Road Salt & Urban Streams

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The Problem of Road Salt

Photo credits: https://www.maintainingmyhome.org.nz/concrete-wall-spalling-cracking-or-flaking-concrete/
http://www.wkrn.com/weather/salt-brine-could-lead-to-costly-car-repairs

The Problem of Road Salt

- **Background**
- How Bad
- Stream Life
- What to Do

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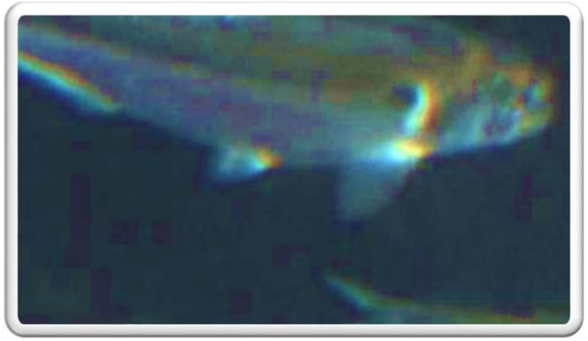

The Problem of Road Salt

Environmental Science & Technology

Viewpoint

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Increased Salinization Decreases Safe Drinking Water

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geologic sources and additional inputs of salinization.[1] Thus, both human inputs and accelerated weathering are contributing to the increased salinization of fresh water.[1,2] Increased salinization can impact drinking water through leaching of contaminants in soils, sediments, and water infrastructure.[3−5] For example, corrosion of water infrastructure influenced by road salt has recently been linked to lead contamination in drinking water in Flint, Michigan. Deicers can also contain impurities and toxic anticaking agents.[3] Despite these and other concerns regarding drinking water contamination, salt concentrations are not currently regulated by the U.S. Environmental Protection Agency. Given widespread increasing salinization

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Increased salinization of fresh water in the northeastern United States

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Contributed by Gene E. Likens, August 4, 2005

Chloride concentrations are increasing at a rate that threatens the availability of fresh water in the northeastern United States. Increases in roadways and deicer use are now salinizing fresh waters, degrading habitat for aquatic organisms, and impacting large supplies of drinking water for humans throughout the region. We observed chloride concentrations of up to 25% of the concentration of seawater in streams of Maryland, New York, and New Hampshire during winters, and chloride concentrations remaining up to 100 times greater than unimpacted forest streams

exists (8). Regulation of road salt was recently considered by the Canadian government after much controversy (6).

