



Zachary Gordon measures clams at a New Jersey farm site this spring. Photo: Meghana Parikh

A boyhood love of the sea grew into a career: 10 questions with Zachary Gordon

Editor's note: In October 2021 Zachary Gordon became the regional aquaculture extension liaison at Connecticut Sea Grant, a new position created in partnership with the National Oceanic and Atmospheric Administration (NOAA) Northeast Fisheries Science Center (NEFSC) Milford Laboratory in Milford, CT. With the Milford lab as his home base, he works in a broad geographic and topical range, all focused on strengthening the aquaculture sector. This spring, he answered 10 questions posed by Wrack Lines Editor Judy Benson about his unique story and career.

1. Your title might sound a little mysterious to readers. Would you explain what it means and describe your responsibilities?

My area of expertise is shellfish aquaculture, and I serve the northeast, from Maine through Virginia. Hence “Regional Aquaculture Liaison.” The Milford Lab has a long history of providing innovation and technical knowledge to the shellfish industry. My job is to broaden these services and help leverage the increasing federal investment in the sustainable growth of the aquaculture industry. Essentially it is to build relationships and trust as a liaison between the aquaculture industry, extension professionals and federal scientists in the northeast. There is a wealth of information within these groups that regularly gets lost in the shuffle because people only have time to focus on immediate needs and not on the bigger picture. I meet growers where they are and understand their needs in relation to the rest of the region. Many growers have important problems that can be addressed with research, but don't have

the time to seek resources, such as applying for and managing a research grant. Many don't have the partnerships with the research community that many grants require.

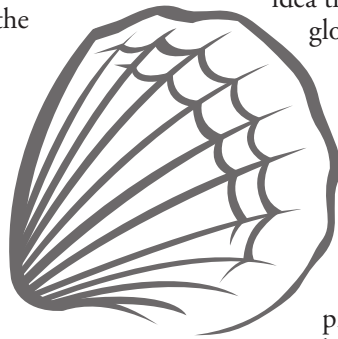
2. What are some of the projects you have or are currently doing in this job that best represent the geographic and topical range you work in? What are some of the challenges you anticipate working on in the future?

My role in many of the projects at the Milford lab is to make sure we are addressing the needs and concerns of the farmers in our region, as well as finding creative ways to translate the research for farmers and industry stakeholders in an engaging and useful way. Recently I have been working on developing a nutrient calculator that will allow growers to quantify the amount of nitrogen removed from the environment when they harvest their oysters. This will be paired with short videos on the importance of ecosystem services that are provided by oyster aquaculture.

Another project I am working on is studying hard clam growth and survival in New Jersey. This project came about when a farmer from New Jersey reached out to the lab and explained that the clams on his farm that normally take 2-3 years to grow to market size are now taking 4-5 years, and he is seeing an increase in death among his clams. This is a problem that is affecting many growers in this region of New Jersey. We secured funding to look at both long and short-term growth patterns paired with environmental data to learn whether we can provide some proof that this is occurring as well as investigate possible environmental conditions that may be causing it.

I am working with the wider aquaculture extension community on a professional development, networking, and mentoring program funded by the Northeast Regional Aquaculture Center (NRAC). This project will bring together aquaculture extension professionals throughout the region to conduct a professional development skills workshop and provide mentoring opportunities. The combination of the COVID-19 pandemic and generational turnover in the aquaculture extension community has led to a gap in resources that this project will fill. Extension agents who participate will develop new skills and networks to better serve the needs of aquaculture industry members in their community.

Looking to the future, I am interested in shellfish hatchery systems and genetics. Hatcheries are where the seed oysters are born and grow to about 2-8 millimeters before being sold to farmers, who grow them to market size. This is also an area in which the Milford Lab has world-renowned expertise. These systems are expensive and technical operations and the speed of growth of farms in the Northeast is outpacing the hatchery capacity. Farmers are already struggling to find the



seed they need. There are a variety of research projects getting started now that will help tackle this issue and I think it is something I will be thinking about a lot in the next five years.

3. How did your educational, professional and personal background prepare you for this job, and what were some of your previous positions?

Working in a variety of different sectors before this job gave me a really great perspective and helped me understand the best way to communicate with the different stakeholders I interact with on a daily basis. My first job in aquaculture was with a non-profit called The Martha's Vineyard Shellfish Group. Over the years I have worked with a few shellfish farms in the private sector, with state government in outreach and education on marine coastal issues in Maine, and I had an internship with the N.Y. Attorney General's Office in the Environmental Protection Bureau.

I was very lucky to be able to gain varied experience over the last five years, while also getting a professional science masters in Ocean Food Systems at the University of New England. In that program I focused on the intersection of private industry, state government and public health in regards to harmful algal blooms. It taught me a lot about the complications of working with these various stakeholders and addressing everyone's needs.

4. How did you first become interested in studying and working in aquaculture? Was there a particular experience that was pivotal to setting you on your current path?

