

My pleasure to welcome you to this important event.

I am the chair of the Greater Sudbury Watershed Alliance made up of a number of Lake and River Stewardship groups with a mandate to protect and improve water quality within the City of Greater Sudbury.

I would like to introduce our board members who are with us tonight.....

Panel Members

- **Dr. John Gunn**
Canada Research Chair, Stressed Aquatic Systems and Director
of Vale Living with Lakes Centre
- **Dr. Charles Ramcharan**
Associate Professor, School of the Environment
Laurentian University
- **Anoop Naik**
Water Resources Specialist, Conservation Sudbury



We are very pleased to have special guest presenters, Dr. Gunn and Dr. Ramcharan and Anoop Naik, who we will hear from in a few minutes. We wish to thank them very much for participating.

Invitations were also extended to the City of Greater Sudbury, various relevant departments including those connected to the current Ramsey Lake Sub-watershed Study, the Sudbury and District Health Unit, the Ministry of Environment and Climate Change, Conservation Sudbury, and the Source Water Protection Committee.

Road Salt

- It's been all over the news in North America
- Used to de-ice roads, parking lots, driveways & sidewalks
- It is primarily made up of sodium & chloride
- Rising sodium & chloride levels is a growing concern in:
 - Freshwater lakes, rivers & aquifers
 - Source drinking water wells
 - Private wells
- Elevated salt concentrations can:
 - Reduce lake water circulation
 - Prevent oxygen from reaching bottom layers of water
 - Interferes with osmoregulation and can be toxic to some aquatic species



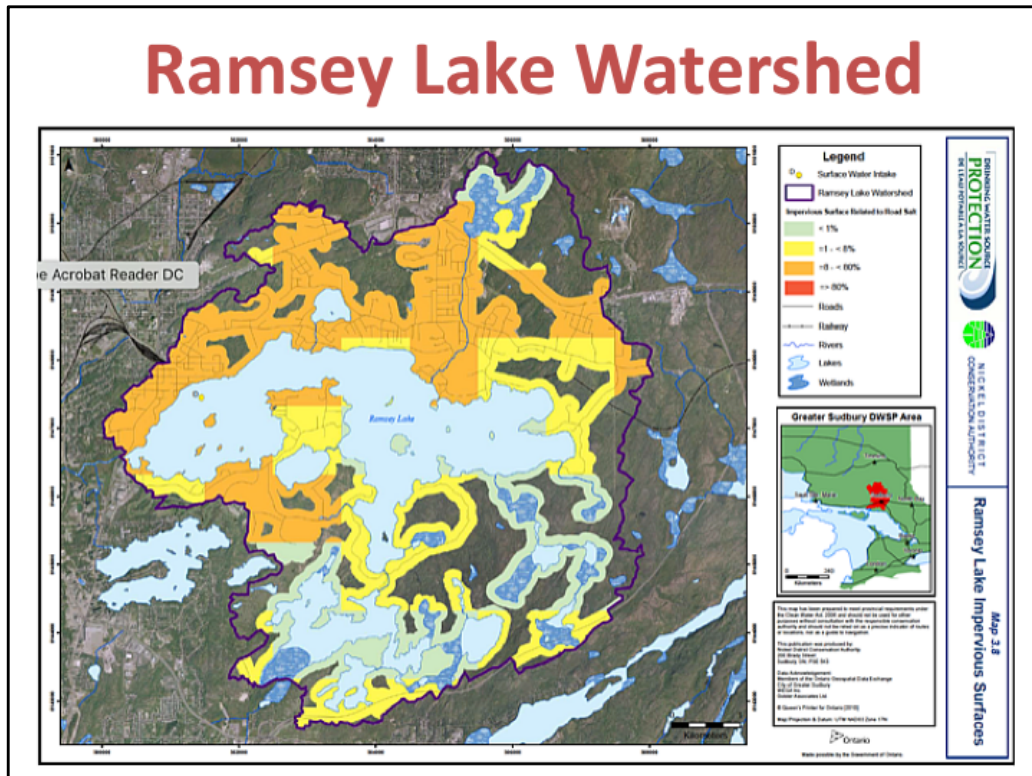
This issue has been in the media a lot this year in northern areas of the United States and Canada where road salt is used to keep paved areas such as roadways, sidewalks, parking areas clear of snow and ice.

Rising sodium and chloride levels is a growing concern in our freshwater lakes, rivers and aquifers.

Elevated salt concentrations can reduce lake water circulation and prevent oxygen from reaching the bottom layers of water.

Our guests will elaborate further.

