March 15, 2019

Senator Brownie Carson, Chair
Committee on Environment and Natural Resources
100 State House Station
Augusta, ME 04333

There are many reasons to support LD 640, but the most important reason is because the Canadian Government has muzzled its scientists for 50 years from revealing the adverse environmental impacts that HydroQuebec's reservoir hydroelectric facilities are having on the air, land, and water.

The following news articles, which I have attached to this letter, are a small sample of this censorship:

1. **Science Abandoned, Scientists Muzzled** Andrea Hill, Postmedia News in "The Leader Post" January 10, 2014 "The federal government 'really doesn't grasp what science is about' and could be unable to respond to adverse environmental changes because it has abandoned research into climate change and water pollution, say scientists interviewed for CBC's The Fifth Estate"

2. **MPs panel to probe allegations fisheries scientists were silenced** in Vancouver Sun, November 1, 1997 "Allegations in a published article by scientists allege they were muzzled and their work is tainted by politics"

3. **Court rejects federal assessment of Quebec power project** by Bob Cox in Ottawa Citizen, November 21, 1992 "The federal government has no power to do an environmental assessment of the $1.5 billion Eastmain hydro-electric project in northern Quebec, the Federal Court of Appeal has ruled. In a 3-0 decision released Friday, the appeal court overturned a lower court ruling which ordered the federal government to do a full impact study of the work, which is part of the James Bay hydro project."

4. **Gagged scientist's study may show hydro power as polluting as coal** by Graeme Hamilton in Gazette Montreal, October 11, 1991 "Judging from data gathered so far on gas emissions from ponds around James Bay, Rudd and Kelly believe hydro-electric stations could contribute as much to global warming as coal-fired power stations."

5. **Federal scientists silenced by government gag order** in the Ottawa Citizen March 26, 1986 "Douglas Hallett resigned in January from his position as senior scientific adviser for Environmet Canada's Ontario region. He said Tuesday he quit because Environment Minister Tom McMillan "muzzled me, tied my hands. I was taken off projects which I started such as the St. Clair River (toxic blob) because they were hot political issues. Finally, I was in a situation where I could not answer my own telephone…..My telephone calls were all screened by a number of secretaries and I only got to call back the people who weren't in the media."

6. **James Bay seen as test on environment** Star Phoenix January 8, 1976 "The man in charge of assessing the environmental impact of Quebec's massive James Bay hydroelectric project admitted Wednesday no one is sure just what its impact on the environment will be. 'We are using this project as an experience to see what will happen,' Alain Soucy said in an interview. 'We have about $100 million to spend over the next 3 years on remedial action, though.' The head of James Bay Energy Corporation's environmental department said that even if there were severe environmental problems caused by the project it would not be curtailed. 'We can't change the scale of the project or it will not work.' he explained."

7. **Dams stop nature's ways on mighty rivers** by Bruce Little in Calgary Herald February 25, 1974 "Hans Neu does not go along with that assessment. He is an expert in hydrology at the Bedford Institute of Oceanography here and he feels hydro power may be far dirtier than most people realize. Instead of looking upriver for the effects of a dam, Neu looks at the ocean into which the river waters eventually spill."

8. **Research shows Canada's dams are salmon's doom** by Dianne Murray in Windsor Star March 5, 1974 "Canadian oceanographer Hans Neu has shown we've already got the world's highest rate of blocked freshwater flow. For his trouble in trying to alert the federal government to his research, he was virtually run out of his job at the Bedford Institute"…."Also, biologist Wilfred Carter makes it sound like there's no relevant research, when in fact Canadian government scientists have been muzzled by their director general on this issue for some time."

9. **Environment Studies Lacking** in Ottawa Journal October 26, 1971 "Dr. J. S. Nelson, president of the Canadian Society of Environmental Biologists, says the Canadian government has not called for a single environmental study at the outset of any major development"….. "Hans Neu, an engineer-scientist with the Bedford Institute near here, said the environment is becoming another business…."a political football"…. "we have to take a closer look at the environment before we continue exploitation."

10. **White Man Will Destroy Everything We Have** in Ottawa Journal February 17, 1973 "Similarly, in Labrador, a new hydroelectric project has dried up Churchill Falls, once one of the world's mightiest waterfalls, but there have been few objections. Spokesmen for the company that built the power plant explained that the waterfall was so remote that relatively few people ever got a chance to see it anyway. Here in the James Bay region, the same kind of outlook is found in a corporation publication that refers to the spectacularly turbulent rivers that are to be harnessed as 'a vast potential now wasting in foam and swirls'…… 'If the white man makes his electricity on our rivers, it will destroy everything we have', said George Pachano, a 49 year old Cree Indian, a wiry man with straight black hair and a face deeply lined by years of squinting into the northern sun."

You don't muzzle the scientific community if your facilities are good for the environment! For this reason, the scope of LD 640 has to be expanded to include the adverse environmental impacts of HydroQuebec's reservoir hydroelectric facilities on the land and water.

Do you know that the NECEC project covers 5,283 acres and the HydroQuebec's reservoirs have flooded over ten million acres; including one million acres of wetlands, streams, ponds, rivers, and lakes?

This is the equivalent of clearcutting almost one half of Maine and these Canadian forests will never grow back again. The Canadian Boreal Forests represent a quarter of the world's remaining intact forests, they are the lungs of the land. The sequestration of carbon dioxide by these 10 million acres of trees has been lost forever!

Do you know the spring freshet is nature's design to provide as much silica and nutrient enriched water as it can just at the time it is needed most to feed the fisheries, silica-encased diatom phytoplankton, and zooplankton and HydroQuebec has eliminated it.

"Diatoms are at the bottom of the food chain and suck up nearly one quarter of the atmosphere's carbon dioxide….Size matters for the creatures that eat them and also for carbon sequestration, as large diatoms are more likely to sink when they die….If smaller size diatoms dominate, then carbon sequestration becomes less efficient, and there may be more carbon dioxide in the atmosphere, which would exacerbate global warming." (Litchman et. Al. 2000) (See "The Problem is the Lack of Silica" S. Kasprzak, October 15, 2018)

"Worldwide, diatom numbers, like other beneficial phytoplankton, are disappearing by about 1 percent per year. In the Gulf of Maine, phytoplankton, including diatoms, have decreased by a factor of five in just 17 years. Diatoms require adequate dissolved sillicate to grow their heavy thick shells" (Bangor Daily New Editorial, Roger Wheeler, January 8, 2019)

Do you know that natural (unregulated) spring freshets typically last up to 3 months with river flows three to five times greater than fall and winter flows?

"To meet the demand of electricity during cold weather, dams and diversions have increased the winter flow on the La Grande River in Quebec by eight times (from 17,600 cubic feet per second to 141,000 cu.ft/sec.) and in order to store water for the following winter have eradicated the spring flood, flow reduced from 177,000 cu.ft./sec to 53,000 cu.ft./sec. (Excerpted from "Silence Rivers: The Ecology and Politics of Large Dams" by Patrick McCully)

The spring freshet (flood) on the La Grande River has been reduced 70 percent by HydroQuebec and the typical reduction on all its dams has been between 50 to 70 percent.

Many in the scientific community, particularly in the U.S., have remained silent over these high reductions in the spring runoff which exceed "a common universality, namely if spring runoff diversions cross 25 t0 30 percent of its perennial norm than a coastal ecosystem's dynamic equilibrium will be irrevocably distorted." (Michael A. Rozengurt 2003)

(See Attached Fact Sheet "MAN-MADE STORAGE OF WATER RESOURCES – A LIABILITY TO THE OCEAN ENVIRONMENT" by Kasprzak Feb. 11, 2019)

"Little-known outside aquatic science, freshwater runoff is crucial to healthy fisheries. Dr. Michael A. Rozengurt and his colleagues have shown a real physical threshold for safely blocking runoff from fish: No more than 25 percent of this freshwater flow to the sea can be blocked before fisheries are doomed to an inevitable decline. In the U.S., the former Soviet Union and elsewhere, the story's the same. Canadian oceanographer Hans Neu has shown we've already got the world's highest rate of blocked freshwater flow. For his trouble in trying to alert the federal government to this research he was virtually run out of his job at the Bedford Institute." (Montreal, Winter Star, March 5, 1974 by Dianne Murray, coordinator Dam-Reservoir Working Group Ottawa)

Ms. Murray also wrote in this article, "Also, biologist Wilfred Carter makes it sound like there's no relevant research, **when in fact Canadian government scientists have been muzzled by their director general on this issue for some time."**

The spring freshets in the rivers of Quebec are so powerful that they eventually reach Maine's Georges Bank.

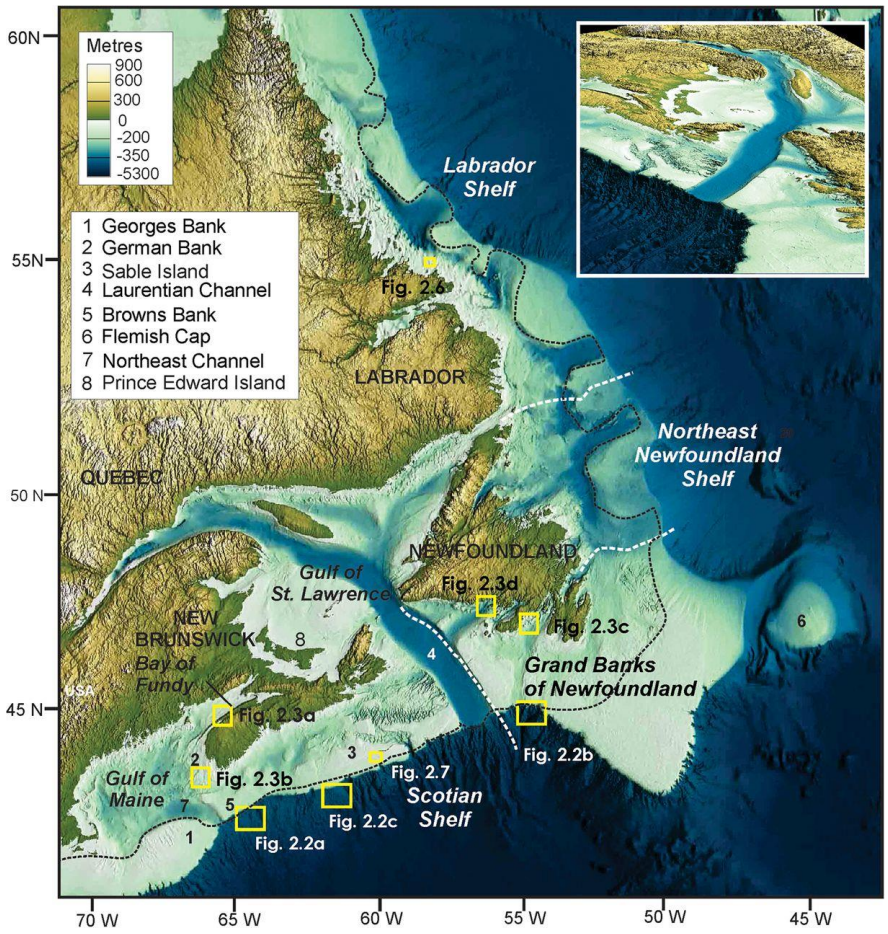
"On the Scotian Shelf, therefore, there are two freshening cycles annually, a larger one in summer and a smaller one in winter from Canadian North. On Maine's Georges Bank, these freshwater waves would arrive in autumn and spring respectively." (Dr. Hans Neu 1982)

HydroQuebec has eliminiated these fresh water waves, which were historically generated by the natural spring freshets.

