

# Southeastern Wisconsin **Regional Planning Commission**



## **Chloride Impact Study for the Southeastern Wisconsin Region**

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Update to WDNR staff

## Chloride loading analyses and forecasts

- Existing and planned 2050 conditions
- Evaluate potential effect of climate change on winter road maintenance operations under planned 2050 land use conditions

## Review State-of-the-Art

- Identify and evaluate best practices and technology
- Explore legal and policy aspects
- Develop performance and cost information for practices

## Develop alternate chloride management scenarios

- Meet public safety objectives
- Minimize harm to the environment
- Cost effective



Public Works Magazine



# ●●●●● Study Monitoring – field complete

40 stream sites operational during October 2018 to October 2020 monitoring period – continued into 2021 for event sampling at select sites

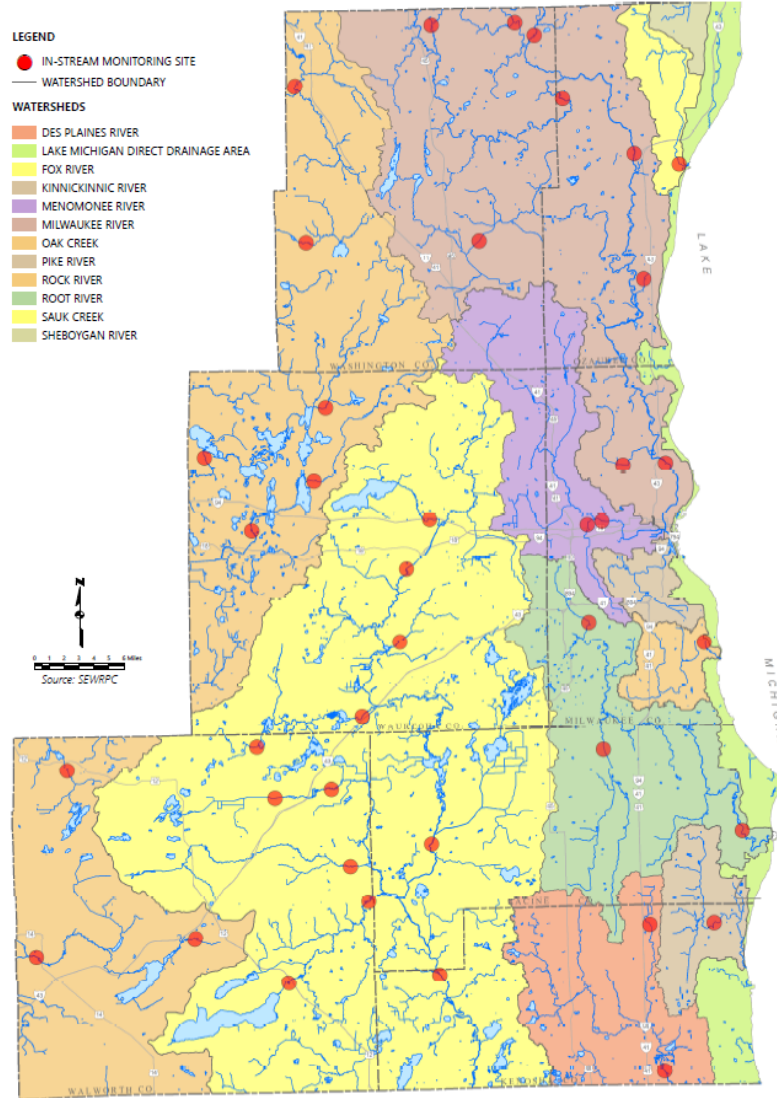
- Distributed across Southeastern Wisconsin

Continuous monitoring of specific conductivity, water temperature, and water level

