystem responses and make recommendations for actions (data, research, monitoring) to better understand the impact of the event(s), including the 2015-16 El Nino.

- At the meeting, Russ Hopcroft gave a summary report for Alaska, using material received from numerous people working throughout the State.
- Carol mentioned that all the meeting materials and videos of the presentations are available on the NANOOS website.
- Here is the link for the [PAWS videos and presentations](#)

AOOS Ocean Acidification Workshop Summary: AOOS held a successful Ocean Acidification (OA) Workshop, which focused on the technical issues (methods, approach, standards, what works, what does not). This was not intended as an outreach workshop; however, it did bring together experts and non-experts working on OA and water quality issues in the State, so was a great venue for information exchange and collaboration building. In feedback following the meeting, several participants said they now see that they need to make more careful measurements to be meaningful to the overall OA research going on in the State/Nation/World, and this was a great outcome. Carol is preparing a workshop report, which will be available on the website when completed.

Ocean Acidification Network for Alaska: A natural outcome of the OA workshop was the convening of the statewide partners in OA research and monitoring. AOOS is now taking the lead to establish an Alaska OA Network following this meeting, and Darcy Dugan is the lead for AOOS on this. She is working under an existing funded OA collaborative project with the west coast IOOS RAs, and has just submitted a short proposal to NOAA to support additional OA Network activities and outreach. The AOOS website will host a webpage for this effort. (Note: This proposal has since been fully funded, April 1, 2016).

Status of the AOOS 5-year Proposal: AOOS learned in February 2016 they received level funding through the IOOS program, and the proposal was well received by the reviewers. This means that AOOS will be able to proceed with the current program for Year 1, but will not likely be able to expand the program in 2016 without additional financial resources or external grants.

Updates from Spring IOOS Meeting: The two-day spring IOOS meeting was held in Silver Spring, MD at the NOAA IOOS office. The new Assistant Administrator for NOAA’s National Ocean Service, Dr. Russell Callender, gave a presentation. IOOS falls under the NOS mission. His relationship is important to IOOS, so it was nice to meet him and hear how he plans to interact with IOOS.

- His position provides strategic vision for NOS and leads the implementation of activities that support NOS’ priorities of coastal resilience, coastal intelligence, and place-based conservation. He serves as the focal point for conveying the value of NOS products and services within NOAA and to the Department of Commerce, the Office of Management and Budget, and Congress. Dr. Callender actively establishes and grows partnerships with other federal agencies, non-governmental organizations, and industry.

Russell discussed his commitment to the IOOS program. Following his presentation, NOS program updates were presented from each program group’s lead PIs, and we discussed how the RAs and IOOS could contribute to these programs, as well as the need for better collaborations going forward to avoid duplication of efforts.

IOOS Closing Gap Campaign:

Carol discussed the IOOS Filling the Gaps campaign and how that works and how it has been received thus far.

- IOOS and regions are working together on an initiative to fill high priority gaps in coastal observing.
- In 2016, HFR surface current mapping gaps were identified in 3-4 regions, and the lack of O&M support for existing aging systems across the network was also discussed.
- This campaign is aimed at filling these gaps and providing O&M support where most needed, keeping in mind that not every region will benefit with each initiative request.
- The good of the whole is the approach here, and this approach appears to be resonating well within NOAA and on the Hill.
- Alaska is one of the regions that would receive additional HFR assets, for monitoring and safety along the [Arctic Marine Highway](#) in the Bering Strait region. (2 stations).
- The [HFR Filling the Gaps campaign handout](#) and materials will be available on the AOOS website.
- Warren wanted to know how the critical gaps were picked. He also stressed the O&M needs for this program, and said AK needs more money than the average HRF set up to keep their few but complicated remote systems going. He stated that AK needs more than other states that are on the grid, and stressed we should be pushing for this. He also expressed concern over losing the expertise here in the state to make these installations possible, so supporting the AK UAF HFR team should also be considered a key priority for AOOS and IOOS.

ICOOS Act Reauthorization activities: Carol discussed the Hill visits to Rep. Don Young, and Senators Murkowski and Sullivan offices.

1. Congressman Don Young is the primary sponsor of House version for ACT, HR 2744. HR 2744 funding would be capped at past appropriation levels. A House mark-up is expected soon.
2. Senators Murkowski and Sullivan are co-sponsors of the Senate version of the ACT, S 1886. It is marked up, and hope is it will get a unanimous vote. The Senate version is more flexible with funding at “such sums as necessary”.

