



SUMMER 2017

THE COLD HARVESTER

NEWFOUNDLAND AQUACULTURE



**Unprecedented
Partnerships**

**Aquaculture
Labour Research**

**Aquaculture
Advancements**



Newfoundland Aquaculture
Industry Association



Cold Harvest 2017

24th Annual Conference and Trade Show

Hotel Gander - Gander,
Newfoundland and
Labrador, Canada
September 26-28

Aquaculture: An Ocean of Potential

Newfoundland and Labrador is regarded by many as Canada's aquaculture growth centre.

The world is watching. There is a global focus on our potential for the future.

On behalf of the Newfoundland and Labrador aquaculture industry, we invite you to join us for our 24th Annual Cold Harvest Conference and Trade Show; full of exciting and informative discussions related to aquaculture and its potential in our province. With world class keynote speakers and guests, sessions and panel discussions related to aquaculture innovation, technology, human resources and consumer trends, this event should not be missed.

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

**More information
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www.naia.ca**





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Summer 2017



**Summer
2017**

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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

As summer approaches, and as responsible farmers of the sea, we are preparing for a busy season of activities to increase our production and grow our industry. The salmon industry breathes a sigh of relief that winter is gone and fish feeding responses increase. Meanwhile, mussel farmers continue to protect their sites with ice booms and monitor the sea ice on the NE coast until July.

In March 2017, the Government of NL released its report ‘The Way Forward: Realizing Our Potential’. The report highlighted the objective to foster the responsible and sustainable growth of the salmonid industry to 50,000 metric tonnes (MT) per year and 10,750 MT for mussels. In December 2014, after a year in consultation with industry stakeholders, the Government of NL released its Sustainable Aquaculture Strategy. In the following year, the provincial government also released a report Economic Impacts of the Newfoundland and Labrador Aquaculture Industry. Meanwhile, in 2015, NAIA underwent a strategic planning process to develop a 5-year blue print for the future of the industry – Vision 2020. And in March 2017, NAIA facilitated a Shellfish Strategic

Planning Session to develop an action plan that identifies barriers to growth and, more importantly, the courses of action to eliminate them.

As an industry, we have a well thought out and developed plans for responsible and sustainable growth of aquaculture in this province. We are confident that we can and will grow our production, as well as contribute substantially to the economic benefits, such as jobs in rural coastal communities and for service sectors in major centres.

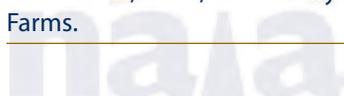
On May 9th, Premier Dwight Ball and Steve Crocker, the Minister of Fisheries and Land Resources, with representatives of the aquaculture and agriculture industries, announced a Cabinet Committee aimed at creating jobs with a focus on food sustainability and fish farming. NAIA and industry stakeholders, in conjunction with decision makers from a variety of regulatory provincial and federal departments as well as academic institutions, have joined forces to form an Aquaculture Steering Committee to put into action items identified in the strategic plans of the aquaculture industry.

As President of NAIA, and with guidance from our Board and members, we anticipate that this industry-led Aquaculture Steering Committee will prove effective in reviewing the suggested courses of action for growth of both the finfish and shellfish sectors of our industry.

I look forward to the summer months ahead (after the ice is truly gone), as we increase our ‘farming of the sea’ activities and as a leader in the aquaculture industry of NL. Meanwhile, we are finalizing our plans for NAIA’s Cold Harvest 2017 conference being held in Gander in September, with its theme of “Aquaculture: An Ocean of Potential”; we hope that you will join us. At the same time, NAIA and government will continue to develop and implement plans to grow the aquaculture industry. We should be very proud of our accomplishments in the past and are confident of a bright future. ✨



Dave Lewis, DFLR, Laura Halfyard and Job Halfyard, Sunrise Fish Farms.





GRAND BANK DEVELOPMENT CORPORATION



The Town of Grand Bank is strategically located to service the aquaculture sector in the Coast of Bays & Placentia Bay

OUR MISSION

To diversify the economy of the Town of Grand Bank through the attraction of new investment and businesses, expansion of existing operations and encouraging export development by offering programs and services that are client driven.

Contact us to learn of our financial and non-financial incentives along with our suite of service offerings.

Conrad Collier, Economic Development Officer
Grand Bank Development Corporation

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DID YOU KNOW?

In Newfoundland and Labrador, the blue mussel is the main commercial shellfish aquaculture species. Production volume for shellfish in 2016 was 3,211 tonnes, representing a 2.6 per cent change over 2015. Market value was up 5.6 per cent to \$13.6 million.

Source: Seafood Industry Year in Review 2016, NL Fisheries and Land Resources





Message from Mark Lane, Executive Director



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

Through dedication and determination, hard-working Newfoundlanders and Labradorians have achieved the highest levels of production of premium farmed seafood in our province's history. In 2016, the Newfoundland and Labrador aquaculture industry exceeded all previous production volumes and market values in our history. Total aquaculture production in 2016 was 28,622 tonnes, representing a 25.5 per cent increase the previous year.

Total market value for the industry reached a record high in 2016; totaling \$276 million, compared to \$161 million in 2015. The rise in market value was primarily due to increased Atlantic salmon production, stronger market prices, and favourable exchange rates.

As responsible farmers of the sea, we are proud that our industry is now worth more than quarter of a BILLION dollars; contributing significantly to the economy of this province and the country, creating jobs and revitalizing rural coastal communities.

The world is watching our industry's progress and looking forward to our potential in the future. We have great potential to grow in a responsible and sustainable manner.

The Government of Newfoundland and Labrador, through their The Way Forward document has identified aquaculture as a strategic growth sector. The Government of Canada, through the Atlantic Growth Strategy, has two departments/agencies both supporting the growth of the industry, which is very encouraging.

Most recently the Premier of Newfoundland and Labrador, Honourable Dwight Ball announced his Cabinet Committee on Jobs. Aquaculture and agriculture were the first two strategic sector working groups announced. In sharing our plan for responsible and sustainable growth in the finfish and shellfish sectors, having high level engagement with the Premier and his Cabinet Ministers responsible for the departments that regulate our industry is critical.

As a result of our potential and our "Open for Business for Aquaculture Attitude" in this province we are attracting the attention of businesses and investors worldwide. It certainly is exciting and energizing to be working each day in a growing industry with people dedicated to the craft and the cause of producing

and providing the world with premium farmed seafood.

This edition of the Cold Harvester is jam-packed with a tonne of positive news articles and initiatives.