Did you know that the spring freshet was the lifeblood of coastal ecosystems and the discharge of its torrents into coastal waters would create temperature and density gradients, known as thermohaline currents, which would pump nutrient enriched deep sea water through deep channels up into the coastal waters and estuarties?

(See Attached Fact Sheet "HYDRODAMS BLAMED FOR DECLINE IN FISH STOCKS" by Kasprzak Feb. 11, 2019)

"Normally, the stronger the flooding the more kinematic's energy is available to regulate water and salt exchange between an estuary and coastal sea….In other words, a natural spring inflow energy tended to maintain regime balance through outflows to seas as required by the first law of thermodynamics." ("Agonizing Coastal Sea Ecosystems: Understanding The Cause; Placing the Blame!" M.A. Rozengurt 2003)



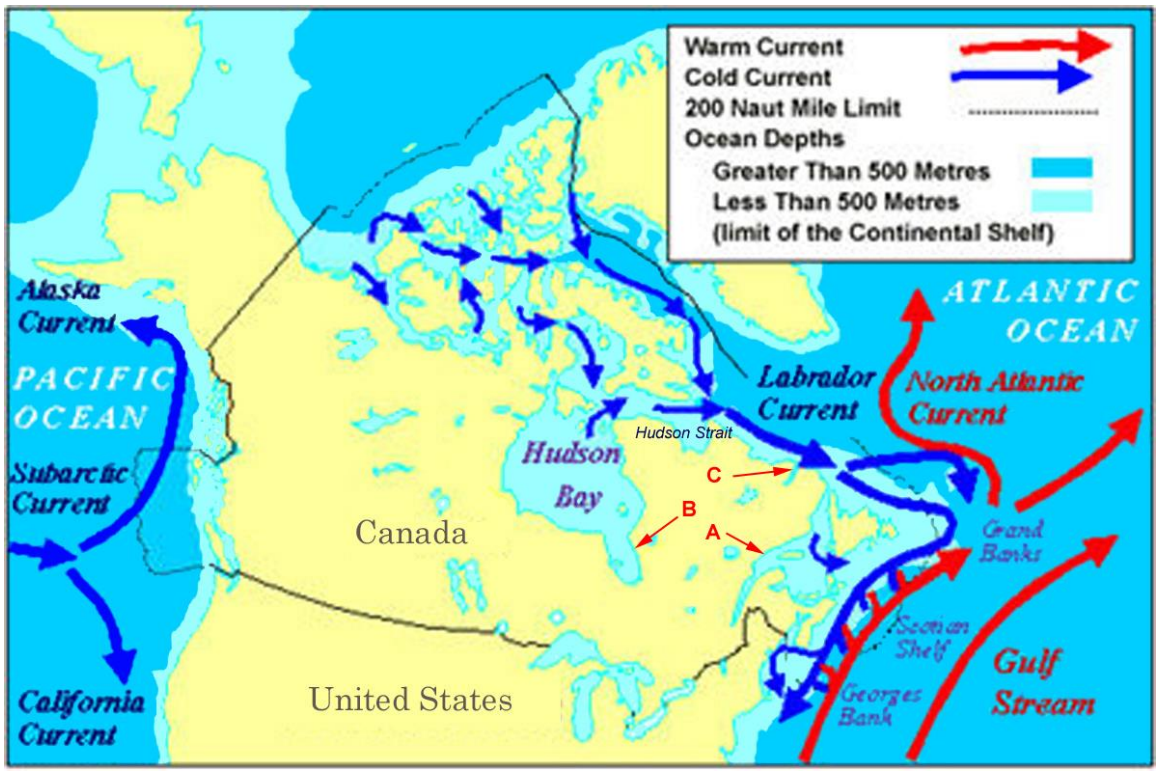
Map 1

Source: SHAW, TODD, LI, MOSHER & KOSTYLEV Geological Survey of Canada (Atlantic), Bedford Institute of Oceanography

HydroQuebec does not have an agenda to feed the ocean fisheries! So instead of letting all that energy of the spring freshet go to waste, their engineers have built larger reservoir dams, which are capable of holding the spring run-off of large drainage areas and storing it until winter, or for years.

The water volume of Moosehead Lake in Maine is 5.19 cubic kilometers and HydroQuebec built the following dams with a storage capacity equivalent to the amount of water in 80 Moosehead Lakes in the three watersheds listed below and labeled on Map 2.

A. Gulf of St. Lawrence Watershed		B. James Bay/Hudson Bay Watershed		C. Labrador Sea Watershed	
1956 Bersimis -1	13.9 km³	1979-81 Robert-Bourassa Generating Station	61.7km³	1971-74 Churchill Falls	32.64 km³
1969 Outardes-4	24.3 km³	1982-84 LaGrande -3 Generating Station	60.0km³		
1970 Daniel Johnson Dam	142.0 km³	1984-85 LaGrande-4	24.5 km³		
		1993 Brisay	53.8 km³		
	180.2 km³		200.0 km³		32.64km³

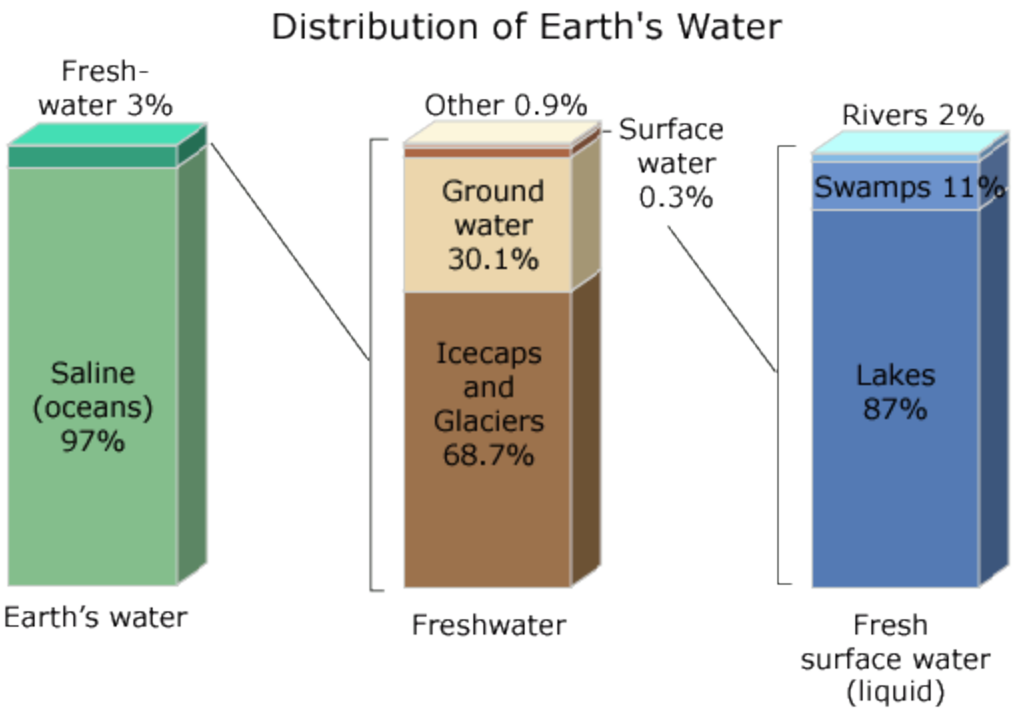


Map 2 Source: The Canadian Encyclopedia

This colossal storage of the water equivalency of 80 Moosehead Lakes is hard to envision. Moosehead Lake is the headwaters of the Kennebec River and the river is approximately 1,000 feet wide at the Interstate 95 bridge in Fairfield. A simple analogy would be 80 Kennebec Rivers flowing together at this point would be 15 miles (80,000 feet) wide. All of this energy and nutrients of the spring freshet have been eliminated by HydroQuebec from Gulf of St. Lawrence and Northwest Atlantic.

Another way to envision the immensity of what HydroQuebec has done is to realize that the storage of 400 cubic kilometers of fresh water represents 20 percent of the water volume in all the rivers in the world.

Freshwater makes up only 3 percent of earth's water and rivers make up 0.006 percent of freshwater with a water volume of 2,120 kilometers.



Source: Gleick, P. H., 1996: Water resources. In Encyclopedia of Climate and Weather, ed. by S. H. Schneider, Oxford University Press, New York, vol. 2, pp.817-823.

One estimate of global fresh-water distribution				
Water source	**Water volume, in cubic miles**	**Water volume, in cubic kilometers**	**Percent of freshwater**	**Percent of total water**
Lakes, swamps	24,600	102,500	0.29%	0.008%
Rivers	509	2,120	0.006%	0.0002%
Total global fresh water	8,404,000	35,030,000	100%	2.5%
Total global water	332,500,000	1,386,000,000	--	100%

Source: Gleick, P. H., 1996: Water resources. In Encyclopedia of Climate and Weather, ed. by S. H. Schneider, Oxford University Press, New York, vol. 2, pp.817-823.

In 1982, global warming was not a household word, but Dr. Neu warned "that both winter and summer temperatures of the surface layer will increase" because of the damming of the spring freshet.

According to the following, there was a boom in dam construction around the world:

"…dam construction began in 1900 and boomed from about 1950 with the use of concrete and inno-vation in excavation (Fig.1). Currently, ~70% of the world's rivers are intercepted by dams (Kummu and Varis 2007) and in China, >80,000 reservoirs were constructed by the end of 2008, among which were >5000 dams higher than 30 m. (http://www.chincold.org.cn). Dams are built to store water for various purposes. Acoompanied with the rapid increase of dam construction (from 1948 to 2010), the global active storage capacity of reservoirs grew from about 200 to >5000 km3, >70% of the total global reservoir capacity (7000-8000km 3); Vorosmarty 1997, Zhou et al. 2016).

Besides thermohaline currents in coastal waters, there is a thermohaline circulation in the world ocean and a major force in the strength of this circulation is the freshwater fluxes of the rivers in Quebec, Newfoundland Labrador (NL) and Gulf of St. Lawrence, including the Great Lakes.

