

Ecology & Action

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Ecology Action Centre

The Ecology Action Centre is an environmental charity based in Nova Scotia. We take leadership on critical environmental issues from biodiversity protection to climate change to environmental justice. We are grounded in community, and a strong voice and watchdog for our environment. We work to catalyze change through policy advocacy, community development, and building awareness. We take a holistic approach to the environment and our economy to create a just and sustainable society. Views expressed in *Ecology & Action* are those of the writers and do not necessarily represent the EAC or its supporters.

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Letters

WE LOVE HEARING FROM YOU!

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From the Centre

In the last issue of E & A magazine, I wrote a short piece reflecting on Raven Davis' Mayworks performance in Cornwallis Park. The performance was part of Davis' broader body of work called "The De-celebration of Canada 150."

I wrote from my point of view as a settler in the early stages of reckoning with both the urgency and the slow work of decolonization. I attempted to reflect on some of the messy and unsettling feelings that Davis' piece provoked, and that have been part of my journey to learn how to best work and live in solidarity with Indigenous peoples on these unceded lands.

Moving towards a decolonized Mi'kma'ki is moving into a great unknown, which I think also means mistakes. Lots of mistakes.

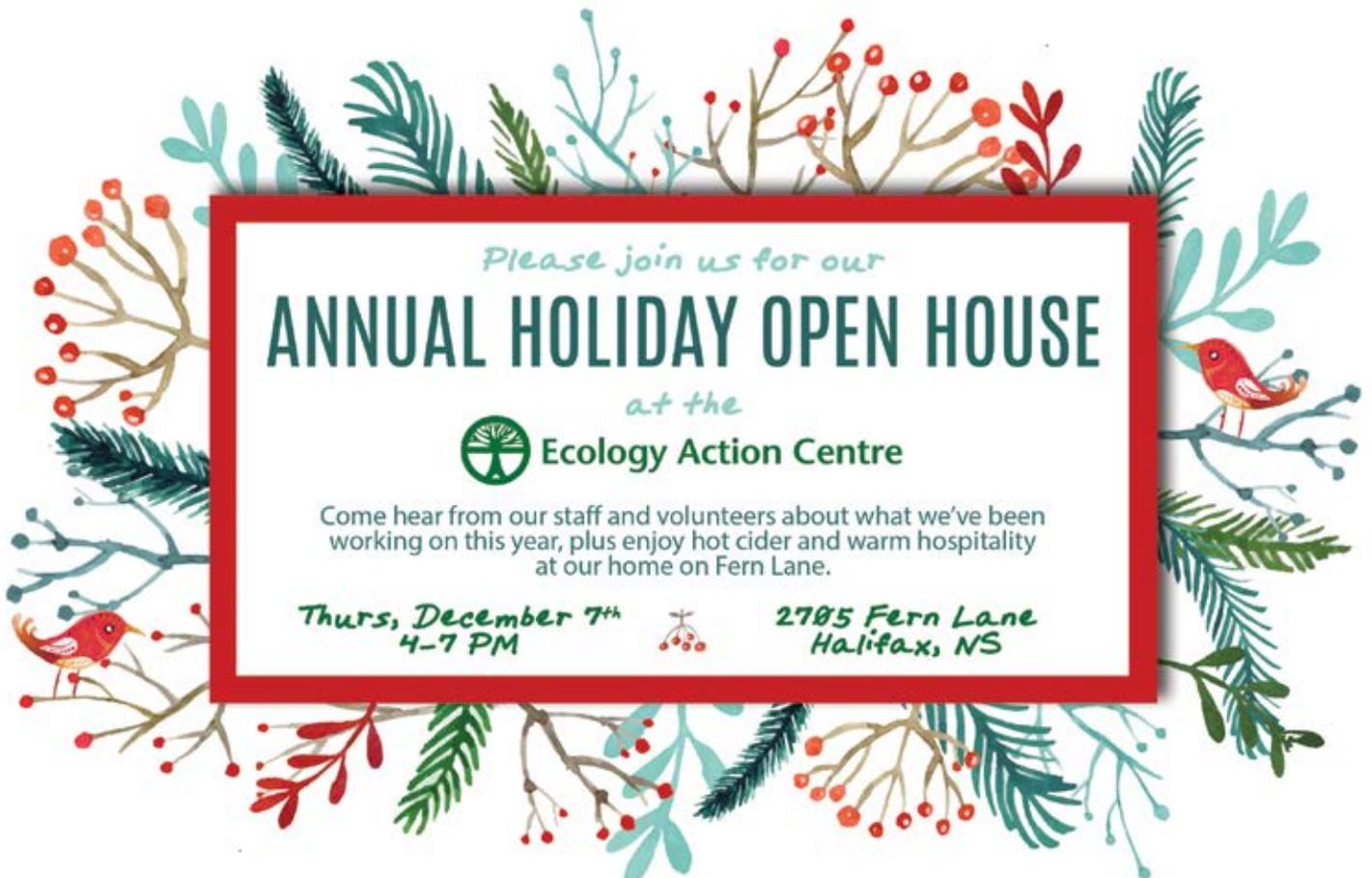
I want to apologize to Raven Davis. "The De-celebration of Canada 150" was created to critique and expose the myth of the confederation of Canada and the discourse and erasure

of Indigenous people, their sovereignty and their history and experiences on these lands. The title of my written piece as it was laid out in the magazine failed to credit Davis' body of work, appearing like I had invented the idea of de-celebrating Canada 150, contributing to the erasure that their art practice works to address.

I also want to share my missteps with other settlers interested in indigenous solidarity. Many environmental activists, like me, are accustomed to acting with urgency, speed and certainty. However, I am learning that the real work of decolonizing begins when we have blundered in our "good" intentions and have stayed with that discomfort. I am learning about what Black Lives Matter organizers mean when they urge us to listen and move at the speed of trust. It is from that humble and reflective place that I hope we can begin to repair harms and build the kind of genuine relationships that contribute to a decolonized future.

Sadie Beaton

*Community Conservation Researcher,
Ecology Action Centre*



Please join us for our
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at the
Ecology Action Centre

Come hear from our staff and volunteers about what we've been working on this year, plus enjoy hot cider and warm hospitality at our home on Fern Lane.

Thurs, December 7th
4-7 PM



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THANK YOU to all that joined in and supported us in exploring the Blue Mountain Birch Cove Wilderness Area and Point Pleasant Park as part of **#HaliBlitz!**

Check out photos and more from the event at **EcologyAction.ca/BioBlitz**



Canada



Ecology Action Centre

Perfect World

*Thank you for a simply
delicious evening!*



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Ecology Action Centre

New Technology, Old Problems

by **ELIZA JACKSON** /// EAC Staff

When I close my eyes and envision the future, I see streets full of people walking, cycling, and taking transit. Creating access to sustainable transportation has the power to positively impact the health of people, the planet, and the economy. In this vision, where sustainability reigns, there is very little room for people driving cars. So when the buzz about driverless vehicles began a few years ago, I quickly dismissed the idea. I have never been someone who has put much faith into any one technology to solve our car-related problems. I was skeptical something so futuristic could become mainstream enough to make a difference. Anything that could make car travel more attractive or convenient had no place in my vision of transportation nirvana.

I only began to pay attention to the conversation about driverless car technology when I heard it described as next big “*disruptor*.” Was this new technology really the game changer everyone thought it would be? Or was it better to stick to what we know about active and public transportation? All of a sudden, this emerging technology had me asking a lot of questions.

