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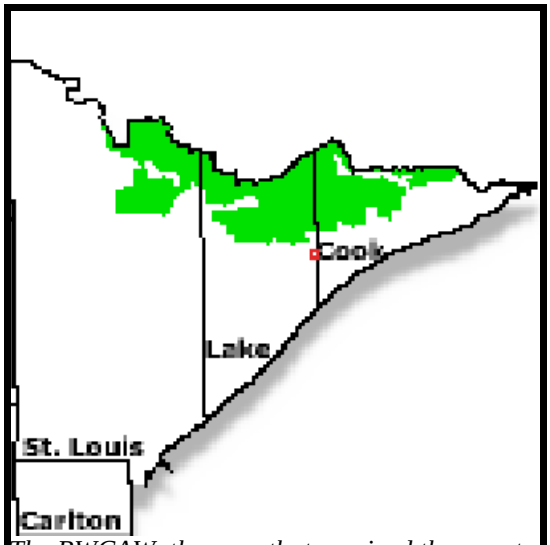
THE NORTHLAND SKY WATCHER

For National Weather Service weather watchers of northeastern Minnesota and northwestern Wisconsin

A Summer to Remember

With over 200 county warnings issued, it was a busy summer for National Weather Service Skywarn spotters and staff members. The Skywarn ham network was activated 20 times for a total of 80 hours. The damage left in the wake of the storms kept emergency personnel busy too. This article will just touch on some of the most damaging storms of the summer.

The severe weather season got off to a rollicking start May 10 as severe thunderstorm winds caused widespread damage throughout Itasca and central St. Louis counties. There was an F0 tornado touchdown near Sarona, WI on June 5 that knocked down hundreds of trees and destroyed a garage. Two-inch diameter hail fell four miles east of Hackensack in Cass county on June 6. There were three confirmed sightings of another F0 tornado as it touched down near Warba on June 9. The tornado knocked down 40 trees on the west side of Shallow Lake. Another F0 tornado was spotted by a sheriff's deputy July 27, two miles south of Toivola. There was minimal damage.



The BWCAW, the area that received the worst damage from the Fourth of July storms, is shaded.

The severe weather crescendoed on the Fourth of July when a huge area of storms, called a "derecho"*(see "Ask the Experts", page 5)* started in eastern North Dakota, then accelerated as it tore across northern Minnesota. It produced wind speeds of 90 mph, tearing down trees and power lines in Cass, Crow Wing, Itasca, Aitkin, St. Louis, Lake, and Cook counties. The hardest hit area was the Boundary Waters Canoe Area Wilderness (BWCAW), where close to 400,000 acres of forest were heavily damaged or destroyed. Thousands of campers were stranded in the BWCAW, with the portages clogged with trees. Twenty seriously-injured campers were airlifted out for immediate medical care, while hundreds received minor injuries. Miraculously, no one was killed.

Thunderstorms continued to pound northern Minnesota and northern Wisconsin through the Fourth of July night and into the 5th. The result was huge amounts of rain that created flooding. Before daybreak on the 5th, the water had already closed many roads.

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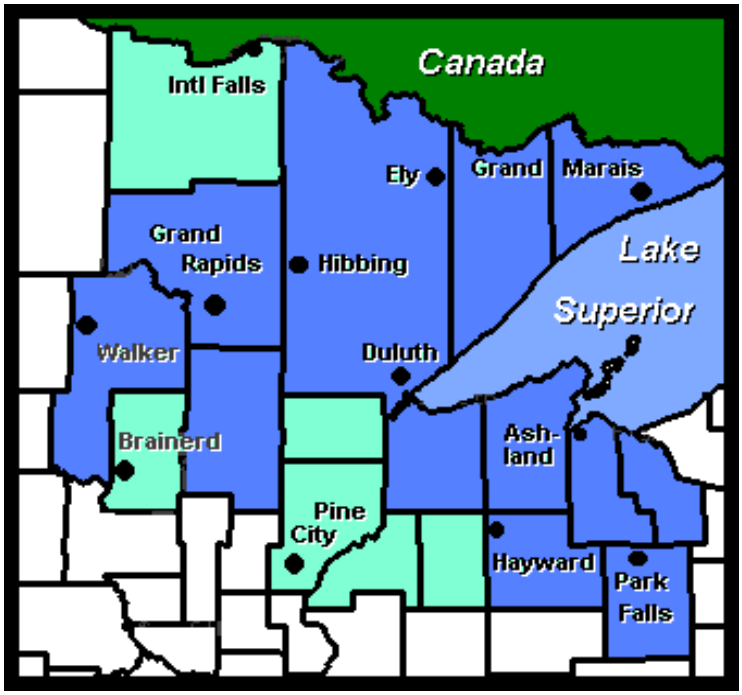
"Summer storms", from page 1

Five to six inches of rain fell across Itasca county, the Iron Range, the north shore of Lake Superior and the south shore of Lake Superior in Wisconsin. Presidential disaster areas were declared for Cass, Aitkin, Itasca, St. Louis, Lake, and Cook counties for the affects of the wind and rain. Damage is estimated to exceed $14 million.



