


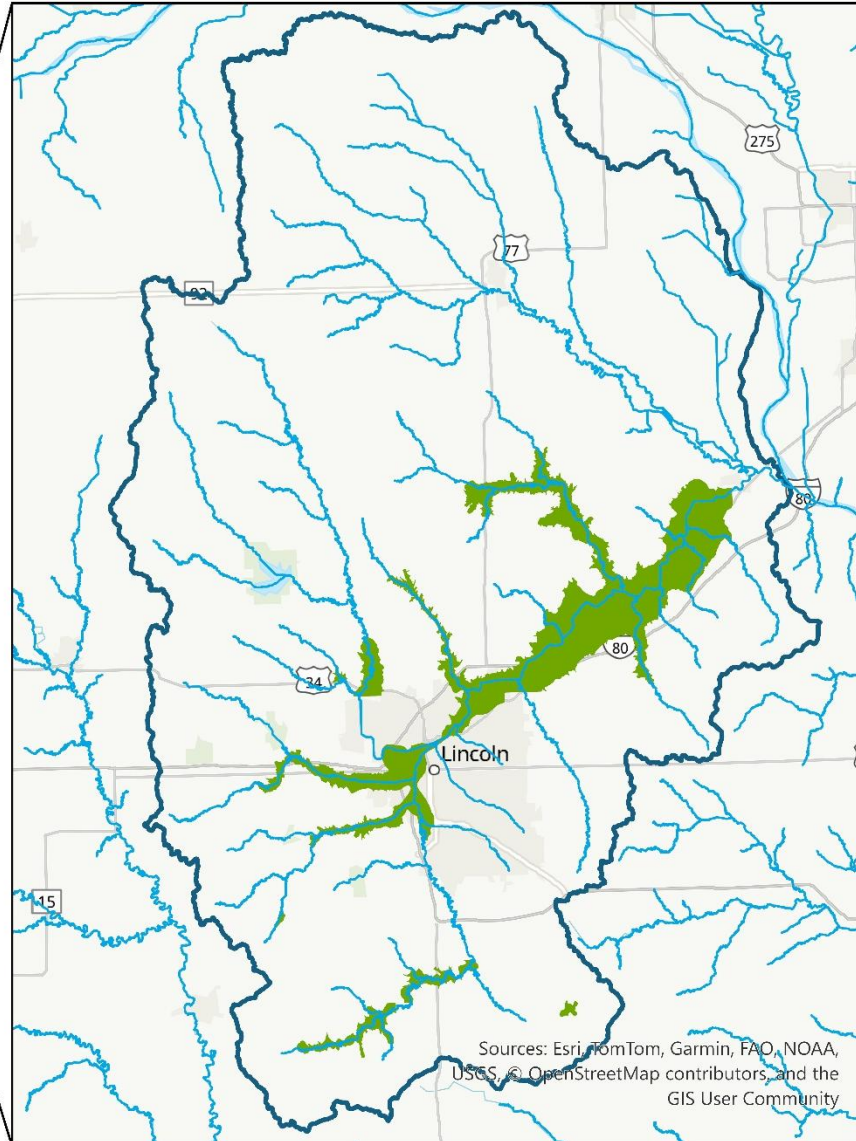
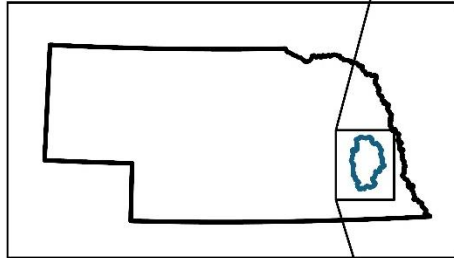
# Natural Background Site-Specific Chloride Criteria in Nebraska's Salt Creek Basin

ACWA Water Quality Standards Workshop  
Little Rock, AR

Kate Bird, WQS Coordinator  
Nebraska Department of Water, Energy, and Environment



- Title 117 Designated Streams
- ▭ Salt Creek Basin
- ▭ Saline Wetlands



Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

# Background

- Saline groundwater present in a confined area of the Salt Creek Basin
- Area is known for regionally unique saline wetlands



Reintroduction of Salt Creek Tiger Beetle larvae  
at Frank Shoemaker Marsh north of Lincoln



