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AQUACULTURE SITUATION AND OUTLOOK REPORT 2009: NEW JERSEY

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Industry Trends and Outlook

The northern quahog or hard clam (*Mercenaria mercenaria*) forms the basis for the largest hatchery-linked shellfish aquaculture in the State, beginning in 1976. At present there are approximately 30 active growers (down from about 60 ten years ago) and four active commercial hatcheries, located mostly in lower Ocean and Atlantic Counties. The Delaware Bay oyster industry is drastically reduced in size, mainly due to MSX and Dermo diseases, with most of the harvest coming from the seed beds. New Jersey

Department of Environmental Protection (NJDEP) Bureau of Shellfisheries is in the process of establishing Aquaculture Development Zones mainly in Delaware Bay, but this has been an ongoing process for at least seven years with no definitive areas being accessed under the new paradigm as of this date.

In addition to shellfish aquaculture, there are a few finfish producers. There is one long-lived trout hatchery that grows fish mainly for stocking purposes and a small amount for market, as well as one medium-sized koi farm and several baitfish and ornamental businesses.

The New Jersey Department of Agriculture (NJDA) currently licenses 192 aquaculture operations, the majority of which are shellfish (164), followed by finfish (21) and aquatic plants and ornamentals (7). These numbers differ from the 2007 Census of Agriculture, which lists 116 aquaculturists in New Jersey, because the U.S. Department of Agriculture's National Agricultural Statistics Service (USDA NASS) only surveys commercial farms of \$1,000 annual farm-gate sales or more. In addition, the 2007 Census of Agriculture also includes production information from public aquaculture. The total production from these operations amounts to \$6.637 million. Shellfish production in New Jersey is valued at \$4.504 million.

The New Jersey Department of Agriculture is in the process of revising the regulation that governs the administration of the Aquatic Farmer License Program. The first aquaculture rule became effective in 2004 and requires that updates to the regulations be made every



Ross Morgan (*left, in pond*) uses air-filled plastic bags to support the float line of the seine while Mat McCann (*right, in pond*) moves the lead line beneath the fish to the pond bank during a Fall harvest event at the Nisei Koi Farm of Quality Koi Company, Inc. in Carney's Point, New Jersey. (Photo: Joseph Myers)



Growing ornamental aquatic plants in a greenhouse. (Photo: Gef Flimlin)

five years. The newest version of the rules is currently being published in the State Register. The updated rules will allow for the expedited renewal of Aquatic Farmer Licenses, the classification of new applications according to one of six production types to allow for easier identification of permitting issues, the accommodation of emerging production strategies such as those that may occur in Aquaculture Development Zones or in State Offshore waters, and greater protection for the health of aquatic animals on existing fish farms.

Commercial Species List

- Angelfish (*Pterophyllum scalare*)
- Bluegill (*Lepomis macrochirus*)
- Brook trout (*Salvelinus fontinalis*)
- Brown trout (*Salmo trutta*)
- Comet (*Carassius auratus*)
- Discus (*Symphysodon* spp.)
- Eastern oysters (*Crassostrea virginica*)
- Fathead minnow (*Pimephales promelas*)
- Hybrid striped bass (*Morone saxatilis* x *M. chrysops*)
- Koi (*Cyprinus carpio*)
- Largemouth bass (*Micropterus salmoides*)
- Mummichog (*Fundulus heteroclitus*)
- Northern quahog (*Mercenaria mercenaria*)
- Rainbow trout (*Oncorhynchus mykiss*)
- Tilapia (*Oreochromis* sp. & *Sarotherodon* sp.)
- Triploid grass carp (*Ctenopharyngodon idella*)
- White sucker (*Catostomus commersoni*)
- Yellow perch (*Perca flavescens*)
- Various ornamental plants

Emerging Issues and Critical Needs

- More market-based research to capitalize on interest in local food
- The promotion of value-added products from cultured species that may appeal to time-starved consumers
- Research into the improvement of growth rates of cultured clams and the evaluation of environmental parameters that are impeding growth rates
- Research into the economic feasibility of open ocean production of shellfish and macroalgae
- Exploration of the potential economic benefits of carbon and/or nutrient sequestration that might be realized by shellfish farmers

Addressing Industry Needs

Researchers, extension agents/specialists, resource managers, industry associations, and concerned stakeholders all play a role in addressing industry needs. The following sections outline new initiatives and recent accomplishments in these areas.