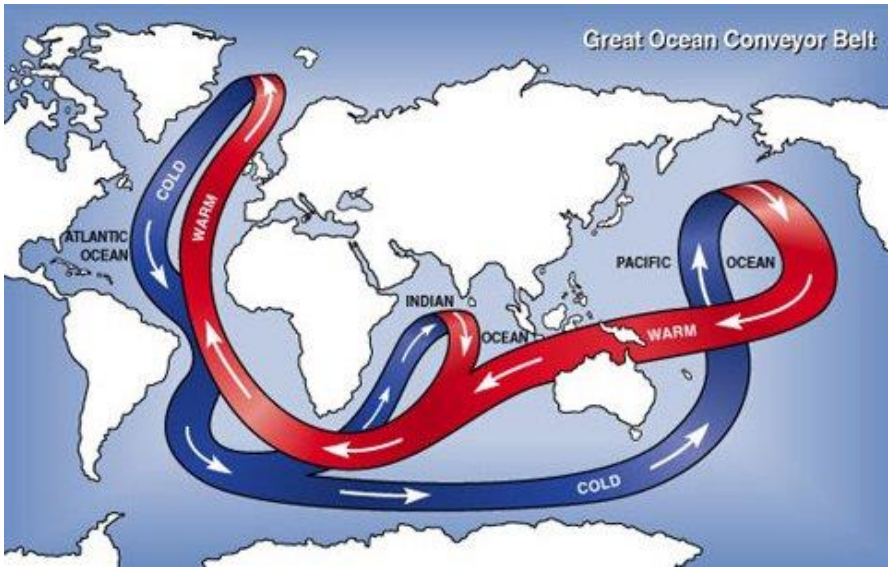
Did you know HydroQuebec has withheld the spring freshet's energy which was used to power the thermohaline circulation?

This large scale ocean circulation is driven by global density gradients created by surface heat and freshwater fluxes, caused by differences in the salinity.

The biggest freshwater fluxes are the spring freshets in the northern latitudes. As you know, in a southern climate, there are no spring freshets.

Thermohaline circulation (*thermo*=temperature, *haline*=salt

* Thermohaline circulation is the part of the ocean circulation which is driven by density differences. Seawater density depends on temperature and salinity. Differences arise from heating and cooling at the sea surface and the introduction of freshwater into the salty sea water. Heat sources at the ocean bottom play a minor role.



Source: Argonne National Laboratory

The strength of the thermohaline circulation has a large impact on the climate of the earth.

Instead of mitigating climate change, a good case can be made that the proliferation of reservoir hydroelectric facilities may be the driving factor in the starvation of the fisheries and a major, if not the driving factor in the warming of the oceans and atmosphere.

The three graphs on the next page tell the story. The elimination of the cold waters of the spring freshet has contributed to the northern waters warming faster than those in the southern hemisphere along with weaker thermohaline currents allowing warmer gulf stream waters to have a greater impact warming northern hemisphere waters.

Conclusion

Both the strength of the localized thermohaline currents and the worldwide thermohaline circulation is directly correlated to the strength of the spring freshet (runoff).

Inevitably, spring follows winter! Not anymore in the Gulf of Maine or its ecosystem, which includes the Gulf of St Lawrence, Labrador Current, James Bay, and Hudson Bay.

Thanks to HydroQuebec, the cold and nutrient enriched waters of the spring freshet have been captured and stored behind its reservoir hydroelectric dams and "Excess water not used to generate electricity is stored in large reservoirs for use in later periods." (HydroQuebec 12/14/2018 letter in Maine PUC NECEC record.

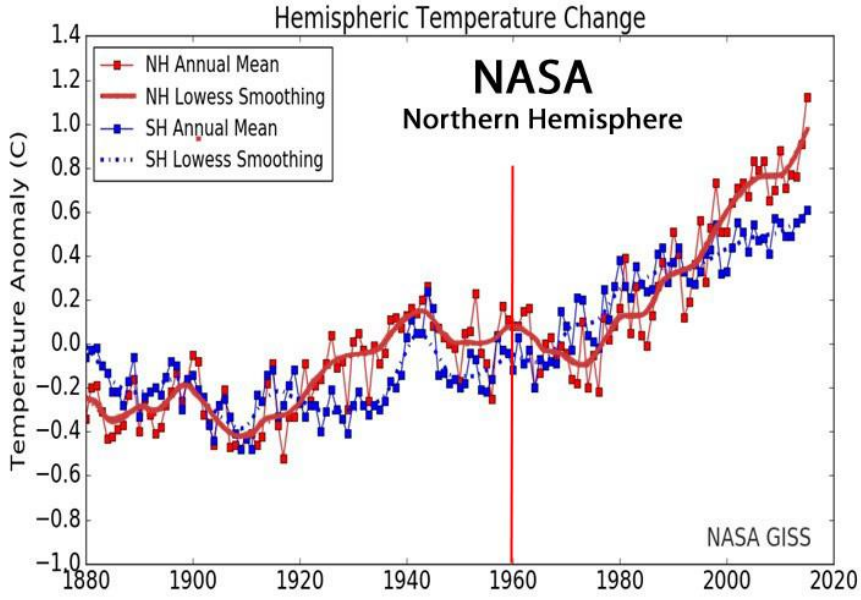
Since the oil embargo of the 1970's, we have been told that hydroelectricity is clean energy. In sharing all of this scientific data, I hope it is no longer hard to conceptualize that large reservoir hydroelectric facilities are polluting and warming the estuaries, coastal waters, and oceans of the world.

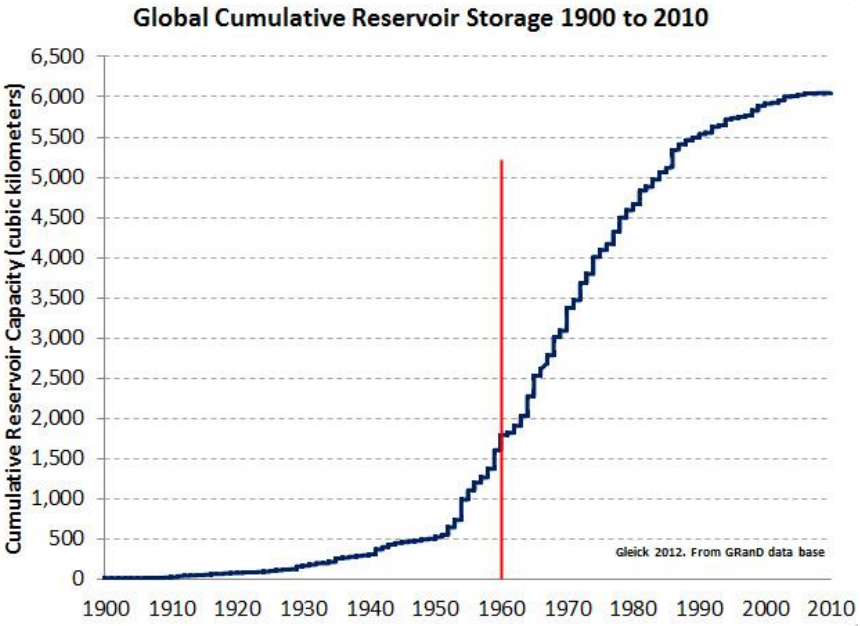
(See Attached: *"Proposed CMP New England Clean Energy Corridor (NECEC) Project Is Not Environmentally Clean Energy" by Kasprzak Mar. 4, 2109.*)

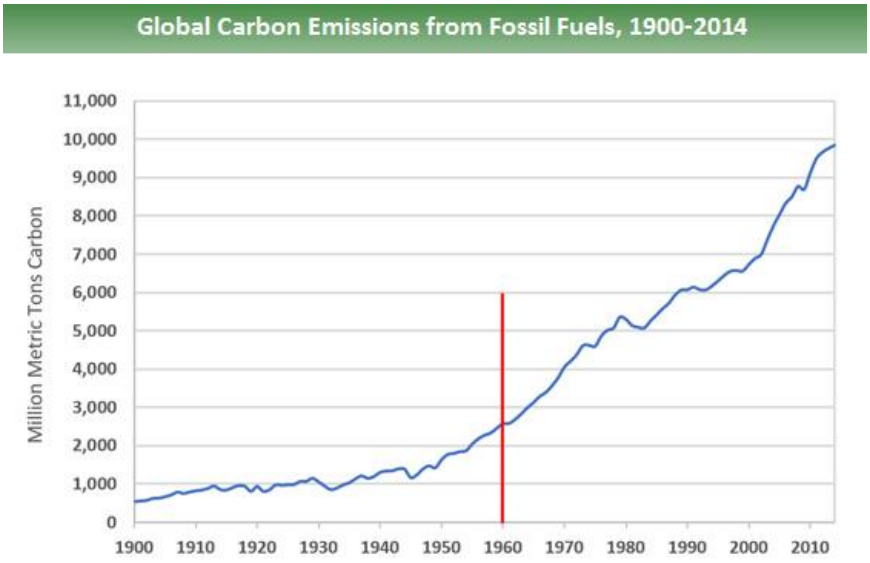
Sincerely,

Stephen M. Kasprzak

cc: Commissioner Gerald Reid, Maine DEP


Hemispheric Temperature Change
NASA
Northern Hemisphere
NH Annual Mean
NH Lowess Smoothing
SH Annual Mean
SH Lowess Smoothing
Temperature Anomaly (C)
NASA GISS
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
1880
1900
1920
1940
1960
1980
2000
2020


Global Cumulative Reservoir Storage 1900 to 2010
Cumulative Reservoir Capacity (cubic kilometers)
Gleick 2012. From GRanD data base
6,500
6,000
5,500
5,000
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
2010


Global Carbon Emissions from Fossil Fuels, 1900-2014
Million Metric Tons Carbon
11,000
10,000
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
2010

Science abandoned, scientists muzzled

ANDREA HILL
POSTMEDIA NEWS

OTTAWA — **The federal government "really doesn't grasp what science is about" and could be unable to respond to adverse environmental changes because it has abandoned research into climate change and water pollution, say scientists interviewed for CBC's The Fifth Estate.**

"What we have done in Canada is turned off the radar. We are flying along in an airplane and we put curtains over the windshield of those pilots of that flight crew and we've turned off the instruments," former government scientist Peter Ross says in the episode Silence of the Labs, which airs Friday night.

"We don't know what is coming tomorrow, let alone next year, in terms of some of these potentially catastrophic incidents."

The scientists said Prime Minister Stephen Harper's government has cut funding of pure science and is instead spending on projects that benefit industry and commerce.

Meanwhile, scientists are being restricted from talking to media and all messaging goes through "a spin machine."

After years of not being allowed to talk to media, Ross's department was terminated last spring because its work was deemed no longer important.

"My ability to convey important findings to the general public, to the electorate, to the taxpayer, had been severely curtailed," said Ross, a marine mammal toxicologist who once gave frequent media interviews about contamination in Canadian waters, wildlife and among northern people.

In 2008, Postmedia News — then Canwest News Service — obtained internal government documents that outlined how Environment Canada was muzzling its scientists by requiring all media inquiries be sent to Ottawa, where communications specialists would help scientists develop approved messages.

"Just as we have 'one department, one website' we should have 'one department, one voice,'" an Environment Canada PowerPoint presentation reads.

Postmedia News has uncovered other examples of scientists being silenced.

Documents obtained under access-to-information law showed that fisheries scientist Kristi Miller was forbidden to speak to media in January 2011 after she published a landmark study about the decline in farmed salmon in the Fraser River. Similarly, ozone scientist David Tarasick was not given approval to talk to reporters about a study he published on an Arctic ozone hole in the fall of 2011.

Additionally, an Ottawa Citizen investigation in spring 2012

Additionally, an Ottawa Citizen investigation in spring 2012 showed U.S. government contributors to a study on snowfall pattern were happy to speak to reporters, while Canadian government scientists working on the same study could not talk. Instead, 11 government employees spent a day emailing back and forth to agree on "approved" lines that did not directly address the paper's questions.

