

# Chloride in the Lake Simcoe Watershed

Board of Directors' Meeting  
November 24, 2023

David Lembcke

Manager, Environmental Science and Monitoring

Bill Thompson

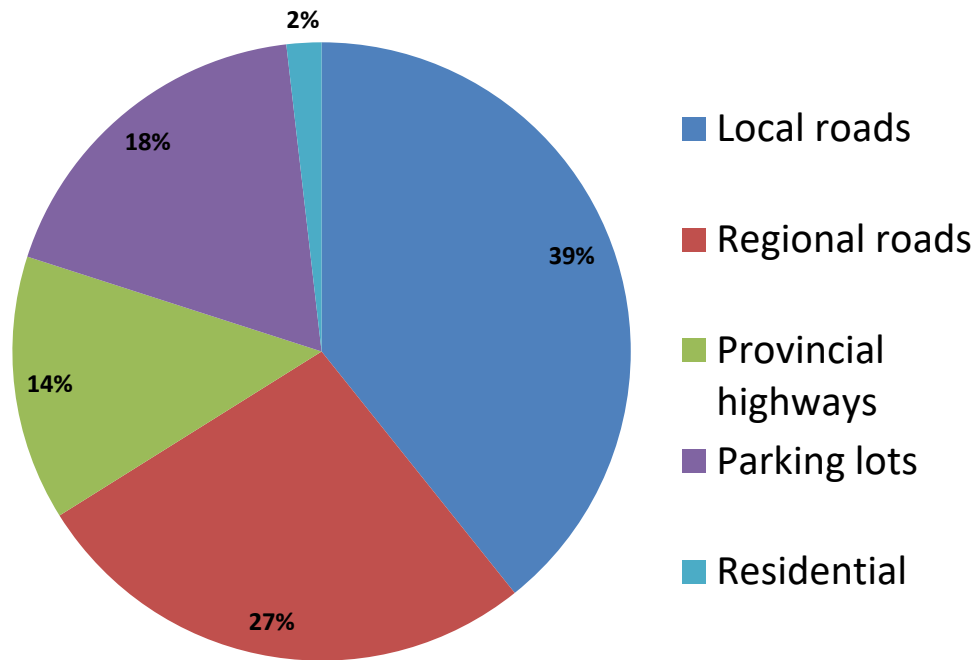
Manager, Watershed Plans and Strategies



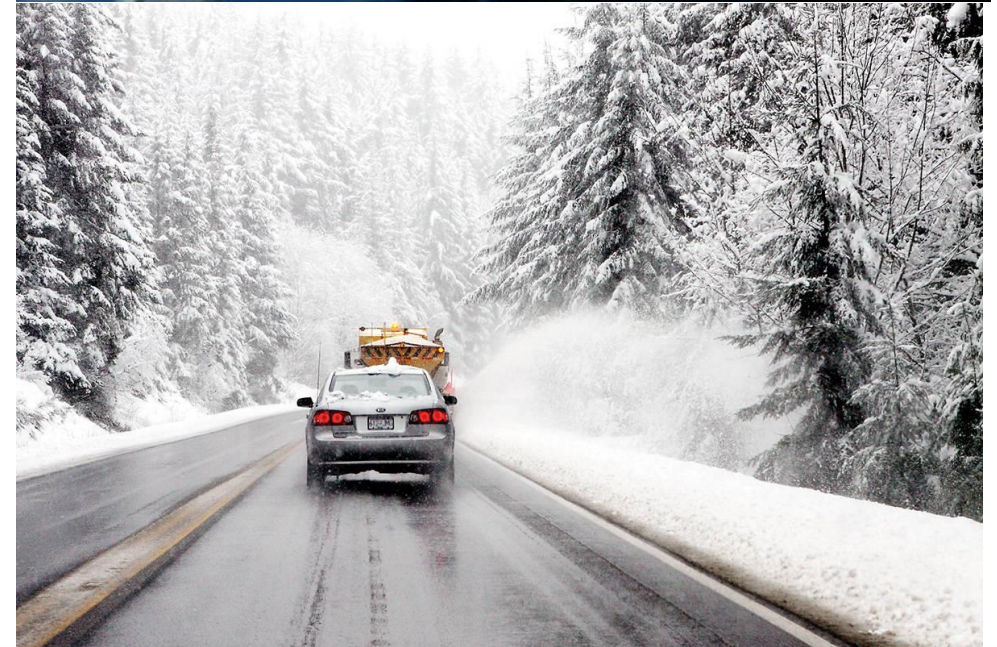
**Lake Simcoe Region**  
conservation authority