NAIA, its staff and volunteer Board of Directors work hard each and every day for our members. It's you, our members, the farmers of the sea, those who provide supplies and services to our industry and the communities in which we operate that enabled 2016 to be a record year. Congratulations to all of you! Job well done!

Remember we are here to support you and your efforts as our members. I encourage all of you to engage my staff and I to share ideas, identify opportunities and most importantly implement course of actions to achieve our corporate and industry goals and objectives. ✨

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Aquaculture Managers Complete Certificate in Aquaculture Management

Aquaculture managers and staff in the Coast of Bays had an extremely busy spring fulfilling their normal every day duties while also taking part in the newly designed Certificate in Aquaculture Management (CAM).

With funding assistance from the Atlantic Canada Opportunities Agency (ACOA), and the provincial Department of Tourism, Culture, Industry and Innovation (TCII), CAM workshops were offered by the Fisheries and Marine Institute (MI).

Over a period of four months, staff from Northern Harvest Sea Farms, Cold Ocean Salmon and Sunrise Fish Farms travelled to the communities of Hermitage, Pools Cove and Harbour Breton to participate in nine three-day workshops. Overall, 89 seats were filled and 18 aquaculture managers will receive the Certificate in Aquaculture Management.

This 12-day program (3 days per course) consists of two required courses and two elective courses that could be selected from six possible options. Courses span a wide range of aquaculture management skills and include topics as diverse as human resources, project management, farm management, communications, regulations and policy, as well as computer skills. All courses were developed from the national occupational standard validated by the Canadian Agricultural Human Resource Council (CAHRC) and the Canadian aquaculture industry. ✨



Thirteen students from Northern Harvest Sea Farms, Cooke Aquaculture and Sunrise Fish Farms took part in the External Communications for the Farm Manager workshop that was held in Hermitage, NL. Photo Courtesy Cyr Couturier, Marine Institute



Executive Council May 9, 2017

Unprecedented Partnerships with Industry to Drive Jobs and Growth in Newfoundland and Labrador



Industries with growth potential will now work with ministers across government to address development needs via a new Cabinet Committee on Jobs. The Honourable Dwight Ball, Premier of Newfoundland and Labrador, established the committee, which will engage industry in joint decision making aimed at stimulating new business activity and creating new private sector jobs for residents throughout the province.

The committee comprises:

- the Premier;
- the Minister of Finance;
- the Minister of Advanced Education, Skills, and Labour;
- the Minister of Fisheries and Land Resources;
- the Minister of Health and Community Services;
- the Minister of Municipal Affairs and Environment;
- the Minister of Natural Resources; and
- the Minister of Tourism, Culture, Industry and Innovation.

In keeping with the Provincial Government's commitment to foster an environment where business can excel, government will pursue new actions in collaboration with industry. These actions will address opportunities and challenges specific to those sectors, and achieve the economic targets outlined in The Way Forward. Government and sector decision-makers will jointly launch these actions at "industry summits." The first two industries government will partner with will be agriculture

and aquaculture, with other industries to follow. Indigenous governments and organizations, and groups advancing diversity and inclusion will be provided opportunity to engage in the development of work plans.

The Cabinet Committee on Jobs is one of a number of economic initiatives included in The Way Forward vision. Achieving the targets outlined in the vision will support approximately 14,000 person years of employment annually in the province.

"Creating jobs for Newfoundlanders and Labradorians is key to improving our economy and achieving our vision of a stronger province. Through this committee, we will pursue opportunities and remove barriers in partnership with industry, and foster the economic activity we need to make our province an ideal place to live, work, and raise a family."

~Honourable Dwight Ball, Premier of Newfoundland and Labrador

"Each job within the provincial aquaculture industry supports the creation of more than three additional employment opportunities elsewhere in processing, transportation, service and supply – making our industry an ideal economic driver for rural coastal communities, and the province as a whole. We look forward to partnering with the Provincial Government to realize the full potential of our industry through sustainable, responsible development, and we appreciate this increased level of industry engagement."

~Mark Lane, Executive Director of the Newfoundland Aquaculture Industry Association

"Food First NL applauds efforts to increase food production in this province that will create a vibrant local food economy and reduce our reliance on outside food sources. These critical steps will help to build a stronger food system and improve access to and availability of healthy food for communities across Newfoundland and Labrador."

~Kristie Jameson, Executive Director of Food First NL

Learn More: The Way Forward - thewayforward.gov.nl.ca ✨

NAIA Events



The Restaurant Association of Newfoundland and Labrador (RANL) held their 10th Annual Savour

Food and Wine Show at the Delta Hotel in St. Johns, NL on Tuesday April 4th. Forty-two food and beverage and twelve lifestyle exhibitors provided an opportunity for 450 guests to visit and enjoy many delicious dishes and beverages from Newfoundland and Labrador Chefs, restaurants and wine and beverage business owners.

NAIA sponsored the event and was on hand to greet the many guests who visited the NAIA booth. Also, prior to the opening, VIPs in attendance were given special privileges to view an on-stage master class cooking demonstration by Chef Watson who prepared Thai Chili Mussels. (See Cooking with Chef Watson for the recipe on page 21) ✨



Photo courtesy of Restaurant Association of NL



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INGREDIENTS

Creating a sustainable base for feed

- Responsible sourcing
- Sustainable partnerships



OPERATIONS

Ensuring our own house is in order

- Reducing environmental impact in our operations
- Improving our own working environment



COMMITMENT

Involving people in the challenge of 'Feeding the Future'

- Employee engagement
- Stakeholder engagement
- Community development



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Seafood Expo North America 2017 A Success



L to R: Honourable Steve Crocker, Fisheries and Land Resources, Honourable Dwight Ball, Government of Newfoundland and Labrador, Mark Lane, Newfoundland Aquaculture Industry Association, Valerie Johnson, Seaward Farms, Lori Kennedy, ACOA, Chef Watson, Agropur, and Roberta Collier, Newfoundland Aquaculture Industry Association.

Seafood Expo and Seafood Processing North America was held at the Boston Convention and Exhibition Center in Boston, MA March 19 - 21. With 1348 exhibitors, this show was their largest in the event's history with the highest attendance to-date and attendees from approximately 53 countries presenting their seafood products, services or processing equipment.

“Our participation at Seafood Expo North America provided a strategic opportunity to meet many influential seafood industry stakeholders to discuss new growth opportunities for locally produced seafood products. With a record production value of \$1.4 billion in 2016 it is clear the investments we are making in the fishing sector are supporting our communities. This government’s ongoing investment in the fishing and aquaculture sectors is also consistent with our commitment to transition to a groundfishery and grow the aquaculture sector.”

