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

www.weather.gov/grb

Packerland Weather News

Volume 13, Issue 1 Winter 2015

Inside this issue:

Help Make Your Community Weather-Ready

The National Weather Service mission to save lives and property by providing critical weather forecasts and warnings can only be accomplished with the help of communities, businesses, and the public at large. Your organization can help make Wisconsin safer and more resilient to weather-related disasters by becoming a Weather-Ready Nation Ambassador, an initiative about building community resilience in the face of increasing vulnerability to severe weather.

AMBASSADOR™ WRN WEATHER-READY NATION

One Ambassador with weather-ready experience is the Moore Medical Center in Oklahoma. On May 20, 2013, an EF-5 tornado struck the Center. Fortunately, the hospital staff had a well-practiced emergency plan and carefully monitored the National Weather Service forecast that day. When a tornado warning was issued, staff quickly relocated patients and others to windowless safe areas and used mattresses and blankets to protect them from flying debris. Damage to the hospital was extensive, but no lives were lost. More than 300 individuals who were at the center that day survived, due in large part to the planning and actions of the hospital administration and staff.

We must involve everyone in an effort to move people–and society–toward heeding warnings, taking action, and influencing their circles of family, friends, and social networks to act appropriately. As a Weather-Ready Nation Ambassador, you will join with emergency managers and city planners, industry, the media, non-profit organizations, and many others to achieve the goal of saving lives and minimizing the impact of extreme weather on daily life by inspiring others to be better informed and prepared.

Almost any business or organization can become a Weather-Ready Nation Ambassador. The application process only takes two minutes. Help make your organization and our community "Weather-Ready." For more information and the Ambassador application, visit: **www.weather.gov/grb/wrn**

Winter 2015-16: One of the Strongest El Niños on Record Expected to Wane This Spring

By Roy Eckberg, Forecaster

There are many factors that influence winter temperature, precipitation and snowfall trends across north-central and northeast Wisconsin. One of the biggest influences is the El Niño Southern Oscillation (ENSO) cycle. Most are aware that El Niño conditions refer to warmer than normal water temperatures in the equatorial Pacific Ocean, while La Niña conditions bring colder than normal water temperatures. Climate forecasters look at the eastern equatorial Pacific Ocean water temperature anomalies to determine if El Niño or La Niña conditions are in progress. Forecasters use the Oceanic Niño Index (ONI) to rank the magnitude of the event (warmer or colder). An event is considered weak if the ONI is +/- 0.5º C to 0.9º C, moderate if the ONI is +/- 1.0º C to 1.4º C, and strong if greater than +/- 1.5º C.

Rank	Winter	Maximum Oceanic Niño Index (ONI)
1	1997-98	2.3
2	1982-83	2.1
3T	2015-16	2.0
3T	1972-73	2.0
5	1965-66	1.8

Note: The strength of the 2015-16 El Niño was through November 30. The El Niño is expected to peak around 2.3º C by January.

One of the strongest El Niños on record is already ongoing (see table above). The El Niño event is expected to peak around 2.0º C by early 2016 and begin to weaken by spring. If the El Niño peaks at the expected magnitude, it would be one of the top four strongest El Niños on record since official records began in 1950.

An evaluation of Green Bay temperatures during El Niño, La Niña, and neutral winters was done using temperature climate normals that were in effect at the time of observation. For example, the climate normals from 1921-1950 were used to compare the departure from normal for the winter 1953-54. Near normal was considered within a half degree of the normal during the period. Sixty-five percent of all El Niño events ended up above normal. The average winter temperature (December through February) during all El Niño winters was 20.0º F, compared to the long term average (1950 to 2014) of 18.9º F. However, there is a strong correlation of the strength of an El Niño and above normal temperatures during the winter months (Dec-Feb). Of the nine weak El Niño events, five events were above normal and four were below normal. Essentially it is a coin flip if you are going to be warmer or colder than normal. A factor that may play a more significant role in our weather pattern during weak El Niño events is the pressure patterns in the arctic called the Arctic Oscillation. If the Arctic pressure pattern is in a negative phase, this pattern would allow for more arctic air to drop southeast into Wisconsin.

Looking at the fourteen strong or moderate El Niño events, only one winter (1963-64) ended up below normal. The average winter temperature during weak El Niño winters is 17.5º F compared to an average of 21.6º F for moderate to strong events. During moderate to strong events, ninety-three percent ended up at or

