GOALS	RECOMMENDATIONS	Action to Date	Future Action
1. Invest in Maine's Capacity to Monitor and Investigate the Effects of Ocean Acidification and Determine Impacts of Ocean Acidification on Commercially-Important Species and the Mechanisms Behind Those Impacts	*1.1. Enhance monitoring and create a database sufficient to support the development of regulatory and non-regulatory approaches to reduce and limit nutrients and organic carbon from sources that are contributing significantly to acidification of Maine's marine waters. Enhanced monitoring should begin in one or more pilot estuaries where impacts are presently occurring.*	**1)** 2018 NECAN workshop series oriented to support community science groups to engage in OCA monitoring and to access EPA guidelines for coastal acidification monitoring. 40 Organizations CT, MA, ME. http://www.necan.org/ocean-and-coastal-monitoring-webinars-citizen-scientists **2)** June 19th 2018 Stakeholder meeting at Darling Marine Center surrounding monitoring to action and potential policy/ mitigation/adaptation efforts. (17 pages of meeting notes available) multiple policy oriented and NGO representatives joined the conversation. **3)** NECAN/NERACOOS engagement with EPA interest in data and metadata standards for crowdsourced OCA monitoring. Tom Shyka and partners are currently exploring a scope of work necessary for OCA data portal through NERACOOS. **4)** Wrote monitoring content for DEVIN Bond bill as related to OA monitoring, current capacity, and important next steps.	

	1.2. Expand monitoring of ocean acidification to establish its natural variability and to detect trends in water chemistry and related biological responses.		
	1.3. Develop new tools with which to assess and understand acidification and its impacts in Maine waters.	1. August 22 Shell Day tool for blitz monitoring. Outreach/science approach to generate a snapshot of coastal conditions at a regional scale. http://necan.org/shellday 2. Exploration of Salinity as a proxy for Total Alkalinity via research associated with Shell Day.	
	1.4. Determine the causes and relative importance of acidification in the waters and sediments of Maine.		
	1.5. Identify the impacts of acidified waters and sediments on Maine's commercial species.		

2. Reduce Emissions of Carbon Dioxide	*2.1. Strengthen coordination and continue participation with existing national, state, and regional initiatives regarding the reduction of atmospheric CO_2 levels.*		
	2.2. Encourage key leaders and policymakers to synchronize in establishing a comprehensive and unified strategy to reduce carbon dioxide emissions.		
	2.3. Expand actions at the state and local levels that may help in reducing CO_2 emissions.	2017 Fishermen's gathering to support RGGI and explore opportunities to link Efficiency Maine programs to fishing vessels and commercial fishing expenses. This resulted in a series of letters in support of RGGI when Maine's participation in RGGI was questioned ~ 2016/2017. Brad Warren was involved in these conversations via webinar. Richard Nelson involved.	

3. Identify and Reduce Local Land-Based Nutrient Loading and, Organic Carbon Contributions to Ocean Acidification and Freshwater Runoff by Strengthening and Augmenting Existing Pollution Reduction Efforts and Making Groundwater Recharge a Land Use Priority.	*3.1. Identify and reduce nutrient loading and organic carbon from point source and nonpoint discharges determined to cause or contribute to ocean acidification.*	NECAN 2018 workshops and webinars and disseminated materials focused on nutrient reductions and the role of nutrients in coastal acidification dynamics.	
	3.2. Assess the need for water quality criteria relevant to ocean acidification.		
	3.3. Ensure that state staff and other practitioners are working with the best information and most effective technology.	In Progress: The core teams from the 2018 NECAN workshops are working to create GIS maps that shows water monitoring stations from Long Island Sound to Downeast Maine and include Metadata for sampling. To be publically released ASAP.	
	3.4. Investigate incentive programs for pollution and freshwater runoff reduction.		
	3.5. Support and reinforce current planning efforts and programs that address the impacts of nutrients and organic carbon and freshwater runoff into coastal waters.		

	3.6. Enhance education and outreach programs that provide landowners with information about best practices for reduction of nutrient pollution.		
4. Increase Maine's Capacity to Mitigate, Remediate and Adapt to the Impacts of Ocean Acidification	*4.1. Preserve, enhance and manage a sustainable harvest of kelp, rockweed and native algae in bivalve areas and adjacent shoreline, and preserve and enhance eelgrass beds.*	Ask J. Robidoux in SEA GRANT	
	4.2. Encourage bivalve production to support healthy marine waters.		
	4.3. Spread shells or other forms of calcium carbonate ($CaCO_3$)in bivalve areas to remediate impacts of local acidification.	CBEP and Maine Coastal program with the help of EPA funds have initiated a Portland Maine Restaurant shell recycling program. The program currently involves 12 restaurants, has been successfully permitted with space to "cure" the shells at the ECO-Maine facility, and is scheduled to begin	

		remediative activities in the Summer of 2020. Shells will be put in Maquoit bay with the dual purpose of preventing marsh erosion while also monitoring chemical changes in the water from the shell deposition intervention.	
	4.4. Increase the capacity of the fishing and aquaculture industries to adapt to ocean acidification.	Modelling efforts through NERACOOS aim to generate forecasting abilities that may become especially useful for aquaculture. A prominent element of the work is an anticipated round of "user" feedback that will be collected from the aquaculture community to understand how model outputs can become most useful for the aquaculture industry. Feedback generated so far includes focusing on the growing number of upweller systems for young oysters and the 3-4 day windows of deleterious conditions that could be avoided with temporary cold storage options.	
	4.5. Identify refuges and acidification hotspots to prioritize protection and remediation efforts.	Shell Day may generate some information pertinent to this goal.	
	4.6. Encourage the enhancement and creation of research hatcheries.		

5. Inform Stakeholders, the Public, and Decision-Makers about Ocean Acidification in Maine and Empower Them to Take Action.	*5.1. In addition to providing the commission's report, its key findings should be communicated to the Governor, Maine's legislative leaders, Maine's Congressional delegation, the press and the general public in a series of briefings by commission members.*		
	5.2. Continue efforts to increase the understanding of ocean acidification among key stakeholders, targeted audiences and local communities to help implement the commission's recommendations.		
	5.3. Enhance the existing communication network of engaged stakeholders, state agency representatives and the research community.		

	5.4. Develop, adapt and use curricula on ocean acidification in K-12 schools and institutes of higher education and increase interdisciplinary university programs to equip young leaders with the skills to find solutions to complex multidisciplinary problems such as ocean acidification.	Competed in NOAA Environmental literacy grant competition aiming to generate 4H curriculum about marine climate change, and to establish pilot high school communities with teachers engaged in teaching about ocean and coastal acidification. This grant passed the first round of competition but did not win funding. It is now available via PI Gassett and PI Strong.	

6. Maintain a Sustainable and Coordinated Focus on Ocean Acidification.	*6.1. Create an on-going ocean acidification council.*	**Participates with MOCA and NECAN and is a member of the steering committee for the OA Information Exchange as of Fall 2019.**	

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