Community Leads Scientific Effort to Monitor Streams

April 19 2022 11:06 AM

EAST ALTON – Research from RiverWatch Director and Stream Ecologist Danelle Haake illustrates how community members can be a part of the scientific field and provides new insight on how road salt application affects our local streams.

Haake, who holds a doctorate in biology from Saint Louis University, is a senior scientist and RiverWatch Director at Lewis and Clark Community College's National Great Rivers Research and Education Center (NGRREC^{sm}) and has over 10 years of experience in stream ecology research.

Her recent paper, "Impacts of Urbanization of Chloride and Stream Invertebrates," was published in the journal "Integrated Environmental Assessment and Management." The article was co-authored by three citizen scientists who also participated in the study.

"The goal of this research is two-fold," Haake said. "It will hopefully lead to greater knowledge about what is happening locally and show how chloride levels from road salt are impacting local stream ecosystems in our communities; second, it will show that data collected by citizen scientists – ordinary people who care about water quality and local stream health – is just as valid as other scientific research."

Haake was one of the founding members who started the chloride monitoring volunteer network over 10 years ago. At the time, she was working as a restoration ecologist in St. Louis and monitored stream water quality monthly with fellow volunteers with the Missouri Stream Team.

"During one monitoring session, we noticed there were really high chloride concentrations," Haake said. "Seeing that, I reached out to other volunteers in St. Louis. That got the ball rolling, and next thing we knew we had 30 volunteers monitoring at almost 60 sites."

The study, in partnership with the Missouri Stream Team, was conducted over the course of 10 years, from 2009 – 2020 at 31 different sites located throughout St. Louis County Missouri.

The research findings show that in communities of all sizes, the amount of roadway has a strong influence on the amount of chloride in the stream, but in areas with medium-to-high density urban development, non-road sources such as sidewalks and parking lots may have an even greater contribution to chloride levels.

“Land managers and municipalities can use this study to show there is a definite impact from road salt, not just the amount being applied on roads, but also on parking lots and sidewalks” Haake said.

The study indicates the need for Best Management Practices (BMPs) for non-municipal applications specifically in commercial areas that are not under municipality management. Larger agencies and municipalities already utilize BMPs as guidelines or codes of practice for de-icing winter roadway, considering cost-effectiveness while limiting environmental risk and damage.

“Rain gardens and retention ponds capture water and salt from pavement and parking lots and slow the infiltration of salt concentrations into streams, but unfortunately, the chloride levels in streams still increase in the long-term.” Haake said. “Whatever you can do to use less salt is the best practice for reducing chloride levels in streams.”

Community members interested in monitoring chloride in their local stream can visit www.ngrrec.org/riverwatch/chloride-monitoring/ to participate in Illinois and mostreamteam.org/ to participate in Missouri.

Haake’s paper is available through the Society of Environmental Toxicology and Chemistry at https://doi.org/10.1002/ieam.4594

For more information, contact Haake at dhaake@lc.edu or (618) 468-2784.

National Great Rivers Research and Education Center (NGRREC)

Founded in 2002 as a collaborative partnership between the University of Illinois at Urbana-Champaign and Lewis and Clark Community College, NGRREC is dedicated to the study of great river systems and the communities that use them. The center aspires to be a leader in scholarly research, education, and outreach related to the interconnectedness of large rivers, their floodplains, watersheds, and their associated communities. To learn more about NGRREC, visit www.ngrrec.org.