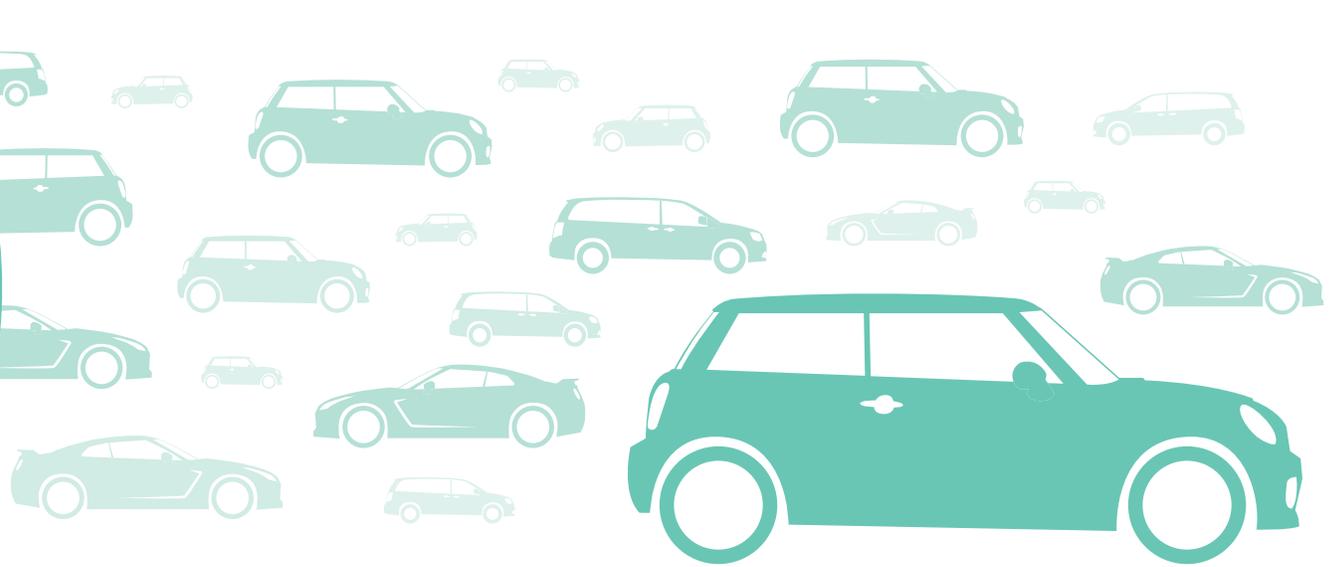
Driverless cars, or autonomous vehicles, use varying levels of human interaction to get from point A to point B. Though initially a concept of the distant future, we’re already seeing vehicles with autonomous capabilities on the market. Right now, the technology includes small things like correcting your vehicle if you happen to travel over the middle line on the road. The end-game, however, is to have vehicles capable of transporting passengers without the need for a driver. While this could open up a world of possibilities, there are still many uncertainties about the impact this technology might have.



Photo: Grendelkhan - CC BY-SA 4.0

What Could The Future Hold?

Many advocates for autonomous vehicles maintain that the best model would be one where a) no one would own their vehicle, they would instead share it with other users within a car share system and b) the engine would rely on renewable energy instead of fossil fuels. At face value, this presents a much more sustainable picture of car travel because we would need to dedicate less land to parking and be able to drastically cut our tailpipe greenhouse gas emissions. At street level, driverless cars have the potential to improve the safety of all users but it’s not yet a guarantee. The North American City Transportation Officials have called on the developers of autonomous vehicle technology to ensure pedestrian and cycling safety is top priority. They recognize that the way people use a street can be a lot more organic than a computer can anticipate. For that reason, it’s going to take a lot of work to ensure they are smart enough to reliably prevent collisions. With the growing demand for public transportation in Nova Scotia, autonomous vehicle technology could help fill a very real need. Already, municipalities are looking to see how ride-sharing services like Uber can be applied on a city-wide scale in place of public transit. Smaller autonomous vehicles that use fewer resources than traditional public transit buses could help to improve the reach of public transportation systems across the province.



“ *In a world where sitting is the new smoking and people are feeling increasingly disconnected, should we really make it easier to drive a car?* ”

Potential Pitfalls of Driverless Car Technology

While I like the idea of safer streets and creating access to public transit, I knew there was more to the story. If you strip the fancy features away, driverless cars are still just cars. Over the last 100 years, we have spent a lot of time, effort, and money to shape our communities into places where it is easier to drive. Ever since cars became mainstream and convenient to use, we started using them for every trip. We stopped caring about building communities where everything was close, including our neighbours. We created a disconnect between where people live and where they work and play. We made it more challenging to walk or bike to the office or school and eliminated one of the easiest sources of exercise from our lives. Urban planners and public health officials alike are seeing more and more the negative impact that car culture has had on our cities. Though the conversation started with physical health, they're also starting to see that urban sprawl creates social isolation and impacts people's mental health. In a world where sitting is the new smoking and people are feeling increasingly disconnected, should we really make it easier to drive a car?

The financial case for driverless cars doesn't look good either. The farther people live from urban centres, the more expensive it is to deliver utilities like water, electricity, and sewage. On top of that (and most perhaps relevant to this discussion), the cost of building and maintaining roads to connect all of that sprawl is continually on the rise. Most of the money that pays for our roads comes from two sources: the tax people pay at the gas pump and the yearly fees to register and license their vehicles. If we move to a model where our vehicles are all powered by renewable energy, and we trade in the idea of owning a vehicle for sharing one instead, we'll be making the same kind of mistake we've been making for years. We'll be increasing the convenience of car travel on a road network that is less and less able to pay for itself. That doesn't sound very sustainable to me.

After all of this consideration, I revisit my vision of transportation nirvana to see if it looks any different. The verdict? Not really. While I support making our streets safer places for everyone with autonomous vehicle technology, taking cars out of the equation could have the same impact. To achieve a future where people have better transportation options, we need to be smart about the way we use technology. As of now, we have all the tools in our toolbox to create a sustainable system of transportation in Nova Scotia: walking, cycling, and transit. To be a true disruptor, autonomous vehicle technology would have to be used in a way that supports more people using these forms of transportation, rather than replacing them.



Eliza Jackson is sustainable transportation coordinator with the Ecology Action Centre. She dreams of a Nova Scotia where the streets are safe, inclusive, and fun.



Photo: Stephen Thomas

Healing our Broken Energy Systems

by **STEPHEN THOMAS** /// EAC Staff

As an engineer, I understand the necessary place of technology in the transition away from fossil fuel-based energy systems. I also feel the weight of the climate crisis that is already raging around us.

Data from the Intergovernmental Panel on Climate Change shows us that, if we're to have any hope of staying below our committed Paris Agreement targets (1.5 C to 2.0 C of warming), then we need to freeze global emissions and begin a managed decline away from fossil fuels in the next three to five years. This means no new fossil fuel infrastructure and enormous technological and infrastructural changes in the next decades.

The implications of the climate crisis are terrifying. It is vital to our shared future that we act rapidly. Equally vital, however, is undoing the harms that our current energy systems have perpetuated on so many communities.

Our energy systems today are broken. They are not broken only because they are fueled by dirty fossil fuels—polluting our communities and causing catastrophic climate change—but also because our energy systems utterly fail to respect or even to seriously consider the rights or the wellbeing of Indigenous people and many frontline communities. They ignore the knowledge held within communities, and do great harm to the lands on which these communities depend.

We need radical changes in the way we generate, transport, and use energy. I am proud of the people doing that work, much of which is happening right here in Nova Scotia. At the same time, we need more discussion around the justice elements of this transition. Today, centralizing decision-making power, stepping over community agency, disrespecting indigenous rights, breaking treaties, and removing and blocking individual citizens from the process of owning energy systems are all par for the course.

I believe, though, that it's not too late to heal our broken energy systems. I worked for more than four years as a community renewable energy developer here in Nova Scotia. During my work, I saw how the exact same technologies can be used to either strengthen or weaken communities.

In Ontario, for example, the huge success in the uptake of large wind energy projects led to resistance from community groups and entire municipalities, and numerous indigenous blockades of wind energy projects.

