

# New York Aquaculture Needs Assessment Report 2021

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(At left) Bags of clams, oysters and scallops are cultured off of a dock in East Creek, Long Island, New York. Credit: Andrew Griffith, NYSG Scholar; (At right) A scallop shell washed ashore in Long Island's Noyac Bay. Like other aquatic filter feeders (clams, oysters, mussels), scallops face survival challenges in bays, estuaries and other waters due to a number of water quality issues, including impacts from harmful algal blooms. *Image credit: Paul C. Focazio/NYSG*



*New York Sea Grant is part of a nationwide network of 34 university-based programs working with coastal communities through the National Oceanic Atmospheric Administration (NOAA). Sea Grant research and outreach programs promote better understanding, conservation, and use of America's coastal resources. Sea Grant is funded in New York through SUNY and Cornell University and federally through NOAA.*

# New York Aquaculture Needs Assessment Report 2021

## Summary

While New York has a long history of shellfish and finfish aquaculture, current production lags far behind other states in the region. According to the 2018 USDA Aquaculture Census, New York had roughly \$8.8 million in revenue from aquaculture. This places New York among the lowest of coastal states, including those surrounding the Great Lakes, some of which are producing double and triple that amount. Even though current production is low in comparison to surrounding states, potential for aquaculture growth in New York is high, with expanding market demands for high quality, locally grown products.

To better understand the New York aquaculture industry, its constraints, and opportunities for growth, a needs assessment was conducted on January 26, 2021 by New York Sea Grant (NYSG). This assessment was done to establish what specific support is required for the NY aquaculture industry's success. There is a large range of diversity throughout the state with multiple finfish operations (trout, bass, salmon), and a large number of shellfish operations throughout Long Island, in addition to multiple seaweed research farms that are starting up. Despite the diversity of the products produced, similar needs were identified across all types of operations; finfish, shellfish and seaweed.

Top Needs of the Industry
<ul style="list-style-type: none"><li>❖ Aquaculture/Seafood Infrastructure development (i.e. logistics, cold storage, processing, feed)</li><li>❖ Community and local support for aquaculture</li><li>❖ Streamline regulations and permitting, and less regulatory burden (cost and complexity)</li><li>❖ Business development assistance (financial, marketing, communication)</li><li>❖ Development of nutrient/carbon credit program</li></ul>

During discussion with the industry, notes were taken to record discussion topics. Discussion points were broken into six categories: regulation, business development, education, network, infrastructure and miscellaneous. Each category has 'Key Points' which are discussion points that were mentioned multiple times throughout the needs assessment (table on the next page).

<b>Key Points</b>
<b>Regulation</b>
<ul style="list-style-type: none"> <li>❖ Development of nutrient/carbon credit program</li> <li>❖ Changing state laws to allow for more diverse crop opportunities (i.e. seaweed)</li> <li>❖ Streamline regulations and permitting</li> </ul>
<b>Business Development</b>
<ul style="list-style-type: none"> <li>❖ Funding for businesses</li> <li>❖ Marketing of aquaculture products</li> <li>❖ Aquaculture business classes and guidance</li> </ul>
<b>Education</b>
<ul style="list-style-type: none"> <li>❖ Increase formal aquaculture education; curricula for high schools and degree programs at colleges</li> <li>❖ Workforce development</li> <li>❖ Community and local support of aquaculture businesses</li> <li>❖ Consumer education about aquaculture</li> </ul>
<b>Network</b>
<ul style="list-style-type: none"> <li>❖ Unified aquaculture network</li> <li>❖ Reinstate the NY Aquaculture Association</li> </ul>
<b>Infrastructure</b>
<ul style="list-style-type: none"> <li>❖ <i>Develop aquaculture/seafood infrastructure (i.e. logistics, cold storage, feed, etc.)</i> <ul style="list-style-type: none"> <li>➤ Processing facilities</li> <li>➤ Develop and expand distribution channels throughout NY and the Northeast</li> </ul> </li> </ul>
<b>Miscellaneous</b>
<ul style="list-style-type: none"> <li>❖ Increase capacity for in-state diagnostics of aquatic animal health</li> </ul>

## Full Report

On January 26, 2021 two virtual needs assessment meetings were held with the aquaculture industry in New York. The first meeting was targeting finfish and land based systems and the second was targeting shellfish and seaweed aquaculture. There were two goals of these meetings:

1. Begin to form an active aquaculture network between academia, industry and extension across the state.
2. To identify the top needs of the aquaculture industry in the state to help NYSG develop targeted programming that would support sustainable production and inform agency and NGO partners with interest in aquaculture production.

