



July Power

Have you noticed how mornings have taken on that late summer feel? More cool, less heat, and fog hangs heavy over the low spots. The changing of the seasons can be seen at the lake, as the tips of the bulrushes turn brown and curl. The water is yet warm and delightful for swimming, but you know the clock is ticking. Large groups of gulls gather and whitewash the docks. Our forest birds have fallen quiet, their morning chorus replaced by the creaking of the crickets. Dozens of nighthawks passed over Deer River the other day, August being their time of departure. Did you see them?

In town, roofers remain busy, a reflection of the power of July storms. Now 87 years old, my father-in-law frets over the power that summer thunderstorms can bring. He says he's really not set up well for that situation, and he is right. It's tough to be elderly when the strong winds blow, the trees fall, and power outages remind us what life is like without electricity and running water. It seems those who least can afford it are hardest hit by the effects of climate change.

The July 5, 2016 storm that resulted in so much damage to the communities of Deer River and Ball Club was known as a "bow echo". This storm ran from Beltrami County to Duluth, with straight line winds registering 60 – 70 mph. Deer River was particularly hard hit, with damage to buildings, vehicles, and other belongings. A town with a population a little over 900 people, it's estimated that debris was removed from about 100 homes.

This is the second time in 4 years Deer River has been strongly affected by a storm. In 2012, a thunderstorm on July 2 created a swath roughly 15 miles wide and 70 miles long along a section of the U.S. Highway 2 corridor running from Bemidji to Grand Rapids, and affected multiple communities in between. Trees that had stood through storms for the past 100 – 200 years were uprooted or broken by this storm, and forests in the Chippewa National Forest were extensively damaged within the corridor area.

July 2016 has been wet and stormy in many parts of Minnesota. July 11 – 12 saw substantial flooding from a 24-hour rainfall event that brought more than 9 inches to some areas of northern Minnesota and Wisconsin. This storm caused record flooding and infrastructure damage estimated in the millions. The area covered by six inches or more of rainfall exceeded 2,000 square miles. Brainerd received nearly 9 inches of rain from the storm; this city usually sees under 8 inches of rain on average for the months of May and June combined.

During the overnight hours of July 20 – 21, a line of intense thunderstorms swept across Minnesota with widespread damage across the northern quarter of the state. Pockets of concentrated damage occur near Bemidji, the Brainerd Lakes area, Duluth, and the Boundary Waters.

Various parts of the Chippewa National Forest have seen parts of these July storms, with all districts experiencing some amount of blowdown. Across the Forest there have been at least 50 roads, over 100 miles of trails, and 11 campgrounds affected. Forest crews and contractors have been working to clear trees and debris and repair recreation sites.

What is going on around us? Although it would not be correct to attribute any given storm to the effects of climate warming, it is the pattern of our weather over relatively long periods of time that reflect our climate. The world's temperature has been rising. Carbon dioxide, the main driver of this change, has reached its highest level in 800,000 years. In Minnesota, the average temperature has risen about 2 degrees in the past century. As a result, our precipitation events are changing. Warmer air holds more water, which leads to stronger and more frequent precipitation events. In the upper Midwest region of the U.S. that includes Minnesota and Wisconsin, extreme precipitation has increased 37% from 1958 to 2012.

Dr. Mark Seely, University of Minnesota Extension Climatologist, explains about Minnesota's changing climate. Our heavy dose convective thunderstorms are accounting for a larger percentage of the total rainfall we receive. The frequency of 3 inch events has increased. In Minnesota, there were three 1000-year flood events from 2004 to 2014. So-called "mega-rain" events, which involve 6 inches of rainfall over 1000 square miles have also increased. There were 7 such events in the first 140 years of Minnesota's recorded weather observations. Counting this summer, there have been at least 6 new events since the new millennium.

Dr. Seely calls these extreme events a wake-up call. He advises we need to look at what's happening in our own back yard and understand it. React to it. He feels those people who look after our natural resources and infrastructure need to pay attention. Particularly their leaders. To do otherwise is to create a regrettable legacy.

Indeed, we all need to pay attention. Part of paying attention to climate change for the Forest Service involves an initiative known as Sustainable Operations. An agency that manages 193 million acres of national forests and grasslands, the U.S. Forest Service employs over 34,000 people. The sustainable operations initiative helps this large organization reduce its collective environmental footprint. This initiative encourages us to design, maintain, and operate our buildings and other facilities in energy efficient ways. It helps us to operate efficient water and wastewater systems. It encourages us to reduce waste and increase recycling, choose efficient

transportation, and purchase green products whenever possible. My favorite part of our Sustainable Operations is the emphasis it brings to employee awareness and community action.

To be as successful as we can, this effort needs to reflect basic changes in the way we do business that become so ingrained in how we operate that it becomes our new culture. Like ripples in a pond from a well thrown rock, if you can change the way people behave at work, you might also change how they behave at home, spreading their good habits to their families, friends, and communities.

What are some examples of sustainable operations best practices that people can employ? Here are just a few, to help you catch the idea. They're pretty basic. Are you doing them?

Defuse energy vampires. These vampires are electronics that consume electricity when plugged in and turned off. Energy vampires typically account for 6% of energy consumption. Turn off computers, copiers, printers, etc. when not in use. Look for cords that glow at night and shut them off.

Carry a reusable water bottle, and skip the bottled water. Bottled water uses 3 times the water to produce a single bottle of water. Bottled water production requires 32 million barrels of oil annually, and emits 2.5 million tons of CO₂ annually.

Reduce, reuse, and recycle – IN THAT ORDER. If you can get by without something, do that. Decline bags and packaging when possible. Look for reusable items instead of disposable items. Perform a waste stream audit. Learn what's really in your garbage, and revise your recycling efforts accordingly.

Consider your driving attitude and habits. How you drive matters for gas mileage: avoid aggressive driving, observe the speed limit, and maintain your tire pressure. Minimize engine idling. Two minutes of idling uses the same amount of fuel as driving one mile.

Don't waste food. About ¼ of all food prepared annually in the U.S. gets tossed. This produces methane in landfills, and carbon emissions from transporting wasted food.

Education is an important component of the sustainable operations initiative. When you seek to change peoples' habits, you are more likely to succeed if you can help them to connect the dots and see the relationship between how they live and the changing climate. When you bring the understanding that the increasing severity and frequency of our July storms is a reflection of the cumulative effect of collective choices, you may help someone to be motivated to do differently.

Do you have a sustainable operations plan in your workplace? Do you talk about climate change in your home? Because as it turns out, one of the most powerful things you can do about climate change is to talk it up. According to the Yale Project on Climate Change Communication, "while most Americans believe climate change is a real and daunting problem, only 1 in 3 talk about it even occasionally...educating people on climate change is a necessary step, but often does not lead to action." This project suggests that people are most likely to take action as a result of

communications with family or friends. Maybe that's an idea you want to explore at your dinner table tonight.



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