



Atlantic Canada Aquaculture Industry Research & Development Network

ACAIRDN

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The Atlantic Canadian Aquaculture Industry Research and Development Network is a unified voice for the Atlantic Canadian Aquaculture Industry in matters of R&D, providing leadership, coordination and communication for the direct benefit of the industry.

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Aquatic Invasive Species (AIS) are still the main focus of R&D here on the Island. With funding from Environment Canada's Invasive Alien Species Partnership Program (IASPP) the PEIAA has been working to raise awareness about the spread of AIS. In the past tunicate mitigation research has mostly been centred on the mussel industry; efforts to find a long-term solution to these problems continues with a four year Atlantic Innovation Fund project funded by ACOA. However increased concern in other shellfish sectors has resulted in a new project to examine potential affects and mitigative measures for oyster culture.

Project Highlights

Awareness Campaign

Funded by Environment Canada's Invasive Alien Species Partnership Program (IASPP) the purpose of this project is to make commercial and recreational boaters aware of how they can help prevent the spread of AIS.

Educational materials such as waterproof binders, posters, leaflets & floating key chains are being distributed to boaters, harbour authorities, marine & dive supply stores and boat dealers all across the island. Workshops are being held partnership with various industry associations and environmental groups, for commercial and recreational boating groups.

To help launch the campaign the provincial government declared July 8th - 14th Aquatic Invasive Species Awareness Week. Since then we have had several AIS related stories in the local media.

For copies of the AIS binder please contact Peter Warris at rd@aquaculturepei.com.

Development Fund

Following on from the success of last year's industry driven development projects an Aquatic Invasive Species (AIS) Development Fund has been created to support proposals

from the aquaculture industry to develop and test new ideas and approaches to manage tunicate infestations on cultured shellfish in 2007. This fund is supported by DFO's Aquaculture Collaborative Research and Development Program (ACRDP), the provincial Department of Fisheries & Aquaculture (PEI DFA) and the PEI Aquaculture Alliance.

The PEI DFA has also undertaken to assess last year's projects over the coming growing season. A report on the 2006 projects is available; please e-mail rd@aquaculturepei.com for an electronic copy.

New Staff at the PEIAA Office

We are pleased to announce two new staff members at the PEIAA.

Linda Duncan is our new Executive Director. Linda is a former Islander who has had an international career in senior management roles in manufacturing, shipping, and service industries as well as heading a non-profit organization in London, England.

Jennifer La Rosa is our new Project Manager, in charge of the Atlantic Innovation Fund Project "Development of Techniques and Mitigation Strategies for the Management of

Invasive Tunicate Species Fouling Aquaculture Farms.” Jennifer has recently been Research Coordinator for PEI Health Research Institute at UPEI and also taught in the Chemistry Department.

Research Meet & Greet

Art Smith, Aquatic Invasive Species (AIS) Coordinator with DFO organised a gathering of individuals involved in AIS related research and monitoring activities in PEI in 2007 this last June in St Peters. The meeting provided the opportunity for individuals to meet with others and better appreciate the

scope of research and monitoring activities being undertaken in the province as they relate to AIS.

The invitees were also polled as to the following:

- The nature of the research / monitoring, the methods and objectives?
- Where and when the work will be done?
- Who is collaborating on the project?

Art has put together a spreadsheet of these projects, for a copy please contact me.

Investigation into the Management of the Invasive Species; the Oyster Drill, the Violet Tunicate, the Clubbed Tunicate and the Vase Tunicate on Oyster Aquaculture Farms

Invasive species continue to affect the mussel industry on PEI. The oyster industry has been affected by several AIS, though to date most areas where oysters are grown are free of invasive tunicates. However the industry members are concerned about the spread of tunicates to these areas and are being proactive in trying to determine management measures for them. Module A of this project will examine impact & possible control measures for three species of invasive tunicates on three different oyster culture systems.

The oyster drill (*Urosalpinx cinerea*) is one of the AIS that are affecting oyster production. This species has survived in PEI waters since its introduction to Atlantic Canada in the late 1800's. It is only as of the last few years that some industry members have observed a dramatic increase in both the numbers of the snail and its impact on oyster populations. Module B will study possible management strategies for operations that are infested with the oyster drill.