"They're feeding the public a bunch of hogwash and I think most people would accept that you can't run a democracy and make it function on a public informed with B.S.," former government scientist David Schindler told the CBC.

Information commissioner Suzanne Legault confirmed in the spring she is investigating whether the government is breaching access to information law by restricting what its scientists can say

The Leader Post. Jan 10, 2014

MPs panel to probe allegations fisheries scientists were silenced

A panel will question officials with the aim of preventing mismanagement blamed for the collapse of fish stocks.

CANADIAN PRESS

HALIFAX — A parliamentary committee has launched an investigation into policies and practices in the fisheries and oceans department after repeated allegations that scientists are muzzled and their work is tainted by politics.

The Commons fisheries committee [illegible] House of Commons without fear of retribution."

Baker's announcement came after months of controversy over leaked documents and a scientific journal article indicating fisheries science was moulded to suit a political agenda before stocks collapsed in 1992.

Between 37,000 and 41,000

Fisheries probe

The background: Allegations in a published article by scientists allege they were muzzled and their work is tainted by politics.

What's happening: The Commons fisheries committee has decided to [illegible]

9 of 152

What's planned: Hear-

Vancouver Sun Nov 1, 1997

Court rejects federal assessment of Quebec power project

By Bob Cox
The Canadian Press

The federal government has no power to do an environmental assessment of the $1.5-billion Eastmain hydro-electric project in northern Quebec, the Federal Court of Appeal has ruled.

In a 3-0 decision released Friday, the appeal court overturned a lower court ruling which ordered the federal government to do a full impact study of the work, which is part of the James Bay hydro project.

James Bay Crees immediately said they would appeal the ruling to the Supreme Court of Canada.

They said the decision has broad implications because it runs counter to recent Supreme Court rulings which favored environmental assessments and expanded recognition of native rights.

Bacon
Roadblock gone

"It's a devastating attack on aboriginal people and the environment," said Bill Namagoose, of the Grand Council of the Crees of Quebec.

"They've clearly given a licence to Hydro Quebec just to go in there and destroy the environment in northern Quebec."

The federal government had already started organizing an environmental review of the project which involves flooding 700 square kilometres of territory along the Eastmain River in the James Bay region.

It is part of the original James Bay hydro project, rather than the $12.6-billion expansion known as the Great Whale project.

In Montreal, Hydro-Québec said it's happy with the decision.

"The judgment confirms our contention that Eastmain 1 is part of the La Grande project which was covered under the James Bay agreement of 1975," said Hydro spokesman Guy Litalien.

In a statement, Litalien said Hydro-Québec will continue its efforts to arrive at an agreement with the Cree on compensation for development of the project.

Energy Minister Lise Bacon, in a statement from Quebec City, said the decision reaffirms Quebec's jurisdiction and clarifies the procedures for putting new hydro-electric projects in operation.

"The decision will allow us to start a project that's important for Quebec's economic development, while respecting environmental laws," Bacon said.

Ottawa Citizen Nov 21, 1992

QUEBEC

'Gagged' scientist's study may show hydro power as polluting as coal

GRAEME HAMILTON
THE GAZETTE

When New York environmentalists were looking for evidence last month on the relationship between flooding for hydro-electric dams and global warming, they turned to a federal-government scientist in Winnipeg who is researching methane and carbon-dioxide production from man-made reservoirs.

But on the day the researcher, John Rudd, was due to leave to testify at a New York City hearing on the state's power contract with Hydro-Québec, his superiors at the Fisheries and Oceans Department told him to unpack his bags.

The order shocked Rudd's coworkers, and one said she thinks department officials silenced Rudd because they were scared his theories might stir up more controversy for Quebec's already beleaguered Great Whale project.

"They were just nervous," said Carol Kelly, an associate professor at the University of Manitoba's microbiology department. "They thought it would be better for somebody to say nothing rather than something that could cause controversy."

Hydro-Québec's $17-billion export contract with New York, which is coming under increasing attack in the U.S., is apparently too sensitive an issue for federal officials to get mixed up in, Kelly said in an interview from Winnipeg.

There is little doubt that Rudd's work has the potential of sparking great controversy, and torpedoing one of the American utilities' major arguments in favor of buying power from Quebec.

Although he did not want to discuss the order not to go to New York, Rudd described his research in an interview from Winnipeg.

In a five-year project, he and other researchers are creating an artificial reservoir in northwestern Ontario to study the release of methyl mercury and greenhouse gases into the environment after flooding.

Rudd's hypothesis is that the peat in wetland areas slated for flooding in Hydro-Québec's James Bay 2 megaproject — similar to the test terrain in Ontario — will break down after flooding and release huge amounts of carbon dioxide and methane.

Scientists believe that when these gases accumulate in the atmosphere, they trap heat near the earth's surface and contribute to a gradual increase in global temperatures.

Judging from data gathered so far on gas emissions from ponds around James Bay, Rudd and Kelly believe hydro-electric stations could contribute as much to global warming as coal-fired power stations. If this were true, it would destroy hydro power's image as a clean alternative to fossil fuels.

Final results from Rudd's study are not expected until 1996.

"What I was planning to do was say, 'We don't know,'" Rudd said. "And maybe because we don't know it would be worth waiting until we do know" to build more dams.

Mike McMullen, the regional director of science for Fisheries and Oceans in Central Canada, denied that political considerations had anything to do with preventing Rudd from going to New York. Rudd had been invited to appear before New York City's environmental-protection committee on Sept 26.

"Dr. Rudd's project is really quite preliminary," McMullen said in an interview from Winnipeg. "He didn't have enough good, solid scientific evidence to add to the discussion going on there."

McMullen acknowledged, however, that it is very rare for one of the department's scientists to be told to clam up.

"No, it doesn't happen very often, or hardly ever," he said.

Oct 11, 1991

Federal scientists silenced by government gag order

Southam News and CP

A gag order has been placed on federal fisheries scientists on the West Coast in what officials have described as a "temporary experiment".

The experiment went into effect last week at the Pacific Biological Station in Nanaimo where the 200 employees have been instructed not to speak directly with the media.

McMillan

The move to muzzle the scientists mirrors recent efforts of Environment Canada to prevent its scientists from publicly discussing their research.

Douglas Hallett resigned in January from his position as senior scientific adviser for Environment Canada's Ontario region. He said Tuesday he quit because Environment Minister Tom McMillan "muzzled me, tied my hands."

"I was taken off projects which I started such as the St. Clair River (toxic blob) because they were hot political issues.

"Finally, I was in a situation where I could not answer my own telephone ... My telephone calls were all screened by a number of secretaries and I only got to call back the people who weren't in the media."

The fisheries gag order insists questions on everything from cloning of salmon to the growth of sea otter colonies must be submitted in writing. The answers, if provided, will be supplied in kind.

"This way they can ensure that there is no ambiguity in what is said about a scientific program," departmental spokesman Joanna Drewry said in an interview from Ottawa.

"You can appreciate that with cutbacks in government, everyone is very concerned that they not be perceived publicly in a bad light."

She couldn't say if the ban would be extended across the country, saying the possibility has not yet been discussed.

"I think we are going to have to sit down and deal with the broader questions of what we are doing ... and how information is going to be accessed."

It is not clear how long the ban will last or why it was implemented.

Jack Nightscales, senior public relations officer in the Pacific and Yukon fisheries office, said

The Ottawa Citizen Mar 26, 1986

Gag

From page A1 story:
Federal scientists silenced by government gag order

the interview ban was prompted by concern for accuracy in stories on fisheries research.

When asked for examples of problems, Nightscales cited a headline that recently appeared in *The Citizen* on a Southam News story on new techniques for aging fish. The headline, he said, ruffled feathers at fisheries headquarters.

"Ottawa (the federal government) got all excited about the headline," said Nightscales, adding that there was "absolutely nothing wrong" with the story which was factually correct.

He conceded the gag order will do nothing to prevent editors from writing headlines that officials don't like.

Another incident that saw Telexes fly to and from Ottawa was a Southam News story in December on sexually altered fish produced at a fisheries lab in Vancouver.

The story, which neither scientists nor fish farmers wanted made public, discussed problems encountered on fish farms using sperm from salmon that had been transformed from females into males.

A story on the discovery of a tarry toxic blob at the bottom of the St. Clair River near Sarnia led to the gag order on Environment Canada scientists.

McMillan was upset by some scientists' remarks and ordered new rules under which only officially designated spokesmen were allowed to talk to reporters. Until then, scientists had been free to answer questions.

In an interview, McMillan said Hallett helped create unwarranted fears among residents of the St. Clair river region.

"It isn't very helpful to have a fairly junior official, in this case Doug Hallett, to say we have potentially the biggest environment issue — a time bomb or whatever it was — in North America.

"We're dealing with life or death issues, all these people's drinking water.

" People around the St. Clair River are literally scared to death to drink their tap water. When they pick up a newspaper and see an Environment Canada spokesperson quoted, they take that as the word of God. "

McMillan appeared to be confusing Hallett with another Environment Canada scientist, Daryl Cowell, who told reporters in November that if toxic wastes buried in nearby limestone formations began to move to the St. Clair River it "could create the biggest hazardous waste problem in North America."

Hallett said he felt he had to quit the government after being prohibited from discussing his research with reporters and the public.

"If this isn't done, then I don't feel scientists are living up to their professional responsibility," he said.

However, McMillan said giving government scientists that kind of freedom was "undemocratic" and "a prescription for chaos."

"I don't think it's a debatable question," he said. "Academic freedom does not apply to civil servants."

The Ottawa Citizen Mar 26, 1986

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Star-Phoenix (Saskatoon, Saskatchewan, Canada) · 08 Jan 1976, Thu · Page 6

1 of 3 matches Hans Neu fish Find

James Bay seen as test on environment

OTTAWA (CP) – The man in charge of assessing the environmental impact of Quebec's massive James Bay hydroelectric project admitted Wednesday no one is sure just what its impact on the environment will be.

"We are using this project as an experience to see what will happen," Alain Soucy said in an interview. "We have about $100 million to spend over the next three years on remedial action, though."

The head of the James Bay Energy Corporation's environment department said that even if there were severe environmental problems caused by the project it would not be curtailed.

"We can't change the scale of the project or it will not work," he explained.

Since the James Bay hydroelectric project was announced in 1971 environmentalists have been worried about its effects.

In 1973 engineer-scientist Hans Neu of the Bedford Institute in Halifax said the project may even affect the climate of the Maritimes.

contends that if the disease spreads in Canada, it could jeopardize sales of semen from Canadian bulls to Australia, a major sheep producer. Semen sales to Australia earned Canada $2.5 million in 1974.

The cattlemen's association, representing most U.S. livestock producers, says the Canadian tests are a form of discriminatory trade practice.

Bill MacMillan, executive vice-president of the association, said in an interview he pressed the agriculture department to undertake random tests because he is convinced bluetongue, which can be spread by gnats, exists in Canada to the same extent as in the U.S.

He said the extensive testing done by Canada means a delay in delivery of about 60 days for some feeder cattle destined for export, making the trade uneconomical.

"I don't think the United States government should take the word of the Canadian government, considering all the problems we've had in the past," he added. He was referring to a restriction originally placed by Canada on U.S. cattle fattened with the growth hormone diethylstilbestrol (DES), potentially a cancer causing substance. Ottawa insisted that incoming U.S. cattle be certified free of the hormone.

