



Figure 1: Seaweed-regenerative ocean farming operations can help reduce ocean acidification levels and are one of many projects eligible for funding under the Blue Communities Bill.

The Acidification of Our Ocean

From rising sea levels and intensifying storms to a rapidly warming Gulf of Maine, the threat climate change poses to communities, ecosystems, and the Massachusetts economy is impossible to ignore. Our global ocean plays a critical role in climate mitigation, absorbing upwards of [30 percent](#) of excess carbon in the atmosphere caused by the burning of fossil fuels. As the chemical reactions that occur from increasing carbon levels mix with nutrient pollution from farms and roadways, the ocean becomes more acidic, harming marine ecosystems and our blue economy.

According to a [2021 report](#) published by the Massachusetts Special Legislative Commission on Ocean Acidification, Massachusetts will be disproportionately impacted by ocean acidification, in part due to the importance of coastal economies and environments. Ocean acidification is harmful to marine species—particularly shellfish such as clams, oysters, scallops, mussels, and lobsters—and their ability to maintain healthy protective shells. Massachusetts currently boasts the [highest number](#) of seafood-industry-supported jobs on the eastern seaboard, second only to California, nationally. Ocean acidification will negatively impact Massachusetts' robust seafood industry, which, [in 2016 alone](#), supported 87,000 jobs and generated \$7.7 billion in sales, the vast majority coming from shellfish like scallops and oysters. The Commonwealth also contains some of the most acidification-vulnerable communities in the country, and models project [10-28 percent](#) in economic losses annually as a result of ocean acidification.

Ocean Acidification: The process by which excess carbon dioxide (CO₂) is absorbed by seawater, resulting in increased hydrogen ions and increased acidity levels. This can lead to the weakening of sea shells and corals, as well as behavioral changes in fish species.

Eutrophication: Also known as nutrient pollution, the process by which excessive nutrients from land-based activities enter coastal waters. This can result in lower water oxygen levels which is harmful to plants and wildlife.

Protecting Massachusetts Waters

To best mitigate ocean acidification and adapt to its impacts on marine ecosystems and the blue economy, the Commonwealth must address knowledge gaps, prioritize the development of monitoring and mitigation techniques, and promote nature-based solutions to build resilient and thriving coastal economies. Two bills filed by Representative Dylan Fernandes and Senator Julian Cyr seek to confront these challenges.

An Act to Overcome Coastal and Environmental Acidification and Nutrient Pollution (H.D3032 / SD.435) creates a Massachusetts Ocean Acidification Council tasked with understanding the threat posed by ocean acidification to our waters, recommending intervention measures, and developing best adaptive practices. The council will also engage in ocean acidification modeling efforts and support the development of a publicly available monitoring system capable of assessing for short and long-term changes in the pH and aragonite mineral levels in coastal waters. This monitoring will increase public awareness about acidification; identify where and when pH fluctuations are occurring to allow the Council to make more targeted mitigation recommendations; and monitor both short- and long-term changes so industries, such as shellfishing operations, understand and can respond to ocean acidification.

Additionally, the bill identifies key ocean acidification knowledge gaps in order to further scientific research on the effects of acidification on ecologically or economically important understudied marine species, casual relationships between nutrient pollution and acidification, and intervention strategies.

Communities across Massachusetts also have an important role to play in protecting state waters from ocean acidification. ***An Act Establishing the Blue Communities Program (H.D3054)*** outlines nine initiatives—listed in the adjacent table—that communities can adopt to help reduce nutrient pollution of aquatic habitats. The bill provides municipalities with funding for further ocean acidification mitigation programs if they adopt five of the nine initiatives outlined in the bill. Communities must also develop a blue community plan that prioritizes environmental justice communities and outlines metrics for each implemented initiative.

These bills provide a clear policy pathway for the state—in partnership with communities—to combat ocean acidification while supporting responsible growth of our blue economy.

Blue Community Initiatives in H.D3054

1. A liquid hazardous waste program that advertises nutrient-dense liquids for safe disposal
2. Groundwater protection regulations to limit land covered by impervious surfaces
3. A residential rain barrel program
4. A shell collection system for local businesses to return carbonate shells to the ocean
5. A shellfish- or seaweed-regenerative ocean farming operation or restoration project
6. A water quality monitoring program
7. A plan to eliminate municipal-owned sanitary sewer or combined sewer overflows
8. A fertilizer bylaw and lawns program to restrict use and educate residents on proper lawn care
9. A stormwater utility program to fund upgrades