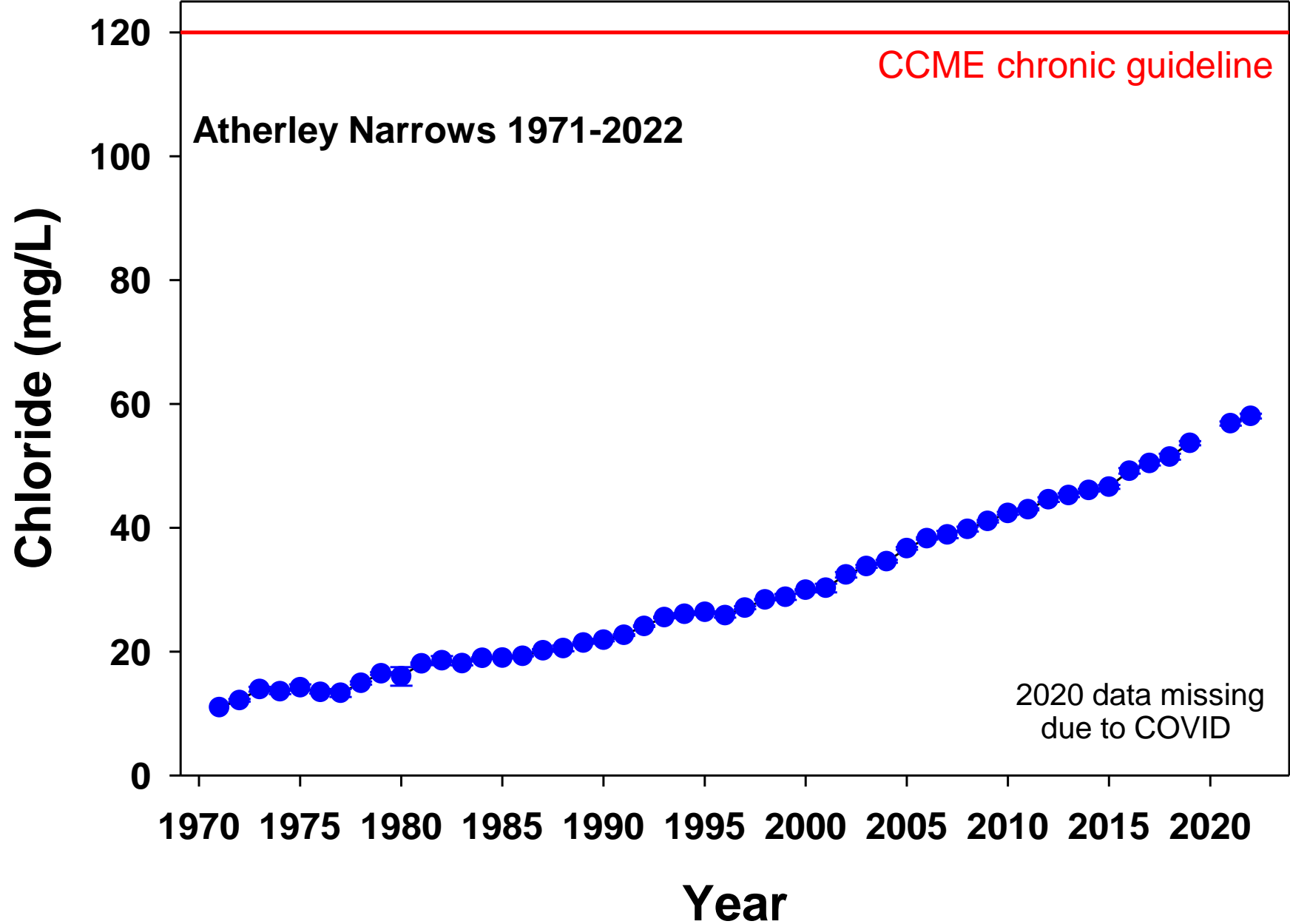
# Application in Lake Simcoe Watershed



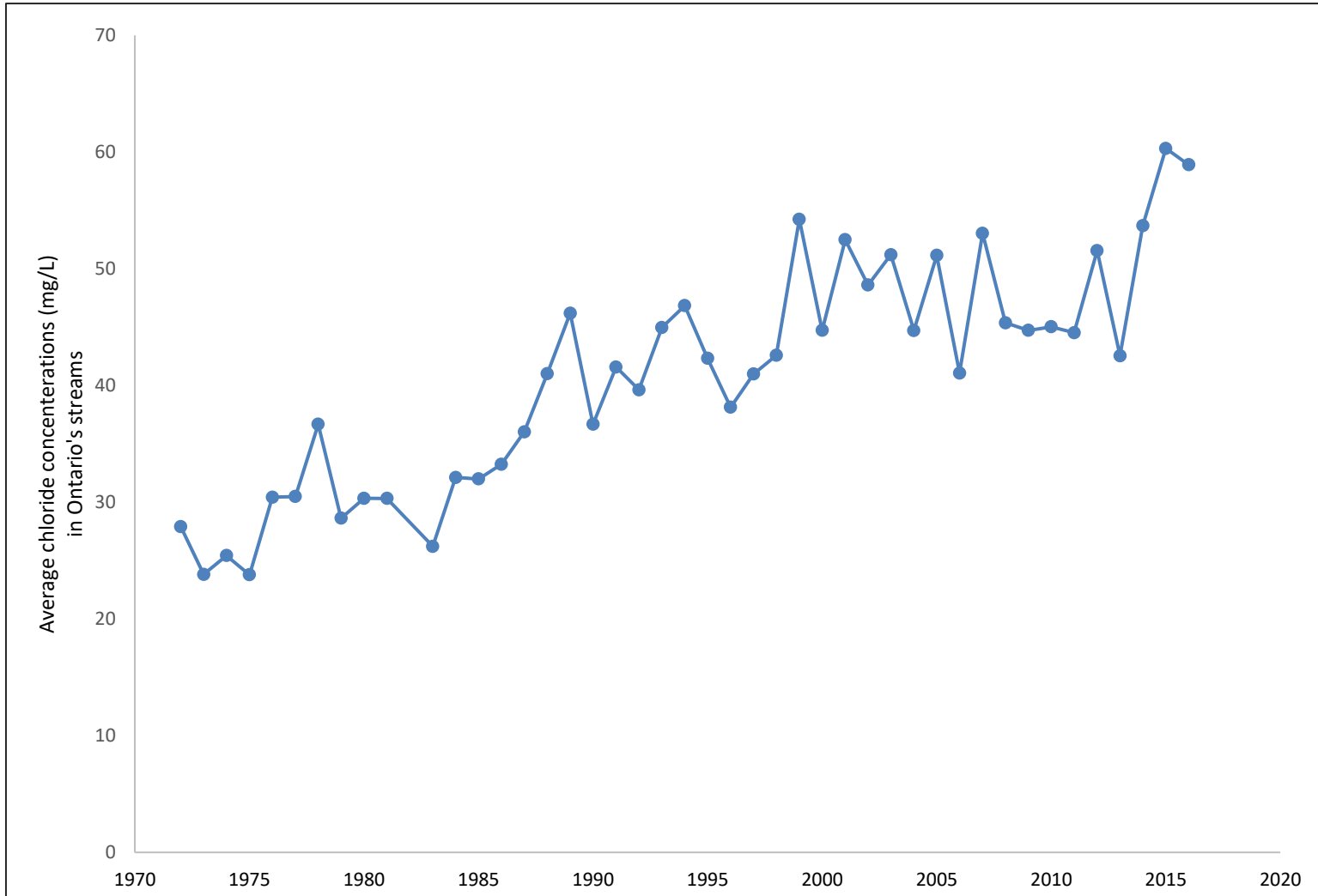
- Total of 100,000 T in 2012
- Equivalent to 225 kg of salt per capita
  - **that is 2.5 of me!**



