

Sea Grant Files March 1, 2016

## **Smart Ponds, Sexy Soil: The Front Lines of Climate Adaptation**

Hi. I'm Jesse Schomberg and you're listening to the Sea Grant Files.

How could it be 67 degrees in New York on Christmas Day ...then weeks later have a record-breaking two feet of snow bury the city? After 4 years of drought, torrential rains are falling in California in a way that is reminiscent of Duluth's epic 2012 flood. Of course, El Nino is at play this crazy-weather winter but the data also tells us that the Earth's climate has, and is continuing to, change.

Knowing that it is prudent to brace for coming storms and, likewise, climate change, Minnesota Sea Grant joined the University of Minnesota's Water Resources Center and many others to host the annual Minnesota Climate Adaptation Conference. The conference, launched by meteorologist and entrepreneur Paul Douglas, was a reality check and a call to action to collaborate. He asked the audience to embrace the weather changes with creativity and resilience. This is prime time to tackle the unknowns of the future with technology and innovation. Who better to take up the challenge than a hardy group of can-do Minnesotans?

At the conference, representatives from Minnesota homegrown business titans Best Buy, 3M, and General Mills shared their company plans for sustainable growth. In every case, embracing renewable resources is enhancing their bottom lines. Best Buy alone is saving \$40 million a year by installing renewable energy technology including automating lighting and energy controls in stores. It's also entering the residential solar market. 3M outlined its commitment to reduce water use in manufacturing by 50%; the company has already reduced greenhouse gas emissions by 60% since 2002.

Jerry Lynch of General Mills perked up the audience with a declaration to "make soil sexy." After a century of treating soil like dirt, he said the company plans to reduce its dependence on nitrogen fertilizer, an energy-intensive product that contributes to the greenhouse gas load in the atmosphere as it breaks down. The 150-year-old company even brought a coalition of farmers to the Paris COP21 climate talks to share field experiences with politicians.

Can climate adaptation efforts be reflected in the food on your plate? You betcha! The University of Minnesota's Regional Sustainable Development Partnership supports local foods projects that embrace climate adaptation. Projects include deep-winter greenhouses that use passive solar lighting to produce copious greens in rain gutters even on a day like today. The Main Street Project in Northfield is another model. It reaps \$15,000 per acre, a gigantic economic leap from the more standard \$1,200 harvest realized by traditional techniques. The 40-acre model of energy efficiency also reduces environmental impacts. You might also note that deep-rooted hybrid hazelnut and American Chestnut trees can withstand extreme temperature variations, produce for hundreds of years, and capture three times more carbon than row crops. Did you know that people were eating bread made of chestnut flour long before wheat was introduced?

Climate change is having a marked effect on water resources ... from water temperature, evaporation to lake levels. Lakes are losing ice and warming. This has significant impacts for water quality, water supply, recreation, shipping, lake ecology and shoreline erosion. Lake Superior is one of the fastest warming lakes in the world with summer surface water temperatures increasing faster than air temperatures. Rapid warming is also occurring in many small lakes. In response, scientists linked to the Great Lakes Temperature Collaboration are studying changes in evaporation and long term trends in Great Lakes water levels, water supply, water quality and aquatic ecosystems so that society can better prepare for what lies ahead.

And cities...let me tell you about cities. Many waste up to half the energy they produce; new technologies are improving that ratio. Not only are cities building coalitions to prepare for extreme weather events, some are moving toward energy-efficient integrated systems of transportation, sewage, water, heating and cooling. In Minnesota, 80 cities along the Mississippi River are working together on sustainability planning around invasive species, drinking water and changes in industry impacted by climate change. The city of Falcon Heights, home of the State Fair, even installed a high-tech OptiRTC forecast-based control system to minimize flooding in one of the city's stormwater ponds. You might call it a "smart pond." The system monitors National Weather Service data through an internet connection. When the system detects a large amount of rain approaching, it opens a valve that drains the pond as much as two feet creating space for the expected influx. At any time, staff can modify what's happening, right from their laptops. While the flooding in Duluth in 2012 was devastating, it created opportunities to update

antiquated infrastructure and a pitch to develop a “ripples of resilience” strategy to achieve long-term, comprehensive resilience.

What can you do to adapt to the changing climate? Stay on the cusp of the revolution in efficiency and sustainability. How? Buy local products when possible. Opt for wind and solar energy if offered through your energy provider; minimize your water footprint; invest in a hybrid or electric car; plant eco-friendly grass that requires less watering, less mowing and no pesticides, and plant trees and shrubs with the next 20 years in mind. Find out what your community is doing and ask how you can be part of their adaptability strategy.

This episode of the Sea Grant Files was produced by Jennifer Gasperini, Sharon Moen, Mariah Schumacher and, me, Jesse Schomberg. For more information, or to listen to other episodes of the Sea Grant Files, visit Minnesota Sea Grant at [www.seagrants.umn.edu](http://www.seagrants.umn.edu). You can also follow Minnesota Sea Grant on Facebook or Twitter. Thanks for listening!