



Darcy Dugan - Alaska Ocean Observing System • Jessica Cross - NOAA Pacific Marine Environmental Lab • Amanda Kelley - University of Alaska Fairbanks • Dorothy Childers - Retired, Alaska Marine Conservation Council  
 Jamie Goen - Alaska Bering Sea Crabbers • Tom Hurst - NOAA Alaska Fisheries Science Center • Jeff Hetrick - Chugach Regional Resources Commission • Kris Holderied - NOAA Kasitsna Bay Lab • Scott Goodman - Bering Sea Fisheries Research Foundation

### About the Network

The Alaska Ocean Acidification Network was formed in 2016 to engage with scientists and stakeholders to expand the understanding of OA processes and consequences in Alaska, as well as potential adaptation and mitigation strategies. It is hosted by the Alaska Ocean Observing System.

## Ocean Acidification in Alaska

- Ocean acidification (OA) occurs as human-generated CO<sub>2</sub> in the atmosphere is absorbed by the ocean, changing the chemistry of seawater.
- Alaska is expected to experience the effects of OA faster and more intensively than other regions. Much of this is due to cold water and circulation patterns which cause seawater to hold more CO<sub>2</sub> year-round.
- The Gulf of Alaska, Chukchi Sea and Bering Sea are currently experiencing seasonally corrosive conditions. The Beaufort Sea is starting to experience more sustained corrosive conditions.
- Many Alaska marine organisms are sensitive to changes in ocean chemistry. So far 16 Alaska species have been studied in the lab for their response to acidified conditions. All 16 showed adverse effects on calcification, growth, reproduction or survival at some life stage.
- There is an increasing effort to discuss OA with coastal community members, fishermen, Tribes, policymakers, shellfish growers, educators and others, and develop shared approaches to address and adapt to OA.



Studies have been conducted in Alaska on red king crab, blue king crab, golden king crab, southern Tanner crab, and snow crab. Results varied among species and among life stages; however, crab survival went down at every life history stage as they were exposed to lower pH water.

Photo by Corey Arnold

### What We Do

- Engage with the research community, fishing, and mariculture industries, Tribes, policymakers, coastal communities, and the general public
- Identify knowledge gaps and priorities for monitoring and research
- Share data and best practices
- Host dialogues, presentations and events
- Act as a resource hub for OA information