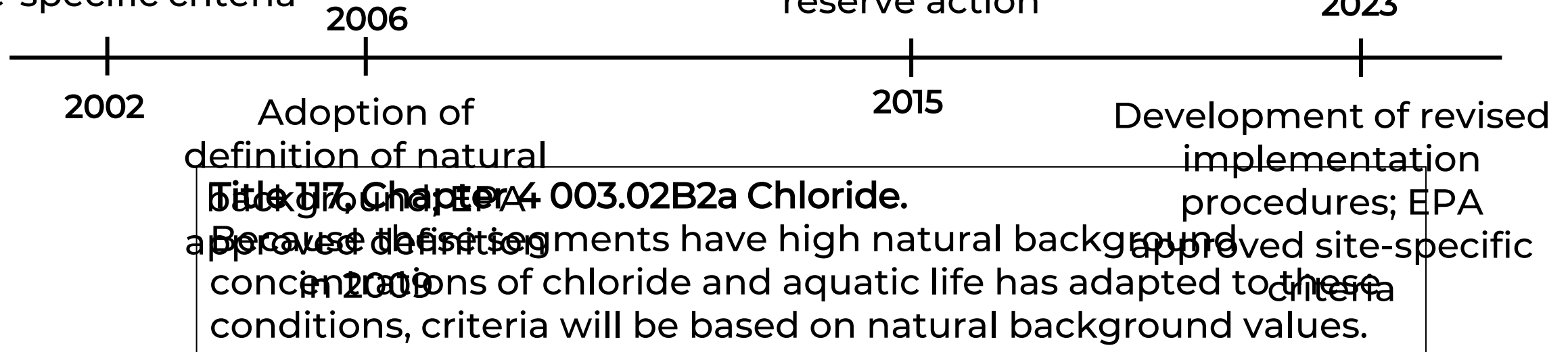
Natural salt deposits on a flat  
in the saline wetland

# Timeline: Chloride Criteria

Adoption of NRWQC  
AL and site-specific  
chloride criteria; EPA  
reserved action on  
site-specific criteria

Initial  
development of  
implementation  
procedures; EPA  
continued to  
reserve action