Afterwards, Canada imposed import quotas on livestock and the U.S. retaliated with broader controls. The restrictions were lifted New Year's Eve.

6 of 33

Star Phoenix Jan 8, 1976

Dams stop nature's ways on mighty rivers

By Bruce Little
[Southam News Services,
Copyright, 1974]

DARTHMOUTH, N.S. — Protests over the environmental effects of huge power dam developments usually focus attention on what happens to the land above the dams that will be drowned in water.

Apart from that, an energy-hungry world tends to see hydro projects as a source of power that is clean relative to nuclear reactors and oil-fired thermal generators.

Hans Neu does not go along with that assessment. He is an expert in hydrology at the Bedford Institute of Oceanography here and he feels hydro power may be far dirtier than most people realize.

Instead of looking upriver for the effects of a dam, Neu looks at the ocean into which the river waters eventually spill.

In his view, well-dammed rivers like the Manicouagan in Quebec, have given man the power to alter drastically the after the entire ecosystem and the Atlantic coast.

His theories start with the hydrological cycle in which ocean waters evaporate, rise into the atmosphere and return to earth again inland in the form of rain that feeds the lakes with water.

In a southern climate, the process is continuous. But in the north, nature comes almost to a halt in the winter and doesn't need the water. Nature's solution is to store the water in the form of snow.

As a result, the flow of water from rivers to the sea falls off in the winter. In the spring, at the beginning of what he calls Canada's "very short but very strong biological activity season", the water is released.

It is nature's design to provide as much water as it can just at the time it is needed most. Before dams were built, water flows from the St. Lawrence, into which the Manicouagan drains, rose to an immense peak in the spring, more than three times the level of wnter.

This is where the other half of Neu's theory comes in.

As the fresh water of the St. Lawrence tumbles into the Gulf, it acts as a pump on salt water, drawing in salt water from the sea through deep gorges and pulling it up to mix with the new water on top.

This churning of the deep-running salt water brings to the surface the nutrients from near the ocean floor which fish and other forms of life need for food.

PROVIDED FOOD

The relationship of the two systems meant that the strongest flows of water, coming as they did in the spring, helped bring near the surface abundant quantities of food and nutrients.

But the daming of rivers has changed that neat interaction.

Instead of letting all that power-producing water in the spring go to waste, engineers have built huge storage lakes behind the dams that can hold the water until the following winter. Then it can be released to create power when the normal river flows would be small.

The result of these storage lakes is a flattening of the wide swings in the flow of rivers. And that means more nutrients in the Gulf are brought up in the winter, when they are needed least, while fewer nutrients are supplied in the spring and summer, when they are needed most.

Manicougan River dams cut the flow of the St. Lawrence River by as much as one-third in the spring, according to Neu's research, and he is worried that it could produce a stagnant Gulf.

Coming events

Announcements appearing in the Coming Events column are charged $2.25 for the first 25 words or less and 40c for each additional five words or portion thereof.

★ ★ ★

NO Shangri-La Bingo at the German Canadian Club on Monday, Feb. 25. T0396U

★ ★ ★

PLAN to attend the North Hill Eagles No 3473 Marathon Bingo March 9th at

Bingo every Tuesday 7:45 p.m. OLPH Hall, 625 - 4th Ave. N.E.

★ ★ ★

Montgomery Bingo 5003 - 16 Ave. N.W. every Wed. 7:45 p.m. $10 and $15 games, 4 jackpots and bonanza game.

Announcements

5 Births

McGINLEY — Patrick and Margaret (Daly) are happy to announce the arrival of Pauline Margaret on February 5. U0092U7

WUDRICH — Emil and Valerie are pleased to announce their first arrival on February 6th, a daughter Tanya Lee, 8 lbs. 11 oz. Many thanks to Dr. McQuitty and Dr. G. Brown and staff at Foothills Hospital. U0002U

CALGARY HERALD Feb 25, 1974

Research shows Canada's dams are salmon's doom

You otherwise excellent front-page articles ("Outlook bleak for wild salmon, scientist fears" and "Threatened species take centre stage," June 9) missed several crucial causes of salmon and sturgeon declines. Also, biologist Wilfred Carter makes it sound like there's no relevant research, when in fact Canadian government scientists have been muzzled by their director general on this issue for some time. Plenty of research is already public, though.

Scientists in Russia and the U.S. have shown much of the fault for collapsed sturgeon stocks in the Caspian Sea and elsewhere belongs to blocked migration routes and destroyed spawning and nursery sites caused by water "development" schemes.

Dams and power stations do more than block migrating salmon; they:

1. kill smolts (baby salmon) coming through power-plant turbines on their way to the sea from spawning grounds;
2. destroy spawning grounds and habitat through diversion flooding and drainage;
3. cause migrating fish to get "the bends" from nitrogen bubbles whipped up by power station turbines;
4. kill fish by increasing the temperature of the rivers;
5. destroy coastal nursery habitat by depriving these areas of the freshwater flows from inland — flows that provide oxygen and nutrients, that clean pollution, and that keep the delicate salt balance right for developing salmon at the coasts.

Little-known outside aquatic science, freshwater runoff is crucial to healthy fisheries. Dr. Michael A. Rozengurt and his colleagues have shown a real physical threshold for safely blocking runoff from fish: No more than 25 per cent of this freshwater flow to the sea can be blocked before fisheries are doomed to an inevitable decline. In the U.S., the former Soviet Union and elsewhere, the story's the same. Canadian oceanographer Hans Neu has shown we've already got the world's highest rate of blocked freshwater flow. For his trouble in trying to alert the federal government to this research he was virtually run out of his job at the Bedford Institute.

Wilfred Carter is wrong: There is lots of research from Canada, from the U.S., from all over — we don't need too much more. In point of fact, Canada has some of the best, if unsung, scientists working on this issue.

Hydrologist Bob Newbury is helping restore Scottish salmon stocks in Scotland. He believes that dams are a relic of the past and have outlived their usefulness. State-of-the-art river management in the U.S. and Australia is seeing the decommission of dams to save fisheries. Yet Canada drags its feet.

Our federal and provincial governments court disaster by reopening the Atlantic salmon fishery while promoting more dams on the lower Churchill River. Dam that river, cut more flow, reopen the fishery, and we doom the whole salmon fishery to oblivion.

There are alternatives. Conservation and renewable-energy technology investment will provide jobs. A continued moratorium on our salmon runs for the near future, and legislation to protect and guarantee 75 per cent freshwater flow to each river and basin will protect our stocks.

We can learn from the mistakes and knowledge of other countries. If governments and utilities just listen and act, we won't have to say goodbye to our salmon and all that they support.

Dianne Murray, co-ordinator
Dam-Reservoir Working Group
Ottawa

Letters to the Editor

We welcome letters, which must include full name, an address and phone number for verification. We condense and edit for style. Cite page and date for articles mentioned.

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www.ottawacitizen.com
Letters Editor:
Brian Sarjeant, 596-3785

WINDSOR STAR MAR 5, 1994

Environment Studies Lacking

HALIFAX (CP) — Dr. J. S. Nelson, president of the Canadian Society of Environmental Biologists, says the Canadian government has not called for a single environment study at the outset of any major development.

Dr. Nelson suggests biologists should be involved in studies for major developments just like engineers.

He told a conference of the Canadian committee on freshwater fisheries research that his organization proposes to become the environmental conscience for Canada.

"We're upset that anyone can claim to be an ecologist and hire themselves out. We see all sorts of incompetent studies done."

Hans Neu, an engineer-scientist with the Bedford Institute near here, said the environment is becoming another business . . . "a political football."

He told a symposium of about 60 scientists from across Canada that "we have to take a closer look at the environment before we continue exploitation."

Mr. Neu said control of nature has been exerted in the Gulf of St. Lawrence by the growing number of hydroelectric power dams.

By holding back the natural springtime flow of river water, he said, the mixture of fresh and salt water in the gulf was altered. Nutrients were reduced, the water temperature, marine life and climate changed.

Spring run-off in the gulf was vital but that the runoff now was largely regulated for power purposes.

He called on the scientists to find ways of determining the total cost to the environment of massive engineering projects.

"I place a lot of these responsibilities on your doorstep . . . to advise government agencies what shall be done to cause the least damage."

Golda Meir's Paris Trip Labelled Ill-Timed

PARIS (Reuter) — A decision by Israeli Premier Golda Meir to attend the Socialist International congress here is a loose organization of Democratic Labor and Socialist parties whose avowed aim is to unify the policies and ac-

ernment to Mrs. Meir's decision as vice-president of the Socialist International to visit here Jan. 13 and 14, but La

Ottawa Journal Oct 26, 1971

'White man will destroy everything we have'

By WILLIAM BORDERS
(c) New York Times Service

L G-2 CAMP, Quebec — George Pachano, a 49-year-old Cree Indian whose ancestors have roamed the wilderness of northern Quebec for as long as anyone knows, is usually out in the bush at this time of year, trapping beavers and otters.

But this winter he is spending much of his time in Montreal, 600 miles south of here, taking part in a grassroots legal battle to stop a $6 billion power project that he considers a threat to his homeland and to his way of life.

Already, heavy trucks are rumbling along a new road through the spruce forests here, and the area is dotted with camps like LG-2, a cluster of tents on the steep bank of the La Grande River, which is to be the heart of the hydroelectric development.

"If the white man makes his electricity on our rivers, it will destroy everything we have," said Pachano, a wiry man with straight black hair and a face deeply lined by years of squinting into the northern sun.

In a David-and-Goliath kind of court battle, the unsophisticated Indians, many of whom are illiterate, are suing the James Bay Development Corporation. The provincial government established the development corporation in 1971 to develop this area and to build what is to be one of the world's largest power plants.

The legal case is still pending. But the controversy, which has been joined by the Sierra Club among others, has emerged as a classic conflict between people who look at a vast wilderness like northern Quebec in terms of exploiting its resources, and those who want to leave things as they are.

The development plans also reflect what critics regard as a lingering frontier philosophy among some Canadians, who think of their northern lands and resources as almost limitless and therefore expendable.

In Vancouver, where new housing developments are covering mountains that used to give the city a spectacular vista, a common view is that, as one resident put it, "those mountains stretch all the way from here to the North Pole, and a couple of them more or less isn't going to matter."

Similarly, in Labrador, a new hydroelectric project has dried up Churchill Falls, once one of the world's mightiest waterfalls, but there have been few objections. Spokesmen for the company that built the power plant explained that the waterfall was so remote that relatively few people ever got a chance to see it anyway.

Here in the James Bay region, the same kind of outlook is found in a corporation publication that refers to the spectacularly turbulent rivers that are to be harnessed as "a vast potential now wasting in foam and swirls."

The La Grande River is to be dammed at four points, and its waters, which now rush to the sea between its steep banks, are to be channeled by 80 miles of dikes, for a yield of eight million kilowatts of electricity. An area more than half the size of Connecticut will be flooded for reserviors.

"They simply do not know — no one knows — what that flooding will do to the delicate ecology up there," said Prof. John A. Spence, a McGill University biologist who has joined the fight against the projects.