~ Honourable Dwight Ball, Premier of Newfoundland and Labrador

“Seafood Expo North America proved to be a positive experience for the Newfoundland and Labrador delegation attending this year as our province took this opportunity to promote growth opportunities for our fishery to international buyers. Record growth in our aquaculture sector and our commitment to grow the groundfish sector are expected to attract new interest in our fisheries. The recently announced Atlantic Fisheries Fund will provide the support required to ensure we can effectively grow our seafood industry and support our communities into the future.”

~ Honourable Steve Crocker, Minister of Fisheries and Land Resources

This event provides NAIA and its members with a great opportunity to network and do business, while exhibitors offer their latest seafood products, processing and packaging equipment available in the seafood market.

NAIA and its members exhibited within the Atlantic Canada pavilion which housed 30 other exhibitors.

Members in attendance this year included Badger Bay Mussel Farms, Northern Harvest Sea Farms, Cooke Aquaculture, Green Seafoods, Atlantic Pacific Trading, Marine Institute of Memorial University of NL, Seaward Farms, and Grand Bank Development Corporation.

“Having achieved a record-breaking year in terms of overall production and total market value of farmed seafood, Newfoundland and Labrador is now positioned as a significant player in the production of premium farmed seafood in Canada. Seafood Expo North America is one of the world’s premier tradeshows that enables our producers and processors to connect face-to-face with key buyers, brokers and distributors, ultimately increasing exports to the United States and other key target markets around the world.”

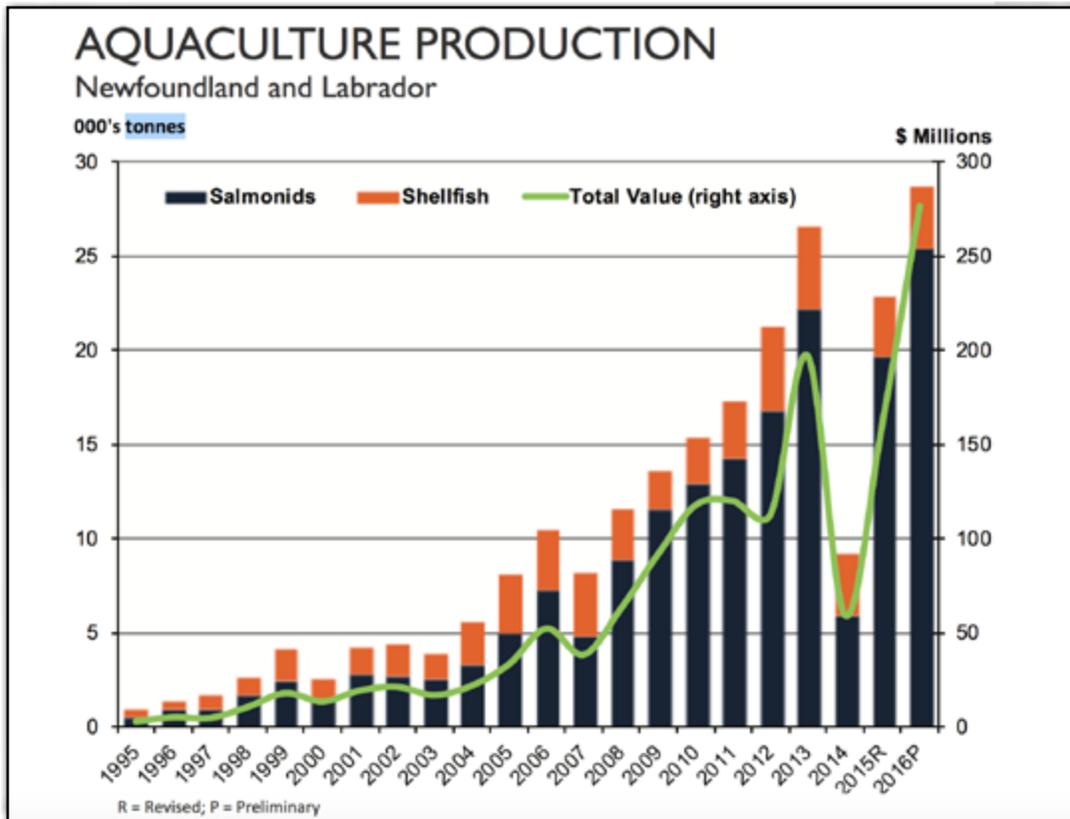
~ Mark Lane, Executive Director, Newfoundland Aquaculture Industry Association ✨



Juan Roberts of Badger Bay Mussel Farms with Chef Watson at the Seafood Show.



Industry Surpasses Quarter of a Billion Dollars



Association. “As responsible farmers of the sea, we are proud that our industry is now worth more than \$275 MILLION; contributing significantly to the economy of this province and the country, creating jobs and revitalizing rural coastal communities.”

Market prices for fresh, live mussels remained relatively stable in 2016, with some minor fluctuations due to exchange rates.

SALMONIDS

Atlantic salmon is the major commercial salmonid species in the province. A limited amount of steelhead trout is also produced. In 2016, there were 88 commercial salmonid

In 2016, the Newfoundland and Labrador aquaculture industry exceeded all previous production volumes and market values. Total aquaculture production in 2016 was 28,622 tonnes, representing a 25.5 per cent increase the previous year. The growth was primarily a result of increased Atlantic salmon production.

Total market value for the industry reached a record high in 2016; totaling \$276 million, compared to \$161 million in 2015. The rise in market value was primarily due to increased Atlantic salmon production, stronger market prices, and favourable exchange rates.

“Through dedication and determination, hard-working Newfoundlanders and Labradorians have achieved the highest levels of production of premium farmed seafood in our province’s history”, said Mark Lane, Executive Director of the Newfoundland and Labrador Aquaculture Industry

site licences, covering a combined area of 2,500 hectares.

In 2016, salmonid production increased significantly to 25,411 tonnes, valued at \$263 million. This represents a 29.1 per cent increase in production volume and a 76.9 per cent rise in market value compared to 2015.

SHELLFISH

In Newfoundland and Labrador, the blue mussel is the main commercial shellfish aquaculture species. Shellfish production in 2016 was on par with the previous year; however, the production value rose slightly as a result of favourable exchange rates. Production volume for shellfish was 3,211 tonnes, representing a 2.6 per cent change over 2015. Market value was up 5.6 per cent to \$13.6 million.

In 2016, there were 53 commercial shellfish site licences that covered a combined area of 4,403 hectares. ✨



Please join us in welcoming new NAIA members!