“ If we don't work to support one another in creating climate justice now, then when will we? ”



Photo: Raymond Plourde



Photo: Stephen Thomas



Photo: Stephen Thomas

By contrast, in Nova Scotia, the Community Feed-in Tariff (COMFIT) program offers a greater sense of ownership and identity when it comes to wind energy. Within this program is more than 40 megawatts of Mi'kmaw-owned projects, which means that the 13 Mi'kmaq bands in Nova Scotia now produce more electricity from wind than they consume annually.

We need to learn from this by creating energy systems that work for our communities, and that put justice, truth, and reconciliation at the forefront. We need energy systems that work for workers, that allow for community ownership and indigenous ownership

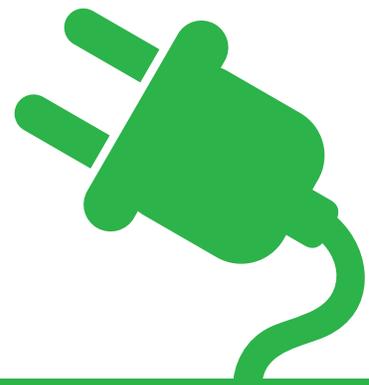
models to flourish, and that maintain decision-making power in our communities.

When we look back at this moment, decades from now, we won't only say to ourselves, "I'm happy someone invented the technology that saved us," but we will also say, "I'm proud of the work we did to strengthen our communities, to own more of our resources, and that we built our solutions together."

If we don't work to support one another in creating climate justice now, then when will we?

Stephen Thomas has been the Energy Campaign Coordinator since July 2016. He supports the work of the Energy Action Team and leads its campaigns, policy and advocacy work on energy and climate change issues. Before joining EAC, Stephen worked for five years in energy efficiency and community renewable energy development as an engineer and project coordinator. He attended COP21 in Paris, and he loves cycling and hosting solar-powered concerts around Nova Scotia. Stephen grew up in Nova Scotia and is grateful to be a guest on unceded Mi'kmaq territory.

Getting Smart with Technology



by **EMMA NORTON** /// EAC Staff

Here in Nova Scotia, the Nova Scotia Community College (NSCC) Applied Energy Research Lab (AER Lab) is researching, testing, and developing smart energy technologies like smart meters, electricity storage, electric vehicles, and hot water tanks. Smart energy technology uses data collection, information, and communication technologies to change the energy consumption of the technology in response to its surroundings.

Located in the LEED certified Ivany Campus, the AER Lab is powered by on-site solar panels and wind turbines. Walking into the lab one sees piles of neatly wound wires, researchers sitting at desks with swathes of data on the screen and a mid-renovation apartment.

The AER Lab will be using this “apartment” to model and test smart technologies that would exist on a micro, or household level. The smart technologies in the model will show how a home can be tuned to run more efficiently from an electrical perspective.

Dr. Alain Joseph has directed and managed the programs at the lab for some time. He believes smart technology can help the grid reduce its greenhouse gas emissions. He says that smart technology, “allows you to fill the peaks and valleys of renewables, instead of having to run base-level coal-fired generation at a certain level, having significant impacts over the long term on greenhouse gas emissions.”

Our modern electricity system is complex and extremely impressive. It needs to generate and supply power when customers need it and reduce the power supply when customers don't.

This period of time with high demand for electricity is called peak demand. Peak demand generally occurs during breakfast and dinner hours. Additionally, demand is especially high during Nova Scotia's winters.

The period of time when demand for electricity is lowest is called off-peak. Peak demand in Nova Scotia is about three times higher than off-peak. Reducing peak demand, or demand response, enables jurisdictions to increase the percentage of renewable energy on our grid, moving us to a fossil fuel free electricity system.

This is where the smart technology tested in the AER Lab has an important role. Demand response requires a smart grid. Smart grids integrate information and communication technology into already existing electrical infrastructure. Smart grids already exist in many jurisdictions around the world: from Maine to California, to Italy, to remote communities such as Hartley, B.C.

Want to be trained for a job that helps fight climate change? Check out any of these climate job-related programs at NSCC:

1. Architectural Engineering Technician
2. Building Systems Technician (HVAC&R)
3. Civil Engineering Technology
4. Electrical Engineering Technology
5. Geographic Sciences - Community and Environmental Planning Concentration
6. Horticultural & Landscape Technology
7. Natural Resources Environmental Technology
8. Oceans Resources - Fisheries and Aquaculture

Discover more climate job-related programs at nsc.ca.

NSCC wants to be a hub for ideas developing around smart energy technology in Nova Scotia. “If any institution is in a good place to do it, we know we are,” says Dr. Joseph.

Some of their primary objectives are about educating a new workforce in the sector and helping industry partners. “There's pretty good growth in a lot of tech sectors in Nova Scotia,” Dr. Joseph says. “There are a lot of start-up companies doing good work and they need people who can help them build out their ideas that they are working on.” He is optimistic about this technology, but he is still concerned about the urgency with which it is needed to help the world reduce our greenhouse gas emissions.

The EAC is piloting smart metering technologies to better understand our energy consumption, and further reduce it. As it stands, we can boast that our building is one of the most energy efficient office buildings in Canada—likely within the top five. We want to continue to improve our energy use, and the best way to do that is to understand our consumption better. That's why we partnered with SimpTek, a local startup that has built a platform to enable consumers to engage with their electricity consumption using real-time data.

Phantom Load (also called vampire load or ghost draw) is the electricity that appliances use when they have been powered off but remain plugged into an outlet. Laptops, computers, microwaves, and entertainment systems are some of the most common household appliances with phantom loads.



Dr. Alain Joseph, Jamie Thomson, Jeremie Bernardin, and Hazim Ajlani stand outside a portable solar photovoltaic electricity generator that their team has been testing and researching.

In partnership with SimpTek, the AER Lab provided hardware for us to pair with SimpTek's software. This hardware consisted of an eGauge unit and current transformer clamps (CTs). The CTs transfer data to the eGauge, which transfers data to the SimpTek platform, which then breaks down the data for easier understanding and to pinpoint inefficiencies.

The EAC is collecting this data and investing in this technology in order to engage with members and building-tour groups. We are also using the platform internally to see if there are any savings measures that may be available through more detailed analyses of our electricity consumption.

So far, using SimpTek's analysis paired with the current transformer technology, we have learned that our energy usage per square foot is roughly 15 times more efficient than buildings newer than ours. We also only use five to six per cent of our total load as hot water versus typical commercial buildings that use over eight per cent. The data has also shown us that even the conservation-minded EAC still has a phantom load that costs us a few hundred dollars in electricity each year. It has also revealed to us that despite having a very old oven and stove, the savings that could be gained from replacing it are too minimal to justify purchasing a new one.

The EAC uses this technology to identify behaviours that help us use energy better. As more data is collected over time, the SimpTek platform becomes more intelligent. Therefore, it will offer better and more personalized recommendations that will help the EAC become even more energy efficient.

NSCC's AER Lab tests and researches technologies, like SimpTek and the associated hardware, that are key parts of the transition to a fossil fuel free future. The EAC believes that Nova Scotia will, in the not too distant future, be fossil fuel free. Our Energy Team is pushing for Nova Scotia to reduce its greenhouse emission levels 50 per cent below 1990 levels by 2030. It's possible. Already Nova Scotia has reduced its greenhouse gases to 30 per cent below 2005 levels. We should build on that progress.

Emma Norton is the Energy Conservation Coordinator at the Ecology Action Centre. One of her roles is as the lead on the international Smarter Energy Communities in Northern and Arctic Regions.

A Fishy First

by **LUCY SHARRATT** /// EAC Volunteer

For the first time, a genetically modified (GM or genetically engineered) animal has been commercialized. After 20 years of GM crops in Canada, the technology of genetic engineering has pushed yet another boundary. But our experiment with GM crops and foods has not yet been assessed, and there has been no public debate over genetically engineering higher life forms.

The new technologies of directly changing the genetic makeup of organisms have boundless possibilities in theory. In practice, however, the risks and limitations are many. Canada is now at the centre of the global debate over the future of GM animals, after GM Atlantic salmon was sold as food this year.

