

# ACAIRDN

Atlantic Canada Aquaculture Industry  
Research & Development Network

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**Volume 8**

*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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### **Your Local Association Here!**

If you are part of an aquaculture association and would like to communicate with us please feel free to get in touch

## Upcoming Meetings & Events

Coastal Zone Canada Conference and Youth Forum  
July 25 – 29, 2010  
Charlottetown, PE  
[www.gov.pe.ca/fard/](http://www.gov.pe.ca/fard/)

FSBI Fish and Climate Change  
July 26 – 30, 2010  
Belfast, UK  
[www.fsbi.org.uk/2010](http://www.fsbi.org.uk/2010)

Tyne Valley Oyster Festival  
August 5 - 9, 2010  
Tyne Valley, PEI  
[www.tynevalleyoysterfestival.ca](http://www.tynevalleyoysterfestival.ca)

Intl Conf. Recirculating Aquaculture (ICRA)  
August 20 - 22, 2010  
Roanoke, VA, USA  
[www.recircaqua.com](http://www.recircaqua.com)

55th Annual Atlantic Fisheries Technology Conference  
September 7 – 10, 2010  
St. John's, NL  
[www.aftc.ca](http://www.aftc.ca)

PEI International Shellfish Festival  
September 17 - 19, 2010  
Charlottetown, PE  
[www.peishellfish.com](http://www.peishellfish.com)

Aquaculture Europe, 2010  
October 6 – 8, 2010  
Porto, Portugal  
[www.easonline.org](http://www.easonline.org)

Aqua Sur 2010  
October 20 – 23, 2010  
Puerto Montt, Chile  
[www.aqua-sur.cl/2010/](http://www.aqua-sur.cl/2010/)

International Seafood and Health Conference  
November 6 – 10, 2010  
Melbourne, Australia  
[www.seafoodhealthconference.com](http://www.seafoodhealthconference.com)

Sixth International Symposium on Aquatic Animal Health  
Tampa, Florida, USA  
September 5 - 9  
[www.epi.ufl.edu/?q=aquaticpath/isaah6/index.html](http://www.epi.ufl.edu/?q=aquaticpath/isaah6/index.html)

## ACAIRDN now on Facebook



Keep yourself up to date on the latest R&D news, join the discussions on important aquaculture related issues, and check out upcoming events. If you're on Facebook already simply search for ACAIRDN to join the group. If you're not, join up now, it's easy ([www.facebook.com](http://www.facebook.com)).

Also, while online, check out the updated ACAIRDN website, [www.aquabasecanada.ca](http://www.aquabasecanada.ca). There you will find contact details for your local industry association, download information sheets on Funding Programs, Aquatic Invasive Species or Sea Lice, request a copy of the latest Industry R&D Priorities and get copies of all our workshop reports and newsletter back issues. If you have any suggestions or requests for our website or Face Book page please pass e-mail them to your local R&D Coordinator.

## **Nova Scotia**

*The Aquaculture Association of Nova Scotia has a long history of promoting, supporting and actively engaging in research and development for Nova Scotia's aquaculture industry. R&D activities in Nova Scotia have had a continued focus on challenges facing the shellfish industry.*

## **Fernando Salazar - AANS**

### **Identification of the causal agent of Malpeque disease in oysters**

The dependence on histological techniques for diagnosis presents practical problems for control of what appears to be a highly virulent infectious agent. This project proposes a two parts development of molecular-based tools for the diagnosis of Malpeque disease. The first part of the project will be to confirm the presence of a pathogen in infected oyster tissues, by isolating small parts of its genetic material. The second part of the project will be the development of a PCR-based test to determine the presence or absence of the pathogen from animal tissues. A PCR test would have several advantages over the current histological test methodology, e.g. improved test precision and accuracy, more rapid case diagnoses, increased levels of surveillance from improved diagnostic efficiencies, the development of tests that may detect sub-clinical Malpeque disease, the provision of improved data to support the management of the Malpeque disease within the infected zone, and improved testing techniques to support movement of American oysters for market and live culture.

