

# NRRI Now

*A monthly newsletter from the*  
**Natural Resources Research Institute**

---

January 2021 | Volume 06 | Issue 01

## A New Year. A New Vision.

### Welcome to 2021!

NRRI is ready to go in the new year. In spite of 2020, we...

- worked through and around the pandemic challenges.
- honed a vision to "discover the economy of the future."
- organized around five [Research Platforms](#) to engage stakeholders.
- managed change and identified opportunities for Minnesota.

I outline it all in my first quarterly column of 2021. Stay well and best wishes for the new year!



**Rolf T. Weberg**  
NRRI Executive Director  
[nrriinfo@d.umn.edu](mailto:nrriinfo@d.umn.edu)

### Our Mission

Deliver integrated research solutions that value our resources, environment and economy for a sustainable and resilient future.

**Natural Resources  
Research Institute**

UNIVERSITY OF MINNESOTA DULUTH  
*Driven to Discover*

Main: (800) 234-0054 | Website: [www.nrri.umn.edu](http://www.nrri.umn.edu) | Email: [nrriinfo@d.umn.edu](mailto:nrriinfo@d.umn.edu)

NRRI Duluth | 5013 Miller Trunk Highway | Duluth, MN 55811 | (218) 788-2694

NRRI Coleraine | One Gayley Ave / PO Box 188 | Coleraine, MN 55722 | (218) 667-4201

## Weberg 2021 New Year Address



January 7, 2021

**New Year's greetings to our NRRI friends and partners:**



I hope that this note finds each of you safe and healthy. 2020 had its share of challenges for all of us. I am forever thankful for the dedication of our NRRI personnel to not only continue to contribute and deliver on a high level, but to also commit to protecting each other's health and that of our colleagues and partners. Despite the challenges, the NRRI team provided essential support to our iron industry as well as our state & federal agencies, broke new ground in forest biomass product research and collaborated across the region to help evaluate new opportunities for Minnesota.

During the migration to our "new normal," we also took the opportunity to refresh our strategic focus. While our charter and mission remain unchanged, we adopted a new vision to "Discover the Economy of the Future." Minnesota has a long history of natural resource-based economies. Over the years, our resources and markets have changed. To compete on the world stage, Minnesota needs to both support incumbent industries and aggressively pursue unique, value-add opportunities that offer greater return on investment and reinvestment in the state and its environment. The economy of the future is a forward-looking mindset that requires an inclusive, state-wide conversation to create a sustainable and resilient economy that values our resources, our environment and our communities.

**SEE VIDEO: [Rolf Weberg's New Year Greeting](#)**

NRRI now offers five strategic research platforms that reflect our expertise and capabilities to attract and engage innovation, collaborators and investment in Minnesota. As part of the University of Minnesota – the state’s premiere research University – NRRI partners across the System and our global network of stakeholders to help develop and accelerate unique solutions into practice. We continue to work hard to develop and maintain productive partnerships consistent with our mission-driven, project focused strategy.

As we look forward into 2021, I cannot help but be optimistic. While change is the new norm, Minnesota has lots of opportunity to evolve its economy within those changes. NRRI has invested in change – new equipment, training, people and capabilities that enhance our ability to partner quickly and effectively. We have streamlined our systems to encourage our researchers to do what they do best – applied research. I am excited to see how NRRI and the University can partner with our state and region to help create Minnesota’s economy of the future.

Stay well.

Rolf T. Weberg  
NRRI Executive Director  
[nrriinfo@d.umn.edu](mailto:nrriinfo@d.umn.edu)



*NRRI scientists applied biochar to plots in the U's Cloquet Forestry Center to research impact to soil health.*

