

**Ocean Acidification: Working Session**

**Wednesday, December 3, 2014 at AOOS: 1007 W 3rd Ave. Anchorage, AK**

***Draft Meeting Notes (1.6.15)***

*Hosted by AOOS in collaboration with Alaska Center for Climate Assessment and Policy, Alaska Sea Grant, Alaska Marine Conservation Council, Ocean Acidification Research Center and others to develop priorities for monitoring, research, education & outreach*

**In Attendance:** Allison Bidlack, University of Alaska SE; Angela Doroff, KBRR; Bob Foy, Kodiak Fisheries Research Center; Brad Warren, Global Ocean Health; Brenda Konar, UAF SFOS; Brenda Trefon, Environmental Director, Kenaitze Indian Tribe; Darcy Dugan, AOOS; Dorothy Childers, AMCC; Ellen Tyler, AOOS; Emily Hutchinson, AOOS; Frank Kelty, City of Unalaska natural resource director; Ian Pitzman, UCIDA/NPFA crab fisherman; Jacqueline Ramsay, Alutiiq Pride Shellfish Hatchery; James (Jim) G. MacCracken, USFWS; Jeff Hetrick, Alutiiq Pride; Jeremy Mathis, UAF OARP; Jessica Cross, NOAA PMEL; Katya Wassillie, Eskimo Walrus Commission; Kris Holderied, NOAA Kasitsna Bay Lab; Lauren Frisch, UAF OARP; Lucy Squibb, Alaska Sea Grant; Margo Reveil, Cook Inletkeeper; Marianne Mills, Cook Inlet Treaty Tribes; Paula Cullenberg, Alaska Sea Grant; Rachel Donkersloot, AMCC; Rebecca Noblin, Center for Biological Diversity; Rob Campbell, PWSSC; Shallin Busch, NOAA; Tom Hurst, Alaska Fisheries Science Center; Tom Tougas, Major Marine Tours; Tommy Evans, Cook Inletkeeper; Weatherly Bates, Alaska Shellfish Farms; Wiley Evans, UAF OARP.

**Meeting Objectives:**

* Capitalize on the expertise of speakers and participants at the OA workshop held in Anchorage on December 2
* Define stakeholder needs across the state for OA monitoring, research, education and outreach
* Direct the energy generated during the Dec 2 meeting towards statewide action.

**Meeting Outcome:**

Given the $2.5m increase (from $6m to $8.5m) for the national Ocean Acidification Program in the final FY15 Federal budget, a $900k package building on current, expected and proposed future opportunities is sought from federal, state, regional and industry partners. This proposal includes $400,000 for basic operations and maintenance of the existing OA buoy network, $350,000 for research recommendations (below) and $150,000 for stakeholder and community engagement, including a Blue Ribbon Panel.

**Meeting Agenda:**

* Welcome
* Ignite session: 3 min recap from each speaker with slides
* One sentence overview
* 3 bullets of outcomes
* Brief next steps (where you are going & what’s missing)
* Jeremy Mathis: review of current monitoring infrastructure
* 3 breakout groups focusing on: monitoring, research, education and outreach
* Report out and group discussion to identify consensus points & next steps

**Meeting Summary**

**Ignite Session: next steps suggested by speakers:**

In addition to providing a brief recap of their presentations from December 2, speakers shared ideas about where we can and should be headed to address OA in Alaska and what specific gaps or needs they see. The slides have been compiled into one presentation posted on the workshop webpage: [aoos.org/ocean-acidification-workshop](http://www.aoos.org/ocean-acidification-workshop/) and on the AOOS workshop reports webpage: [aoos.org/workshops-and-reports](http://www.aoos.org/workshops-and-reports/).

Priority needs included:

* Further research on the energetic responses of different species
* Further research on realistic exposure scenarios, including variance throughout the lifecycle
* Further research on behavioral and sensory changes, especially for fish
* Better understanding of OA in the context of multiple stressors, including freshwater glacial influence, expected changes in salinity and ice cover due to global warming, and terrestrial amplifiers such as nutrient inputs and seasonal bloom dynamics
* Developing industry-science partnerships
* Quantifying economic impacts of OA
* Developing tangible “solutions” to address what we **can** do both personally and politically
* Additional monitoring in local waters
* Connecting lab research, monitoring, education and outreach efforts statewide
* Engaging a core group of champions in industry, NGOs, agencies and communities to make a lift like the Washington Blue Ribbon Panel

**Review of current monitoring infrastructure: Jeremy Mathis**

Long-term observations are needed to characterize natural variability and long-term trends in the ocean carbon cycle, and for identifying physical and biological mechanisms controlling OA. Currently we have four moorings in Alaska: M2 in the Bering Sea, GAKOA in Resurrection Bay, one near Kodiak and one in Southeast Alaska. Recently a Burkolator was installed at Alutiiq Pride Shellfish Hatchery in Seward. The system that was previously in place there (similar but less automated) will be used for a special Gulf of Alaska study this summer, but may be available for deployment somewhere in Southeast Alaska afterwards. AOOS funds OA sampling along the Seward Line twice a year, and last year an intensive survey using gliders and ship-based sampling was also conducted. Currently, funding exists to continue this level of monitoring through 2015. Funding is uncertain after that. The NOAA OA Program has verbally committed to funding two of the buoys (GAK-OA and M2 Bering), and Jeremy is looking to the State to cover the rest.