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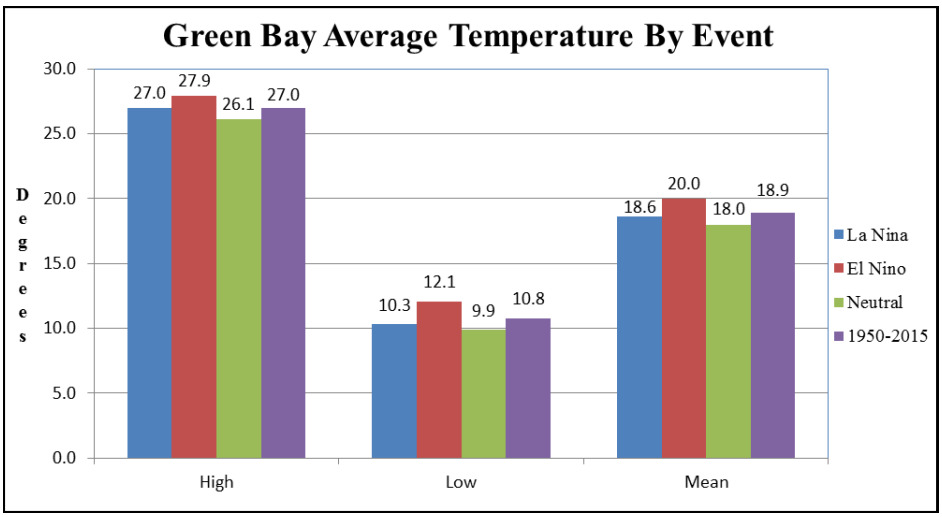
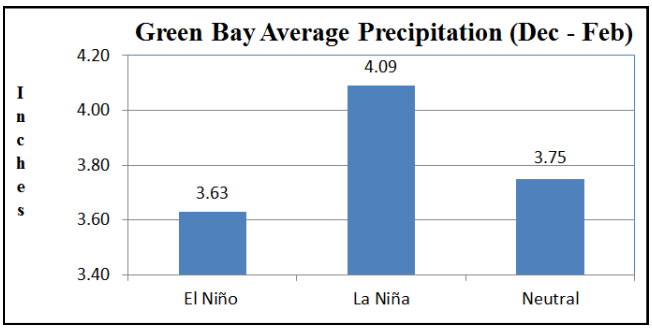


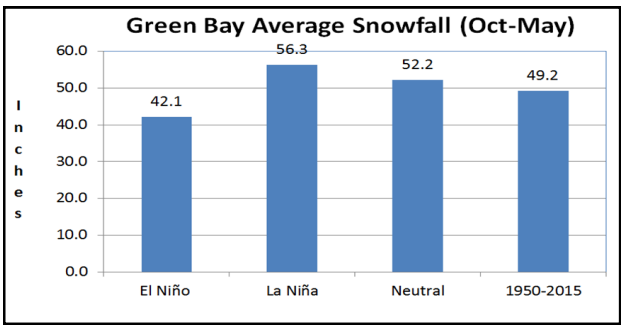
above normal, while only seven percent ended up below normal. The top two strongest El Niño winters averaged well above normal: 1997-98 at 27.1º F or 9.5 degrees above normal (3rd warmest winter on record), and 1982-83 at 25.2º F or 7.7 degrees above normal (8th warmest winter on record). The 6th strongest (tied) El Niño in 1991-92 averaged 24.9º F or 7.3 degrees above normal, and was the 9th warmest winter on record.

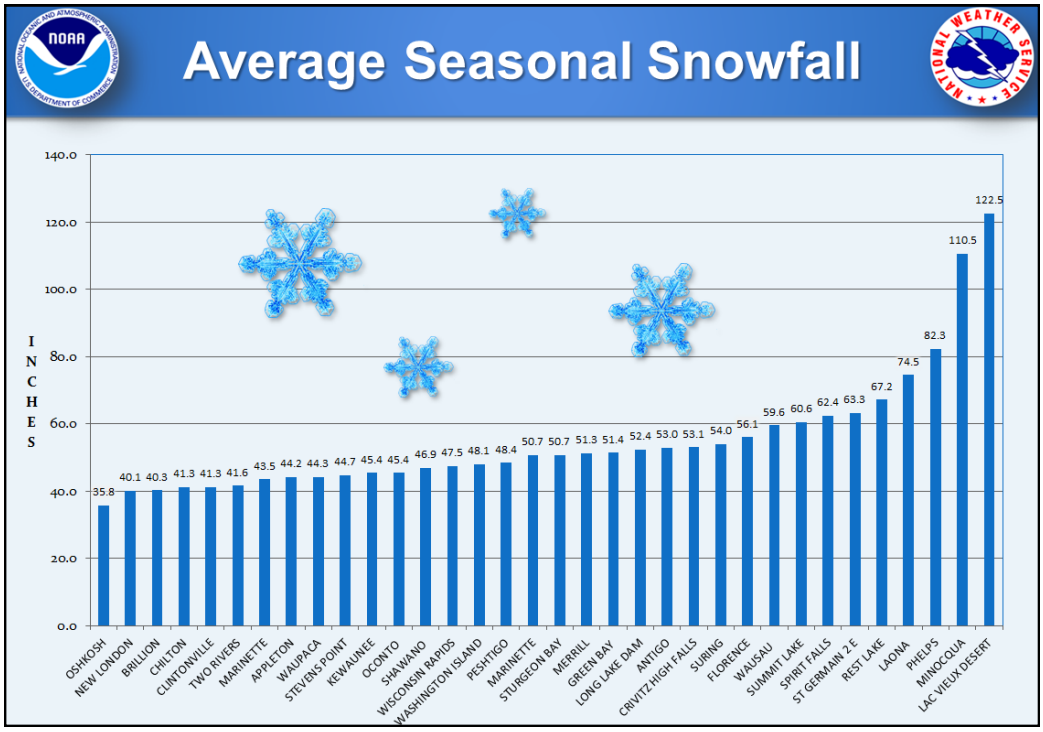
Although the average number of subzero days during all El Niño events was only a day or two less than La Niña or neutral winters, there was a significant difference in the number of subzero days depending on the strength of the El Niño event. There was, on average, seven fewer days of subzero temperatures during strong events compared to weak ones. Looking at high temperatures at or above freezing during the core winter months of December through February, on average there were thirteen more days of highs at or above freezing during a strong El Niño event compared to a weak one.

