SUSTAINABILITY briefing

University of New Hampshire
The Sustainability Institute

food solutions new england

Fox Point Oysters: Building Coastal Resilience

Located in Little Bay, part of the Great Bay Estuary in New Hampshire, Fox Point Oysters provides fresh, delicious, and sustainable oysters to the Seacoast area and beyond. Behind Fox Point Oysters stands Laura Ward, an artist by training who got hooked on oyster farming in 2012.

The Farm

The farm currently spans 1.5 acres, with a total of 75 oyster cages. Fox Point Oysters distributes to numerous restaurants in Portsmouth, Rye, and Dover. The farm also works with distributors and retailers in the region and sells directly to local customers.

> *Ocean acidification significantly impacts marine organisms, especially those who build their shells from calcium carbonate, including oysters. With ocean acidification, these organisms face two threats: their shells dissolve more readily and fewer carbonate ions are available for uptake to build shells and skeletons (2).*

Production

It can take up to three growing seasons for baby oysters to reach harvest size. In the winter, oysters close up and slow their growth drastically. A typical season starts in April, when Laura comes out to the farm and starts counting oysters to determine the loss from winter. "Some loss is expected," says Laura. "If only half of the oysters make it to harvest size, that's great."

The winter ice shifts the cages and oysters around.

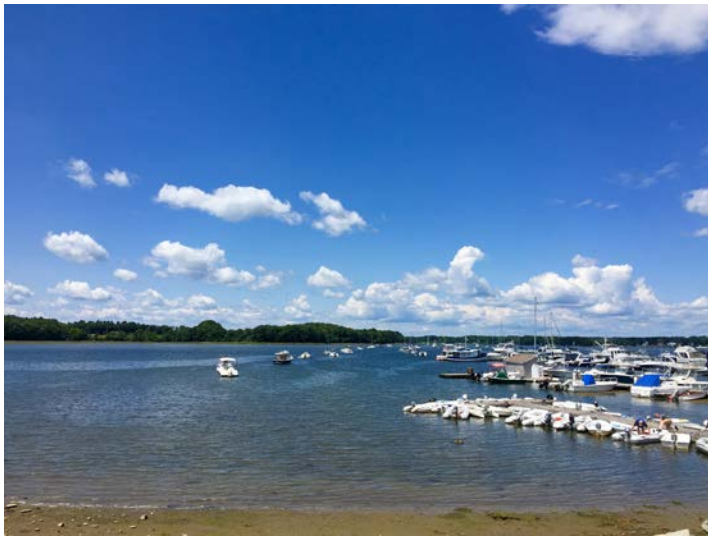

FIGURE 1: Fox Point Oysters, one of the numerous oyster farms in Little Bay, Newington.

In April and May, Laura re-organizes and cleans the cages, by pulling the cages out of water, removing seaweed clinging to the cages, and rescuing escaped oysters. In June, she starts sorting the oysters to find harvestable ones. Most restaurants prefer 3-inch oysters, while some are content with Petit oysters, a more delicate 2.5-inch oyster.

In July, as sales begin, planning for the next season begins as well. Baby oysters ordered from a hatchery are put into cages. This year, Laura put out 300,000 baby oysters, an ideal starting number for her considering only half of the oysters might make it each year and oysters take two to three years to grow. In September, winter preparation is already underway. Once the water is too frigid for Laura to get in, the season is officially over.

