Natural Resources Research Institute
University of Minnesota Duluth
Driven to Discover

NRRI *Now*

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NRRI Mission:
Deliver research solutions to balance our economy, resources and environment for resilient communities.

www.nrri.umn.edu

Expanding Research

Chanlan Chun has been awarded a grant of $334,000 by the LCCMR for the following project: "Promoting Wild Rice Restoration Success by Examining Microbes."

Val Brady has been awarded a grant of $122,640 by the LCCMR for her portion of the following project: "Aquatic Invasive Species Research Center"

Katya Kovalenko has been awarded a grant of $81,116 by the LCCMR for the following project: "Sustaining Walleye Populations: Assessing Impacts of Aquatic Invasive Species."

George Host has been awarded a grant of $24,024 by the Minnesota Dept. of Natural Resources for the following project: "Assessing Forest Land Conservation Risk to Maintain Water Quality in North Central Minnesota."

Euan Reavie has been awarded a grant of $166,129 by the University of Wisc.-Superior (US Dept. of Transportation) for the following project: "Support for the Evaluation and Verification of Ballast Water Treatment Technologies and other Green Shipping Initiatives."

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Global Relevance: Visit to Germany reveals partnerships

A Note From Rolf Weberg:

NRRI was created to look to the future, find key partnerships, develop knowledge and deliver solutions to create new opportunities. Minnesota needs the right tools to participate in emerging global economies and national energy challenges, especially as we all face a changing climate.

In June, I had the opportunity to join a Minnesota delegation to the German state of North Rhine-Westphalia.

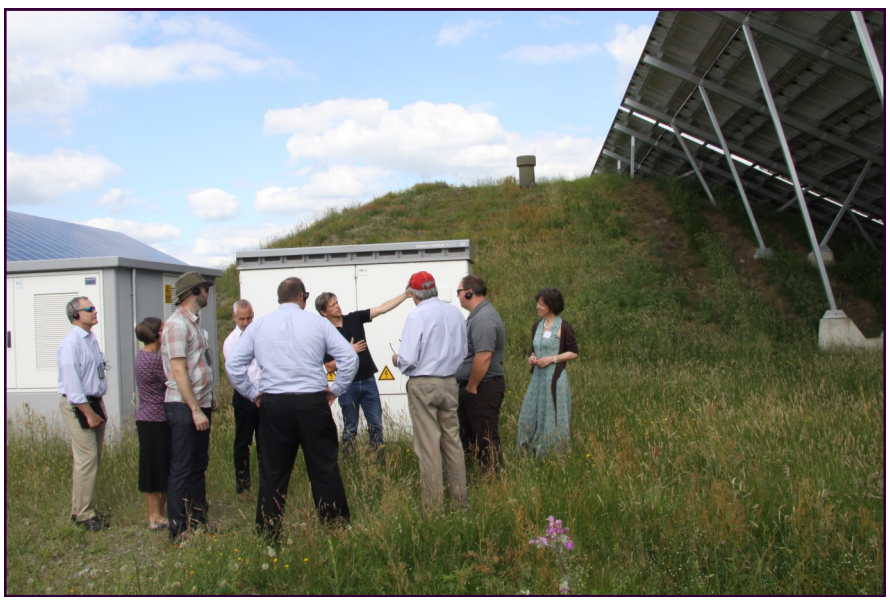
Earlier visits to Germany have focused on technology and policy issues associated with their energy transition to renewable energy. This trip was part of the Climate Smart Municipalities Program, a joint effort between Minnesota and the state of North Rhine-Westphalia to drive climate change adaptation and implementation of renewable energy and energy efficiency via paired partnerships between five cities.

It was a very full week with visits to each of the German cities to learn about projects that included public engagement, sustainable urban planning, environmental remediation, and a range of energy topics. The focus was on making sound, long-term decisions regarding the economy and environment that benefit future generations. Perhaps the most satisfying aspect was observing the inter-city partnerships develop exciting concepts and plans to address climate change while growing economic benefits. NRRI and the University of Minnesota system stand ready to assist in these efforts.