The men on the other side of the argument insist that they are indeed concerned for the area's fragile ecology, and they point to an endorsement that the project got from a government-organized group of scientists who made a brief study of it a year ago.

"Everything you do — even every breath you take — has ecological consequences," said Fred H. Ernst, the vice president of the corporation. "so what you must do is measure the balances, measure the risks."

"What are we going to do, halt development?" Ernst said, "Of course not, so we must find the electrical power where we can, and the La Grande seems our best choice."

He added that the corporation had spent thousands of dollars on ecological studies and that they would be continuing as the project progressed.

As for the 5,000 Indians who live in the area, Ernst said that their lives could be improved by the prosperity that development will bring to the James Bay region.

Ottawa Journal Feb 17, 1973

HYDRO DAMS BLAMED FOR DECLINE IN FISH STOCKS

I believe the driving force in the collapse of cod fisheries in the early 1990's in the Gulf of Maine, Gulf of St. Lawrence and Grand Banks of Newfoundland has been the proliferation of huge reservoir hydroelectric facilities by Hydro-Quebec on the rivers throughout the ecosystem of these three water bodies. The Daniel Johnson Dam discharges into the St. Lawrence Estuary and is the fourth largest in the world. It stores 142.0 cubic kilometers (km^3) of water, which is equivalent to 27 Moosehead Lakes. There were other large reservoirs built (see page 4) storing the water equivalency of an additional 63 Moosehead Lakes.

Dr. Hans Neu, a Senior Research Scientist at Bedford Institute of Oceanography, Dartmouth, Nova Scotia warned Hydro-Quebec, in a February 9, 1977 article in The *Sherbrooke Record*, that the proliferation of its reservoir hydroelectric facilities might be the cause of in the 1970's decline of fish stocks in Gulf of St. Lawrence, as shown in the below graph, and not overfishing.

In a 1982 report, "Man-Made Storage of Water Resources - A Liability to the Ocean Environment.? Part I and Part II," he made the following observations and prediction:

> "*Life as we know it in our coastal waters and its level of productivity has evolved over thousands of years in response to these seasonal variations. Changing this pattern by reducing the flow of fresh water during the biologically active season of the year, or even reversing the cyclic flow altogether, represents a fundamental modification of a natural system. Such a modification must have far reaching consequences on the life and reproduction cycle in the marine environment of the region affected."*
>
> and he made the following prediction in regards to Gulf of St. Lawrence
>
> *"The next big decline (in fisheries stock) probably will be in the early or mid-eighties*" and "*will be worse, since regulation will have increased further in the meantime."*

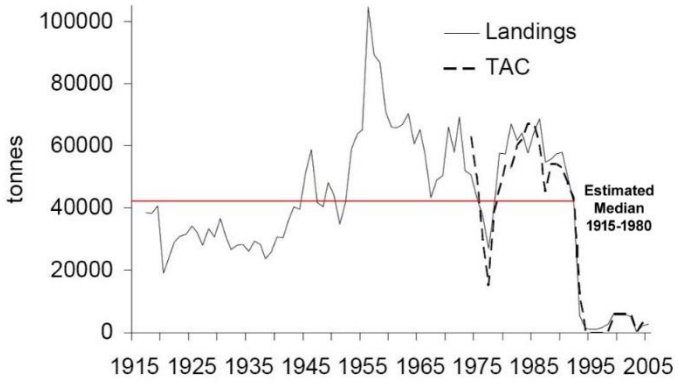


Figure 2: Landings and TAC (t) for the southern Gulf of St. Lawrence cod stock.
Source: Canadian Science Advisory Secretariat Science Advisory 2006/014

The above graph supports his prediction, and please note the following:

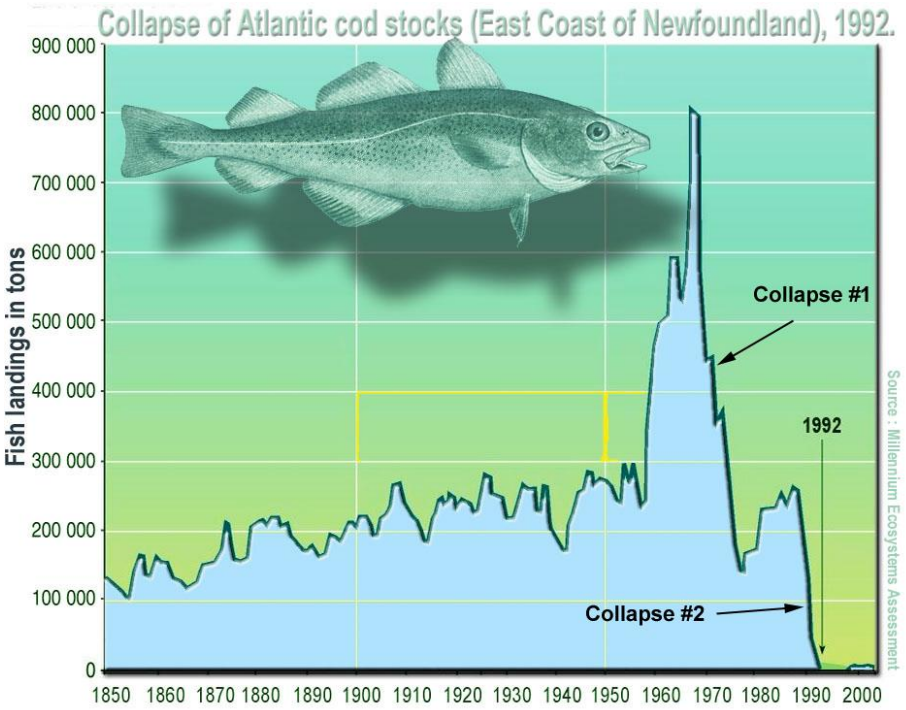
1. Dr. Neu predicted in 1982 that the next big decline after the 1975 decline would be worse because the Daniel Johnson Dam was coming on line. The decline was not only worse, but it has lasted 25 years and appears to be irreversible.
2. There was a sustainable median catch of 42,000 tonnes for the previous 80 years.

He also predicted a decline in the fishing stock off the Grand Banks of Newfoundland:

> *"Even if we cannot yet measure the effects with certainty in our own marine environment,* (Gulf of St. Lawrence SMK) *similar changes must already have happened to the coastal waters of Atlantic Canada and the effect must increase as regulation of our rivers continues. Of particular concern is the increased development of hydro-power-under construction or in the design stage – in Labrador, Ungava Bay, James Bay and Hudson Bay, which are bound to threaten the productivity of the Grand Banks of Newfoundland."*

The second collapse in the following graph supports this prediction. Shown below are two collapses of the Atlantic northwest cod fishery in the past fifty years. Both collapses have been analyzed as one and the cause blamed on overfishing and/or global warming by others

.



There is no doubt that overfishing caused the spike in cod landings during the 1960's and the first collapse in the 1970's is the consequence of overfishing. However, the second and more lasting collapse occurred in the 1989-1991 period. The driving force of this decline has been man-made storage behind the reservoir dams.

From 1850 through the late 1980's there was a sustainable median catch of 200,000 tons per year followed by what appears to be an irreversible collapse, which has continued through 2018.

I believe the elimination of this 140 year sustainable cod catch of 200,000 tons is what Dr. Neu had in mind when he said the storage of these waters "*MUST HAVE FAR REACHING CONSEQUENCES ON THE LIFE AND REPRODUCTION CYCLE IN THE MARINE ENVIRONMENT OF THE REGION AFFECTED.*"

The passage of time has documented that his predictions, based on earlier research, were correct.

THIS NEGATIVELY IMPACTED MARINE ENVIRONMENT ALSO INCLUDES THE GULF OF MAINE

I have written a more comprehensive analysis on other environmental impacts in my January 15, 2019 report, "Hydro-Quebec's Dams Have a Chokehold on the Gulf of Maine's Ecosystem," in which, I describe how these dams have starved the fisheries in downstream waters of nutrients and changed the thermohaline circulation, not only in the Gulf of St. Lawrence, but also in the Labrador Current. Subsequently, this has changed the thermohaline current in the Gulf of Maine as the St. Lawrence waters and Labrador Current mix together over the Scotia Shelf, which is offshore of Nova Scotia, and then flow into the Gulf of Maine.

The strength of the thermohaline current and thus the transport of deep nutrient enriched ocean water into the St. Lawrence Estuary, Grand Banks and Gulf of Maine depends on the amount of fresh water flowing into these water bodies. Reduced spring and summer outflows from these reservoir hydroelectric dams have created a chokehold on the delivery of the annual budget of dissolved silica and other nutrients via both the rivers and upwelling ocean waters. The cumulative impact of these stored waters have starved the fisheries to depletion.

Dr. Neu was quoted as follows in *The Sherbrooke Record*:

> "*In their natural state, rivers carry smaller flows during the winter when precipitation is frozen as snow, and sharply increased flows after the spring thaw. This coincides with the life cycle of marine organisms, increasing food supplies as they come out of their winter hibernation and decreasing supplies when winter returns.*
>
> *But hydro-electric dams tend to level out the cycles, storing much of the spring and summer runoff in the reservoirs until winter, when consumer demand for power is greater. This means that fresh-water nutrients reach the ocean in the winter, when the fish don't need them, and are lost into the barren depths beyond the continental shelf. In the spring and summer the nutrient supply fails to increase as rapidly as is needed."*

THERE WAS A SUSTAINABLE MEDIAN (COD) CATCH FOR 100 YEARS OF 8,000 METRIC TONS IN THE GULF OF MAINE AND THE PRECIPITOUS DECLINE, WHICH BEGAN IN 1991, IS CONSISTENT WITH THE TIMING OF COLLAPSES IN GULF OF ST. LAWRENCE AND WESTERN ATLANTIC.

