



**SUMMER 2018**

# **THE COLD HARVESTER**

## **NEWFOUNDLAND AQUACULTURE**

**Cooke  
Aquaculture  
Adopts  
Thermolicer  
Technology**

**Aquaculture  
Canada  
2018 Overview**

**Advancements  
in Cleaner Fish  
Development**

**World  
Aquaculture  
Society to Meet in  
St. John's in 2020**



## ANNUAL CONFERENCE & TRADE SHOW

Delta Hotel, St. John's, NL, Canada

September 26<sup>th</sup> – 28<sup>th</sup>

We invite you to join us to celebrate the 25th Anniversary of NAIA's Cold Harvest Conference and Trade Show. With world class keynote speakers, informative sessions and engaging panel discussions related to aquaculture innovation, technology, human resources, and consumer trends, you'll be awarded an excellent opportunity to network with local and global key players while celebrating the achievements made in this province's aquaculture industry over the past quarter of a century.



*We are pleased to have Dr. Steve Gaines, Dean of the Bren School of Environmental Science & Management at the University of California, Santa Barbara as our keynote speaker on September 26th.*

*Dr. Gaines is a marine ecologist who seeks conservation solutions by linking innovations in ocean science to more effective marine policy, management, and business.*

*His work involves studies of marine reserve networks, climate change impacts, sustainable fisheries management, and the role of aquaculture in meeting future food demands. He will be speaking on the future of food and how responsible increases in global protein production has to focus on gains in finfish and shellfish production.*

To register, exhibit, sponsor the event or for more information, please contact Roberta Collier at 709-538-3454 or [roberta@naia.ca](mailto:roberta@naia.ca)

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The Newfoundland Aquaculture Industry Association represents aquaculturists and the service sector in the province. Its fundamental purpose is to assist the aquaculture industry to achieve its full wealth creation potential. It is the voice for the industry by ensuring that Federal / Provincial legislation, policy, and services match the needs of the industry. It delivers programs and services to its members to attain excellence in safety, quality, environmental sustainability, and profitability. For more information on NAIA membership benefits, please contact us!



## Message from Laura Halfyard, President



Laura Halfyard, President and Chair of the Board, Newfoundland Aquaculture Industry Association

We have come through another winter-spring season, with Mother Nature trading risks of ice conditions and extreme cold water temperatures for unusual high winds that tested our gear and made working on the water difficult. Meanwhile, it is only three months until the **NAIA Cold Harvest 2018 Conference and Trade Show** which is taking place on September 26-28th, at the Delta Hotel in St. John's, NL. Our theme is "**25 Years Promoting Excellence in Aquaculture**" whereby we will reflect on our past and look to our future. Participants from industry, government, academic institutes and students, service sectors, and the public will have forums to discuss current issues, to network and to formulate growth strategies for NL's aquaculture industry. **Make sure to register soon!** We are also planning for "**Aquaculture Week 2018**" events linked to our salmon and mussel regions in the province.

We are also preparing for our next AGM which will also take place during Cold Harvest, when we will elect a new board. Over the past year, a Bylaws Working Group has reviewed our current bylaws and those of comparable organizations across Canada. We are preparing some amendments that will be discussed at the September AGM. However, to reflect the current status of our industry, we moved ahead with a Special Bylaws Meeting held on May 8th. During this meeting, two motions were presented and passed, whereby we would add one new salmonid and one new mussel representative to our board. We welcome Jamie Gaskill, of Marine Harvest Atlantic Canada and Terry Mills of Norlantic Processors Ltd., who accepted nominations to the

current board and will serve until the September elections. We also amended the term of President from 2 years to 1 year, to align with all other board of directors and succession planning.

The NAIA, with the support of the Government of NL, commissioned MQO, in partnership with Training Works, to conduct a *Labour Market Analysis* of our NL aquaculture industry. This report should be finalized soon, with strategic recommendations for short and long-term human resource needs in support of our industry growth. This will be critical, as we look to increase production under "*The Way Forward - Aquaculture Sector Workplan*" (Gov. NL and NAIA, 2017-2022), and as our rural communities continue to face challenges of reduced youth populations, aging workforce, out-migration, and social infrastructure needs for new workers, etc. We look forward to presenting the report at the conference in September. In late June, we took part in an Aquaculture Steering Committee meeting where we discussed the sector workplan. This was followed by farm visits on the south coast.

Transport Canada, under the Navigational Protection Program (NPP), recently released a proposed national approach for aquaculture site marking requirement and requested comments from industry by June 29th. NAIA made a written submission on behalf of industry, in consultation with members of the NAIA.

While in Quebec City for the Aquaculture Association of Canada Conference, we signed a monumental agreement to host a regional World Aquaculture Society (WAS) Conference in 2020 in partnership with AAC. This is expected to be the largest international conference to be hosted in St. John's. It should be a tremendous event, featuring stories of our NL and Canadian aquaculture industry, as well as future investment opportunities.

As President, I assure you that the NAIA board, ED and staff are diligently working on your behalf; advocating our priorities and generating awareness of the importance of our industry. Through the dedication and determination of all industry stakeholders, the sustainable growth of the NL aquaculture industry will continue to provide stability and economic viability for our communities. ✨

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# Message from Mark Lane, Executive Director



Mark Lane, C.D., Executive Director, Newfoundland Aquaculture Industry Association

**T**his year marks the silver anniversary of our annual Cold Harvest Conference and Tradeshow. Fittingly this year's theme, "25 Years of Promoting Excellence in Aquaculture", is reflective of our Association's mandate.

The Conference Planning and Program Committees are confident that we can make this the largest ever-attended NAIA Conference. Since 2015 we have grown our attendance and expanded our program each and every year. We hope you can join us on this monumental occasion. For more information visit [www.naia.ca](http://www.naia.ca).

As mentioned in previous editions of the Cold Harvester, NAIA has a plan to succeed – to grow our aquaculture industry sustainably and environmentally responsibly; creating rural economic opportunities and providing premium seafood to the world.

A key element to our industry's plan is the Aquaculture Sector Work Plan. I am pleased to affirm that all initiatives have been completed on-time thus far. The interest and access of all the civil service and political personnel involved has been outstanding. The determination and dedication of industry, government and other stakeholders has been second-to-none.

To date the following initiatives are some of those that have been completed:

- Review provincial fees for the aquaculture industry;
- Review and implement improvements to Crown Lands development referrals near shellfish farms and reserves around shellfish sites;
- Prioritize the aquaculture sector for provincial immigration supports; and
- Configure government supports to enable the mussel sector to grow to 10,750 mt.

To date we have also completed the Labour Market Study and Training Capacity Review as identified as a priority in the NAIA Strategic Plan (2015) – Vision 2020; Newfoundland Labrador Sustainable Aquaculture Strategic Plan (2014); and Sector Work Plan (2017). From these two crucial documents we will produce a comprehensive Recruitment and Retention Strategy for the labour force of the future. This Aquaculture Attraction and Retention Strategy will address employment issues, strengthen the human resource capacity of the industry, and undertake new initiatives to attract and retain workers. The final documents will be presented at Cold Harvest 2018.

From this document we will develop labour market information tools necessary to generate awareness of the career opportunities available and engage potential entries into the aquaculture industry labour force.

Liam O'Leary, an Aquatic Resource and Economics undergraduate student is currently conducting a jurisdictional analysis of the cost of production of aquaculture in this province in comparison of other maritime provinces. During his work term Liam will also lead the creation of a working group to develop options on how to increase awareness of the aquaculture industry among the province's youth.

This summer we also intend to issue several RFPs for consultants to conduct a comprehensive assessment of current and future infrastructure and telecommunications needs of the finfish and shellfish sectors to inform a multi-year investment plan.

As you can clearly see there is a tremendous amount of work being conducted on behalf of our members to create a favourable regulatory environment for investment and subsequent industry growth.

At the federal level we continue to collaborate with the Government of Canada to advance opportunities to accelerate aquaculture growth as identified by the Aquaculture Work Plan Steering Committee. Last fall, NAIA and the Government of Newfoundland and Labrador developed and released a Federal/Provincial Collaboration Paper. This working paper outlines policies that the Government of Canada could adopt to support the aquaculture industry, and tangibly enable positive economic growth in Canada. To date this paper has been presented to all NL Members of the House of Commons, Senators, appropriate cabinet Ministers and Deputy Ministers in Ottawa. This purposeful document has been well received and we have already realized its benefits in opening the communication channels within various departments of the Government of Canada.