The finfish meeting had 38 participants representing the private industry, the state hatchery system, academia, and agency personnel. The shellfish and seaweed meeting had 33 participants, representing private industry, academia, and agency personnel. Meetings included a presentation from NYSG about current projects, and presentations from aquaculture professionals and researchers across the state. Connecting researchers to the industry is a large first step in developing an active aquaculture network. The aquaculture industry is the driving force behind research and extension, and connecting the two allows the industry to be aware of what work is currently being done in the state and new advancement in technologies as research progresses. It also puts the researchers in contact with industry members who may be able to offer support or assistance for current or future projects.

To conduct the needs assessment, industry professionals were put into breakout rooms with a moderator and no more than six people per room. This format allowed open dialogue between producers and moderators to openly discuss what the needs of the industry are. Participants were given 25 minutes and were tasked with deciding the top three needs of the aquaculture industry in New York. The top three needs from each room were then compiled into a survey and the entire group voted on the overall list. The table below lists, in order, the top three needs of the aquaculture industry from each meeting.

Finfish Meeting Top Three Needs
<ol style="list-style-type: none"><li>1. Streamline regulations and permitting, and lessen regulatory burden (cost and complexity)</li><li>2. Aquaculture/Seafood infrastructure development (logistics, processing, feed)</li><li>3. Business development assistance (financial, marketing, communication)</li></ol>
Shellfish and Seaweed Meeting Top Three Needs
<ol style="list-style-type: none"><li>1. Political, community and local support for aquaculture</li><li>2. Infrastructure development (cold storage, logistics, shellfish hubs, processing, waterfront access)</li><li>3. Development of nutrient/carbon credit program</li></ol>

Open discussions in the breakout rooms were recorded and notes were taken from conversations to include in the report to reference for future programming and development. The talking points from each break out room, along with the top three needs of each break out room, from both meetings were combined and organized into six categories: Regulation, Business Development, Education, Network, Infrastructure and Miscellaneous.

Below the six categories (Regulation, Business Development, Education, Network, Infrastructure and Miscellaneous) are separated out with notes on discussion points under each. Additionally each category has a 'Key Points' table that highlights the topics that were discussed across multiple breakout rooms. Some sections have "Questions to be answered" listed for areas that may need further explanation from the industry.

## REGULATION

- Development of nutrient/carbon credit program
- Streamline regulations and permitting
- Less regulatory burden - cost and complexity (i.e. fish health testing)
- Legislative and political support of aquaculture
- Changing state laws to allow for more diverse crop opportunities (e.g. seaweed)
- Multi-state coordination (e.g. product transportation, multi-state regulation)
- State level aquaculture coordinator

### Key Points

- ❖ Development of nutrient/carbon credit program
- ❖ Changing state laws to allow for more diverse crop opportunities (i.e. seaweed)
- ❖ Streamline regulations and permitting

## BUSINESS DEVELOPMENT

- Funding for businesses
  - "Seed" funding - secure money to get small business operations started. A number of businesses have tried to get started and run into financial difficulties
  - Funding sources for small scale operators to get involved in the industry
  - People overlook how much it costs to get started, they need financial support for their businesses
- Aquaculture business classes and guidance
  - Calculators and worksheets to highlight the costs of getting into aquaculture
  - Guide on how to get involved in an aquaculture business
  - Guide on how to run an aquaculture business
- Guidance from the state on how to start an aquaculture business in NY
- Incentive for in-state purchase of oysters (93% of oysters purchased are out of state)
- Marketing of aquaculture products

- New market channels for aquaculture products - finfish, shellfish and seaweed
- Develop a market for seaweed
- Expand the market for NY oysters out of state
- Market for “uglies” (non-market quality oysters based on appearance)
- Promote “Grown in NY” label for NY seafood
  - Develop a unified NY aquaculture label
- Identify new and potential operations and provide support to them through developing business resources and networking opportunities

#### Key Points

- ❖ Funding for businesses
- ❖ Marketing of aquaculture products
- ❖ Aquaculture business classes and guidance

#### Questions to be answered:

In order to properly and completely address the needs of the industry, further information will be necessary. Below are a list of questions that remain open to be answered to best address industry needs. These will help to target programming and resources that are developed.

