

## **A Call to Action: Responding to Ocean Acidification in Alaska (12/17/14 draft)**

**Proposal:** This collaborative initiative would build upon existing Alaska efforts to support ocean acidification (OA) research and monitoring that began with the Alaska Legislature's 2011 investment in the University of Alaska's Ocean Acidification Research Center. Federal, state, regional and industry partners will jointly seek funding to collect OA monitoring data, increase research on biological impacts of OA on Alaska shellfish and fisheries, and coordinate education and engagement activities for Alaska stakeholders including shellfish growers, commercial, recreational and subsistence fishers, and coastal communities dependent on Alaska's marine resources. This new effort will benefit from the existing backbone of ocean moorings, initial research on economic and community impacts, and stakeholder and public input gathered over the past three years.

**Background:** In 2011, the Alaska State Legislature allocated \$2.7 million to develop an Ocean Acidification Research Center at the University of Alaska Fairbanks (OARC at UAF). These funds were used to launch a statewide OA monitoring infrastructure, including instrumenting and deploying four OA moorings in the Gulf of Alaska and Bering Sea and a state-of-the-art monitoring system in the Alutiiq Pride shellfish hatchery in Seward. Data collected through these efforts now show that the coastal regions around Alaska are experiencing a rapid and severe onset of OA relative to many other coastal regions. Studies also show that Alaska coastal communities have varying degrees of vulnerability to OA, ranging from moderate to severe, with the most vulnerable located in regions where fisheries are primary economic drivers of local economies. This initial effort has been instrumental in establishing and tracking current conditions; an additional investment is now needed to maintain and expand the network and connect physical and chemical observations with the biological, commercial, recreational and subsistence activities occurring in Alaska waters.

**Need:** Alaska's \$1.5 billion fishing industry is vital for state and national economies, as well as subsistence communities. Based on initial observations, scientists now speculate that the Bering and Chukchi Sea area ground may be zero for OA economic impacts due to the co-location of extreme summertime OA events and established sensitivities of certain crab species to OA. Yet critical gaps exist in the resources necessary to monitor conditions in these important areas. Building on our established baseline understanding of OA around the state and quantified vulnerabilities of Alaska communities, it is time to implement a multi-faceted approach to connect environmental data to potential biological and human use impacts, develop statewide operational OA forecast models, and communicate these results broadly to the public and potentially impacted stakeholders.

Given the \$2.5m increase for National Integrated Ocean Acidification activities in the final FY15 Federal budget, a \$900k package will be sought that builds on current, expected and proposed future opportunities from federal, state, regional and industry partners. This package includes:

- \$400,000 for basic operations and maintenance of existing OA buoy network
  - \$350,000 for research on biological and economic impacts (\$250,000 committed)
  - \$150,000 for stakeholder and community engagement, including a Blue Ribbon Panel
- \$900,000 Total

Current available funding includes:

- \$250,000 from NOAA OA Program (\$0 for monitoring, \$250k for research)
- \$100,000 from AOOS (needs annual board approval)

\$350,000 Total

Potential additional funding sources:

- \$300,000 OA Program: for monitoring
  - \$150,000 State of AK: for stakeholder engagement, Blue Ribbon Panel & additional monitoring (broken down further, below)
  - \$100,000 Industry: for research & monitoring
- \$550,000 Total

**Preliminary Stakeholder Priorities:**

Monitoring

- Continue the existing buoy system and work with hatcheries, tailoring monitoring to foster adaptation.
- Focus additional monitoring on potentially resilient places and identify potential habitat shelters for vulnerable species.

Research

- Expand research to include additional species, especially lower trophic level prey sources for commercially important species, and realistic or in-situ environmental conditions.
- Conduct longer-term, multi-stressor experiments to better understand how organisms will react to OA.

Education and Outreach

- Communicate with stakeholders and provide an open forum for Alaskans to ask questions and get answers.
- Organize and implement a Blue Ribbon Panel to gather further recommendations about a future course of action.

**Partners:** Partners include direct stakeholders or groups that can bring resources and in-kind support to this effort. Current partners in the OA research and monitoring effort include the Alaska Ocean Observing System, the NOAA Ocean Acidification Program, the North Pacific Research Board, the University of Alaska Fairbanks, Alaska Sea Grant, Alaska Marine Conservation Coalition, Alaska Center for Climate Assessment and Policy, and several industry groups including United Fishermen of Alaska, Alaska Shellfish Growers Association and Bering Sea Crabbers. As the OA program in Alaska expands and the impacts of OA are further realized, the number of partner organizations will likely increase, especially to support a Blue Ribbon Panel or statewide coordinating committee.