- Every five minutes since 10/01/2018



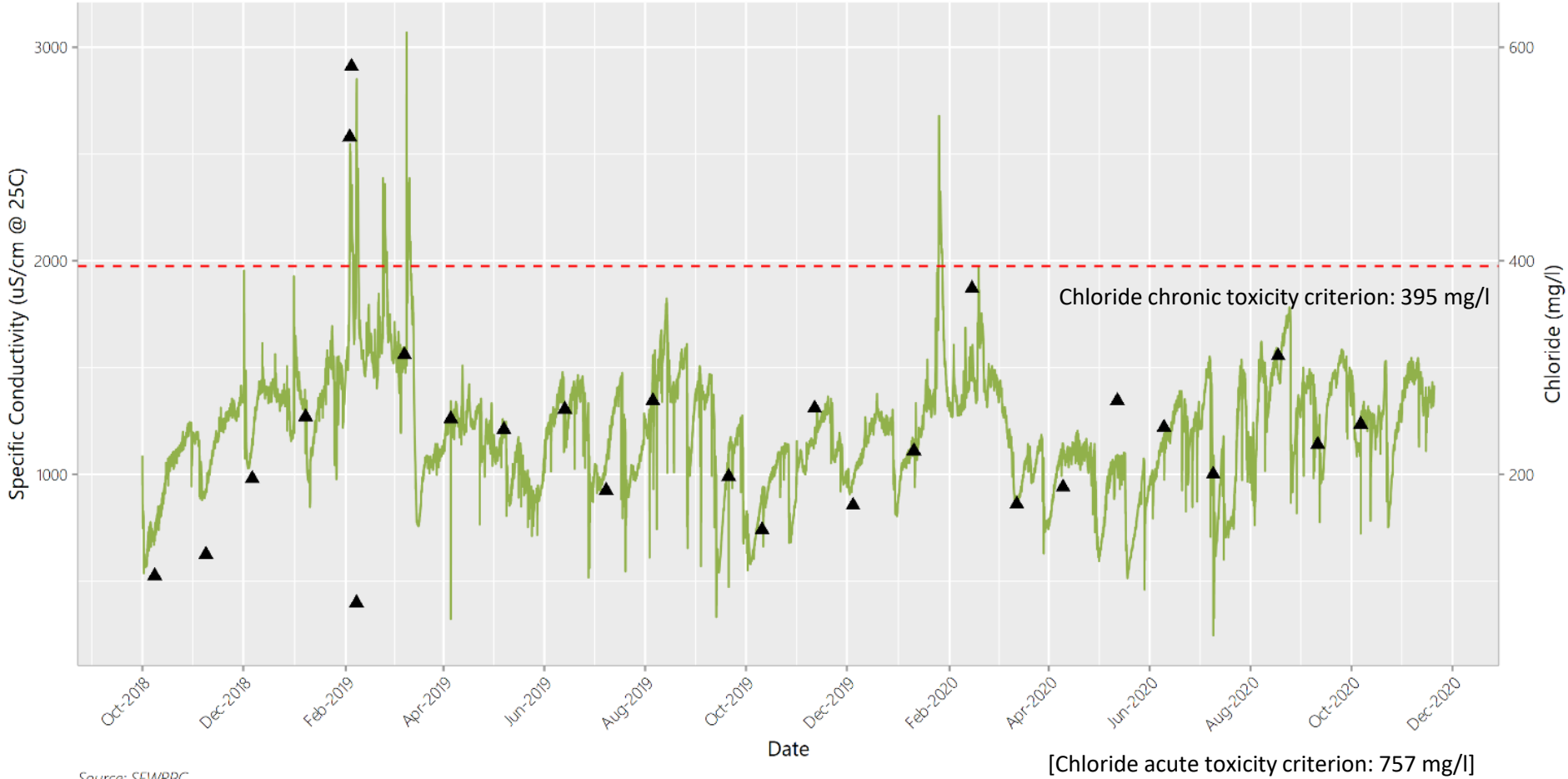
# Study Monitoring Locations



# Stream Monitoring Data

SEWRPC Lab Chloride and Continuous Conductivity  
Site 1: Fox River at Waukesha

Preliminary

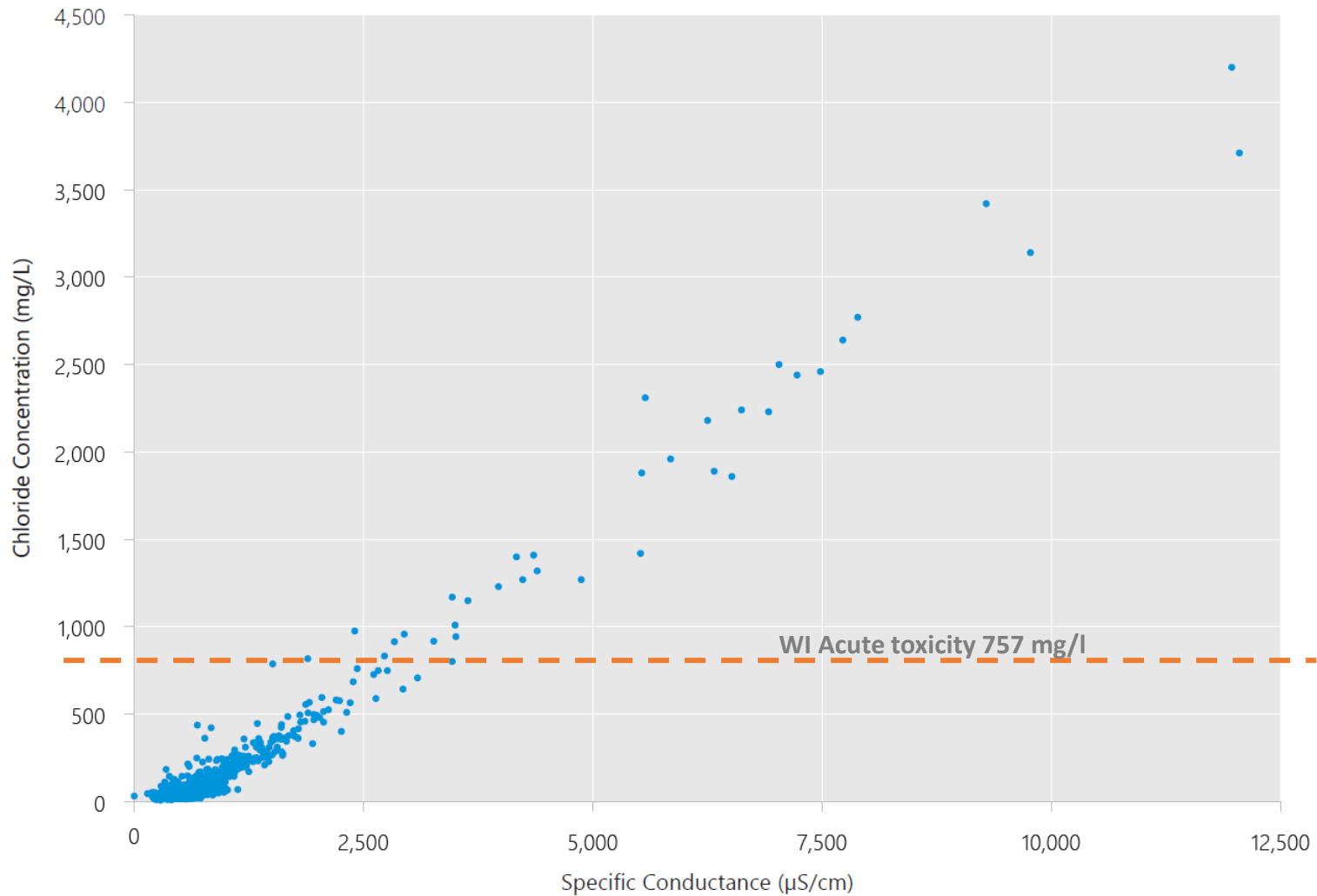