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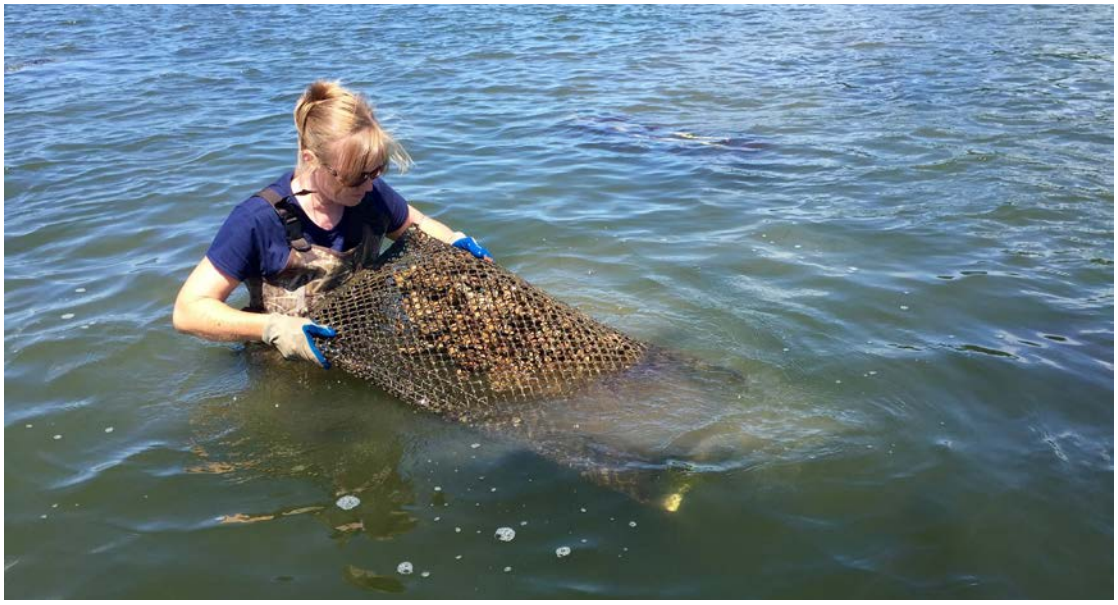

FIGURE 2: Laura tumbles and shakes the mesh bags containing oysters to promote growth.

Management Practices

Fox Point Oysters holds itself to high standards, following strict Best Management Practices and a Code of Practice put forth by the East Coast Shellfish Growers Association (ECSGA). Per the code, Fox Point Oysters follows practices to ensure product safety, dispose waste responsibly, and reduce its environmental impact.

In fact, Laura sees herself as a steward of the Bay. Being out on the water frequently means she is the first to see if something is out of place, such as an intrusive object or a disease outbreak. In these instances, she knows the authorities to contact to keep the Bay unblemished, namely the New Hampshire Department of Health, the New Hampshire Department of Environmental Services, and the New Hampshire Fish and Game Department.

Benefits of Oysters

Oysters are a keystone species, which means they control their environment through filter feeding. They feed by filtering microscopic particles in water, thus removing nutrients and sediments. They even filter nitrogen, a persistent pollutant that can fuel algal bloom. The Great Bay Estuary is a eutrophic system replete with nutrients that drive overproduction of algae. As effective purifiers, oysters help that problem. A single oyster can clear over 15 gallons of water in a day (1).

Since oysters feed off phytoplankton in the water, they do not need to be fed. For that reason, growing oysters takes minimal resources and zero pesticides. Additionally, the spaces between their shells provide habitat for juvenile fish, crabs, and other organisms on which they feed, stimulating aquatic diversity (1).

Climate Impacts Seen

While climate change is not something Laura frets over on a day-to-day basis, it is an issue that concerns her given the vulnerability of oysters to climate impacts. As atmospheric carbon dioxide rises, about one quarter is absorbed in the oceans (2). The absorption of carbon dioxide in ocean water reduces its pH, making the ocean more acidic.

Ocean acidification significantly impacts marine organisms, especially those who build their shells from

