



Summary of 2019-2020 OA Actions in the NECAN Region

Developed by the NECAN Management and Policy Working Group
March 2021

The NECAN MPWG works to help inform and promote collaborations across states relative to Ocean and Coastal Acidification. We recognize that OA is a regional issue and will be best addressed with local and state-based efforts integrated into a regional approach.

The years of 2019 and 2020 were rich in activities at the state level to address ocean acidification (OA) and its impacts. Several states released reports related to OA specifically, or OA was included in more general state climate action plans. The Northeast Coastal Acidification Network's Management and Policy Working Group developed this summary to document recommendations related to OA and highlight commonalities among state reports.

----- MAINE -----

Maine's original OA Commission report in 2014-2015 resulted in six overarching goals:

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 the impacts
2. Reduce emissions of carbon dioxide
3. Identify and reduce local land-based nutrients and organic carbon that contribute to ocean acidification by strengthening and augmenting existing pollution reduction efforts
4. Increase Maine's capacity to mitigate, remediate, and adapt to the impacts of ocean acidification
5. Inform stakeholders, the public, and decision-makers about ocean acidification in Maine and empower them to take action
6. Maintain a sustained and coordinated focus on ocean acidification

The original Commission recommendations were unable to be implemented during the previous state administration. After a change in governorship in 2018, The [Maine Climate Council](#) was formed and wrapped up its work with a comprehensive report in December 2020. One working group created a [report specific to climate impacts in Maine](#). Relative to OA, the climate plan's goals and initiatives are built on the original OA commission report recommendations.

Maine's climate plan emphasizes:

- A comprehensive monitoring plan with temp, O₂, and OA parameters,
- Establishing a hub for climate information,
- Increasing capacity in state departments and
- A survey of salt marsh, seagrasses and intertidal areas for a Blue Carbon inventory.

One outcome of the delay in implementation of the original OA Commission recommendations was the formation of the Maine Ocean and Coastal Acidification partnership (MOCA) as a volunteer organization to focus efforts around OA based on the 2015 OA Commission report. MOCA has been very successful in motivating collaborations, updating Maine communities, and fostering monitoring, legislative, and outreach efforts. [MOCA's website](#) has more information.

A bill passed the legislature in 2020 for a Blue Carbon inventory but did not receive appropriations. The bill has been re-introduced for consideration in 2021. Maine joined the OA Alliance with a letter on Jan 13, 2020. The OA action [plan](#) and [supplemental report](#) was developed through MOCA activities and workshops from summer/fall of 2019.

----- NEW HAMPSHIRE -----

The [N.H. Coastal Marine Natural Resources and Environment Commission](#) (COMNARE) is a standing commission, in contrast to other commissions that are formed as a basis for developing a single report. COMNARE has completed their reports on [OA](#), [nutrients](#), and [marine debris](#). Instead of taking up a new topic, the commission is looking to reach out directly to legislators on communicating recommendations from prior reports. The NH senate and house flipped from Democratic to Republican in 2020, which may impact messaging.

Recommendations from the New Hampshire OA Report include:

1. Develop a monitoring plan to improve our understanding of Omega variability in NH waters and where these vulnerabilities overlap with biological processes related to ecosystem services such as oyster farming, oyster restoration, and fish biology. Although both state and federal investments have resulted in improvement in our monitoring efforts, further investment in implement an OA monitoring plan will be needed in order to identify trends and potential impacts to our coastal waters.
2. Develop a research agenda that will address gaps in knowledge relevant to NH vulnerabilities to the effects of OA. These recommendations are likely to include further research on all life history stages of vulnerable species in NH of high economic and ecosystem value.
3. Explore potential mitigation strategies for OA relevant to NH waters.

----- MASSACHUSETTS -----

The Massachusetts Ocean Acidification Commission, which includes Senate and House representatives, state agencies, academia, and industry representatives, met several times in 2020 to draft a report on the status of OA in Massachusetts and develop a set of policy recommendations to be presented to the legislature. Four work groups were established to discuss and gather information on specific aspects of OA in MA including: monitoring and barrier beaches, fishing and aquaculture, scientific literature, and policy. [The report](#), released in Feb 2021, is a compilation of the findings and recommendations developed by the work groups. It summarizes ongoing water quality monitoring and research that could potentially incorporate OA monitoring in the future to inform managers on ecosystem conditions as well as provide information on potential impacts on the shellfishing industry. The report also examines potential federal and state funding opportunities to enhance capacity building for OA studies.