Source: SEWRPC





# Preliminary Data – Conductivity vs Chloride



Source: SEWRPC

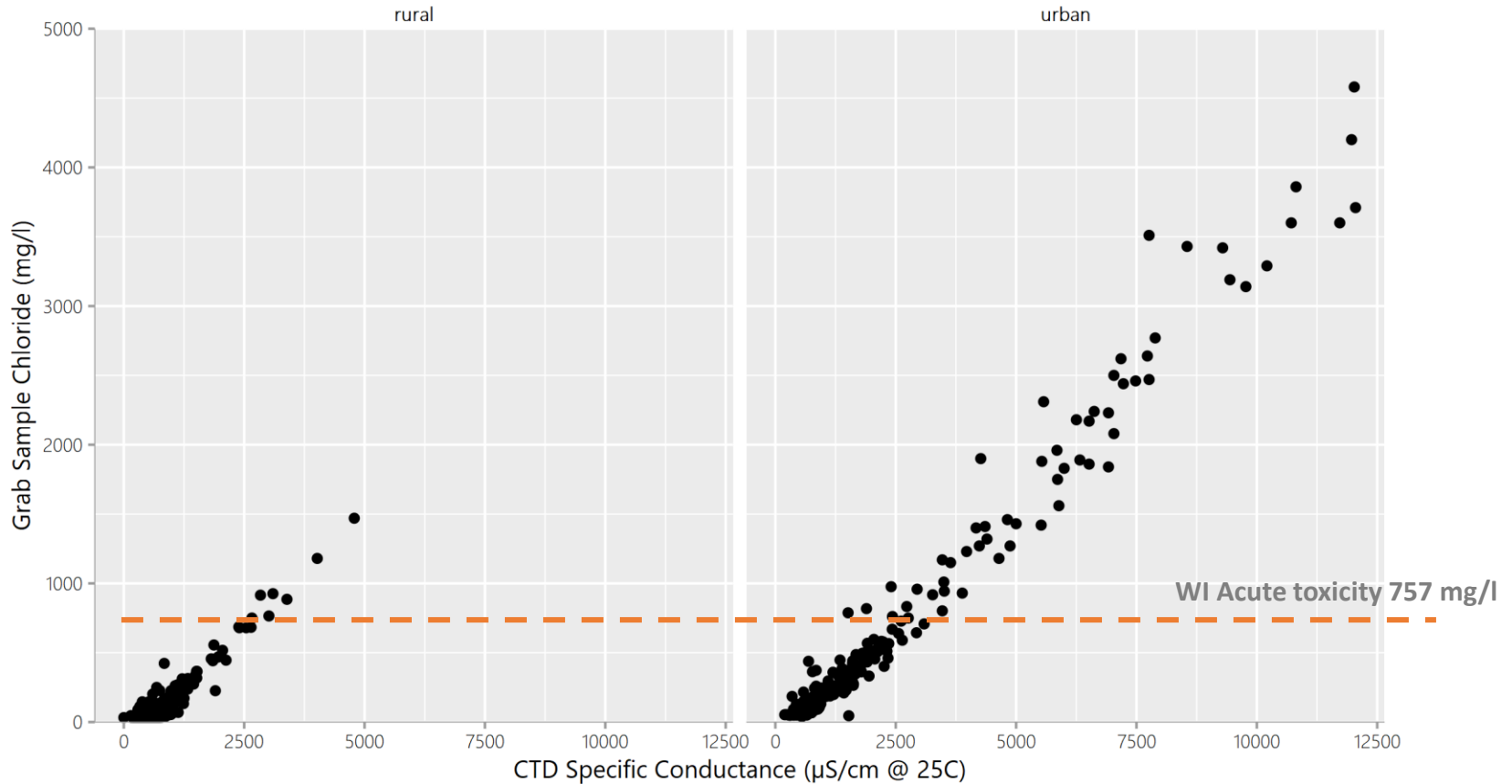
All grab sample data is in SWIMS





# Preliminary Data – Conductivity vs Chloride

## Group 2 - Rural vs. Urban Chloride and Specific Conductance