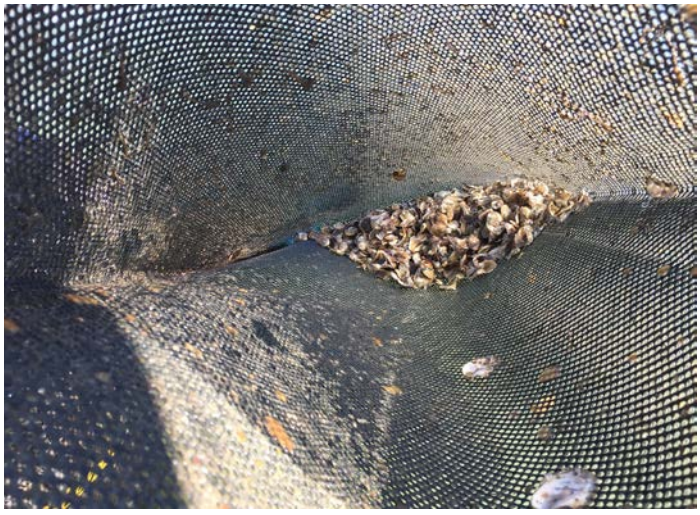

FIGURE 3: This mesh bag contains 3,000 oysters that will gradually grow to reach harvest size.

calcium carbonate, including oysters. With ocean acidification, these organisms face two threats: their shells dissolve more readily and fewer carbonate ions are available for uptake to build shells and skeletons (2).

Another noticeable impact is warming ocean temperatures, which breed diseases. Vibrio is a bacterium found in warm coastal waters and can cause serious gastrointestinal illness in humans upon consumption (3). A recent study concluded that peak ocean temperatures in the Baltic coincided with the unexpected emergence of Vibrio infections in northern Europe (4). Such robust scientific evidence linking disease to warmer ocean temperatures is alarming. In recent years, there have even been several Vibrio outbreaks from oysters harvested in the Gulf of Maine, specifically in Cape Cod (5). While New Hampshire has escaped recent outbreaks, it is unlikely that the state's waters will remain untouched.

Aquaculture is a growing sector of the New England economy. According to the 2012 Census, New England had over 350 farms involved in some type of aquaculture, with over 200 of those farms focused on mollusk production (6). For this reason, continued research on climate impacts is critical to sustaining aquaculture in the New England economy.

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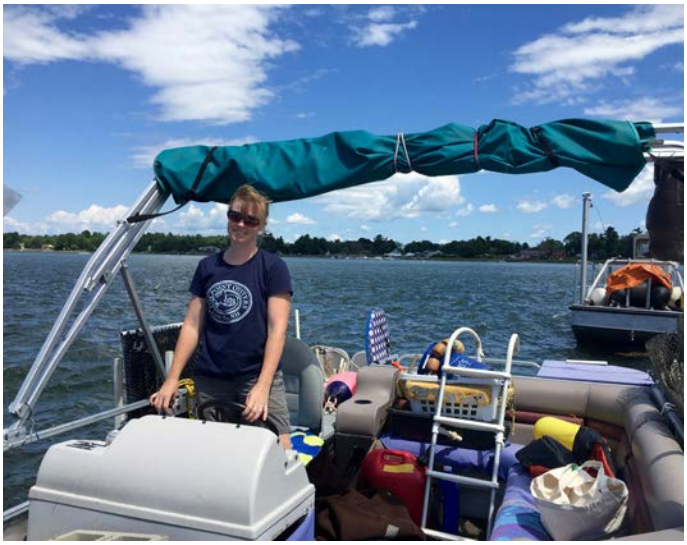

FIGURE 4: The New Hampshire Department of Health and Human Services has strict guidelines for ensuring cleanliness on boats engaged in oyster farming.

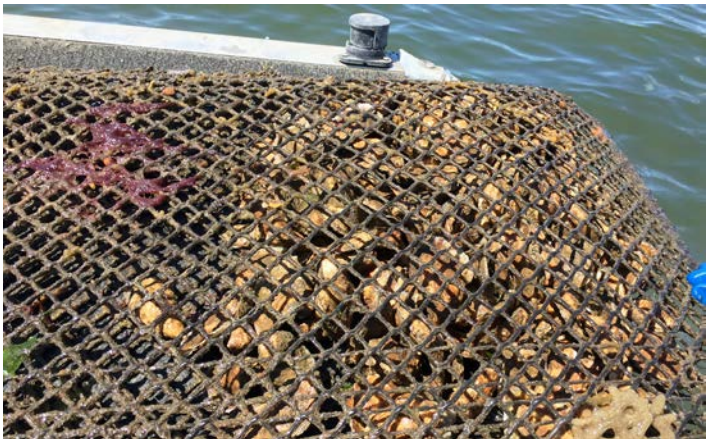

FIGURE 5: Warmer temperatures breed diseases, thus rising ocean temperatures pose a great threat to oysters.