Ramsey Lake Watershed



This Drinking Water Source Protection map shows the Ramsey Lake Impervious Surfaces that includes a number of roads and developments, virtually all of which use road salt.

The particular challenges presented by the geological realities will no doubt be elaborated upon by our special guests.

Ramsey Lake Salt Concerns

Water Quality (Ramsey Lake)

Objectives

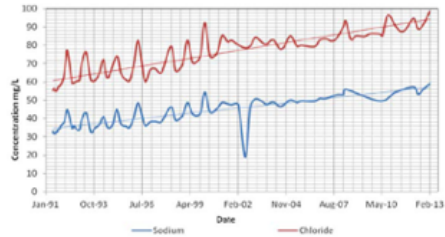
- Identify sources of pollution and water quality trends

Study Tasks:

- ✓ Synthesized water and aquatic sediment data sets
- ✓ Identified long term trends in pollutants

Key Findings

- Sodium and chloride concentrations in Ramsey Lake have increased since 1991
 - Sodium concentrations have been > 50 mg/L since 2013. The Ontario Drinking Water Standard for sodium is 200 mg/L
 - The water quality guideline for chloride, for the protection of aquatic life, is 120 mg/L



Sodium and Chloride Concentrations in Ramsey Lake (1991-2013).

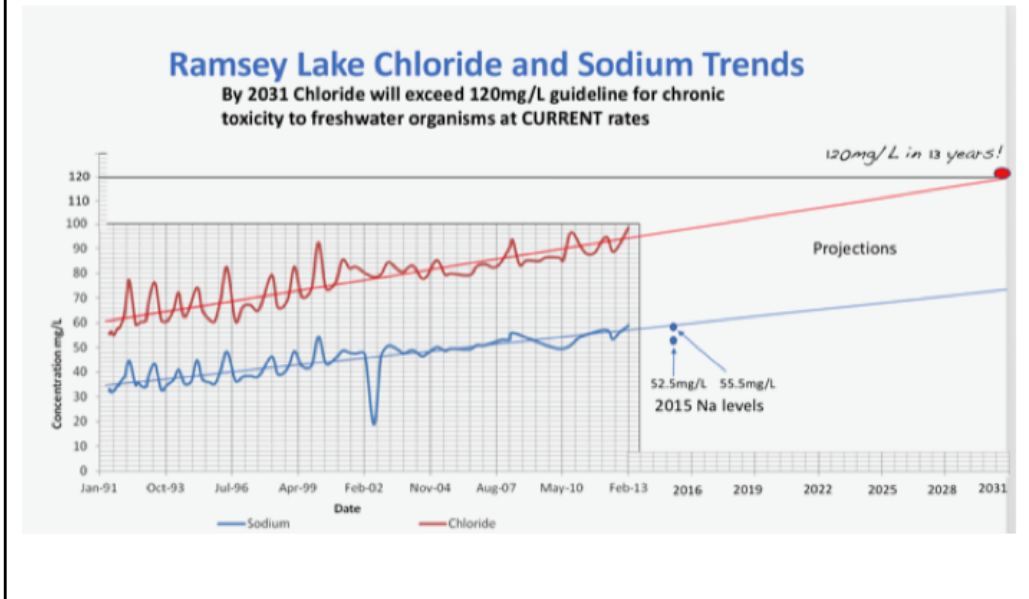
This slide from the current Ramsey Lake Sub-Watershed Study shows the steady increase of both sodium and chloride concentrations in the lake since 1991.

The chloride level at close to 100 mg/L is approaching the water quality guideline limit for the protection of aquatic life of 120 mg/L.

Sodium levels have been well over 50 mg/L for some time.

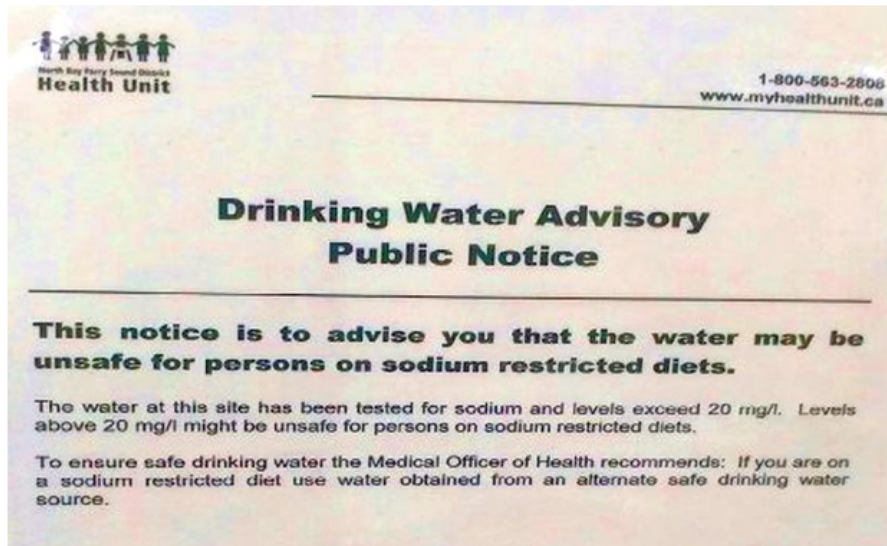
Water begins to taste of salt when levels approach 200 mg/L.