The activities undertaken by the project so far include:

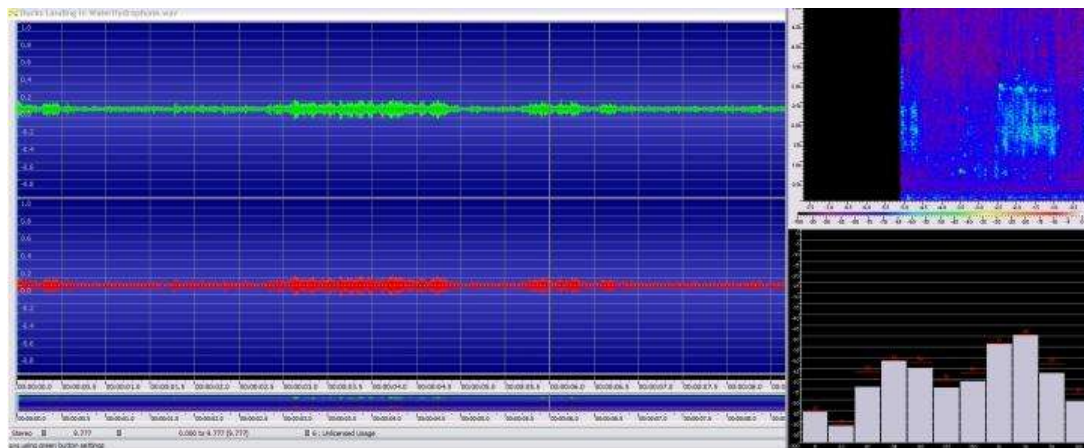
- Acquisition of Malpeque positive oysters, preserved in RNAlater.
  - Usually, RNAlater is not used for preservation of tissue. However, we decided early in the project that the differential display technique on RNA would be the best approach and we organized collection of oyster and preservation in RNAlater. RNA from frozen oysters was collected and analysed for quality. Unfortunately, degradation was apparent which is prevented by RNAlater preservation.
  - The only case we were able to collect provided one positive animal. Unfortunately, the animal is also positive for MSX, which creates a problem for the differential display (possible detection of “MSX” instead of “Malpeque”) – we are working on this sample currently.
- Setup of differential display technique using MSX infected oysters as material for testing.
  - This technique has many variants, i.e. choice of reporter molecule, choice of primers, etc. We settled for a fluorescent detection. After many weeks of trials and assays, it was decided to revert to gel red detection and PAGE electrophoresis on large gels. Results were satisfying and we recently confirmed that we are able to detect differentially expressed genes specific for MSX using this technique.
- Acquisition of Malpeque positive oysters frozen in ethanol.
  - Oysters collected in 2007 were obtained recently. The quality of the RNA needs to be evaluated, and if sufficient, they will be used for differential display.

## Development of Eider ducks electronic monitoring and mitigation technology to avoid predation on mussel lines.

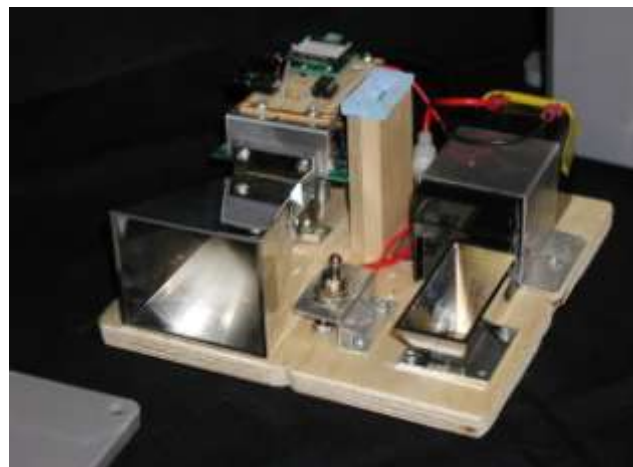
The results so far indicate that:

**Sound.** It may be very possible to use underwater microphones (hydrophones) to detect the presence of ducks in the area. This method sets the detection late when the ducks have already landed near the farm but could be robust as it is not affected by weather and environment. This method also could detect ducks over a large area as low frequency sound would carry a distance in salt-water. (Range TBD)

The picture below is some post-processing on a sample of noise collected with a hydrophone. The hydrophone picks up the noise of the feet and the vocal noises of ducks. In the analysis of the sample a Fast-Fourier Transform (FFT) is taken on the sounds with a Kaiser window (filter). The FFT looks at the sound in the frequency domain over time. The FFT window in the lower-right of the graphic shows more energy at 3KHz when the ducks quack. With further work in the spectrograph (in the upper-right window) the vocal sounds from the various ducks could be determined.



If one listens closely to the sounds there are at least two distinct quacking calls. One group at 3KHz and another group between 2000-2500Hz (see light blue blobs). This could very well provide classification of duck type from the pitch of the calls (which is interesting but not required). It will take more experimenting with data, but the paddling foot noise I believe can be seen in the 100Hz range (see patch of light blue at bottom of figure for entire duration). It will have to be determined but the speed of the feet moving in the water may very well be at this speed.



**Infrared** units may be able to be used to detect the ducks. Infrared units are small and could detect the ducks in a small range. Multiple units could be used on buoys to survey the field. These units would not be affected by the weather but would be exposed for damage on top of modified buoys.

It may be possible to use a computer vision system to look out from the farm to detect the presence of ducks in the area. This method can detect the ducks as they come close to the farm and can be configured to view in all directions. The method would however be effected by poor visibility, and weather. The range of viewing and processing could be very large (line of sight) but would require considerable power and processing power. The camera system would require very few units per farm and may be able to be mounted on shore.

**Radar** is not looking like the best option to protect the farm. Initial investigations are finding small radar units would not be able to detect the presence of single ducks. Thus, multiple ducks in the area are required in the view to create a reliable detection. Also radar units are very directed in view, limited in range, require high power, and do not allow to large areas to be scanned.

### **Impacts of variable wind and wave forcing on aquaculture operations at two exposed sites in Atlantic Canada**

Unfortunately this offshore aquaculture project developed by Dr. Alex Hay from the University of Dalhousie was not chosen by NSERC. We are waiting on the reasons of the rejection to determine if it is possible to amend and re-submit. If not possible, the AANS and the Nova Scotia Fisheries and Aquaculture department are already considering alternatives to re-write and submit it elsewhere.

### **Integrating red macroalgae into land-based marine finfish aquaculture (Expected start date: June 2009).**

This project will be held by Scotian Halibut Ltd in collaboration with the Nova Scotia Agricultural College. The main objective of this project is to establish a model for a highly profitable, environmentally neutral, integrated marine land-based cold-water recirculation system (IMTA-style) incorporating finfish and red algae. This 3 year project will have the following milestones:

- Quantity the growth rate and water purification capacity of three species of red algae under farm conditions at Wood's Harbour using tumble culture techniques
- Expand the research to Advocate Harbour incorporating the best operating practices developed at Wood's Harbour
- Quantify nutrient uptake and growth dynamics under tightly controlled lab conditions.

The three species to be studied: *Palmaria palmata* (Dulse), *Chondrus crispus* (Irish moss); *Porphyra* spp. (*linearis* and/or *umbilicalis*). Experimental factors to include: temperature, light intensity, time of year and nutrient concentration.

Some images of the setup:



## Prince Edward Island

*Industry concern about the effects of Aquatic Invasive Species (AIS) remains the primary focus of both our R&D and education work. Industry members, with Provincial and Federal government support, continue to develop innovative equipment to mitigate the impacts AIS.*

### Peter Warris - PEI AA



#### Development of Interactive Educational Resources to Help Control the Spread of Aquatic Invasive Species in Atlantic Canada

The objective of this project is to stop the spread of AIS in Atlantic Canada and avoid the introduction of others which are close by (e.g. *Didemnum vexillum* from the US). This year we have created a website ([www.aquaticintruders.com](http://www.aquaticintruders.com)) aimed at recreational boaters. Here boaters can find information on different species, how to clean and treat their boat and can plan their trips with the interactive map tool, which highlights high risk journeys; where different invasive species could be spread. We have also developed a small letter sized

poster for fishing boats, that can be easily hung up in the wheel house, with details of each species, including a few on the "Watch Out For" list.