NAIA will continue to work with you, our members and stakeholders, to pursue opportunities and remove barriers to support aquaculture sector growth in Newfoundland and Labrador. Our collaborative actions will cultivate the conditions that will foster new and expanding aquaculture business activity, stimulate private sector employment for residents in the province and help us achieve the industry growth in a sustainable and environmentally responsible manner. ✨



# Welcome Liam O'Leary

Please join us in a special welcome to Liam O'Leary who will be completing his work term with NAIA from June until the end of August. Originally from St. John's, NL, Liam is now enrolled in a joint advanced major degree in Aquatic Resources and Economics which include biology, chemistry and micro/macroeconomics. On the aquatic resource side, he also studies saltwater and freshwater sustainability, fisheries management and aquaculture. This is paired with hands-on experience and field work around Nova Scotia. In terms of economics, he is interested in local community development. This is very applicable to the socio-economic challenges facing rural Newfoundland and Labrador. He hopes to further his studies in community development,

including how farms can reinvigorate a rural economy.

Coming from a family of fishermen, Liam has been connected to the water all his life. His grandfather was an inshore cod fisherman in Portugal Cove South and his uncle is an active crab fisherman. He sees aquaculture as the future of seafood and is excited to learn as much as possible about the aquaculture industry in Newfoundland and abroad.

During his work term, Liam will be establishing an aquaculture awareness youth group in the province where they will work to increase awareness of the industry and boost future employment opportunities. He is also doing a jurisdictional analysis on the cost of aquaculture production. This will be



beneficial for the industry and give valuable insight on where costs can be reduced. He is looking forward to working with NAIA, its member companies and colleagues over the next few months. ✨

# Welcome NAIA Summer Students

We are also pleased to announce that we will have four additional students working in our St. Alban's office during the summer months. We will have a two-person Conservation Corps Green Team, consisting of Miranda Caley who will be working towards a journalism degree at Carleton University in Ottawa; and Amber Willcott who is pursuing a Nursing Degree at Memorial University of NL. The Canada Summer Job Program will support Melanie Collier, a 2nd year MUN Biology major and Michael Coombs, a 2nd year MUN science student who will be pursuing a Pharmacy degree. The team of four will be very busy over the summer months presenting to youth groups and participating in aquaculture, environmental awareness and marine debris related events. Welcome aboard! ✨



**Melanie Collier and Michael Coombs, Memorial University students working with NAIA this summer.**



**Amber Willcott and Miranda Caley will be working with Conservation Corp NL and NAIA this summer.**

# Aquaculture Canada 2018 - Innovation for a Sustainable Future

By: Joanne Liutkus, President of the Aquaculture Association of Canada

**A**quaculture Canada 2018, the annual conference of the Aquaculture Association of Canada (AAC), was held over May 27 – 30, 2018 in beautiful Quebec City at Hotel Le Concorde, Quebec. Over 240 delegates from across Canada and internationally attended. The conference's theme this year was Aquaculture Innovation for a Sustainable Future and it couldn't be more fitting to the focus of the conference's program and to the current snapshot of Canada's aquaculture industry.

The AAC was excited to host three diverse keynote speakers, and 13 sessions, linked through common themes of innovation and communications, ranging from algal culture, to land based aquaculture, to public perceptions and the media. Dr. Alison Van Eenennaam of the University of California, Davis, spoke on the interdependence of sustainability, innovation and science communications, Chef Andrew Gruel, Founder and CEO of Slapfish Restaurant Group, discussed his experiences in promoting seafood sustainability through our one common motivator, food, and Dr. Maurice Moloney, CEO and Executive Director of the Global Institute of Food Security, spoke on the linkages between global food security and innovation. The conference also hosted a screening of Food Evolution,

following the President's Reception. This film explores how science communications have influenced public discourse surrounding genetic engineering and food production, narrated by Neil deGrasse Tyson. Dr. Van Eenennaam took part in this film and was available afterwards for a Q & A session.

Social events were also a big success. The annual Student Fundraiser BBQ in honour of Dr. Joe Brown of the Ocean Sciences Centre, again raised funds for the AAC Student Endowment Fund which helps to fund student conference travel and scholarships each year. During the closing gala, Dr. Rich Moccia of the University of Guelph was honoured with the AAC Lifetime Achievement Award, on a day that also happened to be his birthday.

The AAC Board wishes to thank the Program and Arrangements Committees, session chairs, student judges, and particularly, a major thanks is extended to Joanne Burry, Conference Manager, Cat McLanaghan, Office Manager, and Dr. Tillmann Benfey (University of New Brunswick), Past President, for their continued support and guidance. We're looking forward to seeing everyone in Victoria, BC, May 5 – 8, 2019 for Aquaculture Canada 2019. ✨



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# Cooke Aquaculture launching new green technology in Atlantic Canada

Eco-friendly technology uses warm water bath to address sea lice

April 26, 2018



Cooke Aquaculture launched a vessel equipped with an innovative, eco-friendly sea lice treatment system in Atlantic Canada. The Thermolicer™, designed by Steinsvik, uses a simple warm water bath to address sea lice on salmon farms.

**BLACKS HARBOUR, NB** – Blacks Harbour-based Cooke Aquaculture has added a new vessel to its fleet that will use warm-water baths to address sea lice. It's the first time that this Norwegian technology is being used in Atlantic Canada to combat sea lice. The adoption of Thermolicer™ technology is part of the company's continued investment in innovative, chemical-free sea lice management tools.

"Tried last summer, this technique has proven to be 98 per cent effective at removing the lice without harming the fish. It's a simple and effective treatment that further reduces our need to use chemicals or medicines. This is an exciting evolution in sea lice management for us," said Joel Richardson, Vice President, Public Relations for Cooke Aquaculture.

Cooke Aquaculture has invested millions of dollars in research, development and engineering to build a complement of green sea lice treatment options that don't involve chemical

baths or in-feed treatments. Several options – including some developed in-house and some that have been designed by industry-leading companies – have shown tremendous promise. Provincial and federal governments have also supported research and development of alternative sea lice treatments methods.

The Norwegian-engineered system called a Thermolicer™ – a warm-water based sea lice removal system uses a warm water bath to gently remove sea lice without damaging or causing stress to the fish. Steinsvik, a leading technology supplier to the global aquaculture industry, developed and produced The Thermolicer™. Cooke has recently brought into service the Miss Mildred, a marine vessel equipped with Thermolicer™ technology.

"The Thermolicer™ exploits a vulnerability of sea lice that we know do not tolerate sudden changes in water temperature.



Sea lice are immediately sensitive to sudden temperature changes. By suddenly heating the lice, it will fall off the fish,” said Steinsvik’s Marketing Representative, Tore Laastad.

“Sea lice are naturally-occurring in the marine environment and can affect both wild and farm-raised fish. They do present a fish health challenge for our sector and for many years our company, and in fact the industry worldwide, has pursued effective, environmentally-sound treatment methods,” said Richardson.

The fish are transferred from the pen and separated from the seawater before they enter the Thermolicer™. Each fish moves through the Thermolicer™ in 30 seconds. All lice removed in the system are filtered and safely composted at approved, landbased waste management facilities.

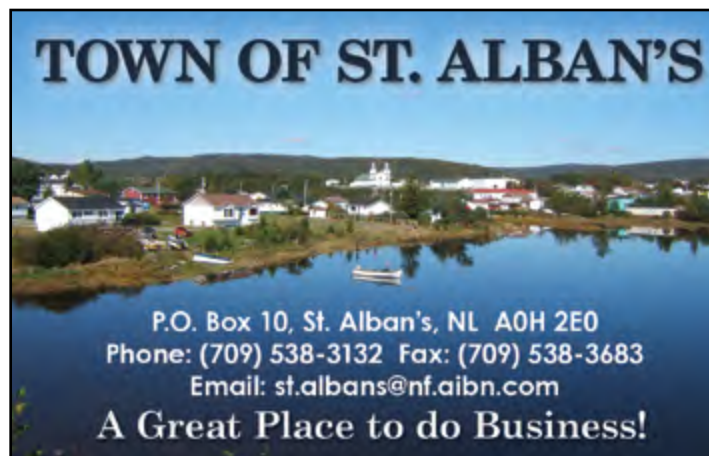
While the Thermolicer™ is a promising development to mitigate sea lice, it’s not the only environmentally-friendly innovation in development at Cooke Aquaculture. Two other systems are expected to be deployed this summer; the in-house designed “Cooke R”, that has been extensively trialed, and the “Hydrolicer” which uses water pressure to remove sea lice. Each of these mechanical sea lice removal tools are effective and environmentally responsible.

“Farmed salmon is one of this region’s biggest economic drivers and exports. Atlantic Canada’s locally owned and

operated fish farms produce 50 per cent of the country’s farmed salmon,” Richardson said. “We have so much to be proud of as an industry – our people, our sector’s sustainable and responsible growth and the healthy salmon we produce. The salmon farming industry has revitalized coastal communities and supported thousands of goods and services suppliers from inland municipalities, towns and villages.”