# Winter Salt in Lake Simcoe



# Not just Lake Simcoe



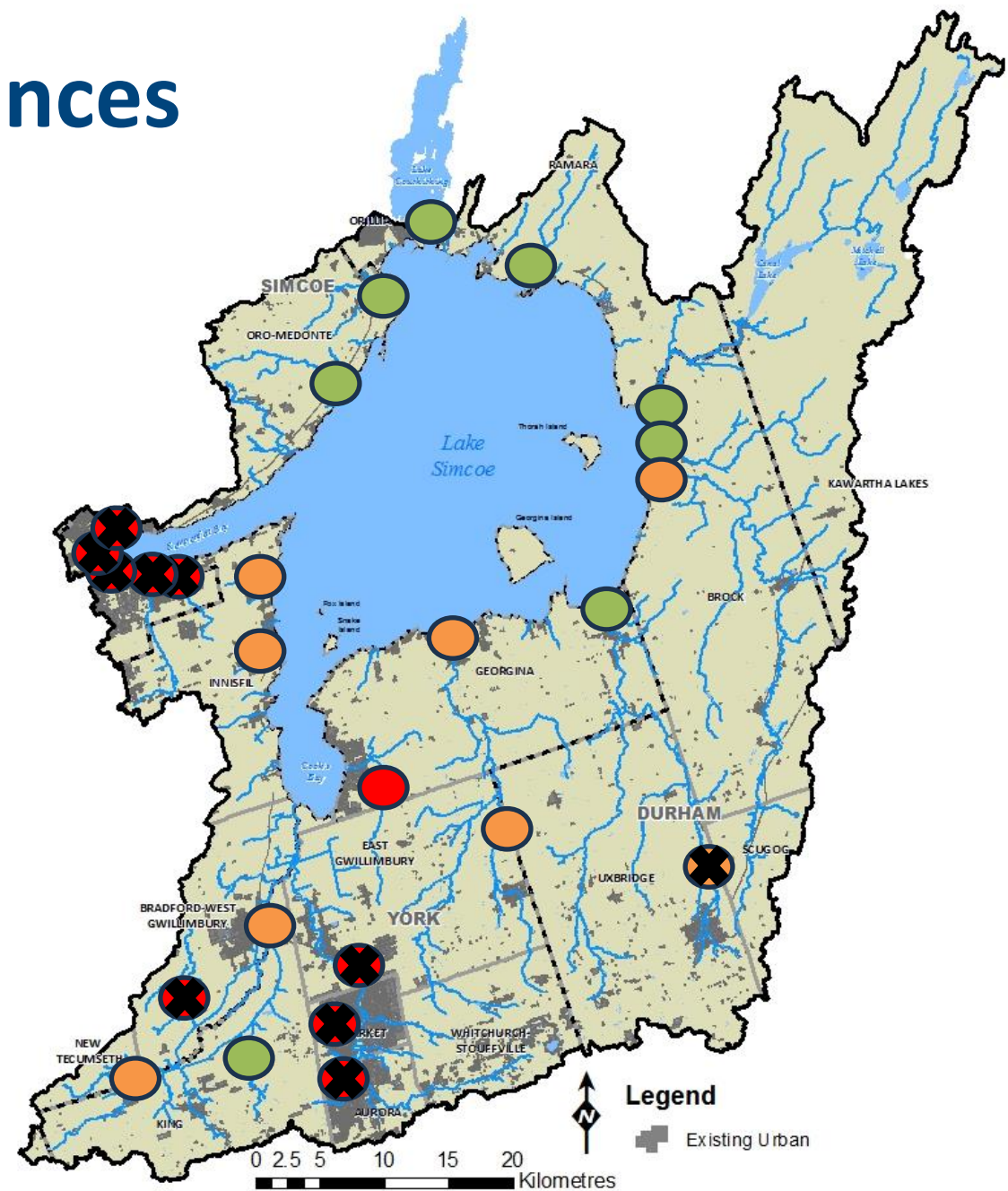
- Results from over 2000 streams in Ontario
- Chloride concentrations in urban streams are typically higher and increasing faster