He estimates that with a $3 million annual investment over five years, we could achieve the following:

1. Expand the coastal OA monitoring network to include additional moorings in the most vulnerable regions, including the Bering and Chukchi Seas, and provide real-time and near real-time data on ocean chemistry and OA parameters;
2. Increase lab and field research on potential biological and human use impacts of OA;
3. Use these data to develop and validate regional OA forecasts, warnings and other products of use to fisheries, shellfish growers and harvesters; and
4. Coordinate a statewide education and outreach program that could include a Blue Ribbon Commission or task force similar to those of Washington, Maine and Maryland, to help Alaskan communities develop adaptive and mitigation strategies to allow for continued traditional and contemporary use of Alaska’s marine resources.

**Discussion on a Statewide Action or Legislative Funding Request**

* The State funding landscape is bleak given reduced oil revenues.
* Instead of asking for funding this year we could ask for a Blue Ribbon Panel or organize a grassroots OA Advisory Panel for stakeholder outreach and input.
* If this is to be successful as a grassroots effort, the objectives must be marketable - it must be seen as affordable and serving the interests of that targeted grassroots base.
* Regardless of whom this is marketed to, it needs to be backed up with a solid research plan.

**Experience of WA Blue Ribbon Panel on OA: Shallin Busch**

* The WA Panel did a good job of quantifying risk to Washington State from OA
	+ Discussion: Alaska has really good data and some of this analysis has already been done
* WA benefited from the close-knit connection between environmental monitoring and a commercially important industry
	+ Discussion: A new mariculture initiative in Alaska could address OA as a risk management strategy **but** with so many other more immediate risks to the developing mariculture industry in Alaska, it would be difficult for OA to rise to the top. Additionally, it would be a political risk for the mariculture initiative here to tie itself so closely to something that could be seen as “climate change advocacy”.
* The WA Panel was successful in building a community of engagement around this issue.
	+ Discussion: Who would sit on such a panel for Alaska and do they have the capacity (time, energy, resources) for this?

**Discussion: Potential Allies**

($ = with funding, C= with institutional capacity, V= with a big voice)

$CV: Community Development Quota groups

$: Oil and Gas industry - only mandated research dollars

$: AK cruise industry including surplus head tax

C: Fishermen, to partner in Community Based Monitoring

C: Juneau Economic Development Council’s ocean cluster

C: Bering Sea Research Foundation

C: AK Crab

C: OA Research Program

V: AOOS (and partners!)

V: Young Fishermen’s group and summit

V: Tribal Corporations

Others: Alaska Native Heritage Program, NPRB, other Integrated Ecosystem Studies

**Breakout Group 1: Setting Priorities for Monitoring**

Current efforts are focused on comprehensive baseline monitoring, as was done by the NOAA/PMEL research team in Resurrection Bay this past summer, connecting physical, chemical and biological processes. The breakout group felt that focusing new efforts on potentially resilient places (we already have placed buoys in what were seen as the most risky or vulnerable places for Alaska’s fisheries), and identifying habitat shelters for vulnerable species would serve the interests of Alaskans. This would also tailor monitoring to promote adaptation.

Some top discussion topics in the breakout included:

* "Refugia" around estuaries is caused by alkalinity. Wiley will examine this with 2014 data.
* There is incredible diversity within Alaska’s geography, which is tough to monitor.
* A priority is looking into different "geochemical habitats" or zones of "geochemical safety".
* There could be a small grant program for aquaculture owners to co-manage their problems alongside researchers showing up to date measurements. To have industry interested, must send researchers out with stakeholders,
* The shellfish growing industry is not expanding as predicted; it is actually shrinking.
* The collapse of native clams in parts of Alaska is a multi-stressor question right now. People are uncertain whether this is being caused by overharvesting, predation, OA or climate change. Recruitment is sporadic so more research and monitoring are needed. However, there is not much leadership from state on either clams or aquaculture expansion.
* Shellfish growers can’t afford to pay for the monitoring needed to understand future changes. We may see a collapse happen before managers will be interested. This is what happened with salmon and crab; will shellfish be next? The current crab hatchery is orders of magnitude smaller than the salmon hatcheries.