**Contact:**

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## **The Cold-Ocean Deep-sea Research Facility**



**The Cold-ocean Deep-sea Research Facility is the newest building at the Ocean Science Centre (building at right with round panels).**

**L**ocated on the coast in Logy Bay, the Cold-ocean Deep-sea Research Facility (CDRF) is the newest asset of the Department of Ocean Sciences of Memorial University. It houses a unique collection of instrumentation and laboratory space purchased with support of the province and the Canadian Foundation for Innovation (CFI). The capacity of the CDRF was built with aquaculture research in mind and provides special capacity to address infectious diseases of aquaculture species.

Key to that mission is the aquatic containment zone (CZ). This space contains both wet and dry lab facilities that are certified to work safely with infectious pathogens. It was designed from the ground up to meet the highest level of aquatic containment standards specified by the Canadian Food Inspection Agency's Office of Biocontainment safety. This includes a range of engineered controls, such as impervious surfaces and HEPA filtered air as well as standard operating procedure to prevent staff and students from unintentionally carrying pathogens into or out of the facility. The CDRF is notable for combining this high level of biosafety with flow-through, rather than

recirculating water systems. This allows for the highest possible water quality for the fish housed in the system as both incoming and outgoing water is treated. Effluent treatment relies on a set of filters and UV lights to disinfect the water. Failure at any part of this system will automatically shut-down the in and out flow of water, preventing accidental release of untreated water. This type of facility is rare and the CDRF is the only of its kind in NL. It allows for almost any conceivable research where preventing the release of pathogens or invasive species from the lab is a necessity. This includes pathogens that are of present concern or emerging organisms that may at some time present a threat to aquaculture operations or the ecology of the North Atlantic.

The search for strategies to eliminate or reduce pathogens from farm operations can rely on a variety of strategies, including novel feed ingredients, vaccines, cleaner fish and so on. Although some of these approaches can be tested using stand-ins, such as viral mimics that induce similar immune responses in fish, the ultimate test is to trial the product against the real thing – live pathogens and fish in combination. That is what



is where the CDRF containment zone comes into play.

The first work to use the CZ was examining the interactions of sea lice (*Lepeophtheirus salmonis*) as part of the Integrated Pathogen Management of Co-infection project (IPMC) led by Dr. Matthew Rise of Memorial University of Newfoundland, Dr. Richard Taylor of Cargill Innovation Centre, and Dr. Mark Fast of the University of Prince Edward Island. This project uses genomics tools to identify biomarkers of infection and co-infection in Atlantic salmon. A variety of pathogens, parasitic, bacterial and viral may infect this fish and it is often the case that multiple types of infection may occur. With the existence of the CDRF, the IPMC project can conduct realistic disease challenges and generate knowledge that will allow Cargill to develop therapeutic diets to reduce the impacts of co-infection.

Additional projects, under the supervision of Dr. Javier Santander, have been looking at the pathogenicity of *Aeromonas salmonicida*, the causative agent of furunculosis, in both Atlantic salmon and lumpfish (*Cyclopterus lumpus*). The CDRF allows for the testing of the efficacy of existing or new vaccines in these species. Future research will characterize the pathogenesis of several bacterial pathogens of concern to NL aquaculture operations such as *Vibrio anguillarum* (vibriosis), *Piscirickettsia salmonis* (piscirickettsiosis), and *Renibacterium salmoninarum* (bacterial kidney disease). Lumpfish provided by the Joe Brown Aquatic Research Building (JBARB, Memorial University, Danny Boyce, manager) have developed into a versatile and favoured research fish at the Department.

The CDRF also houses a variety of advanced analytical tools that support many aspects of aquaculture research. Slides are prepared for analysis of pathology in the automated histology lab. These can be used to assess the physical impact of disease on tissue or the health of intestines when changes are made to feed, for instance using vegetable oils in place of fish oils. Advanced microscopes allow researchers to obtain high resolution, three-dimensional images of cell structures that can be better used to understand how pathogens spread within the fish. Flow cytometry equipment is in use to create cell-culture based assays. These assays can be used to assess the immunological activity of fish cells in the presence of therapeutic ingredients. Since these assays are cell-culture based, rapid screening can be done without requiring large numbers of fish in a test trial. Other microscopy tools, such as the scanning electron microscope (SEM) are used to better characterize fish parasites and early life stages of farmed invertebrates.

Combined with the existing facilities of the Department of Ocean Sciences and its expert faculty and staff, the CDRF allows for the advancement of aquaculture research into areas not previously possible. It is a collaborative centre where academic and industrial partners may work together to provide research to support this sector. Those interested in partnerships and research capacity may contact the manager, Stephen Hill ([sjhill@mun.ca](mailto:sjhill@mun.ca), 709-864-3258, <http://www.mun.ca/osc/cdrf>), to learn more. ✨



Manager of the CDRF, Stephen Hill at work in one of three wet labs in the facility.



Dr. Matt Rise, Dr. Jillian Westcott and Zhiyu Chen (back to front) inspect Atlantic salmon for sea-lice attachment as part of the IPMC project.



# NEWFOUNDLAND AQUACULTURE INDUSTRY ASSOCIATION

## High School Graduating Students 6<sup>th</sup> Annual Scholarship

The Newfoundland Aquaculture Industry Association (NAIA) is pleased to announce its 6<sup>th</sup> Annual Scholarship for graduating students from high schools in Newfoundland and Labrador. Two scholarships, valued at \$500 and \$250, will be awarded to students pursuing a post-secondary education in marine or aquatic related studies. (sustainable aquaculture, marine biology, marine environment technology, ecology, nautical science, engineering, etc.)

### Eligibility:

- To be eligible, you must be graduating in 2018 and entering your first year of University or College.

### Evaluation Criteria:

- Based on academic achievement, references, level of community involvement and volunteerism.

### Review Process:

Applications will be reviewed by the NAIA scholarship committee. Deadline for submissions: July 15, 2018. To apply or for more information please contact: Roberta Collier at: 709-538-3454 or via email at [roberta@naia.ca](mailto:roberta@naia.ca). Only those applicants who are successful in their application will be notified. ✨

### To Apply, Please Submit the Following:

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- Three Reference Letters: Academic (1), Professional (1), and Personal (1)
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# The Coast of Bays Regional Aquaculture Centre Engages with Schools in the Coast of Bays

Authors: Keith Rideout, Coordinating Instructor and Technical Liaison, and Bill Carter, Regional Liaison Officer, Regional Aquaculture Centre, Coast of Bays Region, Fisheries and Marine Institute of Memorial University

This winter and spring of 2018 has been a busy time for outreach to Schools in the Coast of Bays region. In late March, Keith Rideout participated with a Let's Talk Science initiative to bring aquaculture related science and technology to schools in the Coast of Bays region. Let's Talk Science is a national organization that attempts to bring science and technology to school age children. The schools visited included King Academy in Harbour Breton, John Watkins Academy in Hermitage, Fitzgerald Academy in English Harbour West and Bay d'Espoir Academy in St. Alban's. This initiative, coordinated by Kendall Wyman, a Let's Talk Science Coordinator based at the Marine Institute, involved interactive demonstrations of plankton sampling techniques, water quality testing, salmon farming cage technology and fish biology. In addition to Kendall, who's a student in the Advanced Diploma in Sustainable Aquaculture (ADSA) program at MI, two other ADSA students Lucas Hetzler and Julia Norris along

with Zachary Foley and Adena Peters, from the Marine Environmental program, were instrumental in making the activity a success. Over two very intensive days we were able to reach in excess of 290 children with the message that aquaculture is a highly dynamic and interesting field.

Between the beginning of March and early June, Keith Rideout visited all 9 schools in the Coast of Bays region and has given 20 presentations and facilitated 17 interactive fish dissections. In excess of 300 different children have participated in a presentation and/or fish dissection. The presentations introduced aquaculture and talked about the current practices here in Newfoundland and Labrador. In some instances, presentations were given on the environmental impacts of aquaculture or the technologies involved in its practice. Several talks on marine related careers were given in several of the schools. A particular emphasis was placed on the broad range of career options that one has in the aquaculture field. For



MI Aquaculture and Marine Environmental students involved with the Let's Talk Science initiative in March, 2018. From Left, Zachary Foley, Kendall Wyman, Adena Peters, Julia Norris, Lukas Hetzler.



Dr. Jai Ragunathan with enraptured students at Conrad Fitzgerald Academy, May, 2018.



most of the students, the idea that aquaculture involves more than feeding fish was novel. Many went away with a broader understanding of the possible career options. The fish dissections involved a demonstration of the external and internal anatomy of a locally farmed fish species and then the students were given an opportunity to dissect their own fish. For many it was the first time they had dissected anything. For others it was the first time they had 'gutted' a fish so slowly and with such care!

Many went away excited to roll out their new found knowledge for family and friends.

