

Analysis of Environmental Effects of Chemical Deicers in Southwestern Ohio

Christopher Barrett
Advisor: Zelalem Bedaso

Introduction

During the winter various chemical deicers, most commonly sodium chloride based deicers or “road salt”, are applied to roads and highways each year. However while cost efficient and effective, these deicers can cause numerous negative side effects.

Drinking Water

Road Salt can be washed off the road by water and leech into underground groundwater reserves that are used for drinking water. There is not currently a way to reverse groundwater contamination. As road salt is designated as toxic, polluted water is a public health hazard.

Lakes

Road salt can stimulate algae growth in; can cause water stratification that strips oxygen from water; and can mobilize heavy metals from lakebeds. This conditions can poison and suffocate freshwater aquatic life.



References

Harless, Meagan Leigh, "Effects of Chemical Deicers on Amphibian Communities", Dissertation, Michigan Technological University, 2012.
"Salted Road" ISTOCK
"Algal Bloom." Oregon State University
"Salt Burned Leaves" Flower Shop Network
"Dead Bird in Bucharest" Tiia Monto
"Glass of water" City of Burnbay, California

Animals

When food is scarce, Birds and mammals are attracted to road salts to fulfill some dietary needs. Smaller creatures such as birds and rabbits can eat road salt and be poisoned, while larger creatures such as deer or moose are drawn nearer to roads and can cause traffic incidents.

Plants

Road Salt can salt burn trees and brown vegetation, weaken cold resistance and resistance to pests. Plants act as contamination buffer to soil, less plants means more soil pollution. Also means more loose sediment to run into rivers which reduces fish habitat availability.

Conclusion

Road salt is an imperfect solution to deicing roads in winter and we should begin investigating alternatives such as abrasives like sand and cinder, Calcium Magnesium Acetate, and Calcium Chloride.