**Breakout Group 2: Research**

This group noted that we have labs, but we need more research staff and funding. In particular, we need to identify and expand the breadth of species being studied, especially lower trophic level prey sources for commercially important species. We also need to improve our understanding of how calcareous animals interact in complex food webs and identify vulnerabilities at the ecosystem scale. Below are some recommendations from the group:

* Take advantage of infrastructure in place for Alaska OA research
* NOAA labs in Kodiak – focused on crabs
* Alaska Fisheries Science Center - (largely in Seattle, not Alaska)
* Kasitsna Bay
* Expand research efforts:
* Conduct a vulnerability assessment to determine which organisms are most vulnerable to OA to prioritize research
* Expand research beyond commercial shellfish and groundfish. We can’t just study king crab and pollock.
* Find other important species that are not managed by NOAA, for example, bivalves, halibut, chinook salmon
* Design data collection to better understand what the species are experiencing in their environment. This involves more in-situ field experiments, or lab experiments with realistic parameters to produce meaningful results.
* Conduct longer studies. It is tricky to find funding for multi-year studies but very important.
* Conduct multi-stressor experiments to examine response variables at the cellular, molecular, and physiological levels.
* Create a steering committee, keeping track and directing research and making the link to policy. This can also be used as a funding mechanism.
* Obstacles
* Unlike Washington state, we don’t have an industry that has been impacted severely enough by OA for people to unite around
* We don’t have critical mass in Alaska in terms of concerned and active public
* Funding for multi-year laboratory studies is difficult to obtain

**Breakout Group 3: Education and Outreach**

This group recommended prioritizing outreach efforts to focus on growing a strong stakeholder base and outlined a strategy to do this:

1. Hire a coordinator to represent the consortium of many entities concerned about OA, and not just the organization they’re housed with. They would need to work closely with the scientists to understand the latest science, and also be a people-person to connect with the public. It will be important to frame OA in a way that leaves people feeling empowered after meetings instead of depressed. Make sure to leave communities with ideas for things they can do.

2. Host meetings in communities throughout coastal Alaska to explain the science of OA and potential impacts to the ecosystem and humans. Part of these meetings should be given by an OA scientist to provide validity and be on hand to answer questions.

* Ensure the community is interested to learn more before scheduling.
* Find a local leader in each community who is or can become an OA advocate. Work with this person on local publicity, as well as meeting follow-up.
* People in communities are busy. Draw on strength of the individuals that are proactive and already want to do things either out of personal interest or for their job.
* Look for existing events (workshops, meetings, etc.) hosted in communities around coastal Alaska to plan these meetings around in order to leverage people’s time and travel. The events could be regionally specific or industry specific (like fisherman events)
	+ AYEA (AK Youth for Environmental Action) is meeting in March on OA
* Discuss needs for a “situation assessment” survey, getting more information on people’s existing knowledge and understanding. Stacy Buckalew at KBRR has experience with this.
1. Provide time for discussion and questions afterward, potentially with a session led by the local leader on next steps such as:

Join a list serve which disseminates a quarterly report covering topics such as the state of the science, what’s new, recent community activities, blurbs on local people and their actions, funding news, etc.

 Explore a website – create a centralized website that includes the current state of the science, contacts for who to ask if you’d like a meeting in your town, calendar of meetings, video archives, tool kits for communities, and an open forum where people can write and respond to questions.

**Final group discussion to identify consensus points & next steps**

Listening to each of the group reports, it was clear that all three came to focus on “particular places of interest” – either ecologically as refugia or to understand undesirable phenomena, like the decline of native clams. There was significant discussion about teasing out OA from multi-stressor environments and tying future education, research and monitoring efforts to specific communities (of practice and geographic communities). The monitoring group strongly recommended the concept of focusing on "refugia" around estuaries caused by alkalinity; the research group proposed conducting multi-stressor experiments in-situ to understand cellular, molecular, and physiological responses; and the outreach group talked about the importance of growing strong stakeholder bases in particular communities.

It was noted that Katchemak Bay was recently identified as the next (8th designation to date) “Habitat Focus Area” in the NOAA Habitat Blueprint. This designation could lead to increased federal research investments including the role refugia play in multi-stressor complex ecosystem processes. This could provide one place and a context to implement the recommended monitoring, research and education activities described above. Given the history of native clams and oyster culture in the bay, adaptive solutions for farmers could be outcomes of proposed research.

**Proposed Funding Initiative:**

Since the state of Alaska’s near-term budget is grim due to falling oil prices, a $3m a year legislative request does not appear to be practicable. However, given the $2.5m increase (from $6m to $8.5m) for the national Ocean Acidification Program in the final FY15 Federal budget, a $900k package building on current, expected and proposed future opportunities from federal, state, regional and industry partners might be more realistic.

In light of workshop discussion, a possible funding proposal to circulate more broadly would include:

* $400,000 for basic operations and maintenance of the existing OA buoy network
* $350,000 for research recommendations
* $150,000 for stakeholder and community engagement, including a Blue Ribbon Panel