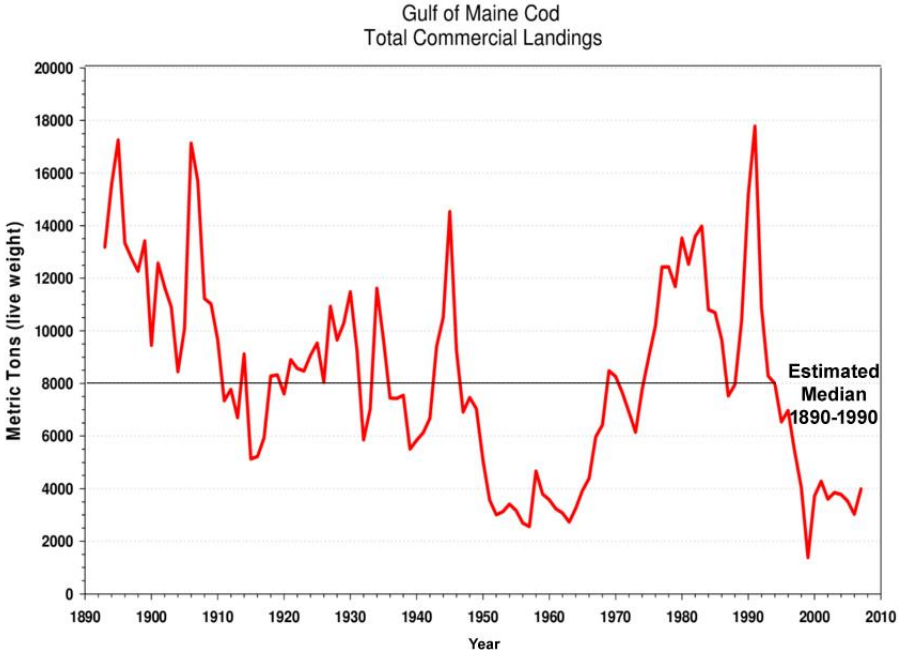
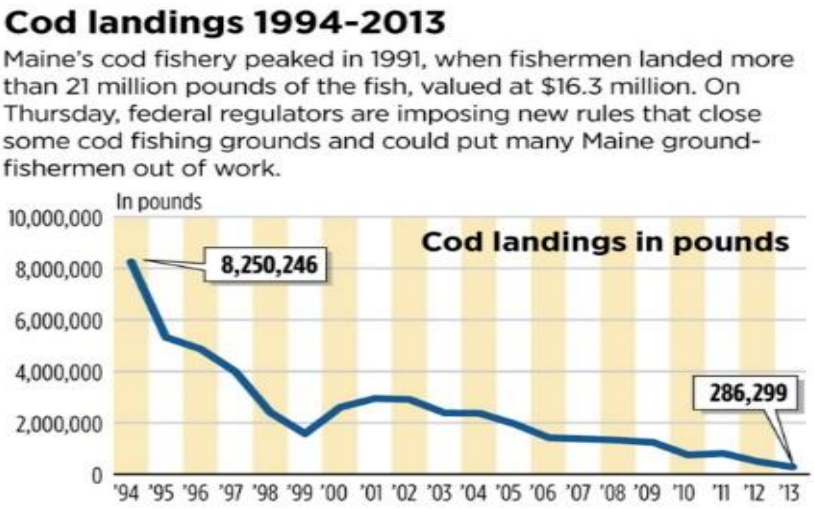


Figure 1.2 Total commercial landings (mt) of Atlantic cod from the Gulf of Maine stock, 1893-2007.

The public perception is that the depletion of the cod fishery has been caused by overfishing and/or global warming. The graph shown below by Michael Fisher of the Portland Press Herald does a great job of supporting this narrative,

but fails to disclose there was a sustainable catch for the preceding 104 years, as shown in the graph on the preceding page.



THE DRIVING FORCE BEHIND THE DEPLETION OF THE COD FISHERY WAS CAUSED BY THE PROLIFERATION OF RESERVOIR HYDROELECTRIC DAMS BY HYDRO-QUEBEC

These dams created huge storage lakes built for power development and capable of holding the spring run-off of large drainage areas and storing it over entire seasons, years and even longer.

The water volume in Moosehead Lake in Maine is 5.19 cubic kilometers (km^3) and Hydro Quebec built the equivalent of 80 Moosehead Lakes in the three watersheds listed below.

Gulf of St. Lawrence Watershed		James Bay/Hudson Bay Watershed		Labrador Sea Watershed	
1956 Bersimis -1	13.9 km^3	1979-81 Robert-Bourassa Generating Station	61.7km^3	1971-74 Churchill Falls	32.64 km^3
1969 Outardes-4	24.3 km^3	1982-84 LaGrande -3 Generating Station	60.0km^3		
1970 Daniel Johnson Dam	142.0 km^3	1984-85 LaGrande-4	24.5 km^3		
	180.2 km^3	1993 Brisay	53.8 km^3		32.64km^3
			200.0 km^3		

To put this in perspective, since the 1970's the review standards in Maine's Natural Resource Protection Act, which mandate submission of proof to minimize environmental impacts, would have prevented the building of even a small or large reservoir on any brook, stream, or river flowing into the Gulf of Maine.

RESERVOIR HYDROELECTRICITY GENERATED BY HYDRO-QUEBEC IS NOT GREEN ENERGY. IF MAINE'S PUC & DEP SAY "YES" TO CMP'S PROPOSED NEW ENGLAND CLEAN ENERGY CONNECT (NECEC), IT WOULD BE THE HEIGHT OF HYPOCRISY.

MAN-MADE STORAGE OF WATER RESOURCES - A LIABILITY TO THE OCEAN ENVIRONMENT

The above title was also the title of a January 1982 Report by Dr. Hans Neu, a Senior Research Scientist at Bedford Institute of Oceanography in Dartmouth, Nova Scotia. Dr. Neu predicted that the huge storage lakes being built for power development would starve the fisheries (see my Fact Sheet "Hydro-Dams Blamed for Decline in Fish Stocks", Kasprzak, February 4, 2019) and weaken the seasonal strength of the density (thermohaline) current thereby warming the waters. The following excerpts were written by Dr. Neu in his 1982 Report:

> *"The most outstanding feature in the encounter between fresh water and salt water is the formation of a current which oceanographers refer to as haline circulation and engineers as density current"*. (Today, this is called a thermohaline current) and *"Obviously, the two-layer current system acts like a large natural pump which constantly transports large quantities of deep ocean water onto the continental shelf and then into the embayments and estuaries."*

Historically, before reservoir dams, both the natural flowing rivers and the upwelling of large quantities of deep ocean water transported dissolved silica and other essential nutrients to the coastal waters and were the major source of nutrients to the estuaries.

> *"Just as for the winds in the atmosphere, the magnitude of the current is proportional to the pressure difference. Hence in times where more fresh water enters the ocean, the longitudinal gradient seaward increases and with it the strength of the current system. From this it follows that in estuaries the density current varies with the seasonal run-off, being at a minimum during the low discharges in winter and at its peak during the large discharges in spring and summer. In coastal waters which are some distance away from the fresh water source (i.e. the Grand Banks, the Scotian Shelf and Georges Bank) there can be delays of from several month to almost a year before the freshwater peak arrives."*

THE DRIVING FORCE WEAKENING THE THERMOHALINE CURRENT, AND THEREBY WARMING THE WATERS IN GULF OF ST. LAWRENCE, GULF OF MAINE, HUDSON STRAIT AND LABRADOR CURRENT HAS BEEN THE PROLIFERATION OF RESERVOIR DAMS BY HYDRO-QUEBEC.

The dams have created huge storage lakes capable of holding the run-off of large drainage areas and storing it over entire seasons, years and even longer. The water volume in Moosehead Lake in Maine is 5.19 km³ and Hydro Quebec built the equivalent of 80 Moosehead Lakes in the three watersheds listed below and 67 of them were built between 1969-1985, which is an average of almost 4 per year.

Gulf of St. Lawrence Watershed		James Bay/Hudson Bay Watershed		Labrador Sea Watershed	
1956 Bersimis -1	13.9 km³	1979-81 Robert-Bourassa Generating Station	61.7km³	1971-74 Churchill Falls	32.64 km³
1969 Outardes-4	24.3 km³	1982-84 LaGrande -3 Generating Station	60.0km³		
1970 Daniel Johnson Dam	142.0 km³	1984-85 LaGrande-4	24.5 km³		
		1993 Brisay	53.8 km³		
	180.2 km³		200.0 km³		32.64km³

Fact Sheet by Stephen M. Kasprzak
February 11, 2019

NATURAL RIVER FLOW VERSUS REGULATED FLOW

Dr. Neu wrote the following in his 1982 Report:

> *"In higher latitudes during the winter, river run-off is at a minimum while power demand is at its maximum. This is shown in Fig. 7, where an average hydrograph and the seasonal power demand of a city in northern regions are plotted. As can be seen, water supply and power demand are out of phase by nearly half a year."*

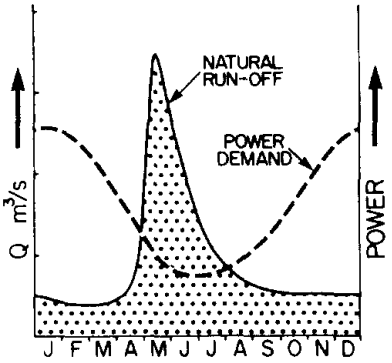


Fig. 7 Typical hydrograph and seasonal power demand.

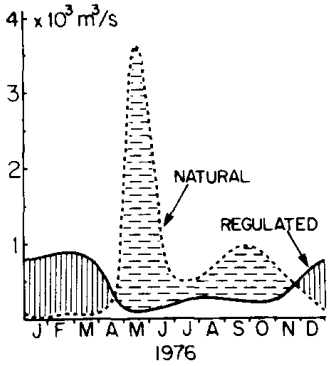


Fig. 8 Natural and regulated discharge of the Manicouagan River at Manic 5 power station.

> *"Developers of electrical energy view this as an inconvenience of nature; thus they reverse the natural run-off cycle by storing the spring and summer flow in artificial lakes to be released during the winter. An example is shown in Fig. 8 for the Manicouagan River at Manic 5 power station.*
>
> *Run-off is transferred from the biologically active to the biologically inactive period of the year. This is analogous to stopping the rain during the growing season and irrigating during the winter, when no growth occurs.*
>
> *Although temperature, particularly during warming in spring, plays an important role in the biological activities of the upper layer, it has less influence on the density of the water, and hence on the motion and mixing, than the fresh water of the river."*

Dr. Neu made the following observations and prediction, which again, have turned out to be true with the passage of time:

> *"Reducing the flow of fresh water during spring and summer and increasing it during the winter changes the seasonal composition of the water in the surface layer and the seasonal strength of the density current.*
>
> *As this trend continues, the cyclic variation will be reversed, the surface salinity becoming saltier in spring and summer, and fresher in the winter. This represents a fundamental change in the seasonal salinity patterns of the coastal region and continental shelf.*
>
> *There is a definite possibility that both winter and summer temperatures of the surface layer will increase; in winter due to an increase in upwelling of deeper warmer water, and in summer due to slower surface currents which will allow the surface layer to absorb more heat during its passage through the system. It can be assumed therefore that fresh water regulation modifies the climate of the coastal region to be more continental-like in the summer and more maritime-like in the winter."*

Gerald D. Reid, Commissioner
Department of Environmental Protection
17 State House Station
28 Tyson Drive
Augusta, Maine 04333-017

March 4, 2019

Subject: Proposed CMP New England Clean Energy Corridor (NECEC) Project is Not "Environmentally Clean" Energy

Dear Commissioner Reid,

I am writing to ask Maine's Department of Environmental Protection (DEP) to deny a permit for the 145 mile NECEC project proposed by Avangrid-CMP to carry hydroelectricity generated by freshwater stored long-term behind HYDRO-QUEBEC'S reservoir dams.

CMP'S CLAIM OF "CLEAN ENERGY" IS A FALSEHOOD BECAUSE IT IS NOT "ENVIRONMENTALLY CLEAN" ENERGY.

According to Maine law, the "purpose" of the DEP is to "prevent, abate, and control the pollution of **the air, water, and land** and preserve, improve, and **prevent diminution of the natural environment of the State**.

The term "clean energy" implies that it has minimal adverse impacts on the air, water, and land; in other words, it is "environmentally clean".

However, CMP advertises that it is better for the air because reservoir hydroelectricity facilities have lower carbon emissions compared to the burning of fossil fuels to generate electriciy.

Think of the absurdity of CMP's claim of "clean energy" if it only applies to the air. We would not allow fossil fuel advocates to use the words "clean energy" because fossil fuels have minimal impact on the water compared to reservoir hydroelectric generating facilities.