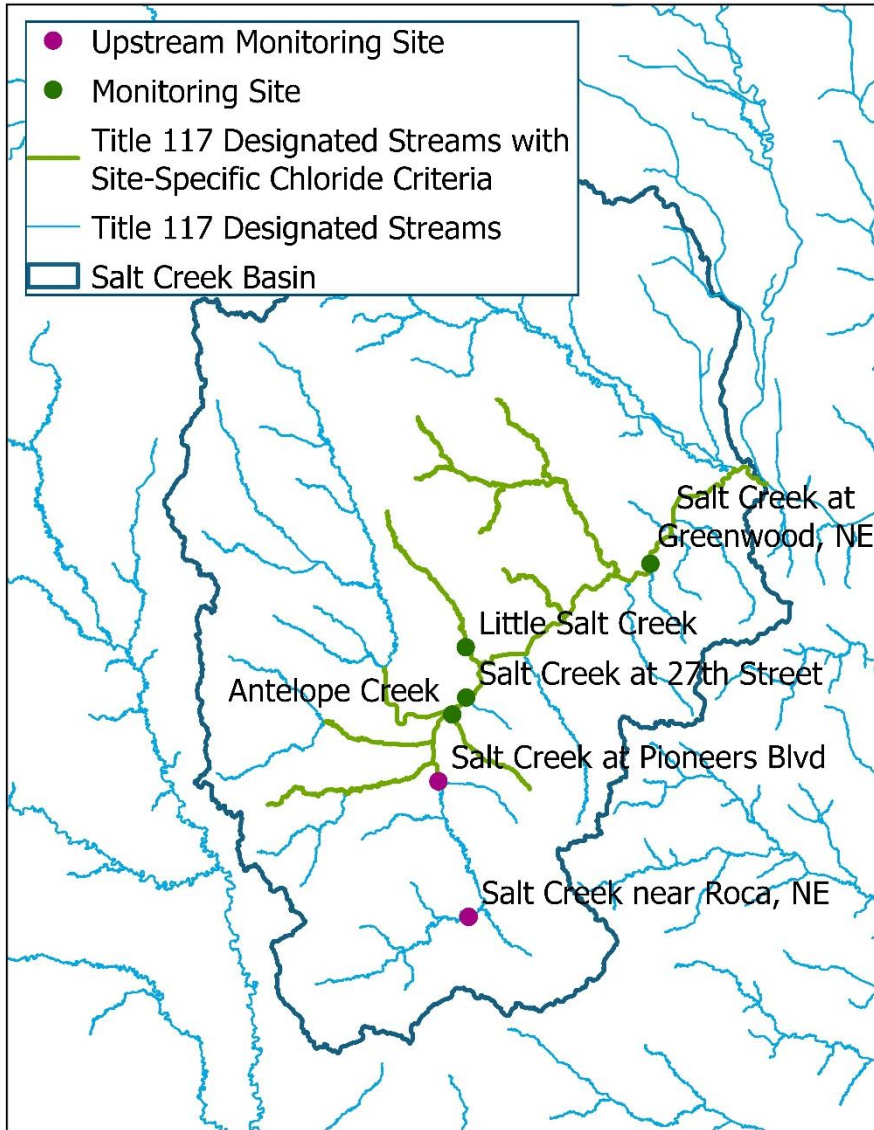
2023



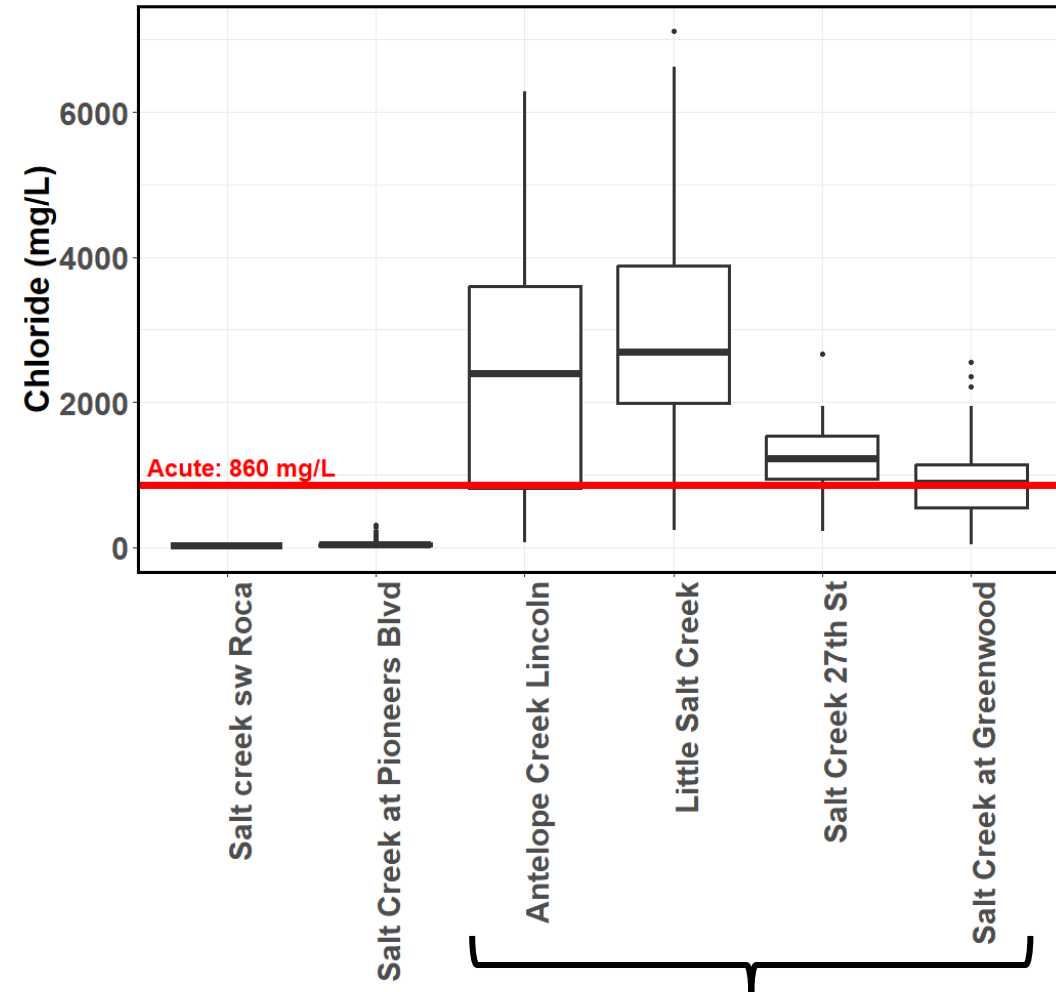
**Title 17, Chapter 4-003.02B2a Chloride.**  
Because the segments have high natural background chloride concentrations and aquatic life has adapted to these conditions, criteria will be based on natural background values.

