Damming the northern rivers

Three provinces are looking for power in the James Bay area

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THE GAZETTE

WHILE QUEBEC'S plans to dam the Great Whale River have attracted the furious attention of national and international environmental groups, the province is not alone in its dream of harnessing power from the north.

Manitoba and Ontario also have designs on the rivers flowing through their provinces to Hudson and James bays, in fact they would like almost every major river flowing into the bays to be dammed or diverted.

Scientists and environmentalists fear that the three provincial utilities are so busy rearranging the northern landscape that they've lost sight of what they're creating — an environmental monster that won't be understood until it is too late.

Looking at a map and seeing the size of Hudson Bay, it is hard to imagine that the projects, large as they are, could make more than a dent on life in and around the bays.

But Andy Hamilton, a biologist with the Rawson Academy of Aquatic Science in Ottawa, says that's exactly the assumption that was made with industrial development around the now highly polluted Great Lakes.

"Significant changes could sneak up on us," he said. "We trap ourselves if we only look at the effects of specific projects. By the time we realize we've gone too far, it's too late."

The vast inland sea formed by Hudson and James bays is still poorly understood by scientists. But they know it plays a crucial role in the ecology of Canada, with almost one-third of the water from the country's river systems eventually draining into the two bays. The Hudson Bay watershed covers a third of Canada, from southern Alberta to Baffin Island.

This water — the total flow into the bays is estimated at 30,000 cubic metres per second, or 13 Niagara Falls — has caused politicians like Quebec's Robert Bourassa to view the otherwise ignored north as a megawatt-mine.

Hydro-Québec's plans for James Bay and Hudson Bay dwarf the projects of the other provinces. If it succeeds in building Great Whale and the Nottaway-Broadback-Rupert project, 26,000 square kilometres will have been submerged in reservoirs.

On the other side of Hudson Bay, where serious tinkering with the Hudson Bay ecosystem began, Manitoba Hydro is getting ready to build Conawapa, its sixth dam along the Nelson River.

In the early '70s, a control dam and channel started diverting three-quarters of the Churchill River's flow south to the Nelson River. The increased flow is fed through dams along the Nelson, generating 3,300 megawatts of power. The 1,390-megawatt Conawapa dam would generate about the amount of electricity used by Winnipeg's 700,000 residents.

The province wants Conawapa finished by 2001 so it can sell the power to Ontario under a $13-billion export contract and has already built an access road. Federal-provincial public hearings are supposed to start late this year.

In addition to Conawapa, another 10 potential dam sites have been identified.

Unlike Quebec and Manitoba, Ontario has built its electricity supply around nuclear power, and its plans for the James Bay area are the most modest. Last week Ontario Hydro announced that it had scaled back its Moose River project in response to native protests.

The utility had planned to build six new dams and expand six existing ones, generating 1,900 megawatts by 2014. Now just four of the dam extensions are planned.

Hudson's Bay watershed covers one-third of Canada.

While the Hudson Bay ecosystem may be able to adapt to changes brought by any one of the dozens of dams built or planned on the vast watershed, the cumulative shock could be too much.

A paper put together recently by the Canadian Arctic Resources Committee, the Rawson Academy and the Inuit community of Sanikiluaq on the Belcher Islands in Hudson Bay points to possible effects on:

■ **Wildlife habitats.** Hudson Bay and James Bay support approximately 60 species of fish. About 8,000 beluga whales spend the summer in western Hudson Bay, and an endangered population of less than 100 bowhead whales is found to the north. There are are also seals and walrus and the coastal areas are a breeding ground for millions of geese and ducks.

■ **Currents in the bays.**

■ **Sediments and nutrients carried by the rivers to the bays.** This would result in lower biological productivity in estuaries and along the coast.

■ **Ice cover of the bays.**

Underlying these possible impacts is the concern that hydro-electric projects turn upside down the natural cycle of freshwater flow into the saltwater bays. Instead of a large runoff in the spring, water is held back in reservoirs and released in the winter when demand for electricity is greatest.

Simon Prinsenberg, an oceanographer who spent eight years studying Hudson Bay and now works out of the federal government's Bedford Institute of Oceanography in Dartmouth, N.S., said large-scale changes in the water cycle could have effects as far away as the Labrador coast, significantly reducing cod catches.

In the spring, fresh water mixes with the salt water, pulling up nutrients from the bay's bottom and triggering a bloom of plankton — the minute plants and animals at the bottom of the food chain. But when fresh water cascades out in the winter instead of the spring, scientists believe the plankton bloom is curtailed, reducing the food available up the food chain — all the way to the thousands of Cree and Inuit who hunt and fish in the area.