On August 4, 2017, United States company AquaBounty, which produces GM salmon eggs at Bay Fortune, P.E.I., released its quarterly financial results. The report revealed that the company had sold around five tonnes of genetically modified Atlantic salmon in Canada. This was the world's first sale of GM fish for human consumption.

The GM fish was sold into Canada without any labelling for consumers. By the time the public learned that GM salmon was on the market, many had unknowingly eaten it.

This makes Canadians the first people in the world to eat a GM animal.

GM Salmon Eaten in Canada

From the company's point of view, Canada is an ideal market for such a controversial product because we do not require mandatory labelling of GM foods. Although Canadian consumers have some information that can help them choose to avoid buying GM salmon, there was no public announcement when this GM salmon was first sold.

AquaBounty call its GM Atlantic salmon "AquAdvantage" salmon. It's engineered to grow faster using a growth hormone gene from Chinook salmon and genetic material from ocean pout.

GM Salmon Factories in Canada?

The GM salmon were grown in Panama (from eggs produced in Prince Edward Island) but it's not clear how much more GM salmon, if any, AquaBounty can produce there.

Instead, the company is now constructing production facilities in Canada and the United States and says, "We expect sales of our fish will be infrequent and of small quantities until our Indiana and Rollo Bay facilities are operational." However, the company does not yet have government permission to grow GM salmon at either of these locations.

The company owns two sites in Prince Edward Island: a research and development facility at Bay Fortune, and a second facility at Rollo Bay. Initially, AquaBounty told the province that "The proposed facility at Rollo Bay West will have no GMO salmon." Just one year later, the company "amended" its proposal, requesting (and subsequently receiving) provincial approval to renovate and construct a plant to produce 250 metric tonnes of GM salmon there each year.

The Rollo Bay facility would be the world's first commercial-scale GM fish factory. However, as a result of the Ecology Action Centre's court action, it is now clear that AquaBounty does not yet have federal approval to grow GM salmon at that location. The company only has approval to produce GM salmon at its small research and development facility at Bay Fortune.

Despite this, the company has started a \$13 million construction project at Rollo Bay.

What is genetic modification?

Genetic modification (GM) is also called genetic engineering or GE and is the introduction of new traits to an organism by making changes directly to its genetic makeup, e.g. DNA, through intervention at the molecular level.

With genetic engineering, scientists can change the traits of plants and animals by inserting DNA pieces, whole genes, or long stretches of DNA segments from many different organisms. These genetic sequences can also be taken from the same species or be newly made up. Scientists can also delete or swap DNA sequences in organisms or introduce genetic material to silence genes.

Unlike conventional breeding and hybridization, genetic engineering is a laboratory technology that enables the direct transfer of genes between organisms in different species or kingdoms that would not breed in nature, and the introduction of new sequences that do not even exist in nature.

GM Salmon Escape

The future of wild Atlantic salmon could be tied to the future of GM salmon.

AquaBounty says it plans to grow the GM salmon in contained land-based structures and that this is the future of its global production. The company relies on multiple physical and biological containment strategies to keep the GM salmon from escaping into the wild, but at any stage, one or more of these strategies could fail.

Scientists at the Department of Fisheries and Oceans (DFO) concluded that escape was unlikely but that if it happened, the risk to wild populations of Atlantic salmon was “high with reasonable certainty.”

AquaBounty says that all the GM salmon will be sterile females. However, they can only guarantee that 95 per cent to 99.8 per cent of the salmon will actually be sterile. The DFO’s risk assessment noted that there is no information on the reproductive behaviour of female GM salmon and characterized this knowledge gap as “significant.”

There is also a possibility that escaped GM salmon could breed with other species. For example, one study showed that GM salmon can interbreed with wild brown trout.

Contamination incidents with unapproved GM animals have occurred in Canada before. In 2004, three experimental GM pigs from the now defunct Quebec pharmaceutical company TGN Biotech were accidentally turned into chicken feed.

In 2002, 11 experimental GM piglets at the University of Guelph were accidentally sent for rendering as animal feed instead of being destroyed as biological waste. At the time, the VP of Research at the university said, “Things you don’t expect to happen can happen.”

The lesson from these events is that, if nothing else, human error is one predictable cause of containment failure.

The Future of GM Salmon Production:

GM salmon has come a long way but it is far from where AquaBounty would like it to be. It’s not yet in full commercial production and its future on the market is uncertain.

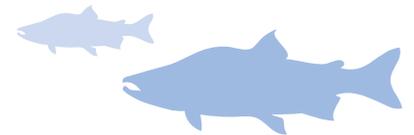
Regulation of GM fish and other GM animals falls to Environment Canada under the Canadian Environmental Protection Act (CEPA). The Standing Committee on the Environment and Sustainable Development recently recommended changes to CEPA that would require public notification of applications for GM animals and provide opportunities for public input. If acted on, these recommendations would open up a process that is not transparent. With so much at stake, every next step sets a critical precedent.

THE FUTURE OF GENETIC ENGINEERING
SALMON, POTATOES and NEW GENE EDITING TECHNOLOGIES
MON, NOV 27 • 7PM
DAL-SUB, RM 303
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Featuring Dr. Ricarda Steinbrecher, UK
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TAKE ACTION

Since the secret commercial launch of GM salmon, many of Canada’s major retailers have told their customers that they have no plans to sell it.

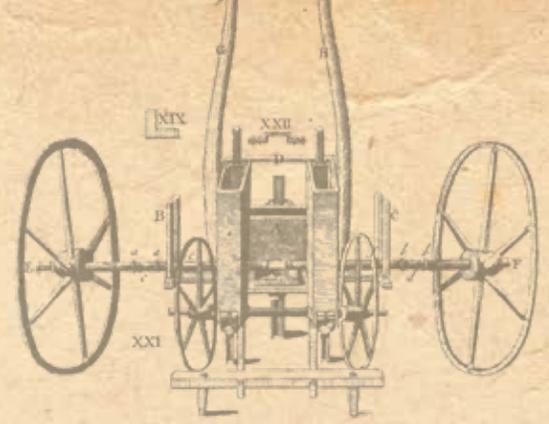
Write to the head office of your grocery store today or send an instant letter to the federal government. Action information, updates and details are posted at www.cban.ca/fish



Lucy Sharratt is Coordinator of the Canadian Biotechnology Action Network (CBAN). CBAN brings together 16 groups to research, monitor and raise awareness about issues relating to genetic engineering in food and farming. CBAN members include farmer associations, environmental and social justice organizations, and regional coalitions of grassroots groups. The Ecology Action Centre is a member of CBAN.

Wheels, Reels, and Ropeways

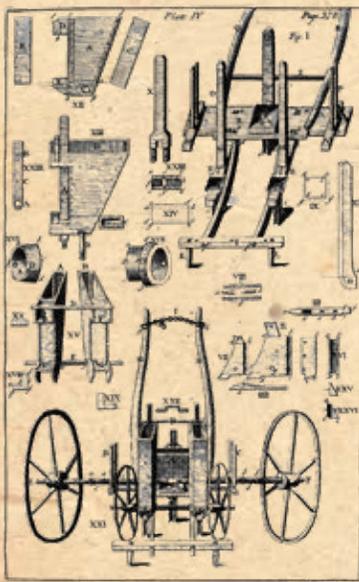
by IAN JOHNSTON /// EAC Volunteer



A greener future looks a lot like the past. Human ingenuity harnessed the power of nature long before we started burning fossil fuels. Flowing water, blowing wind, gravity, and animal and human muscle were all sources of energy to power our machines. Machines that use direct energy are making a comeback.

The Seed Drill

Optimal conditions for seed growth include the depth at which the seed is planted, the spacing between it and other seeds, and proper covering with soil. The seed drill is a device used to plant seeds at the best depth and spacing for the highest yield of crop. Early seed drills were drawn by hand and required ploughed furrows. The earliest innovations were seed drills that could plant seeds in more than one furrow at a time.



