

## NRRI Mission:

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

[www.nrri.umn.edu](http://www.nrri.umn.edu)



## From the Editor:

At the close of this year's state legislative session, NRRI was approved state funding to drive research for Minnesota's economy of the future. An appropriation of \$2.2 million will go to four projects for forest and bioeconomy innovations and funds of \$883,000 will continue NRRI's four projects on minerals and water research.

We do not do this work alone. NRRI will continue to collaborate broadly with agency and University partners to deliver applied research across disciplines.

This says it best: Our research goes to work for you.

*Jane Breneman*

Get these stories by email: Sign up at [www.nrri.umn.edu](http://www.nrri.umn.edu)

## NRRI Leadership

Rolf Weberg, Executive Director

## Directors:

Don Fosnacht, Renewable Energy  
Elaine Hansen, Business Support  
George Host, Forest & Land  
George Hudak, Minerals & Metallurgy  
Lucinda Johnson, Water  
Kevin Kangas, Coleraine Labs  
Eric Singaas, Wood & Bioeconomy

Duluth Labs & Administration  
5013 Miller Trunk Highway  
Duluth, Minn., 55811  
218-788-2694

Minerals & Energy Labs  
One Gayley Avenue  
Coleraine, Minn., 55722  
218-667-4201

The University of Minnesota is an equal opportunity educator and employer.



## Getting to the point with woodcock research

### NRRI enlists hunting dog to learn more about a species in decline

Superbly camouflaged to match the browns of the forest leaf litter, the female woodcock stubbornly sits on her ground nest.

"They're very dedicated brooders," explained Debbie Peterson. "They won't flush until you're right on them." The young chicks also match the forest floor. So finding American woodcocks for research is next to impossible. For a human. But not for a dog.

And that's how Peterson, an avid bird hunter and part time field technician, is helping to conduct NRRI research, led by NRRI wildlife ecologist Alexis Grinde, to inform forest harvesting practices. Her Gordon setter, Riley, nose to the ground, covers seven miles of forest for one mile of Peterson's in search of a mother woodcock.

The woodcock is one of three bird species NRRI is studying to understand how the birds use the resources of a young forest versus a mature forest from birth to young adult. The golden-winged warbler, veery and American woodcock are species experiencing population declines throughout their breeding ranges. But there's a large, young forest plot near mature forests north of Warba, Minn., that attracts these birds.

What's not known is how the woodcock use the forests as they grow and how different forest characteristics impact survival. So while hidden from view, the woodcock can't hide its scent from Riley. He zig zags across the forest while Peterson tracks his movement with GPS.



Debbie Peterson and her Gordon setter, Riley, set out in search of Woodcock near Warba, Minn.

When Riley picks up the scent, he stops and points, frozen in movement until Peterson gets closer and asks Riley to flush out the mama bird so she can approach the nest.

Once the baby birds are found, Peterson loops a thin, degradable "necklace" around the chick with an attached transmitter. The necklace is designed to fall off by fall migration time. Over the next few years of the study, the data will show how long the young stay near their nest, how they seek protection from predators and if mature forests are part of their survival strategy. As of the end of May, they had six chicks carrying transmitters.

Grinde explains, "We are tracking the movements of juveniles as they grow so we can identify forest characteristics that increase survival and ultimately help promote the conservation of these important species."

This project is funded by the Environment and Natural Resources

Trust Fund as recommended by the Legislative-Citizen Commission on Minnesota Resources. It is a continuation of NRRI's long-term study in a forest harvest site supported by UPM Blandin and National Council for Air and Stream Improvement, Inc.

In 1997, Debbie Peterson was a recent college graduate from Northern Michigan University looking to put her biology studies to work. She ended up in the NRRI Bug Lab counting and sorting aquatic macroinvertebrates, which quickly led to joining the avian research team. Jerry Niemi was director of NRRI's Center for Water and the Environment at the time and lead ornithologist.

Now a full-time high school teacher, Peterson has continued doing summer field work for NRRI all those years, as well as for other agencies. "After a busy school year, I'm ready to be in the woods with my dog, listening to birds," she said.



## Biochar: The hot material you don't know about

Think of charcoal and summer picnics come to mind. You might also see it in trendy beauty products – from soap to toothpaste.

But have you heard of biochar? Didn't think so. Biochar, like charcoal, is wood or other biomass resources that are superheated in a low oxygen kiln. The difference is in how these two products are used. Charcoal, as we know, is used for cooking or heating. Biochar is gaining strides in the agricultural and horticultural arenas because it helps soils retain water and nutrients while adding nitrogen. People in the know find it bagged at garden centers.

NRRI is working to bring biochar out of the shadows by expanding markets and developing a life cycle analysis. Researchers are identifying feedstock from Minnesota's plentiful biomass resources and fast-growing hybrid poplars. But this nascent industry also needs more clear definition and specifications.

"This is a tremendous opportunity for NRRI," said Don Fosnacht, Energy Management Research Group Director. "We certainly have the capabilities and equipment and maybe we can bring some real science to this. There's a lot of potential."

The biggest market for biochar is agricultural. The obstacle is that biochar is currently not a cost-shareable item, meaning farmers do not get Farm Bill assistance to use it, as they do other products. NRRI is working to provide the soil scientists at the Natural Resources Conservation Service the information they need to make this possible.

Finding new markets for Minnesota's timber is important. As oriented strand board plants closed and paper production declines, low value trees become forest fire tinder. There is also potential in making biochar from other industry byproducts – corn cobs, beet waste or beetle-killed trees.



Researcher Matt Young holds two types of biochar developed in the NRRI Duluth lab.

"We're looking at this as an economic driver and an approach to mitigating climate change," said John DuPlissis, NRRI forestry program manager. "We can develop a valuable product, start a new industry and sequester carbon at the same time."

Further development of the biomass results in even higher value activated carbon which is highly porous and used in many industry applications. European and Asian countries already have robust markets for charred products. NRRI will play a key role in identifying key characteristics to deliver reproducible product specifications for U.S. markets.