A map showing NWS Duluth's area of responsibility. The dark shaded counties were declared disaster areas by President Clinton.

Northwestern Wisconsin took a weather beating also. The flooding in northern Bayfield county damaged Highway 13. Later in the month, on July 23, more severe thunderstorm winds caused widespread damage in Sawyer county. Numerous large trees and power lines were blown down from Hayward to Clam Lake. Another round of damaging winds hit the Hayward lakes area a few days later, on July 25. Wind damage also occurred from Stone Lake to Winter. Other areas received flooding rain. In Douglas county, where most of the county roads were under water, Solon Springs recorded 5.60 inches of rain. More widespread wind damage occurred July 30 over much of northwestern Wisconsin. One-inch hail also fell in parts of Bayfield county. The President declared Douglas, Bayfield, Ashland, Iron, Sawyer, and Price counties disaster areas, making them eligible for federal disaster funds. Total damage is estimated up to $7 million.

- Carol Christenson, Warning Coordination Meteorologist, and Dean Packingham, forecaster

AVIATION GROUP ON THE FLY

Our Aviation Working Group, which consists of Craig Sanders and Ed Flenz, recently traveled down to the Twin Cities area to visit some of the state and federal agencies which use our aviation forecast products or are otherwise concerned with aviation. Craig and Ed visited the Center Weather Service Unit at the FAA Air Traffic Control Center in Farmington, the meteorology department of Northwest Airlines, the FAA's Flight Standards District Office, the Office of Aeronautics of the Minnesota Department of Transportation, and the FAA Flight Service Station in Princeton.

The trip resulted in closer ties to the agencies which use our aviation products. The information gathered will be used to improve our service to the aviation community.

- Ed Flenz, forecaster

Northern Minnesota and Northern Wisconsin Waterlogged

A seemingly endless barrage of summer storms, caused record to near record rainfall amounts across much of northeastern Minnesota and northwestern Wisconsin. Here at the National Weather Service office in Duluth, we recorded the 4th wettest summer of all-time with a total of 20.26 inches. The individual totals by month included 4.37 inches in June, 8.47 inches in July, and 7.42 inches in August. The summer rainfall record was set in 1952 with 21.06 inches.

Some of the most impressive rainfall statistics came from our Cooperative Observing Network. Several stations even set new record rainfall amounts for July and for the summer season. Stations with record rainfall totals for July in northeastern Minnesota include: Cotton at 14.14 inches, Pokegama Dam at 10.53 inches, Marcell at 11.49 inches, Leech Lake at 7.54 inches, Cook at 10.52 inches, and Indus with 9.24 inches. Wisconsin stations that recorded record rainfall for July were: Solon Springs at an impressive 14.95 inches, Foxboro at 10.97 inches, and Gordon with 10.94 inches. The new summer rainfall records are listed in the table below. Needless to say, this has been one of the wettest summers that many of us have ever seen.

The soggy summer conditions have hampered outdoor activities. Lawns have needed mowing much more frequently, but finding a dry day to do so has been frustrating. Area builders have been having a hard time getting jobs done on time between all the rain. Scott Stariha, Executive Director of the Duluth Builders Exchange, says of the wet weather, “We have not lost work, we have been busy, but projects have been delayed, which puts us off-schedule.”

The wet weather has had an impact on loggers. Marty Christensen, head of the timber unit at the USFS in Deer River, MN said, “The wet ground has severely limited logging operations, which has a big economic impact on the area.” Even the sandy areas of the Chippewa National Forest have been inaccessible to loggers, which, said Christensen, is almost unheard of. Christensen also explained that the national forest is losing timber due to the flooding caused by the record summer rain and beaver dams. Water-logged soil makes trees more susceptible to high winds. Greg Alle, a forestry technician at the USFS in Marcell, MN is in charge of the hiking trails at the Chippewa National Forest. He said that although washouts of the trails have been a problem this summer, the biggest problem has been trees blown down across the trails.

So what does the future hold in store weather-wise? The long range forecasts indicate above normal precipitation with below normal temperatures through at least the first half of winter. The last half of winter indicates temperatures moderating to normal with precipitation near normal.