Another target audience for this project was Aboriginal groups and their members involved in fishing and aquaculture. Presentations were made at the Native Council of PEI's AGM and we attended the Panmure Island Pow Wow to highlight the AIS issue to the several thousand visitors.

This project was made possible by funding from EC (Invasive Alien Species Partnership Program). We would also like to thank Mi'kmaq Confederacy of PEI, the Native Council of PEI, DFO, DFARD and NF DFA for their help and assistance.

**PREVENT  
CLEAN  
TREAT**

**Asking boaters to  
do their part in  
protecting our waters  
and industries.**

#### Strategic Oyster Aquaculture Renewal (SOAR) Program

The SOAR Program was developed to support the expansion of the PEI Oyster Aquaculture Industry through the adoption of innovative techniques and technologies. This three year program is now in its second year and opened for applications on April 19th. Due to the level of interest in the program demand has already exceeded the available funds for 2010-11 and no new applications are being accepted. Year one of the program was also a great success, with 26 applications received and 25 projects completed.

This program is made possible by funding from ACOA and PEI DFARD. Each of the projects also has a cash and in-kind contribution from the industry proponent.



## **Investigation of trapping as a population control strategy for two nuisance species on oyster aquaculture operations**

Oyster Drill and Starfish predation on bottom cultured oysters in some areas of PEI continues to be an issue. The objective of this project to determine whether trapping is a practical population control method for these two nuisance species. The project is now in its third and final year.

This project was made possible by funding from PEI Shrimp Corp. The traps are set and tended by volunteer growers.

## **Development of Aquaculture Management Plans for PEI Aquaculture Areas**

When the PEI Lease Management Board began accepting applications for oyster lease conversions four areas were excluded. Continued development of off-bottom oyster aquaculture in these areas requires the development of an Aquaculture Management Plan.

Through funding from PEI Shrimp Corp, DFO and DFARD the Alliance has hired a consultant to develop such a plan for the Foxley / Trout River. Reducing stress and mortalities associated with the introduction of juvenile trout to sea water marine grow out sites.

PEI's finfish aquaculture industry is focused mainly on the production of salmonid eggs and juveniles. These are then exported to other Atlantic Canada provinces for grow out in marine sites. Steelhead trout introduced to these seawater sites from freshwater hatcheries can suffer from poor growth rates and high mortalities. The objective of the project is to assess the effectiveness of the SuperSmolt® Program treatment system at acclimating trout for entry into full strength sea water.

This project was made possible by funding from AFRI in partnership with Ocean Trout Farms.

## **World Wildlife Fund (WWF) - Bivalve Aquaculture Dialogue**

On March 23rd, 2010 the World Wildlife Fund (WWF) convened a meeting of the Bivalve Aquaculture Dialogue in Charlottetown to discuss the development of global environmental and social standards for bivalve aquaculture.

Please visit the Bivalve Aquaculture Dialogue webpage for information on past meetings, presentations and updates on the standards development progress.

<http://www.worldwildlife.org/what/globalmarkets/aquaculture/dialogues-molluscs.html>

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## **Update and Revise the PEI SAECOP**

The Shellfish Aquaculture Environmental Codes of Practice guidelines were developed in 2002. The document provides environmental management guidelines for off bottom and water column shellfish aquaculture and outlines recommended best practices. SAECOP was designed as a living document that could accommodate any changes in technology and practices, for example the arrival of aquatic invasive species. This review, which will ensure the continued validity of the codes, has also introduced a monitoring and self audit process and environmental contingency plans.