# Tributaries – Chloride Exceedances (2012-2021)

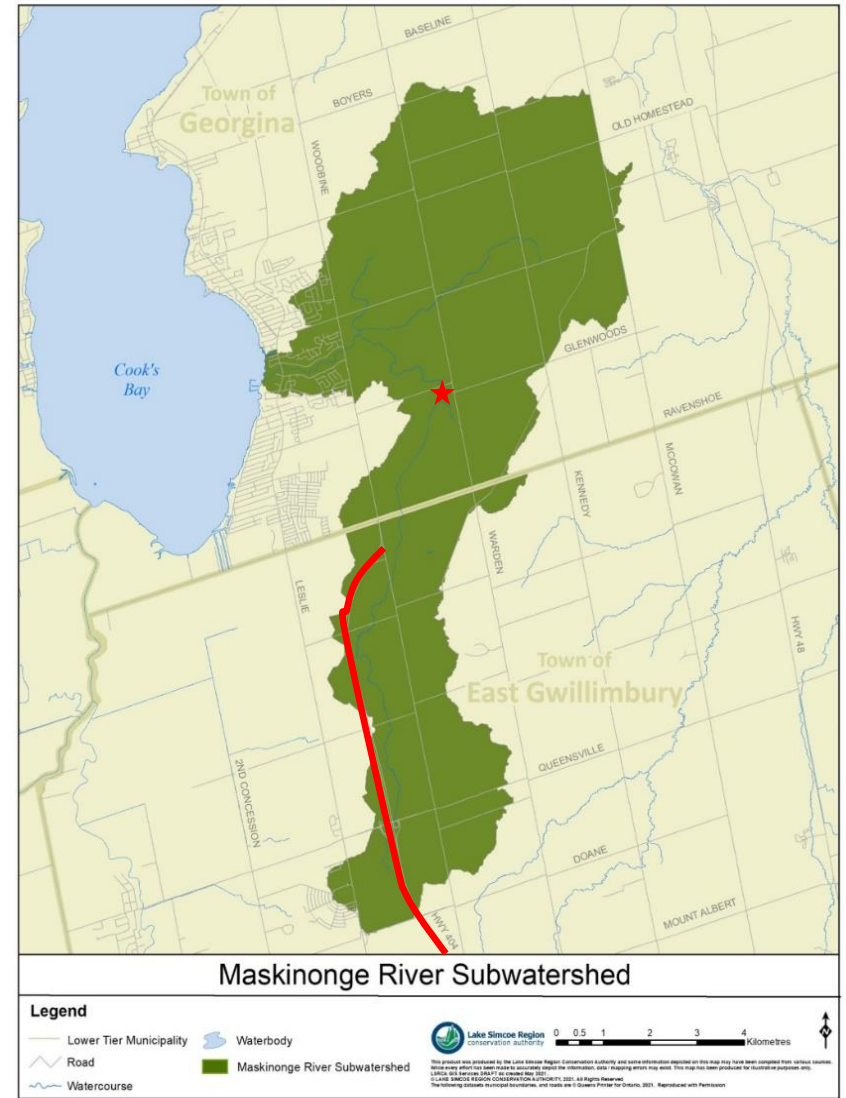
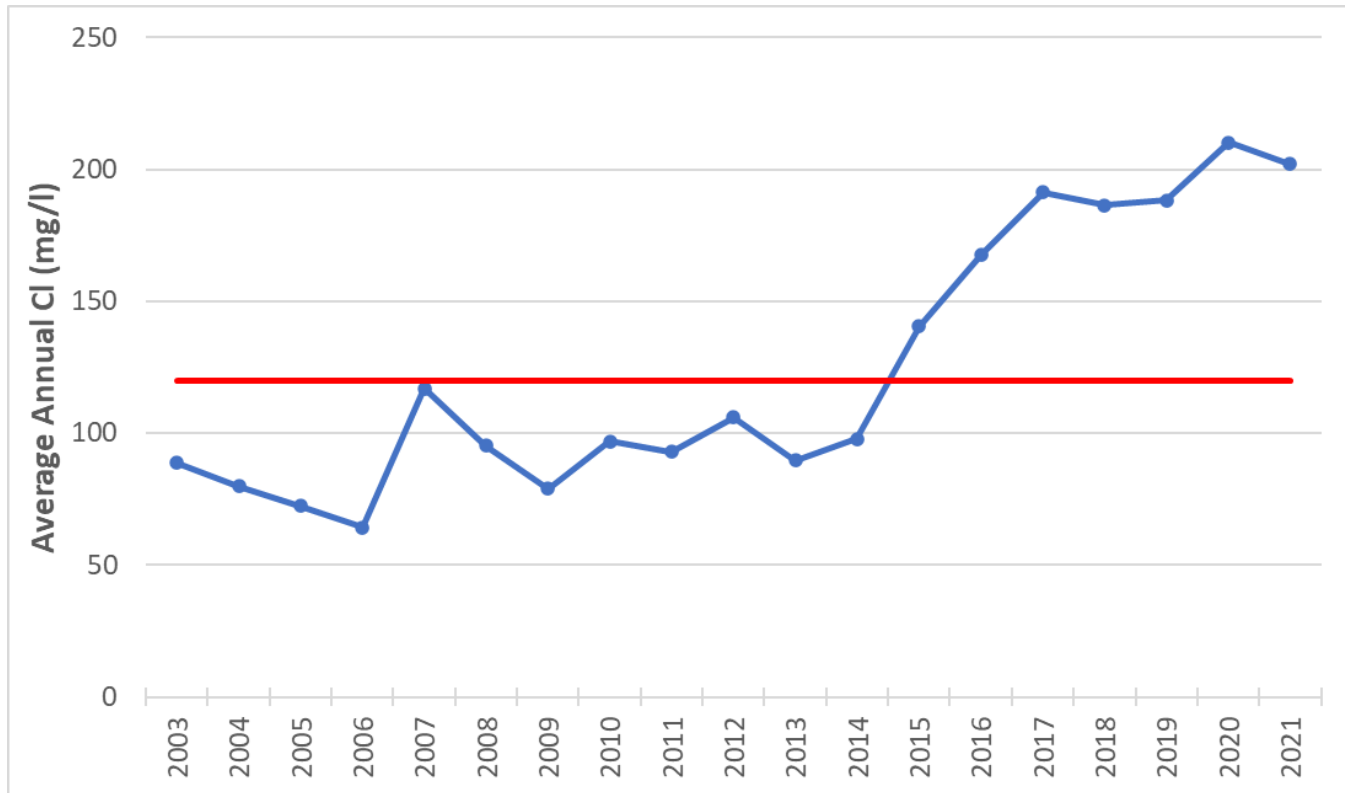
- Chronic Guideline = 120mg/l
- Acute Guideline = 640mg/l

