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2015

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# Natural Resources Research Institute

*Resilient communities through applied research*

## OVERVIEW

Greater Minnesota faces a growing challenge. Regional economies throughout the state are feeling the effects of unsteadiness in key industries like manufacturing and agriculture. In some cases, jobs, and consequently residents, are moving to the metro area, leaving rural communities with shrinking populations and diminished representation in the state Legislature. In order to thrive, Greater Minnesota needs economic development and a more robust workforce. Public-private partnerships, such as those advanced by the University of Minnesota, help drive economic growth, support business needs, promote innovation through research and attract and develop much-needed workers throughout the state.

The [Natural Resources Research Institute \(NRRI\)](#), part of the University of Minnesota's Duluth campus, has a history of helping create resilient communities through applied research. The NRRI, which opened in 1985, studies the economic impact and sustainability of Minnesota's minerals, forest products, peat, biomass and water-related industries. The institute's mission represents a marriage between environmental conservation and economic prosperity by fostering the economic development of Minnesota's natural resources in an environmentally sound manner, while also promoting private sector employment by creating and helping retain jobs that add to the vitality of Minnesota's communities. Among universities, the NRRI is now a recognized model for research, innovation and outreach.

The institute has two main functions: research, which guides informed economic and environmental decisions; and outreach services, which provide technology transfer, business development and experiential learning in the context of informed environmental stewardship and economic development. NRRI works on a wide variety of projects, from small business efficiencies and product development to environmental monitoring and remediation to large industry challenges.

## SOLVING DISCRETE INDUSTRY PROBLEMS THROUGH RESEARCH

Tightening U.S. Environmental Protection Agency regulations have required mining companies to remove more contaminants from mine water. Minnesota's mining industry is crucial to the state's economy, directly employing more than 4,100 people with a **\$3.2 billion** annual impact.

American Peat Technology, a company in Aitkin, Minnesota that manufactures environmentally beneficial products from peat, an abundant natural resource, partnered with NRRI to develop a product that could remove toxic pollutants from waterways. Supported with

Natural Resources Research Institute	
Staff	140
Annual Budget	\$16 million
Industry Partnerships	~100
Research Projects	~160



*NRRI chemist Igor Kolomitsyn conducts research on peat at the American Peat Technology laboratory.*

\$25,000 from NRRI's Product Development Fund, the company kick started development of its product line. Research conducted at NRRI combined with the company's marketing and industry knowledge, were crucial to rapidly developing the APTsorb , American Peat Technology employs 25 people, up from its original staff of four. The company's partnership with NRRI continues with the development of a low-cost, peat-based solution for removing sulfates from water.

## A LONG-VIEW OF SUSTAINABILITY AND ECONOMIC DEVELOPMENT

As part of its mission to promote long-term sustainability and economic development in the state, NRRI has helped Minnesota's forestry industry be more competitive and successful in an environmentally sound manner. A Minnesota Department of Natural Resources report shows forestry-related businesses contribute \$16 billion to the state's economy and provide 63,200 jobs. By finding research-backed methods for better growing and harvesting wood, increasing the value of wood species, and developing new uses for wood, NRRI has increased the value of Minnesota's forestry industry.

For example, NRRI has been evaluating the chemical, mechanical and physical properties of thermally modified wood. Upgraded thermally treated wood can lead to new production companies, creating new regional and national jobs and increased opportunities for exports. Superior Thermowood, a small company based in Palisade, Minnesota, manufactures thermally modified wood using a specialized kiln. NRRI helped Superior Thermowood identify new markets and make connections throughout the wood products industry. NRRI has also gathered technical data on different applications for treated wood species and kiln "recipes" to inform manufacturers and production companies how to thermally modify different species.

In Two Harbors, Minn., NRRI's research into extracting natural chemicals from the bark of birch trees helped launch University start-up The Actives Factory. The company now sells these natural chemicals, which kill bacteria and fungus and limit inflammation, making them valuable ingredients in cosmetics, personal care products and pharmaceuticals.

## STRENGTHENING AND SUPPORTING THE COMMUNITY

Through its research and outreach, NRRI supports regional Minnesota communities. Duluth-based sister companies Loll Designs, an outdoor furniture manufacturer, and Epicurean, a culinary supplies manufacturing business, continue to build on a 15-year



*Epicurean, a culinary supplies manufacturer in Duluth, Minn., produces chopsticks from its leftover wood-fiber.*

relationship with NRRI that has helped support their sustainable growth and build their base of locally hired employees.

- NRRI materials science research is helping Loll stay competitive by conducting weathering and aging tests on their products.
- NRRI helped Epicurean find a way to use the large quantity of high-quality, odd-shaped wood-fiber scraps leftover from its normal product line and developed an efficient manufacturing process for making durable, dishwasher-safe chopsticks from the scraps. Transforming the waste into a product helps the business's bottom line and provides a sustainable use for its waste scrap materials.

## **RESILIENT COMMUNITIES**

Through its applied research and outreach efforts, NRRI contributes to economic development, strengthens the competitiveness of the state's natural resource-based industries and supports the creation of new private-sector jobs, forming more resilient communities. This work is especially critical in the face of the current economic challenges seen in rural Minnesota.