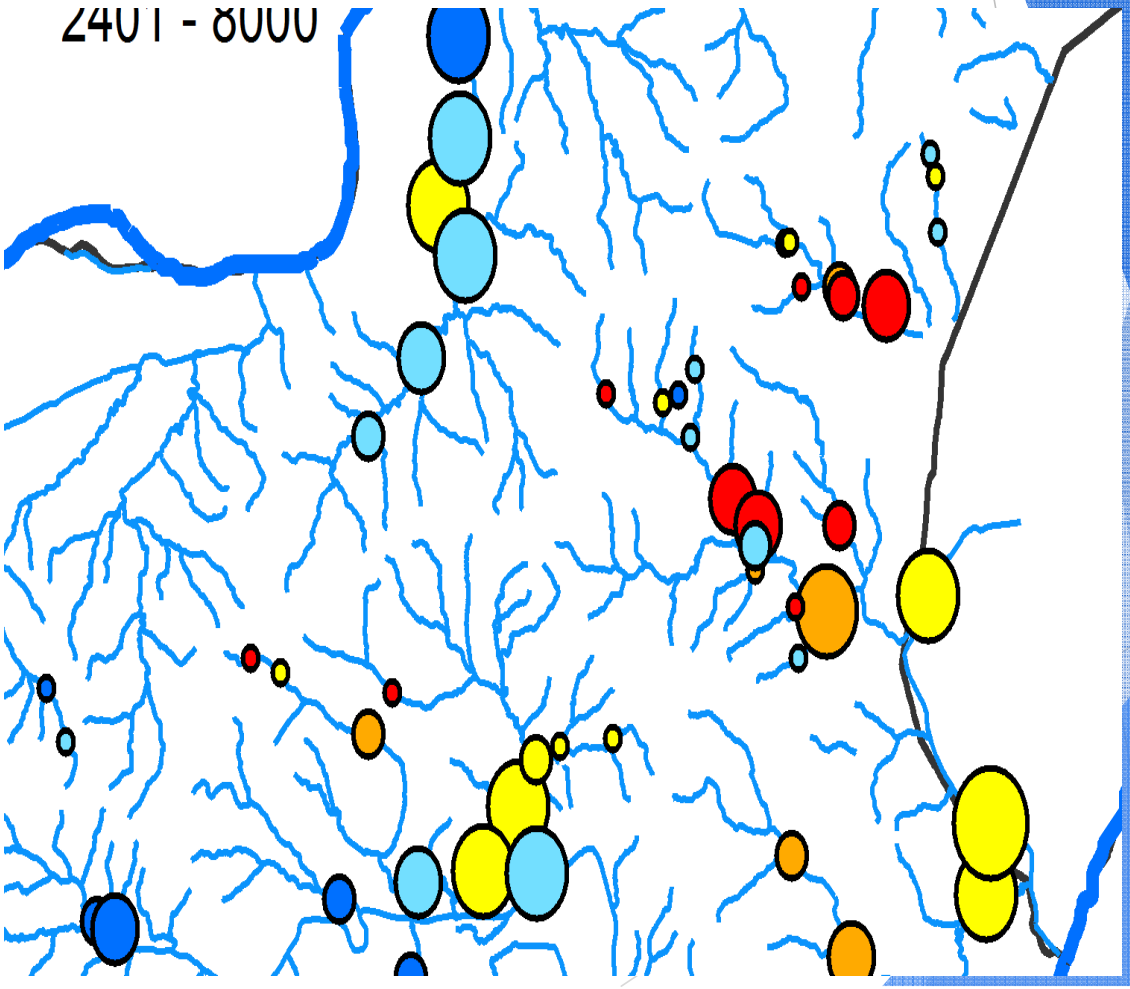
Relatively little is known regarding the relationship between widespread increases in suburban and urban development and long-term changes in baseline salinity across regions of the United States. Impervious surfaces now cover >112,610 km^2 in the United States, an area equivalent to the state of Ohio (10). The amount of impervious surface coverage within the United States is expected to increase sharply with >16,093 km of new

