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Water

A source of concern for agricultural producers and agri-food processors in Quebec.

*Perspective Report prepared for CAPI by
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*Perspective
Report*



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Note from CAPI

Canada, the second largest country in the world, has vast fertile land and contains approximately 20% of the planet's freshwater reserves. It is the 5th largest exporter of food and, in an era of climate change and geopolitical instability, has a key role to play in global food trade and food security. According to the United Nations, by 2050 there will be more than 9.1 billion people in the world, requiring a 70% increase in food production from current levels.

Canada cannot assume the role – indeed, the responsibility – of food provider without a national water management policy in concert with the provinces and the United States. Canada and the US share the Great Lakes and St. Lawrence River watershed, which drains 25% of the world's freshwater resources. Against this backdrop, CAPI believes that water quantity and quality present the prospect of redefining domestic and international agri-food trade.

In this *Perspective* Report, Nicolas Mesly focuses on the issues facing Quebec's agricultural producers and processors. This sector is the province's largest manufacturing sector, and its agri-food exports account for 12% of all Canadian agri-food exports. Nicolas Mesly is a CAPI Distinguished Fellow. As a journalist, photographer and agronomist, he has been recognized by Canada's press associations on more than 30 occasions.

Key Takeaways

- Despite an abundance of water in Quebec – over 1,000 mm per year in the fertile St. Lawrence watershed – the region is suffering from the effects of climate change, such as intense, short-lived rainstorms or prolonged periods of intense heat waves. As a result, crops have suffered and the cost of crop insurance has soared in recent years.
- Producers of vegetables and field crops alike must learn to manage on-farm water using technology such as efficient irrigation systems and reservoirs. The Quebec Vegetable Growers' Association (*l'Association des producteurs maraîchers du Québec, APMQ*) foresees infrastructure such as pipelines to bring water from the St. Lawrence River or adjacent rivers to deficit areas.
- Conflicts emerge between municipalities, agricultural production, industry, and environmental protection. There is a lack of leadership and financial resources allocated to managing competing interests in the watersheds. The greatest threat to water supplies is unbridled urban sprawl.
- The price of water is a concern for the province's agricultural producers, but in addition, the price of electricity is a major concern for members of the Quebec Food Processors' Association (*le Conseil de la transformation alimentaire du Québec, CTAQ*). For the Association, fair electricity and water prices are fundamental to the competitiveness of the industry from farm to fork.
- Livestock production (Quebec is the largest dairy- and pork-producing province in Canada) and intensive grain production (corn, soybeans) have affected the water quality of many waterways. An agreement between Quebec and Vermont is attempting to address the eutrophication problem in Missisquoi Bay/Champlain Lake, but results are mixed.
- Despite the existence of the International Joint Commission to manage transboundary water use and disputes between the United States and Canada, some Canadian businessmen and researchers interviewed for this fellowship fear that, with climate change, the future may hold massive water exports from Canada to the United States.

Foreword

Quebec has 3% of the world's freshwater reserves. The province is part of the immense watershed of the Great Lakes and the St. Lawrence River, the main maritime artery that drains 25% of the world's freshwater reserves. In 2009, Quebec acknowledged the collective nature of its water resources in its National Water Policy 2018–2030.¹

It's easy to imagine that this abundance of water would give Quebec's 27,500 agricultural businesses a competitive advantage. What's more, thanks to its network of hydroelectric dams, Hydro-Québec provides clean, renewable energy to the 550 agri-food processors who are part of the *Conseil de la transformation alimentaire du Québec* (Quebec Food Processors' Council), the CTAQ² which represents some 72,000 full-time workers and 100,000 indirect jobs. With more than \$31 billion in sales, agri-food processing is the largest manufacturing sector in the province.

In addition to those figures, agri-food exports account for more than \$10 billion, or 12% of Canadian agri-food exports (2021). Quebec products, including maple syrup, cranberries, blueberries, fruits and vegetables, and pork, can be found in more than 60 countries, the main ones being the United States, Japan, China, and Europe.