Finally, during the last week of May, Bill Carter of the COB-RAC organized a tour by Dr. Jai Ragunathan of MI's School of Ocean Technology (SOT). Jai is an instructor in MI's Remotely Operated Vehicle (ROV) program. Jai and Bill travelled to schools within the Coast of Bays region to talk about the ROV Program, discuss potential careers and actually demonstrate ROV technology to students. The schools visited included King Academy in Harbour Breton, Fitzgerald Academy in English Harbour West, St. Anne's Academy in Conne River and Bay d'Espoir Academy in St. Alban's. John Watkins Academy had been on the itinerary but a power outage prevented this visit from happening. Students from Rencontre East, Gaultois and McCallum were invited to attend the sessions in English



The best way to get your dissection gear from the ferry to Victoria Academy in Gaultois, April, 2018.

Harbour or Hermitage. The sessions were very well received, students were very interested and some have already expressed a keen interest in the ROV Program at MI. These in-person discussions and demos that allow students to participate and be engaged, spark some real interest among students who are in the process of deciding on which career options they wish to pursue.

The Coast of Bays – Regional Aquaculture Centre (COB-RAC) was established in 2017 to act as a liaison between the Marine Institute and burgeoning aquaculture industry in the Coast of Bays region. The three main pillars of this engagement include applied, industrially relevant research, training and community engagement. Engaging with youth fits nicely into the engagement pillar of the COB-RAC. ✨



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## Dr. Amanda Borchardt, Veterinarian

**Employer: Northern Harvest Sea Farms NL Ltd., St. Albans, NL**

### Where are you from?

I am from Creighton, Saskatchewan. It is a small town similar to St. Alban's, NL but ~400km northeast of Prince Albert, SK.

### What is your background?

I received my Doctor of Veterinary Medicine (DVM) from the University of Prince Edward Island (UPEI). In addition to the aquaculture medicine taught at UPEI, I did external rotations (short work terms) in my fourth year of studies under aquaculture veterinarians in Norway, Scotland, Ireland, Thailand, and Canada (B.C. and NL).

### What does your job entail?

This is the first question people ask me when I tell them that I am a fish vet. I think people have a general understanding of the direct work that I do – going out to sites to check on the fish, performing necropsies (autopsies for fish), diagnostic testing, etc. But what I think a lot of people don't realize is that my job extends far beyond the hands-on work that I do. Fish health plays a key role in every part of this industry, so a large part of what I do involves reviewing and/or advising on standard operating procedures, protocols and other documents for our company – from animal husbandry, to biosecurity, to broodstock programs. In addition, I interact with federal and provincial groups to ensure that our company is following fish health regulations.

### How does this position relate to the aquaculture industry?

Aquaculture veterinarians have their fingerprints all over this industry. They can be found in the field/private sector, governments, diagnostic laboratories, feed companies, academia, research & development and pharmaceutical companies.

### What is the most interesting thing you have ever experienced in this position or while working in the aquaculture industry?

Wow! How do you pick one thing? Aquaculture in Newfoundland is so young compared to other sectors, so to be even a small part of the team that is involved in researching

and expanding our industry is very exciting. I literally am learning something new every day.

### What is the most challenging part of your job?

The most challenging part of my job is coming to a diagnosis. The clinical signs of many fish conditions can look the same – whether it's bacterial, viral, or environmental. Of course there are diagnostic tests that can help out, but sometimes we don't have the luxury of waiting for those results to come in. It is my job to compile as much information as I can – from the site crew, the divers, the weather, and from my site visit, to narrow the list down to a few most likely conditions. That way I can hopefully recommend some husbandry changes that the site crew can implement while we're waiting for those diagnostic results to come in.

### What is the most rewarding part of your job?

By far the most rewarding part of my job is knowing that I have made a difference to the health or welfare of our fish. Having someone tell me that a recommendation I gave helped our fish or lowered our mortality rate is very satisfying. After all, that's why I became a veterinarian in the first place – to help animals.

### What would you recommend to someone (i.e. a young student) who might be interested in this field of work?

I would say to try and get a summer job in the aquaculture sector to feel out the industry and make sure it is where you want to work. And then after that, study hard – good grades are necessary to get into veterinary school. ✨



## Town of Harbour Breton

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# Expressions of Interest

## *Atlantic Canada Aquaculture Technology and Trade Mission to South America - AquaSur October 2018*

**B**uilding on the past successes at Aquaculture Exhibitions, the Newfoundland Aquaculture Industry Association (NAIA) is currently seeking expressions of interest from Atlantic Canadian companies that want to meet and explore technology and trade opportunities with key South American stakeholders this fall. The Atlantic Canadian delegation will aim to develop key strategic markets within Chile and South America and continue to focus its efforts within the industry through trade development and technology partnerships and transfers.

This mission offers an unparalleled opportunity to make new contacts with seafood and aquaculture companies, to explore technology transfer opportunities and expand sales worldwide. Mission components will include 2-3 day tours of the countries rapidly developing aquaculture industry, participation in the Aqua Sur 2018 show, one-on-one business meetings as required by companies, networking events (incl. Atlantic Canadian and Canadian Receptions), industry briefings and aquaculture site tours, processing facilities and research centers. The 2018 mission strives to build upon the successes of the Atlantic Canadian industry and explore potential opportunities within the Chilean and surrounding markets. Currently, we envision working tours centered on trade development and technology transfer for both the shellfish and finfish industries.

Some highlights of this year's mission will include: One-on-one business meetings (matchmaking services) for participating companies, as requested, tours to aquaculture operations within Chile, access to other National and International workshops currently being organized during Aqua Sur 2018.

As a mission delegate you would receive: Assistance with

all logistical arrangements including air travel and accommodations, all in-country group transportation, visitor status at the Aqua Sur 2018 tradeshow, translation services, access to workshops, networking events and receptions, advance market intelligence, training, matchmaking services, logistical services, as required, and,

**Pending funding success, NAIA will lead this Mission with support from ACOA.**

### **Estimated Delegate Costs:**

- A \$750.00 (+HST) (TBC) non-refundable mission registration fee per delegate – due upon receipt of application.
- Airfare and accommodations are estimated at \$4,500.
- All meals and incidentals.

**Mission Travel Funding:** Interested and qualified companies are encouraged to discuss funding opportunities with their provincial government departments (respective provincial associations may have more information on what is available in your province).

Mission support services will be provided by the Newfoundland Aquaculture Industry Association, (NAIA), working in collaboration with the Atlantic Canada Fish Farmers Association (ACFFA), the Aquaculture Association of Nova Scotia (AANS) and the Prince Edward Island Aquaculture Alliance (PEIAA). Support services will also be provided through the Atlantic Canadian Aquaculture Industry Research and Development Network (ACAIRDN), by the R&D Coordinators of the Associations. NAIA will provide matchmaking services and mission support and coordinate the logistical requirements for the mission. NAIA will also conduct appropriate follow up activity at the end of the mission.

**Expressions of Interest should be submitted via email no later than July 29th, 2018 to:**

Mark Lane, Executive Director, Newfoundland Aquaculture Industry Association

Tel: (709) 754-2854 (Ex. 2) Email: [mark@naia.ca](mailto:mark@naia.ca) ✨

# Establishment of a Youth Forum in the Province

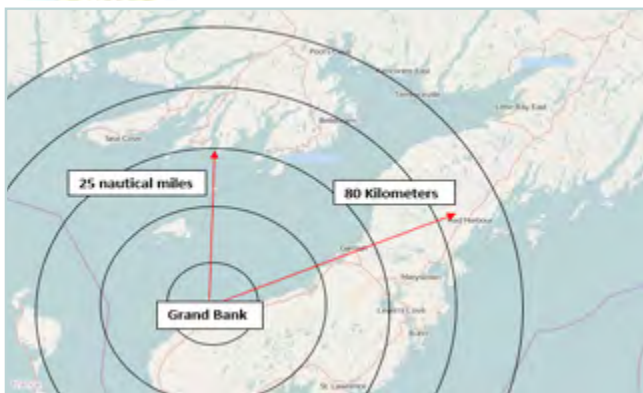
Liam O'Leary, NAIA's student intern is organizing a youth forum to be held during this year's Cold Harvest Conference and Trade Show in September. The forum will be established to promote and increase aquaculture awareness to youth in Newfoundland and Labrador with youth representatives from various regions of the province.

One goal will be to promote the numerous career opportunities available in the industry, from veterinarians and lab technicians, biologists, engineers, boat operators and more to facilitate the growth of the industry that is expected to occur in the next decade.