Project Objectives

- A) Investigate the impact and possible control techniques on suspended oysters and gear for three species of invasive tunicates (violet, clubbed tunicate and vase tunicate) on PEI.
- Using the "Oyster Gro" system and floating bag techniques to determine if the normal husbandry techniques can be used to control tunicate fouling (currently used in NB to control other fouling species).
 - Lime and vinegar treatments on submerged, tunicate fouled oyster cages.
 - When and how often treatment is required on the three system types, described below.





The “Oyster Gro” System – a suspended oyster rack system that floats the bags just below the surface. Pictured here in upside down position with oysters exposed to the air.

1.

Oyster floating bag system – individual oyster bags are suspended at the surface by laterally attached floats. The top of the bag is exposed to the air and the bottom of the bag and the oysters inside remain submerged



Submerged Rack and Bag System – an aluminum rack system that suspends the bags vertically in the water column. Unlike 1 and 2, this system remains submerged and is not exposed to air as a method of fouling control. In the past growers have used physical cleaning to control native fouling organisms.

B) Investigation into the spawning period for the oyster drill in PEI environmental conditions and into possible control methods including.

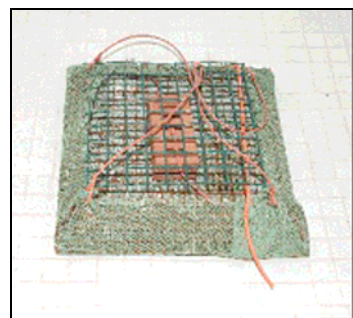
- Trapping as a control method to reduce snail numbers on a heavily infested oyster lease.
- Comparison of three trap designs for trapping efficacy.



Minnow trap



Rebar trap



Wire trap

- Effect of lime, brine and vinegar immersion on viability of egg cases.

This project is funded by Aquaculture and Fisheries Research Initiative Inc (AFRI) and the PEI Atlantic Shrimp Corp. Inc. and is a partnership of the Island Oyster Growers Group (IOGG), PEI Aquaculture Alliance, PEI Department of Fisheries & Aquaculture and the NB Department of Agriculture & Aquaculture.



R&D activities in Nova Scotia have had a continued focus on challenges facing the shellfish industry. The AANS held its annual 'Scotian Pride' conference that included R&D updates for the shellfish and finfish sector. A specific workshop on R&D coordination was also held during Scotian Pride where the updated R&D priorities and funding agency matrix were presented to industry. For copies of these documents please visit www.aansonline.ca

Project Highlights

Testing deterrence devices to reduce losses from diving ducks

Throughout this region it is estimated that 2-3% of the annual revenue from the mussel industry is lost to duck predation, or between 1 to 2 million dollars (Mallet, *pers. com.*).

In Prince Edward Island and Nova Scotia the highest proportion of losses is attributed to the Great Scaup, Long-tailed Ducks, Common Eiders and Scoters during their fall migration. This migration pattern coincides with the collection and socking of mussel spat making the newly deployed seed vulnerable to duck predation.

Although winter ice serves to protect mussels against duck predation, the recent series of mild winters has reduced ice coverage, allowing duck populations a larger window of opportunity which to feed on mussel seed. Several methods have been tested to deter ducks; propane cannons, scarecrows, boat chasing, fluttering tape etc. While these methods have shown some positive results, the long-term effectiveness and cost of these efforts are significant limitations. However, two methods have shown potential as long-term methods for the control of duck predation on mussel farms: 1) underwater acoustics and 2) protective socking material.

Underwater acoustical playback deterrent is essentially a method by which boat motor sound underwater is recorded and played back via underwater speakers. Ducks conditioned by boat chasing are alerted by the noise of a boat motor and flee the site area. Ross et al. (2001) concluded that underwater playback was effective but only over a 100-m radius (approximately 1 ha.). However, it is expected that recent advances in underwater sound transmission technology will allow the transmission of the boat motor playback over a greater radius. Previous studies including Dionne et al. (2006) have shown promising results for the use of protective socking material as a means to mitigate duck predation. These studies concluded that protective socking held promise, although the biodegradable fibres were too slow to degrade, trapping some mussels inside the sleeve.

