The Newsletter of NOAA's National Weather Service in Green Bay, Wisconsin

www.weather.gov/grb

Packerland Weather News

Volume 8, Issue 2 Fall/Winter 2009

Inside this issue:

The Summer Without Severe Weather

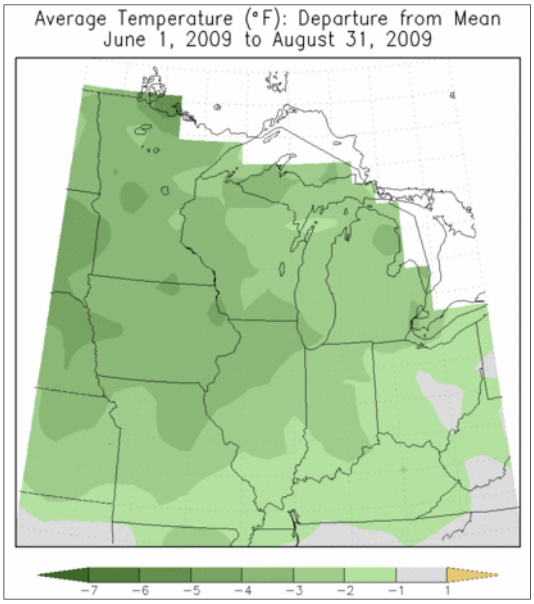
By Jeff Last, Warning Coordination Meteorologist, NWS Green Bay

The summer of 2009 will go down in the record books as not only a cool and dry summer, but also as the year with very little severe weather. In fact, only ten severe weather events (defined as storms that produce one inch hail or larger, damaging wind gusts of 58 mph or greater, or a tornado) occurred in the NWS Green Bay forecast area of northeast and north-central Wisconsin. Ten is the fewest number of events ever recorded for a severe weather season, which usually runs from about April through September. No tornadoes were reported in the forecast area during the year, only the second time that has occurred since 1970. And for the first time ever (since the 1970's), the NWS Green Bay office did not issue a Tornado Warning.

The year also set other severe weather records. For the first time in over 30 years of weather data, there were no reports of severe weather in June or July. In fact, the period of May through July, which is usually the heart of the severe weather season, resulted in no severe events. Incredibly, there was a 100 day stretch from April 25 to August 2 with no severe reports, also a new record.

Why the lack of severe weather? Much of the season was characterized by a cool and relatively dry airmass which inhibited the development of frequent thunderstorms that usually affect northeast Wisconsin. The upper level jet stream winds steered these airmasses from Canada into the upper Midwest, in effect blocking moist and unstable air from the Gulf of Mexico which is needed for severe thunderstorms.

The quiet severe weather season does not necessarily mean the upcoming winter will be quiet. In fact, since the last week of September, several energetic storm systems have moved across the Great Lakes, producing wind and beneficial precipitation. While it is difficult to forecast this far out, it's likely the next few months will be closer to typical late fall and winter weather.



A big reason for the lack of severe weather: A cool summer. Source: NOAA Midwestern Regional Climate Center.

Comments or Suggestions?

If you have suggestions for articles, have comments about the newsletter, or would like to be removed from the mailing list, please contact us at:

NOAA/NWS
2485 South Point Road
Green Bay, WI 54313

or by e-mail: jeff.last@noaa.gov

Thanks to All of Our Volunteers

By Gary Austin, Meteorologist-in-Charge
NWS Green Bay

The NWS in Green Bay is most appreciative of our volunteer weather observers and spotters for their selfless personal dedication in taking observations and reporting them to us. Our volunteers include cooperative observers, hazardous weather spotters and amateur radio operators ("hams"). The hams not only serve as spotters but also relay important information to our office about ongoing weather, as an integral part of our hazardous weather warning operations. Further, six hams volunteer their personal time directly at our station during severe weather operations, or if we were to experience a significant communications outage—this could be at any time of day—serving as our "receivers of information" relayed from other hams in the field.

Cooperative observers assist us every single day of the year in recording temperatures and precipitation. Some have done so for many years in succession—that's outstanding dedication! Their observations, carefully measured in accordance with NWS guidelines, provide us with information that is invaluable on a daily basis. The observations permit us to know what has truly happened "on the ground," and assist us in making forecast decisions and providing information to the public. The observations also serve as the foundation upon which a national climate database is maintained, permitting the study and identification of long-term trends of weather patterns by a wide variety of organizations.