The simplest seed drills were used in Babylon over three thousand years ago. Modern agriculture still uses seed drills, but on an industrial scale. The agriculturist Jethro Tull is credited with improving the seed drill design, inventing a drill that could be drawn by horses. His methods and inventions set off a revolution in agriculture.

Hand drawn seed drills are still available, with some enterprising individuals building them from bicycle parts.

Diagram of seed drill

Attrib: Jethro Tull. Horse-Hoeing Husbandry, 1762

Aerial Ropeways

While not often seen outside of ski-lifts and sport climbs, the ropeway was once an efficient means of moving people and goods. They have been around since ancient times and were common in cities until the mid twentieth century.

Most ropeways could be at least partially powered by gravity. Some can even capture excess energy generated by gravity. It's easy to imagine cable cars moving people and cargo around a city's high-rises. Agriculture, logging, mining, and similar industries could use ropeways to reduce their use of fossil fuels in transportation.



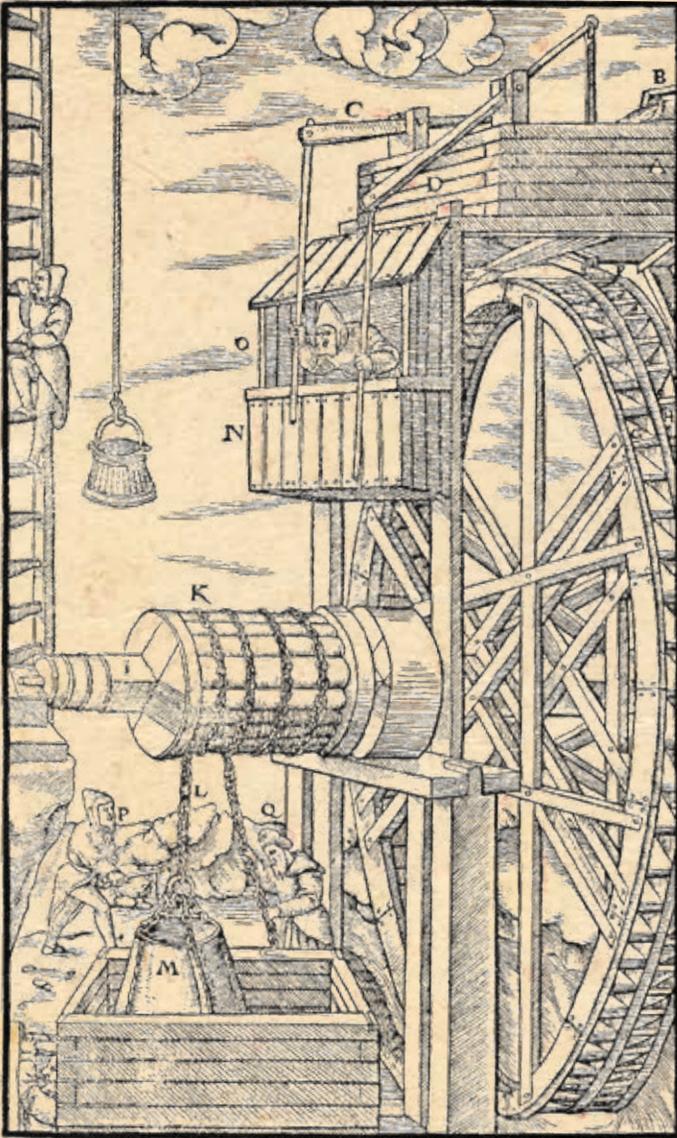
Ropeway in Gdansk (now Danzig) 1644

Attrib: Vannoccio Biringuccio

The Water Wheel

Flowing water has long been tapped as a source of energy. In modern times that energy is often converted to electricity. Water wheels once directly powered machinery through mechanical transmission, often at significantly better efficiency and lower cost than from conversion to electricity.

With Nova Scotia's many lakes and rivers, even small waterways could be harnessed for efficient and direct hydropower. An operating replica of a water wheel is on display at the Wile Carding Mill Museum.



Water wheel powering a mine hoist. *De re metallica*, 1566

Attrib: Georgius Agricola

The Cylinder, or Reel, Mower

The cylinder, or reel, mower was invented in 1830 by Edwin Budding, and the design hasn't changed much since then. Prior to 1830, grass was cut using a scythe.

Cylinder mowers have one fixed horizontal blade, and numerous blades affixed to a rotating cylinder. The motion of the moving blades forces the grass against the horizontal blade and cuts it much like scissors.

By comparison, rotary mowers (the more common, gas or electric powered mowers) have a blade that rotates horizontally like a helicopter. It tears, rather than cuts, the grass.

Many sports venues, such as golf courses, cut grass using cylinder mowers (although they are usually larger, and pulled by a tractor). The mower's blades do need sharpening periodically. Cylinder mowers do not work well on tall grass.

Push-powered reel mowers have a lot to recommend them. Cleanly cut grass heals faster than torn grass, and as such is less vulnerable to disease. Cylinder mowers don't require electricity or gas, and thus don't produce carbon emissions. They are significantly quieter than rotary mowers, especially the gas powered variety. Cylinder mowers are also safer, as the blades move with less force than rotary mowers. They are even usually less expensive than rotary mowers!

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Advertisement in *Garden and Forest Magazine*, February 29, 1888

Attrib: Chadborn & Coldwell Manufacturing Co.

Ecology, boardgames, Shakespeare, mental health, fantasy, and real estate are the unusual topics **Ian Johnston** writes about. He received a Master of Arts from The University of Western Ontario and a Master of Education from The University of Ottawa. He lives in Dartmouth, Nova Scotia.

The Little Eco-Roaster That Can

by **AMBER TUCKER** // EAC Volunteer



With half the package covered in feel-good labels like “Fair Trade,” “Organic,” and even “Bird-Friendly,” it appears that our coffee-loving society has come a long way. We realize that the ecological and ethical implications of coffee production are no more mutable than our deep appreciation for a well-roasted brew.

But most coffee roasting technology still results in emissions of plentiful air contaminants: nitrous oxide, carbon monoxide, volatile organic compounds, oxides of sulfur, and particulate matter.

The owners of Laughing Whale Coffee, Steven Zubalik and Deborah d’Entremont, have spent years searching for a solution. It’s vital to them that the coffee they sell is certified organic and fairly traded. And, just as much, they want their roasting operation in Lunenburg to support the health of humans and the environment. They hope to inspire other roasters, in the Maritimes and beyond, to follow their lead.

The Revelation

The main aspects Zubalik and d’Entremont focus on, as far as greening their technology goes, are decreased fuel usage (through heat recovery and recycling) and reduction of smoke. When they bought the Revelation roaster from its Oklahoma City manufacturers, US Roaster Corp, in 2009, the purchase was not without risk. Still on the cutting edge, it was the first machine of its kind to be used in Canada. One of its claims to fame is its dual-path heating system that combines the technologies of a drum roaster (typically used in commercial roasters) and an air, or fluid bed, roaster (more often found in home roasting systems).

It was also advertised as a “smokeless roaster,” ostensibly eliminating 97 per cent of a traditional roaster’s carbon output. Instead of venting the smoke through a stack to the outside air, the Revelation pulls the chaff and smoke out of the drum with a fan. A cyclone separates the chaff, and the smoke and gasses are directed over a catalytic converter that ignites the smoke as a fuel source. Unfortunately, the roaster didn’t reduce smoke output as much as hoped. Smoke is still easily seen and smelled outside. Laughing Whale has since reduced their smoke output further by installing a larger catalytic converter.

TAKE ACTION

When buying coffee, be sure to look for the logos of independent, third-party certifiers like Fairtrade Canada, the Rainforest Alliance, and Canada’s National Organics Program to be certain you’re really getting what’s on the label.