Chloride in St. Louis Streams

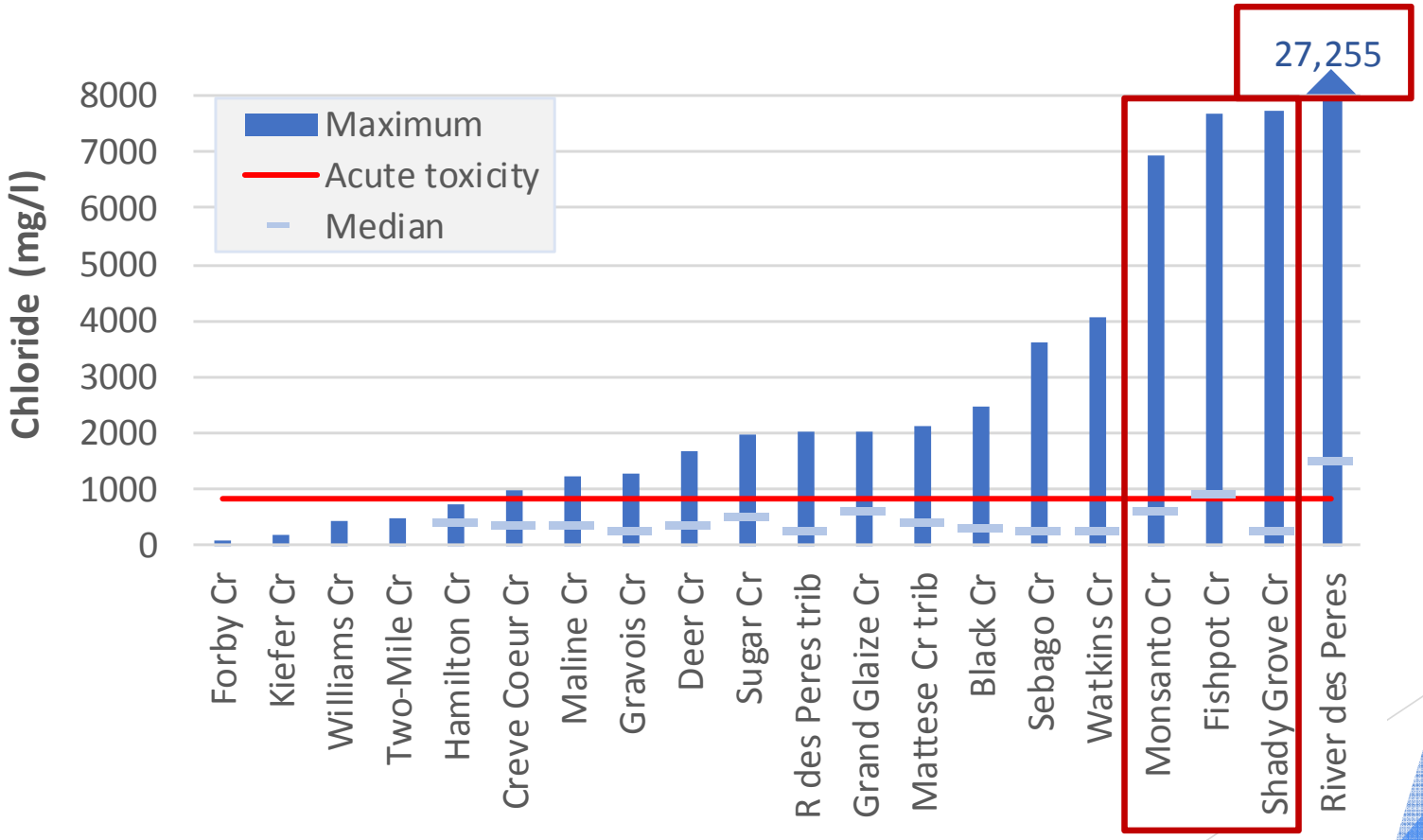
- Numbers to know:

  230 mg/l (chronic)

  860 mg/l (acute)