# Objectives

1. Demonstrate a nonanthropogenic source of elevated chloride
2. Identify an appropriate site-specific criteria value

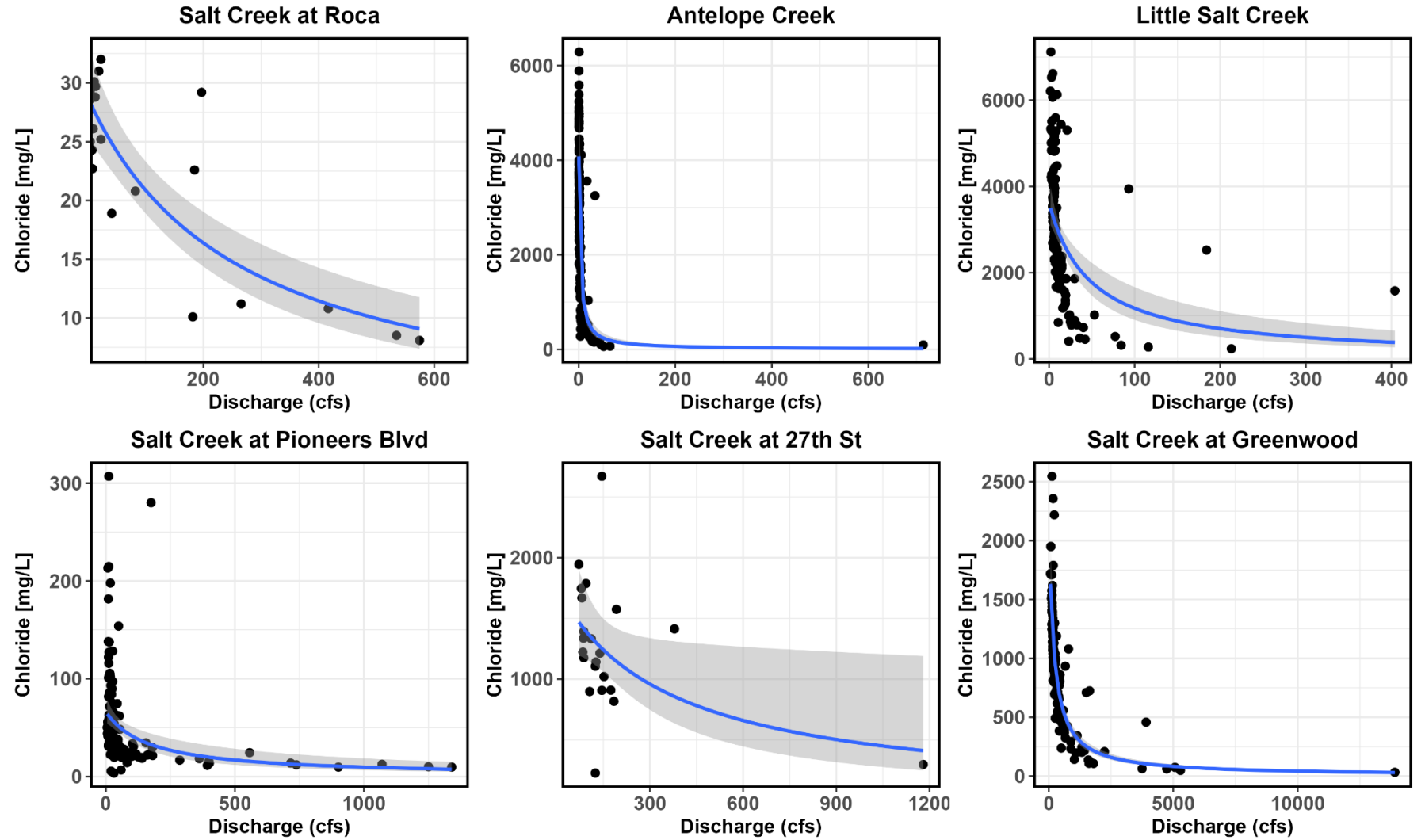


# Observed Chloride Concentrations



Site-Specific Applicable