The purpose of the current project will therefore be to further test these two strategies as a means to reduce the predation rates of sea ducks. Trials will be conducted at Indian Point Mussel Farms in Mahone Bay Nova Scotia with an expected start for fall '07.

Project partners include the Aquaculture Association of Nova Scotia, Nova Scotia Aquaculture and Fisheries, Prince Edward Island Agriculture, Fisheries and Aquaculture, Indian Point Marine Farms, Mallet Research Services, and Pernix Technologies.



Provincial R&D Updates

New Brunswick

The NBSGA has been focused for the past twelve months on implementation of the Atlantic Canada Salmon Farming Sustainability Plan. The plan was prepared by the NBSGA in June 2005 in consultation with AANS and NAIA. It is a commitment by the salmon farming industry to implement the necessary changes to develop a profitable market-driven industry.

Project Highlights

NBSGA Tour

In June, the NBSGA hosted an industry tour, which included many NBSGA members, federal and provincial regulators, regulators from Maine, and representatives from local and regional funding agencies, including ACOA. This tour preceded the 20th AquaFair, which was held in St. Andrews, NB.



Janey Smith (ED, NBSGA) on the left with NBSGA member Bob Sweeney on the right
Brian Muise (ED, AANS) and Ruth Salmon (ED, CAIA) in the background

ISFA Sea Lice Workshop

The NBSGA led the organization of the International Salmon Farmers Association Sea Lice Workshop, held in Norway on August 13th. This one-day industry-led workshop consolidated the state-of-knowledge of sea lice treatment products and methods, and identified immediate needs and opportunities. The workshop demonstrated that the industry is applying a science-based approach to sea lice management. The Workshop Report will be

available from ISFA member associations (including CAIA, NBSGA, NAIA, and BCSFA).



Dr. Sonja Saksida (BC) and Dr. David Jackson (Ireland)

Offshore Aquaculture Project

Phase 2 of the Offshore Aquaculture project is expected to begin in the fall of 2007. The goal of this project will be to develop knowledge of the oceanographic conditions of low, medium and high-energy marine sites in the Bay of Fundy. Oceanographic data and knowledge will be collected from representative sites. Engineering data, particularly related to forces and loads on moorings, cages, nets and feeding systems will be collected from existing sites. Relationships between data sets will be explored to support planning, operating, and monitoring high-energy sites. Researchers from the St. Andrews Biological Station, UNB and NRC-IOT will collaborate with NBSGA members in this 2-year research project.



Depletion of Emamectin Benzoate (SLICE, Schering Plough) from Skeletal Muscle of Atlantic Salmon (*Salmo salar*) being Maintained in Commercial Seawater Cages, Under Ambient Temperature Regimes (0.5 C – 16.0 C)

NBDAA, NBSGA & DFO (ACRDP Grant)
Submitted by Michael Beattie DVM MRCVS
Department of Agriculture and Aquaculture
Province of New Brunswick

Emamectin benzoate (SLICE) is an in-feed treatment used to control wild sea lice infestations in Atlantic salmon. This product is in pre-registration phase in Canada, and is only available to veterinarians under an Emergency Drug Release (EDR) application. Globally, the product is registered in all salmon producing countries with an MRL set at 100 ppb. The majority of countries have established a withdrawal time of 0 days. Pre-Oct. 2005, Canada had set the MRL at 50 ppb with a resultant withdrawal time of 25 days. However, in 2006 Health Canada decreased the MRL to 42 ppb and increased the withdrawal time to 68 days. Rationale for the change was related to new information, which was not provided to Provincial vets due to confidentiality agreements between Health Canada and Schering Plough.

