

The Hook



Catch updates and current trends in aquaculture in Western MA and beyond

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Deadly Fish Virus VHSV Spreading Throughout Great Lakes Basin

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By [Franklin Crawford](#)

A lethal fish virus in the Great Lakes and neighboring waterways is approaching epidemic proportions, according to Paul Bowser, Cornell professor of aquatic animal medicine in the College of Veterinary Medicine. The viral hemorrhagic septicemia virus (VHSV), which causes anemia and hemorrhaging in fish, has now been identified in 19 species and poses a potential threat to New York's \$1.2 billion sport-fishing industry.

"It's pretty obvious this is an epidemic even if it isn't official," said Bowser. "There are just so many species affected and so many mortalities."

Three new fish kills have occurred in 2007 in New York waters since the virus was identified in the Great Lakes Basin in 2005. In the St. Lawrence River, hundreds of thousands of round gobies have succumbed to the disease; gizzard shad die-offs from VHSV in Lake Ontario west of Rochester and in Dunkirk Harbor on Lake Erie also have been reported. Adding to concerns about the spread of the virus, walleye in Conesus Lake have tested positive for VHSV. Conesus is the westernmost Finger Lake and is the only New York lake where VHSV has been found in a body of water other than the contiguous waters of the Great Lakes.

Other species from the Great Lakes Basin area that have tested positive by Cornell include bluegill, rock bass, black crappie, pumpkinseed, smallmouth and largemouth bass, muskellunge (New York's No. 2 sport fish), northern pike, walleye, yellow perch, channel catfish, brown bullhead, white perch, white bass, emerald shiner, bluntnose minnow, freshwater drum, round goby, gizzard shad and burbot. Roughly 1,600 fish have been tested at Cornell since May 2006.

Bowser suspects that the virus is still relatively new to the region and may have originated from an infected marine fish off the Atlantic Coast. Other possible sources of the virus include the movement of infected fish by airborne or terrestrial predators, anglers using infected bait minnows, contaminated fishing anglers using infected bait minnows,

contaminated fishing equipment or live water wells in boats, boating activities and ballast water.

"Basically, we don't know how it got here, but it's here and it's spreading," said Bowser. "It would be wonderful if we did know. However, I don't think we ever will."

The Great Lakes VHSV is not related to the European or Japanese genotypes and poses no health threat to humans, said Bowser. However, as a general rule, people should avoid eating any fish (or game) that appears abnormal or behaves abnormally. Not all infected fish, however, exhibit symptoms. Some may be carriers, and visible signs of the disease may vary from species to species.

Containing the spread of the virus in New York will require restrictions on the movement of live fish, testing fish and surveillance. For instance, New York state regulations require that bait fish be used in the same body of water from which they were collected unless they have been tested. In Wisconsin, new emergency rules prohibit anglers and boaters from moving live fish and require them to drain their boats and live wells before leaving Wisconsin's Great Lakes waters, the Mississippi River and those tributaries up to the first impassable dams, according to the Associated Press.

The spread of the virus could have a devastating impact on aquaculture and particularly the channel catfish trade, which constitutes about 80 percent of aquaculture business in the United States, said Bowser. Catfish is a very popular food fish in the Deep South.

"We have detected VHSV in channel catfish in our surveillance efforts," said Bowser. "The ability of the virus to go beyond a carrier state and cause disease in this important aquaculture species is a major research question we plan to investigate this year."

Earlier this year Cornell's College of Veterinary Medicine received a two-year, \$181,000 grant from the New York Sea Grant Program to advance a rapid technique, developed by Cornell virologist James Casey, for [detecting the deadly virus](#). Current tests take a month, while the Cornell test yields results within 24 hours. Researchers hope to have the new technique validated by the end of 2007 and all fieldwork completed by the end of 2008.

<http://www.news.cornell.edu/stories/May07/fish.virus.spreading.html>

NORTHEASTERN REGIONAL AQUACULTURE CENTER

2007 REQUEST FOR PRE-PROPOSALS

The following targeted research areas have been prepared by the NRAC Technical / Industry Advisory Committee:

- Disease Research
- Environmental Affects of Aquaculture
- Genetic Improvement of Stocks
- Reducing Production Costs

GENERAL CRITERIA FOR NRAC FUNDING

In addition to technical/industry merit (and the specific evaluation categories), research and project proposals are judged against six principle criteria. YOUR PROPOSED RESEARCH OR PROJECT MUST:

1. Support commercial aquaculture industry development.
2. Have the assistance, support, or endorsement of industry.
3. Be regional.
4. Have an extension or outreach component.
5. Identify role of collaborators.
6. Meet budget requirements.