Weather spotters, after learning and/or refreshing their knowledge of hazardous weather spotting at our spring training talks, assist us during significant weather events, in real-time in any season of the year, providing us with information about severe weather in their community.

Without the volunteer service of our observers, spotters and hams, we could not provide the valuable services expected of us by our tax-paying community. We and the citizens of northeast Wisconsin are indebted to you!

NWS Green Bay Forecaster Receives Cline Award

Senior Forecaster Teri Egger received the 2009 Isaac M. Cline Award in the category of outreach during a presentation in August. The award was presented at the local office level with winners having the potential to advance to the regional and national level.

She was nominated by her co-workers for her enthusiastic work in various outreach programs at NWS Green Bay. As the office marine focal point, she is active in educating the public about marine related weather phenomena through her involvement with such events as the WBAY Boat Show and her partnership with the Wisconsin Maritime Museum.

MIC Gary Austin (left) presents the Cline Award to Teri Egger.

The prestigious award is named in honor of Isaac M. Cline, one of the most recognized employees in weather service history. Cline made numerous contributions to the mission of what was then called the Weather Bureau. His most noteworthy accomplishment was the actions he took during the Galveston hurricane of 1900, the deadliest weather event in U.S. history. The Cline Award is presented annually to NWS staff in nine categories of accomplishment.

Largest Tornado Study Continues into 2010

The largest and most ambitious attempt in history to understand the secrets of tornadoes and severe thunderstorms that produce them began this spring across the Central Plains. The two-year, $11.9 million research project, called VORTEX2, seeks to answer the questions: How and why do tornadoes form?

Why conduct an experiment of such magnitude? The short answer is 12 to 15 minutes, the average time it takes for a tornado to touch down after a warning is issued. By piecing together a more precise 3-dimensional picture of severe storms and the process by which tornadoes are created (known as tornadogenesis), NOAA researchers and their partners hope to considerably improve warning times that will save more lives.

For five weeks in May and June, seasoned storm-chasing scientists from NOAA's National Severe Storms Laboratory (NSSL) and National Weather Service's Warning Decision Training Branch, along with partners from 10 universities, 3 nonprofit organizations and 25 reporters from local and national media outlets, traversed the nine-state "tornado alley" region of the Central Plains in a 40-vehicle caravan searching for, quite literally, the perfect storm.

VORTEX2 research caravan. Photo: Robin Tanamachi, Univ. of Oklahoma

Chasing after violent thunderstorms while collecting valuable, accurate data along the way is a difficult and dangerous task. Rapidly changing weather conditions require teams to alter their activities (and location) at a moment's notice. Researchers work 12 to 14 hours a day inside their vehicles, where they monitor storms that may or may not morph into full-blown tornadoes.

For those of you who missed this year's chase, VORTEX2 hits the road again May 1–June 15, 2010.

On the Web

www.vortex2.org

Are You Ready for Another Wisconsin Winter?

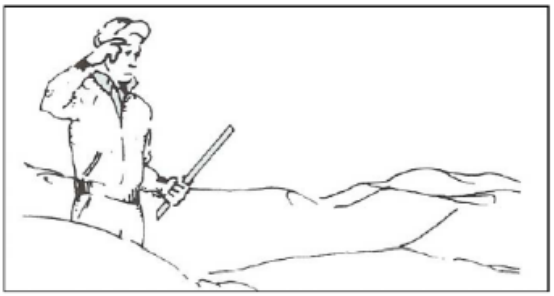
What little there was of summer is long gone, and now is the time to prepare for the upcoming winter season. Last winter, parts of Wisconsin experienced a second year of record snowfall and numerous winter storms. Get ready for this season by putting together a winter storm safety plan for you and your family:

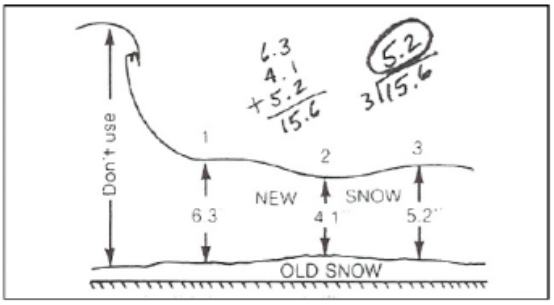
- Check and winterize your vehicle before the winter season begins.
- Have a NOAA Weather Radio with a battery back-up to keep up-to-date on the latest weather situation.
- Store extra food that requires no cooking in the event electricity is cut off.
- Make sure your emergency heating source, such as a fireplace or space heater, has proper ventilation.
- Check the weather forecast before leaving for extended periods.