In light of an ISA (Infectious Salmon Anemia virus) outbreak in the Bay of Fundy region, and due to the fact that sea lice are potential vectors for spread of the disease, NBDAA and industry expressed concern toward the increased withdrawal time. Industry went so far as to state, “with no resolution to the withdrawal time we would see a total collapse of the aquaculture sector within 2 yrs”. Investigations into previous CFIA residue testing exposed the following results;

- 440 samples of Atlantic salmon analyzed since 2000
- 125 samples exhibited trace residues of SLICE
- 2 samples were found to be above 50 ppb

Through intense negotiations between NBDAA, DFO, Health Canada, CFIA and NBSGA the following criteria were agreed upon as a “go forward” strategy in May of 2006;

- CFIA to certify NBDAA lab for residue testing using HPLC
- CFIA to establish sampling protocol for residue testing of cages facing emergency depopulation due to presence of ISA
- No fish to be marketed if above 42 ppb
- Health Can to accept all field/lab data collected by NBDAA
- VDD to establish “expert advisory committee” for aquaculture sector

To date a total of 422 samples have been analyzed by the NBDAA lab. Preliminary results for temporal residue testing indicate that at 12 C all samples tested were below the 42 ppb MRL at day 3 of the withdrawal period. At day 5 the average sample was 26 ppb. Further testing is being carried out by NBDAA in light of these findings.



Under emergency depopulation conditions the following was noted;

- None of the 22 cages tested were found to be >42 ppb
- Results ranged from 20.6 ppb - <2 ppb
- Most cages were tested well before the original 25 day withdrawal period

At present NBDAA and NBSGA are negotiating with DFO for an extension to our ACRDP grant, allowing for further field testing during the summer of 2007. All of the data collected to date has been sent to Health Canada for further consideration. It appears that a withdrawal time of 14 days would be sufficient for all water temperatures experienced between May and Dec. for the fiscal year. Variables that could potentially affect residue elimination (as measured within this study) are;

- Fish size
- Water temp.
- Volume of feed fed during the withdrawal time (fat level, satiation etc.)
- Fish health status and environmental conditions
- Treatment period extensions (could not feed due to weather conditions etc.)

In light of field/lab data, assumptions used by drug investigators can be proven or disproved. If the latter, then adjustments must be made to withdrawal times to more accurately reflect the new data set. Health Canada continues to be an effective and careful advocate for food safety in Canada. The new director of VDD (Veterinary Drug Directorate) is an example for others, in her efforts to provide safe food products for the public while not unnecessarily hampering industry activities.

Research Institute Profile

Centre for Integrated Aquaculture Science (CIAS) Fisheries and Oceans Canada

The Science sector within Fisheries and Oceans Canada has created Centres of Expertise (COEs) in key areas to promote innovation, effectiveness and efficiency in the delivery of its science. The Centre for Integrated Aquaculture Science (CIAS) was created in February 2007 and it is a virtual Centre of Expertise that will incorporate staff from DFO facilities across Canada. The CIAS Secretariat, consisting of a Director, Fred Page, and Manager, Edward Kennedy, is located at the St. Andrews Biological Station.

The CIAS will serve as a focal point of research for aquaculture. The CIAS will lead and implement an integrated aquaculture research program that will support sustainable aquaculture management and development within Canada, leveraging expertise on finfish (marine and freshwater), shellfish and marine plant aquaculture science across the department.

DFO Science provides scientific information and advice required by policy and decision makers to develop and manage aquaculture-related activities involving both production and ecosystem



sustainability expertise. The CIAS will coordinate DFO's national aquaculture research, identify, implement, and facilitate new research activities that address existing and emerging issues, and generate scientific knowledge in support of policies and management decisions.

Research of the CIAS will focus on an integrated, ecosystem-based management framework, meaning all facets of departmental knowledge, including oceans, habitat and ecosystem science, and aquaculture production science, will be incorporated to deliver, quality and unbiased scientific knowledge pertaining to aquaculture. The CIAS will also facilitate collaboration among aquaculture scientists across Canada, within an integrated research framework, to leverage expertise, improve efficiency, and minimize duplication.

Finally, the CIAS will report the results of its research activities to its clients, partners, and the public to share scientific knowledge and strengthen awareness and confidence in DFO's aquaculture science program. During 2007, the CIAS will be developing a website where you will be able to find regular updates on CIAS activities and research results.

The mandate of the Center for Integrated Aquaculture Science (CIAS) is to lead, facilitate, coordinate, and implement an inter-regional and nationally integrated DFO aquaculture research program that supports and enhances aquaculture development and management within Canada in accordance with relevant inter-regional and national priorities of DFO Science clients, and with a focus on an ecosystem-based management framework.