Projections



Here is a projection of sodium and chloride levels into 2031 if the trend continues and nothing is done to mitigate this issue.

Sodium Threat



This slide shows a public sodium warning of over 20 mg/L posted by the North Bay/ParrySound Health Unit.

Local Health Units can post these notices and are required by provincial authority to notify local health professionals when sodium levels in drinking water exceed 20mg/L.

Ramsey Lake sodium levels from the David Street treatment plant have for a significant time been over 50mg/L and continue to rise.'

As far as we know there have been no public postings, such as in restaurants, etc. for those on sodium restricted diets.

“Inconvenient” Salt Facts

- Salt loses its effectiveness if temp. drops below minus 10°C
- Storm water retention ponds do not remove or prevent salt from entering the environment
- Neither do oil and grit separators
- Salt will eventually run-off into our rivers, lakes and groundwater
- No cost effective means of removing sodium from drinking water by either municipal or home treatment
- Corrodes infrastructure



Salt loses its effectiveness if the temperature drops below minus 10 degrees centigrade - so it's usefulness has a narrow window.

Salt will eventually run-off into our rivers, lakes and groundwater, and because it is so soluble there is no means of removing it once it enters the environment.

There is also no cost effective means of removing sodium from our drinking water by either municipal or home treatment systems.

Storm water retention ponds and oil and grit separators do not remove or prevent salt from entering the environment.

The best remedy is prevention – not to use it in the first place, but there are serious safety concerns if we don't keep streets, parking lots and sidewalks free of snow and ice for both motorists and pedestrians.

Alternatives to Road Salt

- Other chlorides such as Potassium, Magnesium or Calcium
- Agricultural wastewater in combination with road salt
 - Beet juice
 - Pickle juice
 - Potato juice
 - Cheese brine
- Traction substances
 - Sand
 - Wood Chips in conjunction with road salts
 - EcoTraction – an eco-friendly negatively charged volcanic mineral that embeds itself into ice & snow



Currently there are no perfect alternatives to road salt.

Chlorides other than sodium are more expensive and have similar environmental downsides.

Beet juice and other agricultural products must be used in conjunction with road salt and could have potential detrimental impacts with respect to lake water quality.

Wood chips and other traction substances do not actually melt snow and ice, but provide better traction.

EcoTraction is an eco-friendly negatively charged volcanic mineral that embeds itself into ice and snow.

What to do?

- Do nothing
- Use less salt
- Use an ecofriendly alternative to salt
- Permeable road/parking/sidewalk surfaces
- Conductive paving on walkways & entrances
- Green infrastructure
 - Vegetative swales
- Effective grading & stormwater collection
- Other??



Doing nothing using current road salt application rates and creation of more hard surface roads, parking lots in the watershed will just speed up deterioration of lake water quality.

This will result in eventual salination of the lake to the extent that it will not be suitable for drinking water, and it will be harmful to aquatic life.

Property values will be reduced, and eventually we will have to find another drinking water source for over 50,000 residents, and likely at considerable expense.

Using less salt together with other materials to slow rate of salt increase over time.

Ensure future development uses permeable surfaces, conductive paving, green infrastructure, and effective grading and stormwater collection.

Other methods would no doubt mean some lifestyle changes such as driving on roadways not cleared to bare surface and banning salt use on private property (like the phosphorus ban).

Agenda

- Presentations by Panel Members:
 - Dr. John Gunn
 - Dr. Charles Ramcharan
 - Anoop Naik
- Q and A period directed at guests
- Other comments – questions from audience
- Action Suggestions
- Provide name & e-mail contact for further information & updates
- Thank you for attending!



Now it's time to hear from our Panel Members, Dr. Gunn, Dr. Ramcharan and Anoop Naik, following which there will be a Question and Answer Period and opportunity for general discussion.

Thank you for attending our Road Salt Forum, and for your interest in this important subject!