A secondary goal will be to increase the social media presence of aquaculture in the province. Recent statistics show that 59% of Instagram users are between the ages 19-28. (<https://www.omnicoreagency.com/instagram-statistics/>) This is a key demographic which we may need to focus on in the near future. The high presence of social media is expected to grow, and it will be important to establish a large following base to help get the word out on this exciting and growing industry. We look forward to working with our members and various youth groups in the province. ✨



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# **NAIA Aquaculturist of the Year 2018**

Dear NAIA Members and Supporters,

We are now accepting nominations for the **NAIA Aquaculturist of the Year 2018**. The award for **Aquaculturist of the Year** will be presented at the Cold Harvest banquet at the end of our annual meeting on the evening of Friday 28 September 2018 in St. John's, NL.

## **Purpose of the Aquaculturist of the Year Award**

The Aquaculturist of the Year Award honour's individuals for outstanding contribution to NAIA and/or the development of the aquaculture sector in our Province (see Appendix for further details). *The emphasis is on significant contributions to NAIA or the industry over time, not just in the past year.*

## **Award Eligibility**

**Any person from industry, the supply sector, academics or a government agency that has made a significant contribution to NAIA and/or the NL aquaculture industry over a prolonged period of time is eligible to be nominated to receive the Aquaculturist of the Year Award.**

## **Award Nomination Process**

1. The criteria for evaluating Aquaculturist of the Year Award nominees are intended to be inclusive. That is, people from all sectors of Newfoundland and Labrador aquaculture should be equally considered as potential nominees.
2. The nominator(s) must provide a written nomination with reasons for nominating the individual or group, including their achievements, and how they best exemplify NAIA's objectives (see Appendix for details).
3. Nominations **must be received no later than 17 August 2018 by email to the Awards Committee Chair, Cyr Couturier** for review and approval by the Committee.

**Please submit your nominations in confidence to: Cyr Couturier, Chair c/o NAIA Committee for Aquaculturist of the Year 2018 via email at [cyr@naia.ca](mailto:cyr@naia.ca)**

Award Selection Committee (past AOY winners): Cyr Couturier (chair): Sheldon George, Allens Fisheries, Clyde Collier, Boyd Pack, Jennifer and Doug Caines, Juan Roberts, Jonathan Moir, Terry Mills, Patrick Dabinett, Job

Halfyard, Geoff Ball, Joan Strickland, Vernon Watkins, Jennifer Woodland, John Kealey.

## **The Award and Context**

1. The Aquaculturist of the Year Award recognizes an individual or group who best exemplifies the aims and objectives of the Association.
2. The Award recognizes significant achievements or accomplishments realized over time in keeping with the NAIA objectives, and not simply an accomplishment in the past calendar year.
3. The primary objectives of the Association are to promote, assist and foster the development of commercial aquaculture activities in the Province.
4. The Award recipient will be recognized formally with a plaque by his / her peers at a special ceremony during our annual conference banquet. **Complimentary travel and accommodations will be provided to the Awardee.** ✨



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[helene@entship.ca](mailto:helene@entship.ca)



# NAIA Events



**Students of John Watkin's Academy in Hermitage participated in a beach survey where they found a great variety of marine life**



**Students at Bay d'Espoir Academy enjoyed the interaction with a live crab and other species at the touch tank in the Fisheries and Land Resource booth.**



**Keith Rideout of Marine Institute explained the use of a refractometer with the students of John Watkin's Academy.**

**W**orld Oceans Day Took was on Friday June 8th and there were many events and celebrations that took place throughout the province. On June 2, the Marine Institute hosted a World Oceans Day family event. The Centre for Aquaculture and Seafood Development had an aquaponics and aquaculture display where more than 300 people visited the rainbow trout and learned about how we can grow plants and fish together. There was also plenty of information on display about the aquaculture industry in Newfoundland and Labrador and the exhibitors engaged in many conversations with visitors about the sustainability of the aquaculture industry in our coastal waters.

To help celebrate and promote this years theme which was: Preventing plastic pollution and encouraging solutions for a healthy ocean, NAIA and a group of volunteers also travelled to St. Joseph's Academy in Harbour Breton, John Watkin's Academy in Hermitage, and Bay d'Espoir Academy in St. Alban's

where various grades from K-6 enjoyed interactive aquatic and marine debris related activities.

The kids had an opportunity to participate in different hands-on learning experiences in each school such as: a touch tank with various aquatic animals, an enviroscape table top marine debris display, a Fisheries & Oceans presentation on habitat and species at risk, and a full Atlantic salmon dissection by staff of Marine Institute. Classes in Harbour Breton and Hermitage also did beach surveys where they looked for living organisms and picked up marine debris which was analysed. A scuba diver from Cooke Aquaculture was even on hand to do a shallow water dive that brought in living plants and animals for the kids to view. Some classes also measured oxygen, temperature and salinity readings with instructor Keith Rideout of Marine Institute and Janice Duggan of Cooke Aquaculture.

Special thanks to the Department of Education and the 3 schools for allowing



**Students of John Watkin's Academy were intrigued at how our climate is contributing to changes in our environment and the effects of marine debris.**



**Keith Rideout of Marine Institute and Amy Negrijn of Northern Harvest Sea Farms demonstrated a salmon dissection to the students at Bay d'Espoir Academy.**





Calvin Rose, Cooke Aquaculture scuba diver did a shallow water dive for students in Harbour Breton. Also in the photo L to R: Janice Molloy, Steward May, Keith Rideout, Megan Strickland and Julia Bungay.



Students at Bay d'Espoir Academy had many great suggestions on ways to reduce marine debris: avoid using disposable plastics (bags, bottles, straws, etc.), use a travel mug instead of a plastic cup, use reusable shopping bags, and always use the 3 R's: Reduce, Re-use, and Recycle.



World Oceans Day Committee and participants: L to R: Heather Bennett of Oceans Learning Partnerships, Roberta Collier, NAIA, Tyson Russell and Nicole Hefferan-Snow, Fisheries and Oceans, Amy Negrijn, Northern Harvest Sea Farms, Keith Rideout, Marine Institute of MUN, Clyde Collier, MAMKA, Gary Framp, Department of Fisheries and Land Resources, and Gail Hoskins of Department of Tourism, Culture, Industry and Innovation.

us to visit you during your busy time and Northern Harvest Sea Farms and Cooke Aquaculture staff for assisting with the demonstrations. Also, to the World Oceans Day committee which consists of NAIA, Oceans Learning

Partnerships, Marine Institute of MUN, Department of Tourism, Culture, Industry and Innovation, MAMKA, Department of Fisheries and Oceans, Department of Fisheries and Land

Resources, Cold Ocean Salmon, Northern Harvest Sea Farms, and Department of Education. ✨

## RANL Savour Food & Wine Show

The Restaurant Association of Newfoundland and Labrador held its annual Savour Food & Wine Show 2018 on April 26th at the Delta Hotel in St. Johns, NL. 38 Food and Beverage and 10 Lifestyle exhibitors took part including NAIA where Chef Watson prepared Thai Chili Mussels on-stage and at the NAIA booth to approximately 500 guests. We

are proud to say that NAIA was the recipient of the Best Booth Award! Award criteria included staff friendliness and booth interaction. Congratulations to all award winners!

*Photos courtesy of the Restaurant Association of Newfoundland and Labrador. ✨*





# Advancements in Cleaner Fish Research in Newfoundland and Labrador



By: Darrell Green, Research and Development Coordinator, Newfoundland Aquaculture Industry Association

**F**armed Atlantic salmon is one of the world's most popular farmed fish, with global production now exceeding 2 million tons, worth over \$16 billion Canadian. The Newfoundland and Labrador salmonid aquaculture industry is seeing unprecedented growth, with the value of production increasing by over 600 percent between 2007 and 2016, i.e. from \$38.8 to approximately \$263 Million. But despite salmon farming having the highest level of technological development and the lowest level of risk among aquaculture sub-sectors, the industry has significant challenges with the management of sea lice. These small naturally-occurring crustacean parasites can cause damage to the salmon's scales and stress the fish, reducing their growth and increasing their risk of disease. The industry globally spends over \$450 million per year on sea lice management and some experts say this is limiting industry growth. Historically, approved veterinary therapeutants have been the primary components in Integrated Pest Management schemes.

One ever-increasing alternative to medicines is the use biological sea lice control, employing wrasse and other cleaner fish. In other aquaculture jurisdictions, it is common to stock salmon cages with several differing species of cleanerfish. In Norway, lumpfish and ballan wrasse are popular complementary choices, since wrasse do not feed on sea lice as actively in winter, while the lumpfish continue to feed at lower temperatures. Ballan wrasse for use in salmon cages are supplied from a combination of wild-caught fish and hatchery raised fish, while practically all the lumpfish used are grown in captivity. The global commercial production of lumpfish deployed into sea cages has now increased to over 30 million, with projections of going to

50 million over the next few years.