In order to deliver this mandate, the objectives of the CIAS are to:

- 1) Develop an awareness within the DFO Science community of the aquaculture related objectives and priorities of the Department, including emerging issues that require a science response;
- 2) Identify, implement, and coordinate national and inter-regional research activities that address the relevant departmental aquaculture needs and priorities;
- 3) Identify new capacities and expertise required to address existing and emerging aquaculture science issues;
- 4) Facilitate inter- and cross-laboratory partnerships as required to address DFO aquaculture science priorities in an effective and efficient manner, and within an integrated research framework;
- 5) Communicate within DFO Science and to its clients (i) the priority needs for DFO aquaculture science, (ii) the science activities being conducted to meet those needs, and (iii) the results of those activities.



Provincial R&D Updates

Newfoundland

With a history of stimulating aquaculture industry involvement in R&D, the Newfoundland Aquaculture Industry Association (NAIA) provides a vital role in helping the industry reach its full wealth potential. NAIA-led projects such as the Aquatic Invasive Species initiative, the Mussel Seed Project and the Ice Slurry Project help to maintain an environment which supports growth within the industry in the province.

Project Highlights

Aquatic Invasive Species (AIS) initiative

In many parts of Canada and the world there are high-profile campaigns in place to educate users of the aquatic resource, such as recreational boaters, sports fishermen, aquaculturists and fish harvesters, of the consequences of AIS establishment and methods to control their spread. These programs have largely been absent from Newfoundland, probably because our industry has been small until recently and, being on an island, we haven't had to deal with invasive species. Thanks to Environment Canada's Invasive Alien Species Partnership Program (IASPP), NAIA is able to deliver an AIS education campaign which aims to create greater AIS awareness within resource user groups in areas of the province which are at higher risk of AIS establishment. Another role of the program is to encourage communication between the aquaculture industry and groups currently working on AIS within the province (DFA, DFO) through the creation of an AIS Advisory Committee.

NAIA has just completed a review of available data, mainly in the form of port traffic patterns, to categorize the major ports and harbours of NL as low or high risk to the introduction of invasive species. Based on this internal report, a survey to gauge the awareness of the issues surrounding AIS establishment has recently been sent out to resource users in the areas determined to be high risk. Results from this survey will be used to tailor the message provided by the awareness campaign.

The AIS Advisory Committee was created in February and includes representation from provincial and federal governments, the aquaculture industry and academia. The second meeting of the Committee was held in June. Topics discussed included rapid response planning, shellfish processing protocols, IASPP activities, and updates on monitoring programs.

Please complete the AIS awareness survey at: <http://www.naia.ca/aisletter.asp> (NL residents only).



Ice Slurry project

The mussel sector in NL expects to see significant expansion over the next few years, but investment into harvesting and processing infrastructure is seen as essential for this growth to happen. The purchase of ice slurry technology for mussel processing is an investment which is expected to reap rewards in terms of reduction in over-pack, increased product freshness and increased shelf life.

An ice slurry machine for the processing of blue mussels arrived at Allen's Fisheries of Benoit's Cove, NL, in May. With the exception of an ice slurry storage tank, which will be ready any day now, the installation of the equipment has now been completed. Personnel at the processing plant are now going through the process of familiarizing themselves in the use of the machine, and have done some trials on live mussels in preparation for use in shipments to markets. While results are promising, the system requires further refining and further training of personnel is needed before Allen's Fisheries are confident enough in the process to use ice slurry on shipments going to markets in other parts of Canada and the US.

Plans for a research project to evaluate the performance of the ice slurry system in terms of product quality, shelf life and reduced over-pack are currently being developed. NAIA will be partnering with the Centre for Aquaculture and Seafood Development (C-ASD) at the Marine Institute to deliver this project which is anticipated to begin over the next few months.

The purchase of this valuable addition to the industry's processing capacity would not have been possible without the support of Allen's Fisheries of Benoit's Cove and the Newfoundland Government through the Department of Fisheries and Aquaculture (DFA).