Quebecers are among the highest per capita consumers of water on the planet. They have always believed that the province's thousands of lakes and rivers are part of its very identity. While this may be true, climate change is changing the game, especially in the fertile lands of the St. Lawrence Lowlands where 70% of the province's agricultural production is carried out. Conflicts are emerging there between the agricultural sector, urban development, industry and the environment. Responsible water management will require a culture shift. Today, more than ever, water has become a societal issue.

The Potatoes are Getting Thirsty



Francis Desrochers, producer and president of the Québec Potato Growers' Association (PPTQ), fears there will be conflicts between producers over water use in the context of climate change (Nicolas Mesly).

"I'm afraid there's going to be a water war," says Francis Desrochers, a producer and President of the *Producteurs de pommes de terre du Québec*. The union represents some 200 producers who generate \$214 million in sales (2021).

Francis Desrochers cultivates 126 hectares in the sandy soil of Quebec's Lanaudière region, an area previously used for intensive tobacco farming. Since 2008, his yields have risen from 33.6 t/ha to 50.45 t/ha, well above the provincial and even the Canadian average (36.9 t/ha). He attributes this improved performance to the genetic improvement of varieties—he grows a dozen of them—as well as improved soil management—including crop rotation and the use of green manure—and the use of phytosanitary products. But above all, he says, the improvement has come from better water management. It takes a lot of water to grow the most popular vegetable in North America, especially in sandy soil.

Francis Desrochers invested \$2 million in a variety of irrigation systems (pivot, boom, sprinkler). He has a dozen ponds on his land that collect water from rain, snowmelt and two adjacent rivers. To satisfy his thirsty crop, he draws water from the Assomption and

¹ <https://www.environnement.gouv.qc.ca/eau/potable/index.htm>

² <https://conseiltaq.com/mission/>

Saint-Jean Rivers, which feed the Tourbière-de-Lanoraie ecological reserve.³ This vast natural environment of 415 hectares, with its rich biodiversity, operates as a filter for the water before it flows into the St. Lawrence River, the eastern Canadian province's main river artery.

The problem is, Francis Desrochers is not the only farmer who irrigates his land by pumping water from these and other rivers. Some 200 agri-business owners in the region cultivate 3600 hectares of crops under irrigation, including potatoes, cranberries, strawberries, but also sod farms and horticultural businesses. This array of businesses generates \$28 million in annual sales. But climate change is taking its toll, and record dry years in 2020 and 2021 have exacerbated tensions among water users.

"Which company will have priority of use over others? Is it going to be a toss-up between producing potatoes, grass or horticultural plants?" wonders the grower who supplies table potatoes to the major Canadian grocery chains Loblaw's, Metro and Wal-Mart, and exports some of his production to the US.



Francis Desrochers, pumps water from the Saint-Jean River, which feeds an ecological reserve in the region, to irrigate his potato fields. (Nicolas Mesly).



To harvest potatoes, farmers need access to water in both quantity and quality. (Nicolas Mesly).

As Quebec's Ouranos Consortium on Regional Climatology and Adaptation to Climate Change reports, the year 2021 was the second warmest on record in 107 years, with temperatures exceeding the 20th-century average for the 24th consecutive year.⁴ In 2021, Francis Desrochers had to pump 20 million extra litres of water from the Assomption and Saint-Jean rivers to ensure a harvest. But that same year, he got a nasty surprise. "My neighbour was drawing water from one of my ponds! Users absolutely have to be made aware of the consequences of poor water management, not only for themselves, but for others as well," he says.

Agricultural businesses in Quebec are subject to several laws and regulations concerning water quantity and quality, as well as the protection of wetlands such as peat bogs. Under Quebec's Water Withdrawal and Protection Regulation, in force since 2014, agri-businesses have been required to declare any withdrawal of surface water (from rivers, lakes or streams) and groundwater that exceeds 75,000 litres per day.⁵ "We don't know if our water permits will be renewed in 2024," says Francis Desrochers.