BioMaxx
Christopher Haley

Chris@BioMaxx.ca
www.biomaxx.ca



Steele Hotels
Garry Stamp

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www.steelehotels.com



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Training Works
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Marine Harvest

www.marineharvest.com



Battlefield Rental
Aaron Legault

Arron.Legault@toromont.com
www.battlefeldequipment.ca

INTERESTED IN BECOMING A MEMBER OF NAIA?

Contact Roberta Collier at 709-538-3454 (Bus.), 709-538-7080 (Cel.), or Email: roberta@naia.ca. ✨

TOWN OF ST. ALBAN'S

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naia
**MEMBER
PROFILE**



Marine Harvest

www.marineharvest.ca



With roots dating back to 1964, Marine Harvest is now one of the largest seafood companies in the world, and the world's largest producer of Atlantic salmon. The company employs over 12,000 people in 24 countries. In 2016, Marine Harvest had a revenue of 3.5 billion (EUR) and harvested 380,000 tonnes of salmon.

Marine Harvest supplies farm-raised salmon and processed seafood to more than 70 markets worldwide.

In its 2016 annual report, the company highlights its focus on meeting the needs of a growing market for healthy seafood by taking the lead in all key areas. By integrating the entire value chain, Marine Harvest controls its products from feed to fork, enabling it to proactively address challenges related to sustainable feed, farming and value-added processing.

Over 6 million meals of seafood from Marine Harvest are enjoyed around the world every day. The company offers a wide selection of fresh or frozen, primary or secondary processed products – much of it tailored to specific markets. Around the world there are a number of well-recognised brands that are produced by Marine Harvest including Rebel Fish, Sterling, Supreme Salmon, Ducktrap River, Donegal Silver, and Admiral's.

Marine Harvest is a part of the Global Salmon Initiative (GSI) – a group that includes 70 per cent of the global farmed salmon producers. The group is committed to greater industry cooperation and transparency in order to achieve significant and continuous progress in the sustainability of aquaculture. The initiative aims to make significant strides in providing a sustainable source

of protein (farm-raised salmon) to feed a growing population.

With an increasing consumer focus on food sustainability, Marine Harvest has been a leader in implementing key product certifications.

“In terms of sustainability, our ambition is to have all our farming operations Aquaculture Stewardship Council certified by 2020,” says Alf-Helge Aarskog, Marine Harvest CEO. “By the close of 2016, we had 25% accredited. ASC certification means that we must adhere to strict operational requirements which we believe contribute to transformational change.”

“At Marine Harvest, we have a bold vision of continuous transformation in fish-feed production, farming, processing, product development, and sales and marketing, all of which are essential for continuous growth in this rapidly developing industry. We call it ‘Leading the Blue Revolution.’”

In Canada, Marine Harvest is four-star certified to the Global Aquaculture Alliance Best Aquaculture Practices, and Marine Harvest Canada was the first company in North America to have a salmon farm certified to the Aquaculture Stewardship Council's salmon standard.

In British Columbia, the company operates 30 salmon farms that produce about 45,000 tonnes of farm-raised salmon annually (including its Sterling brand) and employs about 530 people. ✨



**Marine Harvest's Phillips Arm
salmon farm, British Columbia**



MEMBER PROFILE



Fab-Tech Industries Inc.

198 Station Road, Glovertown, NL, A0G 2L0

P: (709) 533-2375 E: sales@fab-tech.ca

www.fab-tech.ca

Fab-Tech Industries Inc. has been in the metal fabrication business since 1980. Our product line has grown to include Silver Dolphin fully welded aluminum boats, processing equipment as well as production and harvesting barges. We maintain a dedicated staff of 13 employees and operate year round out of a 10,000 sq. ft. production facility.

Since 1981 Fab-Tech has manufactured over 1600 Silver Dolphin welded aluminum boats ranging from 12'-35'. These boats are currently used by Recreational and Commercial customers from Newfoundland & Labrador to Nunavut!

Fab-Tech has worked with the Aquaculture Industry to provide innovative solutions for this growing sector. Fabricated using marine grade material our Aquafeeder food pellet distribution hoppers are designed to give fish growers the most effective means of delivering feed to their stock without feed

breakage and dusting. Our Mussel De-Clumper/Grader maintains production capacity of 3-4 tons of mussels per hour with excellent grades obtained and less than 1% broken shell. This equipment is custom designed with safety, productivity and ease of operation in mind. Fab-Tech also offer Conveyor Systems as well as Harvesting & Production Barges tailored to Aquaculture Processing.

Our clients include recreational boaters, marine dealers, commercial fisher people, provincial and federal government departments as well as private and publically owned enterprises.

Our goal is to produce high quality products. We achieve this by valuing our customer's requirements with a commitment of excellence. ✨



Industry Embraces Stringent Regulations

Representing nearly 100 local companies from all points of the provincial compass, the Newfoundland and Labrador Aquaculture Industry Association’s (NAIA) mandate is to promote excellence in the aquaculture industry in our province.

Our industry and its members, comply with and exceed in many instances, stringent provincial and federal regulations. In addition to governmental regulations, our seafood producing members voluntarily achieve third party certifications at an international recognized standard such as Best Aquaculture Practices (BAP) and Canadian Organic Aquaculture Standard certification. Our members undergo internal and external audits regularly on every aspect of their operations from egg to plate.

“As an industry, we regularly engage in respectful dialogue with the communities and stakeholders where we operate. In everything we do, as responsible farmers of the sea, we aim to

be: a strongly regulated industry that has a low impact on the environment, a good-paying year-round employer; a healthy and affordable food provider; and maintain a conservative approach to seafood harvesting “, said Mark Lane, NAIA Executive Director.

Lane continued, “I always encourage stakeholders to engage industry; those of us who work in the business of farming seafood day-to-day, in meaningful dialogue to discuss our farming operations; including potential improvements to regulatory frameworks”.

In 2016, the Newfoundland and Labrador aquaculture industry has surpassed \$276 MILLION in total market value, producing more than 28,000 MT of premium seafood and creating 1000s of employment opportunities in rural coastal communities. ✨

International Salmon Farmers Association

The International Salmon Farmers Association (ISFA) is an umbrella organization comprised of national and



(L-R) Cyr Couturier, CAIA; Mark Lane, NAIA, Jennifer Wiper, Cooke Aquaculture; Nell Halse, Cooke Aquaculture; Scott Landsburgh, Scottish Salmon Producers; Trond Davidsen, Norwegian Seafood Federation; Jon Arne Grottum, The Norwegian Seafood Federation; Einar Gudfinsson, Ruth Salmon, CAIA; Sebastian Belle, Maine Aquaculture US; Susan Farquharson, ACFFA. Photo credit Kathy Kaufield.

