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NATIONAL RISK MANAGEMENT RESEARCH LABORATORY
GROUND WATER AND ECOSYSTEMS RESTORATION RESEARCH

The Influence of Road Salts on Water Quality in a Restored Urban Stream

Road salts (also known as de-icers) are essential to the transportation and highway maintenance industry in the United States. They keep roadways passable for both commercial and personal vehicles. Often these de-icing salts wash from roadways into nearby bodies of water and become a nonpoint source pollutant that can affect water quality and aquatic organisms. Studies have shown that road salts can accumulate in streams and ground water, persisting beyond the time of application, often into the summer months.

These results coincide with initial findings at Minebank Run, a recently restored urban stream in Baltimore County, Maryland, that has been the subject of a long-term water quality study. Surface and ground water data have been collected in Minebank Run since November 2001, including water levels and a suite of chemical parameters. One of the project objectives was to understand the salt chemistry of surface and ground water and the implications for ecological or human health.

Biweekly sampling, well installation, and other project operations were done in conjunction with the U.S. Geological Survey. Chemistry and water levels were measured from a network of surface water locations and ground water wells (piezometers) installed along transects perpendicular to the stream flow within two primary study locations, one upstream and the other downstream of the I-695 beltway.

EPA scientists are examining ground water/surface water interaction and subsurface flow paths as factors influencing salt retention and ground water quality. The scientists have found that salt levels (chloride and sodium) at Minebank Run are chronically elevated throughout the year, even in summer when no salts are applied. Chloride and sodium levels are significantly higher downstream of the I-695 beltway, suggesting that this major roadway is a significant source of road salts to ground and surface water in this watershed. Research is ongoing to better determine the source zones and residence times of road salts in the Minebank Run watershed.

More information

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