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Most Road Salt Is Making It Into Lakes And Rivers

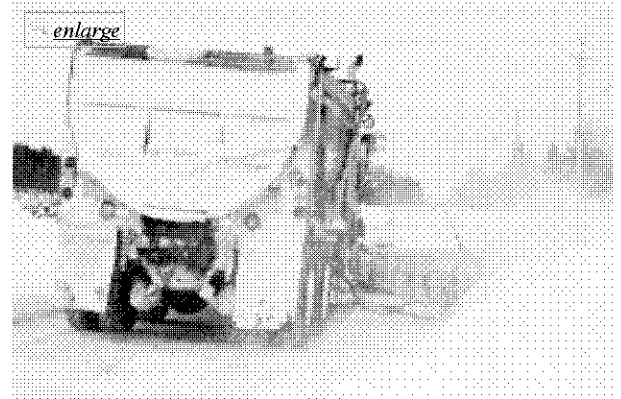
ScienceDaily (Feb. 20, 2009) — Research at the University of Minnesota has revealed that road salt used throughout the winter is making the state's lakes and rivers saltier, which could affect aquatic life and drinking water. The research indicates that better training of snow plow drivers and more judicious use of road salt could help lessen the impact and save the state money.

The researchers studied 39 lakes, three major rivers, 10 tributaries and numerous observation wells, and the results are alarming. They found that approximately 70 percent of the road salt being applied in the metro area is retained in our watershed. The university researchers recently reported their findings to the Local Road Research Board. Nearly 350,000 tons of sodium chloride, commonly referred to as road salt, are applied for de-icing in the Twin Cities metro area every year.

"Nobody has asked the question of where the salt ultimately goes after the winter season is over," said research team leader Stefan, a civil engineering professor at the university's St. Anthony Falls Laboratory. "Our study has been concerned with that question in particular."

Stefan's team (including Eric Novotny, Andrew Sander, Dan Murphy and Omid Mohseni) tracked the movement of chloride applied by humans throughout the water system, distinguishing it from geological or natural origins. They found that the chloride concentrations (salinity) in 39 metro area lakes have increased over the past 22 years, following a similar trend in road salt purchases by the state of Minnesota. Both show a marked increase from 1984 to 2005, which if continued would double salinity in these lakes in about 50 years. Compare this with a near zero concentration in the 1950s, when road salt application began.

The effects could be severe. Continuous levels of chloride concentration (as low as 250 mg/L, the equivalent of one teaspoon of salt in five gallons of water) have been shown to be harmful to aquatic life and to affect the taste of drinking water. In 2008, the Minnesota Pollution Control Agency listed five metro area streams as already impaired by chloride. Increases in sodium and chloride have been shown to decrease the biodiversity in wetland areas, altering the development of wood frogs,



Road salt used throughout the winter is making the state's lakes and rivers saltier, which could affect aquatic life and drinking water. The research indicates that better training of snow plow drivers and more judicious use of road salt could help lessen the impact and save money. (Credit: iStockphoto/Christine Tripp)

decreasing the number and types of fish available, and increasing mortality rates of organisms that rely on an aquatic system. Increases in sodium and chloride have also been shown to increase mobilization of heavy metals in the soil along major highways.

To help reduce the effects, researchers recommend more judicious use of road salt through increased training of snow plow drivers to get the most out of the road salt they apply. Applying sodium chloride to pavement temperatures below 15 degrees Fahrenheit is generally not effective. At higher temperatures, researchers suggest using only one to three cups of salt per 1000 square feet. These recommendations are working at the University of Minnesota. Since training began two years ago, the university has reduced use of road salt by 41 percent and saved more than \$50,000 in the first year.

Adapted from materials provided by [University of Minnesota](#), via [EurekAlert!](#), a service of AAAS.

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