

# Study finds factories a factor for mercury levels in fish

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Summer is coming to a close, but the mercury is still pretty high—not in any thermometers, but in the seafood we consume.

According to a new study by an international contingent of researchers, the mercury showing up in fish comes from factory emissions produced on dry land. The group of 24 North American researchers includes Vincent St Louis, a University of Alberta professor of watershed biogeochemistry; and Jennifer Graydon, a PhD candidate in biological sciences.

St Louis explained that previously, there was no study definitively linking higher levels of mercury in the atmosphere to higher levels of mercury in fish. There are, as he explained, other factors involved.

"For example, climate change. If a lake's warming up, it increases the microbial activity that converts the [type of] mercury in rain to the [type

found in fish]," St Louis said. "So [previously], legislators could have said, 'Well, it's climate change causing this mercury problem in fish, so we don't really need to regulate how much mercury we're putting out into the atmosphere.'"

However, St Louis explained that the results of this new study finally link atmospheric mercury emissions to mercury in fish.

"When you burn coal, coal has a lot of mercury in it. So, you burn coal to produce energy, for example, at Lake Wabamun. The mercury goes up in the atmosphere," St Louis said, adding that this elemental mercury in the atmosphere then precipitates into a form of ionic mercury. This rain then enters into lakes and streams, where the ionic mercury it contains is converted to methyl-mercury by bacteria found at the bottom of these lakes. From there, the methyl-mercury finds its way into algae, then into fish, and finally into humans that eat these fish.

To prove this theory, the group of researchers went to the Experimental

Lakes Area in northwestern Ontario. They then chose a lake with low levels of mercury, and with special permission, put approximately one teaspoon of inorganic mercury into this lake.

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VINCENT ST LOUIS  
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To make sure that any rise in methyl-mercury levels in fish in this lake was due to this increase in inorganic mercury and not any other factors, they used an isotope that they could easily identify later on.

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[inorganic] mercury that we put in the lake directly showed up in the fish rapidly [in an organic form]," St Louis said.

And as Graydon pointed out, mercury does quite a bit of harm in living organisms.

"[It mostly has] neurological effects: stumbling, slurred speech, blurred vision, [and], in the very worst scenarios, total neurological death," she said.

As a result, Health Canada advises people to limit their consumption of fish known to have high mercury levels to no more than once per week.

However, according to St Louis, despite the fact that ingesting mercury has long been known to be harmful, mercury emissions have remained, until now, either unregulated or only voluntarily regulated. He said that this is because there was previously little proof of mercury emissions from factories affecting mercury levels in the human diet.

St Louis now hopes that, in light of these results, the lack of regulation will change not only in Canada but

in the United States and elsewhere, adding that mercury emitted from one country often ends up in the lakes and oceans of another.

"Politicians used to say, 'We can't enforce these regulations because there is no direct link,'" St Louis said. "Now they can't say that because there is a direct link. Now it becomes the argument of, 'If we do remove mercury from the emissions, it will cost all this money and cost all these jobs.'"

"In the acid rain days, they actually said the exact same thing: 'This is going to cause a loss of jobs.' It didn't. It really didn't. It actually pays off for industry to lower their emissions."

St Louis suggested that one factory could benefit by selling their emission credits to another factory, and that capping mercury emissions might even pay off in other ways.

"If you start looking at health benefits and things like that, those are big payoffs that are never accounted for in statements of the cost associated with putting in regulations."




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