

Assessing Long-Term Trends in Chloride Concentrations in the Groundwater and Surface Water of a Rapidly Urbanizing Watershed in Southern Ontario

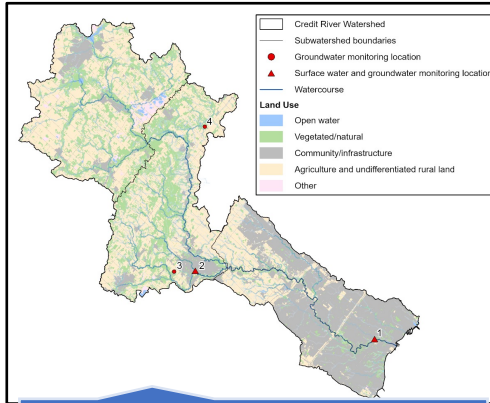
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Background

- Chloride concentrations in the Great Lakes basin have been increasing over the last 30 years as the area has urbanized
- The predominant contributor is the application of road salt (NaCl), especially in urban areas
- Elevated Cl (and Na) concentrations are harmful to freshwater organisms and can impair drinking water quality



Land use map of study area, Credit River watershed including the 4 sampling locations

Field Campaign

- A combination of drive point piezometers, monitoring wells, and surface water bodies are monitored
- Samples are regularly analyzed for major ions, stable isotopes (¹⁸O and ²H), and field parameters such as pH, electrical conductivity and temperature
- Additional, intermittent analyses including:
 - Tritium-helium (groundwater dating)
 - Artificial sweeteners (source characterization)
 - Rn-222 (tracking groundwater discharge)



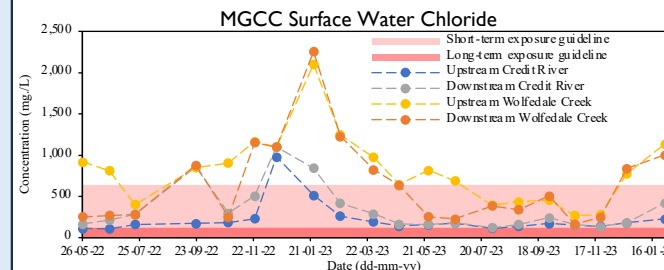
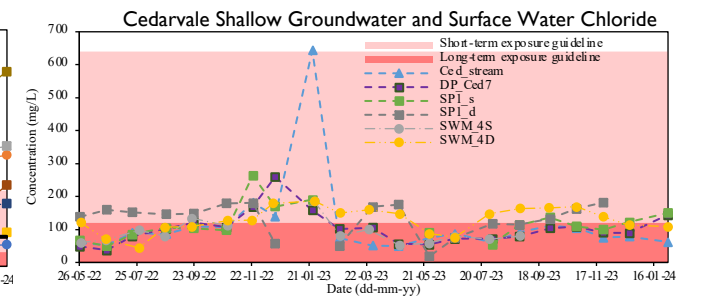
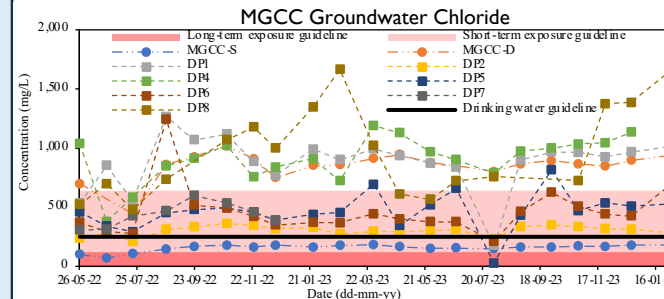
Objectives

- Analyze the long-term trends in chloride concentrations in the groundwater and surface water in the Credit River watershed and how they relate to climate forcing
- Evaluate the effects of seasonal storm events on these trends

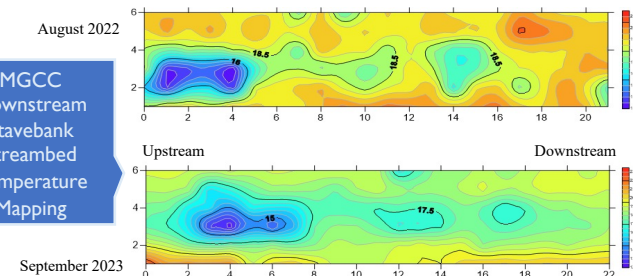


Over applied road salt on a walkway

Preliminary Results



MGCC Downstream Stavebank Streambed Temperature Mapping



Acknowledgements

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