Here in Newfoundland and Labrador, where the ballan wrasse is not a native species, development efforts are concentrated on use of wild-caught cunners (a.k.a. conners in NL) and cultured lumpfish. To date, experimental trials in salmon cages with these two species across Atlantic Canada have had encouraging results. Since 2010, Danny Boyce and his team at the Dr. Joe Brown Aquaculture Research Building (JBARB) within the Department of Ocean Sciences of Memorial University, have been actively working on cleanerfish development. Experimental-scale production of both cunner and lumpfish have been very successful.

Over the past couple of years Cold Ocean Salmon (Cooke Aquaculture, NL) have been working on lumpfish with the JBARB and have converted a previous cod nursery building in Belleoram into a lumpfish nursery. Juvenile "lumps" from the program at the JBARB were transported to this facility and grown to the size needed for deployment into salmon cages. Once lumpfish are about 20 g they are ready for deployment into smolt net pens; larger lumpfish are needed for cages with larger mesh nets. As a result of this work, 55,000 lumpfish were deployed into COS salmon cages in Newfoundland and Labrador this spring. The company is also planning to use cunners this year and expects to have all their current salmon net pens stocked with cleanerfish. With each of their net pens stocked at appropriate densities, they will have over 400,000 cleanerfish in the water this year. And demand from Northern Harvest Sea Farms, Marine Harvest Atlantic Canada and Grieg NL Seafarms is likely to almost triple this number.

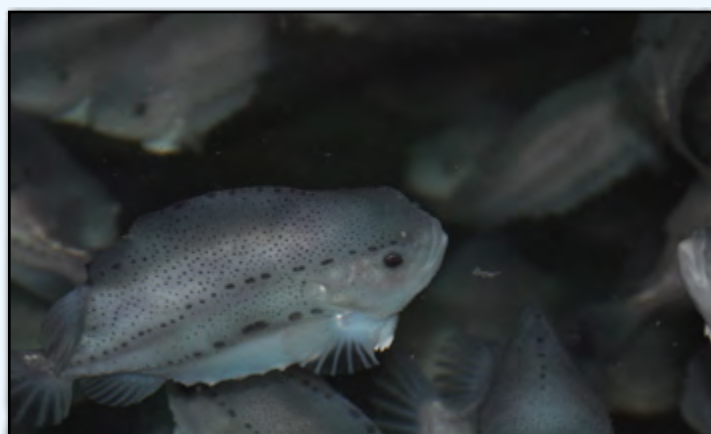
Efforts are also underway to trial the use of wild-captured



cunners as biological sea lice control. Currently a group in Conne River are planning to gather information on wild populations of cunners to estimate the sustainable level to which this resource can be relied on as cleanerfish. Led by Shayne MacDonald of Conne River, the group has been working with experts at Fisheries and Oceans Canada (DFO) on cunner population biology and working towards getting approvals for an exploratory license under the Emerging Fishery Policy. The group won't be stocking salmon farms this year, but will be doing research on gear type, population estimation, exploitation rates, etc. Their plan is to eventually become a supplier of cunners to the salmon farming companies.

Even with the ongoing work, the supply of cleanerfish in Newfoundland and Labrador will likely fall short of the demand over the next few years, until lumpfish culture is expanded and cunner fisheries get established. In order to scale up the cleaner fish sector to meet this demand, the current challenge is to identify and mitigate the main challenges and bottlenecks facing cleanerfish culture and capture. There are several critical knowledge gaps in this area, in Newfoundland and Labrador, which must be filled. A recent gap analysis activity identified knowledge gaps in areas such as timing of wild stock spawning, broodstock husbandry, broodstock selection, juvenile diets, fish transport, use of vaccines, fish welfare in cages, supplemental diets in cages, efficacy evaluation, post-use disposal, disease profile of wild-collected cunners, wild cunner populations and regulatory requirements for collection and use. Each of these knowledge gaps are significant in the context of cleanerfish production scalability.

In order to strategically organize industry resources for cleanerfish development the Newfoundland Aquaculture Industry Association, in consultation with Memorial University and



our member salmon aquaculture companies, is organizing an Atlantic Canada Cleanerfish Workshop for delivery in August 2018. The workshop will be instrumental in helping fill industry's knowledge gaps. To this end, Danny Boyce of JBARB, Elizabeth Barlow of Marine Harvest Atl. Canada and Sheldon George of Cold Ocean Salmon, have helped assemble a group of world renown cleanerfish experts to come to Newfoundland and Labrador and present on the current state of knowledge in cleanerfish development. Presentations, question and answer session and networking opportunities will aid in knowledge transfer and collaboration. At the end of the day the workshop will help industry set an overall direction for the development of cleanerfish supply in Newfoundland and Labrador.

*Darrell is the Research and Development Coordinator (RDC) for NAIA. He has worked in the aquaculture industry since 1997. He has management experience in commercial aquaculture and had worked on aquaculture research projects involving cod, halibut and blue mussels at Memorial University, before joining NAIA in 2007. In his current capacity, Darrell plans, initiates and manages NAIA R&D projects on behalf of, and in partnership with, NAIA member aquaculture companies. ✨*

## Atlantic Canada Cleanerfish Workshop

**Date: August 9 - 10, 2018 • Venue: Capital Hotel, St. John's, NL – Salon A/B**

The Newfoundland Aquaculture Industry Association (NAIA), in collaboration with Memorial University and our member salmon aquaculture companies, is organizing the Atlantic Canada Cleanerfish Workshop set for August 2018.

The main purpose of the workshop is to survey the state of cleanerfish production globally and to fill knowledge gaps with respect to the scale-up of production and use of cleanerfish in Atlantic Canada.

National / International experts include representatives from:

- Marine Harvest (Norway, Atlantic)
- Cooke Aquaculture (NB)
- Skjerneset Fish AS (Norway)
- Akvaplan-Niva (Norway)
- Hiddenfjord (Faroe Islands)
- University of Swansea (UK)
- Fiskialing (Faroe Islands)
- Dorset Cleanerfish Ltd. (UK)
- Pharmaq / Zoetis (Norway)
- Skretting / Nutreco, (Belgium)

**Cost:** \$80 (CAD) per person plus taxes - **Advance registration is required.** To register or for more information, please contact: Darrell Green **Email:** [dgreen@naia.ca](mailto:dgreen@naia.ca) • **Phone:** +1-709-754-2854 (Ext 3)

# COB-RAC Introduces Aquaponics to the Coast of Bays

By: Keith Rideout, Coordinating Instructor and Technical Liaison, Regional Aquaculture Centre, Coast of Bays Region, Fisheries and Marine Institute of Memorial University

The Marine Institute's (MI) Coast of Bays Regional Aquaculture Centre (COB-RAC) has brought aquaponics to the Coast of Bays for the first time by placing two set-ups with regional branches of the Community Youth Network (CYN) in Harbour Breton and St. Alban's.

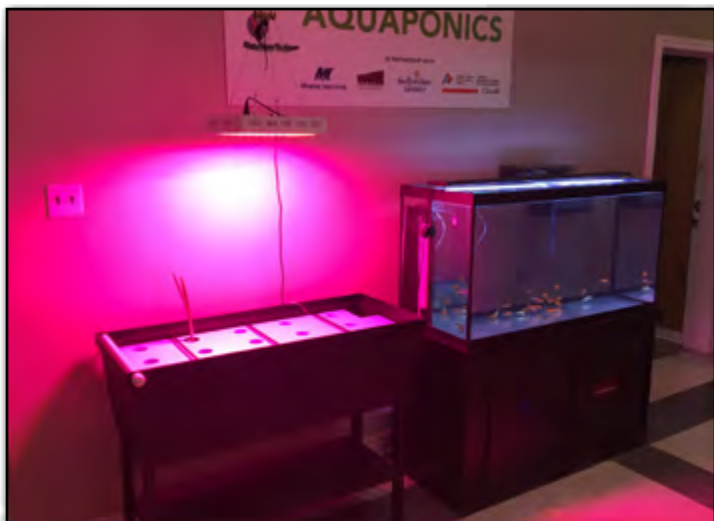
The Institute's Mark Santos designed and sourced the components for these aquaponic systems. Aquaponics is a type of aquaculture that incorporates the production of fish with plants (Figure 1). The ammonia contained in dissolved wastes from the fish are converted by bacteria to a form usable by the plants. As a result, the water is cleaned and the plants are nourished without adding any additional fertilizer to the system. The clean water is then returned to the fish tank to begin the cycle again. The removal of ammonia from the dissolved waste is an important step in any land-based aquaculture system because, if left to build up, this waste will become toxic to the fish.

The plants in aquaponic systems are held in floating beds using a deep water culture technique (DWC) where their roots dangle freely in well oxygenated water; no soil is required in these systems. A wide range of plants can be grown in aquaponics systems; anything from leafy greens to a wide range of herbs.