Growing up on the Connecticut coastline I was always very interested in the marine environment, but my interest gradually diminished in my teenage and young adult years. I went to college in landlocked upstate New York and became interested in sustainable food systems. In my junior year of college I joined a study abroad program in New Zealand and took some marine science courses, but never connected it back to my interest in sustainable agriculture. During college I worked and volunteered on land-based farms and thought that was what I wanted to go into. I was really interested in the idea that local food systems could help solve some of our global food problems.

Not until my second job out of college did I become interested in aquaculture and discover how important this little-known food source could become. I had the opportunity to work at The Martha's Vineyard Shellfish Group. I worked in the hatchery where we grew oysters, clams and scallops, and I also worked on shellfish restoration projects including an oyster shell recycling program and nutrient mitigation projects. This taught me about the environmental benefits of shellfish that go beyond just food and really got me hooked on aquaculture.



5. Do you like to eat shellfish? What are your favorite kinds and ways to eat them? Do you harvest clams and oysters recreationally?

I eat all types of shellfish. When I worked on a mussel farm, sometimes for lunch break I would just put a couple mussels in a mug and throw it in the microwave for 30 seconds with nothing else. That is a really good snack. Oysters on the grill are my favorite and are easy because you don't have to shuck them. I add a little bit of butter and sriracha hot sauce right after they open.

Steamers, otherwise known as soft-shell clams, are another one of my favorites. Growing up I harvested soft-shells and hard clams with my family regularly. Over the years clam populations have declined a bit in Connecticut, making it harder to find them recreationally, and moving away for many years I lost knowledge of the best spots to go. Since moving back to the area I have been planning to get back into clamming for fun.

6. What are the most significant ways you believe the work you're doing can contribute to the larger world?

Introducing people to seafood and aquaculture is one of my favorite things to do, and most people I talk to are fascinated by the process. Seafood will play an increasingly huge role in feeding the world and I am passionate in my belief that Americans should be eating more seafood and should be growing more seafood domestically. We import more than 80% of the seafood we currently eat from other countries, where it is often produced in a less sustainable and less regulated way than what we do here. I don't deny that there can be downsides to aquaculture, but no food source is perfect. The goal is to create more sources of local food, which shellfish can do. There is work to be done to lower the cost and make it more accessible to everyday Americans, but I strongly believe shellfish should be part of the solution.

Each of the projects I work on lend to these larger goals of producing more sustainable seafood in the United States and educating people on the benefits of eating more seafood. I am passionate about aquaculture and enjoy connecting with people of different backgrounds. This job is very fulfilling because it lets me do both.

9. Would you tell readers about the history of the Milford lab?

The NOAA Northeast Fisheries Science Center (NEFSC) Milford Laboratory has a long history of applied research and technology transfer in support of shellfish aquaculture. Victor Loosanoff became the first full-time employee of the Milford Lab in 1931. It was founded to help solve the issues facing the oyster industry in Connecticut. Under his leadership, the Milford Lab made fundamental contributions to the understanding of shellfish biology and reproduction. Milford scientists developed methods to spawn bivalve shellfish nearly year-round and to rear all life stages (embryonic, larval and adult). This became known as the "Milford Method" and is still used worldwide in the aquaculture industry. In the 1950s another scientist at the lab, Robert R.L. Guillard, began to develop the microalgae culture collection that we still have today. This is a collection of isolated species of algae that are either commonly used to feed shellfish in hatcheries or are an important species for scientific study. The lab sends starter algal cultures to anyone who requests them for commercial or research purposes.

10. Would you tell readers about some of the people working there now and a few of the projects they're working on?

Today the lab staff is comprised of about 15 research scientists and about 20 contractors and technicians who work on some of the most pressing issues facing the shellfish aquaculture industry for the Northeast region and beyond.



Lisa Guy, left, curator of Milford microalgal collection, shows the collection to Amanda Lawrence of the National Sea Grant office during a recent tour of the lab. Photo: Judy Benson

A FEW EXAMPLES OF CURRENT PROJECTS INCLUDE:

Ecosystem services provided by shellfish aquaculture:

This project, led by Julie Rose and Renee Mercaldo-Allen, is quantifying ecosystem services to help industry regulators accurately balance the pros and cons of a project when deciding whether to grant lease applications. It is also teaching industry members about these services to help them market their products more effectively.

Effects of ocean acidification and climate change on commercially important shellfish:

Led by Shannon Meseck, Katie McFarland and Matt Poach, this project aims to understand how these species adapt to changing ocean conditions.

Disease dynamics of oysters in Long Island Sound:

Also led by Katie McFarland and Meghana Parikh, this project is looking at diseases that may affect natural oyster populations in the Sound and how restoration efforts can be sited to reduce diseases.

MORE INFORMATION:

For more information on projects at the lab, visit: <https://www.fisheries.noaa.gov/new-england-mid-atlantic/aquaculture/current-research-milford-laboratory>