- What type of funding for businesses? - loans (private, state, federal), low interest loans, forgivable loans, state support/funding, grants, investors, renting of equipment or facility space, partnerships, etc.?
- What kind of marketing channels? - direct to consumer, new markets developed, increased retail and wholesale options?

#### EDUCATION

- Increased formal aquaculture education; curriculums for high schools and degree programs at colleges
- Consumer education about aquaculture
  - Public education on farm raised being a viable option of a food source
  - Clearly identify the goals of each type of aquaculture industry (stocking vs. consumption)
  - Grassroots aquaculture education and training
  - Better education about aquaculture on social media - people read and believe what they see on social media
- Technology transfer
  - Dissemination of technology to operations of all sizes - the larger recirculating aquaculture systems (RAS) operations have much better access to new technology
  - Large [RAS] businesses that bring in millions of dollars, their success is based on high level technology - this also needs to be included in education programs - not just basics

- Examples: increased percentage of recirculated water, oxygen-dissolving systems, etc.
  - Improved genetics of cultured product
    - Better genetics for oysters and clams - selective breeding (shellfish industry is very far behind)
    - Example: selective breeding of broodstocks
  - Affordable application of new technology
- Technically trained aquaculture extension agents
- Increase interest and education in aquaculture as a profession
- Workforce development
  - Need professional training and education for aquaculture professionals
  - More aquaculture job opportunities in New York
- Course for RAS and flow through systems - similar to shellfish eCourse offered by Cornell Cooperative Extension and NYSG
- Community and local support of aquaculture businesses
  - Community outreach
- Increased research capacity and aquaculture specific grant support
  - Funding opportunities for aquaculture research through Sea Grant - New York is behind in terms of the number of aquaculture researchers
  - Incentives for the academic community to use and research seaweed and kelp
- Sustainability and public health connection for products produced in aquaculture

#### Key Points

- ❖ Increase formal aquaculture education; curricula for high schools and degree programs at colleges
- ❖ Workforce development
- ❖ Community and local support of aquaculture businesses
- ❖ Consumer education about aquaculture

#### NETWORK

- Directory of local aquaculture products
- Unified aquaculture network
  - Collaboration within the industry
- Resources to get advice and support for industry
- Strong connection between Sea Grant and industry
- Revive the NY Seafood Council (this is a national issue) - An industry-led professional organization that coordinated promotion and political support for NY Seafood in general.



- Reinstatement of the NY Aquaculture Association - Disbanded in 2019, but was a group of private hatchery owners and people interested in developing a strong aquaculture industry in New York State, sharing current issues and information.
  - Annual meetings with the industry
  - Bring farmers together - need to get people organized and together
  - Aquaculture Association focused on all types and aspects of aquaculture

#### Key Points

- ❖ Unified aquaculture network
- ❖ Reinstatement of the NY Aquaculture Association

## INFRASTRUCTURE

Throughout both meetings there was repeated mention of the need to *develop aquaculture/seafood infrastructure (e.g. logistics, cold storage, feed, etc.)*. This has been identified as the top need of the industry. Below are the specific infrastructure needs that were discussed throughout the meetings.

- Access to cold storage facilities
- Access to working waterfronts
  - Re-establishing shellfish hubs/cooperative working waterfronts - a location where farmers share the expenses to have processing facilities, berthing and landing areas, and other needs to maintain their businesses.
- Small seafood purveyors
- Processing facilities
  - Central processing facilities, or network of processing facilities
  - Co-op based processing facility
- Local food distribution areas
- Develop and expand distribution channels throughout NY and the Northeast
  - Getting products to the city, or beyond the city is extremely difficult
  - Moving oysters around Long Island is difficult

### Questions to be answered:

In order to properly and completely address the need to develop aquaculture and seafood infrastructure, more specific information is necessary to understand what exactly stakeholders need. Below are a list of questions that remain open to be answered to address industry needs. These will help to target programming and resources that are developed.