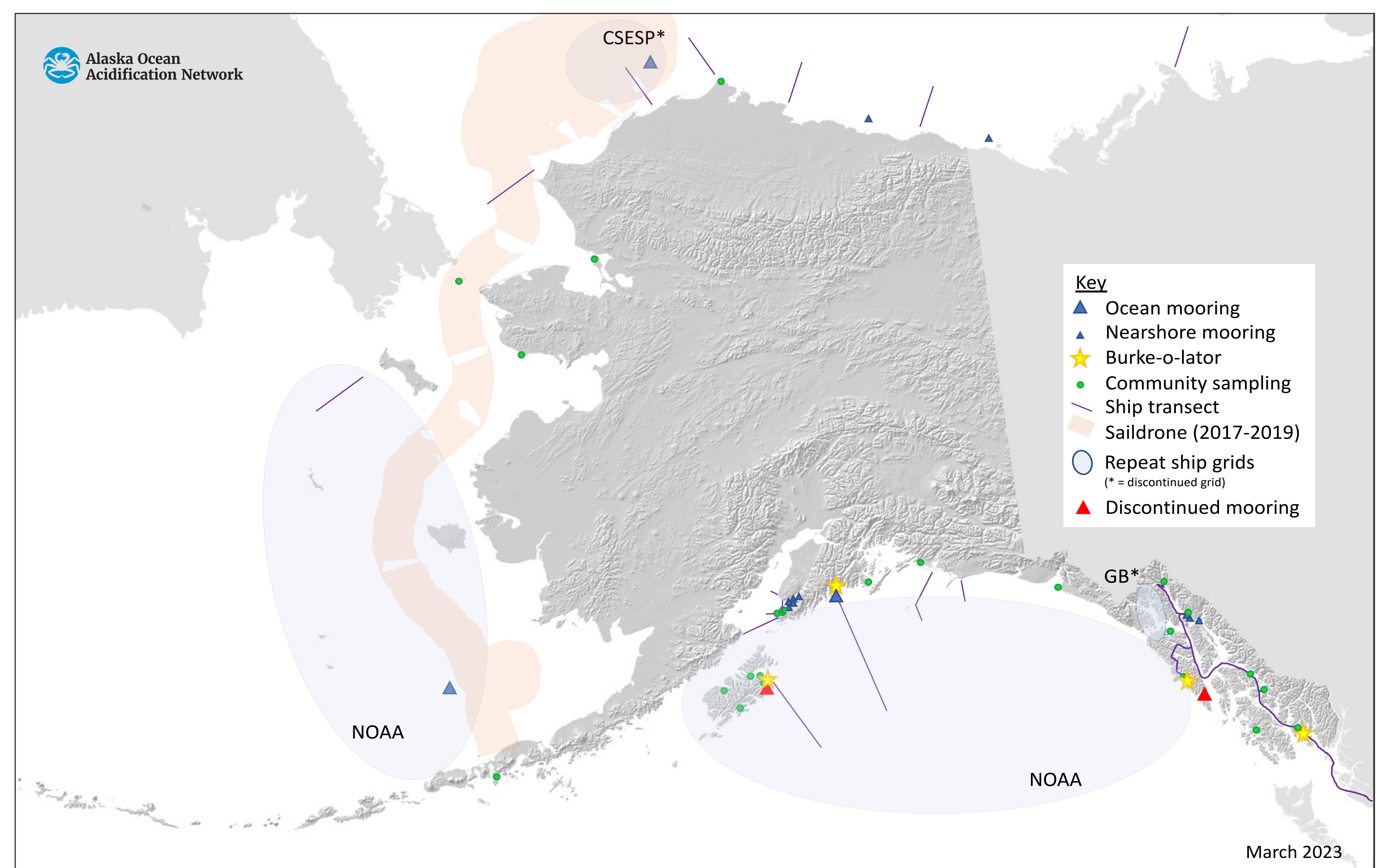
### Available Resources

- Regional conditions
- Response of Alaska species
- Researchers and their specialties
- Data catalog
- Downloadable handouts
- Recorded presentations and webinars
- Bi-monthly newsletters



### Monitoring & Research

- Alaska has over 44,000 miles of coastline. Challenges for monitoring include remoteness, lack of infrastructure, extreme weather and seasonal sea ice.
- Over 20 researchers are working on OA in some capacity and this number is growing each year (it's a good time to be an OA researcher!)
- Alaska researchers are employing a combination of fixed instruments, research cruises, vessels of opportunity, autonomous vehicles, and community sampling efforts to establish baseline conditions and track change over time.
- Four labs across the state host species response studies including crab, herring, clams and salmon.



This map shows instrumentation for the study of ocean acidification in Alaska. Partners include NOAA, the University of Alaska Fairbanks, the Alaska Ocean Observing System, the Hakai Institute, the Alutiiq Pride Marine Institute, the Sitka Tribe of Alaska, the Alaska Marine Highway System, and a multitude of Tribal communities conducting local water sampling.

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### Partnership Highlights



Photo by Teal Hetrick



Photo by Alaska Marine Highway System

#### Community Sampling

Around 20 communities across Alaska have been active in taking weekly water samples to develop baseline data on OA. This effort is unique in the U.S. and is primarily coordinated by Tribes. The water samples are used to understand local conditions in the nearshore environment, seasonal changes, and natural influences. By creating a consistent time series, communities can better understand the water chemistry in areas important to subsistence species.

#### Alaska Marine Highway System

An Alaska state ferry serves as a platform for OA monitoring thanks to a collaborative partnership between a group of Alaska and Canada research entities, NOAA, and the Alaska State Dept. of Transportation. A surface seawater monitoring system was installed on the M/V Columbia, which runs a weekly 1,854-mile round-trip route between Bellingham Washington and Skagway, Alaska. The project is part of an international effort to understand the impact of OA along the British Columbia and Alaska coasts.

### Best Practices for Engaging with Alaskans on OA

Through discussion series, focus groups, and conversations, Alaskans have offered the following guidance:

- Approach different stakeholders with targeted information
- When shaping research, keep in mind the most common stakeholder questions: "What's happening now," "How will this affect me," and "When do we need to worry."
- Be clear in differentiating between natural variability and OA. Most of what we see so far in the data is natural variability.
- Provide more maps, infographics, videos and social media!
- Expand two-way engagement between researchers and non-researchers. One-on-one interactions have big benefits.
- Work towards integrating known OA impacts into management documents
- Provide actionable information and ways to get involved.