Carol provided handouts to the DMAC for the IOOS DMAC Vision Document and the RA DMAC Survey that was conducted for the spring IOOS Meeting. **Rob completed this survey?**

Rob added that IOOS is trying to centralize its data system to reduce duplication in effort, and to make accessing data more seamless for the user wanting to access and see larger-scale regional data displays and data streams. With Axiom supporting work for IOOS as well as assisting other RAs with their data management

services (CeNCOOS and SECOORA), AOOS can benefit from programmatic efficiencies and new products developed by these other programs.

Ocean Sciences Meeting 2016: Carol gave two presentations with PI co-authors (AOOS Project Principal Investigators) at the biennial Ocean Science meeting in New Orleans, Feb 21-26, 2016.

1. Talk title: Expanding Alaska's Remote Ocean Observing Capabilities Using Robotics, Gliders and Remote Sensing Technologies, which presented projects that utilize these technologies, and also some new profiling float data along a 2 year transect following the Aleutian Trench.
2. Poster title: What is going on up there? The Chukchi Sea Ecosystem Mooring. This poster described the AOOS instrumentation outfitting this mooring, and also presented preliminary results from the IOOS funded Ice Freeze-Up Detection Buoy deployed in 2015.

10:30-10:45 Break

10:45 Data Team Report – Rob Bochenek, Axiom

Rob discussed the new data center NCEI – National Center for Environmental Information. NCEI will be the umbrella organization for NOAA's three national data centers: NODC (Nat. Oceanographic Data Center, (including the National Coastal Data Development Center), NCDC (Nat. Climatic Data Center), and NGDC (Nat. Geophysical Data Center). NCEI will be responsible for hosting and providing access to comprehensive oceanic, atmospheric, and geophysical data and will be the Nation's leading authority for environmental information.

- They have a new army of software engineers to do more as well, like products and portals.
- Matt Biddle is on detail to the IOOS Program and will be coming to AK to develop more pathways to get AOOS data into NCEI, developing automated machine to machine ways to get data and metadata to NCEI without having to do the traditional process that involves lots of back and forth with word document exchanges. The plan is to streamline the data transfer process.
- Also, they want to develop a turbo tax style submission pathway from the research workspace. Example: we pull in data and capture information from ongoing programs. The campaign based programs that are typically shorter term, for example whale blubber studies, come in different forms (csv, Excel, ascii).
 - AOOS/AXIOM developed a research tool for the workspace for the project, so Rob and Matt want to develop a way to make an automated conversion of such data into a format that can be easily fed to NCEI.
- While Rob was at the NCEI meeting, he gave an AOOS capabilities demo during two back to back 30 minute talks. Office of coastal surveys noticed the AIS work...OCS is going to bring \$60K to scale up the AIS capabilities developed by Axiom.
- NCEI Arctic Data Portal Plan: Hopefully there will be some collaboration and minimal duplication of efforts. Not all Arctic data is landing in the AOOS portal either. AOOS will be watching this and helping guide this effort where it can.

Questions:

Warren asked what the relationship was between NODC, NCDC, etc. was. Rob explained they merged and now area all under the NCEI umbrella.

Update on the Arctic Domain Awareness Center (ADAC) at UAA:

Rob started by reviewing for the DMAC what the ADAC program is and what it wants to do and intends to do.

- Rob presented some examples of what he demonstrated last November 2015, including visualizations of the Hycom Model and the NOAA Oil Spill trajectory model Gnome.

- Axiom was working with the first team last fall, and in November 2015, at the ribbon cutting ceremony, they were required to demo the developed capabilities.
- ADAC now has a new Principal Investigator (Doug Causey) and a new Director (Randy "Church" Kee, Maj. General (US Air Force, ret). General Kee has a mathematics background.
- The challenge ADAC faces now is meeting requirements from the Department of Homeland Security which has tight timelines. Tight timelines can be difficult to impose in academic settings.

Question: Warren asked if UAF was involved with this effort. Rob said yes, now they are, but they were not originally. Tom Heinrichs is involved with the data, and Larry Hinzman has been brought in as Research Lead. Rob will put Warren in touch with Randy "Church" Kee. Randy seeks and wants more interactions with actual users of products. He wants ADAC to be "NASCAR," with everyone's sticker and logo affiliated with the project.

NOAA ERMA Demonstration, January 2016. Rob and Molly set up a meeting with Amy Merten and Office of Response and Restoration (ORR) staff in Seattle to discuss the capabilities Axiom developed as part of the ADAC contract Axiom had last fall, including a coastal inundation model from Tom Ravens at UAA and also the GNOME particle trajectory model runs and visualizations, and brainstorm what other services AOOS and ADAC could provide to ORR. ORR staff view ADAC and AOOS as a testbed for next generation capabilities, hoping that those capabilities could then become operational for groups like ORR. They have a lot of directives to bring back, and this is good for AOOS/AXIOM as it is what we want to do more of -- serve as a testbed for models.