- What type of distribution channels need to be developed? - Trains, purveyors to move products, refrigerated trucks, established truck routes, co-ops to move products, etc.?
- What type of processing facilities? - Co-op processing facilities, state owned and operated, privately owned and operated, rented processing time at a facility, etc.?



- What type of cold storage facilities? - Co-op facilities, state owned, privately owned, rented space, etc.
- What type of access to working waterfronts? - More availability to places to berth and land vessels, a co-op owned waterfront space, rented waterfront time, more readily available waterfront access throughout Long Island etc.

#### Key Points

- ❖ *Develop aquaculture/seafood infrastructure (i.e. logistics, cold storage, feed, etc.)*
  - Processing facilities
  - Develop and expand distribution channels throughout NY and the Northeast

#### MISCELLANEOUS

- Crisis response and contingency plans for farms (pandemics, natural disasters, disease, etc.)
- SOAR program and similar opportunities - The Nature Conservancy and its partners purchased more than 5 million surplus farmed oysters in response to COVID-19 and used them in oyster restoration projects throughout the East Coast, calling the project SOAR (Supporting Oyster Aquaculture and Restoration).
- Government procurement program for aquaculture products - “why can’t students eat clam chowder at school?”
- Increase capacity for in-state diagnostics of aquatic animal health
- Increase in-state capacity for rapid testing of seafood product quality and safety
- Explore opportunities to overcome trade bans between the US and EU on shellfish to open new overseas markets similar to what MA and WA have done
  - European Union (EU) rules restricting the import of live mussels, oysters and other shellfish - unless they are either harvested from “Class A” waters or have already been “depurated”, that is cleaned by being left to stand in saltwater tanks, prior to entering the EU. Currently, the European Commission (EC) has finalized that shellfish from Massachusetts and Washington state meet their requirements for safety and can be imported. For more information: [Shellfish Traded Between the United States and Certain States of EU](#)

#### Key Points

- ❖ Increase capacity for in-state diagnostics of aquatic animal health

## Conclusion

The top needs of the industry are relatively broad and will require support and effort from industry, agency, and academia.

Top Needs of the Industry
<ul style="list-style-type: none"><li>❖ Aquaculture/Seafood Infrastructure development (i.e. logistics, cold storage, processing, feed)</li><li>❖ Community and local support for aquaculture</li><li>❖ Streamline regulations and permitting, and lessen regulatory burden (cost and complexity)</li><li>❖ Business development assistance (financial, marketing, communication)</li><li>❖ Development of nutrient/carbon credit program</li></ul>

***Aquaculture/Seafood infrastructure development*** was discussed across most breakout rooms in both meetings. Producers across the state need processing facilities, cold storage for their product, and easier methods to transport products across the state (or out of state), etc. Infrastructure includes all physical and organizational structures that facilities need to operate efficiently and effectively. Without significant infrastructure changes, the aquaculture industry in New York will continue to struggle to reach its full potential.

There are a few current efforts in place, though it is expected that more efforts will be required to meet the needs of the industry.

- The Gino Macchio Foundation (GMF) is a non-profit organization that was started in memory of Gino Macchio, who was passionate about supporting the oyster industry in New York and cleaning up the Great South Bay. The GMF has an oyster processing trailer, which is set up to assist farmers with processing their oysters. The foundation also has an oyster boat to assist farmers with harvesting and transporting their oysters to market. Even more, the GMF has an “Oyster Station and Mini Barge” which provides farmers direct access to equipment and supplies to harvest and process their product on the water, which are impossible to transport on smaller farming vessels. The GMF barge was mentioned a few times during the needs assessment as a great resource and networking place for new and veteran farmers.
- The five Eastern towns in Suffolk County, Riverhead, Southold, Southampton, East Hampton and Shelter Island, voted to collect a one-time 2% real estate property transfer tax on transactions. The money collected in each town, stays in each town and is used to protect open space, farmland, historic structures and improve water quality. This money has been used to purchase working waterfront in danger of development into non-water dependent uses (e.g. condominiums), keep it open and available for aquaculture producers in Suffolk County.

