UNIVERSITY OF ALASKA FAIRBANKS

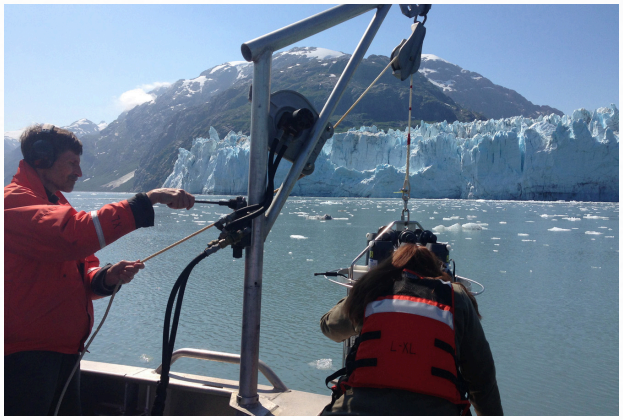
College of Fisheries and Ocean Sciences

OCEAN ACIDIFICATION RESEARCH CENTER

OARC

ABOUT OARC

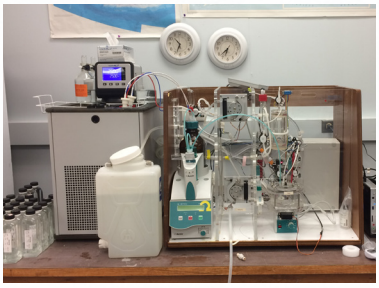
Founded in 2008, the Ocean Acidification Research Center is charged with studying the potential long-term impacts of ocean acidification on Alaska's waters. OARC addresses growing concerns of increasing acidity in open ocean and nearshore waters, and the impacts of on Alaska's marine ecosystems.



OARC research goals:

- Conduct long-term ocean monitoring and modeling efforts
- Quantify biological responses of vulnerable species

INSTRUMENTATION



OARC operates MARIANDA instruments to quantify dissolved inorganic carbon (DIC) and total alkalinity (TA). DIC is measured using the lab's AIRICA instrument, while TA is measured on a VINDTA.

The OARC recharge center is available to run seawater samples for climate quality analysis. Prices are available upon request. For more information on OARC services, please contact Natalie Monacci at nmonacci@alaska.edu.

INSTRUCTION AND FIELD TECHNIQUES

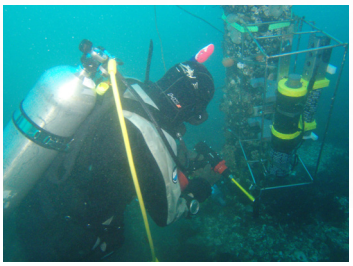
CFOS

CFOS currently offers courses that relate to our work at OARC.

MSL 394: Human Impacts to the Marine Biosphere is taught by OARC principal investigator Amanda Kelley (alkelley@alaska.edu)

MSL 481/681: The Oceans and Global Change is taught by CFOS researcher Andrew McDonnell(amcdonnell@alaska.edu)

MSL 494: Field Techniques in Ocean Acidification Research is taught by OARC principal investigator Amanda Kelley (alkelley@alaska.edu)



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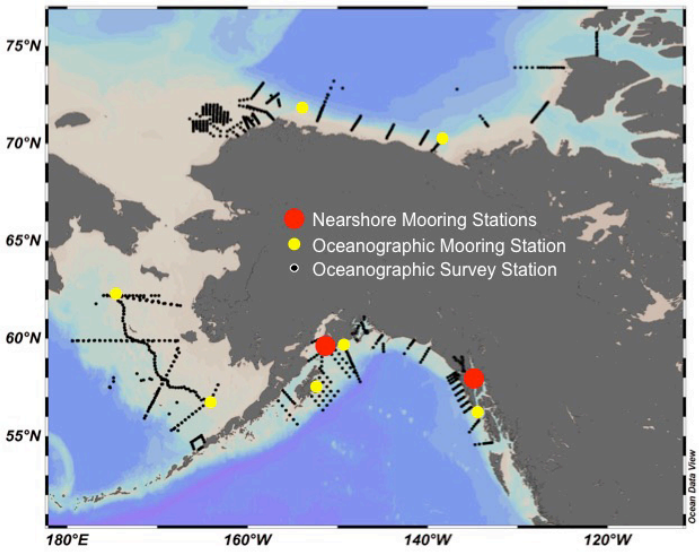
OPEN OCEAN MONITORING

Established in 2010, the Alaska Ocean Acidification Mooring Network consists of a series of instruments that have been deployed in oceans around the state of Alaska to monitor changes in carbon dioxide and OA indicators.

OARC has deployed moorings in the Gulf of Alaska, the Bering Sea and the Arctic Ocean. These moorings continuously measure partial pressure of carbon dioxide (pCO_2), pH, temperature, salinity, dissolved oxygen (O_2), and fluorescence. Water samples have been collected at survey stations during oceanographic cruises. These data provide information on the duration, intensity and extent of ocean acidification events around Alaska.



NEARSHORE MONITORING

Nearshore ecosystems protect the coastline and provide important habitat for marine animals. In 2017, OARC researchers installed a network of 5 sensor arrays in Kachemak Bay, Alaska, to measure pH, temperature, salinity and oxygen concentrations at five nearshore sites along the bay. This first step at measuring pH conditions at high resolutions will vastly improve the understanding of how OA affects nearshore systems.

A similar sensor network will be deployed in Lynn Canal in Juneau, Alaska, in spring 2019 in association with the recent National Science Foundation EPSCoR project. Together, these sensor networks will vastly expand our understanding of nearshore physicochemical processes in coastal Alaska.

ASSESSING BIOLOGICAL IMPACTS

Ongoing research at OARC is investigating the impact of OA on larval razor clams, juvenile basket cockles and juvenile littleneck clams. This work, in collaboration with the Alutiiq Pride Shellfish Hatchery in Seward, aims to better understand how OA-related stress affects shell formation, growth, metabolism and acid-base regulation of these important clam species. These studies seek to determine the sensitivity or resilience of marine species to future ocean change.

In the future, OARC researchers plans to expand this research by studying a greater number of species and response variables. To assist with this, the EPSCoR project is building an ocean change system at the Kasitsna Bay Laboratory in Kachemak Bay that can study variables simultaneously and examine organism responses.

For more information about utilizing the Kasitsna Bay Laboratory and the ocean change system, contact Katrin Iken at kbiken@alaska.edu.

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