Scatterplot - Same Scale



Source: SEWRPC

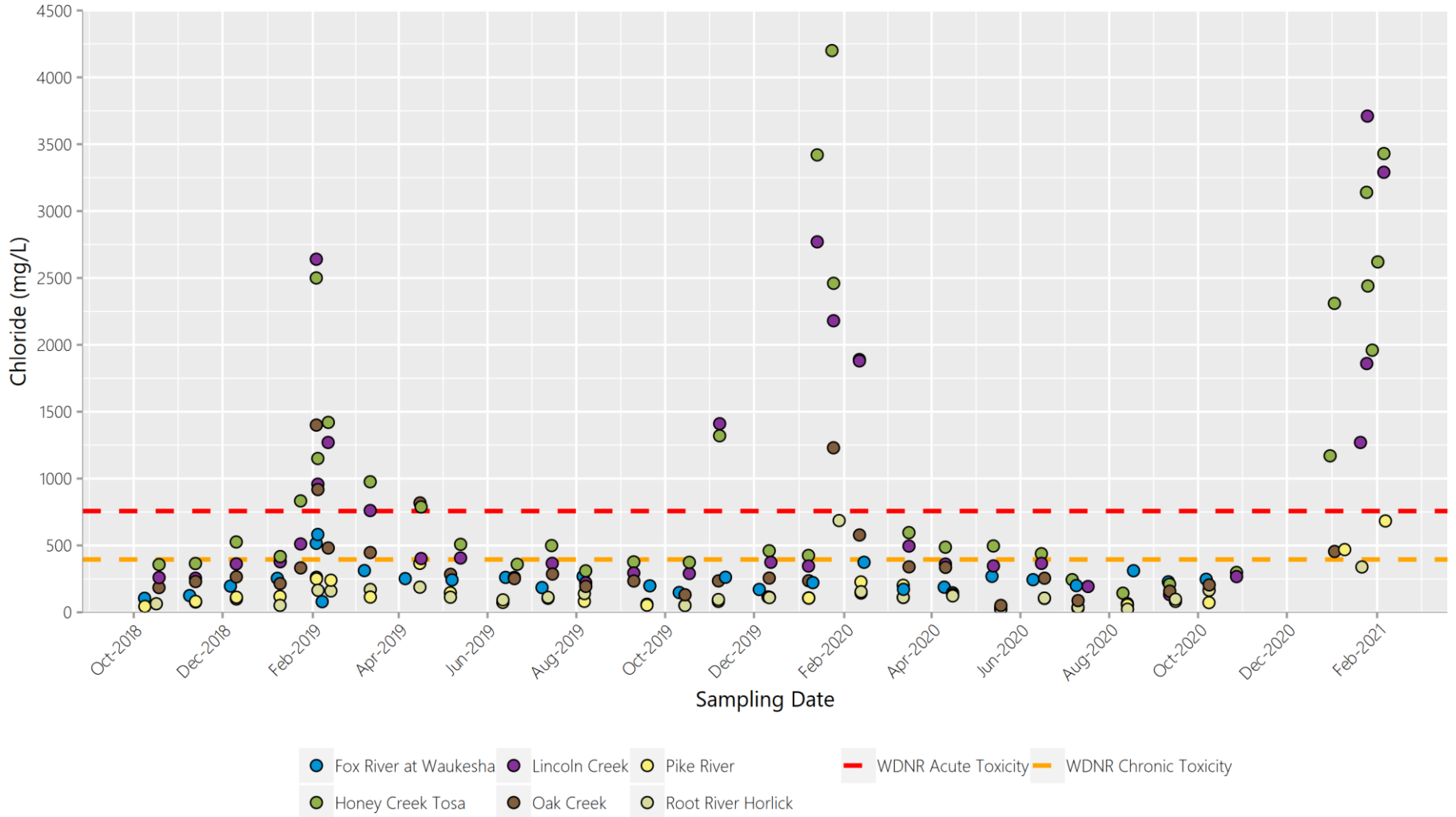
All grab sample data is in SWIMS





# Select Urban Sites – Sampling Results

SEWRPC Grab Sample Chloride Concentrations from Select Urban Sites



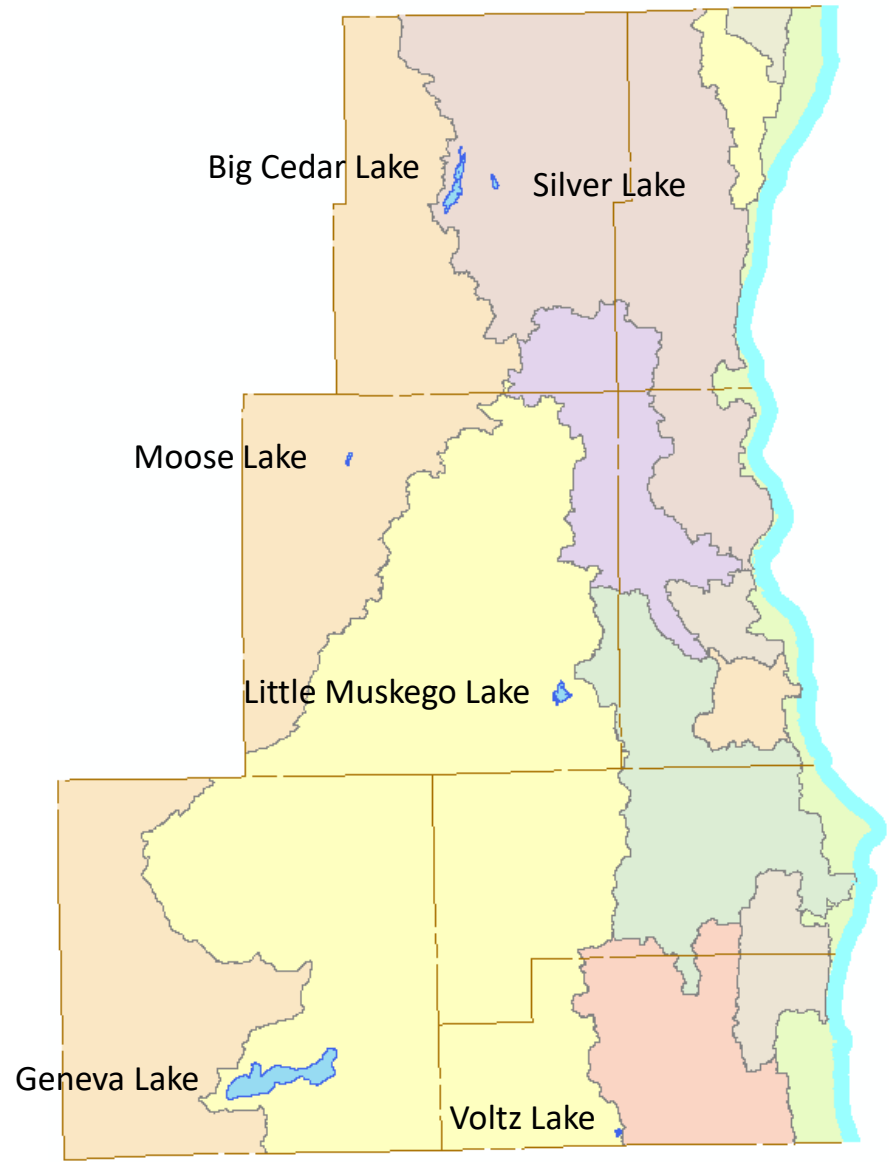