- No samples >120mg/l
- Some samples >120mg/l
- Majority of samples >120mg/l
- ✘ Some samples >640mg/l



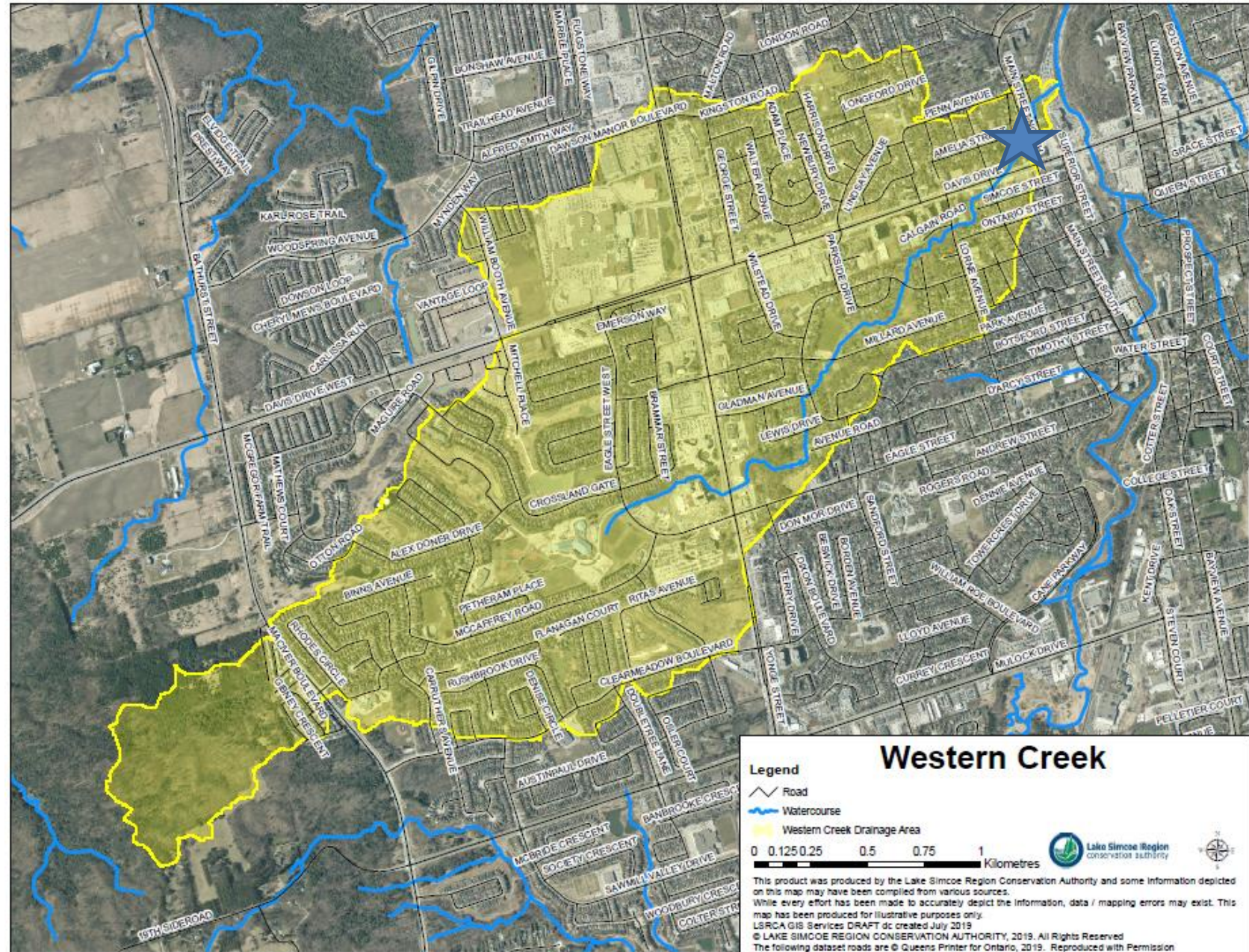
# Maskinonge River– Chloride (2003-2021)