The Island's finfish industry is now also included within the codes, reflecting their need for a strong bio-security policy and to maintain a clean, disease free water supply. A draft outline for a finfish aquaculture code of practice has been put together and development of the full COP will continue over this summer in partnership with DFARD. This project was made possible by funding from DFO, DFARD and the PEI Shrimp Corp. We would also like to thank all the Review Committee members for their time and effort on this project.

## New Brunswick

*Betty House joined the New Brunswick Salmon Growers Association as our Research and Development Coordinator. Betty assumed this role on August 24th after the departure of Caroline Graham who has taken a teaching position with the New Brunswick Community College. Betty has been a part of the aquaculture industry for 17 years and has worked both here and Newfoundland, her home province. Most recently Betty was the Saltwater Certification Coordinator with Kelly Cove Salmon / Cooke Aquaculture where she assisted the Kelly Cove team in obtaining CQS and ECO certification on its marine site in New Brunswick, Nova Scotia, Newfoundland and Maine. Prior to taking this position she worked primarily in the role of sampling / fish health technician for Heritage and Kelly Cove.*



## Betty House - NBSGA

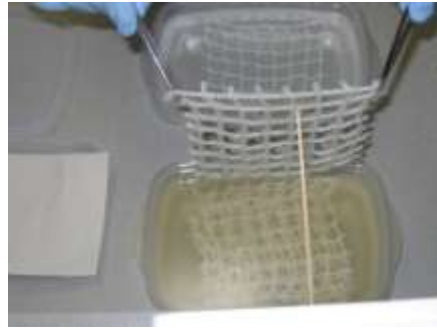


**A Rotary Screw Trap (RST or Smolt Wheel) operating on the Upper Salmon river in Fundy**

### **Inner Bay of Fundy Atlantic Salmon Project**

This program is intended to assist in the rehabilitation of wild salmon stocks in the Bay of Fundy. It is a collaboration between the Association and our members – Admiral Fish Farms and Kelly Cove Salmon / Cooke Aquaculture with Parks Canada's Fundy National Park. It will receive funding support through an ACRDP grant. As part of the recovery plan for the iBoF salmon stock, Fundy National Park employees capture smolt as they leave the Park's rivers for the sea and move them to a freshwater facility for growout. The mature salmon are then

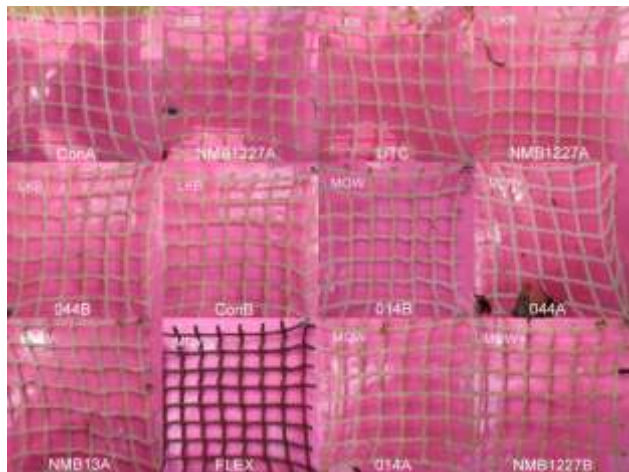
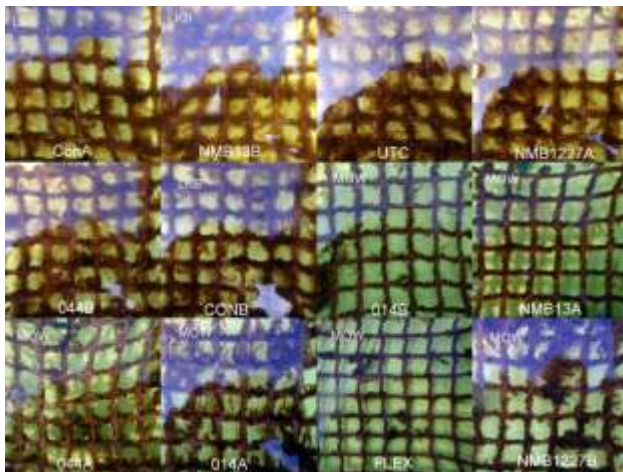
used in breeding programs and/or released into their native waters. With fitness and domestication issues a potential concern for the existing all freshwater gene bank maintenance approach, the ACRDP project was developed to assess the performance of iBoF smolt placed in marine cages for grow out, an approach which better mimics the natural freshwater-seawater life cycle. The iBoF smolt were placed on two marine sites this spring and are being monitored and sampled by Parks Canada personnel monthly, as is a comparable group at the Mactaquac hatchery. The iBoF smolt will be kept on the marine sites for the full grow out cycle and then used for breeding or tagged and released to monitor homing rates.