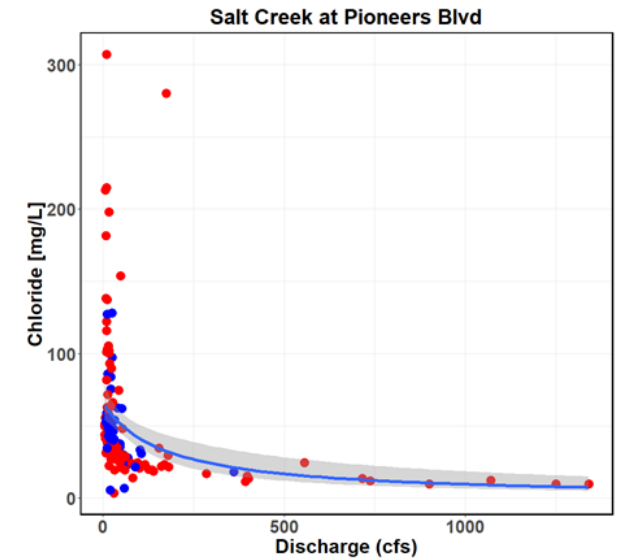
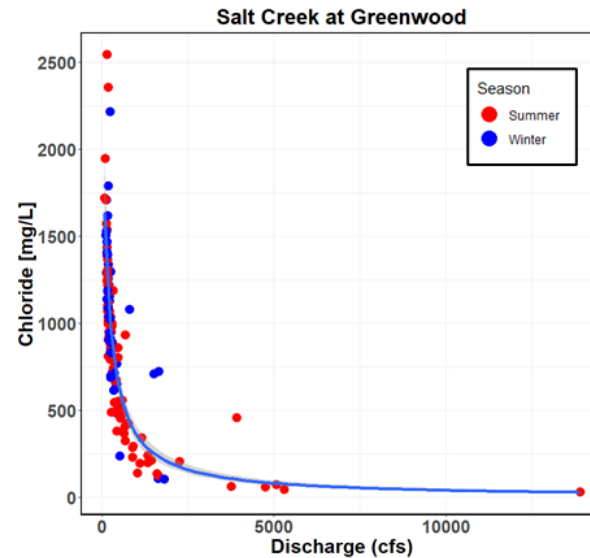
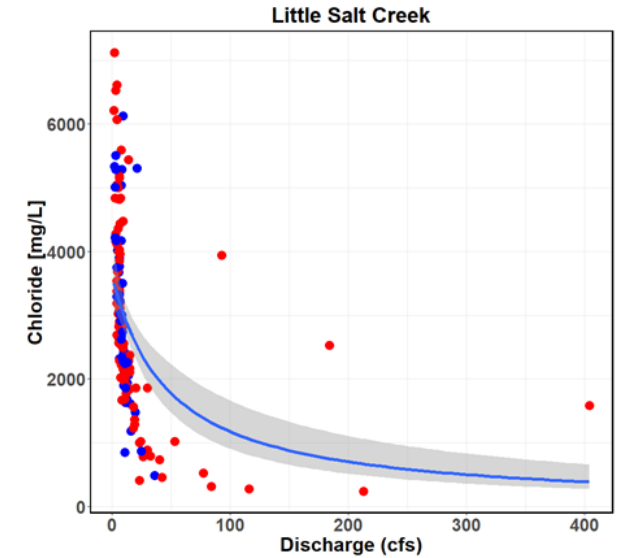
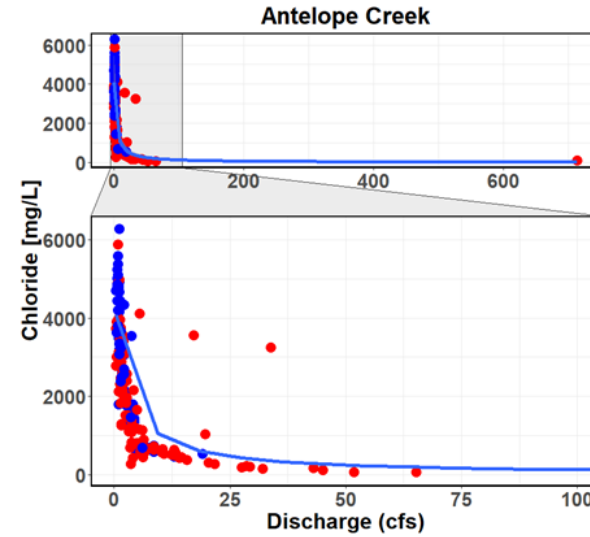
# Relationship to Stream Discharge



