

Road Salt: An Environmental Meltdown?

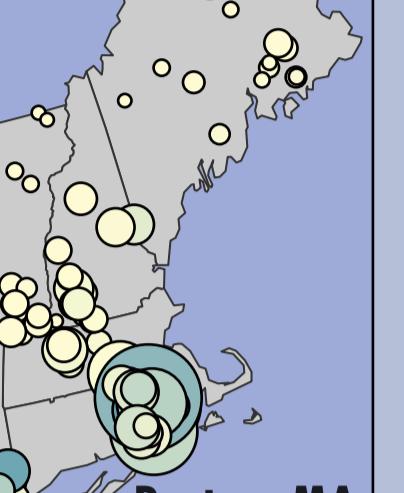
Since the 1950's and 1960's, road salt has been used as a de-icing agent on roads, sidewalks, and parking lots. Its use has been a critical player in public safety for its continued ability to melt snow and ice well at a relatively low cost.

In fact, a study by Marquette University found that road salt used as a de-icing agent reduced the number of crashes by **88%** and reduced accident costs by **85%**

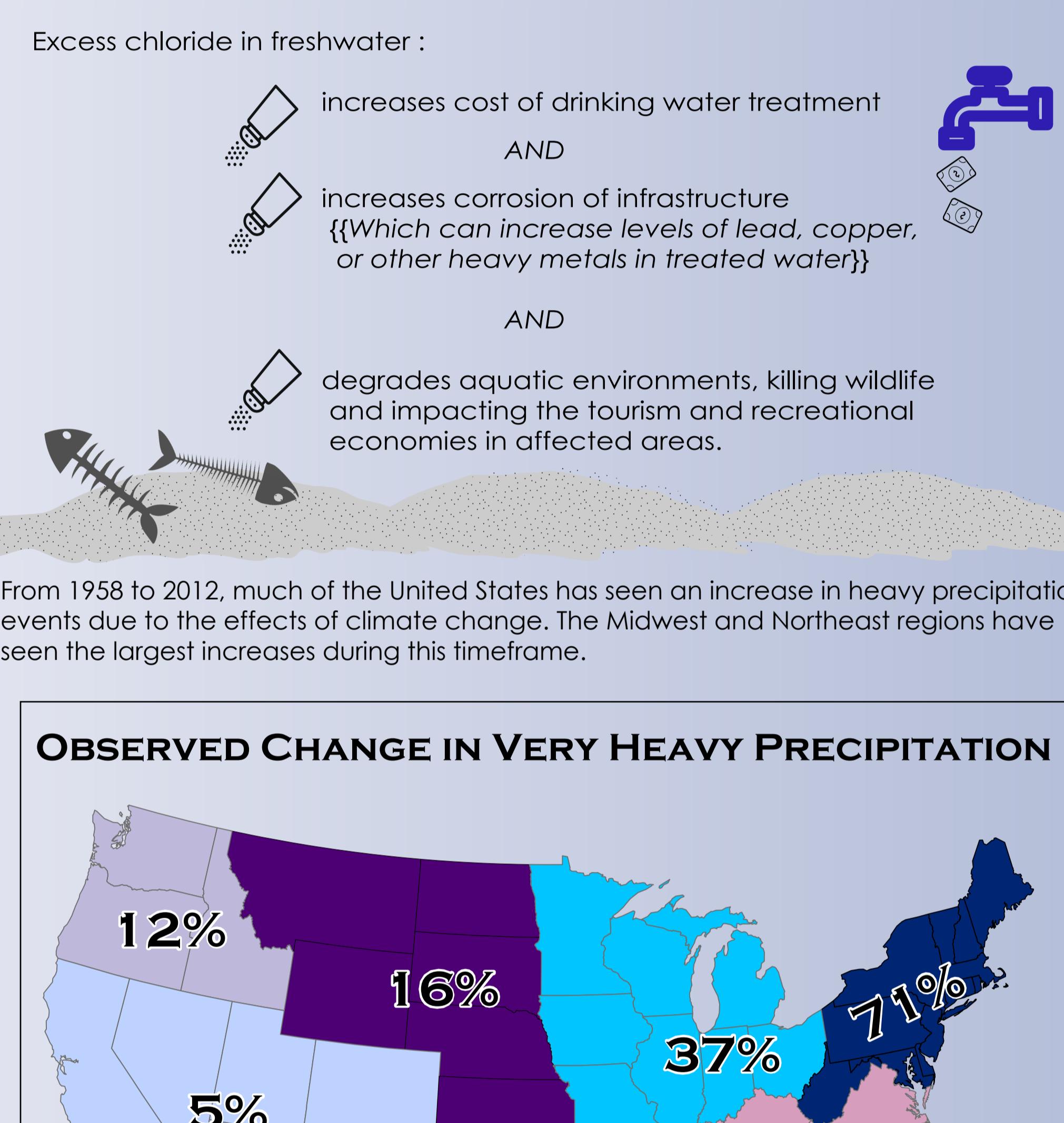
However...