Source: SEWRPC





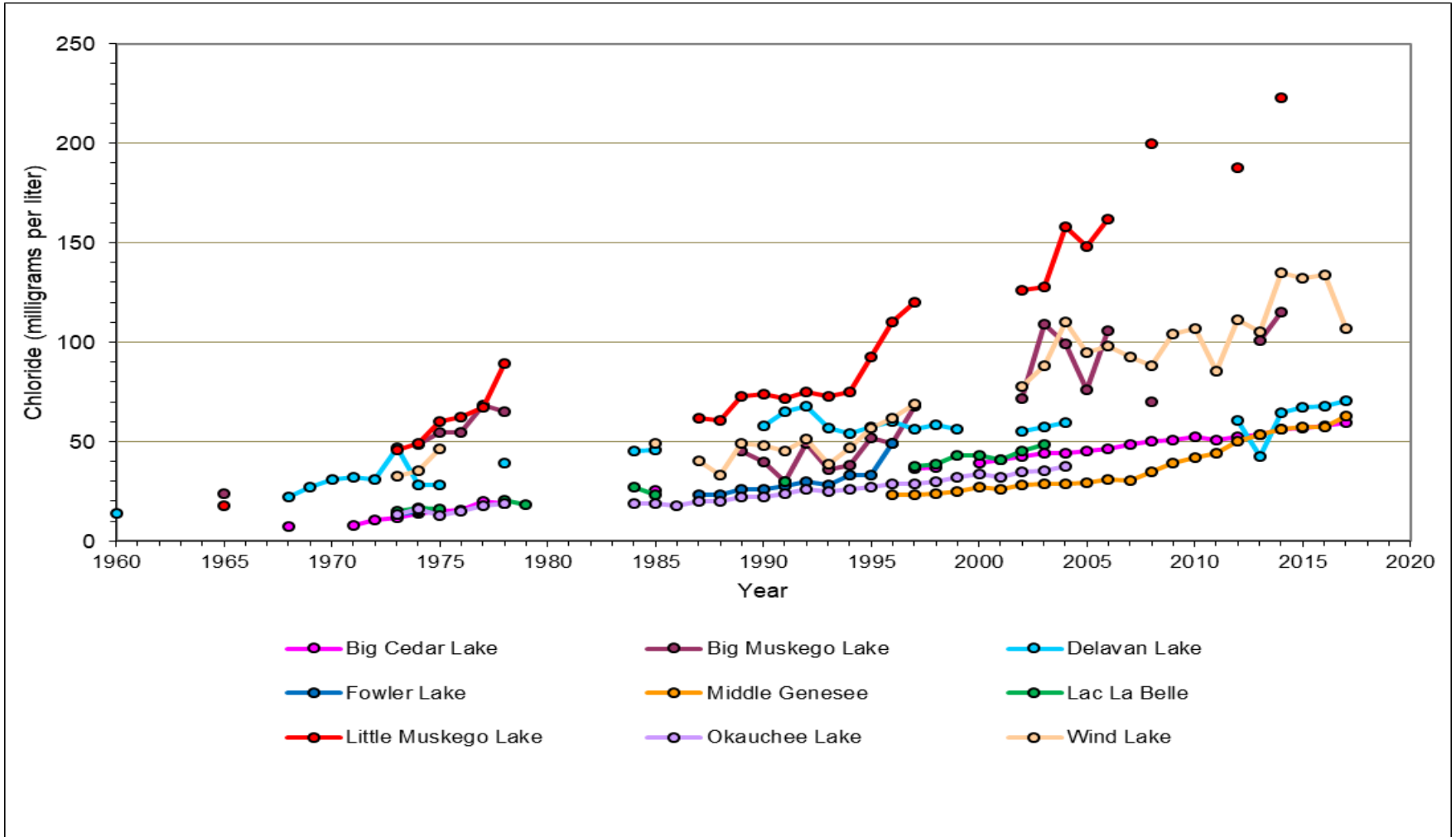
# ●●●●● Lake Sampling

- Six lakes in the SEWRPC Region were sampled summer 2018 – winter 2021
- Sampled Quarterly
- Little Muskego levels are of concern – approaching 250 mg/l taste threshold
- Did not see high chloride accumulation at the bottom of any of the lakes during sampling period



# Chloride Trends - lakes

## Annual Average Cl Concentrations for Selected Lakes in SE WI



Source: U.S. Geological Survey, Wisconsin Department of Natural Resources, and SEWRPC.