The Community Youth Network branches in the Coast of Bays are two of 34 located throughout Newfoundland and

Labrador, serving youth from ages 12 to 18. Their mandate is to engage youth in meaningful dialogue through the provision of appropriate programs and services that support learning, skill development and civic engagement. The branches provide youth with varied engagement opportunities where youth can: develop leadership abilities, learn from/with others from their community, gain work experience through volunteering, participate in community projects and recreation activities, develop citizenship skills, advance entrepreneurial skills, and obtain career/work information.

*"We are always looking for new opportunities to engage youth and younger members of our programs and seeking to provide ways that they can learn new things,"* says Marie Bungay, Executive Director of the Harbour Breton Community Youth Network. *"Our Aquaponics system is teaching our young people how to become more environmentally responsible, how they can grow vegetables without soil, and how the production of food in this way can provide healthy sustainable options and fresh produce. They are being exposed to science, agriculture, aquaculture and engineering with this small scale system. We are very happy to be part of this program with MI."* Lisa Willcott, Executive Director of the Bay d'Espoir Community Youth Network adds *"This has been an excellent way to provide hands on tangible education to our youth on how Aquaculture and Hydroponics*



Aquaponics set-up at the Bay d'Espoir Community Youth Network with the pink hued grow light shining on plant bed with the fish tank to the right.



Aquaponics set-up at the Harbour Breton Community Youth Network. Front row (CYN Youth) from left Pacey Griffin, Brianna Mullins, Lauren Carter, Alana Griffin, Allison Day. Back row (MI) from left Keith Rideout, Mark Santos.



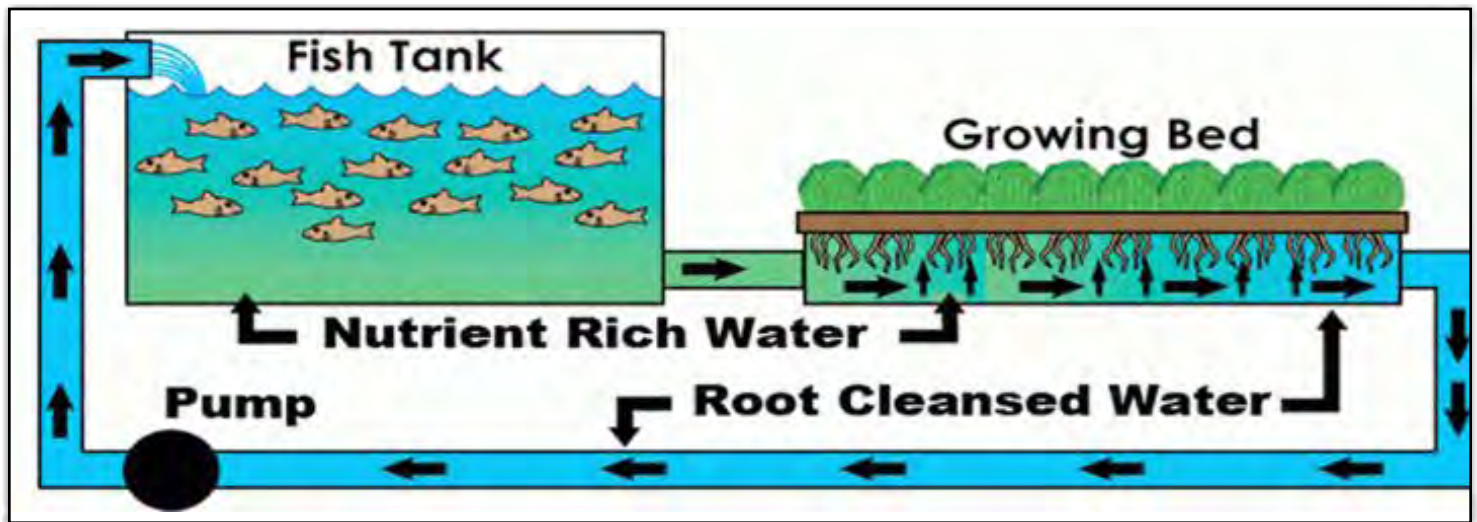


Figure 1. Aquaponics system showing fish tank, plant bed and water flows.

can work together to provide fresh organically grown vegetables. This endeavour has also given our youth a chance to further develop their problem solving and communication skills while performing some very educational and fun science experiments.”

The COB-RAC was established in 2017 to act as a liaison between the Marine Institute and burgeoning aquaculture industry in the Coast of Bays region. The three main pillars of this engagement include applied, industrially relevant research, training and community engagement. This

aquaponics activity fits nicely into the engagement pillar of the COB-RAC. As part of community and youth engagement, a major emphasis has been placed on getting the word out about the career opportunities inherent in the local aquaculture industry.

These aquaponics set-ups introduce youth to the complexities of keeping living organisms alive and hopefully spark some interest to investigate aquaculture, as a possible career option down the road. ✨

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## Fish Farmers Respond to Canada's Commissioner of the Environment Report on Salmon Farming

**APRIL 25, 2018 - ST. JOHN'S** – Salmon farming is a growing industry in Canada that provides an important source of healthy sustainable seafood. Globally, aquaculture now provides more than half of all seafood for human consumption.

Aquaculture is a fast-evolving sector and our farmers rely on the latest science, innovation and technology to manage their farming operations, maintain healthy fish, produce premium seafood and reduce their environmental footprint.

The aquaculture industry of Newfoundland and Labrador supports well-informed recommendations and regulatory proposals that are based on robust science, clarify regulator roles & responsibilities, achieve sustainable growth, and protect wild salmon populations and the environment.

Salmon farming practices in Newfoundland and Labrador are regulated by federal and provincial regulations, and international third-party sustainability certifications. It is important to note that this audit and subsequent report did not examine regulations and policies at the provincial level or within other federal departments and agencies that provide

regulatory oversight of the industry.

The Government of Newfoundland and Labrador has very stringent regulatory policies and regulations that our industry complies with; such as our Code of Containment, which exists as a current condition of licensing. In the report, the Commissioner also stated that Canadian producers demonstrate “high compliance” with licensing conditions.

We expect Canadian regulations to evolve to reflect modern advances in our industry. We are pleased to read the progressive responses by Fisheries and Oceans Canada (DFO) and the Canadian Food Inspection Agency (CFIA) included in the auditor's report.

As responsible farmers of the sea we offer our support and cooperation to DFO and CFIA to implement the eight recommendations outlined in Canada's Commissioner of the Environment Report on Salmon Farming.

Mark Lane, Executive Director, NAIA

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# Cooking with Chef Watson

## Farmed Atlantic Salmon Melt with Farmers Marble Cheddar and Mozzarella Cheese

### Ingredients

- 10 oz. of cooked Farmed Atlantic Salmon Fillet
- 1 med. Shallot chopped
- 2 tbsp. Mayonnaise
- 1 tbsp. Lemon juice
- 1 tbsp. minced Flat-leaf parsley
- ½ tsp. Salt
- 1 lg. Dill pickle chopped
- dash of Hot sauce
- Freshly ground pepper, to taste
- 2 Tomatoes sliced
- ½ c Shredded Sharp Farmers Marble Cheddar and Mozzarella Cheese
- 4 slices Whole-wheat bread toasted



### Directions:

Preheat broiler. Combine Atlantic salmon, shallot, mayonnaise, lemon juice, parsley, salt, hot sauce and pepper in a medium bowl. Spread ¼ cup of the salmon mixture on each slice of toast; top with tomato slices and 2 tbsp. cheese. Place sandwiches on a baking sheet and broil until the cheese is bubbling and golden brown, 3 to 5 minutes. ✨



**C**hef Steve Watson served as an apprentice in London, and worked in Scotland, Belgium, France and Germany before moving to Canada in 1977 to study North American cooking. He taught culinary arts at the Cambrian College in Sudbury, ON before joining the Canadian Pacific Hotels chain in 1988.