## Investigating Potential for Development of a Marine Antifoulant Treatment from Marine Bacteria

The NBSGA has been working with DFO, RPC and industry partners Kelly Cove Salmon / Cooke Aquaculture and FutureNets in an attempt to identify naturally occurring marine bacteria that have the potential to be used as an environmentally friendly antifoulant. The basic concept is to use naturally occurring marine bacteria that produce antifoulant compounds as a coating for nets, ropes and other equipment to prevent the settling of other undesirable inhabitants. The first group of surface colonizers – marine bacteria – establish an environment that is conducive for the settlement of other, consecutively larger organisms in a layered effect. The theory is that if this first group of bacteria could be identified, then it would be possible to search out other species that would prevent this first group from colonizing and inhibit the fouling process. Accordingly, several marine surfaces were sampled and a group of 70 potentially relevant bacteria were identified – in the end four promising strains were selected for testing.

Each of these four strains was mixed with an alginate to help form a coating and then applied to experimental net panels. Six frames were constructed to hold 15 panels so replicates of the bacterial coating could be placed in each frame together with controls and samples of FlexGuard coated netting. The frames were placed in two different locations starting in June, and monitored through July and August. While awaiting image analysis to be completed, a second trial will be initiated in the next couple of weeks using increased concentrations of two of the bacterial strains that showed promising results in this first round of exposure tests.



## Monitoring, Surveillance and Research in Support of the Emergency Registration of Alphamax

Since 2000 the aquaculture industry in Atlantic Canada has been limited to the use of only one product for the treatment of sea lice - SLICE. With potential tolerance issues being observed and recognition of the importance of having alternative treatments available to growers to implement a fully operational integrated pest management approach, the NBSGA engaged provincial and federal government agencies to assist with identifying potential products. AlphaMax, a deltamethrin product, was chosen for review, based on the documented results observed in countries where this product is fully registered and approved for use with positive results. To specifically assess potential environmental impacts in the Bay of Fundy and to provide additional information for application for full registration of the product, an extensive monitoring and research program was developed with federal and provincial collaborators for field trials. This program includes monitoring the fate of the product with regard to dispersal, dilution, and vertical mixing both in the cages and around the site, and assessing any potential impact to sentinel species including mussels being grown as part of IMTA projects and lobster which are an important commercial specie in the area. Trials began in July and data is continuing to be collected and analyzed.

### **Offshore Aquaculture Project**

The NBSGA is in the second year of a two year project to help develop a better knowledge base of conditions experienced at low, medium and high energy sites within the Bay of Fundy to support the development of offshore aquaculture sites. The short term objective is to gain oceanographic knowledge using specialized equipment procured to evaluate existing and potential sites. Such information is needed to determine the appropriate technology and equipment required at potential offshore locations exhibiting a range of sea state energy conditions.

Since January several pieces of equipment (load cells, strain gauges, acoustic Doppler current profilers, a motion sensor, and a surface wave buoy) have been on site and have provided mixed results - largely due to a number of technical problems resulting from the high energy conditions within the Bay of Fundy. However, even with these challenges we have collected a considerable amount of useful information which is being analyzed. The equipment array will next be situated at a sheltered site to provide data for comparison before being moved back to a high energy site for the winter. This project concludes in March 2010.