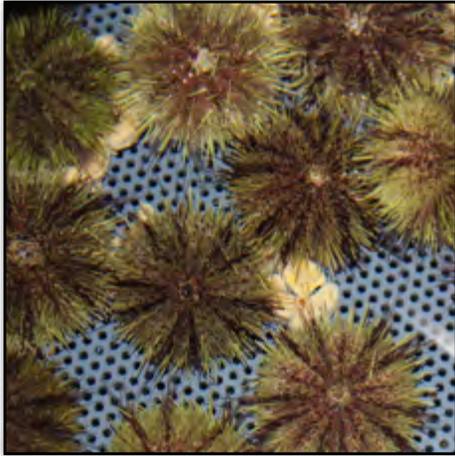
regional associations from around the world. ISFA members share a common vision and dedication to helping our farmers and industry professionals produce healthy food, revitalize coastal communities and build vibrant businesses.

The farmers and industry professionals we represent produce healthy food in an economically, socially and environmentally sustainable manner. They create work in remote areas of the world and strive to be a forward looking industry, learning through research and innovation.

The ISFA is led by an Executive Committee with Trond Davidsen of Norway as President. The group held their AGM and semi-annual meeting in Boston leading up to the 2017 Seafood Expo North America. The Association’s next meeting will be held in August in Trondheim, Norway prior to AquaNor. For more information visit: <http://www.salmon-farming.org> ✨

New Opportunity to Turn Green Sea Urchins into a Sustainable Socioeconomic Benefit for Newfoundland and Labrador

By: Patrick Gagnon and Danny Boyce



Green sea urchins feeding on C-shaped pellets of the revolutionary feed in the first stage of the research at Dr. Joe Brown Aquatic Research Building (JBARB) of MUN. (Photo: Samantha Trueman)

Despite the world economic crisis, the aquaculture sector in Newfoundland and Labrador (NL) has generally grown steadily since 2003, with a production focussed on blue mussel, Atlantic salmon, and Steelhead trout. The Province's aquaculture industry is eager to explore opportunities to diversify the range of seafood products it produces and distributes on regional, national, and international markets. With densities of up to 300 individuals m², the green sea urchin, *Strongylocentrotus droebachiensis*, is the dominant macroinvertebrate in shallow rocky habitats along the extensive coast of NL. A green sea urchin fishery entirely dependent on wild harvest (manual collection) developed in NL during the 1990s. However, success was, and still is, limited mainly because of highly variable gonad or "roe" (the urchin's organ marketed for human consumption) yields of

undernourished urchins collected from barren grounds and sent directly to markets. Novel approaches to consistent roe production from green sea urchins harvested in natural habitats are required to unleash the high potential for a wealthy urchin aquaculture industry.

Dr. Pat Gagnon of the Department of Ocean Sciences of MUN is working with local and international industry partners on a new approach to consistent roe production, with the hope of creating an urchin farming industry in the province. This feed is known for the quick production of large volumes of high-quality roe in other parts of the world. The global right holder for the feed is Kaston International AS, a Norwegian company founded by Mr. Brian Tsuyoshi Takeda and operating under the venture name Urchinomics. The feed, which is currently in its 10th iteration, is the fruit of over 20 years of research conducted by Nofima, a Norwegian state owned research institute. Urchinomics, in partnership with Mitsubishi, has since further formulated it into the exact composition that would make urchin gonads the right colour, taste, and texture preferred by Asian markets. Variations of this feed have been tested on a variety of species in Japan, British Columbia, and California. However, no previous trials were in environments like Newfoundland and Labrador's cold water systems.

In December 2016, Mr. Takeda, Dr. Gagnon, Mr. Danny Boyce of MUN, and Mr. Darrell Green of NAIA co-organized a first series of meetings in St. John's to present their ideas to provincial, government,

and industry partners and stakeholders. Representatives from various provincial and federal research funding agencies, including the Natural Sciences and Engineering Research Council of Canada (NSERC) and the Research Development Corporation of Newfoundland and Labrador (RDC), were also present. Following these meetings, Dr. Gagnon and Mr. Mark Sheppard of Green Seafoods Ltd. put together an NSERC Engage proposal, which funds new research collaborations with industrial partners that applies a researcher's expertise to address a company challenge. In February 2017, the new partners received word that NSERC will be supporting the proposed research. With this funding, they are currently exploring, in the Dr. Joe Brown Aquatic Research Building (JBARB) at the Ocean Science Centre in Logy Bay, a variety of questions relating to land-based production of urchin roe with the feed.

Specifically, the project examines in controlled laboratory conditions how water temperature affects urchin health and survival, roe quantity and quality, and feed assimilation efficiency as a first step to determining if the feed can support steady commercial roe production in NL. Urchins at two different stages of their life cycle (before and after natural spawning) are examined to help identify best practices. Information generated from this industry collaboration will be used by Green Seafoods Ltd. to examine the possibility of adding urchin roe to its production line to offer a competitive product on international markets when needed.



An experimental setup at the JBARB is being used by research assistants David Bélanger and Samantha Trueman to investigate feed performance on green sea urchins from Southeastern NL as part of a new NSERC Engage research partnership between Dr. Gagnon and Green Seafoods Ltd. of Winterton, NL. (Photo: Anne Provencher St-Pierre)

The first stage of the research, consisting in a 4-week experiment, concluded in mid-March with quite encouraging results. The final stage of the research, which began a few weeks ago, should wrap up at the end of June 2017 with

formal assessment of roe quantity and quality by a taste panel and biochemical analysis.