When traveling, carry a winter storm survival kit that includes blankets, a flashlight with extra batteries, a first-aid kit, high-calorie non-perishable food, a shovel and knife, a windshield scraper and brush, and a cell phone. Keep your gas tank near full to avoid ice in the tank and fuel lines. If you must travel in a winter storm, avoid traveling alone.

Storm Spotters: It's Time to Get Out the Yardsticks

Over the last two winters, with near record snowfall across parts of northeast Wisconsin, storm spotters were valuable resources during winter storms. Your timely reports during and after snow, ice, and wind events provided important information to National Weather Service forecast staff, which resulted in more accurate warnings and advisories. Before you know it, arctic cold and snow will return to the area. Your accurate snowfall measurements will again be needed this season.





It is important to measure snowfall (and snow depth) in locations where the effects of blowing and drifting are minimized. Finding a good location where snow accumulates uniformly simplifies all other aspects of the observation and reduces the opportunities for error. In open areas where windblown snow cannot be avoided, several measurements will be necessary to obtain an average depth—these measurements should not include the largest drifts. In heavily forested locations, find an exposed clearing in the trees. Measurements beneath trees are inaccurate since large amounts of snow can accumulate on trees and never reach the ground. Avoid measuring directly on the grass; rather, use a snowboard or other hard surface away from the house. Make sure the snowboard is well cleared after your final measurement.

Snowfall should be reported in tenths of an inch (for example, 3.9 inches). Official spotters can call in their reports to the NWS at any time using the toll-free hotline or send them via eSpotter, linked on the NWS Green Bay website:

www.weather.gov/grb

Average Snowfall Amounts in Northeast and North-Central Wisconsin

Location	Snowfall (Inches)	Location	Snowfall (Inches)
Appleton	46.4	Marshfield	50.3
Antigo	59.9	Merrill	55.4
Brillion	44.6	Oconto	52.6
Chilton	48.1	Oshkosh	44.2
Goodman	57.0	Rhinelander	66.7
Green Bay	53.1	Shawano	50.8
Hancock	55.0	Stevens Point	46.5
Lac Vieux Desert	114.4	Sturgeon Bay	48.9
Laona	73.5	Washington Island	52.2
Lakewood	65.0	Waupaca	47.3
Manitowoc	50.0	Wausau	59.1
Marinette	55.4	Wisconsin Rapids	47.6

Old Man Winter Makes an Early Return to State

By Roy Eckberg, Forecaster

NWS Green Bay

The mild and dry weather pattern that prevailed during most of September abruptly shifted to a cool and wet pattern late in the month when Eagle River reported the first flurries of the season on September 30. This cool and wet pattern continued into October with the first light snow in the Northwoods on October 10. In Vilas County, Presque Isle reported 0.4 inches, and Winchester had 0.2 inches. The average date of the first measurable snowfall of the season (at least a tenth of an inch) ranges from late October in Vilas County to mid-November along Lake Michigan.

With the very cool weather in place, a strong jet stream combined with an upper level disturbance to bring the first significant snowfall of the season to parts of northern and central Wisconsin on October 12. Some of the higher totals included 3.7 inches near Lac Vieux Desert, 3.6 inches southwest of Laona, 3.2 inches a few miles northeast of Rhinelander, 2.8 inches in Marshfield, 2.6 inches in Merrill, and 1.4 inches at Wausau. Although this October's event was an early season snowfall, it is not unprecedented. On October 10, 1990, central Wisconsin received almost 10 inches of snow. A narrow band of heavy snow was reported across southwest into central Wisconsin with the heaviest band of snow across central Marathon County. Some of the higher totals with this storm included 9.8 inches at Wausau, 4.5 inches at Waupaca, and 3.5 inches at Marshfield.