Pre-Proposals: NRAC encourages short pre-proposals to present ideas, objectives and working procedures on identified industry problems. Submissions are due July 6.

Please CALL NRAC (301) 405-6917, email NRAC at nrac@umd.edu, or consult NRAC's Website at <http://www.nrac.umd.edu> if you have any questions regarding these issues, for assistance in building regional teams, or in developing extension/outreach programs.

Important Dates in Aquaculture

- July 6 Preposals due for Northeast Regional Aquaculture Center Projects
- July 23-27 **13th Annual Recirculating Aquaculture Systems Shortcourse** Waimanalo, Hawaii
www.bee.cornell.edu/outreach/aquaculture/short-course/
- July 31-August 3 **13th Annual Recirculating Aquaculture Systems Shortcourse** Ithaca, NY
www.bee.cornell.edu/outreach/aquaculture/short-course/
- August 9 4:30-6:30 p.m. **Twilight Meeting: Pond Aquaculture and Bass Fingerling Production.** Four Star Farms, Northfield, MA
- February 9-12, 2008 **Aquaculture America 2008** Orlando, FL www.was.org

Global warming threatening shellfish

21 March, 2007

Certain types of shellfish are being threatened by the rise of global warming, European scientists have discovered. Most shellfish are at some risk, but the worst affected species are oysters and mussels, which are in serious danger of being wiped out because of the increase in greenhouse gas levels in seawater, according to the scientists.

The report, which was carried out by French and Dutch scientists at France's CNRS research centre and the Netherlands Institute of Ecology has found that rising levels of acid in the sea caused by carbon dioxide emissions are threatening some of the world's most popular edible shellfish. Scientists said the carbon dioxide (Co2) was preventing oysters and mussels from producing shells, making them slow to develop and vulnerable to predators. The report also found that the creatures' shells were reduced by up to 25% in seawater, with CO₂ levels predicted for the end of this century. Increasing CO₂ levels in the water led to the shells dissolving completely.

The researchers say that this is the first time this effect has been shown on shellfish. However, UK shell fishermen, especially those on the Yorkshire Coast, where the richest grounds are to be found, say that catches of crabs, lobsters and mussels are at their best for years and have found no evidence of any deterioration in stocks.

But white fish trawlermen say that sea temperatures in the North Sea are rising and this has led to an increase of warm water fish such as red mullet, especially in the southern section of the North Sea. They also claim that cod stocks are at their best levels for years.

The European study showed that higher carbonic acid levels in the ocean increases acidity, which makes it harder for the molluscs to calcify their shells. All sea life needing calcium carbonate for its shell, including coral, is at risk. Oceans absorb a third of the atmosphere's carbon dioxide. Levels have risen by 30% since the beginning of the industrial revolution, but could increase by up to four times by the end of the century.

If the amount absorbed only doubles, mussel growth will drop by a quarter and oysters by 10% by 2100. But at higher carbon dioxide concentrations, mussel shells may dissolve completely, the researchers found. Oysters are less affected, as they use another crystalline form of calcium carbonate for their shells.

<http://www.fishfarmer-magazine.com/news/fullstory.php/aid/967>

UMass Extension's Demo Aquaponics System

A 1000 gallon aquaponics system has been completed and is receiving visitors at UMass Amherst. The system consists of two 300 gal fish tanks and two 8 ft x 2 ft plant beds. Water is moved through the system by air lift pumps powered by an air blower. Water is filtered through a simple sediment filter then routed through gravel under the plant beds. Bacteria colonizing the gravel convert fish-generated ammonia to nitrite, then convert the nitrite to nitrate. A variety of vegetable and herb plants then remove the nitrate, utilizing it for plant growth, and removing toxins from the system. Currently, the system is stocked with large mouth bass and yellow perch.