Challenges

The biggest challenge is farm financial viability. "It can take up to five years to turn up a profit," says Laura. The initial investment is sizable due to the cost of the equipment, with a single cage costing upwards of a hundred dollars. With the cost of 75 cages at the farm approaching $10,000, the investment in the equipment alone can be prohibitive.

Identified Needs & Research Areas

Laura is still learning all oysters can do. Research on using shellfish to remedy water pollution is especially enticing to her.

Laura is hopeful for restrictions on pollutants in areas surrounding water, specifically on pesticide use in lawns. Presently, just a mere inch and a half of rain can shut down the Bay for oyster farming temporarily as a safety precaution, largely due to pesticide runoff. With more extreme weather events predicted for the future, curtailing pollutants in areas surrounding water can ensure that oyster farms will continue to thrive.

Lastly, education is an integral, and often overlooked, piece of the puzzle. There has been modest opposition to oyster farming in the area due to concerns that aquaculture spoils waterfront views and hinders recreational activities such as boating and swimming. Educating people about oysters, their ecosystem services, and the stringent regulations imposed on oyster farms can alleviate these hesitations. In fact, educating people on the benefits of oysters will be a boon to both oyster farming and coastal communities.

To learn more, visit foxpointoysters.com

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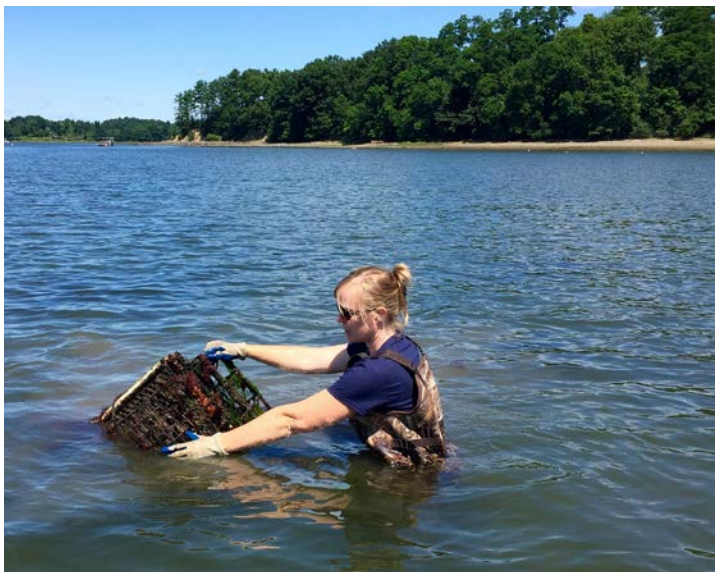

FIGURE 6: The investment to get an oyster business off the ground is hefty, with a single cage costing upwards of a hundred dollars.

Climate Change and the New England Food System Case Study Series

This briefing was researched and written by the UNH Sustainability Institute’s 2015 Climate Fellow, Ravdeep Jaidka. Ravdeep’s fellowship focused on documenting and communicating climate impacts and adaptation strategies for New England farmers and fishermen. Ravdeep graduated from the Agriculture, Food, and Environment Master’s program from Tufts University this May. She is currently the Supply Chain Coordinator at Equal Exchange, importing fair trade bananas from small producer groups in Latin America. The fellowship was based at the Sustainability Institute and hosted in collaboration with Food Solutions New England (FSNE). FSNE is a regional, collaborative network organized around a single goal: to transform the New England food system into a resilient driver of resilient driver of racial equity and food justice, health, sustainable farming and fishing, and thriving communities. Learn more at www.foodsolutionsne.org.

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