Mussel Seed Quality Project

The lack of growth in the supply of blue mussel seed is a problem that has become a R&D priority for the industry throughout the Atlantic Provinces. In Newfoundland the increasing demand for mussel seed coupled with a lack of information about mussel seed stocks within the province could represent a significant bottleneck in the expansion of the industry over the next few years.

This past year our partners in the Mussel Seed Quality Project, the Centre for Aquaculture and Seafood Development (C-ASD) at the Marine Institute, examined spat collection at 11 sites in Placentia Bay and, with the help of DFA, at 8 existing mussel farms across the province. The C-ASD has analyzed the data from this past year and has found that 6 of the 11 sites in Placentia Bay have seed collection qualities that the industry requires.

Field activities for this year are now well underway. The best 5 sites from Placentia Bay have been selected for further study, with sampling of the seed which had been over-wintered completed and analysis of these samples just beginning. Larval monitoring for determination of timing of collector deployment has been ongoing for some time and deployment of new collectors is anticipated over the next week or so. The initial assessment, as was done last year for Placentia Bay, has now begun for areas of Bonavista Bay. Larval monitoring has been ongoing for the last several weeks, and collector deployment has just been completed on all sites.

The Mussel Seed Quality Project is a NAIA initiative, in partnership with Fisheries and Oceans Canada (DFO), the Provincial Department of Fisheries and Aquaculture (DFA) and Memorial University of Newfoundland (MUN). Funding support for this project is provided by DFO's Aquaculture Collaborative Research and Development Program (ACRDP), the National Research Council – Industry Research Assistance Program (NRC-IRAP), and the Canadian Centre for Fisheries Innovation (CCFI).



Researcher Profile

Dr. David J. Innes

Department of Biology,

Memorial University of Newfoundland

Education: University of British Columbia (B.Sc.), Dalhousie University (M.Sc.), SUNY Stony Brook University (Ph.D.).

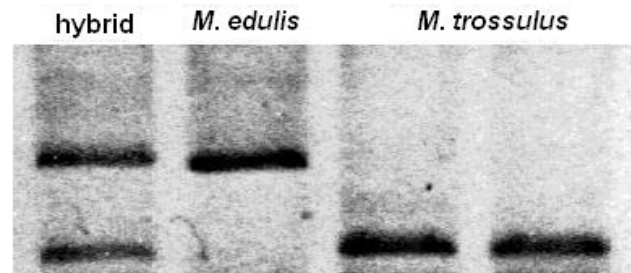


Dr. David Innes is a Professor with the Biology Department of Memorial University of Newfoundland in St. John's, where he teaches courses in genetics, evolution, evolutionary genetics and evolutionary ecology. The aquaculture-related research in his laboratory focuses on the evolutionary genetics of the interaction between the blue mussels *Mytilus edulis*, *M. trossulus* and their hybrids in Newfoundland (in collaboration with Dr. Ray Thompson, Ocean Sciences Centre). Other research is being done on sexual and asexual reproduction, primarily using *Daphnia pulex* as a model organism. Dr. Innes has also been involved in collaborative research projects on the population and reproductive ecology of moss campion, bog bean and spiders in Newfoundland, and the reproductive ecology of *Grevillea spp.* in Australia.

Ecology and Genetics of *Mytilus* spp. in Newfoundland

Blue mussels are important for aquaculture in Atlantic Canada where two species (*Mytilus edulis* and *M. trossulus*) coexist and hybridize along the coasts of Newfoundland, Nova Scotia, New Brunswick and Québec. This hybrid zone offers an excellent opportunity for basic scientific research on how mussel ecology, genetics and hybridization can provide useful information to improve mussel aquaculture.

Since a mixture of the two species occurs on most mussel aquaculture sites in Atlantic Canada, a major question facing the industry is the relative performance of the two species and the affect of hybridization on production. Both species of mussel are morphologically very similar and can only be reliably distinguished using genetic markers. Genetic markers available consist of enzyme protein variation as well as DNA variation (nuclear and mtDNA). Genotype can be determined from a small piece of tissue and each individual classified as *M. edulis*, *M. trossulus* or hybrid.



