To: **Fred Bever, Maine Public Radio**

From **Stephen M. Kasprzak**

Date: **April 23, 2019**

Subject: **"Scientists: No Evidence CMP Project Dams Would Disrupt Vital Nutrient in Gulf of Maine Food Chain" by F. Bever March 28, 2019 in Bangor Daily News**

The title of your news article implies that I provided "no evidence" to support my claim "CMP Project Dams Would Disrupt Vital Nutrient in Gulf of Maine Food Chain?" and ignores all of my references to Dr. Hans Neu, a Canadian oceanographer and Dr. Michael Rozengurt, PH, a Russian scientist.

You reference two of my editorials but ignored my February 14, 2019 letter to Maine's DEP, which totals 98 pages with many references to Dr. Neu's and Dr. Rozengurt's scientific studies supporting my claims and can be viewed at the DEP NECEC webpage.

In my opinion, a solid case can be made that the proliferation of HydroQuebec's reservoir hydroelectric facilities and flow regulation may be the driving factor in the starvation of the federally listed endangered Gulf of Maine Atlantic salmon and North Atlantic right whale and other fisheries and a major, if not the driving factor in the warming of the oceans and atmosphere, and especially the accelerated warming of the Gulf of Maine.

You quoted William Balch at Bigelow Laboratory for Ocean Sciences and Andrew Pershing at Gulf of Maine Research Institute, who said "This gets sort of into the nature of science versus pseudoscience"

Your article provided no "evidence" by these scientists to support their "pseudoscience" claims and by association that my references must also be based on "pseudoscience".

On page 3 is a March 5, 1974 Windsor Star newspaper article which describes Dr. Neu's hypotheses that the long term storage of spring runoff would starve the fisheries, warm the oceans and eventually the climate.

Eight years later, Dr. Neu published the following two reports, which support his hypotheses.

"Man-Made Storage of Water Resources – A Liability to the Ocean Environment? Parts I & II" by Dr. Hans Neu January 1982.

Dr. Rozengurt's hypotheses can be summarized as follows:

a) "Spring runoff was the lifeblood of ecosystems. Normally the stronger the flooding the more kinematics' energy is available to regulate water and salt exchange between an estuary and coastal sea, or to enhance advection, horizontal and vertical mixing, and circulation of estuarine and marine waters as well as sea biochemical characteristics"

b) "It appears to be a common universality, namely if spring runoff diversions will limit 25% to 30% of the perennial norm then a coastal ecosystem's dynamic equilibrium will be irrevocably distorted."

Dr. Rozengurt, uses the First and Second Laws of Thermodynamic in the following two reports, which are Attachments 8 & 9 to my April 2, 2019 letter of submission to U.S. Army Corps of Engineers (USACE) File Number NAE-2017-01342 for Presidential Permit (PP-448) to support his hypotheses:

1. "Running on Empty: The Distortion of Coastal Ecosystems" by Dr. Michael A. Rozengurt, PH 1994

2. "Agonizing Coastal Sea Ecosystems: Understanding The Cause, Placing The Blame" by Dr. Michael A. Rozengurt, PH October 2003

My hypotheses are consistent with Dr. Neu's and Dr. Rozengurt's and I have used recent observations to reinforce their hypotheses as the passage of time has proven them to be correct.

If anyone is practicing pseudoscience it is the scientist's at Bigelow and I also suspect at the Gulf of Maine Research Institute as demonstrated by the following April 15, 2019 statement by Dr. Deborah A. Bronk at Bigelow:

"I recently had the privilege to bring this message to an intense conversation about climate change at a hearing held by the Water, Oceans, and Wildlife subcommittee of the House Committee on Natural Resources in Washington, D.C. As part of a panel of experts, **I testified about the overwhelming scientific consensus on climate change** and described the myriad ways that it influences our oceans and lives." (Emphasis by Dr. Bronk)

If anyone is practicing "pseudoscience", it is Dr. Balch, Dr. Pershing and their colleagues who hide behind the cloak of "overwhelming scientific consensus" to refute Dr. Neu and Dr. Rozengurt hypotheses, which are based on the scientific (empirical) method using verifiable observations.

I am sending your news article and this memo to Maine DEP and USACE as "evidence" that Dr. Neu's and Dr. Rozengurt, P.H.'s observations, which were used in my submissions must be accurate since you, Dr. Balch and Dr. Pershing have failed to challenge them and their veracity.

