Minnesota’s Statewide Chloride Management Plan
Why is Salt a problem?

Toxic to aquatic life

230 mg/L
860 mg/L

Permanent Pollutant

78% retained in TCMA

Contaminates Groundwater

Disrupts Lake Mixing

1 tsp. of salt pollutes 5 gallons of water
- Highlight chloride impacts on water quality
- Inform and guide best practices
- Demonstrate success and cost savings of improved practices

- Surface and groundwater trends
- Chloride sources identified
- Goals for protecting MN waters

- State and local government entities
- Winter maintenance workers
- Elected officials and general public
Contents of Chloride Management Plan

1. Minnesota’s Land Use, Water Resources & Climate Conditions
2. Sources of Chloride
3. Negative Impacts of Chloride
4. Chloride Water Quality Conditions & Trends
5. Prioritizing and Implementing Restoration and Protection
6. Success Stories
7. Monitoring, Tracking, Reporting, and Adaptive Management
8. Research Needs
1. Effects of Climate Change in MN

- CMP summarizes the climate change impacts already occurring in MN
  - MN’s warming has taken place where and when it’s usually the coldest – winter and night
  - Rainfall increasing but also occurring earlier in the growing season
- Discusses how these change may impact chloride use
  - Increased variable local winter weather
  - Changes in snowmelt and runoff
  - Possible increases in the number of thaw and freeze days
  - Stresses on aquatic life will be compounded and may decrease their ability adapt to Cl

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Observed Trend</th>
<th>Confidence Change is Occurring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extreme cold</td>
<td>Rapid decline in severity &amp; frequency</td>
<td>Highest</td>
</tr>
<tr>
<td>Extreme rainfall</td>
<td>Becoming larger and more frequent</td>
<td>High</td>
</tr>
<tr>
<td>Heavy snowfall</td>
<td>Large events more frequent</td>
<td>Moderately Low</td>
</tr>
<tr>
<td>Severe thunderstorms &amp; tornadoes</td>
<td>Overall numbers not changing but</td>
<td>Moderately Low</td>
</tr>
<tr>
<td></td>
<td>tendency toward more “outbreaks”</td>
<td></td>
</tr>
<tr>
<td>Heat waves</td>
<td>No recent increases or worsening</td>
<td>Lowest</td>
</tr>
<tr>
<td>Drought</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Confidence Scale
- Lowest
- Low
- Moderately Low
- Moderately High
- High
- Highest

Snapshot of observed trends among common weather hazards in Minnesota, and confidence that those hazards are changing in response to climate change. Graphic based on information from 2014 National Climate Assessment and data analyzed by the Minnesota DNR State Climatology Office.
2. Sources of Chloride to MN Water Resources

Salt pollution comes from several sources:

- Road salt
- Water softeners
- Fertilizer Manure Dust suppressant

Too much salt is bad for aquatic life and drinking water.
3. Impacts to Lakes

- Disrupts the natural mixing process in lakes
- Heavier “salt” water sinks to bottom
- New UMN research highlights this impact on Stormwater Ponds & phosphorus release
### 3. Impacts to Plants, Fish, Macroinvertebrates

#### Macroinvertebrates
- Mussels
- Mayflies
- Amphipods (side-swimmers)

#### Fish
- Least darter
- Pugnose shiner
- Walleye
- Northern pike

#### Plants
- Canada Bluejoint
- Lake Sedge
- Spike Rush
- Bulrush

#### Amphibians
- Wood frogs
- Tiger salamander
- Eastern newt
4. MN Surface Water Chloride conditions

- 50 chloride impairments
  - 3 new listings added 2018
- 75 High Risk waters
  - Values ≥ 207 mg/L or at least one exceedance
- 80% of surface water chloride data is in the TCMA
- Increase in chloride in Mississippi, Minnesota and St. Croix Rivers (Metropolitan Council 2014)
4. Chloride in Groundwater

2/3 wells with chloride concentrations exceeding the SMCL were located in the TCMA, rest were in urban areas.

40% of wells tested across the state are increasing in chloride.