- 43% of samples exceed chronic guideline (120 mg/L)
  - Before 404 Highway extension (2014): 11% exceeded guideline
  - Since 2014: 80% exceed guideline
- No samples above acute guideline (640 mg/L)

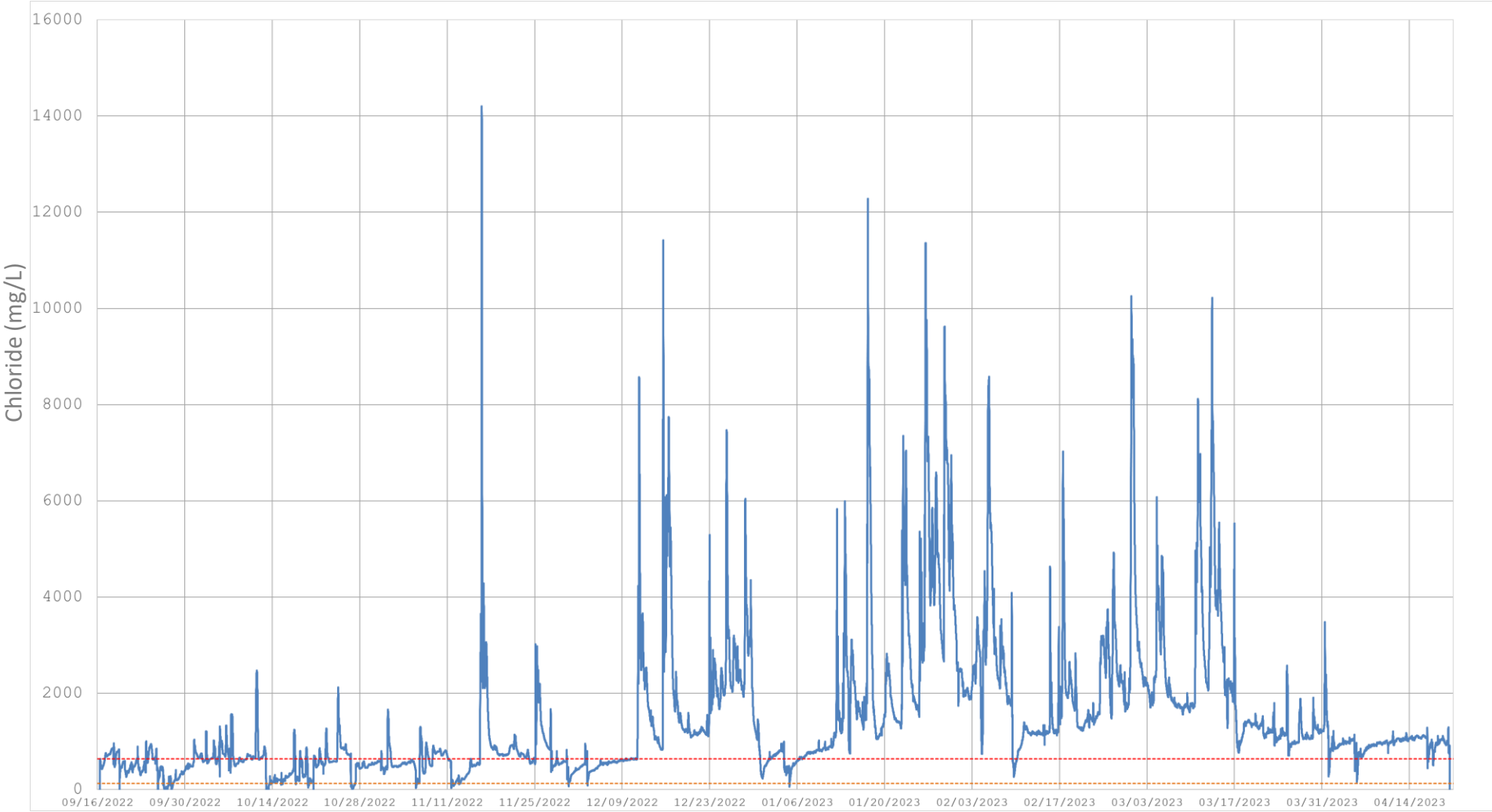




# Western Creek



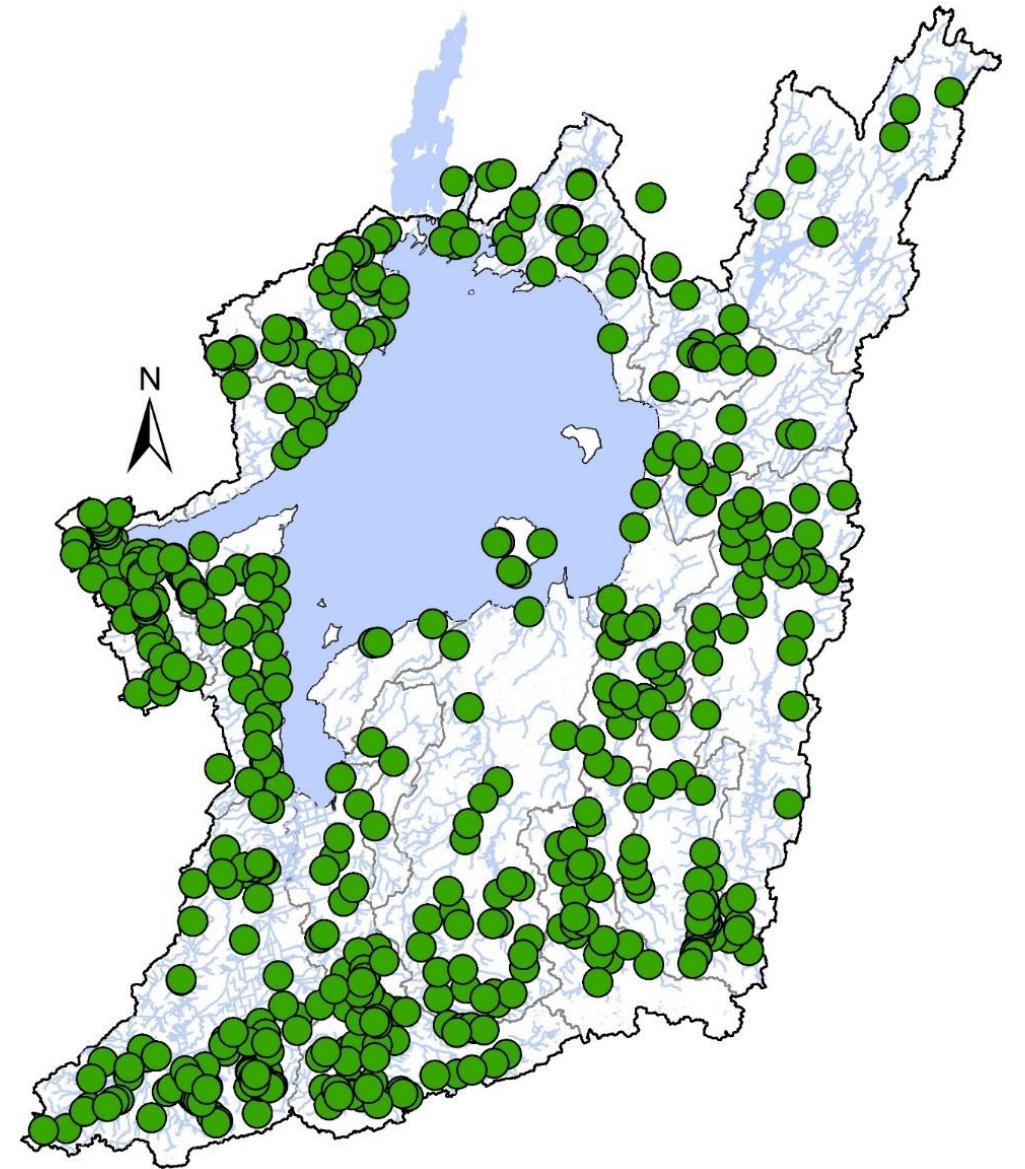
# Continuous Chloride in Western Creek





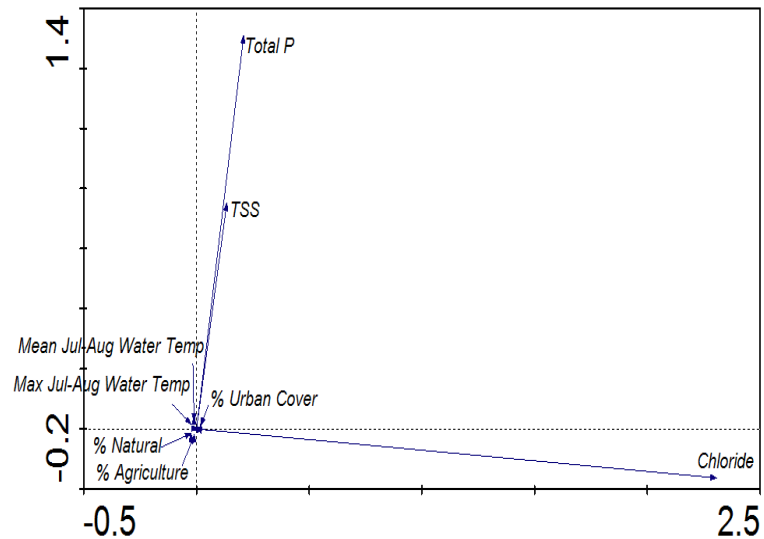
# Tributary Fisheries Assessments

- From 2002 to 2021
- 1393 assessments
- 63 species capture
- 157,999 Fish Captured
- 530 sampling sites
- 23 annual sites that overlap with water quality sites



# Drivers of Tributary Fish Health

## The Main Drivers of Change



- Chloride concentration account for 64.3% of variation
- Phosphorus and TSS account for 27.7% of the variation
- Totaling 92% of the variation



# Engaging Salt Users

- Lake Simcoe Salt Working Group
- Parking lot design guidelines
- Technical briefs