But the potential conflicts over protecting this water reserve are not limited to agricultural producers. The reserve is bordered by seven municipalities whose growing populations will create additional demands for drinking water, both for residents and industries. "The water law stipulates that the needs of the population have priority over all other sectors—industrial, agricultural and natural habitats—for the use of drinking water. This is a growing source of conflict in many Quebec municipalities in the context of climate change," notes Isabelle Charron, agronomist and President of Groupe AGECO, a consulting firm mandated by Quebec's Ministry of Agriculture, Fisheries and Food (MAPAQ) to conduct participatory research with key institutions and propose different scenarios for achieving sustainable agricultural water management by 2050, and which has already published two reports.⁶

Water issues related to the Lanaudière ecological reserve are now part of a large multidisciplinary research project called SCELANEAU,⁷ which is funded with a \$150,000 contribution from MAPAQ. The project brings together experts from various institutions and is spread over three years from 2021 to 2024. Researchers in the project have already considered drawing water from the groundwater trapped in a layer of clay beneath the reserve, but this water is salty, a legacy of the Champlain Sea that covered the entire Lower St. Lawrence region some 10,000 years ago.

"One avenue being explored is building a pipeline from the St. Lawrence River with pumping stations that will supply the region with 12 billion litres of water," says Dominic Brochu, agri-environmental officer and project manager at the Lanaudière Federation of Quebec's *Union des producteurs agricoles* (Union of Agricultural Producers, UPA). The cost of building such a pipeline, and the question of who will foot the bill, will not be known until the research project is completed.

⁴ <https://www.ouranos.ca/en>

⁵ <https://www.legisquebec.gouv.qc.ca/en/document/cr/q-2,%20r.%2035.2>

⁶ https://www.agrireseau.net/agroenvironnement/documents/101346/recherche-participative-d_alternativesdurables-pour-la-gestion-de-l_eau-en-milieu-agricole-dans-un-contexte-de-changement-climatique-radeau-1

⁷ <https://www.mapaq.gouv.qc.ca/SiteCollectionDocuments/Agroenvironnement/EAU-003-RESUME.pdf>

Because of droughts in 2020 and 2021, Johanne Pagé, a soybean producer in Quebec's Lanaudière region, is considering irrigating part of her fields with water from the Assomption River. (Nicolas Mesly).



Lettuce That's Drowning

While potatoes are getting thirsty, it's the opposite case about 50 kilometres south of Montreal, a stone's throw from the American border. The region is nicknamed "Little California" because of its black soil, ideal for growing vegetables. "It's much easier to deal with a drought than with a surplus of water," says Jean-Bernard Van Winden, standing near a huge field of head lettuce that could not be harvested. In July 2022, the field received 200 mm of rainfall in one week. "That was 100 mm too much," says the vegetable producer and co-owner of Hotte and Van Winden Farms.

The cost of excess rain, heat waves, hail, frost and crop insurance indemnities granted to producers by the *Financière agricole du Québec* (Agricultural Finance Organization of Quebec, FAQ) exceeded \$70 million in 2020, almost three times the average annual amount granted over the last ten years. In 2021, the cost was \$62 million. These compensations include vegetable producers, but also, increasingly, grain and hay producers.

Jean-Bernard Van Winden, co-owner of Hotte and Van Winden Farms, in front of a field of head lettuce that was never harvested during the 2022 season because of excess rain (Nicolas Mesly).