With an active sub-tropical jet stream and stormy weather across the southern United States, one would expect not as active of a pattern across the northern United States. The average precipitation is only down slightly from neutral winters, but down about a half inch compared to La Niña events. It should be noted that weak El Niños indicated a greater trend of below normal precipitation, while moderate to strong El Niños were pretty evenly split between above and below normal precipitation. On average, El Niño winters average about ten inches less snow, and just over a foot less on average from a La Niña winters. (see page 3 for normal snowfall totals from around the area)

Although nothing is guaranteed, the probability of experiencing a mild winter is very high, while the chances for above normal snowfall are very low.





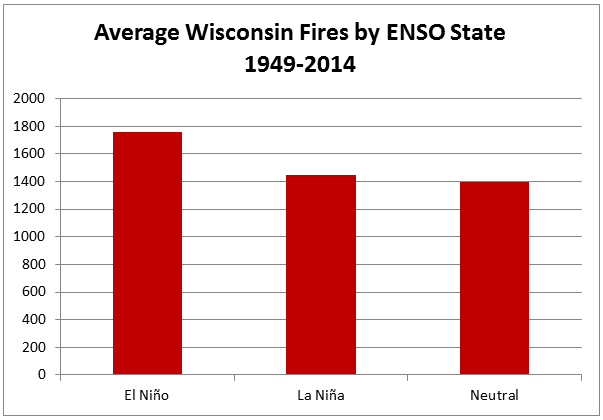


El Niño's Impact on How Wisconsin Burns

By Sean Luchs, Meteorologist Intern

Much attention is given to how the El Niño-Southern Oscillation (ENSO) can influence weather patterns, particularly with respect to temperature and precipitation trends. However, notable departures in temperature, rain, and snowfall can also have implications on the following wildfire season. Australia is notorious for intense wildfire activity associated with El Niño events. Florida tends to see the opposite, with their most active fire years associated with La Niña events. Though the relationship between the ENSO state and wildfire activity in Wisconsin is not as straightforward, we do see a trend more similar to our friends Down Under. The Wisconsin Department of Natural Resources provided data that relates the number of wildfires seen in the state to the preceding winter's ENSO state. Fire seasons following El Niño winters tend to see more wildfires than years that follow neutral or La Niña winters. Seasons following El Niño averaged 1758 wildfires, while neutral and La Niña winters were followed by an average of 1397 and 1446 fires, respectively.

This relationship is perhaps not surprising. El Niño winters tend to be warmer, result in lower snowfall – and, perhaps more importantly, have a shallower snowpack. It is logical that the stage would be set for increased wildfires following such a winter. Of course, just as there is variability between the ENSO state and our weather patterns, the fire season can't be predicted simply by knowing whether we are in El Niño or not. Following the 1975-76 La Niña winter, Wisconsin saw the most active fire season of the entire period, with 4141 wildfires. In addition, though seasons following El Niño winters are generally more active, the 1953-54 winter was followed by only 957 wildfires. So, while a potentially strong El Niño winter typically brings a busy wildfire season, there are still other factors that may strongly impact how busy the state's wildland firefighters will be this spring.