(ITS fragments separated in an agarose gel. Photo: J. Toro)

Dr. Innes' research group have been working on the mussel hybrid zone in Newfoundland for almost 20 years and are continuing their research in order to better understand the genetic and environmental factors maintaining the hybrid zone. They have examined species differences in: shell colour and morphometrics, relative frequency within populations with differing shell length and life history stage, relative frequency in larval populations, reproductive cycle (Gamete Volume Fraction), growth at aquaculture sites, condition index, mortality and environmental preferences or fitness.

Dr. Innes and his students have found that life history differences likely play an important role in maintaining the coexistence of the two species. Furthermore, both pre- and post-zygotic isolating mechanisms prevent extensive hybridization between the species. Further research is in progress to determine genetic and ecological factors that maintain this mussel hybrid zone. These studies can also provide information on performance characteristics that can assist in increasing mussel production at aquaculture sites by favouring one species or the other.

One of the current projects that Dr. Innes is involved in is the Mussel Seed Quality Program. The intent of this NAIA-led initiative is to evaluate seed collection at a number of potential mussel seed collection sites around Newfoundland based on abundance, growth and genetic characteristics of seed as well as a number of physical, environmental and biological parameters.

Upcoming Meetings & Events

NBSGA Aquaculture Tours

St Andrews, NB. Friday afternoons, starting August 31st. Call 1-877-688-2600 to book or contact Caroline at c.graham@nbsga.com

PEI International Shellfish Festival

September 14 - 16, Charlottetown, PE
www.peishellfish.com

Aquaculture Canada 2007

September 23-26, Edmonton, AB
www.aquacultureassociation.ca

International Conference on AIS

September 23-27, Nijmegen, The Netherlands
www.icaais.org

International Invasive Sea Squirt Conference II (IISSC II)

October 2-4, Rodd Brudenell River, PE
www.who.edu/page.do?pid=11503

AIF Cod Pathway To Commercialization

October 16-17th, Nagle's Place, St. John's, NL
www.fluvarium.ca

Live Feed In Marine Fish Hatchery Workshop

October 18-19th, Ocean Sciences Centre, St. John's, NL
www.osc.mun.ca

BC Shellfish Growers Association Annual Workshop & AGM

October 19th & 20th, Courtenay, BC
www.bcsnga.ca

Aquaculture Europe 2007

October 24-27, Istanbul, Turkey
www.easonline.org

Technology Partnership in Sustainable Open Ocean Aquaculture

27-29 November, St. Andrews, NB
E-mail aac@mar.dfo-mpo.gc.ca for more information.

Important Announcement for Industry Members

As part of IISSC II (Oct 2-4) a session directed at members of the aquaculture industry has been organised. This will involve presentations of selected papers felt to be of direct relevance to industry members and an open forum for discussions. This **Risk Assessment and Management** session will take place on Thursday October 4th from 1-5pm and is free to growers, though registration is still required. Attendees will also receive a free IISSC II T-shirt! To register for this session please contact Neil MacNair, **before the 14th Sep.** at ngmacnair@gov.pe.ca, or at 902-368-5615, with your contact details and T-Shirt size. For further details about the conference, including the session program go to <http://www.who.edu/page.do?pid=11503>.



BC Salmon Farmers Association (BCSFA)**Salmon Farmers and Government Working Towards Solutions - The BCSFA Technical Committee**

As part of its commitment to environmental sustainability, the British Columbia Salmon Farmers Association has been working with the BC Ministry of Agriculture and Lands, the BC Ministry of Environment the federal Department of Fisheries and Oceans and the Canadian Food Inspection Agency to develop a comprehensive Waste Tissue/Finfish Mortality Contingency Plan for the industry. The Waste Tissue/Finfish Mortality Contingency Plan is intended to provide for the proper disposal of fish mortalities when volumes exceed those experienced during normal growing operations. Such unexpected volumes of fish mortalities can occur due to natural or man-made events such as contaminated feed, plankton blooms, oil or chemical spills, and disease.

Development of the plan is being funded by the Investment Agriculture Foundation of British Columbia's Livestock Waste Tissue Initiative (LWTI). Its successful completion will fulfill the mission of the LWTI which is to enable animal producers in BC "...to dispose of or utilize waste tissue in an efficient, cost effective manner, under normal and emergency situations, while operating in compliance with relevant legislation." The plan will also satisfy Best Management Practice regulatory requirements of Ministry of under its Finfish Aquaculture Waste Control Regulation, and *Environmental Management Act*.

