Does road salt harm the environment?

By Nina Rastogi | Posted Tuesday, Feb. 16, 2010, at 7:13 AM ET
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Slate.com

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Every time it snows, the road crews in my neighborhood spread loads of salt all over the sidewalks and roads. I know it wreaks havoc on my car. What does it do to the environment?

This is definitely an issue worth thinking about, considering that we toss more than 20 million tons of sodium chloride on our roadways every winter. That's about 13 times more salt than is used by the entire food processing industry (PDF). Salt lowers the freezing temperature of water and thus melts street-clogging snow and ice. But its public safety benefits do come with some ecological drawbacks.

The biggest concern with road salt is how it affects water quality. The stuff doesn't just disappear when the snow and ice melts: It washes away into lakes and streams or seeps into groundwater supplies. Researchers in Minnesota recently found that, in the urban Twin Cities area, 70 percent of the salt applied to roads stays within the region's watershed. Once it gets there, the contamination is difficult and expensive to remove. (The study was the first to analyze salt retention over an entire metropolitan area; in other places, a greater proportion of the salty run-off may wind up in the ocean.)

Salty groundwater can make for salty drinking wells. That's a health issue for people on restricted-sodium diets and a taste problem for everyone else. When salt migrates into lakes and streams, it can also harm aquatic plants and animals. A heavy influx of sodium and chloride ions—which is what you get when salt dissolves—will disrupt the ability of freshwater organisms to regulate how fluid passes in and out of their bodies. Changes in the salinity of a pond or lake can also affect the way the water mixes as the seasons change, leading to the formation of salty pockets near the bottom and biological dead zones.

Salt pollution in surface waters is measured in terms of chloride concentration. The Environmental Protection Agency recommends that levels be kept below 230 milligrams per liter, measured over the course of four days. (That's the equivalent of about one teaspoon of salt in five gallons of water.) Last September, the U.S. Geological Survey reported that 40 percent of the urban and suburban streams they tested in the northern part of the country had chloride levels at or above that threshold at some point during the sampling period (1991 to 2004). De-icing of roads was singled out as a major culprit.

Sprinkled salt can affect the environment in other ways, too. When it splashes off the road, it can erode the soil, and damage trees and vegetation as far as 650 feet away. Roadsides can also turn into a sort of artificial salt lick that would be attractive to animals like moose and elk. As a result, they run a higher risk of becoming road kill. Birds are common victims, as well.

So if salt is so problematic, why are we still using it? Because it's cheap. Alternative chemicals can be much more expensive (PDF), and they often require municipalities to invest in new spreading equipment. Plus, replacements can come with their own environmental issues. Sugar beet juice, for example, may cause oxygen depletion in waterways. (Plus it's really messy.) So far, no one's invented a completely benign way to get ice off the roads—except, perhaps, the shovel.

As researchers continue to look for substitutes, there are plenty of ways that road crews can cut back on their salt usage. Pre-wetting the salt, for example, allows for more controlled application and better sticking power. Weather

monitoring is key, too: Applying salt just before a storm hits, so that the snow can't adhere to the ground, is usually more efficient than waiting until after the snow has fallen. And since sodium chloride doesn't work below 15 degrees Fahrenheit, getting an accurate read on pavement temperature helps cut down on waste, as well.