How Social Media is used in NWS Operations

By Ashely Allen, Meteorologist Intern

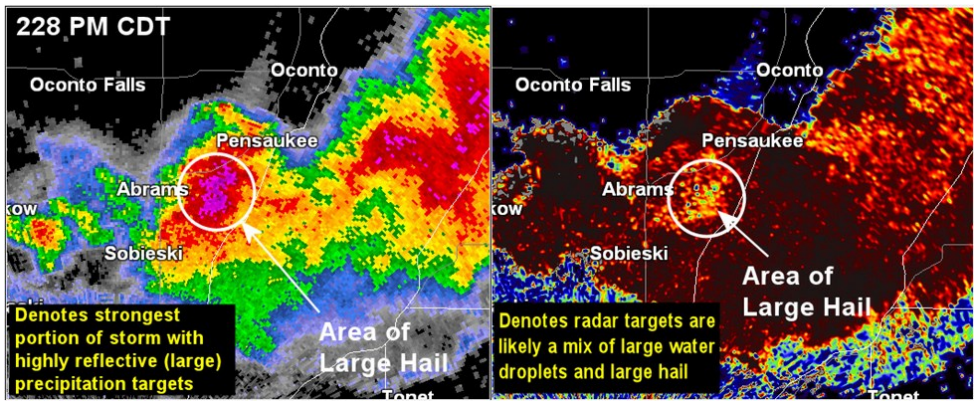
Technology has come a long way since the beginning of the NWS, but it isn't perfect. That's why we still need people to report the weather and what they are seeing! The forecast process is not a one way street; weather spotters provide ground truth so forecasters can verify their thinking based on radar and weather models, and to aid in situations where the models are going awry. While spotters have always been an essential part of the forecast and warning decision-making process, the addition of social media gives the public a new way to notify NWS offices.

Advancements in Twitter and Facebook have reaped major benefits for the National Weather Service. The NWS has been successful in getting potentially lifesaving information more quickly to a larger community by sending updates on our social media accounts prior to and during high impact events. Likewise, quick but vital information can now be sent to NWS offices to alert us of inclement or changing weather in your backyard. We use spotter reports in real time and monitor our social media accounts diligently to receive your information. These reports are not only used in our forecast and warning-decision making process, they are sent to local officials who make important decisions on how to keep communities safe. They are sent to local media outlets to alert your community of hazardous situations. They are even used in warnings, which studies show will increase the likelihood that people will take appropriate safety measures. Essentially, your report could save a life, and social media provides a quick way to send your reports and pictures to our office.

Social media is used year round for all types of weather, even when it is quiet. However, during high impact events, timely reports become crucial for the warning decision process. In fact, there are some situations where spotter reports make or break a situation.

On August 2, 2015, a complex of severe thunderstorms with large hail and damaging winds moved across northeast Wisconsin. The first severe thunderstorms of this event developed just north of Green Bay in Oconto and Marinette counties. The NWS Green Bay office was in severe weather mode, having extra meteorologists working the event to help interrogate storms and gather data. This included someone dedicated to updating and monitoring the NWS Green Bay Facebook and Twitter accounts.

As the storms strengthened, severe thunderstorm warnings based on radar signatures were issued to highlight possible large hail and damaging winds. Soon after, spotters began to send reports and pictures of hail into the office via social media. Our severe warnings were quickly updated to reflect that the warnings were now verified; the wind and hail hazards were no longer "radar based" but now were "spotter verified." Hail reports continued to come into the office, with 1 inch hail noted in the warnings. However, as the storms matured, the hail size grew. Accurate storm reports coming in via social media made updating warnings with the latest information easier since we were receiving ground truth from spotters. Hail size went from quarter size, to half dollar size, to golf ball size. Eventually, we were receiving reports of 3 to 4 inch hail, with several pictures verifying this extremely large hail posted on Facebook and Twitter. This information enabled the NWS to alert local emergency managers