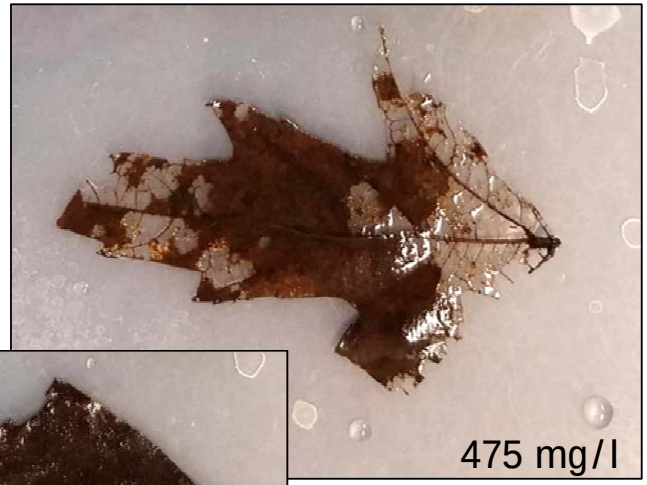
Chloride in St. Louis Streams

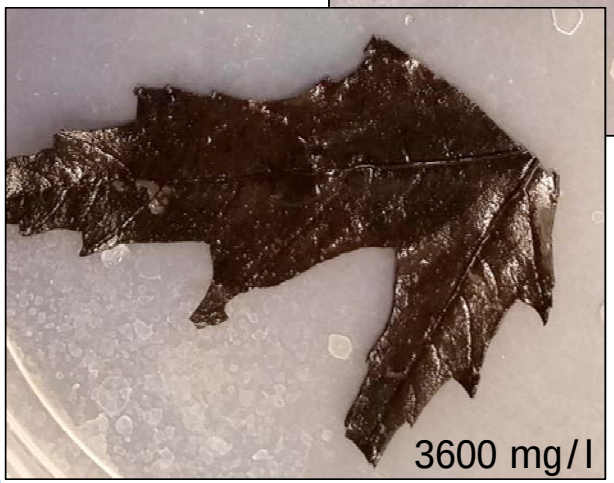


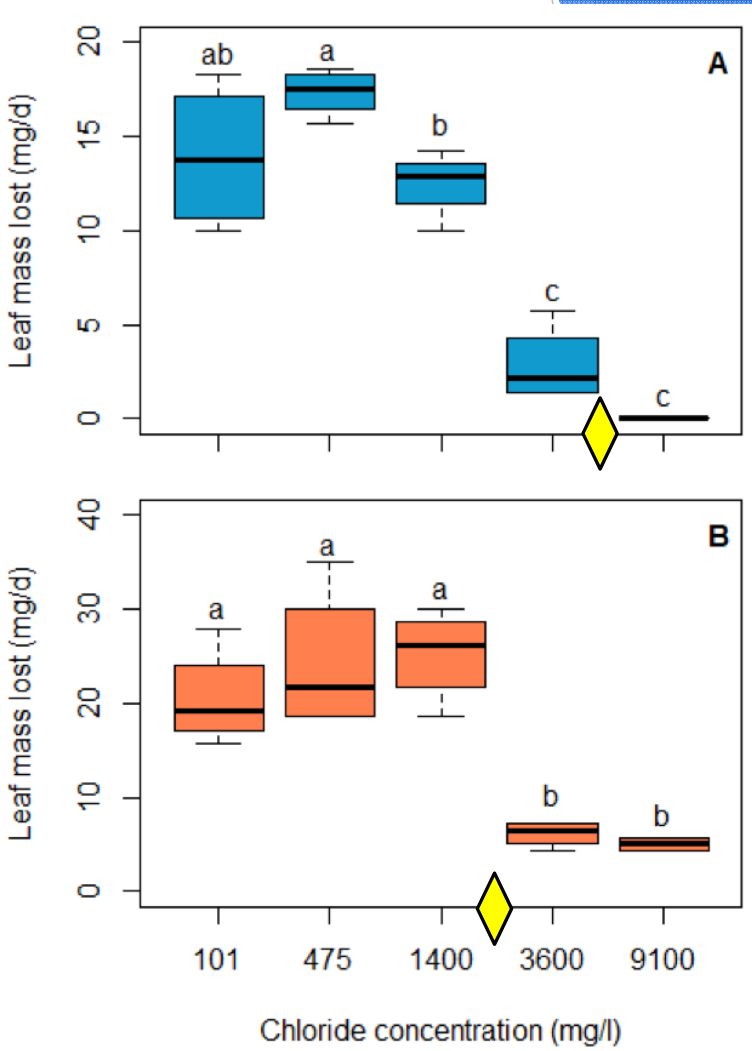
Laboratory Toxicity

	***Gammarus minus* (scud)**		***Stenonema femoratum* (mayfly)**	
Trial Length	**Cold (6°C)**	**Warm (19°C)**	**Cold (6°C)**	**Warm (19°C)**
2-day LC50	6,500 mg/l	5,300 mg/l	--	--
7-day LC50	5,000 mg/l	2,700 mg/l	8,400 mg/l	3,200 mg/l