Pumping Groundwater

Hotte and Van Winden Farms is one of the four founding farms of the Van Winden family that supplies Vegpro International, Canada's largest producer and exporter of fresh vegetables, with a sales figure of \$270 million.⁸ The vegetable crop needs to use drinking water quality, especially to wash fresh salads and ready-to-eat baby lettuce, in order to meet the requirements of Canada GAP, a private certification body that guarantees traceability and food safety, which is required by major grocery chains in Canada and the United States. The Van Winden farms and associates also pump well water from regional groundwater, both to irrigate their production and to supply their washing and packaging facilities. The problem is that the groundwater table is overexploited.

"No more than 10% of the water in a water table should be withdrawn, but up to 40% is now being withdrawn in the region, which is not sustainable, especially with climate change," says René Lefebvre, a hydrologist at Quebec's *Institut national de la recherche scientifique* (National Institute of Scientific Research, INRS). The researcher notes that in the region, industrial draining such as that being carried out by quarries is siphoning off the most groundwater (51%), followed by residential uses (32%). Contrary to the general belief that agriculture is a major consumer of water, agriculture uses the least groundwater (17%).

Quebec's Ministry of Environment, Climate, Wildlife and Parks (MELCCFP), which is responsible for water policy, has for the last several years been drawing up an inventory of groundwater and surface water in an attempt to obtain an accurate picture of the overall quantities of water available. But there is no single leader who manages and allocates water resources for the province. "There are some forty watershed organizations⁹ that have a good

⁸ <https://vegpro.com/en/>

⁹ Between 2018 and 2021, the watershed organizations received an annual grant of \$240,000 each for their operations <https://statistique.quebec.ca/docs-ken/vitrine/strategie-quebecoise-eau/documents/7.1.1-Financement-OVB.pdf>

knowledge of the players on the ground and they should play this role. But they are underfunded and have no regulatory power,” explains Frédéric Lasserre, an expert in water geopolitics and professor at Laval University.

“Without having the acute water supply problems of California, Quebec will have to think about building infrastructure to store water on farms and to bring water from point A, where there’s a surplus, to point B, where there’s a deficit, possibly by pumping water from the St. Lawrence or from rivers that flow into it,” says Catherine Lessard, Assistant Director of the *Association des producteurs maraîchers du Québec* (Quebec Association of Vegetable Growers, APMQ), which has nearly 390 members.¹⁰

While considering the possibility of building this type of infrastructure, the agricultural community will have to adapt to the new reality of water scarcity or excess in Quebec, says Isabelle Charron. Charron says producers will have to learn to better manage the vital liquid by putting in place efficient irrigation systems and adequate retention ponds and by using technologies such as tensiometers, some of which were developed in Quebec and even used by producers in California,¹¹ the salad bowl of North America.

The province’s universities (McGill and Laval) and colleges, who teach agricultural economics, environmental science and technology, will also have to supply training to agronomists, other professionals and farmers on water management and other issues related to Quebec’s “blue gold.” But in all the scenarios being considered, population growth rate and consumption behaviour will have the greatest impact on water use, adds Isabelle Charron. “Producers can make an effort to feed the world, but if, by 2050, citizens are still pouring water over asphalt-covered parking lots in the middle of a heat wave to wash their cars or cool themselves off, we will still be very far from sustainable management,” she concludes.



“Water use is a taboo subject among agricultural producers because they fear that their permits will not be renewed,” says Isabelle Charron, agronomist and President of Groupe Agéco (*Émilie Nadeau*).

¹⁰ <https://apmquebec.com>

¹¹ The patented Hortau <https://hortau.com/technology/> tensiometer technology for accurately measuring water availability was invented by Professor Jean Caron, professor of soil physics at Laval University.

“Ten years ago producers thought of irrigation as an expense, but today they see it as an insurance policy,” says Mathieu Ricard of the company Riego (*Nicolas Mesly*).



Watch out for Rising Electricity Prices!