There are five other reasons I believe their hypotheses are correct: the Canadian government tried to muzzle Dr. Neu; Dr. Rozengurt fled for his life from Russia; you dismissed the overwhelming body of research I've discovered and presented, instead of discussing the merits or countering with facts; and the scientific community has abandoned the "scientific method" for "overwhelming consensus".

IT IS HARD TO BELIEVE, SCIENTISTS ARE ABANDONING THE FIRST AND SECOND LAWS OF THERMODYNAMICS IN ORDER TO SUPPORT A FALSE NARRATIVE!

Hydro power: clean or dirty?

By Bruce Little
Southam News Services

DARTMOUTH, 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 drastically alter the entire ecosystem of the Gulf of St. Lawrence 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 winter.

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.

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 damming 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.

Manicouagan 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.

Wind and tides move the water to some extent, but fresh water flows into the Gulf, he says, strongly influence water movement.

"Stagnancy is the most poisonous condition of nature," Neu says. He fears that declining catches of fish may be one result.

"We may not only overfish; we also may starve nature during this period of its major peak activity with food. This is a suspicion. I have no proof. It's so complex to prove it."

Neu's theories are not new. He has been pushing them for more than 10 years. But now he is afraid that the mistakes of the past are being repeated in the James Bay power development and that the consequences could reach as far as here.

He does not think the James Bay project can be stopped. But he would like to see it scaled down with fewer storage lakes built to hold back water from Hudson Bay.

It would mean some interference with the hydrological cycle and some flattening of the swings in the river flow, but not so much to present a massive danger to the ecology of the ocean. It would also mean less power, but he figures the economics of energy have improved so much, it should still be feasible.

The aim of engineers on projects of this sort, he says, is to equalize the flow of water and "take it out of the hands of nature altogether and make it subservient to man's needs."

Unless those priorities are changed, he suggests, nature could have the last word by damaging the life systems of the ocean.

In a world that is looking increasingly to the oceans as a source of protein, it is a disturbing prognosis.

I have highlighted below some of Dr. Neu's and Dr. Rozengurt's verifiable observations and hope that you, Dr. Balch and Dr. Pershing will provide "evidence" to support your claims these observations "get sort of into the nature of science versus pseudoscience".

Part I of Dr. Neu's 1982 Reports is Attachment 3 to my April 2, 2019 letter submission to USACE's File Number NAE-2017-01342.

In the report, Dr. Neu wrote the following:

"The utilization of power from water is as old as human civilization. In fact, the invention of the water wheel was a key step in reaching our present level of technology. Initially, effects on the environment were minimal but by the turn of the century, when technology was able to modify entire river systems, the consequences became perceptible. The major impact, however, started after the Second World War when huge storage lakes were built for power development capable of holding the run-off of large drainage areas and storing it over entire seasons, years and even longer. Today, these schemes are changing the hydrology not only of regions but entire continents. It should be realized that the prime concern of this paper is not the development of power but the modification of the run-off, particularly its seasonal cycle. As will be demonstrated, this regulation represents a severe interference in the basic concept and balance of activities in the ocean."

Using mean monthly fresh water and surface salinity variation (1960-1976) he estimated the strong runoff from the Manicougan River created a fresh water wave at Cabot Strait "on the average of about 4,000 m^3/sec and at its peak probably 6,000 m^3/se.

According to Dr. Neu's measurements, this freshwater wave was 4 to 5 months in duration and:

"This current (wave, Kasprzak) was primarily the result of the difference in density between the freshwater of the runoff and the saline waters of the ocean." And in its simplest form, "this arrangement forms a two layer flow system in which the surface layer flows outward and the deeper layer flows inward. The system acts like a large natural pump during the spring runoff which constantly transports large quantities of nutrient enriched deep ocean water on to the Continental Shelf (including Scotian Shelf, Kasprzak) and up into the embayments and estuaries (including the Gulf of Maine and St. Lawrence, Kasprzak)." (Part 1, Dr. Neu 1982)

The mouths of the Northeast Channel leading into the Gulf of Maine and the Laurentian Channel leading into the Gulf of the St. Lawrence are about 150 miles apart latitudely.

