

Written by Joan Russow
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by [Bob Weber](#) , The Canadian Press January 7, 2013
<http://www.timescolonist.com/news/weather/government-funded-study-concludes-toxic-hydrocarbons-from-oilsands-pollute-lakes-1.41572>

EDMONTON - New research has provided the most conclusive proof yet that oilsands development in northern Alberta is polluting surrounding lakes.

The findings all but end the debate over industry's contribution to toxins found in local watersheds, say the report's authors.

The federally funded research by some of Canada's top scientists was published Monday in the prestigious U.S. journal the Proceedings of the National Academy of Sciences. It concludes that levels of toxic hydrocarbons in six lakes in the oilsands region are between 2 1/2 and 23 times what they were before the mines were built.

While overall toxin levels remain low, trends aren't good and some lakes are already approaching warning levels. The paper adds that the timing of the contamination and its chemical makeup both point to industrial sources.

"This shows very conclusively that at least in the lakes we looked at, we cannot see any way we can attribute this to natural causes," said study co-author John Smol, a biologist at Queen's University in Kingston, Ont.

Industry and government have long suggested that hydrocarbons found in water bodies near oilsands development could have come from naturally eroding bitumen deposits. That door is now shut, said Smol.

"(That debate's) completely over. If there was still a coffin to be nailed, I think this is kind of

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putting in a lot of nails in the coffin."

Industrial contamination in the oilsands region has remained controversial because baseline levels of hydrocarbons in the environment were never adequately established before development began. Rivers do cut through deposits and naturally occurring oily slicks are clearly visible along some shorelines.

To assess how things used to be, Smol and his colleagues took core samples from the sediment of six lakes — five close to oilsands facilities and one more distant. The layers in the sediment provide an annual record going back to 1880.

Levels of polycyclic aromatic hydrocarbons — many of which are cancer-causing and considered highly hazardous — increased over time in all six lakes.

In four of the lakes, sediments now have an average of more than four times as many such hydrocarbons as they once did. In Lake NE20, levels were 23.2 times greater. Even Namur Lake, 90 kilometres to the northwest, had 3 1/2 times as much of the toxins.

The data shows levels began increasing in the late 1960s, almost exactly when commercial production from the oilsands began, and at a time when such levels were declining in other northern lakes. As well, lakes downwind of oilsands mines showed greater increases than those upwind.

The makeup of the contaminants also changed about the time oilsands development began. The proportion of hydrocarbons associated with natural processes such as forest fires decreased and those considered to be oil-derived increased.

"(The analysis) didn't just tell us the total amount of PAHs, it told us where they're coming from," Smol said.

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The study suggests overall levels of toxins in sediment remain relatively low, well beneath those recorded in other Alberta lakes near industry, agriculture or urban areas. But Smol points out that until recently the study lakes were wilderness waters.

"We're not saying we have toxic lakes right now, but we see that these are wilderness lakes that are now at the level of a typical urbanized lake."

Biologist and co-author Joshua Kurek says the line on the graph is headed the wrong way.

"The general trend is that in remote lakes (deposition) tended to peak earlier, in mid-20th century, whilst the oilsands lakes are on a clear trajectory for increasing," he wrote in an email.

At NE20, the lake most heavily affected, seven of the 13 contaminants considered already exceed sediment quality guidelines above which ecological effects could begin to appear. If nothing changes, Smol said, three of those contaminants are likely to start have effects within the next few years.

"The trajectory is not good," Kurek said. "We've already entered the area of concern."

Smol added that hydrocarbons are only one worry. The study didn't measure levels of contaminants such as heavy metals, mercury or soot.

As well, oilsands production is expected to more than double by 2025.

"It's just starting," said Smol. "I don't see the pollution decreasing in the near future."

The paper is the latest in a string of published studies attempting to determine the industry's environmental impact.

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Last fall, a pair of reports found little evidence of long-distance impact from industry. They found changes in heavy metal and hydrocarbon levels about 200 kilometres downstream from the oilsands didn't seem at all related to industrial development.

Other scientists responded that 200 kilometres is a long way and the lakes and rivers in the study had sediments that are complex and less clear cut.

In the summer, an Environment Canada study found no evidence that mercury levels were increasing in fish near the oilsands. The authors acknowledged their conclusions were softened by a lack of hard data from the area.

A spring 2011 report concluded hydrocarbons in Athabasca River sediment had increased by 40 per cent between 1999 and 2005.

In 2010, a pair of studies from University of Alberta ecologist David Schindler concluded that industry was releasing heavy metals and hydrocarbons at levels that were, in some cases, already toxic to fish and equivalent to a major oil spill every year. Schindler's work was later backed up by a provincially appointed review panel.

Smol said there's still more work to do. He said the scope of the study should be expanded to include more lakes and more contaminants — including a look at how different toxins might interact with each other in the environment.

He said climate change is also starting to have an impact on lakes in the area. Warmer temperatures increase the growth of algae and the creatures that feed on them.

"We're living in a multi-stressor world."