

A Proposal for a Collaborative Fisheries Extension Project by New York and Rhode Island Sea Grant Programs.

Project Title: Regional VHS/VHSV Informational Meeting for Marine Fisheries Extension, Fish Health Professionals and Fisheries Management Agencies in Rhode Island, Connecticut, New Hampshire, Maine, New Jersey and New York.

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Submitted by:

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Background information: Past and ongoing success of the extension outreach and research conducted by Sea Grant has been recognized on an international scale. These initiatives have demonstrated effective extension outreach models that can be broadly applied when new issues are either emerging or have the potential for doing so. Both rapid responses, as illustrated by the Lobster Disease workshop for Long Island Sound, and proactive programming, as exemplified by ANS issues in the Great Lakes, are hallmarks for SG.

VHS is a serious viral disease that has resulted in significant mortalities of wild marine and aquacultured marine and freshwater fish since its first discovery in 1938. It has been a serious fisheries problem in Europe, the Pacific Northwest, Northeastern Atlantic and Baltic Sea. The pathogenic virus, VHSV, has been detected in the Northeastern Atlantic and Baltic Sea in Atlantic cod, haddock, halibut, turbot, Atlantic herring, sprat, plaice, flounder; whiting, blue whiting, and European eel elvers. In the Pacific, viral isolates have been found in such species Pacific herring, Pacific sardines (pilchard), Pacific smelt (euchalon and surf smelt), and anchovy. Large-scale, population level mortalities from VHS have been reported among Pacific Northwest stocks of Pacific herring, Pacific hake, walleye pollack and Pacific sardines. Experimental infection studies reveal however that many species such as Atlantic cod, Atlantic halibut may be refractory to the development of serious disease (< 2% mortality) displaying external lesions (ie skin ulceration/petechial hemorrhage) or are otherwise asymptomatic in terms of internal pathology despite high titers of virus in tissues. These experimental studies however have used viral strains endemic to European waters.

VHSV is classified as a Rhabdovirus, a bullet-shaped, negative-strand RNA virus. To date there have been at least four distinct genetic variants or genotypes of the virus identified around the world: Type I, Type II, Type III, and Type IV. With the emergence of VHSV in the freshwater environment of the Great Lakes, Genotype IV has been split into two major groups: Genotype IVa consisting of the previously known marine isolates of Genotype IV and Genotype IVb consisting of the freshwater Great Lakes Basin isolates. As of the end of 2007, over 20 isolates of VHSV Genotype IVb have been

made in the Great Lakes Basin. At present scientists believe there may be at least two viral genotypes in Northwestern Atlantic (Genotype III (discovered in Atlantic halibut off the Flemish Cap of Newfoundland) and Genotype IVa isolated in the Gulf of St. Lawrence along other Canadian maritime provinces in important species such as mummichog, Atlantic herring, striped bass. Genotype IVa is the same Genotype found in the Northwest Pacific that has been implicated significant mortalities of herring, hake, and pollack.

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What is not known in eastern North America is how Genotype IVa will affect stocks of haddock, cod, and Atlantic herring. It may only be a matter of time before losses of the magnitude of those observed in the marine environment of the Pacific Northwest are seen along the Atlantic coast of North America. An additional concern that has been given little attention is the potential that the freshwater Genotype IVb may move to the marine environment and cause devastating mortalities as are occurring in the Great Lakes Basin. If this were to happen, the commercial industry could face severe economic hardships

The Sea Grant Response: As a result of several joint discussions, the Sea Grant Fisheries Extension programs of New York and Rhode Island propose to develop a one-day informational workshop on VHS for fisheries extension professionals, researchers, fisheries managers, environmental groups and representatives from the commercial fishing industries in Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New Jersey and New York. The workshop faculty will consist of at least 5 speakers from fish health research, and fish health management. A draft agenda is present on last page. The workshop will be held during the spring of 2008, potentially at the Atlantic SG Network meeting. We are in the process of trying to orchestrate a special pre-conference workshop at that forum. Alternatively, the project could also be held in Providence Rhode Island or near the University of Rhode Island campus.

Justification: There is an overriding need to inform fisheries extension professionals, researchers, fisheries managers, environmental groups and representatives from the commercial fishing industries in Maine, New Hampshire, Rhode Island, Connecticut, New Jersey and New York. These professionals and interested parties would be well-served to be fully aware of the emergence of VHSV, a foreign animal disease, in the Great Lakes Basin. This emergence is a prime example of the emergence of a new pathogen in an environment where there are numerous naïve hosts that are susceptible to infection. While there are many unanswered questions regarding the specifics of most susceptible vs. least susceptible fish species, there is no doubt that the emergence of VHSV in the Great Lakes Basin is the most important fish health event to ever occur in North America. Those individuals who work in the marine environment of the Northeast must be made aware VHSV and be vigilant to the potential that it may emerge as a significant pathogen in the marine environment.

