



The Maine Ocean and Coastal Acidification (MOCA) Partnership

March 2018 Newsletter

The Maine Ocean and Coastal Acidification Partnership

Changes in Governance:

- **Steering Committee:** In December 2017, after two years as coordinator, Susie Arnold (Marine Scientist, Island Institute) stepped down from that role to assume other responsibilities. Ivy Frignoca (Casco Baykeeper, Friends of Casco Bay) will serve as coordinator in 2018, and Esperanza Stancioff (Extension Educator, Maine Sea Grant) will serve as assistant coordinator. In 2019, Esperanza will move into the coordinator position and a new assistant coordinator will be named. The steering committee will strive to remain between 5-8 members, and is currently composed of Ivy Frignoca, Esperanza Stancioff, Aaron Strong, Mick Kuhns (Me DEP), Richard Nelson (retired lobsterman), Meredith White (Mook Sea Farms), Rep. Mick Devin and Rep. Lydia Blume. If you have an interest in serving on the steering committee in future years, please email Ivy Frignoca, ifrignoca@cascobay.org.
- **Guidance:** The MOCA Steering Committee created a guidance document to facilitate the voluntary partnership and promote organization.
- **Google Group:** In 2017, members used the maineoceanacidification google group for interesting discussions regarding research and policy. To guide our interactions in the future, the steering committee created a policy to keep our discussion focused on matters related to ocean acidification and to limit the number of emails we all receive.

For more information, please visit the [MOCA website](#).

Invitation to join the



Ocean Acidification Information Exchange

The OA Information Exchange is a new interactive website that is catalyzing response to ocean acidification through collaboration and information sharing. NECAN invites you to join this online conversation! Members of the OA Information Exchange are using the site's collaborative tools to share resources, engage in online discussions, and interact with people in other disciplines and regions to build a well-informed community working to respond and adapt to ocean acidification. Anyone working on or with an interest in ocean acidification can join the OA Information Exchange, including government, tribal and academic research scientists, citizen scientists, experiential and formal educators, NGO employees, marine resources managers, policy makers, concerned citizens, aquaculturists, people in the fishing industry, technology developers, data managers, and others.

Learn more about the OA Information Exchange at www.OAInfoExchange.org or [request an account!](#)



December Meeting Highlights:



1. Monitoring in Casco Bay:

In 2017, several continuous monitoring systems were deployed in Casco Bay. These included a year round station maintained by Friends of Casco Bay, a winter-spring system maintained by the Island Institute and Bigelow Labs, and a summer - fall system maintained by the University of New Hampshire. The data from these stations shows that the Bay is vulnerable to acidification.

- Mike Doan from Friends of Casco Bay reported that data from the FOCB station showed warmer temperatures longer into the fall; salinity around 30 ppm other than a spring dip with snow melt; a dissolved oxygen spike in the spring, falling off in the summer, and rebounding in the fall; pH peaking in the spring and falling off in the summer and pCO₂ lower in late winter and rising in the fall. Doan also calculated omega aragonite saturation and found the level to be below 1.5 from winter into spring. Below 1.5 shellfish have trouble calcifying.



Casco Baykeeper Ivy Frignoca and Research Associate Mike Doan check on a data sonde and carbon dioxide sensor in our Continuous Monitoring Station, aka, The Cage of Science.

- Nicole Price from Bigelow Labs discussed a halo affect her monitoring captured around a kelp farm. Her research monitored a control site and around the kelp bed. She saw higher omega aragonite levels and pH around the kelp farm. In 2018, Price and her team will focus on disentangling the relationship between salinity and pCO₂. (Bigelow also has projects in the Damariscotta River examining the relationship between rockweed harvesting and CO₂ absorption. Bigelow will continue this research in 2018.)
- Joe Salisbury of UNH reported that his data was similar to other data, but higher with pCO₂ and lower with pH. He wondered if this was because his station was near the Fore River Harbor or because it was at the bottom (FOCB platform also sits on the ocean floor). With respect to oxygen and pH, Joe observed a linear relationship indicative of a system driven by temperature and biology, high productivity during stratified conditions, and VERY low pH during intense rains. From other monitoring efforts, Salisbury observed ocean water with low pH and offshore water coming in and mixing with low pH freshwater. Salisbury also calculated dips in omega aragonite with levels spiking in July. His main takeaway was that temperature and salinity are the major drivers during the summer on seasonal variations in pCO₂.

2. Harmful and Nuisance Algal Blooms:

The Gulf of Maine is experiencing changes in the amounts and types of phytoplankton and nuisance macroalgal blooms. Excessive blooms in the near coast area can contribute to coastal acidification. The change in species may be, in part, attributable to increased nitrogen pollution and/or increasing temperatures.

- Barney Balch of Bigelow Labs studies phytoplankton between Portland ME and Yarmouth NS by placing a lab on the back of a truck on the ferry. He documented a huge increase in temperature between 2016-2017, low productivity that rebounded in 2016-2017 but not back to pre-2006 levels, low omega aragonite during the winter months, elevated pH in the summer, and that HABs are almost always associated with the Eastern Maine Coastal Current.

- Bryant Lewis of DMR provided a summary of East Coast HABs and an overview of 2017 HABs in Maine. Since 1996, DMR has monitored for phytoplankton in conjunction with shellfish testing. DMR staff and highly trained citizen scientists monitored 81 stations in 2017. From March through September they documented Alexandrium (which can cause paralytic shellfish poisoning), which appeared earlier than normal. From May up to meeting time, they documented Pseudonitzchia (which can cause amnesic shellfish poisoning). In December a bloom of *P. australis* affected most of Casco Bay from Chebeague to Brunswick. DMR documented *Karenia mikimotoi* in Maine for the first time. It bloomed in Casco Bay, causing shellfish and lobster kills, odor and scum, and dark brown water.
- Steve Archer of Bigelow talked about the HPLC (high performance liquid chromatography) approach at Bigelow, which is the only FDA approved approach to do PSP and ASP chemical analyses. Pros: provides a lot of information for management decisions. Cons: expensive, labor intensive, requires specialist.



Friends of Casco Bay volunteer Deb Dawson took this algal bloom photo over Portland's Back Cove this summer to document how much the green slime had spread.

- Ivy Frignoca of Friends of Casco Bay talked about persistent nuisance blooms of *Ulva* species in Casco Bay. The mats first appeared last year, but this year appeared earlier at more locations and lasted longer. Some blooms persisted into October. Observed impacts of the blooms included juvenile clams that could not

settle, adult clams smothered under the bloom, and drops in sediment pH under the dense bloom in Mill Cove in 2016.



3. Keynote: State and Regional Action on Carbon Markets

Kathleen Meil of the Acadia Center provided an excellent overview of the Regional Greenhouse Gas Initiative that Maine participates in. RGGI is a bipartisan effort among north eastern states to reduce carbon emissions from power plants. The existing RGGI agreement covers 167 power plants and will reduce carbon emissions by 45% by 2020. The new RGGI agreement proposes caps that will decrease emissions further. Auctions held under RGGI generate funds for energy efficiency. The bulk of the money Maine receives from RGGI funds Efficiency Maine. At the time of the meeting, a bill authorizing Maine's continued participation in RGGI was pending before the legislature. The bill has now passed into law. The next big sector to tackle will be transportation, which produces the largest share of carbon emissions.

Summer Meeting
Information
Coming Soon!

