

# Make Winter's Passage a Green One!

# Deicing Best Management Practices and Green Alternatives

## GETTING READY FOR WINTER

Winter is here and we can soon expect our annual dose of winter storms. Snow and ice on drive-ways, sidewalks, roads, and parking lots can create hazardous conditions for people and property. As a result, we make every effort to remove snow and ice in order to minimize the impact on our everyday schedules. To do so as fast and effectively as possible, we rely heavily on deicers.

## HOW DO DEICERS WORK?

Deicers are chemical products that melt ice by dissolving in water and **lowering its freezing point**. As the deicer dissolves in water, it becomes a solution known as **brine** (in chloride-based products). When brine comes in contact with ice, it melts it by either releasing or absorbing heat (thermodynamics!). By doing so, it prevents ice from bonding with other hard surfaces and makes it easier to remove.



However, relying heavily on deicers can have environmental and economic impacts, such as “salting” soils and waterways, as well as causing infrastructure damage due to corrosion. **Although rock salt is the most commonly used deicer, there are less-harmful alternatives that work just as well!**

## “SALTING” THE EARTH

Low-cost deicers may get the job done, but not without repercussions. Sodium Chloride (road salt) is the most readily available, but it can:

- Deplete the oxygen supply needed by aquatic animals and plants.
- Kill or harm adjacent vegetation by changing the soil composition.
- Contaminate groundwater and surface waters by increasing the salt concentration.
- Be harmful to pets and wildlife.
- Deteriorate paved surfaces, buildings, infrastructures, and the environment.

## BE PART OF A GREENER WINTER

The most effective way to reduce the negative impacts of deicing chemicals is to reduce the amount of chemicals needed overall.



In this article you will be able to learn some strategies to reduce the total amount of deicer used, as well as, to mitigate its impacts on the environment.

# BMPs for a Greener Winter: Overview

## VARIETY AND QUALITY

There are many different types of deicers available on the market, with varying attributes, prices, and impacts, which can make it difficult to choose between them. Environmentally *preferable* deicers (other than rock salt) have been used successfully by state departments of transportation for many years and you can too!






Below you will find a table that summarizes the most commonly used deicers (chloride-based and acetate-based), and important information on each.



Note: Carbohydrate-based products tend to have high levels of phosphates, nitrates, or total organic content **which are major water contaminants**. At LaRC, we strive to protect our waterways; when buying deicers for use at LaRC, remember to not purchase any with those compounds.

## BEST MANAGEMENT PRACTICES

1. **Remove snow before it melts:**
  - ✓ Monitor the weather to know when to expect snow and remove it by shoveling or plowing, as much as possible, before applying deicer.
2. **Adopt a green deicing application plan:**
  - ✓ Apply non-chloride coatings (anti-icing) before a snow event; it helps reduce the amount of chemicals needed overall.
  - ✓ Follow manufacturer's protocol and use only the amount needed. Adding more won't melt ice any faster and the excess will contaminate soils and waterways.
  - ✓ Pre-wetting solid deicers melts ice faster and saves product (less is needed).
3. **Snow and ice disposal:**
  - ✓ Do not dispose of snow in wetlands, creeks, harbors, or other waterways or directly on top of storm drains.

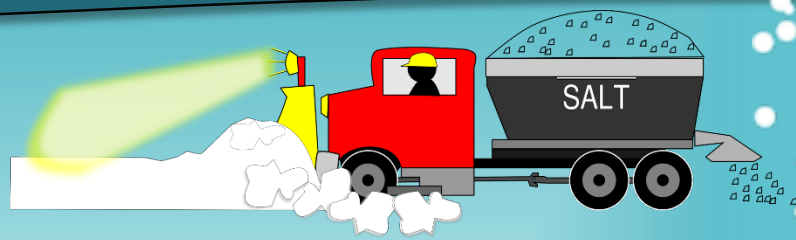
	Chlorides			Acetates	
Description					
	Sodium Chloride (Rock Salt)	Magnesium Chloride	Calcium Chloride	Calcium Magnesium Acetate (CMA)	Potassium Acetate
Works down to	15 °F	-10 °F	-20 °F	20 °F	-15 °F
Positive attributes	- Lowest cost - Melting capacity	- Melting range (temperature) - Low cost	- Melting range (temperature) - Less product needed	- Non-corrosive	- Non-corrosive - Melting range (temperature)
Environmental impacts	- Corrosive - Harmful to vegetation - Water contamination	- Corrosive - Harmful to vegetation - Water contamination	- Corrosive - May mobilize heavy metals from soils into waterways	- Can lower oxygen levels in water	- Can lower oxygen levels in water

# BMPs for a Greener Winter: LaRC



During winter, special considerations for erosion and sediment control (ESC) measures are needed. As the ground freezes, installing BMPs becomes challenging and soils end up bare or without proper stabilization. This will inevitably result in **soil erosion** as the snow starts to melt.

The best approach is to plan ahead and prepare sites with proper BMPs before a storm event. The following table will help LaRC maintain effective sediment and erosion control throughout the winter season!



## ⚠ IMPORTANT REMINDERS! ⚠

- **New Center requirement: Deicing agents containing urea or other forms of nitrogen or phosphorous are **NOT ALLOWED** for any reason. These are major contaminants of aquatic ecosystems.**
- All construction sites must remain in compliance with the VPDES permit throughout winter, whether construction continues or not; always ensure site compliance with permit requirements.

1. Prior to Winter: Pro-active measures	2. During Winter: Special considerations	3. After Winter: Re-establishing BMPs
<ul style="list-style-type: none"> <li>✓ Focus on sequencing soil disturbances and stabilize them properly before ground freezes.</li> <li>✓ Seed at least 30 days prior to freeze to allow for germination.</li> <li>✓ Ensure perimeter controls are installed and anchored firmly.</li> <li>✓ Stockpiles should be mulched or covered for over-winter protection.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Check ESC measures constantly, especially after snow melts, to ensure they are functioning properly.</li> <li>✓ Minimize new soil exposure.</li> <li>✓ Keep materials used for erosion control (gravel, sandbags, etc.) on-site to address issues quickly.</li> <li>✓ Stockpile frozen material removed during construction at least 100 ft. away from waterways.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Conduct weekly inspections (or more) to ensure the integrity of ESC practices.</li> <li>✓ Immediately repair damaged perimeter controls and stabilize any exposed soils to avoid the risk of high sediment discharge from snowmelt runoff.</li> <li>✓ Clean and stabilize sediment basins to ensure erosion control and provide storage opportunities for spring meltwater.</li> </ul>

# BMPs for a Greener Winter: Home

Want to put your home on a low-salt diet?

- Homeowners, you can follow these easy tips to choose the best deicing product for your home and the environment!



## 1. Be prepared, buy early:

Make sure to buy your deicing product before the storm hits. This way you will be able to find more environmentally friendly choices at the store.

## 2. Check the label:

Check the package closely to see what you are buying. Look for the 'Safer Choice' label for products with chemicals that are less harmful for you and the environment!



## 3. Know your salt-risk zone:

If you have salt-sensitive plants close to the driveway or sidewalk, avoid products that contain chlorides or use very small doses. You can also opt for safer alternatives (acetates).

## 4. Reduce total deicer amount:

Follow the product's recommended application rate. Remove as much snow as possible by shoveling, then apply deicer (works best when there is only a thin layer of snow or ice that must be melted).