As accidents have decreased, the United States uses an average of **17 MILLION** tons of salt on its roads per year - and our rivers and lakes are paying for it.

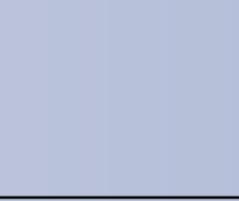
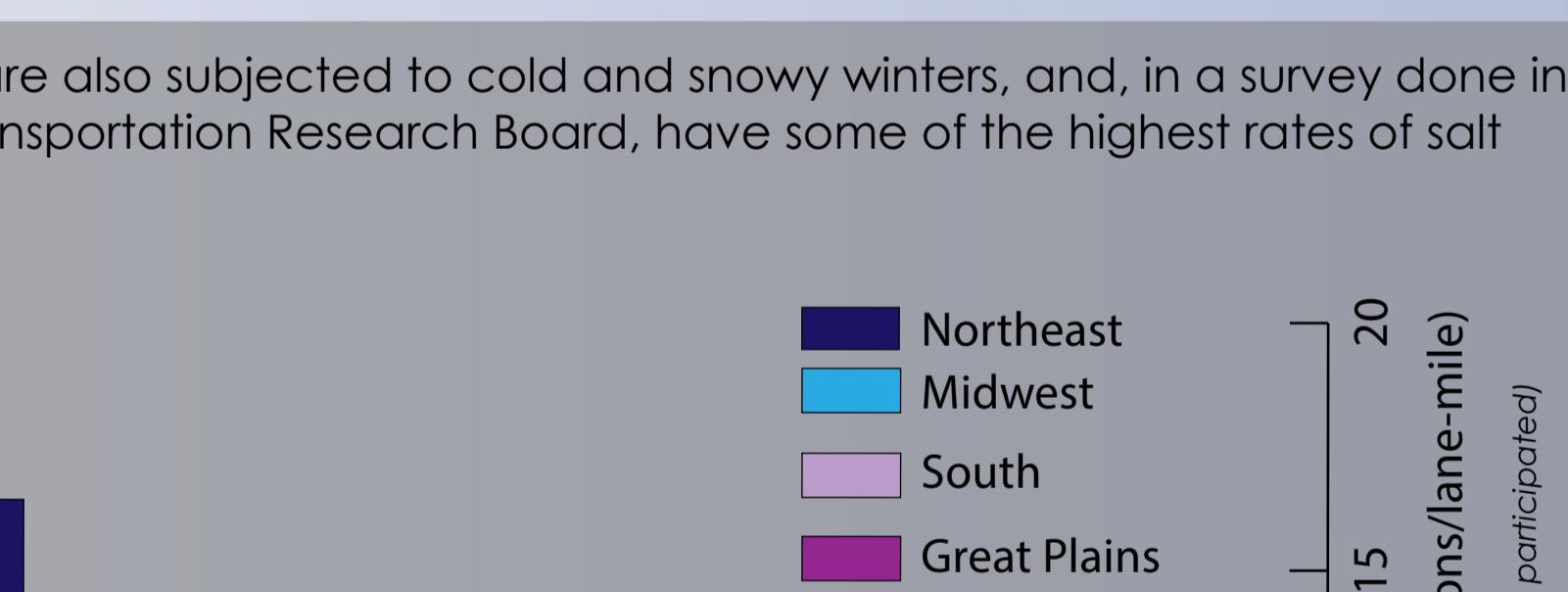
Freshwater lake sampling across the U.S. has shown high concentrations of chloride, especially those in urban areas of the Midwest and Northeast.



Freshwater Lake Sample Locations: Mean Chloride Concentration and Density of Roads within 500 Meters of Site



Excess chloride in freshwater :

-  increases cost of drinking water treatment
AND
-  increases corrosion of infrastructure
(Which can increase levels of lead, copper, or other heavy metals in treated water)
-  AND
degrades aquatic environments, killing wildlife and impacting the tourism and recreational economies in affected areas.