“If we’re not careful about the price of both water and electricity, it will be hard for the Canadian agri-food sector to remain competitive,” says Jean Gattuso. The former President and Chief Operating Officer of Lassonde Industries Inc, a Canadian and North American leader in the manufacture of fruit and vegetable juices and drinks, accepted an interview with the Canadian Agri-Food Policy Institute (CAPI). Gattuso was speaking a few months before taking a well-deserved retirement (September 2021).

Under his leadership, Rougemont, the Quebec-based Lassonde saw sales catapult from \$80 million in 1987 to almost \$1.9 billion in 2021. The company, listed on the Toronto Stock Exchange (LAS-A.TO), has 18 plants in Canada and the United States, and 2,700 employees.

Jean Gattuso was one of the founders of the *Conseil de la transformation alimentaire du Québec* (Food Processing Council of Quebec, CTAQ). The organization brings together 550 agri-food processors in a sector that generates more than \$30 billion in sales and provides 72,000 direct and 100,000 indirect jobs, making it the largest manufacturing sector in the province.

It’s Quebec’s Crown corporation, Hydro-Québec, that heats the province’s houses and supplies energy to its industrial sector, including agri-food processors. Agri-food processors have benefited from stable electricity rates

that are well below the 2% inflation rate for many years. But in December 2019, the government changed this by introducing a new law that adjusts Hydro-Québec's rates to inflation (Bill 34).¹²

In joint testimony before the Parliamentary Committee on Agriculture, Fisheries, Energy and Natural Resources (CAPERN),¹³ CTAQ Vice President of Innovation and Economic Affairs Dimitri Fraeys, as well as Sylvain Mayrand, Chief Operating Officer of Lassonde and Hammid Ghannou, Director of Energy Valuation at Olymel, the country's largest meat processor and largest exporter of pork, all strongly disagreed with the introduction of annual industrial rates based on inflation.

The trio argued that since food processing plants are already working with low margins, they cannot pass on inflation-based increases in electricity costs to their customers. In the case of Lassonde, the company is competing with Pepsi (Tropicana) and Coke (Minute Maid), two giants on the shelves of major supermarket chains. The same is true for Olymel, which has sales of \$3.4 billion and 9,500 employees and is competing with pork sold in the Chinese and Japanese markets by American, Brazilian, European and Chilean exporters. (Quebec's pork exports average more than \$1.9 billion, or more than twice the hydroelectricity exports for the period 2019–2021.)

"This increase in electricity rates is not sustainable. It means less money for short- and medium-term investments for our businesses, for research and development, and to cover environmental expenses. Moreover, this increase makes our companies less competitive with the rest of Canada and internationally," says Dimitri Fraeys.

Since the law was passed, the world economy was halted by the COVID-19 pandemic in 2020–2021; it has suffered under the effects of the US-China trade war and the disruption of supply chains; it has been subjected to the Russian invasion of Ukraine in 2022; finally, it saw a general increase in interest rates to counter inflation and flirted with the threat of a recession in the same year. In addition, the Quebec government was forced to cap both domestic and industrial Hydro-Québec rates well below the rate of inflation. In 2022 alone, this rate averaged 6.3%!¹⁴

However, Quebec's current government still has its eye on hydroelectricity rates. On the one hand, Premier François Legault wants to convert the province into the "green battery" of North America by relying heavily on Hydro-Québec, one of the largest electricity producers in the world. To achieve this goal, the province would need to increase its current output by 50% to meet, among

US INVESTOR BECOMES MAJORITY SHAREHOLDER OF VEGPRO INTERNATIONAL

VegPro International, Canada's largest producer and exporter of fresh vegetables, welcomed a new majority shareholder to its ranks in June: the Seattle-based American investment fund Vision Ridge Partners. "This new shareholder is clearly banking on the strong growth potential of our company. It's clear that our water management, as well as the availability and quality of our water, were attractive features in the transaction," explains Anthony Fantin, one of the two co-founders of VegPro International, who was interviewed at the company's head office in Sherrington, south of Montreal.

