

The Overuse of Salt for Deicing

What are the Issues?

The #1 source of the chloride permanently accumulating in Minnesota's lakes, streams and groundwater is from deicing salts used as wintertime snow and ice management tools.

Known best practices reduce usage while maintaining public safety. Public applicators are reducing, but disincentives for private applicators result in continued over-application and unnecessary damage to lakes, streams, groundwater, and infrastructure.

Why is chloride a problem?



When snow and ice melts, chloride in deicers dissolves in runoff water, traveling to streams, lakes and groundwater. Just one teaspoon of deicer contains enough chloride to pollute five gallons of water. (Fortin) Once in the water, chloride become a permanent pollutant and continues to accumulate over time. There is no cost-effective way to remove it. **Minnesota currently has 50 chloride-impaired water bodies, with 110 additional water bodies close to the limit.** (MPCA).



Environment

"The more (deicers with) salts we put in our water, the more stressed the ecosystem will be." (Dugan, U of Wisconsin)

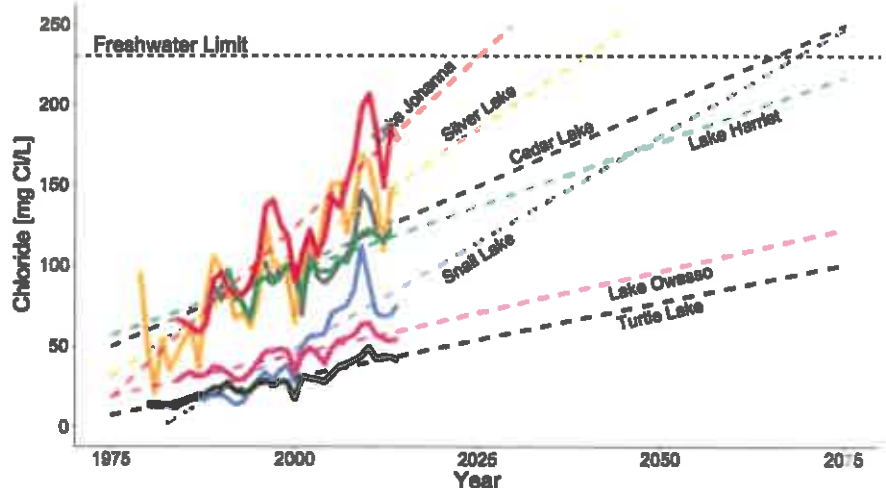
- Excessive chloride is toxic to aquatic life, especially native fish and the food chain on which healthy fisheries depend.
- Road salts dissolved in drinking water negatively impact taste and are a potential human health concern due to increased sodium.
- Chloride can hurt pets and wildlife.

Infrastructure Damage

The cumulative damage resulting from the 365,000 tons of deicers applied each winter in Twin Cities Metro Area is estimated between \$290 million to \$1.2 billion annually. (Twin Cities Metro Area Chloride Management Plan)

Chloride accelerates corrosion of metal in vehicles, roads and bridges. It prematurely damages pavement on roads, bridges, garages, sidewalks and building facades and entrances. In the landscape it kills plants and lawns, and alters soil so that future growth is negatively impacted.

Historical and Projected Chloride Concentration



Above: The future of five Minnesota lakes if present rate of chloride use continues. Source: Freshwater

Tale of Two Applicators: Public and Commercial

Driven by an interest in reducing expenditures and damage to infrastructure, **public sector applicators**, MnDOT, cities and counties, are taking significant steps to reduce deicer use by using known and effective best practices. Hundreds of public applicators are trained and certified in Minnesota each year. They report reductions of 30% - 60% in deicer use after the first year of training (MPCA). Public applicators have considerable immunity from slip and fall lawsuits.