Prinsenberg also wonders what will happen when mercury released from the ground into the water by the flooding of reservoirs makes its way into the bays: "How much pollution can the ocean take?"

The Canadian Arctic Resources Committee, the Rawson Academy and Sanikiluaq's environmental committee fear that marine mammals and migratory birds in James Bay and Hudson Bay are especially at risk. Toxic metals and chemicals from existing dams and distant factories have already infiltrated the northern environment.

The groups say the impacts of global warming — triggered by a buildup of carbon dioxide, methane and other gases in the atmosphere — will be most dramatic in arctic and subarctic regions of the world. That could mean a host of changes, including higher sea levels and increased snowfall. There is also concern that the flooding required for the projects releases large amounts of methane and carbon dioxide, aggravating the climate change.

Another fear is that the various hydro dams are smoothing the way for the ultimate environmental insult — the Grand Canal, first conceived in the late 1950s by Newfoundland engineer Tom Kierans. This scheme proposes building a dike right across the top of James Bay, turning it into a freshwater lake and channelling the water to the United States.

It sounds preposterous, but the idea has enthralled Premier Robert Bourassa, who in his 1985 book *Power from the North* wrote glowingly about the possibility of "recycling" water "which has already served its useful purpose in Canada and would otherwise be lost to the sea."

Prinsenberg says the utilities have contributed to the scientific understanding of the bays, but: "They don't like to have bad results, so they concentrate their research at the river mouths and look at one river system at a time."

And because the provinces' jurisdiction does not extend beyond their shores, technically it's not up to them to worry about effects out in the bays. Environment Canada has been trying to convince the three provinces to share their data.

Stephen Hazell, executive director of the Canadian Arctic Resources Committee, says such a study could be done in three years, at a cost of $700,000.

He acknowledges that governments bent on building dams will balk at any proposal that might delay them, but says public pressure will force them to back down.

"Even if Quebec becomes an independent state, there are international laws governing the behavior of one state with regard to other states," he said.

In a move reminiscent of the creation of the Grand Council of the Cree of Quebec to fight the first phase of James Bay development in the early 1970s, the Cree of Quebec, Ontario and Manitoba recently banded together, pledging to help each other block proposed hydro developments affecting their land.

Matthew Coon-Come, grand chief of the Quebec Cree, says the natives are a force the three provinces will not be able to ignore.

"Before any project is built, there should be native agreement. The days of the colonialist attitude are over. You can't just go in and bulldoze and never mind the Indians who live there," he said recently.

GAZETTE GRAPHICS

Power sites

Here's a list of power sites in Quebec, Ontario and Manitoba.

QUEBEC

La Grande — The largest of all the developments, with reservoirs covering 14,950 square km; 15 dams and 331 dikes. The first phase, completed in 1984, cost $13.7 billion and generates 10,300 megawatts. A second phase, to be completed by 1996, will generate 5,250 megawatts and cost about $10.7 billion.

Great Whale — Reservoirs will cover 4,387 square km, with five dams and 133 dikes producing 3,168 megawatts. Construction, delayed until next fall, is expected to be finished in 1998; projected cost is $12.6 billion.

Nottaway-Broadback-Rupert — Reservoirs will cover 6,497 square km, with 16 dams and 115 dikes, producing 8,400 megawatts by 2007. Projected cost is $16 billion, says Hydro-Québec.

ONTARIO

Moose River — Originally called for development of six new sites and six expansions along three rivers — the Moose, the Abitibi and the Mattagami. Ontario Hydro announced this week that the new sites and two of the proposed expansions have been shelved pending an agreement with natives. The slimmed-down project, planned for 1998, will produce 400 megawatts and cost $650 million, with almost no new flooding.

MANITOBA

Churchill-Nelson Project — Started in the early 1970s, it involved the diversion of three-quarters of the flow of the Churchill River south into the Nelson River. Power stations and control dams built to date have flooded about 600 square km and cost $2.9 billion. They produce about 3,300 megawatts, with another 600 megawatts coming on line next year.

The next phase is the 1,390-megawatt Conawapa dam, projected to cost $5.5 billion, to be in service by 2001 to respect an export deal with Ontario. It would flood only 3 square km.

Another 10 power stations have been proposed, but only one — the 350-megawatt Wuskwatim dam — is planned for the next 20 years.