He recently retired as Territory Sales Manager and Executive Chef with Agropur, and has taken on a new passion of working as a tour guide with McCarthy's Party in St. John's, NL. He's also a devoted family man and a prominent member of the local community. Steve epitomizes the definition of a volunteer, including his work with NAIA and his quarterly submissions to the Cold Harvester, and spends countless hours giving back to the people of a province he now calls home. ✨

	 <p><b>MHA Tracey Perry</b> District of Fortune Bay-Cape La Hune</p> <p>P.O. Box 429, 101 Main Street St. Alban's, NL A0H 2E0 Tel: (709) 538-3112 Toll Free: 1-888-538-3112 Fax: (709) 538-3079 E-mail: TraceyPerry@gov.nl.ca</p>
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# Couturier on Culture

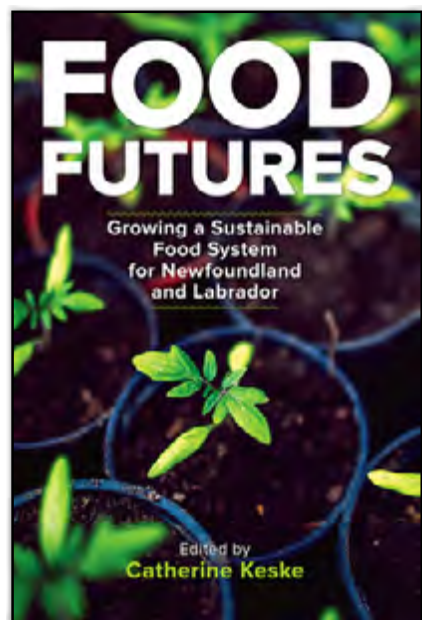
## *The Environmental Costs of Food*

Cyr Couturier is an aquaculture scientist and program chair at the Fisheries and Marine Institute of Memorial University. He has 35+ years of experience in applied research and development, training and education in aquaculture. He is a Board and Executive member of several aquaculture & development associations, including NAIA (past-president), CAIA (president), CAHRC, etc. He has worked in aquaculture development in over 18 countries. The views expressed herein are his own. Contact: [cyr@mi.mun.ca](mailto:cyr@mi.mun.ca) or follow on Twitter @aquacanada

By: Cyr Couturier

**A**quaculture and fisheries are essentially about producing food from the sea, or **seafood** as it is referred to most commonly. Much is made of these days about the ecological impacts of food production, and it is estimated that up to 30% of all greenhouse gases now come from agri-foods production.

The good news is that seafood in general has a fairly low impact overall. In fact, it can be much lower than some plant proteins, as evidenced in a new study by Hilborn et al. (June 2018)(<http://sustainablefisheries-uw.org/environmental-costs-of-food/>). Hilborn and colleagues examined 148 so-called cradle to grave studies and compared food products under 4 metrics: energy use, green-house gas emissions, and potential for eutrophication and acidification.



Cover of the Food Futures book released June 2018, and available from ISER Books, Memorial University.

In general, animal proteins requiring lower amounts of fuel or energy for production, had much lower impacts overall on the environment, including net pen salmon, molluscan shellfish like mussels or oysters, pelagic fish, when compared to beef, pork or poultry proteins. The least impactful overall in fact were the farmed molluscs as there is little in the way of food requirements or energy

use for production and harvesting. Seaweeds were not included: use for production and harvesting. Seaweeds were not included in the emissions estimates, but they are an important source of food globally, and would likely rank as least impact overall of any food proteins, if they had been considered.

Some forms of aquaculture products, tilapia, shrimp or catfish, for example, actually have fairly high carbon impacts, as much as wild shrimp trawling, or chicken and pork production, given the requirement for additional feeds and energy associated with providing oxygen and water circulation to ponds for example. Within a category - say salmon farming - Hilborn et al. clearly show once again that net pen farming of salmon has a much lower environmental footprint overall than land-based salmon farming, presumably due to the energy costs of feeding, circulating and filtering the water within RAS systems.

So, the good news is that seafood in general can have a lower impact on the environment, requiring fewer resources (space, energy, freshwater) than the common terrestrial animal proteins and some plant proteins. But, there is room for improvement and the further greening of our food systems, including various aquaculture products.

The greening of our food systems is discussed in a recently released book entitled *Food Futures: Growing a Sustainable Food System for Newfoundland and Labrador*. Available from ISER Books at Memorial University there are chapters on the social, cultural and food security aspects of a variety of food systems, including fisheries and sustainable aquaculture. In the aquaculture chapter, Couturier and Rideout provide an overview of the history of aquaculture in Newfoundland dating almost 200 years, to the present, and discussed Memorial University's role in the past and in the future in developing the sector. ✨



# St. John's, Newfoundland to Host Largest Aquaculture Focused Conference in Canadian History

June 4, 2018



(L-R) Back row: Betty House, Joanne Liutkus, Cyr Couturier, Dr. Tillmann Benfey, Dr. Debbie Plouffe, Tara Daggett and Joanne Burry. Front row: Dr. Stefanie Colombo, President of AAC; John Cooksey, Executive Director of WAS; Mark Lane, Executive Director of NAIA

On May 30, 2018, in Quebec City, World Aquaculture Society (WAS) signed a historical agreement to host WAS NORTH AMERICA 2020 in partnership with the Aquaculture Association of Canada (AAC) and Newfoundland & Labrador Aquaculture Industry Association (NAIA) on August 30 – September 2, 2020 at the St. John's Convention Centre, St. John's, Newfoundland, Canada.

This will be the first collaborative meeting between AAC and WAS in many years. It is especially exciting that NAIA will join this collaboration also.

John Cooksey, Executive Director, World Aquaculture Society - "WAS has been trying for many years to have a joint meeting in Canada and we are excited to have the opportunity to help organize a major Aquaculture Conference and Exposition in Canada. We look forward to the world aquaculture community focusing on Canadian Aquaculture innovation. Mark your calendars now!"

Stefanie Colombo, President, Aquaculture Association of Canada - "We are very excited that Canada will be the host of WAS North America 2020! The partnership among WAS, NAIA and AAC will undoubtedly yield a productive

and inspiring meeting. We look forward to welcoming the global aquaculture community to our country!"

Mark Lane, Executive Director NL Aquaculture Industry Association - "We are absolutely thrilled and honoured to be selected as the location for WAS North America 2020. To have Newfoundland and Labrador recognized for its potential as an aquaculture growth area globally is a milestone that we are proud of. We look forward to sharing our success stories as an industry and

our beautiful province as a world class tourist destination with aquaculture enthusiasts spanning all areas of the globe in 2020".

St. John's, Newfoundland and Labrador is an ideal location for this meeting because of the fast-growing aquaculture community in the province and as a world class tourist destination as being the oldest city in North America.

For more information on Newfoundland and Labrador: <http://www.newfoundlandlabrador.com>

The combined international conference and exposition is expected to draw over 2000 attendees from more than 100 countries and featuring 150 exhibits; the largest of its kind to ever be held in Canada.

## For more information:

- John Cooksey, Executive Director, WAS  
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- Joanne Liutkus, President, AAC  
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# New President for Aquaculture Association of Canada



**C**ongratulations to Joanne Liutkus who recently started her tenure as President of the Aquaculture Association of Canada.

Originally from Placentia Bay, Newfoundland, following a B.Sc. in Biology at Memorial University, in 2005, Joanne was inspired by a presentation from Cyr Couturier to enrol in the Advanced Diploma in Sustainable Aquaculture program at the Marine Institute. She then went on to complete an M.Sc., studying halibut culture, while living in beautiful St. Andrews, NB.

She spent several years in Ottawa, working with Fisheries and Oceans Canada's Aquaculture Science Branch, and the Aquaculture Management Directorate, before moving on to work with Ruth Salmon at Canadian Aquaculture Industry Alliance. She then moved West in 2014, and since that

time has worked with the BC Salmon Farmers Association in Campbell River, BC, now in the role of Regulatory Affairs and Research Manager.

Joanne has been volunteering and attending conferences with the AAC since she was a student. She has chaired the Aquaculture Canada program committee for the past two years. She can speak first hand to the role of the AAC in inspiring students to follow an education and career path in aquaculture, and in providing a networking venue important to the continued development and sustainability of the Canadian aquaculture industry. She's looking forward to the upcoming year and finding new ways to foster student and member engagement. ✨

## Congratulations to Jillian Westcott

**C**ongratulations to Jillian Westcott of Marine Institute on recently being awarded the 2018 Marine Institute teaching award. This award recognizes teaching excellence in an individual who has gone above and beyond in the pursuit of teaching and learning, innovation, and leadership at the Marine Institute. It acknowledges excellence primarily attained over a minimum of five calendar years prior to the awarding of this distinction. The award is open to faculty and demonstrators who have not previously received the Marine Institute Teaching Award. Jillian is also a long-time volunteer with NAIA and is currently participating in the Cold Harvest 2018 program committee. ✨



**Jillian Westcott, Instructor/Researcher, Fisheries and Marine Institute of Memorial University of NL receiving her Teaching Award during the award ceremony in June. Photo courtesy of Fisheries and Marine Institute of Memorial University of NL.**





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Newfoundland and Labrador is one of very few places in Canada with plenty of aquaculture space available. It also offers an excellent investment environment. Various international investors have already recognized this and are currently partnering with local companies to grow the industry . . . and their return on investment.

The Newfoundland Aquaculture Industry Association (NAIA) offers a constructive and personalized approach to help you develop positive relationships with experienced, reputable local partners. Please contact NAIA to learn how we can help.

For more information contact: Mark Lane, Executive Director  
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