Aquaculture Research

Research in New Jersey is mainly conducted through Rutgers School of Environmental and Biological Sciences/New Jersey Agricultural Experiment Station Haskin Shellfish Research Lab in Port Norris. The recently completed Multi-Species Aquaculture Development Center is just beginning operations with the culture of oysters.

One current project underway to research the environmental impact of hard clam plots in coastal New Jersey bays. There are two pending research projects relating to hard clams, one examining overwintering techniques and one evaluating the impact of hard clam growout plots on eel grass production.

Other research may be conducted by individuals in other institutions of higher learning, though there is no specific clearinghouse for the work that is being done in-state. Some research in aquaculture has been funded over the years through the New Jersey Sea Grant Program, and some of those reports can be found at: http://www.njmssc.org/Sea_Grant/Publications_Directory.htm#TechnicalReports.



Rack and bag oysters on Delaware Bay Cape Shore flats. (Photo: James Tweed)

Significant recent accomplishments of research faculty in New Jersey include:

- Development of tetraploid technology which allows "natural" triploids to be produced
- Discovery that QPX is in part stock- and latitude-dependant
- Methods of distinguishing oyster species from one-another in China (this has implications on the potential introduction of *Crassostrea ariakensis* in the U.S.)
- Development of a budget for loss of oyster shell in seed beds

Aquaculture Extension

There is presently one extension agent working in commercial aquaculture, based at Rutgers University. Extension programming focuses on shellfish aquaculture, specifically the nursery and growout phases of the hard clam, but has recently included ornamental aquatic plant production. At present, Rutgers Cooperative Extension is leading the Barnegat Bay Shellfish Restoration Program: <http://ocean.rcrc.rutgers.edu/marine/bbsrp1.html>

There are not any formal extension centers in the state; however, the Multi-Species Aquaculture Development Center in Cape May will likely have an outreach component when it is completed. Part of a research greenhouse in the Rutgers Eco-Complex in Columbus had a recirculating tilapia system linked with hydroponics for vegetables and aquatic plants, as well as a demonstration project using aquaculture as the model to teach high school math and science in the classroom. Those projects have ended and the facility is investigating new opportunities for more aquaculture research, but without any faculty working in finfish aquaculture the potential for developing demonstration projects there is low.

Aquaculture Education

There are five high schools which have aquaculture course work or formal aquaculture curricula. The aquaculture education program at Cumberland County College, which used a recirculation process for growing tilapia, has been closed due to lack of interest in the curriculum by prospective students.

There are three established community-based shellfish restoration programs in New Jersey that use aquacultured shellfish in their efforts. Although the intent may not be to restore shellfish to previous levels, they do use the shellfish as a tool to attract attention to activities in the surrounding watersheds, educate people about their impacts on the estuaries, and encourage residents to change behaviors that may be negatively affecting the region's waters.

Aquaculture Resources

New Jersey Aquaculture Information

<http://www.jerseyseafood.nj.gov/aquaculture.html>

Barnegat Bay Shellfish Restoration Program

<http://ocean.rcrc.rutgers.edu/marine/bbsrp.html>

ReClam the Bay

<http://www.reclamthebay.org>

NY/NJ Baykeeper

<http://www.nynjbaykeeper.org/programs/42>

Project PORTS: Promoting Oyster Restoration Through Schools

<http://hsrl.rutgers.edu/~calvo/PORTS/Welcome.html>

Sorting cultured single oysters. (Photo: James Tweed)



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