

NRRI Mission:

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

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From the Editor:

This bit of news got us thinking: We read last fall that Duluth breweries relate the quality of their beer to the quality of the water in Lake Superior.

And water quality is something NRRI is passionate about.

So on April 18, we're hosting a new event: Tapping into Science, and open house from 4—6 p.m. with water science and craft beer tasting stations and a Water Bar.

We invite the public to join us as we share our important and innovative water research while tasting superior water and beer.



NRRI Leadership

Rolf Weberg, Executive Director

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NRRI, UMD host community conversations on climate change

One day Duluth is called out as an attractive “cool city” that can build its population with people seeking refuge from climate change. The next day, Duluth is identified as an area that will experience the impacts of climate change even more acutely than the rest of the United States.

Both are true. On a March Wednesday, Harvard Professor Jesse Keenan addressed a full auditorium on UMD's campus to speculate that the impacts of climate change in other parts of the country could send 10,000 to 20,000 people to Duluth – climigrants, he called them. The next day, a report was released saying that the Great Lakes region will be facing more algae blooms, more intense storms and warming temperatures that will lead to further environmental change.

There are winners and losers in climate change scenarios, and that was often acknowledged during the Our Climate Futures: Meeting the Challenge in Duluth event.

The two-day conference started at NRRI with panel discussions amongst researchers, community leaders and business representatives. What are the business opportunities in the future economy? How must our infrastructure adapt to intense storms? What supply chain disruptions can be anticipated from our forest resources? Can Minnesota build its energy capabilities?

“Sustainability is just smart business,” said Marianne Bohren, Executive Director of the Western Lake Superior Sanitary District. “It leads to cost savings and keeping the social license to operate.”

Senior Climatologist Kenny Blumenfeld for the Minnesota Dept. of Natural Resources laid out data collected since the 1800s. In general, Minnesota has gotten warmer and wetter. Winters are shorter and less cold, with more snowfall but less snow cover. “In fact, winter is warming 10 times faster than summer,” he said. Minnesotans should prepare for more severe



NRRI's Collaboratorium is full during the March 19 panel sessions about climate adaptation.

weather and plan to pay for it in infrastructure damage.

Keenan claimed that Duluth and Buffalo, New York, have the cooler climates, access to fresh water, untapped resources and infrastructure to attract people from hurricane and high heat-prone zones.

“This really is the focus of NRRI,” said Schoff, a researcher and biology professor. “Our applied research is all about looking ahead and planning for the future. We gather information and data that will help mitigate impacts and offer options to adapt to a changing world.”

The conference was a timely opportunity for NRRI Water Initiative Director Lucinda Johnson to announce the release of the Environmental Law & Policy Center report that she contributed to: An Assessment of the Impacts of Climate Change on the

Great Lakes. The 71-page report, compiled by 18 scientists in both the U.S. and Canada, is a comprehensive assessment of climate impact on the region ever compiled.

“We're already seeing algae blooms in Lake Superior, which is alarming,” said Johnson. “And we can't ignore the so-called 500 year storms that we're seeing fairly frequently. Aside from the cost to repair roads and buildings, the runoff is also damaging to water quality.”

The ELPC report recommends advancing renewable solar, wind and energy storage to create jobs and spur economic growth, avoid carbon pollution and improve energy efficiencies. Energy dollars spent on coal and natural gas drains money out of the region, where renewable installations and retro fits would create jobs for the new Minnesota economy.

NRRI helps inventor develop new markets for recycled paper, reduce plastics

NRRI is hoping that one waste stream – excessive paper waste – can provide a solution for another pollution problem: single use plastic. And hopefully, make Minnesota the manufacturing and distribution hub for this new product.

Stadiums and airlines, in particular, are considering how to reduce the plastics in their food service. They need a biodegradable food tray that can be heated in an oven and will also stand up to greasy foods.

The Minnesota Pollution Control Agency is funding NRRI's research through their Recycling Market Development program.

NRRI Bioeconomy Initiative Director Eric Singaas is working to turn recycled paper pulp into biodegradable food trays that will hold up to a greasy chili cheese dog. Current “cardboard” products on the market are either leaky or they're coated with plastic which keeps them from composting.

“Our dream would be that the tray and packaging and food are all compostable, going into one bin,” said Singaas. “Stadiums and airports would have their own industrial compost stations on site.”

And he's building off something similar. An inventor in Israel developed a heat and grease resistant, compostable food tray using sugar cane harvest byproduct. Joseph Siani, Founder of W-Cycle, is working with NRRI to develop the same product out of locally-sourced recycled paper, opening new markets for the pulp and reducing single use plastic pollution. Verso Corporation's Duluth Paper Mill is supplying recycled pulp for product trials.

Once the product is developed, Siani hopes to set up a national manufacturing and distribution center for the products here in Minnesota. He already has a lot of traction for his sugar cane product in Europe and Australia.

“Our innovative patent is the first ever eco-friendly and compostable, single use packaging solution,” said Siani. “I have been researching this product since 2003 with the goal to make a material that is 100 percent compostable and can withstand temperatures



NRRI Scientist Victor Krause tests trays with specially formulated oils.

from the oven to the freezer.”

Singaas admits that reformulating the sugar cane product to use recycled paper pulp is challenging, but societal demand is generating research funding to move this along.

A trial formulation was pressed into trays that are being sent to the Wisconsin Institute for Sustainable Technology at the University of Wisconsin, Stevens Point. There, a Compostability Certification Lab will test the product against the ASTM and Biocompostable Products Institute technical standards. The goal is to develop the trays with the maximum possible percent of recycled content.

“I've been trying to work in this area for a long time, but now people are making plastics into a high profile issue,” said Singaas. “I feel like the world is finally catching up to what I've been wanting to do with my career.”