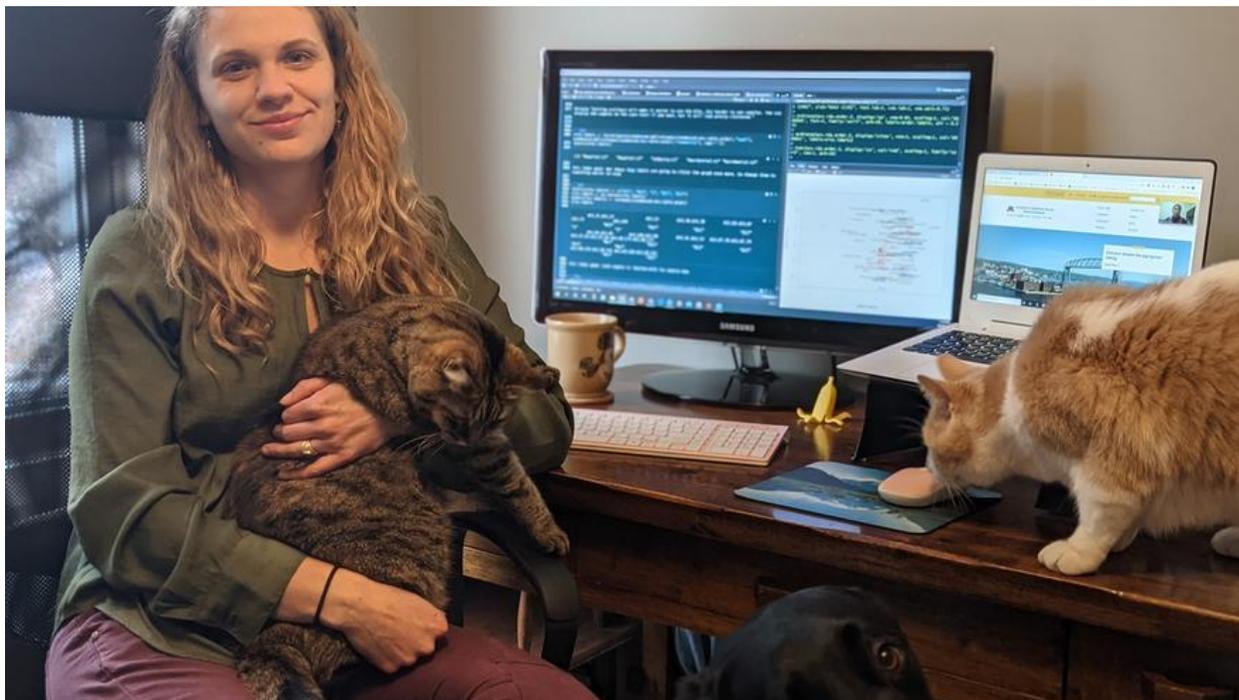
## Top 5 News Stories of 2020

Thank you for staying in touch with us. NRRI is continually evolving to meet the evolving challenges of our natural resources based economy. Our unique role and diversity of projects lend to some interesting stories to tell throughout the year.

**Here are the top 5 most read in 2020:**

1. [Minnesota a leader in biochar demonstration and research](#)
2. [Thermally modified wood boardwalk project](#) at the Sax Zim Bog (with video)
3. [NRRI funded projects Jan 1 - August 28, 2020](#)
4. [Worth its salt. Research aims to reduce road salt impacts](#) (with video)
5. [Cooped up for COVID?](#) NRRI and U online resources

## Meet the Researcher: Adelle Keppers



December 21, 2020

June Breneman

**Master's candidate Adelle Keppers goes to the source to help remove pollutant from sewer waste water.**

*“My goal is to figure out where the high quantities of antibiotic resistant genes are coming from so we can identify where to put onsite treatment systems.”*

As a Water Resources Science master's candidate, Adelle Keppers' research has local impact that's globally relevant. As the year wrapped up, Keppers defended her thesis “Characterization of Antibiotic Resistant Genes in Two Unique City Sewer Systems” based on work she did at NRRI under the supervision of NRRI Senior Research Program Manager and UMD Civil Engineering Professor, Chan Lan Chun.

Antibiotic drugs are used to fight bacterial infections and save lives. But some bacteria can survive the application of these drugs by acquiring antibiotic resistant genes and passing this resistance to their offspring and other bacteria. These resistant genes are a harmful pollutant that get into the environment in many ways, including getting flushed into sewer systems. It's increasingly a concern world-wide.

With a bachelor's degree in cell and molecular biology and a master's focus on microbial ecology, Keppers looked at upstream sources of the wastewater treatment plants – hospitals, homes and industry.

“By the time resistant bacteria reach the wastewater treatment plants, they've had a chance to proliferate and shared their resistant genes with other bacteria,” said Keppers. “My goal is to figure out where the high quantities of antibiotic resistant genes are coming from so we can identify where to put onsite treatment systems.”

### **Sharing Knowledge**

Keppers is using an automated sampling system to collect sewer samples every 30 minutes over the course of 24 hours. This technology provides more stable and consistent data than she could possibly get by sampling manually. And it's this sampling process that Keppers shared her knowledge of with UMD Assistant Professors Richard Melvin and Glenn Simmons for their research to monitor the occurrence of the Coronavirus on the Duluth campus as an early detection tool.

“This sampling process saves time and energy,” Keppers added. “I know it seems simple but establishing the sample collection process is the first step in a series to obtain good data and needs to be done with care.”

### **Safety First**

And because she's working with sewer water, Keppers is especially grateful for the safety protocols in place at NRRI.

“Facilities Manager Craig Maly has been really helpful to make sure we have bleach or other disinfectants and secondary containment protocols in case there's a spill,” said Keppers. “Obviously, if we can't do this research safely, we can't do it.”

### **Pandemic Pleasures**

The stay-at-home order has opened up opportunities for afternoon walks with her husband, Justin, and dog, Sterling.

“It is nice to get out and get some sun during the day since it sets so early now,” said Keppers. “It has become sort of a replacement to grabbing tea or lunch with a coworker or friend.”

## **NRRI Recent Funding Awards**

### **Sponsored Awards:**

Chris Filstrup, Bridget Ulrich, Euan Reavie and research teams received a five year award from the U.S. Environmental Protection Agency for the Great Lakes Sediment Surveillance project.

Tim Hagen and research team received funding from an industry partner for Agglomeraiton Potential of Lime Based Co-Products.

Matthew Aro received funding from Washington State University for Demonstration of Fire Performance of Durable Wood Strand Mass Timber Panels.

Ron Moen received funding from the MN Dept. of Natural Resources for Moose Population Modelling.

### **Internal Grant Awards:**

Chan Lan Chun received a University of Minnesota MNDRIVE Demonstration Grant for Biological Sulfate Treatment Coupled with Sulfide Immobilization for Electric Power Utility Water.

### **Service Contracts:**

The Coleraine Team has secured services contracts with seven industry partners.

The Duluth Team has secured services contracts with four industry partners.

### **The following people have been awarded Internal funding from the NRRI Funding Review Board:**

Donald Fosnacht received funds for "Preparation of Coleraine Site for Installation of the Boiler/Generator for the Xcel Project."

Jeff Kinkel received funds for "Dust Hazard Analysis for Densification Dust Collector."

Shashi Rao and Mei Cai received funds for "Indoor Pilot Trial for Sulfate Reduction."

Bridget Ulrich, Chris Filstrup, and Euan Reavie received funds for "EPA Great Lakes Sediment Surveillance cost share to purchase two mass spectrometers and room alterations for the equipment."