The company generates \$270 million in sales and has farms and packaging centres in Quebec and Florida, which allow it to supply the American east coast 12 months a year. VegPro International also operates in British Columbia. Fantin would not say how much the financial deal with Vision Ridge Partners would cost, but he said the company's farmland holdings in Quebec, Florida, and B.C. are excluded from the deal.

¹² <https://ici.radio-canada.ca/nouvelle/1422495/bailon-projet-loi-34-tarifs-electricite-adopte-aujourd'hui>

<https://montrealgazette.com/news/quebec/quebecers-will-pay-more-opposition-parties-blast-caqs-hydro-quebec-rate-bill>

¹³ <https://www.assnat.qc.ca/fr/video-audio/archives-parlementaires/travaux-commissions/AudioVideo-82017.html>

¹⁴ https://www.bankofcanada.ca/rates/indicators/key-variables/inflation-control-target/?_gl=1*_ga*_ga*NTA4MDM3MDQwLjE2NzM1NTYyOTg.*_ga_D0WRRH3RZH*MTY3NjM4NDk2Ny4yLjEuMTY3NjM4NTAxMy4wLjAuMA..&_ga=2.243645446.2036704764.1676384967-508037040.1673556298

https://www.bankofcanada.ca/rates/indicators/key-variables/inflation-control-target/?_gl=1*_ga*_ga*NTA4MDM3MDQwLjE2NzM1NTYyOTg.*_ga_D0WRRH3RZH*MTY3NjM4NDk2Ny4yLjEuMTY3NjM4NTAxMy4wLjAuMA..&_ga=2.243645446.2036704764.1676384967-508037040.1673556298

other things, the boom generated by the development of electric vehicles on the continent. There is also talk in the province of building new dams.

On the other hand, the Premier is aiming to decarbonize the Quebec economy by adjusting industrial electricity rates for businesses in function of their efforts to reduce greenhouse gases. A vast consultation on revising electricity rates for businesses is planned for next spring with a view to introducing a bill in the fall of 2023 and the CTAQ will certainly have its say in that.

The Price of Water

What exactly happened to make water, an essential resource for life, thousands of times cheaper than diamonds? This paradox, raised by the Scottish economist and philosopher Adam Smith (1723–1790), is still a source of debate today. Since 2010, the United Nations has declared water a fundamental right at a time when, according to the World Health Organization, one in three people in the world do not have access to safe water.

Since 2011, all economic actors in Quebec have had to pay for water according to the user pays principle. At the COP15 in Montreal last December, Quebec Premier François Legault said he wanted to introduce a bill in 2023 that would significantly increase rates for companies that use drinking water in Quebec, according to the *Journal de Québec*.¹⁵ So far, farmers have been spared paying for the precious liquid, but they must declare their water consumption over a certain threshold. Industries such as water bottlers as well as beverage, pesticide and fertilizer manufacturers that use water in their products must pay a fee of \$0.07 per cubic metre used.¹⁶ In 2021, Quebec received less than \$3 million in royalties for water withdrawals of 811 billion litres, according to the press release.¹⁷

The Quebec organization *Eau Secours* (Help our Water),¹⁸ which argues for responsible water management, along with several municipalities are, together, asking for more transparency about the royalties the government is receiving for water, as well as the quantities of water being withdrawn by different industries on its territory. The Premier also announced the creation of a Blue Fund using these fees, which should reach \$650 million by 2026. This fund would be used, among other things, to support farmers by establishing riparian buffer strips to control pollution from fertilizers or pesticides.

¹⁵ <https://www.legisquebec.gouv.qc.ca/en/document/cr/Q-2,%20r.%2042.1>

¹⁶ https://www.quebec.ca/nouvelles/actualites/details/page?tx_news_pi1%5Bnews%5D=44825&cHash=e52b6dbb23f90460406648869e1a6c6d

¹⁷ https://www.quebec.ca/nouvelles/actualites/details/page?tx_news_pi1%5Bnews%5D=44825&cHash=e52b6dbb23f90460406648869e1a6c6d

¹⁸ <https://eausecours.org/annonce-dun-projet-de-loi-sur-leau-redevance-doit-rimer-avec-transparence/>

François Legault, Premier of Quebec (Government of Quebec).