In Part II (See Attachment I to "HydroQuebec Dams Have a Chokehold on The Gulf of Maine's Marine Ecosystem" by S. Kasprzak 1/15/2019), Dr. Neu wrote the following:

"…regulation was stepped up from an average of 4000 cubic meters/second to about 8,000 cubic meters/second with the implementation of the Manicouagan-Outardes-Bersimis hydro-power-complex. I contend that this further reduction in the spring flow was probably the final straw in the decline of the fish stocks."

A colossal amount of spring runoff has been eliminated by HydroQuebec's reservoir dams and has led to the starvation of the salmon, right whale et.al. fisheries in the Gulf of Maine and St. Lawrence while also warming the waters and climate. Both of these water bodies had a sustainable annual cod catch for approximately 100 years, and they dropped to the point of depletion, at the same time, around 1990. (See Fact Sheet "Hydro Dams Blamed for Decline in Fish Stocks" S. M. Kasprzak, February 4, 2019)

Atlantic salmon, a federally listed endangered species, has experienced a similar drop in population (see graph on page 14 of "The Problem is the Lack of Silica", S.M. Kasprzak October 15, 2018")

"Eighty percent of the annual input of dissolved silicate to the ocean is transported via our rivers and streams" (P. Treguer et.al. 1995) Silica encased diatom phytoplankton is at the bottom of the food chain and the cod and salmon are being starved to death.

The size of the deluge calculated above can be easily verified. The amount of water stored behind these reservoir facilities is 142 cubic kilometers at Manicouagan (aka Daniel Johnson Dam), 24.3 cubic kilometers at Outardes and 13.9 cubic kilometers at Bersimis.

This is a total of 180.2 cubic kilometers and the amount of water in Moosehead Lake is 5.19 cubic kilometers. These 3 hydroelectric facilities have stored the equivalence of 35 Moosehead Lakes and withheld 50 to 70 percent of the spring runoff.

The Department of Environmental Protection and the U.S. Army Corp of Engineers must include the Gulf of Maine and the Canadian rivers, which are in its watershed, (in their assessments) because there has never been an environmental study on the impact of long term storage of the spring runoff on Maine Atlantic salmon, North Atlantic right whale, cod or water quality by either Quebec or Maine."

The following is taken from Dr. Rozengurt's 2003 Report and I again ask Dr. Balch and Dr. Pershing to comment on:

1) The appropriateness of Dr. Rozengurt using the 1st and 2nd Laws of Thermodynamics to illustrate how increases in "water withdrawals" reduces the "runoff's total energy E which equals KE+PE"?

2) His graph in Figure 1 shows that a reduction of 50% in the long term storage of the runoff will result in an eighty percent loss in the total energy of the spring runoff.

Dr. Rozengurt's observations are consistent with Dr. Neu's observations and the following observation in 2001:

> "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.

Introduction. Consideration for river-estuaries-coastal sea management.

Coastal sea ecosystems used to be the world's most productive basins. They supported migration routes, spawning, nursery, and feeding grounds for a reach diversity of valuable fish and shellfish. Their properties and survival were based on four fundamental processes: 1) stochastic fluctuations of unimpaired runoff; 2) dynamic equilibrium of water and salt balance; 3) ecological continuity, and 4) biological tolerance. Their natural regime peculiarities sustained life in coastal embayment for millenniums, and concomitant enhancement of coastal seas. Spring runoff was the lifeblood of ecosystems. Normally the stronger the flooding the more kinematics' energy is available to regulate water and salt exchange between an estuary and coastal sea, or to enhance advection, horizontal and vertical mixing, and circulation of estuarine and marine waters as well as sea biochemical characteristics. Spring flooding used to serve as a physical barrier to repulse excessive saltwater intrusion into estuaries and deltas, and flash out natural or man-made contaminants. In other words, a natural spring inflow energy tended to maintain the regime balance through outflows to seas as required by the first law of thermodynamics (Fig.1). Suffice to say, that the powerful frictional drag could entrain up to 10 to 100 times volume of marine waters than that of flood itself. In this case, the enrichment of seas with thousand tons of oxygen, inorganic and organic matters took place. Riverine or estuarine plumes that participate in these processes can be seen between mixed and fully marine waters of many kilometers from river mouths or straits. Moreover, a part of the energy outflow transfer is linked to the dispersion into an unavailable form of energy as required by the second law. But most important was its ability to maintain essential equilibrium of food chain and vitality of numerous fresh and marine waters' organisms for millennia (Rozengurt, 1974).