The heat-recycling features of the Revelation work much better, cutting propane consumption below levels in standard practice. Diverting hot stack gas back into the firebox recycles that energy, as well as creating an environment with reduced oxygen and increased humidity in the roasting drum. This helps preserve coffee flavours. Zubalik and d’Entremont had planned to also capture some of the heat expelled by the roaster to help heat the building through in-floor hot water pipes. However, the amount of smoke produced would cause fouling problems with an air-to-water heat exchanger, and this idea had to be put on hold.

Zubalik is frank about the drawbacks, but there have been benefits. Laughing Whale went from using two table-top roasters, that could only roast one pound of beans per batch, to the Revelation’s capacity of 18 kg per batch. This allowed them to grow rapidly into a sustainable local business with three full-time production employees as well as several part-time employees who work at farmers’ markets in Lunenburg, Hubbards, and Halifax.



Looking Forward

While there isn't necessarily a straightforward solution to forgo the fossil fuels used and clouds of pollutant-heavy smoke emitted by a typical roaster, Laughing Whale's progress toward greener roasting is impressive. For their next step, Zubalik and d'Entremont are planning to upgrade to even newer roaster technology: a roaster called the Loring. It boasts a single heat source that roasts the coffee while incinerating all the carbon in the smoke. The exhaust it produces won't dirty the heat exchanger the way smoke does, so by using a water tank, they hope to capture up to 30 per cent of the waste heat to help heat the building. The Loring even allows roasters to download roast data, upload software updates, and remotely control roasting via laptop, tablet, or smartphone.

This could be the eco-coffee of the future.

Editor's note: *The Laughing Whale is an EAC Sustainability Ally. However, opinions expressed in the article are that of our writer.*

Amber Tucker writes, edits, and drinks a lot of coffee in Halifax, savouring the many and excellent local roasts Nova Scotia has to offer. She thanks Steven Zubalik for taking the time to share Laughing Whale's journey so far.

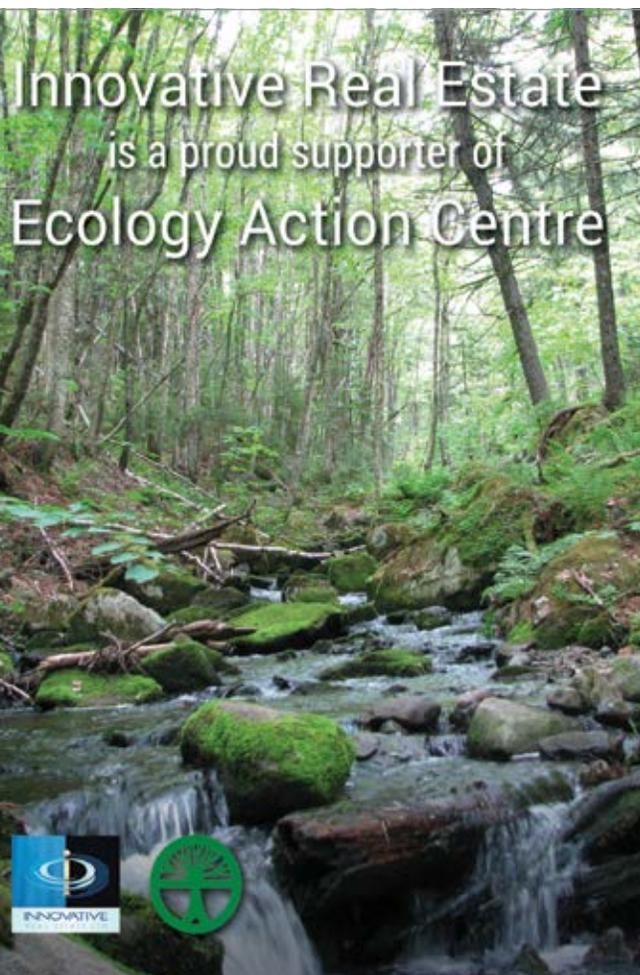
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Tech on our Waters

by **CHELSEY KARBOWSKI** /// EAC Staff

In Atlantic Canada, there are 38 populations of marine fish species considered to be at risk, as assessed by the Committee on the Status of Endangered Wildlife in Canada. Some of these species are still targeted for catch while others are caught as non-target and bycatch. It is crucial to the survival and health of these species and fisheries that we collect high quality and trusted catch data in order to feed this into scientific assessments to minimize uncertainty and risk in management decisions.

Currently in Canada, scientific assessment and management of these populations rely heavily on the at-sea observer and dockside monitoring sampling programs. A review of these programs is included in the *2016 Report of the Commissioner of the Environment and Sustainable Development on Sustaining Canada's Major Fish Stocks – Fisheries and Oceans Canada*. This review highlighted the systemic problems in the management of third party observer programs, citing insufficient quality, delayed access, and inability to incorporate the data into fisheries management decisions as its flaws.

In Atlantic Canada, the observer program is faced with additional challenges influenced by the high number of small-scale and owner-operator vessels comprising many of our fisheries. The main challenges, including the large number of vessels with remote ports requiring many hours of travel to get to, along with other issues, may also provide some of the most significant opportunities for a new innovative form of monitoring called Electronic and Video Monitoring (EVM).



EVM is a rapidly growing technology that monitors and collects information on fish populations. It uses a mix of cameras, pressure sensors, Radio Frequency Identification tags (RFID) and Geographical Positional System (GPS) to perform this work. During a fishing trip, EVM continuously records video using two to four high resolution cameras—keeping track of all the fishing activity taking place. Once the video is captured it is saved to a hard drive, removed from the vessel, and analyzed.

Built within the EVM system is software that signals parts of the video to be reviewed and parts to be discarded. This saves time and money in monitoring fisheries catches and interactions by reducing the total analysis time. The analysis that does take place can reveal a number of things, including the type and number of species encountered during each fishing trip, and the size of a caught species. EVM can also be adapted to collect various types of oceanographic data, including pH, temperature, and salinity.

EVM has multiple benefits for various sectors within fisheries, including, but not limited to, areas of science, management, industry, and the public. The technology is used globally. British Columbia has been using EVM for nearly two decades. Electronic and video monitoring tools are considered some of the best options to address the current issues with monitoring and the lack of available data for at-risk populations—providing a means to monitor fisheries, collect data, securely manage, and hopefully conserve these crucial species for generations to come.

Chelsey Karbowski is a Marine Conservation Officer on the Marine Team at the Ecology Action Centre and received her Master's from the University of Akureyri in Iceland.

Upcycling by the Sea

by **CLAUDIA VANRIESEN** /// EAC Volunteer

As the child of an artist, Dorothea LeBlanc learned to observe quietly while a drawing or sculpture came to life in front of her. “I loved watching my dad make art, watching him pick away at a block of wood and seeing shapes emerge,” she explains. “And I still remember the first time he used colored pencils to draw a face on a blank sheet of paper. I was so impressed.”

Early exposure to art, along with an instinctive love for nature and the environment, served to nudge LeBlanc toward pursuing a degree in fine art. Soon she was exhibiting her own work and winning awards.

Today she is a forerunner in the art of creating upcycled paintings that incorporate recycled and found objects. Recent paintings have seen her mount such items as broken jewelry or lovingly retrieved sea glass onto her canvases well before she proceeds to dip brush into paint. “Building up texture is sculptural to me,” she says. “I like to build up a two-dimensional plane into a third dimension. It’s very satisfying and it pulls a creativity out of me that feels authentic.”

Because she is a long-time environmentalist and recycler, LeBlanc initially looked around her own environment for items she could use in her paintings. “First I would go through my own jewelry that I was no longer wearing and glue them onto my canvas, but since then I’ve also used odder things, like internal computer parts and switch plates, even cutlery, anything that has a fairly low relief. Miscellaneous drawers are a really good resource,” LeBlanc says.

“It’s a great adventure for me to make something beautiful out of formerly useless things that might otherwise end up in a landfill.”