- Sam Standfield, hydrometeorological technician and Carol Christenson

New Summer Rainfall Records

Location	Old Record	New 1999 Record
Cook, MN	20.63 inches in 1972	20.97 inches
Solon Springs, WI	22.25 inches in 1952	28.07 inches
Foxboro, WI	22.59 inches in 1986	22.97 inches
Gordon, WI	20.36 inches in 1966	21.24 inches

A Fish Story

It is an exciting time for our office as we enter the final design stage for the development of the NOAA Weather Center at the Great Lakes Aquarium in the Lake Superior Center. The center, which is under construction along Duluth's Lake Superior waterfront, is expected to open next summer. The NOAA Weather Center will be a state-of-the-art interactive marine weather display, utilizing the latest in Internet and telecommunications technology. Some of the items which may be included in the display include: live camera displays from around the lake, real-time weather information, marine forecasts, NOAA Weather Radio simulcasts, and plenty of safety information for land and sea. The weather center will be located near the rear of the second floor, overlooking the Duluth/Superior harbor.

Our involvement with the Great Lakes Aquarium culminated a few years ago, when we contacted David Lonsdale, the center's executive director, to offer our support. This call lead to the development of the NOAA Weather Center. After some initial planning meetings with the museum services staff, we began working with Jack Boris, the individual now responsible for the creation of the weather center. We are proud to be involved with the Great Lakes Aquarium on this project, and look forward to assisting them in the future.

- Dean Packingham, forecaster

A New Science Guy

Our science guy, Norv Larson, is due to start here on September 27. Norv's official title will be Science and Operations officer. He will be responsible for training our staff in the latest technology and scientific knowledge. Norv was born in Morocco, Africa where his father was stationed while serving in the Navy, but grew up in Golden Valley, MN. After high school, he received an appointment to the U.S. Naval Academy in Annapolis, MD, graduating with distinction in 1984 with a B.S. in Oceanography. Norv left the Navy after 5 years, which included a deployment to the Arabian Gulf and the Persian Gulf during the Iran-Iraq war and began graduate studies in meteorology at the University of Wisconsin in Madison. After a stint with a private weather company Norv began his career in the NWS in Pueblo, CO as an intern. He has most recently been a senior forecaster at Grand Junction, CO weather office. Norv and his wife Carolyn have two boys, Maxwell, age 5, and Alex, who is 2.

More Staff Changes

The Summer of 1999 saw many changes in our staff. Gary Austin, our first science and operations officer, left in July to be the meteorologist-in-charge at the Green Bay, WI office.

Dan Markee, a hydrometeorological technician, came from the Bismark, ND NWS office in July to replace Glenn Nielson who transferred to Aberdeen, SD. Dan, a cheese-head by birth, is glad to be closer to his family. Dan spent eight years with the Air Force as a weather specialist, traveling in Europe and the U.S. Dan will be working with the co-op program, so many of you will have a chance to meet him.

August 11th was the last day for Greg Harrell, our electronic system analyst, who left the NWS to become a full-time Methodist minister in Washburn, WI.

Finally, Dave Bagnato, electronic technician, left us on August 29th to transfer to the Charleston, WV NWS office.

Greg's and Dave's replacements will be hired this fall.

Ask the Experts

Q What's a Derecho?

A The term "derecho" (pronounced day-RAY-cho) has been used in connection with the extensive July Fourth blow-down of trees in the Boundary Waters. Just what is a derecho? The word was first used in the 1880s by Gustavus Hinrichs, director of the Iowa Weather Service, to describe a long-lived, damaging thunderstorm wind event. The term conveniently differentiated severe straight-line winds from tornadoes. (Derecho is the Spanish word for “straight ahead”, while tornado comes from the Spanish word for “turn”.)

The definition has been simplified a bit, and a derecho is now considered any family of widespread thunderstorm winds in excess of 58 mph that produce damage at least once every 3 hours. The damage path usually extends from northwest to southeast and can be hundreds of miles long. Derechos occur most frequently in the upper Midwest (which includes Minnesota and Wisconsin). A 3-day derecho event in July 1995 also caused an extensive blow-down of trees in northern Minnesota.

- Ed Flenz, forecaster

Got a weather question? Ask the NWS experts! Call us or write us at the numbers or addresses on the back of this newsletter!

Co-op Corner

The Station Where History Was Made

Kathleen and Denny Hoppa, NWS Cooperative observers near Tower, MN, pose with their new instrument shelter. Their site has the distinction of recording the coldest temperature ever in Minnesota: -60 degrees on February 2, 1996.

NWS Cooperative Observers Johnhenry and Hazel Johnson of Brimson, MN recently received their 20 year service awards from NWS official Jim Christenson.

The *Northland Sky Watcher* is a quarterly newsletter published by the National Weather Service Office in Duluth, MN for our weather spotters and observers. We welcome your questions and comments. We can be reached by:

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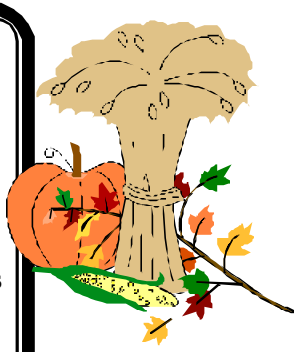

Fall begins September 23 at 6:12 a.m. CDT

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