DEP has a mandate to protect the air, water, and land and should not approve the NECEC project because it will not be transmitting "environmentally clean" energy.

In 1987, CMP proposed a major power purchase of up to 900 megawatts (MW) from HYDRO-QUEBEC. At that time, "HYDRO-QUEBEC and CMP promoted HYDRO-QUEBEC's power as environmentally clean, cheap, and reliable" (The Legal Framework for HydroQuebec Imports by Pamela Prodan, Tulsa Law Review, Vol 28 (1992) Issue 3, Article 5)

In 1989, Maine PUC turned down CMP's proposal. Obviously, the PUC believed it was not "environmentally clean" energy.

The passage of time has proved that HYDRO-QUEBEC's reservoir hyrdroelectricity is not "environmentally clean" and I have documented in my February 14, 2019 letter to the DEP, via the necec.dep@maine.gov email protocol, many of these negative environmental impacts. As of March 4, 2019, DEP has failed to post this letter to the website with other public comments on the issue. I hope this will be done in the near future, as I have made many references to it here.

One of the most catastrophic of these negative environmental impacts is the long term storage or flooding by HYDRO-QUEBEC of more than 10 million acres of land in Quebec and Newfoundland/Labrador (NL). **These flooded areas are part of the Gulf of Maine's ecosystem and have been a major force in the diminution of its fisheries, increased acidity, and warming of its waters.**

Quebec has one of the world's largest reserves of fresh water, occupying 12% of its surface. It has 3% of the world's renewable fresh water. More than half a million lakes, including 30 with an area greater than 250 square kilometers (97 square miles) and 4500 rivers pour their torrents into the Atlantic Ocean, through the Gulf of St. Lawrence and the Arctic Ocean, by James, Hudson, and Ungava Bays. (Wikipedia – Quebec)

Twelve percent of the flooded ten million acres is surface water and means HYDRO-QUEBEC has flooded over a million acres of wetlands, streams, rivers, ponds, and lakes to generate so called "clean energy". **This never could have been done in Maine under DEP's jurisdiction.**

Inevitably, spring follows winter! Not anymore in the Gulf of Maine or its ecosystem, which includes the Gulf of St. Lawrence; James, Hudson, and Ungava Bays; and Churchill Falls in NL.

I assume the reader took note of the following in the above reference from Wikipedia: "and 4500 rivers pour their torrents into the Atlantic Ocean". Obviously, this is no longer true as HYDRO-QUEBEC has captured the torrents of the spring freshet behind its reservoir dams and reduced summer flows in order to increase historic and natural river flows in the winter by 300 to 400% on average!

"HydroQuebec's December 14, 2018 letter is in the Maine PUC's NECEC public record and a full copy is in Attachment #8 to my February 14, 2019 letter. There is not a debate over the capture and storage of the spring freshet as HydroQuebec wrote: "Excess water not used to generate electricity is stored in large reservoirs for use in later periods."

HydroQuebec's long term storage of "excess water" has starved the fisheries in downstream waters of nutrients and changed the thermohaline circulation, not only in the Gulf of St. Lawrence, but also the Labrador Current. Subsequently, this has changed the thermohaline current in the Gulf of Maine as the St. Lawrence waters and the Labrador Current mix together over the Scotia Shelf, which is offshore of Nova Scotia, and then flow into the Gulf of Maine.

The strength of the thermohaline current and thus the transport of deep nutrient enriched ocean water into the St. Lawrence Estuary, Grand Banks, and Gulf of Maine depends on the amount of fresh water flowing in to these water bodies. Reduced spring and summer outflows from these reservoir hydroelectric dams have created a chokehold on the delivery of the annual budget of dissolved silica and other nutrients via both the rivers and the upwelling ocean waters. The cumulative impact of these stored waters have starved the fisheries to depletion.

Dr. Neu was quoted as follows in The Sherbrooke Record (2/9/1977):

"In their natural state, rivers carry smaller flows during the winter when precipitation is frozen as snow, and sharply increased flows after the spring thaw. This coincides with the life cycle of marine organisms, increasing food supplies as they come out of their winter hibernation and

decreasing supplies when winter returns.

But hydro-electric dams tend to level out the cycles, storing much of the spring and summer runoff in the reservoirs until winter, when consumer demand for power is greater. This means that fresh-water nutrients reach the ocean in the winter, when the fish don't need them, and are lost into the barren depths beyond the continental shelf. In the spring and summer, the nutrient supply fails to increase as rapidly as needed."

SINCE CMP'S PROPOSAL IN 1989 TO PURCHASE HYDRO-QUEBEC'S HYDROELECTRICITY, THE POLITICIANS AND REGULATORS OF MAINE HAVE FAILED TO COME TO GRIP WITH THE FACT THAT HYDRO-QUEBEC'S HYDROELECTRICITY IS NOT "ENVIRONMENTALLY CLEAN".

"Canadian hydroelectric power is viewed in the United States as an **environmentally clean resource**, because water, the source of the power, is considered clean, and because the generating facilities are in Canada. In reality, large scale hydroelectric generation has devastating ecological consequences. Further, the environmental effects of electric power generation are of no different magnitude or seriousness because the site of the generation is north of the border. Yet, projects that would not be considered in the United States are proposed to be constructed over the next decade across northern Canada."

And

"In addition, more emphasis is needed on the importance of giving citizens full access to information which can facilitate their undertanding of the connection between individual consumption decisions and the global impacts of those decisions. **Then, even if we cannot prevent another nation from carrying out a policy contrary to the principles of sustainable development, at least we can make an informed decision not to encourage such destruction by participating in the making of its profit**." (Pamela Prodan 1992) (Emphasis added by me)

HYDRO-QUEBEC's hydroelectricity was not "environmentally clean" in 1989 and the passage of time has proven that it is still not "environmentally clean", all of which I have documented in my February 14, 2019 letter to DEP.

In this February 14, 2019 letter, I asked that CMP's application be found incomplete because the list of components does not include HYDRO-QUEBEC's reservoir hydroelectric facilities.

I have been told verbally by DEP that the NECEC project has been defined by DEP with its starting point at the Canadian border and ending in Lewiston and these reservoir facilities are not part of the project.

In January 1989 the Maine PUC denied CMP's proposal to purchase HYDRO-QUEBEC power, but "the PUC did not acknowledge that the importation of HYDRO-QUEBEC power would necessitate critical developments having environmental and social impacts. Further, the PUC expressly left the door open for future HYDRO-QUEBEC purchase." (Pamela Prodan 1992)

Thirty years later and the regulators are still trying to keep the door open while they hide the negative environmental and social impacts of HYDRO-QUEBEC's reservoir hydroelectric facilities by not including them as a component in the proposed NECEC project.

MAINE'S CITIZENS EXPECT ITS POLITICIANS AND REGULATORS TO TAKE INTO ACCOUNT THE NEGATIVE SOCIAL IMPACT AND DISCRIMINATION AGAINST THE INDIGENOUS PEOPLE OF QUEBEC AND NL BY HYDRO-QUEBEC.

"The assessment of United States utilities that Canadian hydropower is clean can only have come about because its primary effects are far removed from the experience of the United States citizens and regulators. The lack of a legal requirement in the United States that a government authority examine and justify the effects in Canada of the importation of electricity has allowed this claim to go virtually unchecked by utilities." (Pamela Prodan 1992).

I believe the DEP has both a fiduciary and statutory obligation to educate the public as mandated in the Maine Law. "The department shall protect and enhance the public's right to use and enjoy the State's natural resources **and may educate the public on natural resource use, requirements and issues**." (Emphasis by me)

The following are the first two footnotes of Pamela Prodan's paper, and after reading them and the documents referenced; it should be obvious to everyone that HYDRO-QUEBEC has perpetuated social injustice against the indigenous people of Quebec and NL in the pursuit of "clean energy".

1. The Cree of Quebec have employed both public pressure and litigation to oppose further James Bay developments. In the litigation arena, the Cree have intervened in United States proceedings and in Canadian National Energy Board proceedings and have brought a number of legal actions in the Canadian courts. For a short narrative of the implications of the James Bay hydropower projects, see Harry Thurston, Power in a Land of Rememberence, AUDUBON, at 52 (Nov.-Dec.1991); Sam Howe Verhovek, Power Struggle, N.Y. TIMES, Jan. 12, 1992, (Magazine) at 16; infrapart III. For an extensive look at the people and their resistance to the projects, see BOYCE RICHARDSON, STRANGERS DEVOUR THE LAND (1991).

2. Discrimination Against Indigenous Peoples Transnational Investments and Operations on the Lands of Indigenous Peoples, U.N. ESCOR, Commission on Human Rights, 43d Sess., Agenda Item 15, at 14, U.N. Doc. E/CN.4/Sub.2/1991/49 (1991) [hereinafter REPORT ON TRANSNATIONAL INVESTMENTS AND OPERATIONS]. To illustrate the magnitude of the problem, the planned projects at James Bay alone require three times as much total storage, and inundate more than five times as much land as the 50-year-old Bonneville Power system on the Columbia River in the United States, which includes Grand Coulee Dam. Hydro-Qu6bec also wants to build a hydroelectric megaproject with Newfoundland, Canada's poorest province, on Labrador's Churchill River. Fred Langan, Canadians Negotiate Power Project, CHRISTIAN SCIENCE MONITOR, Sept. 18, 1991, at 7. In the late 1960s, Hydro-Quebec built a 5,428 MW project at Churchill Falls in Labrador, at a time when oil was about $1 per barrel, in a deal that turns out less than favorable to Newfoundland: Hydro-Quebec bought all of the power from Newfoundland at 2.2 cents per kilowatt hour (kwh) for electricity until 2020, thereafter 1.6 cents per kwh until 2040. Id. The two proposed Labrador dams would produce 3,088 MW of electricity, compared to the proposed James Bay Great Whale's 3,060 MW. Id. The Innu people in the affected, yet unceded, territory have protested the existing and proposed hydroelectric projects by refusing to pay electric

bills and by removing electric power meters from residences. Peter Penashue, President of Innu Nation, Address at St. John's, Newfoundland (Nov. 5, 1992). See infra notes 21-24 and accompanying text for description of other projects.

HydroQuebec's reservoir hydroelectricity facilities are not "environmentally clean" and they have flooded and polluted the lands and waterbodies which are part of the Gulf of Maine's ecosystem.

Pamela Prodan wrote the following in 1992 and I believe it is still true today.

> "Unfortunately the current framework for dealing with the environment and development is inadequate. **The United States and Canadian legal systems are structured so as to promote wasteful and environmentally destructive energy development. Indeed, these energy policies threaten the existence of a healthy global ecosystem if they are not challenged and changed**." (Emphasis by me)

DEP is mandated by state statute to protect the land, air, and water of the Gulf of Maine's ecosystem even if it lies in Canada. Denying CMP's proposed NECEC project would be a great first step in carrying out their mandate and it is long overdue.

Sincerely Yours,

Stephen Kasprzak

Stephen M. Kasprzak

CC:
Governor Janet Mills
NECEC Service List
Maine Committee on Environmental and Natural Resources
Maine Committee on Marine Resources
Maine Committee on Inland Fisheries and Wildlife
Say NO to NECEC