11:30 Phil Mundy, DMAC Chair, joined the meeting (by Phone)

Beluga Portal: This project portal contract will end March 2016, and the portal will launch in early April.

Climate product development: Axiom and AOOS (Carol) are working on the first generation climate product development for the AOOS website. Currently the plan is to release standard seasonal "climatologies" for data sets with 3+ years of continuous data, and expand user interface moving forward to allow the user more control on defined periods for producing long term statistical scenarios.

Comment from Peter Olsson: After discussing the precarious use of the term climatology, he suggested the term climatology is okay to use, as long as you say the number of years of data you are presenting in the climate product. i.e. 7-year climatology. Carol added that there are specific meanings to how the data are averaged and edited for this to be totally clear, so additional information on how the data were computed must be supplied in the documentation.

Motion: Approve the DMAC Meeting Summary from November 2015 (we were waiting for Phil Mundy to join the call). Approved unanimously.

11:45 Lunch Break

Peter Olsson showed Snotel station (mostly) generated precipitation maps for Southeast AK. (Peter Olsson and Rick Thoman generated these maps). He showed how the AK precipitation is normal except in a few areas in the SE.

12:00 Rob showing new capabilities during lunch:

IOOS Special Products and Projects

- The entire US map, uses same tools as the more local AOOS Regional tools
- Ocean Sites mooring data “curtains” products...how can these be improved?
- 4-D glider plots that Axiom is developing using data from the IOOS Glider DAC....are these useful?

Rob discussed the North Pacific Research Board (NPRB) data additions now that Axiom is working with NPRB on their data management. These data will be added to the AOOS Ocean Data Explorer as well. NPRB has 700 research product data archives. AXIOM is helping them get it sorted. It amounts to about \$400 million worth of data, migrated into a research workspace. They plan to incorporate it like structured data, and Axiom will process some of their physical measurement data. Plan is to put into NETCDF and prepare to export it to NCEI federal archives.

Warren suggested that Axiom can include BOEM drifter data to compare to GNOME model.

Rob showed sea ice map predictions overlaid with AIS live feed and real time data streams for areas in the Bering and Chukchi Seas. (NOTE: this is for ADAC only, and is not currently available as an AOOS option).

Steve Lewis: Suggested how to display data:

Min, Max current speed, mean and STDV...this would extract out of 4 shape files.

Rob tried to explain that we try to enable cloud based scripting...in R and Python, to write analytical workflows that produce the outputs the way they want. The Cloud based scripting environment is not running on a machine, whereas the scripts Axiom is using are being run on a high performance computer (thru research workspace). AOOS has structured data, and science project data.

PWS model discussion-does AOOS continue to support this model?: Phil Mundy led discussion.

Observational data from drifters deployed during two past PWS field verification experiments have shown that it is not that accurate for guiding oil spill response if it is not run in data assimilation mode.

- So why run it if not in data assimilation mode?
- Do we keep it or move on to some other need in the program?
- Scott was wondering if we are talking about moving the model somewhere else, which means we will be in same boat, or do we intend to just end spending on the model altogether to put money somewhere else.
- Phil mentioned recap from last minutes (November 2015) page 3, and wanted to remind group of that discussion for this conversation.
- Scott: still trying to figure out where to go with this model.
- Phil asked if the PWS model was using real data.
- Peter said JPL file was made from the WRF model data they output, and used as a boundary condition. JPL and TEXAS AM pick up the boundary conditions, but nobody seemed to know. **Need to ask CHAO (action item for Carol and Molly).**
- Scott Pegau talking points:
 - Local community probably not aware of it, and probably not even able to use it.
 - If you quit modeling, you lose your acumen, and sad to see it go away, but if nobody is really using it, it is a valid question whether to move resources to something else.
 - Last time he talked to NOAA spill responders...they don't use this model, they use their own and their own data sets (only NOAA) data. Scott said GNOME does incorporate the model data from other sources, and in field trials. Phil said that in the first PWS field verification experiment that NOAA did run their model in parallel with ROMS. Both failed to predict the path of the experiment's drifters, since neither model was doing data assimilation at that time.