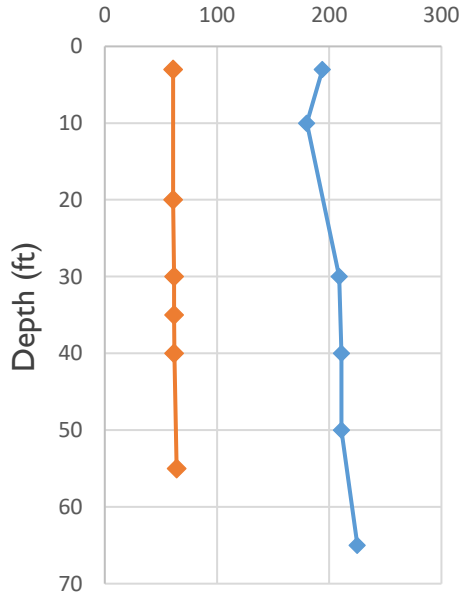


# Lake Chloride Profiles - 2019

## Moose Lake and Little Muskego Lake Seasonal Chloride Profile Comparison

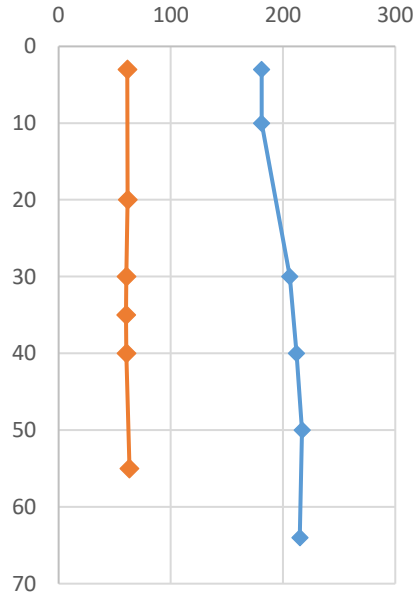
### Spring (May)

Chloride (mg/L)



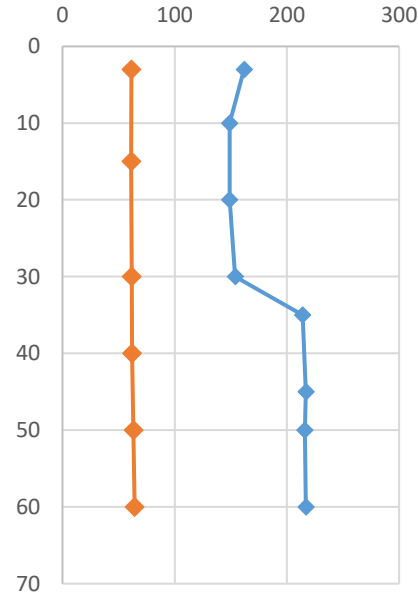
### Summer (August)

Chloride (mg/L)



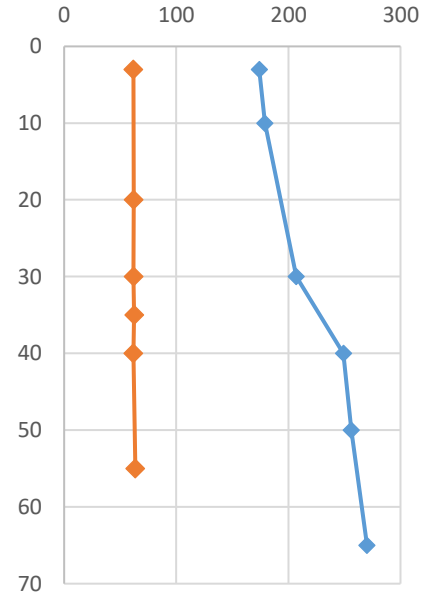
### Fall (October)

Chloride (mg/L)



### Winter (February)

Chloride (mg/L)



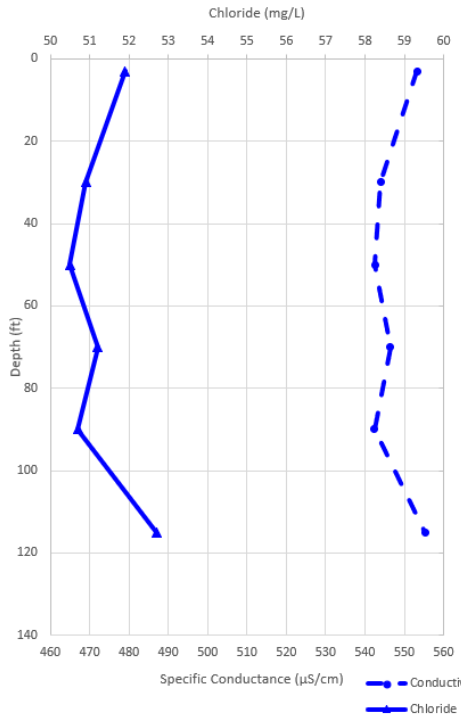
	Moose Lake	Little Muskego Lake
Maximum Chloride (mg/L)	66.3	270 *
Minimum Chloride (mg/L)	56.6	145