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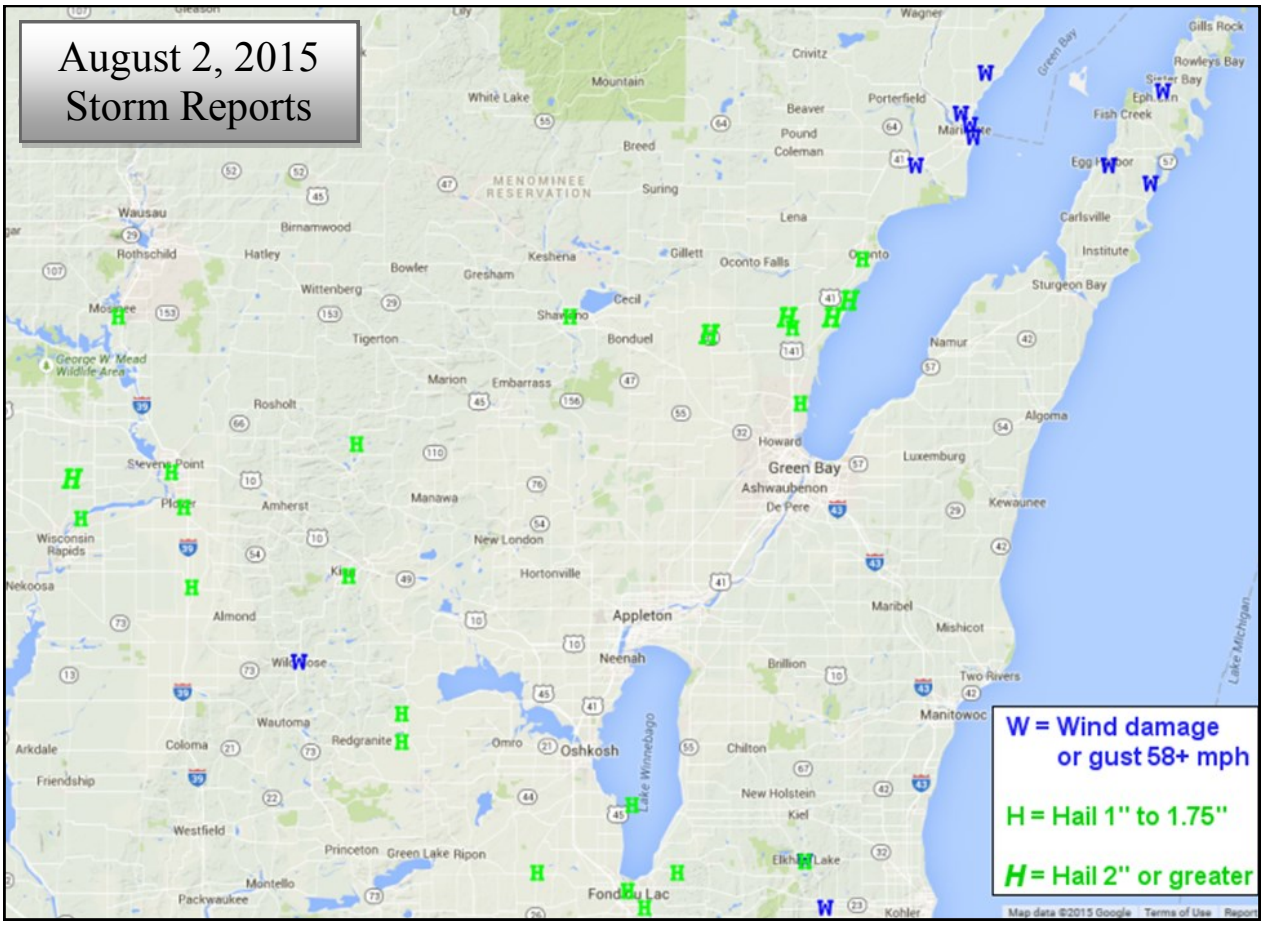
and sheriffs of a very dangerous situation. After the thunderstorms passed, we were able to put together a summary of the event which included a rare 4 inch hail event in northeast Wisconsin. This data can later be used for research and climate studies. Social media played a critical role by providing pertinent information on storm impacts that was shared with decision makers and the public.

This is just one example of how social media benefits the forecast warning process. We encourage reports of all types of weather, including flooding, snow amounts, heavy rainfall, and fog. Every report is valuable and used by meteorologists to produce an accurate and timely forecast or warning. Never assume we always know what is going on in your backyard! We need people to be the eyes and ears of the outside world. It's technology and people working together that make the process work!