Recommendations from the Massachusetts OA Report include:

1. Fund research into the economic and ecological effects of acidification
2. Develop a set of best practices for shellfishing and marine industries in Massachusetts
3. Improve acidification monitoring along the coastline
4. Update nutrient pollution regulations to reflect the impact of acidification due to eutrophication
5. Implement updated pollution standards through upgrades to publicly owned treatment works and septic systems, and through the restoration of coastal wetlands
6. Further incentivize the adoption of green infrastructure through the creation of the Blue Communities Program
7. Update legislative and executive language in order to acknowledge the effects of human activity on ocean acidification
8. Engage the general public in ocean acidification mitigation and research efforts, and join the International Alliance to Combat Ocean Acidification
9. Create a permanent ocean acidification council and adaptive fund to support the recommendations outlined above

----- CONNECTICUT -----

On September 3, 2019, Governor Ned Lamont issued Executive Order No. 3 reinstating the Governor's Council on Climate Change (GC3). The charge to the Council was to "...monitor and report on the state's progress on the implementation of carbon mitigation strategies, as well as on the development and implementation of adaptation strategies to assess and prepare for the impacts of climate change in areas such as infrastructure, agriculture, natural resources and public health."

In December 2019, the GC3 held its kickoff meeting. From January 2020-October 2020 the subcommittees and workgroups held meetings, conducted outreach, developed new draft recommendations and reported on the progress towards meeting the reduction strategies set forth in the original GC3 December 2018 report. Following a public comment period, the working groups finalized their reports in December 2020.

[*Taking Action on Climate Change and Building a More Resilient Connecticut for All*](#) was released in January 2020 as required in the Executive Order. This report contains recommendations for near-term actions to begin to be implemented in 2021 and 2022, including:

Address coastal acidification with a focus on impacts to the shell-fishing industry by developing research and monitoring and joining the International Association to Combat Ocean Acidification.

1. Join the International Association to Combat Ocean Acidification (OA Alliance) and commit to furthering the five goals identified in the Alliance's Call to Action:
 - a. Advance scientific understanding
 - b. Reduce causes of OA
 - c. Build adaptation and resiliency
 - d. Expand public awareness
 - e. Build sustained international support
2. Evaluate approaches to research, monitor, and address coastal acidification impacts to natural resources including shellfish, crustaceans, and fish, including a monitoring system for water quality parameters critical to the shell-fishing industry in real-time to forecast potentially high-risk events.

----- NEW YORK -----

New York recently developed an [Ocean Acidification Action Plan](#) for 2017-2027 that incorporates some of the deliberations of the [NY OA task force](#).

The NY OA Action Plan includes the following goals and objectives:

GOAL 1: Ensure the ecological integrity of the ocean ecosystem.

- Objective A: Protect and restore sensitive inshore, offshore, and estuarine habitats.
- Objective B: Improve the management of ecologically and economically important species.
- Objective C: Evaluate the ecological integrity of the ocean ecosystem off New York.

GOAL 2: Promote economic growth, coastal development, and human use of the ocean in a manner that is sustainable and consistent with maintaining ecosystem integrity.

- Objective D: Implement and advance offshore planning.
- Objective E: Promote sustainable ocean-based industry and recreation.

GOAL 3: Increase resilience of ocean resources to impacts associated with climate change.

- Objective F: Conduct climate change vulnerability assessments.
- Objective G: Adopt long-term climate adaptation and coastal planning strategies.
- Objective H: Implement ecologically sustainable inshore and offshore sediment resource management strategies.

GOAL 4: Empower the public to actively participate in decision-making and ocean stewardship.

- Objective I: Increase stakeholder participation in resource management and offshore planning.
- Objective J: Advance ocean outreach and education.
- Objective K: Support local and regional stewardship programs.

On a sad note, one of the main proponents in NY and co-chair of the OA task force, Dr. Larry Swanson of Stony Brook University, passed away over the summer of 2020. NY OA efforts will continue through MACAN and a new lead from SBU has been announced (Henry Bokuniewicz).