TAKE ACTION

LeBlanc encourages upcycling and likes to share what she has learned about the process of upcycled painting with other artists. She has two workshops planned for 2018, one in Halifax and the other in Truro, and invites interested artists to sign up.

In the meantime, a visit to LeBlanc’s website (dorothealeblanc.ca) and blog provides many interesting and useful tips, as well as opportunities to purchase her upcycled paintings.



Photos: Dorothea LeBlanc

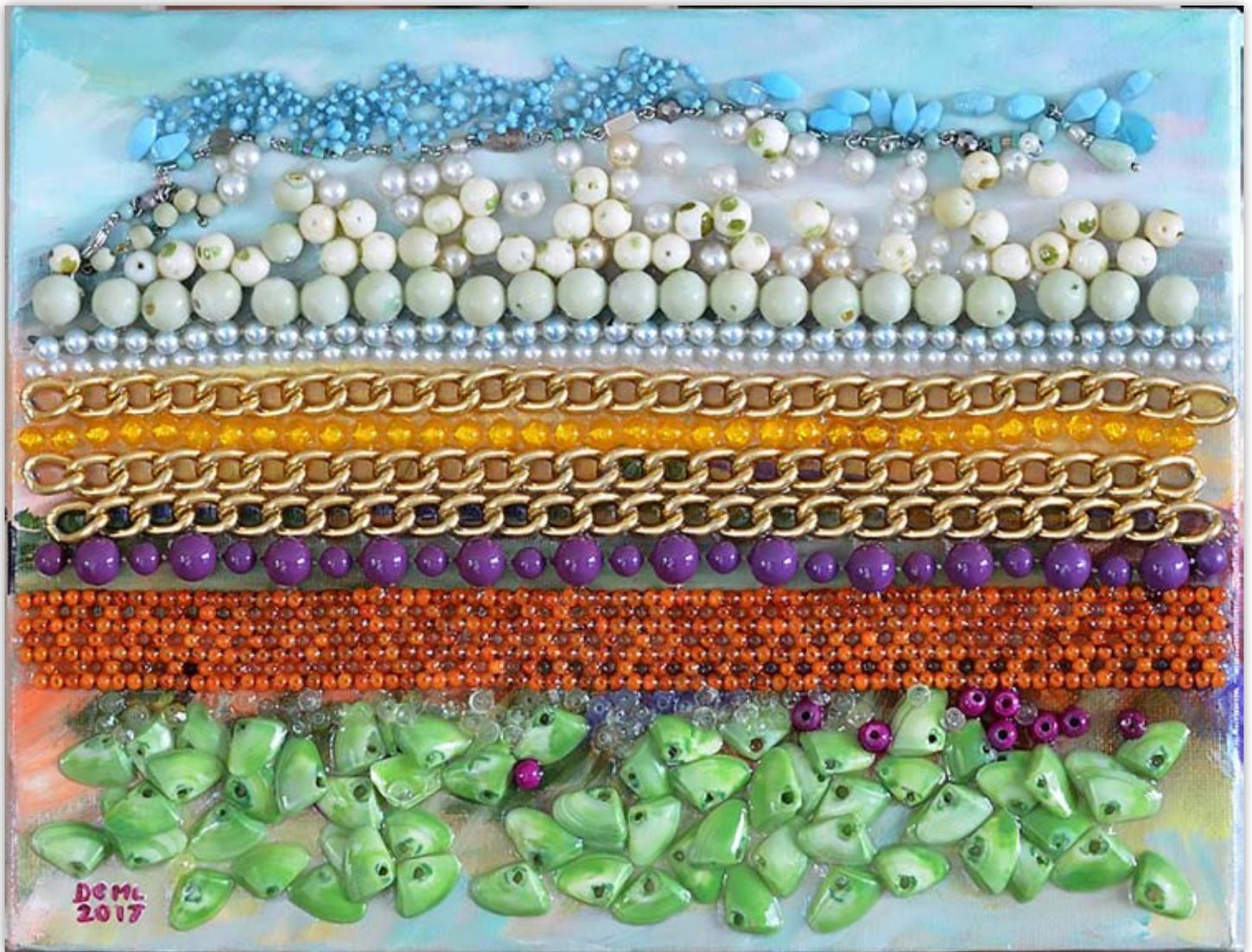


LeBlanc uses various items in her paintings, putting glue under or over them, or sometimes adding matte or gloss medium over them, acrylic binder or glazes. “I just keep working on a painting until I think it’s good,” she says.

Finding the sea glass she used in recent painting took hours as Dorothea foraged along the Atlantic shoreline some distance from her home in Halifax.

“Sea glass is garbage but the sea has given it soft edges and turned it into jewels that people overlook. Its colour ranges from white to green or brown. On one beach, every two steps you take, you’ll see one or two pieces. In my latest large format painting, I used more than two hundred pieces of sea glass.”

Some years ago, LeBlanc used to walk with her young children up and down St. Margaret’s Bay road near her home, picking up garbage and teaching them respect for the environment, always hoping that other parents would do the same.



“ Making something beautiful out of formerly useless things ”



Claudia Van Riesen is Dorothea's sister and a freelance writer and editor who lives with her husband in Georgian Bay, Ontario.

Action is our Middle Name

FOOD

Food Leadership

As part of a national effort coordinated by Food Secure Canada, we hosted a conversation in Halifax to inform the federal government's development of *A Food Policy for Canada*. Approximately 40 people attended to share their ideas and vision about what's working well and what needs to change, along with short-term and long-term priorities to build healthier, more just, and more sustainable food systems for all. Additionally, we launched the *Community Food Leader Certificate Program* in Cumberland, Cape Breton and Halifax. Participants include local organizations and businesses that are working to grow food initiatives in their region. Other quick bites: the Cost-Share CSA Local Food Box Program is underway for its 5th season in Cumberland, a Food Policy Working Group is taking shape in Cape Breton, and we launched the Plants to Plates Activity Guide—a new facilitator's guide for youth food and garden programs.

MARINE

Eco-certifications and consultations

With our colleagues at SeaChoice, we released a comprehensive review of eco-certifications in Canada for wild-caught and farmed seafood. We have also been heavily engaged with government consultations on improvements to food labelling and *A Food Policy for Canada*, with the view towards improving the transparency of our seafood value chain and ensuring access for Canadians to sustainably caught seafood. We presented our SeaChoice seafood labelling report and seafood DNA testing results at the World Seafood Congress in Iceland, and discussed the benefits of increased traceability and labelling in the seafood supply. We also hosted a seafood-focused consultation in Truro to give fisheries and aquaculture input into *A Food Policy for Canada*. We attended the first UN Oceans Conference as part of the Canadian delegation to ensure that Canada commits to high standards of marine protection on the world stage.

BUILT ENVIRONMENT

Building the Foundation for the Built Environment

The Built Environment Team has been busy advocating for better planning. At the end of June, we co-hosted a panel presentation with Smarter City researchers to present key research showing the financial impact that sprawling, green field development has on the city. In August, we got moving on our Main Streets Campaign, in which we'll be advocating for Halifax to create better plans for good economic development in suburban and rural HRM. Meanwhile, we continued our Green Network advocacy as stakeholders and launched a letter writing campaign through the new Our HRM Alliance website. Visit ourhrmalliance.ca/take-action to ask your councilor to support the green network with a click of a button. Finally, this summer and fall, we've welcomed over 150 people to hiking and biking adventures that we co-led with Our HRM Alliance member groups in places like the Purcell's Cove Backlands, the Bluff Wilderness Trail, and Salt Marsh Trail.

COASTAL & WATER

Winds of Change and Water Justice

With the Atlantic hurricane season in full swing, the importance of planning for sea level rise and other coastal hazards has been more apparent than ever. We have a series of outreach sessions planned, to educate coastal communities about the impact of sea level rise. On the water justice front, we've been working on the Shades of Green Podcast project, a five-part series exploring environmental justice perspectives and uncovering ways we might work together to bring about a just future here in Mi'kma'ki. It will launch later this fall at: shadesofgreenweb.wordpress.com. Looking to support frontline water protection along the Sipekne'katik River? It is a great time to visit the Mi'kmaq rights holders and allies resisting Alton Gas at the Treaty Camp and Truckhouse site. You can also make a monthly sustaining donation at: stopaltongas.wordpress.com/donate.