Laboratory Toxicity

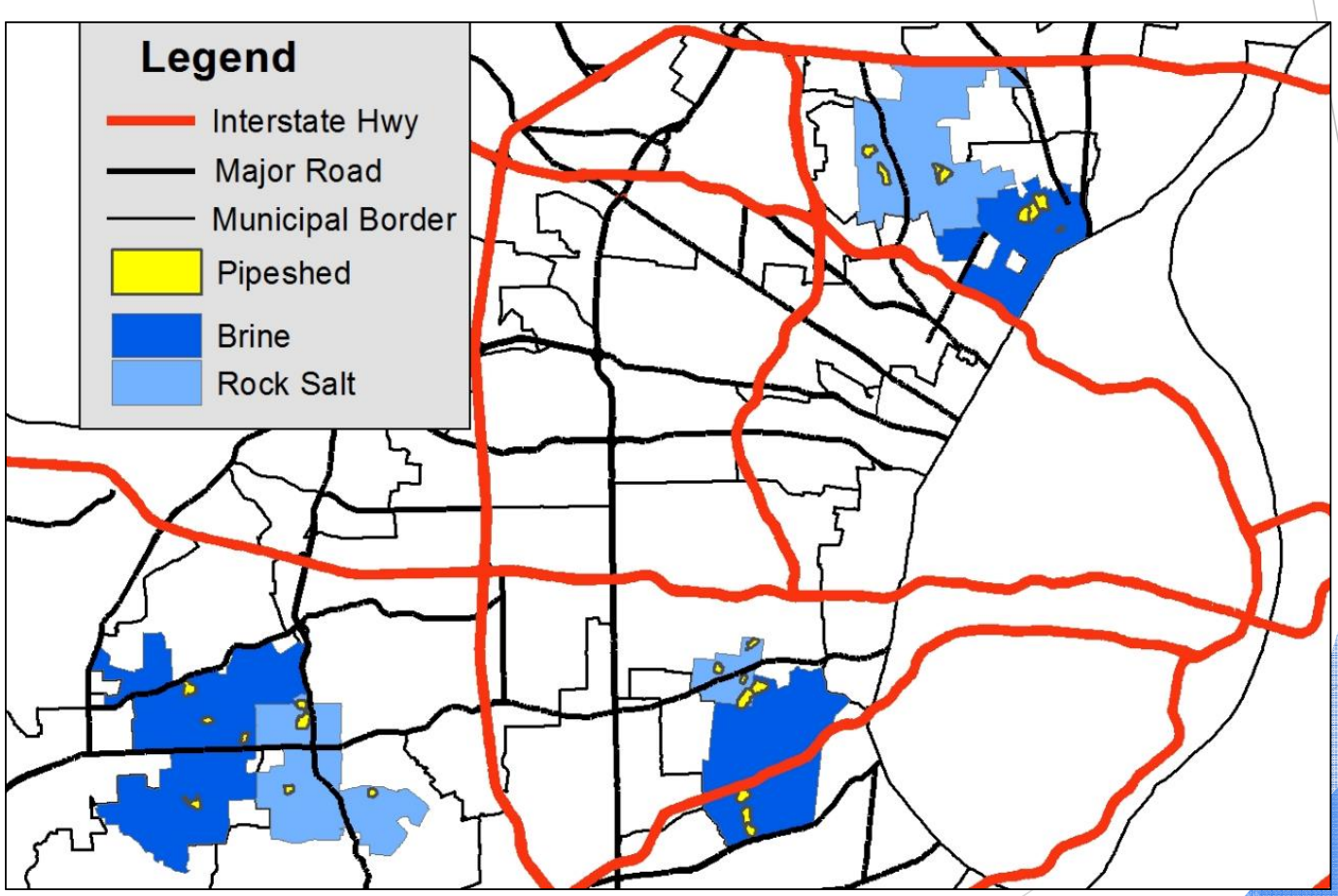




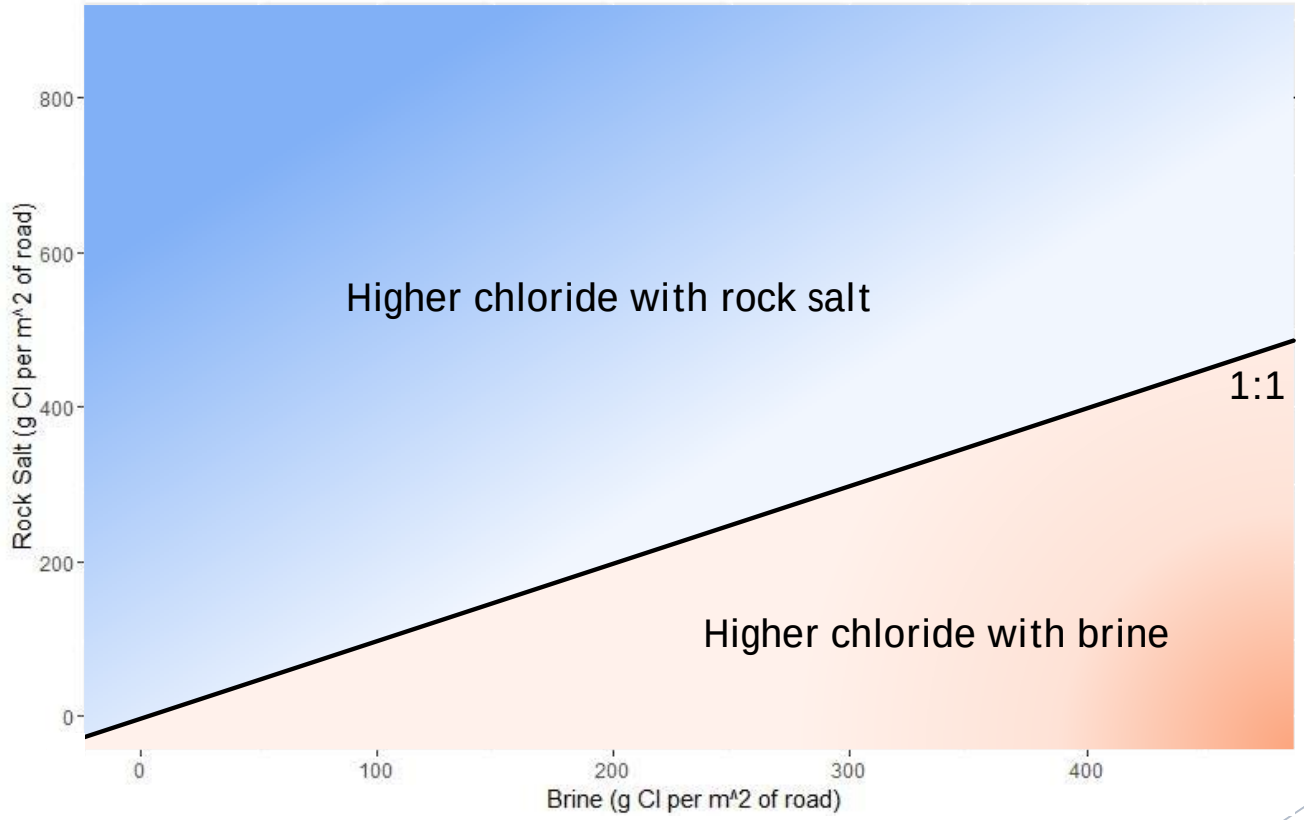


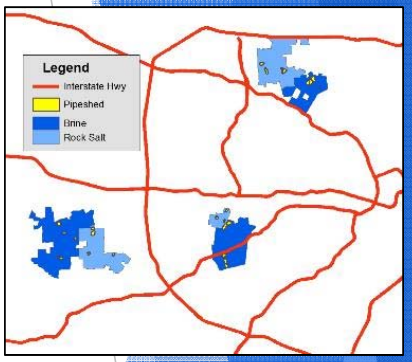
Best Management Practice: Brine

Brine vs Rock Salt

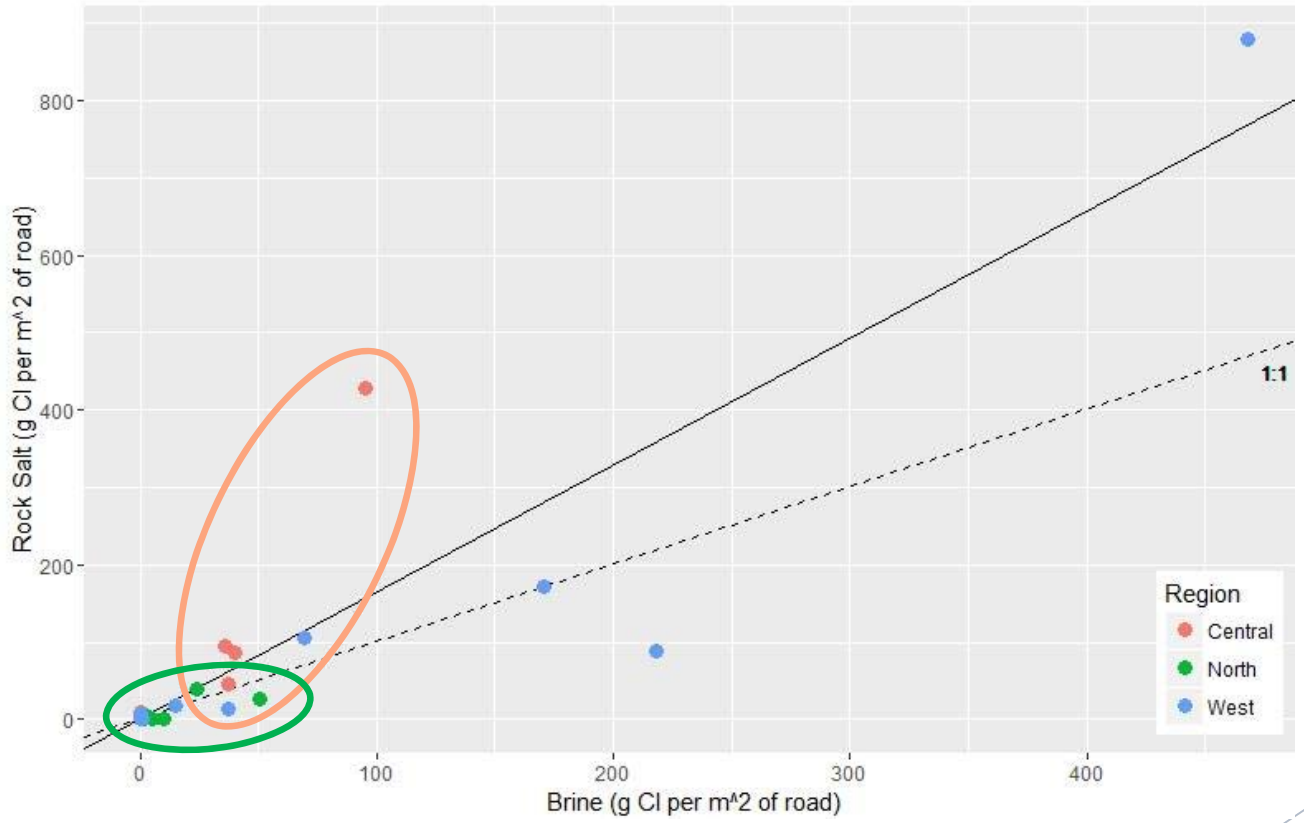


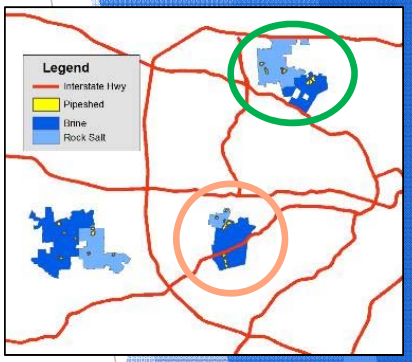
Results


Higher chloride with rock salt
1:1
Higher chloride with brine
Rock Salt (g Cl per m^2 of road)
0
200
400
600
800
0
100
200
300
400
Brine (g Cl per m^2 of road)


Legend
Interstate Hwy
Pipeshed
Brine
Rock Salt

Results


Rock Salt (g Cl per m^2 of road)
800
600
400
200
0
0
100
200
300
400
Brine (g Cl per m^2 of road)
1:1
Region
Central
North
West


Legend
Interstate Hwy
Pipeshed
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Rock Salt

Conclusions

- Many streams in the St. Louis region are highly impacted by chloride
- Stream invertebrates are susceptible to this pollution
- Municipal managers respond to each storm individually.
- Availability of brining technology generally leads to decreases in the amount of chloride in stormwater.

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MORTON
SALT
THIS SALT DOES NOT SUPPLY IODIDE, A NECESSARY NUTRIENT
NET WT. 26 OZ. (1 LB., 10 OZ.) 737 g