## **Newfoundland**

*With a history of helping develop applied R&D projects to meet industry's challenges the Newfoundland Aquaculture Industry Association (NAIA) provides a vital role in helping the industry reach its full potential. NAIA-led projects such as the Aquatic Invasive Species initiative, the Mussel Seed Project and the proposed SmartBay – Fortune Bay Project help to maintain an environment which supports growth within the industry in the province.*

## **Darrell Green - NAIA**

### **Environmental and Oceanographic Data – Coast of Bays SmartBay**

Aquaculture is a science-and-technology-based industry and to be successful requires an understanding of the dynamic biophysical conditions influencing a farm site. This includes information about all aspects of the ocean environment, such as water currents and temperatures, tidal and wave patterns, weather conditions and seabed information. Such information can dramatically impact the success or failure of an aquaculture operation.

One of the research and development priorities identified for the salmonid farming industry in the Coast of Bays region, is the need for better access to near-real-time and long-term archived data on environmental conditions in the Fortune Bay / Bay d'Espoir region. Such information would aid in the management of existing salmonid cage sites as well as the planning of new sites and management areas.

In 2008 NAIA had assembled a steering committee and, working with the School of Ocean Technology at the Marine Institute (developers of SmartBay.ca), had put together a proposal for funding. The proposal outlined the establishment of a system whereby near-real-time data would be collected from locations in Fortune Bay and could be accessed by the finfish sector via the internet. This project had been placed on the back burner after not being funded in 2008, but since renewed interest in this initiative has been shown on the part of industry and supporting agencies/departments a revised proposal is under development.

### **Enhancing Mussel Production - Mussel Seed Project**

The blue mussel aquaculture industry in Newfoundland is expected to undergo significant growth over the coming years as there is an abundance of room for future farm expansion. One of the primary priorities identified by mussel growers in Newfoundland has been to guarantee that a consistent supply of good quality mussel seed is readily available to the industry.

The NAIA initiative “Enhancing Sustainable Mussel Industry Production and Growth through Assessment and Removal of Constraints in Seed Supply” (also known as the Mussel Seed Project) builds on the 3 previous successful years of investigation of potential and existing mussel seed sources. Again this year we have been concentrating efforts on potential sites in Bonavista Bay and existing sites in Green Bay.

To date collection analysis and morphometric analysis (shell length, depth and width, shell strength, cavity volume, shell color, etc.) has been done on all seed collected in 2008 and grown on collectors over the winter (2008 year class). Genetic species composition analysis (PCR analysis of “glu-5” and “ITS” DNA markers) is also being performed on seed from these sites. The next sampling field trip,

which will sample the seed collected this past summer, is scheduled for mid-November. Once morphometric analysis has been completed for the 2009 seed, seed transfer experiments will begin.

A site in Placentia Bay has been selected as the growout site for seed transferred from all other collection locations. The seed will be grown at this site to make comparisons between all seed sources as well as the locally collected Placentia Bay seed. The transferred seed to be evaluated will be the 2008 year class and will include seed collected from:

- 1) An existing private seed collection site in Green Bay
- 2) An existing site in Green Bay where seed is collected for sale
- 3) 3 - 4 potential seed sites in Bonavista Bay (including 2009 year class where seed is large enough)

Funding support for this project is provided by DFO Aquaculture Collaborative Research and Development Program (ACRDP), the National Research Council – Industry Research Assistance Program (NRC-IRAP), and the NL Department of Fisheries and Aquaculture (DFA) with additional contributions from Memorial University - including the Fisheries and Marine Institute and Department of Biology.

### **Development of liquid fertilizers from aquaculture wastes**

Currently it is estimated that Newfoundland's salmonid sector produces about 2000 MT of fish carcass wastes (fish offal and fish mortality) an annual basis and this number could increase with industry growth to 10,000 MT.

