

Water Contamination and De-Icing: THE LINK

The most commonly used de-icing salt is sodium chloride (NaCl), which is readily available and inexpensive. When applied, it melts snow and ice on roads and sidewalks and helps to prevent new ice from forming. What most people don't know, salt is most effective at temperatures above 20° F. Below 10° F it cannot dissolve and cannot break the ice-pavement bond.

But, what are the impacts of road salt applications to drinking water supplies and watershed ecosystems?

Up to 90% of the salt used for deicing can enter air soil, groundwater, and surface water from Snowmelt runoff, release from surface soils, and/or wind...

Their accumulation and persistence in watersheds pose risks to aquatic ecosystems and to water quality. Approximately 55% of road-salt chlorides are transported in surface runoff. The remaining 45% are infiltrating through soils and into groundwater aquifers.

Resources:

The Salt institute:
Snowfighter Handbook

<http://www.saltinstitute.org/>

McHenry County Snow and Ice
Control Handbook:

<http://www.mchenryh2o.com>



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County of McHenry Water Resource

Residential Deicing



Shovel Early + Shovel Often

The environmental impact of pavement salt

Economic impacts: When humans are forced to use water of higher salinity in their homes, water pipes and hot water systems rust more easily. Salt on roads penetrate concrete to corrode the reinforcing rods causing damage to bridges, roads and cracked pavement. Furthermore it corrodes metals on automobiles.

Contamination of groundwater: Chloride is water soluble and since it is not readily removed by any natural chemical process, once in water its always in the water. Therefore it increases the cost of treating water for drinking, reduces the suitability / availability of water for irrigation and other industrial applications, and contributes to the loss of productive land.

Harmful to human health: Excess dietary sodium is associated with hypertension and up to 30% of the US population could have borderline hypertension. But, the major objection to concentrations of sodium in public water supplies arises from the taste preference of consumers.

Influence on plants: Elevated sodium and chloride levels in soils inhibits water absorption and reduces root growth. Salt also disrupts the uptake of plant nutrients and inhibits long-term growth.

Influence on wildlife: Damage to vegetation degrades wildlife habitat by destroying food resources, habitat corridors, shelter, and breeding or nesting sites. Increased salinity levels in freshwater rivers, creeks or wetlands may kill native plants or animals or make them sick. This can cause species loss in sensitive river and wetland reserves.

Some animals: Elk, moose and sheep eat road salt causing "salt toxicosis" where they lose their fear of vehicles and humans, causing many fatal encounters. Also, salt acts like a desiccant and will dry out and crack animal paw pads - house pets are particularly susceptible.

Birds: Seed-eating birds may not be able to distinguish between road-salt crystals and the mineral grit their diets require. This means behavioral abnormalities can occur in small bird species with ingestion of a single salt particle and death can occur with ingestion of two particles.

Road salts applied to roadways can enter air, soil, groundwater, and surface water from snowmelt runoff, release from surface soils, and/or wind-borne spray. These salts remain in solution in surface waters and are not subject to any significant natural removal mechanisms. Their accumulation and persistence in watersheds pose risks to aquatic ecosystems and to water quality. Approximately 55% of road-salt chlorides are transported in surface runoff with the remaining 45% infiltrating through soils and into groundwater aquifers.

Alternatives to salt

Not every driveway, sidewalk, parking lot and road has to be snow-free! There are alternatives to reduce the sliding-factor of pavements.

Calcium Magnesium Acetate (CMA) and Potassium acetate (KA):

Both are biodegradable materials that have less of an environmental impact than rock salt. Unfortunately these two products are more expensive, but use of these may lead to longer lasting bridges and cars and less environmental damage.

Another option being researched is the use of beet juice mixed with brine. Once sugar has been extracted from sugar beets, a waste product remains that producers noticed never froze. This mix has been in use in several states, and is used by the McHenry County Division of Transportation!

To keep your car's windshield free of ice, fill your windshield wiper tank with a mix of one part water and two parts vinegar and use the mix prior to leaving your vehicle for the night - this should help prevent ice build up.


The greenest choice

#1: The most important step in deicing is to **physically remove as much snow and ice as possible** before applying a deicer! **A good workout with a snow shovel is more effective than any chemical deicers.**- Got a bad back? Pay the neighbor's teenager to do the job for you and keep the money flowing in your local economy!

#2: If you use deicer, **use only enough deicer to break the ice-pavement bond**, then remove slush by shoveling. Select pellets rather than flakes, as they are more effective at penetrating ice.

#3: It is Winter! Not every pavement has to be snow-free! **Sand, gravel and kitty litter are not deicers, but they do offer traction on ice.** Unfortunately they can add sedimentation into streams if not cleaned off the road.

#4: **Buy a good set of snow tires** that will offset the loss of fuel efficiency tour of slipping tires by providing traction.



There are many alternatives to salt with varying degrees of environmental safety.