The idea is that with the feed bringing urchin roe to a sufficient quality and quantity for market in only 12 weeks, and

using minimal infrastructure, this kind of farming can be done year-round or as needed to fill gaps in a seafood producer's schedule. The growing consortium met again in St. John's in March 2017 and is now talking to other industry partners, including Dr. Laura Halfyard of Sunrise Fish Farms. It is seeking additional funding from various provincial and federal programs to address further questions relating to both land- and field-based production of urchin roe, environmental sustainability, and socio-economic development opportunities for the province. Dr. Gagnon and his collaborators are looking forward to begin studying the environmental impacts of semi-commercial, field-based trials in southeastern Newfoundland, hopefully within the next year. One of the group's top priorities will be to ensure there is a sustainable balance between creating jobs and money for the province, and preserving the ecological integrity of the systems from which urchins are collected for farming. ✨

About the Authors



Dr. Pat Gagnon is an associate professor of marine biology and ecology at the Department of Ocean Sciences of Memorial University of Newfoundland. He teaches a wide range of topics, including invertebrate biology, biological oceanography, adaptations of marine organisms, and scientific diving. He runs the Cold Ocean Benthic Ecology Lab (COBEL) and has more than 20 years of experience researching various aspects of the biology and ecology of marine benthic invertebrates and seaweeds, including green sea urchin and kelps. He is the lead scientist for the growing urchin farming consortium in Newfoundland and Labrador. More information about his research can be found at <http://www.ucs.mun.ca/~pgagnon/> ✨

Mr. Danny Boyce is the Facilities and Business Manager of the Dr. Joe Brown Aquatic Research Building (JBARB) at Memorial University. His current responsibilities include the day-to-day management of all aspects of the JBARB including policy and project management, proposal writing, contract negotiations with industry partners and cash flow. He has 25 years of experience in Fisheries and Aquaculture. He has been active in various fish hatcheries, on commercial cage sites, plus has been responsible for overseeing numerous research and development projects. He is also an active Director on Newfoundland Aquaculture Industry Association's Board (NAIA) currently sitting as Treasurer. He also plays an advisory and technical role to various other projects. ✨



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Provincial Government Announces Funding for Regional Aquaculture Centre in the Coast of Bays Region

A new Regional Aquaculture Centre is being developed in the Coast of Bays region by the Fisheries and Marine Institute of Memorial University. This new centre will further Marine Institute's efforts to facilitate the growth of the fisheries and marine sectors through education, training, applied research and development, and technology transfer.

The Honourable Steve Crocker, Minister of Fisheries and Land Resources, announced \$131,500 in funding on behalf of the Honourable Christopher Mitchelmore, Minister of Tourism, Culture, Industry and Innovation, to assist the Marine Institute in the development of the new centre. The Department of Fisheries and Land Resources has also provided \$25,000 for the development of the new centre.

This Regional Aquaculture Centre will direct its activities around labour market research with industry, to help identify and develop training programs for the aquaculture industry.

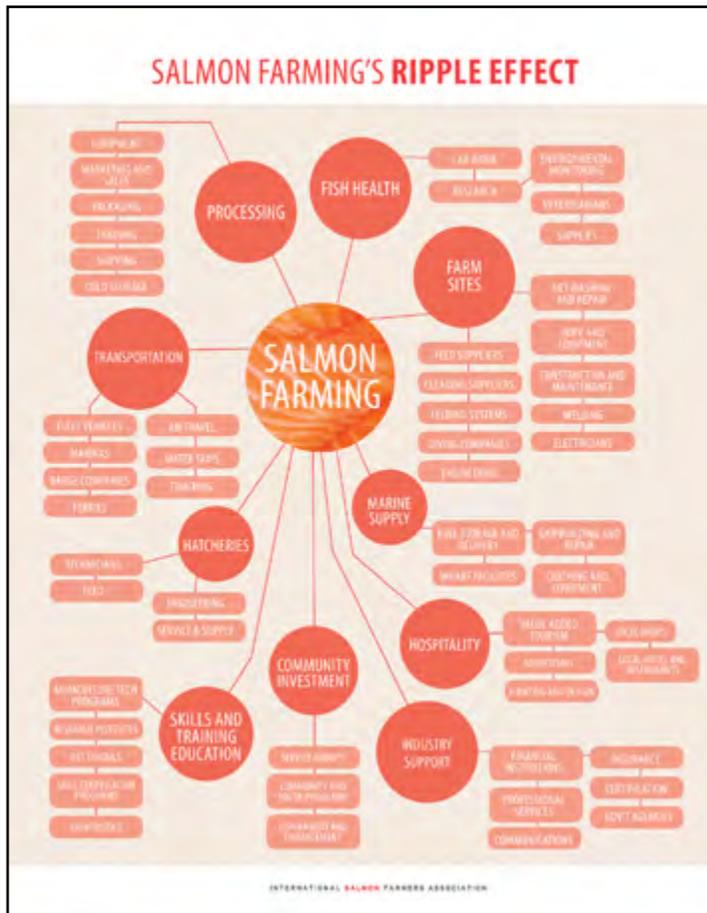
"Today's investment to establish a Regional Aquaculture Centre in the Coast of Bays region plays a key role in the development

of the aquaculture industry, and also supports our government's commitment to diversify the economy and advance business innovation as outlined in The Way Forward. Our government continues to support aquaculture to ensure this industry is developed in a sustainable and environmentally responsible manner, and this investment will be significant in helping us achieve these goals."

~Honourable Christopher Mitchelmore, Minister of Tourism, Culture, Industry and Innovation

"Having a physical presence in the Coast of Bays region will enable Marine Institute to have greater access to aquaculture stakeholders in rural areas. In The Way Forward we have committed to growing our salmon aquaculture industry to 50,000 tonnes per year and this announcement will help us achieve this goal in addition to allowing for easier collaboration and the ability to work with stakeholders to define important issues, as well as an ability to implement solutions."

~Honourable Steve Crocker, Minister of Fisheries and Land Resources ✨



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- Community Based Education Unit
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Aquaculture Professional Profile

Pamela Willcott

Human Resources/Payroll Coordinator

Northern Harvest Sea Farms / Northern Harvest Smolt

St. Albans, NL

Please give us a few examples of your day-to-day work activities.

Working in human resources, some of my day to day activities include processing payroll for Northern Harvest Sea Farms and Northern Harvest Smolt, maintaining employee records, responding to employee inquiries, assisting with new employee recruitment, selection and orientation as well as creating/administering HR policies and procedures.

Has your work experience assisted you in this career path?

My previous work experience included working with various computer programs and working with the public. This has been a huge help in my current position as I am able to deal effectively with questions or concerns that arise with employees. It also enabled me to grasp our payroll and accounting software fairly quickly.

What attracted you to your current job? (Were there many opportunities?)

I was first attracted to a temporary position that became available with Northern Harvest Sea Farms because of my desire to learn and gain skills in the ever-growing aquaculture industry that was right here in my backyard in the Town of St. Alban's. I quickly found out that there is plenty of room to advance my career from within as I now have a permanent, full time position that I thoroughly enjoy!

Which benefits do you appreciate most?

Being able to live and work in my hometown is a huge benefit of this job. My husband and I can raise our children here in rural Newfoundland like we've always hoped to do. And I'm even able to go home for lunch every day, how great is that!

What is your favorite thing about your job?

My favorite thing about my job is working with the excellent team here at Northern Harvest. I'm definitely a "people person" and I very much enjoy the day to day interactions that come with this position.



What advice would you give to people considering job opportunities in aquaculture?