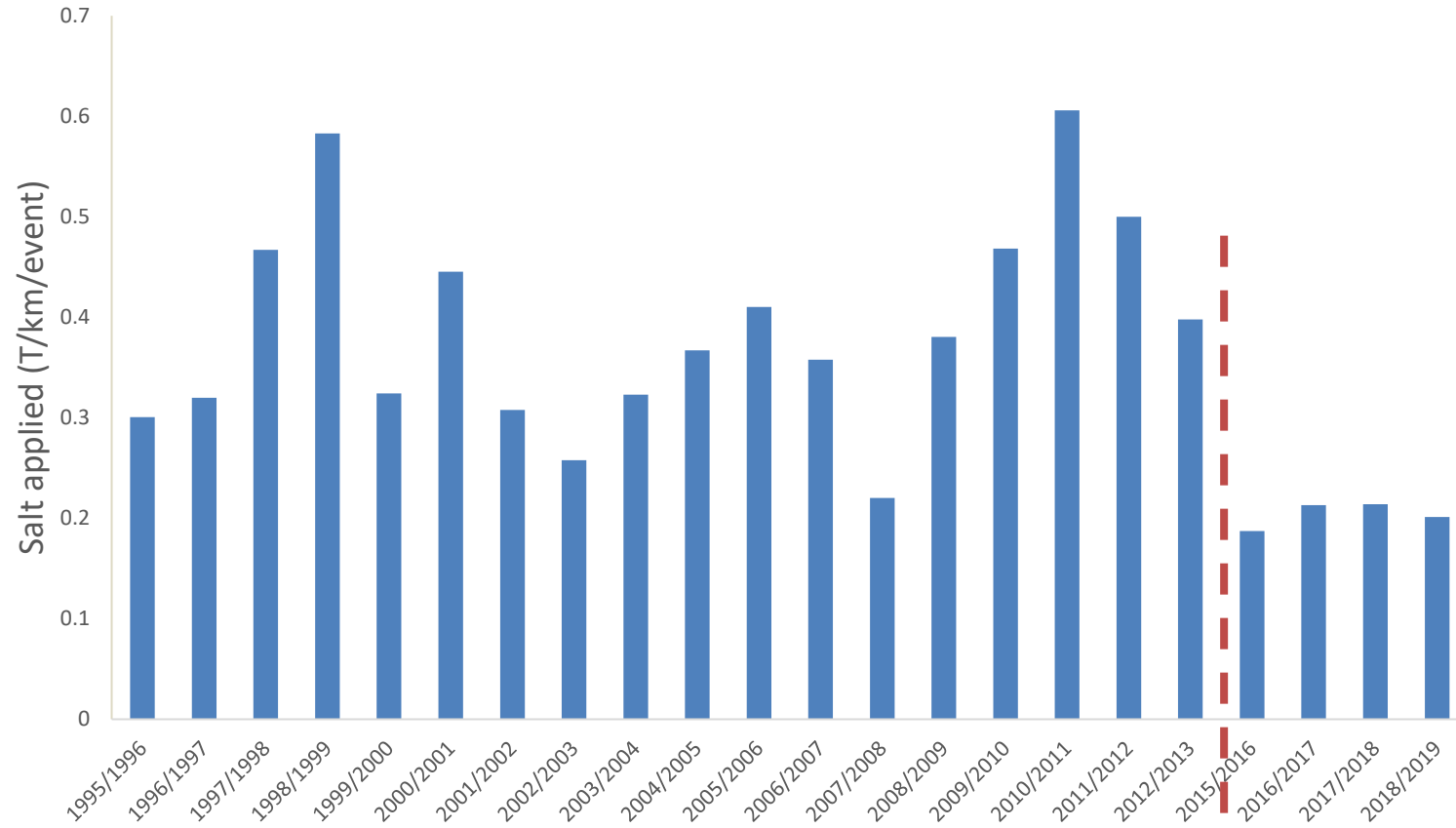


Available at [sustainabletechnologies.ca](http://sustainabletechnologies.ca)





# Case Studies



**Sustainable Technologies**  
EVALUATION PROGRAM

TECHNICAL BRIEF

## Town of Newmarket: Operational Changes and Effects on Chloride Application

Municipal salt application for road safety in the winter months is among the highest sources of chloride in the Lake Simcoe watershed (Figure 1), and in southern Ontario in general. In recent years, several municipalities in the watershed have been working to refine their practices and apply less material to roadways. This is being undertaken for several reasons:

- The recognition of the environmental impact of large volumes of chloride entering our aquatic systems
- The desire to remove sand from the mix, as sand clogs waterways and stormwater infrastructure (where it requires removal) and adds to operational costs.
- The exploration of new, potentially more effective materials, such as treated salt products (e.g. Thawrox®).
- A desire to find the optimal application rate to ensure safety, while reducing the amount of material applied.
- Optimization of winter maintenance budgets; costs are lower if less material is applied and spring cleanup costs are reduced.

Source	Percentage
Local roads	45%
Regional roads	19%
Provincial highways	17%
Commercial	17%
Residential	2%

The Town of Newmarket, in York Region, is one of the Lake Simcoe municipalities that has been working to refine its practices. Until the 2016/2017 winter season, the Town used a mix of salt and sand, like many municipalities in the area (an exploration of salt vs. sand can be found in this Technical Bulletin). From 1995 to 2015, the Town used a ratio

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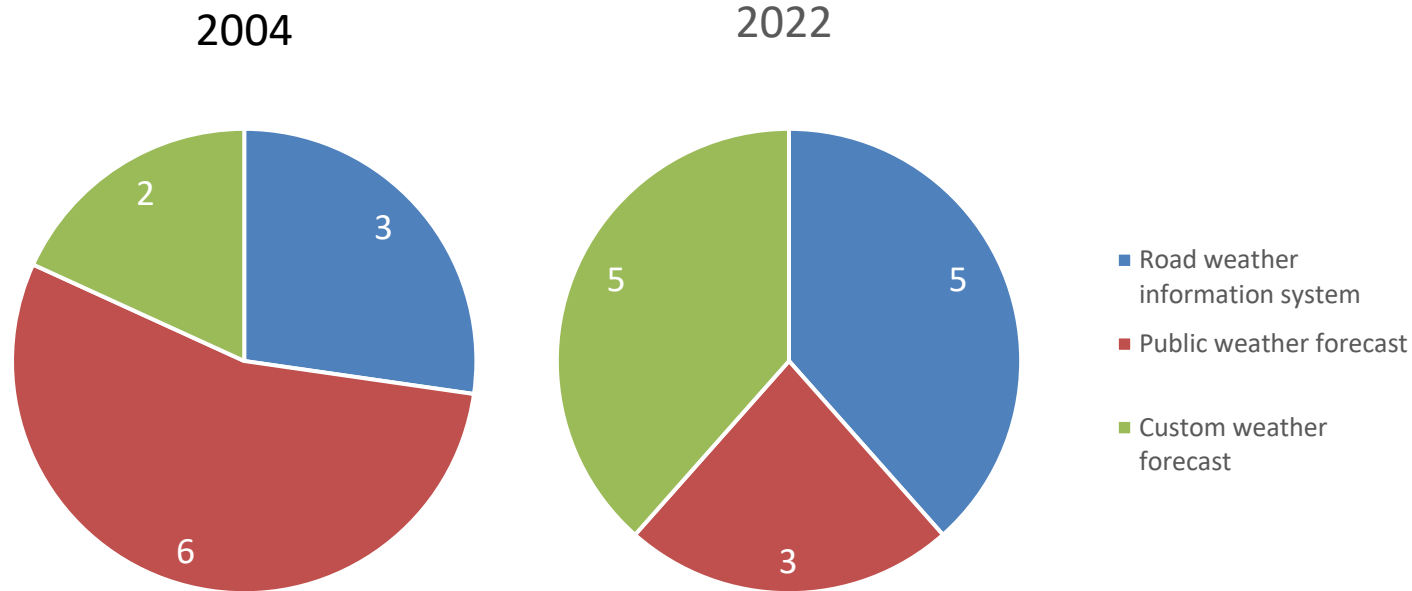
# Changes in Municipal Practices

- Review of salt management plans (2004 - 2005)
- Benchmarking survey (2017)
- Benchmarking survey (2022)