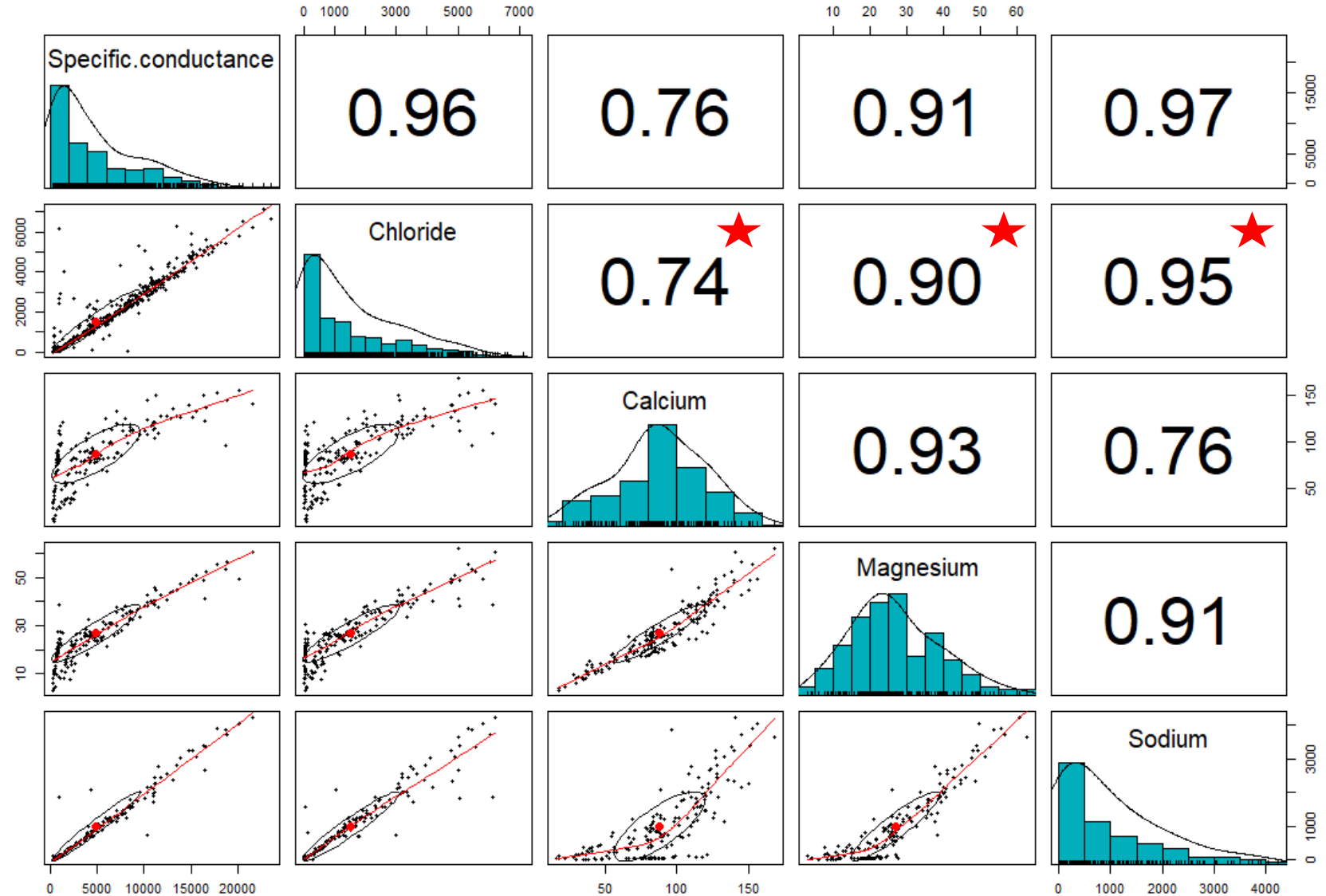
Site-Specific Applicable

# Relationship to Stream Discharge: Seasonality

- 4 of 6 sites with summer and winter data

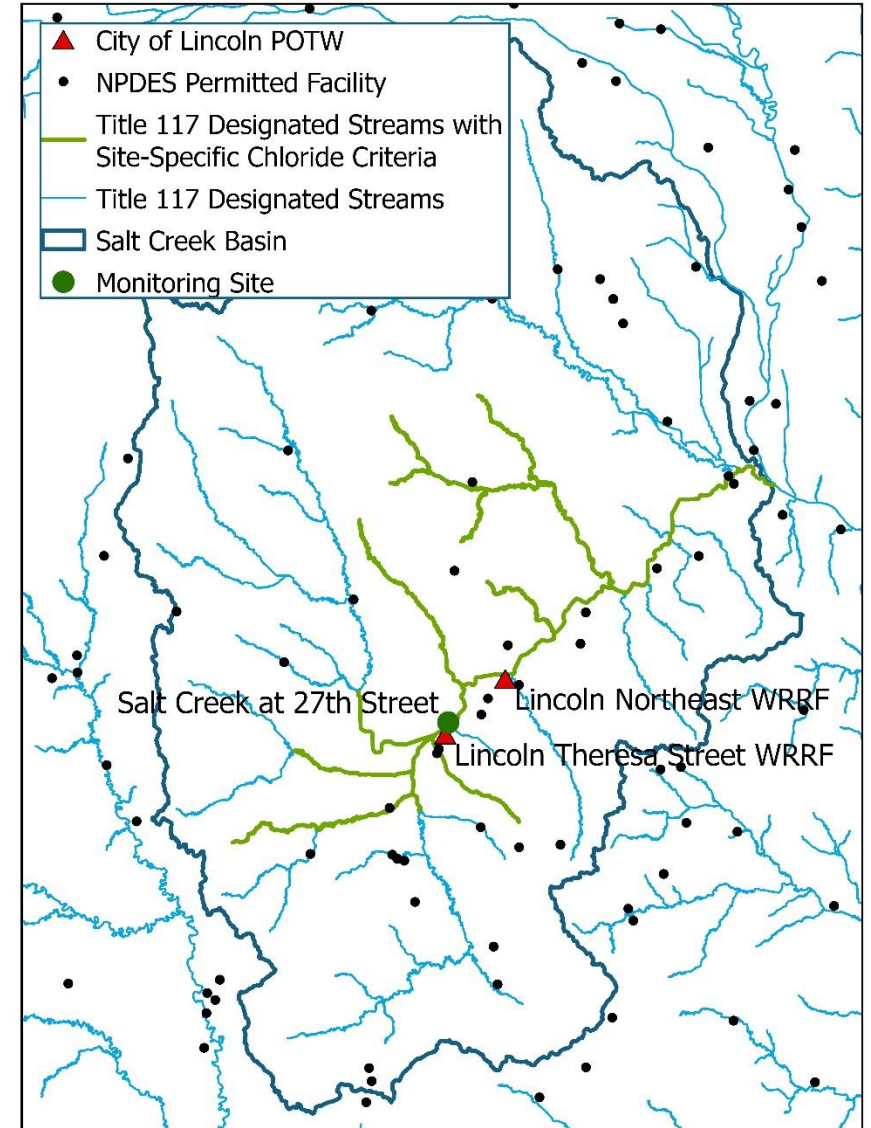


# Relationship to Groundwater-Derived Minerals



# Evaluation of Point Source Contributions

Facility	Monthly Mean Chloride Loading (kg/day)	Chloride Loading in LP2-20000 (%)
Theresa St.	15,739	4
Northeast	2,395	0.6



# Criteria Implementation

## Challenges:

- Data availability
- High variability in observed chloride concentrations
- Need to address seasonal differences in flow and/or chloride?



## Site-Specific Criteria:

- 90<sup>th</sup> percentile of observed surface water chloride concentrations
- When data are insufficient, general aquatic life criteria will be used

## Acknowledgements

- Tara Anderson
- Tom Heatherly
- Many other DWEE staff

## Contact

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# Questions?