Photo by: April Sedenquist
Pensaukee ~3.5" hail

Photo by: Beth Gosa
Oconto

Photo by: Sarah Griffin
Abrams

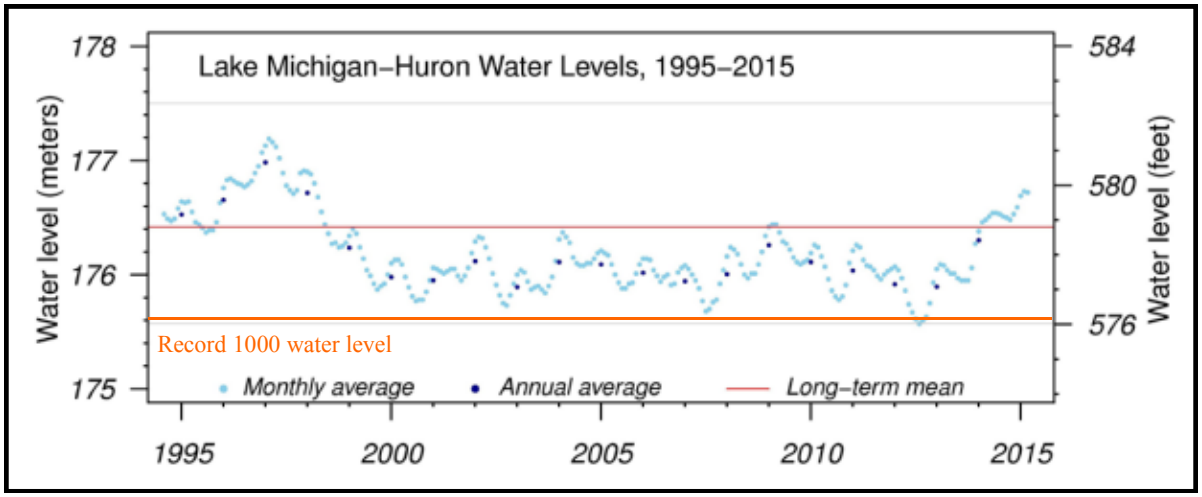


A Dramatic Rise of Water Levels in the Lake Michigan-Lake Huron Basin

By Mike Cellitti, Forecaster

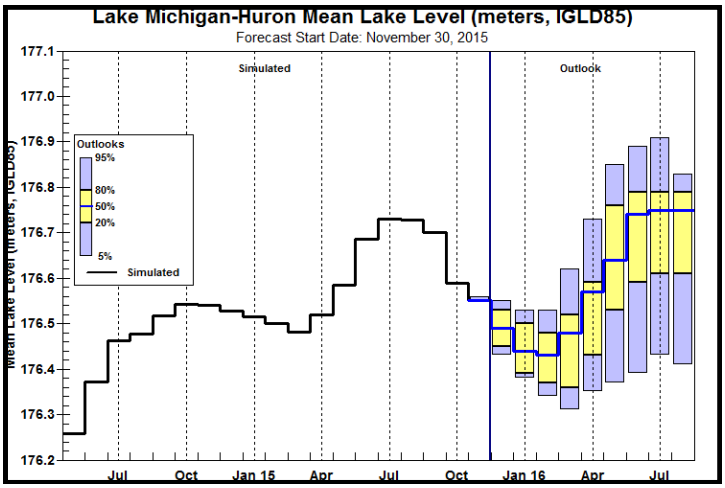
Lake Huron and Lake Michigan rank as the second and third largest of the Great Lakes, respectively. Connected by the Straits of Mackinac, Lake Huron and Lake Michigan share a common basin and water level. The water level can fluctuate on a monthly, seasonal, and annual basis depending upon a variety of factors including the amount of precipitation, evaporation, and rainfall-induced runoff. Precipitation and rainfall-induced runoff typically peak in late spring and summer as a result of thunderstorm activity. Although evaporation is difficult to measure, evaporation is highest when cold air flows over the relatively warm waters of the lakes in fall through late winter.

Source: Michigan State University Extension and the Michigan Sea Grant College Program, 2000



Over the past two years, a dramatic rise of the water level of the Lake Michigan-Lake Huron basin has been observed. The plot above shows the water level of the Lake Michigan-Lake Huron basin over the past 20 years.

From 1998 through 2014, the water level for these Great Lakes have been below the long-term mean, other than for brief periods of time. In fact, the lowest water level on record was reached in January 2013 which is represented by the orange line in the graph. But since that minimum was recorded, the water level has risen over 3 feet and is now comfortably above normal. Extensive ice coverage over the Great Lakes (reducing the amount of evaporation) during the past two winters is one factor that is believed to have contributed to the dramatic recovery of water levels. Above average precipitation in 2013 and 2014 has also supported a rise of water levels.



Looking ahead, the forecast shown in the chart on the left calls for a decline in water levels this winter before rising up to or slightly surpassing this past summer's levels.

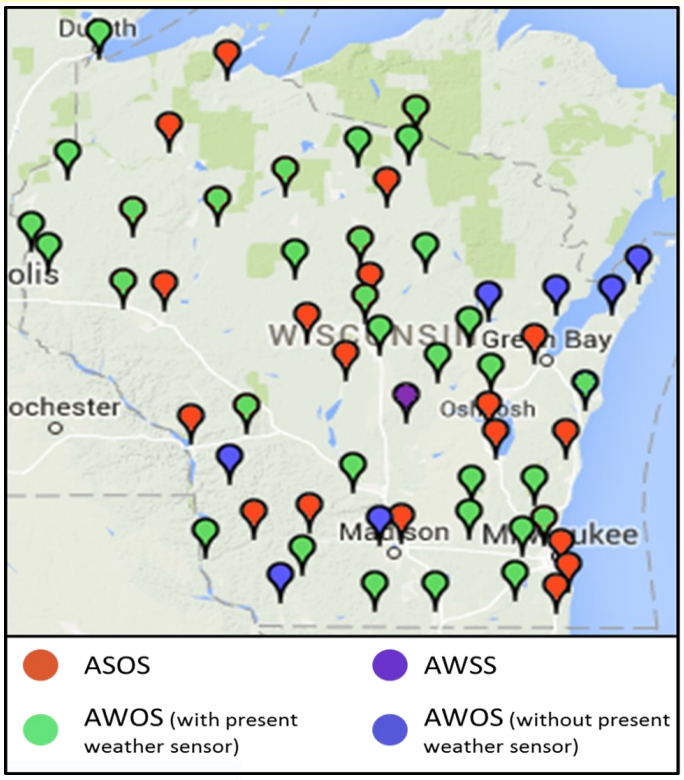
For more information on Great Lakes water levels, visit:

http://www.glerl.noaa.gov/data/now/wlevels/

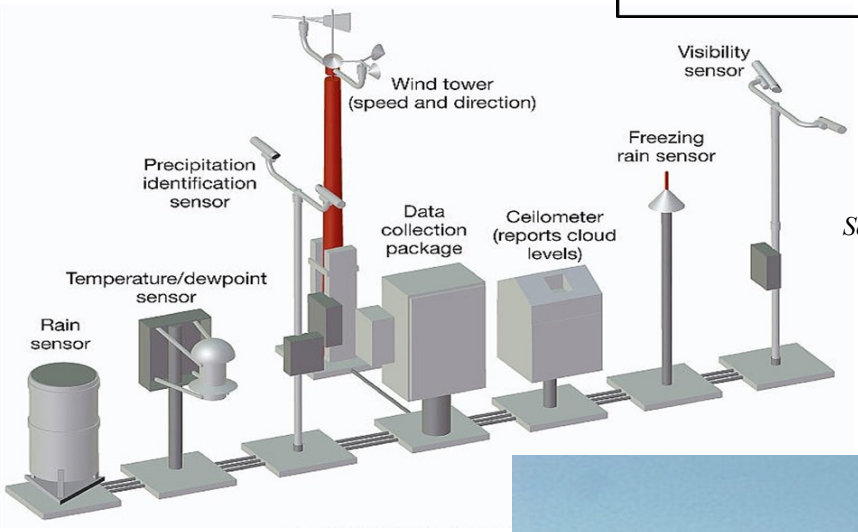
Airport Weather Reports

By Rich Mamrosh, Lead Forecaster

In addition to the very useful daily weather reports it receives from its Cooperative Observer Network, the National Weather Service receives weather reports from automated weather observing systems at many airports across Wisconsin, the United States, and around the world. The map on the right shows the location of the airport weather systems in Wisconsin.



These automated systems (Automated Surface Observing System (ASOS), Automated Weather Observing System (AWOS), Automated Weather Sensor System (AWSS)) measure weather using a combination of sensors and algorithms to determine sky cover, cloud height, visibility, pressure, temperature, dew point, and wind speed and direction. Some systems (ASOS and AWOS-P (precipitation)) can also determine the current weather type, such as rain, snow, freezing rain, etc.



Schematic drawing of a typical AWOS/ASOS/AWSS system

These automated reports are available at least every hour, but much more frequently when the weather is changing. They are available to the NWS, FAA, TV and radio stations, and to the general public on the internet.

A "typical" automated airport weather system.

Northern Wisconsin Lakes and Reservoirs Return to Normal

By Tom Helman, Lead Forecaster & Hydrology Program Manager

From 2005 to 2012, a prolonged period of below normal precipitation, lack of snowfall, mild winters, and warm summer temperatures lowered water levels on many lakes and reservoirs. While water levels held steady for a few years longer, a couple of cold long snowy winters and overall above normal rainfall from 2012 to 2015 have helped raise reservoir, lakes, and rivers back to more normal levels. The Willow Reservoir in western Oneida County recorded a water level difference of 15 feet between the peak of the 2010 drought and 2015 water levels.

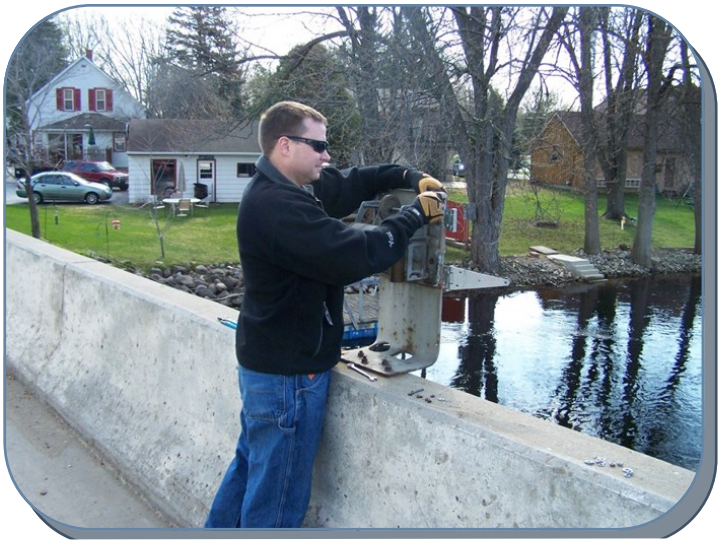
Picture taken in 2010 showing the low water levels.

Aerial view and shoreline picture of Crescent Lake 3 miles west of Minocqua taken in 2010 (left) and 2015 (right).

Shiocton River Measurements Continue

By Tom Helman, Lead Forecaster & Hydrology Program Manager

A new wire weight gauge was installed in Shiocton, Wisconsin (Outagamie County) in the spring of 2015. The wire weight gauge replaced an existing wire weight gauge which was installed around 1985. Shiocton Waste Water Treatment (WWTP) employees have been taking morning observations daily for those 30 years. What is unique for Shiocton is this string of 30 years of river measurements by the WWTP continues a legacy of long term measurements going back 100 years. This data is very important to the local Shiocton area as well as for flow information downstream of the Wolf River and into the Lake Winnebago basin.