In contrast, **commercial applicators**, the companies that maintain privately owned parking lots, streets and sidewalks, are often over applying deicers. Only a small percentage of commercial applicators are trained in best practices, but more importantly commercial applicators are under continual pressure from property owners, managers and citizens to apply additional amounts of deicers as protection from slip and fall accidents. Additionally, liability for accidents is shifted to applicators. Trained or not, applicators are put in the position of over applying deicers to please customers and financially protect their businesses.

In the Twin Cities Metro Area 5% to 45% of the 365,00 tons of deicer applied annually is attributed to commercial applicators. Exact percentage varies by watershed (MPCA).

Proposed Legislation Targeting Commercial Sector Applicators

Voluntary Certification + Documentation = Limited Liability Protection

The legislation proposes a voluntary pathway to limited liability through certification in the existing MPCA Smart Salting training program. Commercial applicators with current certification in Level 1 & 2 Smart Salting training that implement best practices and maintain records of their work, would, under this legislation, receive limited liability from slip and fall lawsuits, as would the businesses that hire them.

This approach:

1. Lowers risk of frivolous lawsuits to applicators and property owners.
2. Protects water and property without compromising safety.

A diverse coalition of legislation supporters is listed on page 4.



How Reducing Chloride Would Benefit One Watershed

In Nine Mile Creek Watershed District (NMCWD) commercial applicators as a group are the largest contributors of chloride. **They apply an estimated one-third of the deicer (2,300 tons) in the watershed annually (NMCWD Chloride Total Max Daily Load Report).**

If just half this watershed's commercial applicators became certified and used best practices, in the first year this watershed would see reductions of

- 345 to 690 tons of deicer,
- \$270,000-\$2.3 M damage to parking lots, sidewalks, buildings, landscaping and vehicles.

(Estimates based on 30% to 60% reductions reported by public applicators after Smart Salt Training,)

Furthermore, experience among public sector applicators indicates the number and cost of slip and fall lawsuits would be checked.

FAQ's

1. Can chloride be seen in water?

No. Once dissolved in water chloride becomes an invisible problem. *At right: chloride reappears as water levels recede in Nine Mile Creek.*



2. Why can't we get chloride out of water?

Desalinization requires reverse osmosis, a prohibitively expensive process.

3. What alternatives are there to deicers that contain chloride?

All economically practical and effective deicer options contain chloride. The best alternatives are to shovel, brush and plow more, and apply less deicer.

4. Are deicers the major cause of chloride pollution in lakes?

Yes. Chlorides also come from water softening salts, wastewater plant discharges, fertilizers, manure and dust suppressants statewide.

5. Can chloride really reach drinking water sources?

Yes. In Madison, WI there is a chloride contaminated municipal well with water that has an off-taste.

6. Why doesn't more deicer provide more safety?

There is a point where additional deicer does not yield better results. Trained applicators can discern whether more deicer means more safety or is simply wasteful.

7. How do we know certification reduces deicer use?

Applicators certified in Minnesota's Smart Salting training report reductions of 30-60% in usage in their first year after training (MPCA). Municipalities have documented the cost savings to their public works operations.

8. How could legislation targeted at training commercial applicators benefit Minnesota's waters?

It creates an incentive for more commercial applicators to voluntarily take training.

9. Will the costs of training hurt small businesses (applicators)?

They are being hurt now by the continual expense and daily disruption of pressure of 'slip and fall' lawsuits. Applicators and their trade organizations are endorsing this legislation.

10. Do any other states have similar legislation?

Yes, New Hampshire, enacted a voluntary salt applicator certification 2013. Minnesota's proposed legislation has been patterned after New Hampshire. Illinois (2016) and Colorado (2018) passed bills

that void contracts that indemnify or hold others harmless for damages, and provide for defense of another party.