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Chloride (mg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sewered Residential</td>
<td>45 mg/L</td>
</tr>
<tr>
<td>Unsewered Residential</td>
<td>16 mg/L</td>
</tr>
<tr>
<td>Commercial/Industrial</td>
<td>82 mg/L</td>
</tr>
<tr>
<td>Agricultural</td>
<td>14 mg/L</td>
</tr>
<tr>
<td>Undeveloped</td>
<td>1 mg/L</td>
</tr>
</tbody>
</table>

5. Prioritizing and Critical Areas
Smart salting training success in the news - City of Cambridge Public Works

A recent article in the County News Review highlights how Todd Schwab, City of Cambridge Public Works/Utilities Director and his staff have embraced best management practices to apply less salt safely for all surfaces. These strategies can result in infrastructure savings, reduce damage to vehicles and vegetation, and reduce chloride that enters our surface water resources.

Cambridge staff have been certified in the MPCA Smart Salting Training Program. They have increased sand to salt ratios, purchased equipment that applies salt brine for deicing purposes which reduces salt use, and intend to use pre-treating methods before snow events to additionally save on salt use.

Success story: City of Marshall

The City of Marshall discharges treated wastewater into the Redwood River, and as of 2016, the chloride concentration in the discharge was between 470 mg/L and 689 mg/L. The proposed limit for the City of Marshall was 261 mg/L. To address this reduction, the city hired a consultant to identify the major sources of chloride in wastewater and found that 75 percent came from residential, commercial, or industrial water softening.

Marshall Municipal Utilities evaluated options to further soften water at its water treatment plant; currently, it reduces hardness from 53 grains to 31 grains. The utility determined that updating lime slacking and providing soda ash treatment could reduce the hardness to 5-7 grains prior to distribution. The city then informed residents about the change, and a considerable number said they would turn off or reduce their use of in-home or on-site equipment if the city achieved the lower hardness levels.
Summary of the CMP

• Minnesota’s Chloride Management Plan provides the information needed to:
  • Understand the issues with chloride and the sources
  • Track water quality conditions and impacts
  • Determine strategies for prioritizing implementation
  • Evaluate all chloride reduction activities and determine what will work for you
  • Learn how other organizations have been successful
  • Track progress of implementation and water quality impacts
  • Work collectively to reduce chloride pollution and protect our water resources

• CMP will be on Public Notice mid-August for final comments and suggestions
## Our strategic plan

**Sixteen strategic goals for our agency | 2018-2022**

### Water
- **Reduce chloride (salt) entering surface waters and groundwater.**
- Accelerate prioritized and targeted reductions in nutrient pollution by integrating strategies with local watersheds.
- Achieve wastewater pollutant reduction goals and maximize cost-effectiveness of public infrastructure investment.

### Land
- Reduce food waste from households and businesses by generating less and rescuing and recycling more.
- Identify and address emerging risks by completing assessment of backlogged contaminated sites.
- Prevent and reduce risks to groundwater from unlined construction and demolition landfills.

### Air
- Improve air quality in population centers.
- Offset excessive emissions and advance diesel reductions via the Volkswagen Settlement.
- Reduce air permitting backlog.
- Reduce Minnesota’s greenhouse gas emissions from transportation.

### Cross agency
- Incorporate strategies to address environmental justice concerns in all programs.
- Increase involvement of communities in decisions and actions that affect them.
- Act on opportunities to increase resilience of communities and the environment to climate change impacts.

### Excellence
- Increase the diversity of the agency’s workforce, through best efforts in recruitment, hiring and retention.
- Accelerate the availability of data and information in a self-service format.
- Improve agency’s ability to identify, manage and sustain organizational improvement.
Smart Salting Training program

• Created in 2006 by Fortin Consulting, in partnership w/ MPCA, MN Local Technical Assistance Program (U of M), MnDOT, and many local watershed partners

• Smart Salting classes & certifications:
  • Roads
  • Parking Lots & Sidewalks
  • Level 2 Organizational certification (SSAt)
  • Property Management

• Voluntary certification given to participants who pass test

• Currently working to expand and establish a sustainable training program
• MPCA now has Smart Salting training staff, Angela Bourdaghs