"This is an important focus for the industry," stated Norman Penton, Research and Development Coordinator for the BCSFA. "In the unlikely event of a large scale mortality event in the industry, such as a plankton bloom, we want to be prepared to ensure we are able to deal with this in an environmentally and socially responsible way. The BCSFA, on behalf of its member producing companies, recognized that fish mortality processing capacity and infrastructure must be improved in order to properly handle a mass fish mortality incident should one occur."

Golder Associates Ltd. of Victoria, BC has been awarded a contract to review current fish farm mortality disposal methods and capacity, to evaluate present capability to respond in the event of an environmental emergency, and identify potential bottlenecks. Golder has been interviewing producers, processors and companies and other stakeholders involved in the disposal process to quantify the existing capabilities. If any problems are identified Golder will work with those organizations in the disposal chain to create solutions that will benefit all stakeholders.

More information about funding available though the Livestock Waste Tissue Initiative can be found at: www.iafbc.ca/funding_available/programs/livestock/livestock.htm

Norman Penton,
 Technical Committee Chair and Research & Research Development Coordinator for BCSFA.
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www.salmonfarmers.org



BC Shellfish Growers Association (BCSGA)

The BC shellfish industry is currently experiencing much activity, both in terms of research & development projects, and industrial opportunities and challenges. The '06 / '07 winter storm events were possibly the biggest challenge to industry infrastructure, but they have led to opportunities for thinking about innovative farm design, anchoring and rigging. Positive consumer awareness was achieved through participation in numerous shellfish festivals and other culinary events. And with food security issues and global demand for our products in mind, the BCSGA is leading a charge towards import and export confidence by initiating the BC shellfish Aquatic Animal Health Program (AAHP), described in more detail below.

Project Highlights - BC Shellfish (AAHP)

In 2003, the European Union (EU) implemented animal health conditions and disease freedom certification requirements for imports of live shellfish products. This decision had an immediate economic impact on the BC shellfish industry and it highlighted, for Canada, the implications of the absence of a systematic, coordinated shellfish health program. Subsequently, under the umbrella of Canada's National Aquatic Animal Health Program (NAAHP), the BCSGA has commenced establishment a provincial shellfish health program in an effort to meet export requirements and to better manage the health of BC shellfish stocks.

In 2006, the BCSGA commissioned a report to outline the industry components of the BC shellfish AAHP. Karreman (2006) advised that the high priority components included: (1) development of a Shellfish Health Code of Practice, template Standard Operating Procedures, and template Shellfish Health Management Plans (drafts complete Spring 2007); (2) shellfish health training for producers (basic) and technicians (commencing Fall 2007); and (3) a federal surveillance pilot project, led by the Canadian Food Inspection Agency (CFIA) (commencing Fall of 2006 and ongoing for two years).

The objective of the surveillance pilot project is to provide evidence of disease freedom for the Manila clam (*Venerupis philippinarum*) and Pacific oyster (*Crassostrea gigas*) industries in BC for a list of 12 OIE listed pathogens. In the Fall 2006 sampling period, a total of 423 samples were collected (293 Manila clams and 130 Pacific oysters). No pathogens or abnormalities were noted in any of the screened samples. This number of samples (423) fell short of the planned sample size due to delays in commencement of sampling, limited initial lab capacity at DFO, and a limited number of opportunities to conduct sampling in conjunction with CFIA fish plant inspections. While some these limiting factors have been addressed for the Spring and Fall 2007 sampling periods under the local leadership of Dr Andrea Osborn (CFIA Area Veterinary Specialist) there remain significant ongoing logistical and regulatory challenges.

Preliminary results (as at July 24th) show:

- 487 clams sampled / 231 examinations complete = results negative for all pathogens of concern.
- 487 oysters sampled / 276 examinations complete = results negative for all pathogens of concern, EXCEPT 9 positive with Denman Island Disease (*Mikrocystos mackini*), which is endemic to all surveillance areas and disease freedom is not an objective for this pathogen.

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