My advice to those who may be considering employment in the aquaculture industry would be to definitely go for it. With the many opportunities to advance, anyone with a good work ethic can make a very comfortable living right here at home! ✨

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Cooking with Chef Steve Watson - Central Dairies

Thai Chili Blue Mussels

Ingredients:

- 750g fresh NL organic mussels
- 1 tbsp. ground nut oil
- 100g ready diced onions
- 40g Thai taste red chilli paste
- Handful of fresh coriander stalks finely chopped
- 165ml coconut milk
- Juice of 1 lime
- 1 red chilli, deseeded and sliced into strips
- Crusty bread to serve

Directions:

Rinse the fresh mussels in cold water. Discard any cracked or open mussels that don't close when tapped with the back of a knife. Heat the oil in a large skillet over a medium heat and fry the onions for 5 minutes until softened. Add the Thai chilli paste and coriander stalks and fry for a further minute. Pour in the coconut milk and simmer gently for 2 minutes. Add the mussels to the skillet and gently mix in the coconut milk. Cover and cook for 2-4 minutes until all the shells have opened (discard any closed ones). Remove the lid, squeeze over the lime juice, then scatter over the coriander leaves and chilli. ✨



www.naia.ca
www.bluemussels.com

Chef 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 is currently a Territory Sales Manager and Executive Chef with Agropur. He's also a devoted family man, a dedicated employee, and a prominent member of the local community. Steve epitomizes the definition of a volunteer, and spends countless hours giving back to the people of a province he now calls home.

Look forward to **A Taste of the Atlantic with Chef Watson during Cold Harvest 2017 in Gander, NL Sept 27th!** ✨



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Successful Conclusion to the NAIA Ensiling Demonstration Project

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.



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



The first addition of material to an ensiler in June 2016.

On December 31, 2016, NAIA concluded the Ensiling Demonstration Project for the salmonid sector. The main goal of the project was to examine the potential of the use of silage as a bio secure industry practice which inactivates pathogenic organisms and stabilizes organic constituents of fish mortalities for further use. Furthermore, the project aimed to encourage the development of silage utilization and silage-handling infrastructure within the province.

Ensiling is a well-established process used for the preservation of protein and oils in farmed and wild fish by-products and is a common method for the intermediate storage of salmon farm mortalities. Ensiling salmon mortalities is a proven practice in other salmon farming jurisdictions with the material being used for agricultural feed-stuffs for animals such as hogs and for fur production.

The most important consideration in adopting the industry-wide use of ensiling is that of biosecurity. Ensiling rapidly inactivates pathogenic bacteria and viruses and is common practice in areas such as Norway and Scotland as a bio secure method of handling mortality.

To produce silage the fish material is macerated and preserved in acid at a pH of 4.5 or lower. Typical farm-based systems consist of a 1000 or 2000 liter container with a macerator and an acid

dosing system. As part of our project, ensilers and associated equipment were trialed by our partners Cold Ocean Salmon Inc. and Northern Harvest Sea Farms Ltd. The ensilers used in the trial were 2m³ 'Supermort' ensilers from NorFab Equipment in Scotland. The trial produced approximately 46,500 L of silage. New World Dairy, of St. David's, NL, participated in this project by receiving the silage for inclusion in their anaerobic digester.

Overall the project met our expectations in terms of proving that ensiling can work with the current salmonid farming operations in Newfoundland and Labrador. It proved that salmon carcass silage can be utilized efficiently through an anaerobic digester, such as operated at dairy farming operations. Overall costs of production of silage during this project were found to be in line with information we had obtained from salmon farming operations in other countries. But the project showed that further study and analysis is needed with respect to operational factors, cost factors, climatic factors (winter temperatures) and



Intermediate Bulk Containers (IBCs) were used for transportation of silage.

human resource factors. More work is needed before we know how to optimize this practice for implementation on salmonid farming sites in Newfoundland and Labrador.

The Newfoundland and Labrador Aquaculture Industry Association would like to thank partner companies Cold Ocean Salmon Inc., Northern Harvest Sea Farms NL Ltd. and New World Dairy Inc. for their participation and significant in-kind contributions to this project. We would also like to acknowledge

early project partners Nova Fish Farms Inc. and Gray Aqua Group Ltd. for their involvement to the project.

Financial assistance for this initiative was provided by our industry partner companies as well as Research and Development Corporation, Atlantic Canada Opportunities Agency, NL Dept. Fisheries and Land Resources, NL Department of Tourism, Culture, Industry and Innovation. ✨

News Release: Advanced Education, Skills and Labour Fisheries and Land Resources

May 26, 2017

Minister Byrne Announces Funding for the Newfoundland Aquaculture Industry Association

The Honourable Gerry Byrne, Minister of Advanced Education, Skills and Labour, was at Northern Harvest Smolt Ltd. in Stephenville today to announce \$396,551 under the Labour Market Partnership Program for the Newfoundland Aquaculture Industry Association to assist in the development of a human resource plan for the aquaculture industry in our province.

The Labour Market Partnership Program is used to encourage, support and facilitate labour force adjustments and human resource planning activities.

Newfoundland and Labrador's aquaculture industry is helping meet the growing global demand for healthy and sustainable seafood. The total value of aquaculture production in 2016 was \$276 million, up an impressive 25.5 per cent from the previous year.

In *The Way Forward: A Vision for Sustainability and Growth* in Newfoundland and Labrador, the Provincial Government committed to growing the aquaculture industry by doubling salmon production and more than doubling mussel production. Another *Way Forward* initiative, the Cabinet Committee on Jobs, is partnering with the aquaculture industry to stimulate new business activity and foster private sector jobs, including in rural and remote areas.

"Aquaculture in our province is a growing industry, providing economic opportunities for residents in rural parts of Newfoundland and Labrador. With today's strategic investment, we are collaborating with our stakeholders to strengthen human resource capacity in the industry."

Honourable Gerry Byrne, Minister of Advanced Education,

Skills and Labour

"Our seafood industry continues to be a substantial contributor to our provincial economy reaching over \$1.4 billion in production value in 2016. The aquaculture industry played a significant role in this record high and has tremendous potential for economic diversification. The Way Forward outlines our plan to grow our lucrative aquaculture sector in this province, and this initiative supports that commitment."

Honourable Steve Crocker, Minister of Fisheries and Land Resources

"Diversifying the economy in rural parts of our province is key to ensuring the long-term viability of our communities. I am pleased to see this investment in the aquaculture industry, which is a growing field capable of providing many jobs and increasing the economic resilience in Newfoundland and Labrador's coastal regions."