The system is housed in UMass' Agricultural Engineering Building in an industrial space with large glass expanses on the south and west. While, this is ideal in the winter, in the summer the room's heat is excessive for fish growth. Thus, most of the windows are covered to reduce solar gain. However, plants need light: in one bed, the light source is two high intensity sodium bulbs (400 watts each: a total of 800 watts of light). We are attempting to lower the energy needs of the system by experimenting with red and blue LEDs (light emitting diodes) for the second plant bed. The current LED arrangement uses 130 watts for plant-suitable growth.

The purpose of this system is education and demonstration. In the fall, it is planned to enroll two UMass students to operate the system and to further test the utility of the LEDs. Visitors are welcome: to arrange a visit, contact Craig Hollingsworth



Tomato plants under LEDs at UMass

Twilight Meeting –Northfield, August 14, 4:30 to 6:30

A meeting to demonstrate pond aquaculture and the progress of Four Star Farms in developing a bass fingerling hatchery will be at the farm. We will begin with viewing of the ponds and discuss their progress and challenges since last year. The meeting will then move to the barn to view and discuss the bass fingerling operation that was begun last fall. Four Star Farms is located on Route 63, south of Northfield Center. Directions will be posted at www.umass.edu/aquaculture or call Craig Hollingsworth 413 545 1055.



Feed training bass fry at Four Star Farms

UMass Aquaculture Program – FY08

For the past five years, the Aquaculture Program has been funded through a bond bill which enabled the Massachusetts Department of Agricultural Resources (MDAR) to fund Aquaculture Centers in Southeast, Northeast and Western Massachusetts. While some level of funding is expected to resume in FY09, no funding is available for FY08 (beginning July 1, 2007). However, we have managed to secure some funds for a scaled-back Aquaculture Project for FY08. These funds will enable us to work on the following projects.

- provide limited consulting for current and new-entry aquaculture enterprises. This includes a number of potential growers who have contacted us about starting fish raising enterprises.
- explore new funding opportunities, particularly through the Northeast Regional Aquaculture Center.
- maintain and expand our website, www.umass.edu/aquaculture
- maintain communications with MDAR and the other aquaculture centers in Massachusetts
- continue operation of the demonstration aquaponics system, including training two students per semester in its operation.
- conduct at least two training sessions and one twilight meeting.

Educational Programs

ASERP

Undermountain Elementary School teacher Christine Fenner recently led her 2nd grade class as they finished off their pilot year with ASERP (Atlantic Salmon Egg Rearing Program) by releasing the fry into nearby Sandy Brook, a tributary of the Connecticut River. Therefore, the students are now an integral part of the Connecticut River Salmon Restoration Program, along with numerous other ASERP participants.

These students have raised the young salmon since they received them, as eggs, in February. After intensely observing the hatching process, the students became quite attached to the alevin and even tried to name all of them. That was a difficult task considering how many of the eggs hatched and survived to be released- 419 out of approximately 500.

Christine had a great time with the program and plans to participate again next year, and hopefully many more to come. Working with Tara Johnson, UMass Extension Aquaculture Program Outreach and Education, three teachers from the Mt. Everett Regional School District joined ASERP last fall. This year was a success and now the group is discussing ways to fine tune and better plan events and field trips for the upcoming school year.

4TH GRADE GIRLS' SCIENCE CLUB

Also from Mt. Everett Regional School District, the 4th Grade Girls' Science Club worked with Tara Johnson to become experts on various characteristics of Rainbow Trout. This year the Aquaculture Center at their school housed 150 adult trout originally used in an aquaponics system and 75 young trout recently acquired for a mark and recapture experiment. For over a month a handful of young ladies from the club visited the trout every week to feed and study them. All of the hard work paid off when they presented their projects at the Berkshire Environmental Educators' Network Student Expo this spring. Knowledgeable lectures and creative visual aids held the attention of the expo attendees and provided important information on their school's Aquaculture Program. Great job ladies!

THANKS

The efforts from a number of folks have helped to make this past year's aquaculture program a success. A tip of the hat to: Tara Johnson, Reagan Ellis, Keith Wilda, Julie Ryan, Pete St. Marie, Ken Bergstrom, Four Star Farms, Ben Wiinikanen, Kathy Carroll, Doreen York and the UMass Aquaculture Advisory Committee.

UMass Extension Aquaculture Program

For more information on this program please contact Craig Hollingsworth at chollingsworth@umext.umass.edu



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