• This new role will help schedule, coordinate, promote, and support the training program while we work to strengthen, enhance and expand the program

• New Smart Salting program email: smartsalting.pca@state.mn.us

• Sign up for the new Smart Salting newsletter, for keeping up with all things Smart Salting!
Smart Salting Assessment tool

- Evaluate current practices & identify areas for improvement
- Develop goals to implement best practices
- Track BMP implementation progress and salt reduction over time – MS4 permit
- Adding chloride source evaluation to Smart Salting tool
- Water Softening and Fertilizer assessments coming soon

www.smartsaltingtool.com
GreenCorps Program

- Minnesota GreenCorps is an environmentally focused AmeriCorps program coordinated by the MPCA
- Chloride reduction components in the program
- Members serve approximately 40 hrs/week for 11 months from Sept. through August
- Member paid through MPCA GreenCorp program
- Eligible organizations include public entities, school districts, not for profit institutions of higher education, and 501 (c)(3)
- Look to host a member in February

www.pca.state.mn/mngreencorps
Distribution of educational materials focus on chloride impacts on water resources and practices to reduce salt use

Store salt properly (as taught in Smart Salting classes)

Use of their regulatory mechanisms to require proper storage at commercial, institutional, and other non-permitted facilities (model ordinance)

Requires a written Snow and Ice Management Policy

Annual training of all staff performing winter maintenance activities (Smart Salting training meets requirements)

Permittee’s with a Chloride WLA must:
  • Document the amount of deicer applied each winter maintenance season
  • Conduct assessment of winter maintenance operations to reduce salt use annually
Virtual MS4 permit Chloride Session

SAVE the DATE: October 5, 2020

• Join MPCA staff and other MS4 communities to discuss the new MS4 permit requirements for Chloride
  • Ask questions about requirements
  • Learn what other MS4s are already doing
  • Discuss available and needed resources
  • Share your ideas for chloride reduction actions

• Visit Chloride website for updates or contact Brooke or Cole for details:
  https://www.pca.state.mn.us/water/water-permit-holders-and-chloride
  brooke.asleson@state.mn.us  cole.landgraf@state.mn.us
Izaak Walton League of America Partnership

- The MPCA is partnering with IWLA to bring their Salt Watch program to citizens in Minnesota

- Encourages volunteers to monitor chloride levels in their streams, lakes, and wetlands and advocate for smarter salt use in their communities

- Low-cost Salt Watch test kit includes 4 chloride test strips and instructional card

- For more information visit the IWL Winter Salt Watch website:

  www.iwla.org/water/winter-salt-watch
Chloride Reduction Model Ordinances
www.pca.state.mn.us/water/statewide-chloride-resources

1. Occupational Licensure for Winter Maintenance Professionals – Requires anyone who provides snow & ice services within their city limits to be Smart Salting trained & certified.

2. Deicer Bulk Storage Facility Regulations – Requires any entity that stores bulk de-icer within the city limits to follow the guidelines for proper salt storage.

3. Land Disturbance Activities – This approach utilizes existing land use regulations for new and redevelopment projects. Requires a chloride management plan and designation of a certified Smart Salting applicator. Already implemented by Nine Mile Creek WD and Riley-Purgatory Bluff Creek WD.

4. Parking Lot, Sidewalk and Private Road Sweeping Requirements – Incorporates sweeping requirements into existing off-street parking, sidewalk and private roadway snow management requirements. The intent for this ordinance is for excess salt after an event to be swept up.

These concepts can be implemented as policies; City of Minneapolis and Metro Transit require that any contractor bidding on their snow & ice contracts must be Smart Salting certified to be eligible.
Register for the 2020 Salt Symposium (Aug. 4 & 5).

Chloride (salts)

Chloride 101
The basics of chloride and why it matters

Salt applicators
Training and Blits for professionals

Water permit holders
Chloride in stormwater and wastewater

Reduce salt use at home
Your diet isn’t the only place to cut down on salt

Statewide resources
For partners, local governments, and stakeholders

- Hire a certified applicator trained to minimize salt use
- Stay informed on smart salting. Sign up now for email updates
Thank you!

Follow me on Twitter @brookeMPCA

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