John Finn, MHA for Stephenville - Port au Port

"One of the limiting factors to future growth of the aquaculture industry in Newfoundland and Labrador is access to a skilled labour force. Having an aquaculture human resources plan that clearly identifies labour challenges and an Aquaculture Attraction and Retention Strategy that outlines initiatives to overcome those challenges, will be a critical tool to enable farmers of the sea to grow their business; supplying the world with premium farmed seafood."

Mark Lane, Executive Director, Newfoundland Aquaculture Industry Association ✨

Couturier on Culture

Aquaculture Innovation – Innovate or Perish

Cyr Couturier is an aquaculture research 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), AAC (past-president), CAIA (president), RDÉE TNL, CAHRC, etc. He has worked in aquaculture development in over 18 countries. The views expressed herein are his own. Contact: cyr@mi.mun.ca



By: Cyr Couturier

It's Innovation Week in Newfoundland and Labrador as I write this column in May 2017, and there is lots to celebrate in this area for aquaculture. By definition, innovation is the development, creation, origin, adaptation, transformation of a new idea or process or way of doing business, technology, or even marketing. It plays a role in the Research-Development-Commercialization (RDC) continuum, where it is essentially the bridge and feedback loop between all three segments of the continuum.

In today's world, those that don't innovate, perish! This can

be demonstrated by just a couple of quick examples. First, if a company doesn't innovate constantly, its products or services can quickly become obsolete to a customer, or at the least, lose market share against competitors that do innovate. Second, if you don't innovate in the production or process side, your costs of production will increase, relative to others, and this will make you uncompetitive, and eventually close shop. Third, innovation in the market place, in terms of marketing and promotion is critical to maintaining or even increasing market share, as customers can be fairly fickle to your brand.

I will now give you a few examples of technological innovations that are allowing aquaculture and fisheries sectors, in Newfoundland and Labrador to thrive. Of course this will be viewed by some as shameless promotion by the Marine Institute and other units within Memorial University, but hey, why not call a spade, a spade! We do great work in assisting the industry to innovate. Not only that our expertise is recognized nationally and internationally, and we do business on the innovation side for aquaculture and fisheries virtually across the globe.

First, it's well recognized that there is a declining productivity in the fish processing sector in our province, from an aged workforce, outmigration, lack of recruitment to the workforce,

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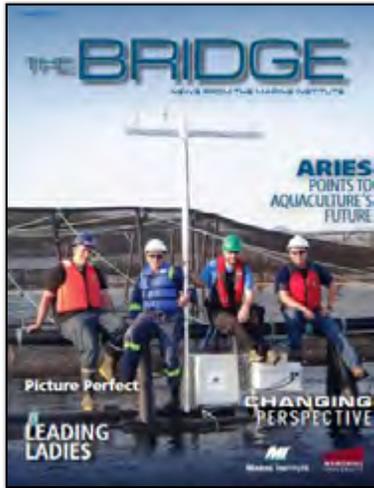
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Marine Institute - Crab Automation Robotics

and lack of raw material for the processors (on the wild side at least). Enter innovative processing technology to automate production in the plant, using robotics and 3-D printed parts, to process crustaceans, crabs in particular. The YouTube video can be viewed here, for those interested: <https://youtu.be/BzQCChIspRk> In this example, the partnership among industry, government and the University's Marine Institute and the College of the North Atlantic is clearly evident and innovative. The aquaculture sector has already started to innovate using robotics etc. for its fish and shellfish plants some time ago, so I won't give examples of this here.

Second, the innovation of taking SmartBay.ca concept to



a real-time aquaculture environmental monitoring system (ARIES) for ocean deployment in harsh conditions, is another example where the Marine Institute is partnering with the aquaculture industry and government to provide innovative solutions for fish farmers to manage their farms in a

more efficient and cost effective manner. Readers can go to the Newfoundland Aquaculture Industry Association's site to get more details (www.naia.ca) or else peruse the pages of past editions of this magazine, the NAIA Cold-Harvester.

Third, we all know that someone's garbage, is another's gold. Value adding and materials utilization is another area the University is assisting the aquaculture industry to innovate. For example, the creation of commercial biodiesel from farmed fish byproducts or the extraction of high value compounds from fish offal is being developed and refined to semi-commercial scales by the marine bioprocessing unit at the Marine Institute.

Finally, colleagues in the Oceans Sciences Department are developing alternative proteins and oils for aquafeeds, new breeding techniques for finfish, and new fish health tools (e.g., Cleaner fish) with industry and / or the Marine Institute. All of these are examples of innovations being developed for the aquaculture sector by Memorial University to serve not only the Newfoundland aquaculture industry, but also by extension their Canadian and international counterparts.

In closing, innovations are essential for any industry or business to thrive, and at the moment, the Newfoundland and Labrador aquaculture industry is thriving and will look to grow to meet the insatiable demand for healthy, environmentally and socially responsible seafood. ✨

Otto Reginald Whelan

January 15, 1954 – April 20, 2017, Pilley's Island, NL

Otto Reginald Whelan of the Sunrise Fish Farms family recently passed away recently at the age of 63, leaving his wife Ruby Whelan of Pilley's Island, daughter April Osmond (Hughie) of Robert's Arm, and many siblings.

During the 12 years Otto worked with Sunrise, he was one of the main operators for our mussel seed stripping barge system and for mechanical work. He was quiet and patient in nature when things went wrong. He was always reliable and could be called on any time – a characteristic that was admirable. "He was there when we needed him, no matter what", said Trenton Johanson, farm manager for Sunrise Fish Farms and Connaigre Fish Farms.

"Otto was dedicated to the craft of farming mussels. He was a master at splicing rope, teaching others the trade and

always the one we could rely on to ensure our ice booms and lines were properly installed", said Laura Halfyard.

Otto will be missed but never forgotten. ✨





Newfoundland Aquaculture Industry Association

High School Graduating Students 5th Annual Scholarship

The Newfoundland Aquaculture Industry Association (NAIA) is pleased to announce its 5th 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 2017 and entering your first year of University or College.

Evaluation Criteria:

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

To Apply, Please Submit the Following:

- Completed Application Form
- Resume and Cover Letter outlining the rationale why you should be the successful recipient
- Three Reference Letters: Academic (1), Professional (1), and Personal (1)
- Recent Transcript

Review Process:

Applications will be reviewed by the NAIA scholarship committee. Deadline for submissions: July 15, 2017. To apply or for more information please contact: Roberta Collier at: 709-538-3454 or via email at roberta@naia.ca. Only those applicants who are successful in their application will be notified.





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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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