Maine Voices
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Maine Voices: Hydroelectric dams produce green energy? Think again

Building such dams in Maine would violate federal and state environmental laws, for good reason.

BY **STEPHEN M. KASPRZAK** SPECIAL TO THE TELEGRAM

CAPE PORPOISE — Before advocating for the 145-mile line to carry hydroelectricity generated by Hydro-Quebec (Our View, Dec. 9), the Maine Sunday Telegram Editorial Board should first explain why hydroelectricity produced by reservoir dams should be called "green energy." The construction of these dams in Maine would be prohibited by Section 401 of the Clean Water Act of 1972 and Maine's Natural Resources Protection Act.

Every reservoir hydroelectric facility represents an environmental catastrophe, not only to the dammed river, but also to the ocean regions where the rivers' currents convey nutrients.

ABOUT THE AUTHOR

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Commissioned in 1969, the Outardes-4 hydroelectric reservoir dam on the Outardes River discharges into the St. Lawrence River. Its surface area is 252 square miles – five times bigger than Sebago Lake.

Four other hydroelectric facilities, built from 1967 to 1989 on the nearby Manicouagan River, also discharge into the St. Lawrence. The Manicouagan Reservoir is a giant head pond created by the Daniel-Johnson Dam and has a surface area of 750 square miles – equivalent to 16 Sebago Lakes.

There are four other reservoirs on the Manicouagan River, and the Mavic-Outardes hydro project has an annual capacity of 5,579 megawatts. Maine's total annual hydroelectric capacity is 753 MW.

The St. Lawrence, the largest-volume river in North America, is the major supplier of dissolved silicate to the Gulf of Maine, as daily flows are 40 to 50 times greater than any of Maine's major rivers.

The Churchill Falls Generating Station was built in the 1970s in Newfoundland-Labrador on the Churchill River, which discharges in the Labrador Current.

There are 11 generating units and a series of 88 dykes, which have a total length of 40 miles and created the Smallwood Reservoir with a surface area of 2,200 square miles – equal to 46 Sebago Lakes. The annual capacity is 5,428 MW.

The Robert-Bourassa hydroelectric project was completed in 1986 in Quebec on the LaGrande River, which discharges into James Bay. It has an annual capacity of 10,800 MW and five reservoirs with a surface area equal to 89 Sebago Lakes.

A second phase of hydroelectric dams was built on the LaGrande River in the 1990s with an annual capacity of 5,200 MW. The surface area of these three additional reservoirs equals 13 Sebago Lakes.

The surface areas of the above reservoirs, built on just four rivers, are equal to 169 Sebago Lakes or 982 transmission corridors 145 miles long by 300 feet wide.

Before these dams were built, the silica cycle was in a steady state with input balancing off the output. The major output loss is in the ocean waters, where it is estimated that the burial rate of biogenic silica is 2 to 3 percent per year. A cumulative loss of 3 percent per year would result in a 50 percent loss of silica in only 23 years.

This ocean loss was offset naturally each year by the input of dissolved silicate transported by the rivers. Rivers account for 80 to 85 percent of the annual

input of dissolved silicate to the oceans. In temperate rivers with reservoir dams, scientists have calculated an annual silica removal as high as 50 percent.

The cumulative impact of less silica being transported each year to the ocean has resulted in fewer and smaller diatoms. Depleted diatom populations fail to support a healthy food chain or ameliorate ocean acidity, and they'll release less oxygen into the atmosphere. This has led to the starvation of creatures and fishes that eat them and increased acidity. The silicate of the smaller diatoms dissolves before the carbon can be sequestered to the ocean floor.

These reservoir dams have had other catastrophic impacts. For example, the temperature of the high-volume winter discharged waters flowing into the ocean has increased. These reservoir waters are now thermally stratified lakes. In northern temperate lakes, the bottommost waters are typically close to 4 degrees Celsius year-round, which is much warmer than the super cold river waters flowing under ice in the winter. It is not surprising the Gulf of Maine is warming so fast.

How long will the media and officials remain silent about all the key causes of the demise of the Gulf of Maine because of Canadian hydropower dams and unnatural freshwater flow regulation?