I was also able to spend a day working with our collaborators at Metabolon, a partnership between a German waste management company and the Technical University of Koln. This group has taken a former landfill and transformed it into a public research center to study leach water treatment, biomass digestion and biogas generation, process control architecture and hydrothermal carbonization of wet biomass into solid fuels.

Much of this work overlaps nicely with efforts at NRRI's unique Renewable Energy Laboratory, particularly water treatment and hydrothermal carbonization. We identified several potential collaboration projects that we believe will accelerate progress for both organizations.

Our German colleagues will be visiting Minnesota in early October. We look forward to welcoming them with progress on numerous projects as we work together to create opportunities with global relevance.



NRRI Executive Director Rolf Weberg (far left) joins a tour of the town of Saerbeck in Germany which generates its own energy with a huge solar farm (above) and wind energy. Within five years of moving completely to renewables, the town was generating 3.5 times more electricity than it needed.

Minnesota Value: NRRI publishes guide to manage red pine

.With some 630,000 acres of red pine in Minnesota supporting a robust wood products industry, managing our forest resources right will help sustain them for future generations.

To do that, NRRI forest experts asked the state's silviculture managers what they need to make the most of this wood resource.

The answer: A handbook that addresses the critical early growth years of this versatile tree species. That lays out all the options for managing the landscape for biodiversity and economic value. That pulls together past research with current findings in an easy-to-follow format.

And that is exactly what NRRI published in June, released for distribution by the Minnesota Department of Natural Resources.

"One of the big concerns with red pine management is waiting too long to thin it," explained Dan Buchman, co-author on the project with NRRI colleague Bill Berguson. "Then you have a tree stand that's susceptible to wind blow-downs, snow damage and insects. This handbook gets managers around that situation with early thinning techniques."

The timing couldn't be better. Minnesota has a lot of red pine acreage coming upon their first thinning. To do it most cost effectively, the handbook tells the harvesters to go after the large diameter trees that have the highest value. This is in contrast to previous strategies which took out the smallest trees first to let the larger trees grow.

Earlier studies on this technique by Robert Buckman, a researcher with the U.S. Forest Service from 1953 to 1986, found that there's no difference in growth and that it increases the value of the harvest. Buckman's research lays the groundwork for red pine knowledge in the Upper Midwest lake states.

Red pine is a very versatile tree species that can be grown for a variety of products. It also grows without much encouragement.

"I could do nothing to a red pine stand and 100 years from now it would give us the same volume if it had been thinned," said Buchman. "But an unthinned stand would look very different. The trees would be very tall and thin; not very high value. Our techniques will help deliver a steady flow of products out of young red pine stands."

The goal is to have properly managed working forests that are healthier and less of a fire risk than unmanaged, overgrown forests. By opening the canopy and allowing for native understory plants, red pine regrowth is already on its way when the stands are harvested.

NRRI research shows that proper thinning of red pine stands increases productivity and harvesting efficiency. A newly published guide explains the technique to landowners to improve their yields.

Whatever happened to…. Grand Log Homes?

"We're a 26-year overnight success!" laughed Charlie Mizia, co-founder of the business he and his brother, Richard, have been nurturing for decades. And like many entrepreneurial efforts, it started with an idea that they just couldn't shake.

They wanted to develop the look of big log siding using small dimensional lumber.

"NRRI was extremely helpful on the front end, developing a press system for the manufacturing process," said Richard.

"We've tweaked the original design for our second generation press, but it's still the basic design that NRRI came up with."

The brothers received a U.S. patent for their "modular log assembly system" and a Canadian patent in 2015. Their current project – an old farmhouse renovation on the Mississippi – demonstrates the product's value as a home "recycler" by improving an existing structure.

"With some proven successes under their belt, the Mizias are now focused on finding investors in this market-ready business. With each step forward, the Mizia brothers' entrepreneurial perseverance and belief in Grand Log Homes is leading to success.