11. What is the history of this legislation in Minnesota?

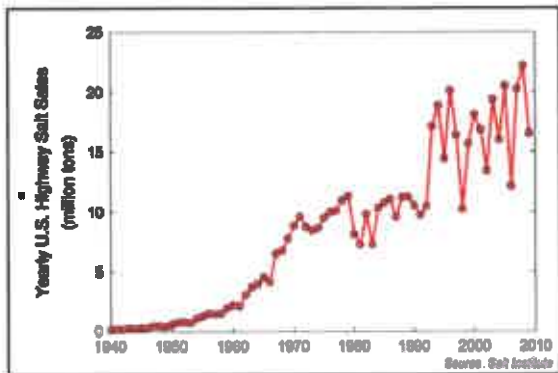
Bills to provide limited liability to commercial applicators were introduced in 2016 and 2017. HF3577/SF3199 passed out of several committees during the 2018 session, but was not enacted.

12. What do other cold weather countries do?

Canada classifies road salt as a toxic/harmful substance. (Environment Canada) Northern European cities and counties avoid granular deicers, instead using brine, plowing, or sand + cleanup (International Federation of Municipal Engineering). Hilary Dugan, University of Wisconsin studied 114 lakes in Sweden where even lakes close to roads have low chloride levels. "There's almost no salt use in general," says Dugan. They drive more slowly. And liability is a very different topic in Scandinavia." (University of Minnesota Technology Exchange June 2018)

More information about the Chloride Issue.

The Growing Reality of Too Much Chloride



Cold weather states, including Minnesota, started using road salt in earnest in the 1960's.

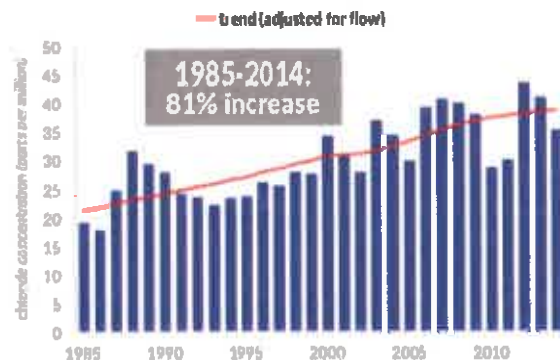
See chart at left.

Monitoring of lakes, streams and groundwater in urban and suburban areas across the state shows rising levels of chloride from five decades of winter salt use. (MPCA)

Where is Minnesota now?

The Twin Cities Metro Area uses the most deicer and has the most documentation of accumulating chloride. Cities, towns and lake regions in outstate Minnesota are not immune, but less data is available.

- One-third of shallow monitoring wells statewide have elevated chloride. (MPCA).
- Three-quarters of chloride applied in the metro area stays in Cities waters. (U of MN)
- Elevated chloride found in
 - 70% percent of lakes with 1% or greater impervious surface within 500 meters of the lake. (Dugan, U of Wisconsin), and
 - in areas with road density of 18% or greater (MPCA)



Source: Metropolitan Council Environmental Services, St. Croix Watershed Research Station

Additional Resources

- Fortin Consulting, Hamel, Minnesota
- Minnesota Nursery and Landscape Organization
- Minnesota Pollution Control Agency
- Nine Mile Creek Watershed Chloride Total Daily Minimum Load Report (available online)
- Twin Cities Metro Area Chloride Management Plan (available online)

Above: 81% increase chloride in Mississippi River.

Support for Liability Legislation

Building Owners & Managers Association (BOMA)
Conservation Minnesota
Cities of Edina, Minneapolis, Richfield, and Rosemount
Clean Water Action
Fortin Consulting
Freshwater
Friends of the Mississippi
Minnesota Licensed Beverage Association (MLBA)
Minnesota Nursery and Landscape Association (MNLA)

Minneapolis Regional Chamber of Commerce (MRCC)
Minnesota Superintendents Golf Course Association,
Snow & Ice Management Association (SIMA)
StopOverSalting, and the following watershed districts:
Lower Mississippi River, Minnehaha Creek, Nine Mile Creek,
Ramsey-Washington Metro, Shingle Creek Watershed
District, West Mississippi, Riley Purgatory Bluff Creek



StopOverSalting.org, a volunteer citizen group, produced this document (Nov 2018).
For questions or additional information on sources, contact
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