Road salt is vital to transportation as it lowers the melting point of ice, and provides traction on roadways. However, road salt also increases the corrosion rate of vehicles, infrastructure, and degrades local ecosystems. The goal of this research project was to investigate the springtime distribution of road salts into hydraulic systems within Schmeeckle reserve. This subject is of interest to us because high salt levels are detrimental to vegetation, surface water and ground water quality. In addition elevated salt levels are most noticeable in late winter and through the spring when it is easily transported and distributed by meltwater. Schmeeckle’s geographic setting as a forest preserve in an urban environment and its close proximity to well-traveled roads suggest a high probability of increased salt within the reserve’s ground and surface water.

GIS Methods:
- Compiled the spatial data within the Reserve, which was then analyzed with ArcMap and ArcCatalog.
- Geodatabase and secondary data sets were created using Hydrologic ArcMap processes to identify areas that were vulnerable to contamination by road salts.

Field Methods:
- Selected well and surface collection sites within the areas designated by the GIS analysis.
- To sample pre thaw surface waters we augured a hole through the ice and the surface water was tested using a conductivity meter, post thaw samples were taken at the surface.
- Well samples were collected by a well bailer after clearing the well.
- Before and after each sampling, the conductivity meter was rinsed with distilled water.
- Depth to groundwater measurements were also taken.

The result of the GIS analysis indicated areas that are likely affected by road salt infiltration. The sites of concern within Schmeeckle were Lake Joanis, Moses Creek, and the wetlands to the east of Michigan Avenue, due to their close proximity to the roads. The field testing yielded interesting results, conductivity remained stable and consistent through the below freezing weather. Once the weather warmed, all the surface water and the two wells showed an increase in conductivity within two weeks of the temperature rise.

Schmeeckle Reserve is a forest preserve just north of UW-Stevens Point. Its forests sit on a thin layer of glacial outwash overlaying granite bedrock. This bedrock forces the flowage from the Northpoint culvert, Lake Joanis, and two monitoring wells.

- Study Site Description -

- Conclusion -

While we feel confident in our data and our methods; there are things that we could have improved to make our data more complete and to give us better results.
- More time to gather more data, ideally the project would have been a year long study.
- Collected bottom water samples, where denser salt water resides, from Lake Joanis.
- Clearing the wells 12-24 hours before sampling.
- Complete a soil study near the wells to determine salt, carbonate and clay content.

With the sampling complete and the statistics completed, we concluded that there was a significant difference in conductivity in the surface streams of Schmeeke throughout the springtime thaw. This conductivity was influenced by the road salt used on the nearby roads. We also concluded that Lake Joanis was affected by road salt as well, as there was a noticeable difference between the lowest conductivity sample and the rest of the samples taken on Lake Joanis. Finally, we cannot conclude anything about the wells, only that their high conductivity suggests that there were multiple outside factors influencing the conductivity of the wells. The close proximity of well 10W to Michigan avenue led us to believe that road salt was having an effect on its water quality. However, with only one other well to compare it against, it was not possible to draw a definitive conclusion.

- Sources -