***Community and local support for aquaculture*** was also mentioned across almost all breakout rooms. Producers are finding that the community is either unaware of aquaculture as a viable source of protein, or has a poor understanding of the sustainability of aquaculture products in New York. Without

this, education communities are unable to show up for producers and support them in the ways they need: purchasing of products, support for new ventures, speaking up in support, etc. New York has over 70 aquaculture farms across the state, ranging from small local farmers to large scale producers. here is incredible potential for aquaculture in the state and for it to truly be successful, it needs the support of the local community.

Currently, a large portion of the current efforts are educational programs available for school aged children. This is an important step in educating the community about aquaculture and its products, but from conversations during the meetings, the audience for education to help gain support needs to be broader. Here are some programs currently educating the public:

- The New York Harbor School offers a three year program to high school students focused on aquaculture. During the course students learn about different types of aquaculture, with a focus on shellfish culture and restoration work. The program is educating students on the research, environmental and business aspects of the industry. This allows students to see aquaculture as a viable career path, as well as learn about the positive impacts on the environment the aquaculture industry can have.
- The Billion Oyster Project was founded in 2014, in partnership with the New York Harbor School, to restore the oyster reefs throughout New York's harbors. However, the founder believed "restoration without education is only temporary." Therefore the Billion Oyster Project took the initiative to educate over 6,000 students, 100 NYC schools, and 10,000 volunteers on the power of the oyster to help clean water and establish reef homes for many marine organisms. This type of education helps the public open their minds to the potential that shellfish farming can have positive impacts on the local environment.
- Suffolk Project in Aquaculture Training (SPAT) is an initiative by Cornell Cooperative Extension. This program was created to encourage members of the community to take an active role in restoring shellfish to the bays of Long Island, as well as learn about oyster aquaculture that is helping to rebuild native oyster populations.
- The Gino Macchio Foundation (GMF) is a non-profit organization started in memory of Gino Macchio, who was passionate about supporting the oyster industry in New York and cleaning up the Great South Bay. The GMF operates an "Educate the Spats Program" where they visit local schools and provide seminars for students about oyster farming, oysters, the ecosystem and how they keep New York's water clean.

***Streamline regulation and permitting, and lessen regulatory burden (cost and complexity)*** was discussed multiple times. Producers understand the need for regulation, but are having a hard time keeping up with permits from multiple different sources, as well as the amount of paperwork required to keep the permits and farm in good standing.

New York Sea Grant does not have the authority to change regulations, or lobby for a change in regulations. NYSG's role is to help the aquaculture industry navigate current regulations and communicate any comments to the regulatory agencies for their consideration. With that, New York Sea Grant has already begun to form task forces and regulatory guides to address some of these needs.

- New York Sea Grant has created a Seaweed Task Force to address the bottlenecks and challenges to obtaining permits to cultivate seaweed in New York's waters. This task force aims to develop guides to help producers navigate the current regulations to cultivate seaweed, and work with agencies to streamline the process in the future.
- New York Sea Grant is also in the process of developing Seafood Regulatory Guides to help producers navigate regulations to sell their product. These guides target both aquaculture and wild caught seafood products.

***Business development assistance (financial, marketing, communication)*** was an in-depth conversation throughout the breakout rooms. New York has seen a decline in new farmers entering into the industry, and many producers contribute this to the large amount of capital required to start an aquaculture business. In addition to a lower number of new producers entering the industry, there is concern that producers are not receiving enough support in business management and marketing to ensure success for their farms. There needs to be resources readily available for producers to understand the business and marketing aspects of aquaculture, in addition to financial support.