Massive Water Exports to the United States?

In the context of climate change, fear that Canada's powerful American neighbour will one day take over its waters is very much alive among the researchers and business owners surveyed by CAPI. The province of Quebec is located at the end of the immense watershed of the Great Lakes and the St. Lawrence River. The Great Lakes, which border the United States and Canada, constitute the largest freshwater reserve in the world. Since 2005, this precious stock of "blue gold" has been the object of an agreement between eight American states,¹⁹ Ontario and Quebec, under the aegis of the International Joint Commission.²⁰ The agreement aims to conserve and protect the vital resource and resolve transboundary water withdrawal disputes between Canada and the United States.

"The agreement was prompted by concerns about massive exports of water from the Great Lakes to supply cities in the central and southern United States, and to California, where it would be used for irrigation. These withdrawals would affect the water level of the Great Lakes, of which barely 1% of the total volume is renewed each year," explains Frédéric Lasserre, an expert in the geopolitics of water and professor at Laval University.

Pharaonic projects

Two major infrastructure projects, one American and the other Canadian, have fuelled an emotional debate since the 1960s, explains journalist Peter Annin, a specialist of environmental conflicts, in his book *The Great Lakes*

¹⁹ (Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania et Wisconsin)

²⁰ <https://ijc.org/en/who/role>

Water Wars. The first of these projects, The North American Water and Power Alliance (NAWAPA), would have diverted astronomical amounts of water through one canal starting in Alaska and transited through Alberta and Saskatchewan to Lake Superior, where another would carry it all the way to California. The other huge project, called the Grand Canal, is the eastern Canadian equivalent of the NAWAPA. The project was the brainchild of a Canadian engineer, Tom Kierans, who graduated from McGill University in Montreal. According to his scenario, massive amounts of water would be drawn from James Bay and channelled through Quebec and Ontario to the Great Lakes and then redistributed through a spider's web of canals throughout the United States. Both outrageous plumbing schemes would have cost hundreds of billions of dollars. But as it turned out, both died on drafting table because of their high cost and strong opposition from both sides of the border.²¹

Locking up the Great Lakes Water

It was also a Canadian businessman, John Febraro, President of the Nova Group, based in Sault-Ste Marie in northern Ontario, who sparked discussion of massive Canadian water exports in the late 1990s and early 2000s.²² His plan was to pump drinking water from Lake Superior to fill huge tankers which would then be exported to Asian markets. The project raised a thorny question: if we start considering the Great Lakes water as a commodity, how will we turn the tap off? "The legal argument put forward by the Great Lakes agreement is that if water is removed, it must be returned in the same volume and condition as it was taken. That brings water treatment into the issue and sets the environmental bar very high for any project," explains Frédéric Lasserre. The Nova Group abandoned its project, but it's worth asking if a wealthy businessman like Elon Musk, with the necessary political backing, couldn't give it a shot one day.

"It's not impossible. In the North American Free Trade Agreement (NAFTA), now the Canada-United-States-Mexico Agreement (CUSMA), the question of a whether bulk water is a commodity is not legally defined. For example, water sold in bottles or used in beverages is marketed as a commodity. For bulk water exports, it is not clear, but since the bar is so high on the environmental requirements needed to draw water from the Great Lakes, it would be it a very difficult venture."

Quebec wants to double its greenhouse production

The Quebec government has announced a 2020–2025 greenhouse growth strategy to double the current volume of fruit and vegetable production in the province's greenhouses, with the goal of reaching food self-sufficiency and a focus on renewable energy sources. Various support and financial assistance programs, including hydroelectricity rate subsidies, are available to businesses. These programs total \$91 million over five years and also aim to reduce GHG emissions by replacing oil and propane with electricity and biomass heating.