Working with the NL Department of Fisheries and Aquaculture, NAIA is now in consultation with the Newfoundland and Labrador Federation of Agriculture (NLFA), the NL Department of Natural Resources – Agrifoods Division (DNR) and the Institute for Biodiversity, Ecosystem Science & Sustainability (IBES) to develop a project to generate and evaluate liquid fertilizer derived from fish farm wastes.

The project is expected to look at recommendations describing the effectiveness of various formulas, the potential demand for the product, availability of materials and the feasibility of such a product in the context of estimated costs in comparison to existing uses of the waste.

A steering committee has been established for this project, which is anticipated to begin in early 2010 and take 2 years to complete, and funding options are being assessed.

### **Salmonid Fish Health - Therapeutants for the Control of Sea Lice**

For Canadian salmon aquaculture companies to remain globally competitive, it is imperative that they preserve the health of their stock. Fundamental to this objective is the need for a variety of safe and efficacious products for the control ectoparasites such as sea lice. Having a suite of therapeutants available for use would enable the implementation of an Integrated Pest Management (IPM) approach to sea lice control.

While several products are available in other salmon producing countries, there is only one therapeutant registered in Canada for the treatment of sea lice - Slice. Another treatment, Calicide, has recently (October 2009) been made available through Health Canada but is not yet available to the market. Recently the NBSGA, working together with the government of NB and Health Canada's the Pest Management Regulatory Agency (PMRA), have been able to have 2 products (Salmosan and AlphaMax) made available to farmers through emergency registration.

These emergency registrations apply only to specific areas of NB. Recently and the NL Department of Fisheries and Aquaculture (DFA) have submitted application to have these products made available for

NL salmon growers as well. NAIA has been working with DFA to provide the department with information for the PMRA application, such as which farming areas to include in the application. NAIA and DFA have also been working with the NL Department of Environment and Conservation (DEC) and the NB Department of Environment to have everything in place once the products become available. This involved liaising for the creation of a specific training course for sea lice treatment and helping organize courses to have farm managers trained as pesticide applicators.

The NAIA RDC also sits on the National Fish Health Working Group as we have taken a keen interest in what's been happening nationally as industry and government have been working towards the creation of an IPM program for farmed salmon.

### **Aquatic Invasive Species (AIS) Initiative**

Aquatic Invasive Species (AIS) have been a considerable economic threat to shellfish farms throughout Atlantic Canada over the recent past. Although there has not been any invasive species found on any aquaculture site in Newfoundland they still pose a significant potential threat to the Newfoundland shellfish industry. In Newfoundland to date we have found a handful of populations of golden star tunicate and one isolated population of violet tunicate, while European green crab continues to show up in new areas. These 'invasions' illustrates that the threat to our industry is real.

This year (2009-2010) is the third year in a row that NAIA has been able to avail of funding for our AIS initiative through the Government of Canada's Invasive Alien Species Partnership Program (IASPP). In past years NAIA was able to deliver an AIS education campaign to create greater AIS awareness within marine resource user groups and to encourage communication between the aquaculture industry and groups currently working on AIS within the province (DFA, DFO) through the creation of a Newfoundland and Labrador AIS Advisory Committee. Though the education campaign has been greatly reduced this year, the Advisory Committee now in our 3<sup>rd</sup> year remains an important and productive component of NAIA's AIS project. A new area of focus this year is shellfish aquaculture biosecurity. This year we will be holding a Shellfish Biosecurity Workshop during which we will examine strategies for shellfish gear transfer, harvesting and equipment handling which help avoid the spread of AIS.

In December 2009 the AIS Committee will again be holding the third in a series of yearly Newfoundland Aquatic Invasive Species Workshops. The previous 2 workshops have been successful in raising the profile of AIS within the province and in engaging people from a wide range of backgrounds and interests. These workshops have brought together academic researchers, government officials, aquaculturists, representatives from fish harvesters' organizations, representatives from environmental groups and marine industry managers. Presentations by experts in the field of AIS management have focused on species of concern, impacts of AIS and management approaches. Keep an eye out for the AIS Workshop again in December 2009!

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