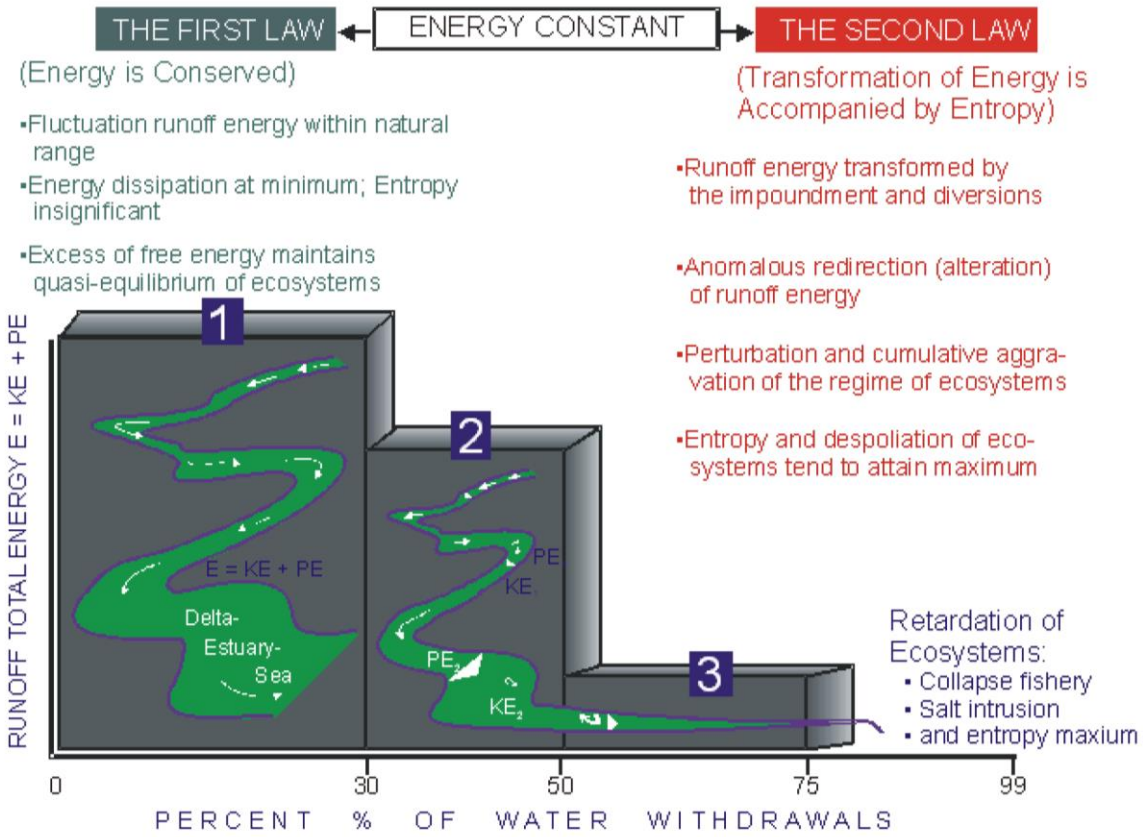

Figure 1. Application of Laws of Thermodynamics to River-Delta-Estuary-Sea Ecosystems

1- Normal, 2 - Subnormal, 3- Critical
KE - Kinetic Energy, PE- Potential Energy, ▷ Dams

I am also sending this Memo to LD 640 sponsor, Senator Brownie Carson and the other members of Maine Legislature's Environment and Natural Resources Committee, which approved on April 17, 2019 to move forward legislation to require the Department of Environmental Protection to perform an independent analysis of the climate change impacts from Iberdrola-CMP's deeply unpopular NECEC corridor project. The bipartisan committee vote was 9 to 3 to support the bill, with one absent legislator.

It would be great if you, Dr. Balch and Dr. Pershing put their support behind the need for mores studies specifically in regards to the endangered species in the Gulf of Maine and adverse impacts of long term storage of the spring runoff on these species et.al. fisheries in the Gulf of Maine.

Stephen Kasprzak

Stephen M. Kasprzak

cc: DEP NECEC Web Page
USACE Official Site File Number NAE-2017-01342
Say NO NECEC Webpage