Frédéric Lasserre (Credit: Frédéric Lasserre)



²¹ Peter Annin, *The Great Lakes Water Wars*, Island Press, 2006, chapter 4, pages 58 to 63

²² Peter Annin, *The Great Lakes Water Wars*, Island Press, 2006, chapter 11

A Polluted Border

The province of Quebec is the country's leading producer of milk and pork, and 75% of the grain produced in the province, principally corn and soybeans, is used for animal feed. But agricultural development has come with a price: it is affecting the quality of the province's waterways.

"Two thirds of the phosphorus found in many of Quebec's waterways comes from farm fertilizers used in fields. The intensification of livestock farming over the past few decades, combined with intensive corn and soybean crops planted and harvested with increasingly heavy machinery, has caused soil compaction, which has led to runoff and soil erosion. All this, combined with excessive land drainage, leads to high loads of phosphorus, pesticides, sediments and coliforms in streams, rivers and lakes, including the St. Lawrence River," explains Aubert Michaud, a researcher and water quality expert who recently retired from the Research and Development Institute for the Agri-Environment (IRDA).

Some watersheds are heavily affected by agricultural pollution. This is the case for the Missisquoi Bay watershed of Lake Champlain, a popular tourist region on both sides of the border whose waters are shared by Quebec and Vermont. The Quebec portion has 630 agricultural businesses that occupy 30% of this territory, while Vermont agriculture occupies 24%. The territory is crossed by several rivers (see map²³). The problem is that an increase of blue-green algae (cyanobacteria) due to excess phosphorus has turned the bay and parts of the lake into what amounts to a disgusting soup for the 50,000 seasonal and permanent residents and tourists of Quebec and Vermont.

In 2002, the governments of Quebec and Vermont signed an agreement to work together to reduce the amount of phosphorus in the lake in order to clean it up, with Quebec sharing 40% of the responsibility and Vermont, 60%. While progress has been made since then, the target phosphorus concentration of 25 micrograms per litre of water, necessary to prevent eutrophication of the lake, has never been reached. The agreement expired in December 2016 and was renewed by authorities five years later, in 2021, explains Pierre Leduc, President of the *Organisme du bassin versant Baie Missisquoi* (Missisquoi Bay Watershed Organization).²⁴

On both sides of the border, the goal is to encourage farmers to adopt environmental farming practices, including reduction of inputs, direct seeding, crop rotation, cover crops, riparian buffer strips and other measures. Quebec's Ministry of Agriculture Fishing and Food (MAPAQ), for example, has set up a five-year, \$125 million sustainable agriculture plan for 2020–2030²⁵ that encourages producers across the province to adopt good farming practices, including reducing phosphorus levels in the water.

"On the one hand, this aid is not getting through to our region, and on the other hand, we have a sense of urgency pushing us to try to solve the problem well before 2030," says Pierre Leduc. On the American side, he explains, the federal Clean Water Act (CWA) has more teeth than Quebec's water laws. And Ottawa doesn't have the equivalent of a CWA. The CWA requires Vermont to have an action plan in place to significantly reduce daily phosphorus concentrations in the lake. Over the past five years, the US has injected more than US\$29 million in support measures for agri-businesses. "We are still waiting for a precise financial game plan for our part of the watershed. It's embarrassing," concludes Pierre Leduc.

²³ Map: Catchment area <https://obvbm.org/territoire/gestion-transfrontaliere-des-eaux/>

²⁴ <https://obvbm.org/obvbm/equipe-et-contact/>

²⁵ https://cdn-contenu.quebec.ca/cdn-contenu/adm/min/agriculture-pecheries-alimentation/publications-adm/dossier/plan_agriculture_durable/PL_agriculture_durable_MAPAQ.pdf