ENERGY

People Power: The Fuel That The Just Transition Needs

Would you like a daily reminder of the fossil fuel free and just future we are building? Consider purchasing one of our 2018 Green Jobs Calendars! We have been gathering stories from inspiring people from across Nova Scotia who work in our growing, green economy. These make great stocking stuffers and the proceeds go to support the Energy Team's projects advocating for a just transition to a fossil fuel free future. We're continuing to support community organizations endeavours to generate solar electricity and become more energy efficient. This helps community organizations use their resources more effectively to serve Nova Scotian communities.

TRANSPORTATION

Bridges to Success

After years of advocacy from the EAC and other community organizations, Halifax Council approved an all ages and abilities approach to the MacDonald Bridge to make cycling across the harbour more accessible. Additionally, we advocated for safe school site design in the Halifax Regional School Board with multiple levels of government and community partners to actively support safe walking and cycling. Our Welcoming Wheels program had another successful summer of gifting and training newcomers on bikes and we hosted a Fall event to celebrate our successes with participants, volunteers and partners. Finally, we've been developing the Active Transportation Ambassadors Program—a school achievement program to encourage active transportation across Nova Scotia—that we plan to pilot in the near future.

WILDERNESS

Blue Mountain Biodiversity, and Another Forestry Review

Over 600 people joined forces for HaliblitZ, our week-long exploration of local biodiversity in urban parks and protected areas in Halifax this past September. The thousands of nature observations collected through HaliblitZ highlight the ecological importance of areas like Blue Mountain Birch Cove Wilderness Area and keep its profile high while the City continues to dither over how to acquire the necessary private lands surrounding the provincial Protected Area. Blue Mountain is the site of a long-promised and yet-to-be-delivered urban wilderness Regional Park. Meanwhile, the *Independent Review of Forest Practices* committed to by the provincial government and led by William Lahey is underway. We are continuing to push for this review to build upon the commitments of the recent Natural Resources Strategy, and the massive public call for a significant reduction in clearcut harvesting. Join us in this call for change and add your voice to the review.

The Seasonal Gourmet

by JASON LYNCH

Gnocchi à la Parisienne with Blue Cheese and Herbs

INGREDIENTS (SERVES 8)

- 1 1/2 cups milk
- 12 tablespoons (6 ounces) unsalted butter
- 1 tablespoon + 1 teaspoon kosher salt
- 2 cups all-purpose flour, sifted
- 1 tablespoon chopped chervil
- 1 tablespoon chopped chives
- 1 tablespoon chopped parsley
- 1 tablespoon chopped tarragon
- 5–6 large eggs
- 1 cup blue cheese (choose your favourite)

This recipe is originally published in *Straight From the Line: Recipes and Reflections From a Chef at Work* and has been reprinted with permission from **Able Sense Publishing**.

Jason Lynch is the executive chef at Grand Pré Winery's Le Caveau Restaurant where he sources roughly 80 per cent of the restaurant's ingredients locally. Jason is also executive chef at The Black Spruce Restaurant in Gros Morne National Park. Learn more at chefjasonlynch.com

PREPARATION (1 1/2 HOURS)

Set up a heavy-duty mixer with the paddle attachment. Have all the ingredients ready before you begin cooking.

Combine the milk, butter, and 1 teaspoon of salt in a medium saucepan and bring to a simmer over medium-high heat. Reduce the heat to medium, add the flour all at once, and stir rapidly with a stiff heatproof or wooden spoon until the dough pulls away from the sides of the pan and the bottom of the pan is clean, with no dough sticking to it.

At this point the dough should be glossy and smooth but still moist. Enough moisture must evaporate from the dough to allow it to absorb more fat when the eggs are added. Continue to stir for about 5 minutes, adjusting the heat as necessary to prevent the dough from colouring. A thin coating will form on the bottom and sides of the pan.

When enough moisture has evaporated, steam will rise from the dough and the aroma of cooked flour will be noticeable. Immediately transfer the dough to the mixer bowl. Add the herbs and 1 tablespoon of salt.

Mix for a few seconds to incorporate the ingredients and release some of the heat. With the mixer on the lowest speed, add 3 of the eggs, one at a time, beating until each egg is completely incorporated before adding the next one. Increase the speed to medium and add another 2 eggs, one at a time, mixing well after each one. Turn off the machine.

Lift some of the dough on a rubber spatula, then turn the spatula to let it run off. It should move down the spatula very slowly. If it doesn't move at all or is very dry and just falls off in a clump, beat in 1 additional egg. Place the dough in a large pastry bag fitted with a 5/8 inch plain tip and let it rest for about 30 minutes at room temperature. (If you have only a small pastry bag, you can do this in two batches.) Bring a large pot of lightly salted water to a simmer.

Twist the end of the pastry bag to push the dough into the tip. (From time to time, as the bag empties, you will need to twist the end again.) As you squeeze the back of the bag with your dominant hand, hold a small knife in your other hand and cut off 1-inch lengths of dough, allowing the gnocchi to drop into the pot. Pipe about 24 gnocchi per batch. First, the gnocchi will sink to the bottom of the pot. Keep the water temperature hot, but not at a boil. Once the gnocchi float to the top, poach them for another 4 minutes, then remove from water and place in a bowl filled with cold water. Once they are cool, place in a strainer to remove excess water.

The gnocchi will keep in the fridge for 2–3 days. When ready to serve, heat a medium non-stick pan with a little olive oil, then add the gnocchi and sauté until golden brown. Place in a bowl and crumble the blue cheese over top. I also like to add pine nuts and some fresh arugula. This is a fun dish that also makes a great appetizer, and I encourage you to play around with the toppings.



Photo: Jeff Harper

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Recent Success

- Success! After more than five years of advocacy including hosting public discussions, support for indigenous, grassroots and front-line groups, research, reports, and work as an official intervenor in the National Energy Board (NEB) process, the EAC was among the thousands of people across Canada who worked together to **successfully stop the Energy East Pipeline**.
- After years of advocacy by EAC, Our HRM Alliance, the Backlands Coalition, and WLCC, we welcomed the decision by Halifax Council to purchase they key areas of the Purcell's Cove Backlands to **create the next great wilderness park** just steps from downtown. Once the process is complete, the Backlands will be protected in their natural beauty forever!
- EAC's marine team, as the longest standing Canadian ENGO observer to the Northwest Atlantic Fisheries Organization, helped to **protect an additional five seamounts** in the New England seamount chain from all bottom fishing activity—linking high seas protections with those in place (as of now) to those within US waters.
- Our Welcoming Wheels program provided **more than 162 new Canadians** with refurbished bicycles, new helmets, lights, bells, and locks, and provided participants with safe cycling training and post-program support.

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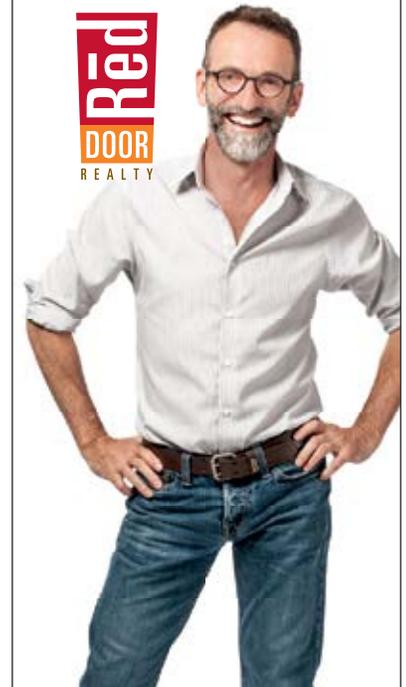
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