The earliest significant snowfall (3 inches or more) across northern and north-central Wisconsin occurred on September 26, 1942. Snow accumulations included 6.3 inches in Eagle River, 5.7 inches in Tomahawk, and 5 inches in Marshfield. The earliest significant snowfall in Green Bay occurred on October 23, 1887, with 9.9 inches and in Oshkosh on October 22, 1929, with 4 inches.

NOAA's Climate Prediction Center has forecast equal chances of above, below, or normal precipitation for the meteorological winter months of December, January, and February as well as slightly above normal temperatures.

On the Web

www.cpc.ncep.noaa.gov

	Average date of 1st snowfall (Inches)			Earliest snowfall of the season greater than or equal to (Inches) / Date		
Location	0.1	1.0	3.0	0.1	1.0	3.0
Antigo	Nov 9	Nov 10	Nov 26	(2.0) Sep 26, 1942	(2.0) Sep 26, 1942	(3.5) Oct 10, 1990
Appleton	Nov 12	Nov 20	Dec 17	(0.1) Oct 10, 1990	(2.8) Oct 12, 1909	(3.0) Oct 24, 1933
Green Bay	Nov 11	Nov 22	Dec 11	(0.1) Oct 9, 1925	(2.3) Oct 12, 1909	(9.9) Oct 23, 1887
Manitowoc	Nov 18	Nov 23	Dec 19	(2.5) Oct 12, 1909	(2.5) Oct 12, 1909	(6.5) Oct 29, 1917
Marshfield	Nov 10	Nov 13	Dec 5	(5.0) Sep 26, 1942	(5.0) Sep 26, 1942	(5.0) Sep 26, 1942
Merrill	Nov 8	Nov 14	Dec 2	(0.6) Sep 22, 1913	(2.5) Oct 10, 1990	(3.5) Oct 20, 2002
Oshkosh	Nov 18	Nov 24	Dec 14	(0.2) Oct 10, 1932	(1.2) Oct 16, 1952	(4.0) Oct 22, 1929
Rhinelander	Nov 9	Nov 14	Dec 5	(0.7) Oct 3, 1951	(1.3) Oct 4, 1936	(3.0) Oct 12, 1909
Stevens Point	Nov 16	Nov 22	Dec 7	(0.5) Oct 9, 1917	(2.0) Oct 10, 1932	(6.0) Oct 25, 1898
Sturgeon Bay	Nov 18	Nov 22	Dec 17	(0.5) Oct 9, 1925	(3.0) Oct 24, 1933	(3.0) Oct 24, 1933
Wausau	Nov 6	Nov 14	Dec 3	(0.3) Sep 26, 1942	(9.8) Oct 10, 1990	(9.8) Oct 10, 1990
Wisc. Rapids	Nov 14	Nov 21	Dec 9	(0.5) Sep 25, 1965	(2.5) Oct 9, 1917	(3.0) Oct 10, 1990

Table showing average first snowfall and earliest snow dates for locations across central, north-central, and northeast Wisconsin.

Winter Weather Word Search

By Scott Cultice, Hydrometeorological Technician, NWS Green Bay

Winter storms can last several days and can be accompanied by high winds, freezing rain, snow, and cold. Snow can be fun to play in, but too much can be dangerous. Remember when outside, bundle up with layers of clothes and wear a hat and mittens. Can you find the words below that go with the winter season and storm safety?

A	F	R	O	S	T	B	I	T	E	M	I	R	Z	B
T	R	B	A	L	D	L	E	L	C	I	C	I	A	R
E	E	G	H	E	I	A	V	B	N	E	E	R	I	O
M	E	F	E	E	D	N	M	N	O	L	I	C	M	A
P	Z	U	R	T	L	K	B	L	I	Z	Z	A	R	D
E	I	L	Y	A	O	E	T	R	E	Z	W	S	E	M
R	N	Q	L	T	C	T	A	H	T	I	U	H	H	I
A	G	S	A	I	V	S	N	O	W	R	D	F	T	T
T	W	E	A	T	H	E	R	R	A	D	I	O	O	T
U	H	G	H	J	S	C	S	H	O	V	E	L	P	E
R	K	C	O	A	T	L	D	Z	X	D	C	V	Y	N
E	B	S	T	O	O	B	N	N	M	N	T	A	H	S
S	E	I	R	E	T	T	A	B	I	I	T	T	R	E
P	S	T	O	R	M	H	C	T	A	W	A	T	E	R

batteries blankets blizzard boots car coat cold
drizzle freezing frostbite hat heat hypothermia ice
icicle mittens scarf shovel sleet snow storm
temperature watch water weather radio wind wind chill

Did You Know?