\* Exceeds the US EPA Chronic Toxicity Threshold of 230 mg/L

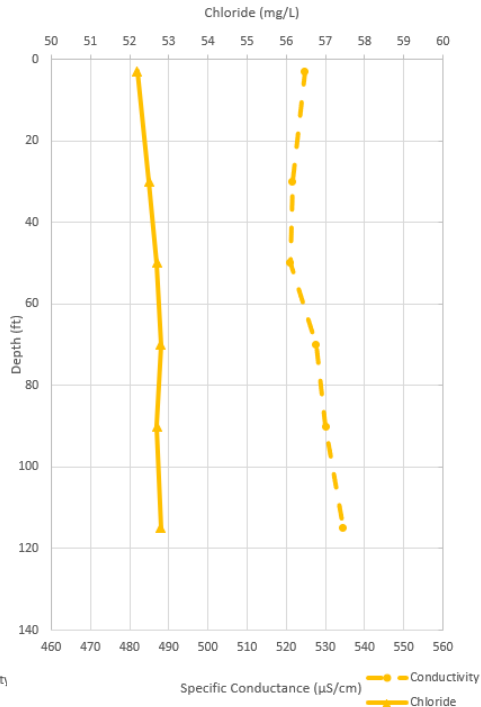


# Geneva Lake Results - 2019

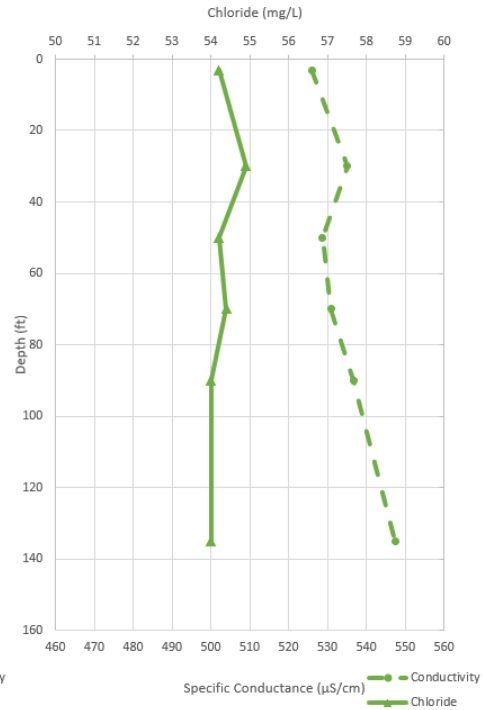
Winter 2019 (February)



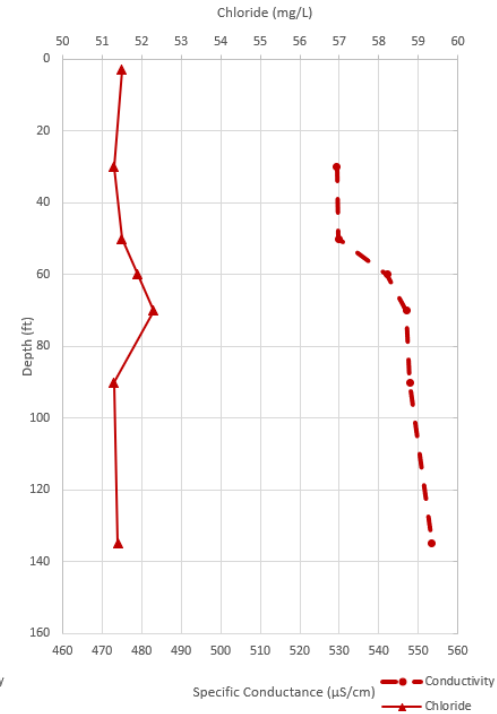
Spring 2019 (June)



Summer 2019 (August)



Fall 2019 (October)



# ●●●●● Next Steps for Study

- Continue loading analysis
  - Begin data cleaning effort
  - Begin regression analysis for conductance to chloride
  - Continue to analyze chloride source data
    - Winter deicing – public and private
    - Wastewater treatment plants – water softening
    - Agricultural
    - Groundwater – landfills and food processing
  
- Continue state-of-the-art information gathering



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Webpage for study

[www.sewrpc.org/chloridestudy](http://www.sewrpc.org/chloridestudy)

