

Introduction

- Share information about yourself and your organization

Causes and effects of increased use of road salt

- Road salt use has doubled in the past 50 years.
- Increase caused by:
 - Increased development – more impervious surfaces such as roads and parking lots
 - Fear of liability for slips and falls
 - Change in public expectations
 - Lack of knowledge about correct amount of salt to apply
- Deicers used: sodium chloride (rock salt), magnesium chloride, calcium chloride. All contain chloride.
- More than half the road salt is put on parking lots.
- After the snow melts, salt gets washed directly into creeks, storm drains, and 45% ends up in the groundwater.
- Over time, salt gradually accumulates in the groundwater, making it saltier and saltier.
- Most Pennsylvania streams are fed by groundwater. If the groundwater is salty, the streams will be salty too.
- Problem for environment:
 - Interferes with osmotic regulation, and reduces oxygen content of water.
 - Impacts: zooplankton, amphibians, fish.
 - Ponds/lakes: salty water is denser and sinks to bottom, forming oxygen-deficient layer.
 - Affects aquatic plants.
- Soil and plantings:
 - Rock salt can travel 10 meters off surface – bounce and scatter.
 - Salt damages soil and plantings.
 - Damages green infrastructure e.g. rain gardens.
 - Extremely costly to replace.
- Damage to infrastructure:
 - Corrosion of metal structures – railings, door frames, ramps.
 - Damage to concrete structures e.g. floors of parking garages.
 - Damage to finished floors
- Effects on drinking water:
 - Sources of drinking water – rivers and groundwater.
 - Water treatment does not typically remove salt. To do so is very costly.
 - Sodium problematic for people with hypertension.
- It only takes one teaspoon of salt to permanently pollute 5 gallons of water
- Correct amount of salt:

- 12 oz sufficient for 20 paving squares. Crystals should be approximately 3 inches apart
- You don't need to feel the "Crunch" underfoot
- It only takes one teaspoon of salt to permanently pollute 5 gallons of water
- **Excessive salt poses slip/fall risk.**
- After snow events, leftover salt should be swept up.

Show your pictures and any data you have

Best Management Practices (BMP's):

- Right amount of deicer at the right time.
- Maintain safety.
- Reduce landscaping expenses
- Reduces damage to environmental and drinking water
- Mechanical snow removal:
 - During and after storm
 - Prevents compaction
 - Reduces need for deicing chemicals
 - Paths and sidewalks:
 - Rotary brooms, snow blowers, snow scrapers
- Segmented or live-edge plows
 - Blade has short, spring-loaded sections
 - Conform to road surface
 - Give cleaner scrape = fewer passes
 - 50% reduction in salt used
- Close high-risk, high-maintenance areas
 - Duplicated sidewalks, stairs, high-risk areas
- Calibrating spreaders –low-cost
 - 50% reduction in salt
 - Calibrate annually, anytime service performed, and for each type of material
 - Mayo Clinic had been using 3 – 6x recommended amount of salt. Their contractors had been using 4 – 15x recommended amount of salt.
- Pre-wetting salt – spraying it with brine
 - Sticks to surface = significant savings in salt.
- Pre-treating with brine:
 - 23.3% solution of salt and water
 - Spray on roads, parking lots, and sidewalks before storm
 - Prevents snow/ice from bonding with surface
 - Melts snow-ice faster than rock salt

- Easier and faster to plow later
- 50% less salt needed
- Can be spread well ahead of storm = savings on overtime
- Does not cause expensive damage to landscaping

- Salt storage: salt can be dissolved by rain causing runoff and leaching into ground.
 - Under cover – permanent structure or weighted tarp
 - Level site
 - Impervious surface
 - Outside 100-year floodplain
 - Drainage controls to prevent runoff
 - Clean up spills
 - Inspected and maintained regularly

- Temperature sensors
 - Show pavement temperature – important for using application rate charts
 - Hand-held infrared units – inexpensive
 - Truck mounted units – give real-time information
 - In-road sensors – can be used at remote sites
 - Pole-mounted units

- Storage of plowed snow
 - Higher concentration of salt and other pollutants
 - Melting snow piles can leak into waterways and wetlands
 - Should be >100 feet from private wells

- Hiring of contractors
 - Different types of contracts
 - Time and materials contracts reduce the amount of money contractors get if they use less salt - least effective for reducing amount of salt used. contractors
 - Seasonal contracts provide contractors flexibility to use BMP's while assuring they will provide service on when and where necessary.
 - Sample contract from Wisconsin is available for reference.

Ask for questions