Follow-Up: The Nexus of Restoration and Economy for Local Aquaculture in Southeast New England

Adam Reilly

Aquaculture can be a sensitive subject depending on who you talk to. If done poorly, near-shore aquacultural products, like oysters, risk over-saturating a niche market and threaten the livelihoods of local shellfishermen. If done right, aquaculture may be a catalyst to develop new expanded markets and provide an additional tool to address widespread nutrient pollution and sequester carbon across southeastern New England. Ultimately, it all comes down to the need for community-driven planning that takes into consideration the needs of various stakeholders: fishermen, business owners, community leaders, restauranteurs, farmers; and seeks common ground among them by expanding available markets, thinking beyond the current niche shellfish market, and weighing the potential drawbacks and benefits that aquaculture may provide as a public service.

In 2019, 50 million farm-raised oysters were harvested in Massachusetts alone: a value of approximately $30 million for the Massachusetts oyster aquaculture industry; the third most valuable seafood product in Massachusetts behind lobster and sea scallops. Oysters are a significant industry in the region, but they've struggled to meet their full potential as a commodity item. Studies suggest they may provide an additional method to help address two interwoven crises threatening southeast coastal New England: nutrient pollution and climate change. Oysters are surprisingly adept at helping address both concerns, given that they can filter up to 50 gallons of water per day and sequester carbon and nitrogen in their tissue and shells. Natural and/or artificial oyster reefs are also incredibly effective at providing habitat and protecting coastlines by attenuating storm surge.

However, for all the potential of oyster aquaculture, the expansion of the industry throughout the SNEP region has run into several issues: community hesitancy, balancing the existing supply of oysters to the demand, and finding new markets to accommodate an influx of additional oysters. Near-shore aquaculture has remained in a fairly steady-state over the past few decades throughout Southeast New England. In Massachusetts, only 0.08% of open water is available to shellfish growers. Out of 1.5 million acres of near-coastal water that's available in Massachusetts, only 1,300 acres is committed to shellfish aquaculture. More than 20 years ago, that number was 1,000 acres. If we can address barriers to aquaculture, the region could benefit from increased jobs and exports, an increased supply of local food, and cleaner waters.

The shellfish industry has to meet limitations on where and how to expand. Communities can be hesitant to allow or accept the development or expansion of aquaculture, and restrict existing sites to less-desirable locations and impede new ventures from forming. There are concerns about how near-shore aquaculture farming may impact water vistas that bring visitors to the region, and affect existing local shellfish economies and environments. Oyster and kelp aquaculture ventures are typically sited close to shore, which puts them in closer proximity to local communities and can therefore be a potential concern to those looking to preserve the serene ocean vistas that are synonymous with southeast New England. The business can also be noisy.

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Local oyster growers are businesses that can be built and managed responsibly to provide a real impact on their surrounding communities. Perry Raso is working to change negative perceptions about aquaculture by inviting community members and the public to his Matunuck Oyster Farm and restaurant in Matunuck, Rhode Island:

"[That's] the benefit to the community aside from jobs and tax revenue…we put Matunuck on the map. A lot of that has to do with farm tours and showing [the community] how the farm is operated…the more you can do that, the more you can create those champions of your business, and then that brings people to your small town as an attraction."

Aquacultural ventures are successful when they are embraced as part of a community. Contracts have been used to alleviate local concerns. Evidence of these social contracts can be seen in some of the language of local aquacultural licensing agreements. "I've seen some very complex agreements," said Chris Schillaci of NOAA, "your generator has to be off by this time of night, you can't do that kind of work, no work after this time; they've been successful. I would encourage folks that are reticent to try to look at aquaculture as something they can bring into their community. It's a professional business; treat it professionally, look at what's out there. Do the development and you'll end up with a pretty awesome new industry in your community." Yet while siting is one concern, markets are another.

Many of the existing oyster aquaculture ventures are competing to fill a commodities market: oysters on the half shell commonly sold at oyster bars or other seafood restaurants. However, there is concern that this market is near-saturated and increasing the supply of oyster products to fill a niche market could risk crashing the market absent any increase in demand. To address this, our panelists encouraged their audience to think outside the box and work to grow the market further, during a recent SNEP webinar held on February 11, 2021.

Panelists mentioned that the United States is low on the list of top seafood consumers. While there are opportunities to expand the audience for oysters on the half shell, another might be to partner with local food banks, as was suggested by Scott Soares. A different and perhaps more promising opportunity could be to look beyond the edibles market and increase demand by finding new markets either through increased exports (locally and internationally) or through new applications such as using oyster products to create fertilizer or animal feed, as is being considered with kelp. Kelp also sequesters nitrogen and carbon and can be grown vertically in the same area as oysters. While less developed in the food market, they are being experimented as an additive to cattle fed, which would effectively reduce cattle methane emissions by as much as 97% (see "Agriculture and Aquaculture: Food for Thought"). Though kelp has also run into issues with finding space to grow. There are ways to address several of these concerns in tandem.

Educating communities on the benefits of local aquaculture, inviting communities in on the process, working with existing farmers and fisherman to ensure that aquaculture expansion does not harm existing ventures, and finding new markets for aquaculture products are all ways of overcoming these hurdles through a community-driven process.

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If social and economic concerns can be addressed, aquaculture may help solve environmental issues in the SNEP region. Some local municipalities are piloting the use of oyster aquaculture to evaluate its ability to address water pollution caused by too many nutrients entering coastal waters. Although the nutrient reductions needed in most places will require widespread wastewater solutions, there is interest in seeing if aquaculture can be used in combination with other solutions to help restore their waters more quickly. If this is found to be successful, expanded oyster farms would not only benefit the farmers by granting them access to new space, but also help the community by adding another option in their toolbox for keeping their waters clean and helping improve those that are degraded.

It is important to acknowledge that aquaculture may also play an important role in helping to solve more than one environmental problem. Aquacultural products like oysters and kelp, by nature, are excellent vehicles for carbon and/or nitrogen sequestration and provide a much-needed ecosystem service to help reduce future climate change. As a smaller, more visible sector, aquaculture farmers could serve as test cases for how to compensate growers for the sequestration and pollution abatement services their products provide. Successful adoption of aquaculture as an ecosystem service could become a model for other kinds of multiple benefit agriculture. These benefits have led to some communities embracing local aquaculture farmers as part of the communities they serve and could lead to new innovative designs and strategies such as the incorporation of vertical farming techniques.

The challenges to advancing local aquaculture in the region are real but not insurmountable. A healthy dose of innovation can go a long way.

For more information, please reference our recorded SNEP webinar or reach out to SNEP staff at SECoastalNE@epa.gov