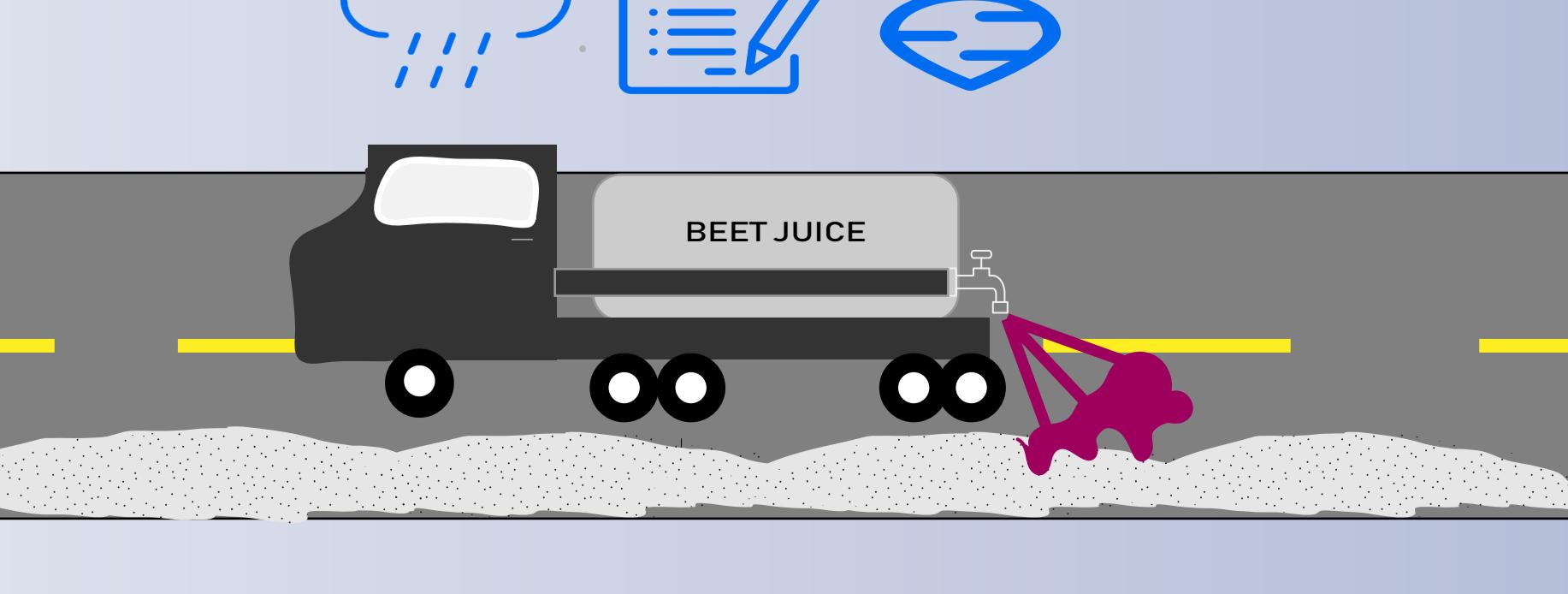
From 1958 to 2012, much of the United States has seen an increase in heavy precipitation events due to the effects of climate change. The Midwest and Northeast regions have seen the largest increases during this timeframe.

OBSERVED CHANGE IN VERY HEAVY PRECIPITATION



*self-reported survey (not all States participated)

These regions are also subjected to cold and snowy winters, and, in a survey done in 1991 by the Transportation Research Board, have some of the highest rates of salt application.



Created by Mary Mahoney, October 2018

Data and References:

1. Long-term chloride trends in freshwater lakes. Hilary A. Dugan, et. al. Proceedings of the National Academy of Sciences Apr 2017, 114 (17) 4453-4458; DOI: 10.1073/pnas.1620211114

2. Highway Deicing: Comparing Salt and Calcium Magnesium Acetate. (1991). doi:10.17226/11405

3. Heavy Downpours Increasing. (n.d.). Retrieved September 25, 2018, from <https://nca2014.globalchange.gov/report/our-changing-climate/heavy-downpours-increasing#intro-section-2>

4. SVG illustrations provided by freepik's and vecteezy standard licenses and flaticon's basic license.

So WHAT CAN WE DO?

- Monitor weather events and apply salt only right before snow and ice events. Avoid using de-icing agents before a rain event.
- Educate private applicators and government agencies on the effects of excess chloride. Teach proper application techniques that still support public safety.
- Look towards moving to alternative de-icing agents - such as beet juice - that are less corrosive and more environmentally-friendly.

Created by Mary Mahoney, October 2018

Data and References:

1. Long-term chloride trends in freshwater lakes. Hilary A. Dugan, et. al. Proceedings of the National Academy of Sciences Apr 2017, 114 (17) 4453-4458; DOI: 10.1073/pnas.1620211114

2. Highway Deicing: Comparing Salt and Calcium Magnesium Acetate. (1991). doi:10.17226/11405

3. Heavy Downpours Increasing. (n.d.). Retrieved September 25, 2018, from <https://nca2014.globalchange.gov/report/our-changing-climate/heavy-downpours-increasing#intro-section-2>

4. SVG illustrations provided by freepik's and vecteezy standard licenses and flaticon's basic license.