- The question came up as to what other models are available or operational for PWS? What are the resources being used to run the Model? Best guess at the meeting was ~\$100K, but after the meeting it was found to be \$50K annually.
- For the 2009 PWS field experiment testing model (POM) against drifters, the model was run with data assimilation and was much more accurate at predicting drifter path.
- Comment was nobody here seems to know what is going on with this now, and a problem AOOS has in the modeling program are the targets are diffuse and there is no clear direction. Peter suggested this was an issue that needs resolving.
- Scott suggested we need to focus what the AOOS model mission is, what we want to get from the models (just model data or do we want to do anything live or more operational).
- POM model was run in 2009. The ROMS model has no data to assimilate...we need HFR data to really do it well.
- **ACTION ITEMS:**
 - a. Carol, ask Chao if this is running in data assimilation mode.
 - b. What does it take to get accuracy, which is a question of what scale, and what additional observations are needed to accomplish that.
 - c. We should step back and see what we hope to get from the model...how much of state do you want to cover, and focus.
 - d. Models have value for specific purposes. Once AOOS has identified the intended purpose it may be possible to improve the model through validation experiments. If it is possible to fix weaknesses, then we should do so. If it turns out that AOOS does not have the capacity to fix the problems identified, then AOOS should move the funding elsewhere.
 - e. This seems to make sense. Can we make it accurate enough given our data resources in the state...and how do we define accurate enough? Is this in the AOOS mission and does AOOS have the capacity to do this financially? This was in fact done in 2009 through the PWS Field Experiment. The conclusion was that the model could only be validated with an ongoing extensive observation network. However, there did not seem to be funding support from the PWS user community (Alyeska, Coast Guard, etc.) and the AOOS Board was not willing to devote so many financial resources to PWS for the long-term.
- Rob said a fisherman claims to have improved his fishing success as he uses the temperature fronts to decide where to focus fishing efforts.
- Peter gets model feedback from users of his PWS WRF model...when it turns off.
- Action Item: AOOS should consider getting some stakeholder feedback on how people and groups are using the PWS model, what is the demand.
- Perhaps we can help outreach efforts on how to use ocean model data. Someone needs to talk about the oceanographic model. Fisherman want the models...they are positive about the model...PWS RCAC...they are running workshops Dave Goldstein and Orson Smith...and having Peter give talks on what you can expect from model output, what is realistic and not, and school them on the model use. We could do similar with our models.
- Carol will try to get onboard with this locally. Scott in Cordova... volunteered to give a talk on the PWS model output.

13:30 Peter had to leave

Rob reviewed Workplan updates. DMAC meeting next summer, you will see some profound changes.

Warren...question on topic 5 – MARES project. What information can be used by AOOS?

- Axiom is collecting the entire data from MARES, tags and Argo feeds...raw data un-qaqc'd data from smooth tag and Argo tag...then secondary track including how to get from raw to secondary.

- ONR tags with CTD data.
- The PI wants to finish processing and showing their secondary results before we publish on AOOS. We can use the tag CTD data at some point.
- 5 seals were the only data source that came in.
- We can visualize the CTD data like the glider data.
- BOEM study...DC BOEM promised 25 mil, but they never had it...they tried to get NOPP, NOAA, SHELL to pay in...they did not...so they never funded it fully...much smaller scope, so handed it to BOEM AK...they were thinking about doing something smaller in the eastern Beaufort.
- Warren wanted to tag Belugas on Canadian side...and see what they did. Did not get approved.
- Phil chimed in that those Belugas are important for Arctic fish stocks.
- Warren was also saying they were hoping to do fish counts with moorings...using the acoustic methods...cod. Tags would give info on where belugas. HQ initiated it, but that was problem.
- Another issue is when can we go out with ships and even if we can go out with ships much anymore.
- Erasure coding.

Shell data transfer to AOOS:

Steve Lewis asked if NOAA bought the portal hard drives, could we find discretionary funding to pay for Axiom time to get the data over here?

Steve asked if Phil could help coordinate this effort from the grants, tipping off protected resources. Perhaps NMML. Phil agreed to do so.

Carol stressed that the agreement was to make the data publicly available.

Action item: Steve said we need to get moving on this asap. Phil is to contact NOAA Fisheries leadership to see if there is interest and resources to help.

Check with NCEI...if data went to NCEI, we would have to down load 300 TB of data still.

If AOOS gets it, we could do it better most likely.

We could try to see if NCEI is really going do what they say, and support this effort.

Carol mentioned North Slope Borough data transfer status...and we are less concerned in time about this, and they have a budget to do this transfer. *Correction 4/11/16: Actually, the budget for this effort is uncertain as well.*

Motion to Adjourn. 14:20