Because of the potential for VHSV to infect important commercial species in the Northwest Atlantic, as well as possibly affecting important forage species such as Atlantic herring it is imperative to proactively put this issue on the radar screens of fisheries professionals enabling them to respond if or when the disease emerges. Sea Grant is well-positioned to develop this program because of its strong ties to fisheries research and extension in both the Atlantic coastal states and Great Lakes. Sea Grant has had documented past successes in such issues as lobster diseases, and aquatic

invasive species because of its ability to respond quickly and effectively on threats to sustainable fisheries. Moreover, the National Sea Grant Fisheries Extension Initiatives has opened the doors for improved networking between Great Lakes and marine counterparts. The VHS issue is one with considerable overlap in Marine and Great Lakes extension and research.

The NYSG role: NYSG has been actively involved in the VHS issue by organizing workshops and information meetings with in the state, through compilation of > 250 pdfs of VHS information, and through direct outreach contacts with to elected officials including US Senators Clinton and Schumer, Congressman McHugh, NY Senator Wright, NYS Assembly members, Koon, Oaks, Aubertine, Scozzafava that successfully raised awareness of VHS and potential impacts on NYS fisheries. NYSG was also invited to submit a formal testimony at a public hearing on fish pathogens/AIS organized by the NYS Assembly Committee of Environmental Conservation, convened by NYS Assembly members Robert Sweeney and Dale Aubertine. Moreover, the marine fisheries extension program has established effective linkages with counterparts in the Atlantic SG network states and has also organized a VHS discussion with bait industry representative and resources managers. NY Sea Grant will solicit funding to support travel expenses of workshop faculty and work with RI Sea Grant to develop agenda.

The Rhode Island SG role: RISG fisheries specialist, Dave Buetel, will orchestrate logistics of the workshop; make contacts with SG colleagues, commercial fishing industry representatives, fish health professionals and fisheries managers in the Atlantic network. RISG will also contribute additional funding to support workshop which is estimated to be in the \$1500.00- \$2000.00 range. Dave will also play a pivotal role in this project by co-developing the communication strategy for this workshop.

Project Objectives:

- Summarize current state of knowledge: distribution, viral dynamics, infection routes, population impacts, disease pathology, diagnostic tools.
- Identify information gaps.
- Encourage more widespread monitoring for fish diseases.
- Encourage adoption and use of high tech diagnostic tools
- Encourage support for additional funding for research and extension efforts.

Outcomes/Products:

- Establish a VHS working group of SG fisheries extension professionals, fisheries researchers/managers and commercial fishing industry representatives in the Northwestern Atlantic and Great Lakes.
- Establish a research contact list for VHS worldwide.
- A CD of important VHS research pdfs published worldwide.
- Development of a VHS Action Plan for marine Sea Grant States in the event of further spread, possible fish health effects.

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Draft Workshop Agenda:

Welcome, introductions, housekeeping, purpose/outcomes of workshop (VHS as an potentially emerging issue in the Great Lakes and possibly in the Northwest Atlantic)
Dave Beutel, RI Sea Grant and Dave MacNeill, NY Sea Grant

A Perspective on Bridging Marine and Great Lakes Extension Efforts. (Or Proactive versus Reactive Programming? Dr. Jim Murray or Dr. Mike Liffman, National Office.

Overview of Fish Diseases in Marine and Freshwater Fisheries. Dr. Paul Bowser, Cornell and Marine Counterpart: Dr. Mark Fast, MSRC, SUNY Stony Brook.

The role of USDA APHIS in Fish Health Management: Dr. Jill Rolland, APHIS, Washington D.C.

History of VHS in Marine Fisheries and Aquaculture: Dr. Gael Kurath, USGS Western Fisheries Research Center

History of VHS the Great Lakes Watershed: Dr. Paul Bowser

Virology 101: Structure of VHSV Rhabdovirus, Possible mechanics of spread, Genetics. Dr. Jim Casey

VHS Pathology and Diagnostics: Dr. Paul Bowser/Jim Casey.

Open Dates: April 21-25, 28-30; May 5-8; June 24-27

Estimated Budget: \$5325.00

For this collaborative project, the investigators are requesting financial support to underwrite travel for workshop faculty. The breakdown is as follows:

Travel:

- Governmental per diem rate for Bowser, Casey, Kurath, Rolland, Clemetson and MacNeill for 3 days. Providence RI = \$232.00, first/last day \$48.00 (travel days)= 280.00/person = \$1,680.00
- Roundtrip airfare for Kurath (Seattle to Boston/Providence); Roland (Washington to Boston/Providence) \$550.00-625.00 x 2 = \$1150-\$1250
- Roundtrip Amtrak: MacNeill- Syracuse to Providence: \$134.00
Clemeston – NYC to Providence: \$134.00
- Cornell University vehicle: Casey/Bowser, Round trip, Ithaca to Boston = 343 miles; Ithaca to Providence RI= 341 miles .37/mile =

Direct Costs: Workshop operational costs: \$2000.00 for lunch/refreshments/room rental. RI Sea Grant may assume these costs.

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Estimated Budget total: \$5325.00