There are some current resources that can begin to address the need of business development with the aquaculture industry:

- The New York State Grown & Certified program helps consumers to identify local, safely-handled, and environmentally responsible agricultural products. This type of program, which some aquaculture producers are currently certified with, can help consumers become aware of the safe and responsible aquaculture products that are grown right here in New York. This is also a great marketing tool for aquaculture farms to help consumers easily identify their New York products. This voluntary program is a cooperative effort among producers, processors, wholesalers, retailers, restaurants, and the New York State Department of Agriculture and Markets to meet consumer demand for high-quality food and products. For more information: [Become a New York State Grown & Certified Producer](#)
- The United States Department of Agriculture (USDA) Farm Service Agency (FSA) makes and guarantees loans to beginning farmers. These loans can help new farmers purchase land and equipment for their new farm at reasonable rates. For more information visit: [Beginning Farmers and Ranchers Loans - Farm Service Agency](#)
- Stony Brook University has a Small Business Development Center which offers support to small businesses in New York. No cost, confidential counseling with NYS certified business counselors, on-site assistance at the business locations, workshops on key topics and areas of concern, as well as resources with information about market information, industry trends and sample business plans. Visit their site at: [Stony Brook Small Business Development Center](#)
- SCORE provides no cost business mentorship for businesses throughout New York. Through their mentorship process, businesses are paired with a volunteer mentor who has been successful in their career and is looking to help other businesses succeed. These mentors are able to assist with writing business plans, marketing, social media presence, patents and more. SCORE also offers free webinars and a library full of business resources. Please visit their website to learn more: [SCORE Long Island](#)

***Development of a nutrient/carbon credit program*** was discussed in one breakout room, though when presented to the entire group was voted as one of the top three needs of the industry. Producers are interested in the development of a carbon credit or bioextraction program to provide alternative opportunities for income and highlight the benefits shellfish and seaweed farming have on the environment. Currently, no such program exists in NY, however recent research lends itself to supporting the development of these types of programs in the future.

In 2018 the New York State Department of Environmental Conservation (NYSDEC) with support from the Long Island Sound Study launched its Nutrient Bioextraction Initiative. Bioextraction is a method where shellfish and seaweed are used to remove excess nutrients, like phosphorus and nitrogen, from the water to improve water quality. This initiative was put in place to help clean the waters around New York and Connecticut. Bioextraction pilot projects were launched in 2019 in the Great South Bay and Hempstead Bay in Long Island. Researchers are looking at the impact sugar kelp can have on removing excess nutrients in those areas. Research is ongoing with data still being collected into 2021. This project offers great information for the state and can be used to establish a bioextraction credit program in the future. To learn more visit: [Nutrient Bioextraction: Extracting Pollution from the Sound](#)

Additionally, a group of shellfish biologists, economists, and modelers from NOAA Fisheries, NOAA National Centers for Coastal Ocean Science, and Stony Brook University conducted a case study to use transferable replacement cost methodology to estimate the value of clam and oyster aquaculture to remove nitrogen from the water in Greenwich, Connecticut. Their model found that clam and oyster aquaculture removes approximately 9% of the nitrogen from Greenwich Bay (~31,000 pounds of nitrogen annually)<sup>1</sup>. This research lays the foundation for future work for a bioextraction credit program.

Moving forward, developing a carbon credit or bioextraction program will require coordination between state regulatory agencies, researchers, as well as farmers. The first step is understanding the research and beginning dialogue between entities to highlight the tremendous amount of industry support for the development of this type of program.

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<sup>1</sup> Dvarskas, A., Bricker, S. B., Wikfors, G. H., Bohorquez, J. J., Dixon, M. S., & Rose, J. M. (2020). Quantification and Valuation of Nitrogen Removal Services Provided by Commercial Shellfish Aquaculture at the Subwatershed Scale. *Environmental Science & Technology*, 54(24), 16156-16165.





Sea Grant student interns observe Gregg Rivara, site director at the Suffolk County Marine Environmental Learning Center (SCMELC) in Southold, NY. SCMELC is headquarters to the Cornell Cooperative Extension Marine Program's Aquaculture Program, which includes several shellfish hatcheries and nursery areas. Inset: Interns are looking at oyster spat on an oyster shell. Spat are the juvenile oysters that will eventually grow to full size. Image credit: Michael Ciaramella/NYSG

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*New York's Sea Grant Extension Program provides Equal Program and Equal Employment Opportunities in association with Cornell Cooperative Extension, U.S. Department of Agriculture and U.S. Department of Commerce and cooperating County Cooperative Extension Associations.*



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New York

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