Even though the 2009 Atlantic hurricane season was quiet, the weather in the Pacific Ocean was much different. The strongest hurricane in the eastern Pacific in more than a decade, and the second strongest on record, occurred in mid-October 2009. Hurricane Rick formed as a tropical depression nearly 400 miles south of Acapulco, Mexico, on October 15. The cyclone quickly gained strength, reaching Category 5 on October 17 with winds of 180 mph.

The strongest eastern Pacific hurricane on record was Hurricane Linda, which formed in September 1997. Winds in Linda were estimated at 185 mph as it churned across mainly open water.

The Cooperative Observer Corner

By Pat Hein, Observations Program Leader, NWS Green Bay

Walt Kaszynski, a 38 year veteran volunteer weather observer and owner/operator of WOCO radio station in Oconto, was presented with the prestigious John Campanius Holm Award for outstanding service to his community and the National Weather Service on September 29. The award is the agency's second most prestigious award for cooperative weather observers. Kaszynski was one of only twenty-five recipients in the nation to receive the award this year.

As a long time weather observer for Oconto, Kaszynski has many achievements to his credit, the foremost being training his entire family in taking weather observations. The weather station is part of the U.S. Historical Climatology Network, with records dating back to 1889.

After the award, WOCO radio hosted a one hour talk show. Guests for the show included Oconto Mayor Donald Nerenhausen, NWS Green Bay Meteorologist-in-Charge Gary Austin, and NWS Green Bay Observations Program Leader Pat Hein.

Award ceremony in Oconto. Back row, from L-R: Mayor Donald Nerenhausen, Walt Kaszynski, Gary Austin, Dorothy Kaszynski. Front row: Terri Kaszynski, Larry Kaszynski.

Inside the Doppler Radar Tower

The distinctive Doppler radar tower and radome (the "golfball") that stands tall next to the National Weather Service office in Green Bay has been part of the landscape near the airport for over 15 years. But did you ever wonder what was inside the dome?

A parabolic dish antenna, 28 feet in diameter, is protected by the radome that covers the top of the tower. The antenna rotates constantly, sending a narrow beam of energy out to detect precipitation, dust, pollen, and anything in the atmosphere large enough to reflect some of that energy back to the antenna. The amount of reflected energy (called "reflectivity") is what meteorologists use to determine the location and intensity of rain, snow, hail, and even non-weather targets. In addition, the radar is able to measure the motion of the reflected energy, providing forecasters with wind speed ("radial velocity") inside of storms. This information is critical to predicting the severity of thunderstorms.

A small part of the dish antenna can be seen in the top photo. The bottom picture shows the radar pedestal that moves the dish. Photos: Peg Zenko.

The Newsletter of NOAA's National Weather Service in Green Bay, Wisconsin

www.weather.gov/grb

Send correspondence to:
NOAA/NWS
2485 South Point Road
Green Bay, WI 54313

Phone: 920-494-2363
E-mail: jeff.last@noaa.gov

The ***Packerland Weather News*** Editors: Jeff Last
Linda Skowronski
Roy Eckberg
Scott Cultice

Marion Dam Drawdown in May 2009

By Tom Helman, Senior Forecaster
NWS Green Bay

Two large holes that appeared in the Marion Dam along State Highway 110 forced a drawdown of the adjacent Marion Pond in May of 2009. The state Department of Natural Resources and city engineers noticed the holes after a heavy rain event in the area two days earlier. Since the pond has a west to east orientation, it is believed strong west to northwest winds contributed to the erosion over time due to the wave activity on the east side of the pond along the dam.

The dam was not a threat to fail at the time of the drawdown, but a continued degradation of the dam and road may eventually have led to dam failure. The dam and bridge underwent repair in late 2009.

The city of Marion is on the Waupaca-Shawano county line in northeast Wisconsin, located 40 miles west of Green Bay.

One of the holes discovered under the bridge in Marion.

Marion Pond looking west of the highway after drawdown.