

Title: "Road salt poisoning water bodies, study finds"
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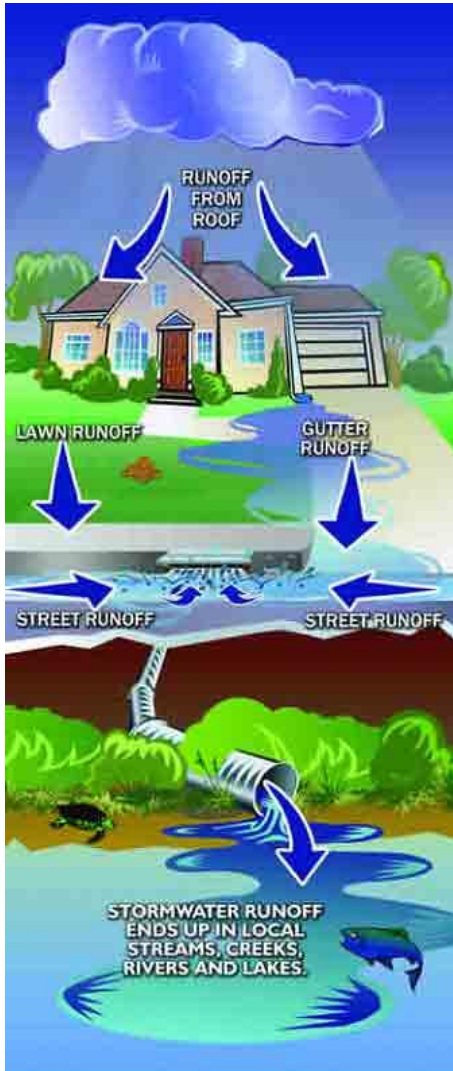


Figure 1: Various forms of runoff
(Source: <http://www.thecoves.ca/project.php?id=22>)

Summary:

Scientists from the University of Toronto studied the effects of salt being spread on highways in Pickering, Ontario. They discovered that salt from the roads is going into Frenchman’s Bay, and reaching levels close to those in the ocean. Around Pickering, they spread about 7600 tonnes of salt and 50% of it ends up in the groundwater, which increases the salinity of the water to almost double what it is supposed to be. Older fish can survive, but new fish move closer to fresher water. They discovered that areas that had runoff experienced double the salt than areas that did not have runoff. Runoff from the roads also contains other pollutants. Environment Canada is doing a review and already has recommended a reduction of salt use.

Link to course:

This article shows both the human interactions with coastal zones or marine habitat, and major sources of pollution affecting coastal zones and their surrounding environment. (See Figure 1) Humans need salt to reduce the amount of ice on the roads, as salt reduces the temperature that ice will form. We do not want ice on the highways as vehicles will lose traction and this will lead to accidents. But the salt that we use on our roads does not stay on our roads. (See Figure 2) When the ice melts, the water will run off of the road and into water. This is just one example of salt going into water, but all across Canada there are communities using salt on their roads, and it can run into rivers, lakes, and the ocean. Extra salt in the ocean may not seem that bad, but the salt also brings pollutants into the water. It has already been found that the salt is changing the number of fish in the water, and causing fish to migrate to different areas.

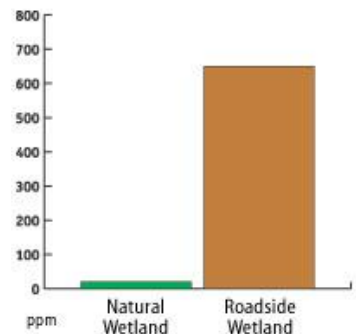


Figure 2: The difference in salt levels of water bodies close to roads is evident. (Source: <http://chicagowildernessmag.org/issues/winter2004/salt.html>)

Road salt is poisoning water bodies, study finds

During winter thaws, some streams have salinity levels just under those found in the ocean

MARTIN MITTELSTAEDT

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ENVIRONMENT REPORTER

One of the most detailed investigations ever conducted in Canada into the fate of road salt has found that it is polluting groundwater and causing some streams during winter thaws to have salinity levels just under those found in the ocean.

The elevated salt readings were detected in Pickering, where researchers from the University of Toronto have been studying how the salt spread on highways, such as the 401, and other roadways through suburban sprawl affects water quality. They found that so much salty water from the community is ending up in Frenchman's Bay, a scenic lagoon on the shores of Lake Ontario, that the small water body is being poisoned.

"Our findings are pretty dramatic, and the effects are felt year-round," said Nick Eyles, a geology professor at the university and the lead researcher on the project. "We now know that 3,600 tonnes of road salt end up in that small lagoon every winter from direct runoff in creeks and effectively poison it for the rest of the year."

He called the findings, which were published recently in the journal *Sedimentary Geology*, "a really bad-news story" involving a "relentless chemical assault on a watershed."

The Pickering area provided researchers with an ideal place to study the effects of road-salt spreading, because most of the city lies within a relatively compact 27-square-kilometre watershed, where it was easy for pollution monitors to track where salt spread on roads ended up.

About 7,600 tonnes of salt is applied each year to roads in the community. About half of this amount seeps into groundwater, which in turn flows into streams year-round, making the water courses more salty than they should be, according to the research. The rest drains into Frenchman's Bay, which is visible to commuters on the 401 and has a struggling fish population because salt levels are more than double the amounts typically found in the Great Lakes.

The salt water "knocks out fish," Dr. Eyles said, adding that in the most contaminated areas, only older fish can survive, while younger ones move to areas of the lagoon closer to Lake Ontario and its fresher water.

The finding of major impacts on Pickering's ground and surface water suggests a far greater toll from the use of salt elsewhere across Canada, where an estimated five million tonnes, or approximately 150 kilograms per Canadian, is used on roads each year to make them safe for travel in winter. The vast majority is applied in Ontario and Quebec.

"It's a general problem. ... There are lots of other areas like this," Dr. Eyles said, referring to the Pickering findings.

Environment Canada has recognized that salt has adverse impacts on wildlife, plants, water and soil, and in 2001 considered adding it to the country's list of the most toxic substances. Instead, in 2004, the government instituted a voluntary code of practices to encourage municipalities and others to use the de-icer more sparingly, while maintaining highway safety. But with the vast amount used, huge quantities are still polluting soil and water, according to Dr. Eyles.

"It's a toxic material and yet we continue to throw it with abandon on our roads," he said.

The University of Toronto research was based on water monitoring between May, 2002, and March, 2003, before the code went into effect.

It noted that after winter thaws, there were spikes in the amount of salt in streams, with those taking runoff from the 401 having approximately double the concentration of the pollutant than watercourses nearby that don't take its storm

water. Runoff from the highway, Canada's busiest, also contains benzene, toluene, and xylene, hydrocarbons associated with contamination from underground gasoline storage tanks.

Environment Canada says it is currently reviewing whether the voluntary practices code has led to any reduction in the amount of salt being spread on roads. "If it is concluded, based on the review of progress, that other steps are needed for the management of road salts, Environment Canada will consider a range of possible options," the department said in reaction to the study.