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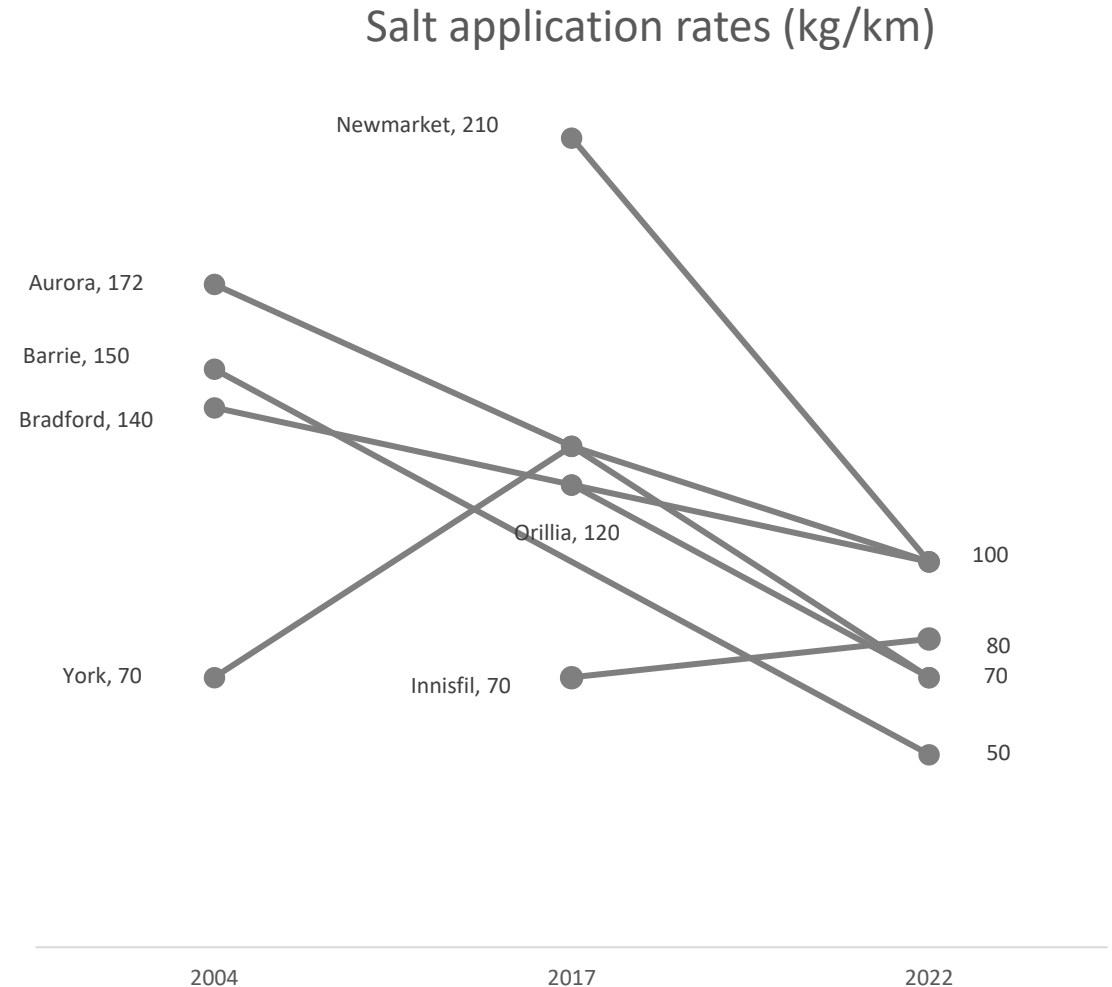
# Changes in Municipal Practices – Weather Forecasting





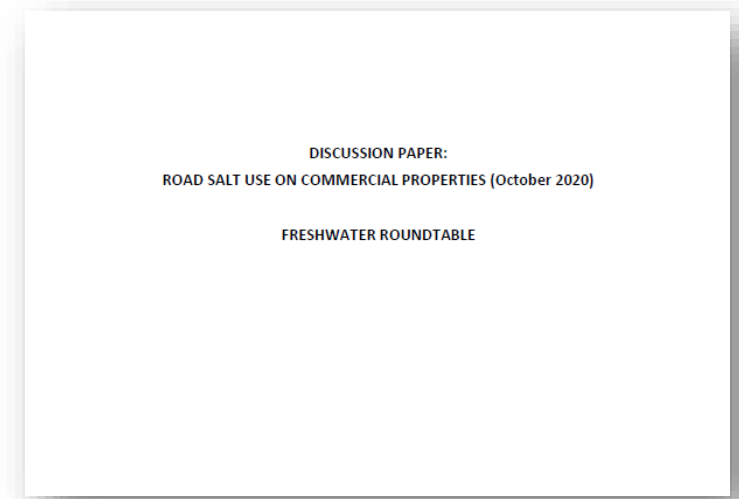
# Municipal Salt Application Rates Dropping

- Better weather forecasts
- More sophisticated materials and equipment
- Staff training
  
- Are weather events increasing though?



# Private Sector Engagement

- Smart About Salt
- Freshwater Roundtable
- Promoting regulation change: limited liability





# Crisis in the Industry

*“Our rates went from \$6000 to \$16,000 in the span of a year 2018 now in 2019 they are \$35,500.00”* *Nicholas Dean, Dean Ryans, Ottawa*

*“The last two years alone my costs for insurance rose almost **28%** from **\$55,224.48** to **\$76,272.36**. My deductible for each claim also increased from **\$5,000.00** to **\$10,000.00** and our company has never had a slip and fall claim awarded against us since conception of the company.”*  
*Doug Dolson, Paramount Landscaping, Campbellville*

*“If I cannot get insurance or if insurance rates are so high that I can't stay in business, who will keep properties safe and accessible? **This past year, my insurance increased by \$20,000.** That was in large part due to the winter liability portion of our insurance. Several competitor Snow and Ice Management companies have recently stopped providing winter service to their customers because of high or unavailable insurance costs.”*  
*Kevin Marshall , Komoka*



# Salt Forum 2023

- Co-hosted by LSRCA and Landscape Ontario
- With Waterloo, Guelph, Toronto Metropolitan University, Conservation Ontario
- 100 people in attendance
  - Contractors
  - Provincial staff
  - Municipal staff
  - Conservation Authority staff
  - Academics and NGOs



# Salt Forum 2023

- Environmental trends
- Operational realities
  - Contractor's viewpoint
  - Client's viewpoint
  - Liability / risk management viewpoint
- Solutions
  - The "New Hampshire model"
  - Training and certification programs
  - Effectiveness of best practices
  - Inexpensive, sophisticated weather forecasting systems
- Panel discussions





# Queen's Park Day

- Landscape Ontario at Queen's Park, Oct 25
- Positive feedback, including from Minister, Premier





# Next Steps

- We're not done yet!
- Additional case studies to prompt adoption in the public sector
- Work with partners to promote regulation change in the private sector
- Continue to support Smart About Salt's development