

HIGHLIGHTS FY2019

**Engaging
and
Innovating
for
Minnesota**



**Natural Resources
Research Institute**

UNIVERSITY OF MINNESOTA DULUTH

Driven to Discover

INNOVATIVE RESEARCH • MINNESOTA VALUE • GLOBAL RELEVANCE

From the Executive Director:

Delivering solutions that support long-term decisions concerning how to best use, protect and restore Minnesota's natural resources is complicated. NRRI relies on our many partners, advisors and stakeholders – both regional and global – to provide applied research that meets our unique mission.



This year has been especially exciting.

You'll read about many of our successful projects in this summary. This year we've also attracted more talented scientists and staff to NRRI, adding critical new skillsets and expanding our capabilities. Thanks to the 2019 Minnesota Legislature's support, NRRI received two appropriations to help focus research on Minerals and Water Innovation and on Forest and Bioeconomy Research. We look forward to not only delivering on these projects, but also to leveraging this state support to attract both Federal and private investment to Minnesota.

NRRI is committed to being an effective research partner to all of our stakeholders. In the spirit of continuous improvement, we are embracing new business development and project management practices to sharpen our delivery. Looking forward, the Institute is focused on enhancing engagement with industry partners and our agency, non-governmental organization, academic and public stakeholder collaborators as we drive the University's impact across the state.

We look forward to partnering with you as we work together to develop Minnesota's economy of the future. Consider visiting our facilities to learn how NRRI research goes to work for you.

Stay tuned and thank you for your support.

A stylized, handwritten signature in black ink, appearing to read 'Rolf T. Weberg'. The signature is fluid and cursive, with the first letter 'R' being particularly large and prominent.

Rolf T. Weberg

Executive Director

Natural Resources Research Institute

NRRI MISSION

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

FY2019 IMPACTS

INNOVATION

- Invention Disclosures **14**
- New Commercial Licenses **2**
- Patents Filed **6**
- Business Startups **4**

DELIVERY

- Industry Service Contracts **87**
- Journal Articles **41**
- Technical Reports **18**

ENGAGEMENT

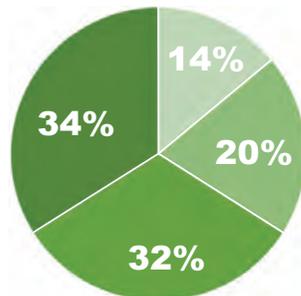
- Individuals on Tours **337**
- Public Open Houses **4**
- Presentations and Posters **56**
- Public Service, Committees **78**

OPERATING BUDGET FY2019

- Total funding **\$15.7M**
- University Funding **14%**
- PUTF Funding **20%**
- Contracts and Grants **32%**
- State Funding **34%**

External Contracts and Grants

- Federal **23%**
- State **25%**
- Industry **42%**
- Other **10%**

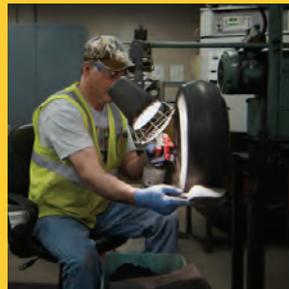


KNOWING OUR RESOURCES

- Examining the microbes in wild rice root systems to understand lake restoration efforts.
- Deploying bird houses in boreal forests to improve habitat for declining species.
- Developing online tool for MnDOT to improve road construction planning by identifying areas of potential acid rock drainage.
- Researching impacts of beaver dams on steelhead trout spawning on North Shore streams.
- Studying the different effects on wildlife between two tree harvest practices: one that leaves scattered trees and one that leaves clumps of trees.

DEVELOPING MINNESOTA'S PORTFOLIO

- Working with an entrepreneur to develop a compostable product from recycled paper that can replace single-use food service plastics.
- Developing long lasting pothole repair material that utilizes waste taconite rock for a high value product for commercialization.
- Adding life cycle analysis to all new development projects to understand risks and impacts.
- Identifying industrial waste streams that can be mixed in a variety of ways to design soils for restoration, agriculture and other uses.
- Developing a new way to separate non-magnetic ores for processing into taconite pellets.



DIVERSIFYING OPPORTUNITIES

- Expanding trials of hybrid poplar trees across the Midwest to meet anticipated need for biomass resources for bio-based materials, energy and chemicals.
 - Testing new processes to develop higher value, more pure iron products from Minnesota's Iron Range.
 - Helping a West Coast business identify opportunities in excess forest resources to make a clean-burning, fossil coal replacement fuel.
 - Defining and characterizing the potential in biochar as a forest and agricultural enhancement.
 - Researching a new process that turns low value tree lignin into a bio-based plastic replacement material.
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PARTNERING FOR SUCCESS

- With an applied, mission-driven focus, NRRI brings integrated solutions to state-wide challenges.
- NRRI researchers have deep expertise with access to dynamic and diverse colleagues in the next office and across the University of Minnesota system.
- With over 35 years of partnerships and collaborations, NRRI engages with industries seeking innovation and data, and communities seeking resilience.
- The future is dynamic. Resources are changing. NRRI is preparing Minnesota for what's ahead.



ABOUT NRRI



INNOVATION THROUGH COLLABORATION

As part of the University of Minnesota system research enterprise, NRRI employs over 140 scientists, engineers, technicians, staff and students in two industrial research facilities. Through collaborative partnerships, we deliver the innovative tools and solutions needed to utilize and sustain Minnesota's precious natural resources.

CONTACT NRRI

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