----- Commonalities Across States -----

Although some states embedded their recommendations in wider climate reports and others have stand-alone OA commission reports, several commonalities stand out:

Monitoring

As the saying goes, “You can’t manage what you don’t measure”. All state reports agree that monitoring is necessary, both to understand current conditions and evaluate trends over time. Because of the high variability of coastal state waters, it is unlikely that a comprehensive monitoring system could be mounted that describes every area of each state’s coastline. Nevertheless, there are opportunities to monitor certain sites, perhaps where there are hatcheries or nearby grow out areas, or areas that are already set up for other water quality monitoring that could be prioritized for monitoring and followed over time. Bottom monitoring is particularly important for many shellfish areas.

NECAN held a [workshop](#) on monitoring in conjunction with the National Regional Ocean Council and supported a citizen science monitoring “blitz” activity in 2019 called [Shell Day](#). It may be possible to build on these initial efforts to consider a region-wide plan for standardized monitoring that each state could implement.

Carbon reduction and mitigation

Many states show an interest in Blue Carbon initiatives to sequester carbon. As these efforts gain traction in state plans, NECAN may be able to play a role in coordinating activities and sharing lessons learned. EPA hosted a recent webinar series on adaptation and mitigation strategies for ocean acidification. Presentations are available on the [EPA website](#). As these types of efforts become more common, it will be important to track their success and monitor their effects.

Managing co-stressors

All reports recognize the interactions of OA with other variables that are managed through state coastal zone programs, especially nutrient management, freshwater runoff, and habitat restoration. Managing these issues within a multi-stressor context can provide win-win outcomes. NECAN developed an [infographic](#) for policy makers on how various actions might relate to major OA drivers. Additional research and monitoring are needed to link actions to specific outcomes re. nutrient (or hypoxia) reduction and improvement in general water quality. This will be important to help justify state actions.

Understanding impacts on locally important species

State reports are clear on the need for increased research on commercially important species and the impacts of OA on their ecology and economic output. Many state Sea Grant programs, as well as national research programs, have taken this to heart and supported research directly tied to commercial species. As results from this research come to fruition, clear materials will be needed that explain results in ways that the general public and state officials can understand. NECAN has a project to develop one such information product, but there will be ongoing needs to continually update and refine these as new research is completed.

Continued engagement and outreach

States recognize the importance of continued engagement and outreach around OA and climate impacts in general. Some states have joined the [International Alliance to Combat Ocean Acidification](#) and developed a OA Action Plan, or intend to join. Outreach includes citizen engagement in research and monitoring and education at all levels. Some reports recommend a centralized hub for information related to climate, which would provide an entry point for many citizens to gain information.

----- Regional Collaborations -----

The commonalities among the state reports show shared issues regarding OA and its impacts. While each state will approach these in different ways, there is value in putting individual state actions in a regional context.

Several regional bodies exist that could help states implement recommendations in a coordinated way. The [Northeast Regional Ocean Council](#) is a group that already helps to coordinate state efforts around ocean planning and management and provides a data portal for state planning. The [Northeastern Regional Association of Coastal Ocean Observing Systems](#) collects and provides weather and ocean data and serves as an information hub for ocean data. [NECAN](#) helps to provide OA information to decision makers and stakeholders and evaluate potential environmental and socio-economic impacts of OA to the northeast region. NECAN, and especially its Management and Policy Working Group, will continue to keep track of OA actions at the state level and help to coordinate these on a regional basis.

A potential model for a regional collaboration to document and synthesize carbon storage is the Integrated Sentinel Monitoring Network, which is housed at NERACOOS. ISMN sees itself as: *“an adaptive sentinel monitoring program that leverages and enhances existing monitoring efforts to detect key changes, informs researchers, managers, and the public about ecosystem status and vulnerabilities; and supports an integrated, ecosystem-based management framework for adaptive responses to changes in ecosystem states.”*

Eelgrass has emerged as a potential “OA refuge”. ISMN has initiated work on establishing a workgroup for monitoring eelgrass, *Zostera marina*, in the Gulf of Maine. Some of the tasks of this group will be to compile an inventory of datasets, compare different methods for conducting monitoring, determine some kind of either minimum or region-wide protocols, and evaluate setting up a hub or clearinghouse of datasets, including abiotic data, and identifying gaps in our data, geographic, or intensity, to make better estimates of eelgrass loss or recovery, or changes in ecosystem services such as blue carbon, habitat value, ocean and coastal acidification, and responses to changing water quality. A targeted workshop is planned for Fall 2021.