NWS GRB Electronics Technician Steven Louria replacing the wire weight gauge on the Highway 51 bridge in Shiocton.

We Need Your Help!

We've all seen days where it is sunny and dry at your house, but the neighbors across the street are in a downpour! The National Weather Service has specialized equipment in the field to report rain and snow totals, however they are too far apart to see these localized situations. These small scale events can have major impacts on the forecasts and can even create a dangerous situation. That is why we need you to fill in the gaps in the NWS observations network. We are looking for volunteer Community Collaborative Rain, Hail, and Snow Network reporters, also known as CoCoRaHS. Your observations will be used by the National Weather Service as well as by media, researchers, farmers, and even members of your own community. You don't need to be a scientist to join; anyone with an interest in weather, from young to old, can become a CoCoRaHS observer! If you would like to volunteer, please visit the links below for more information on how to join. Participation is greatly appreciated and remember: ***every drop counts***!

www.cocorahs.org

In addition, we also need precipitation-type observers. Weather radars are great at telling us where it may be raining or snowing aloft, but it won't tell meteorologists what's happening on the ground. You can give us that ground truth with no training or equipment necessary! All you need to do is look out the window and report what kind of precipitation is falling in your backyard. You then simply submit the report using an app for your mobile phone. Your submission of a precipitation-type report will assist local meteorologists assess what is happening at your location and help provide the most up-to-date and accurate forecast possible.

For more information on the Precipitation Identification Near the Ground project (or PING), please go to:
http://www.nssl.noaa.gov/projects/ping/

The National Weather Service and your local community thank you for your observations and please know that every report is a valuable one. It's technology AND people working together that makes the weather forecast and warning process work!

Four NWS Green Bay Employees Receive Local Cline Award

By Linda S. Skowronski, Administrative Support Assistant

The National Weather Service office in Green Bay recently recognized four employees for the 2015 local Cline Award. The employees, and the category for which they were nominated, are Eugene Brusky, Jr. in Leadership, Michael Cellitti in Data Acquisition Management, James Skowronski in Program Management and Administration, and Linda Skowronski in Support Services.

Brusky, Cellitti, and James Skowronski were nominated for their efforts in the system migration from AWIPS to AWIPS2. This national upgrade affected the forecasting system that every forecaster in the National Weather Service utilizes. Linda Skowronski was nominated for her efforts in managing a number of administrative projects, in addition to helping surrounding offices in their administrative functions.

Congratulations to all award winners!

Senior Forecaster Returns to NWS Green Bay

By Linda S. Skowronski, Administrative Support Assistant

Phillip Kurimski returned to the NWS Green Bay office in April 2015 as a Senior Forecaster. He began his Weather Service career at NWS Milwaukee/Sullivan until he was promoted to a General Forecaster at NWS Green Bay, and then to a Senior Forecaster at NWS Detroit.

Kurimski is actively involved in a national team that is improving the software all forecasters utilize to disseminate weather warnings, statements, and advisories. Kurimski also is interested in storm chasing and has participated in several storm chases through the years.

A native of South Glens Falls, New York, Kurimski earned his Bachelor of Science Degree in Meteorology from the State University of New York at Brockport and his Master's Degree in Meteorology from the University of Wisconsin-Milwaukee.

We welcome Phil back to NWS Green Bay!

NWS Forecaster Earns Regional Cline Award

By Linda S. Skowronski, Administrative Support Assistant

Senior Forecaster Phillip Kurimski was presented with the Regional Isaac Cline Award in the category of Leadership. Kurimski earned this award in collaboration with Evan Bookbinder, Information Technology Officer at NWS Pittsburgh, Pennsylvania, for their efforts in including large public events into warnings and statements to provide greater decision support services to our partners and the public.

Recipients of the Regional Isaac Cline Award were first selected as a local office winner. From there, they are eligible to advance to the regional level. Kurimski was selected from other distinguished candidates from 38 weather forecast offices, two river forecast centers, and five center weather service unit offices within the Central Region of the National Weather Service. He is now eligible to advance to the national level where selections for the award are made from all regions of the National Weather Service.

The prestigious award is named in honor of Isaac M. Cline, one of the most recognized employees in weather service history. Cline's 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 ten categories of accomplishment.

NOAA/NWS Participates at EAA Oshkosh and the Oconto Fly-In

NOAA and the National Weather Service once again staffed a booth at the EAA AirVenture in Oshkosh last summer. This year, 553,000 aviation enthusiasts visited AirVenture. The highlight of the booth was a hurricane simulator (photo on the right) where people were able to experience the winds of a Category 1 hurricane. The NWS booth featured information about NOAA and the NWS, aviation weather services, and severe weather safety brochures. The booth also included an interactive website showing current and forecast weather information and real weather instruments, past and present (photo below).

The Green Bay National Weather Service also participated in the 7th annual EAA Warbirds Fly-In at the Oconto Airport on September 14th. Many people were interested in the winter weather outlook and how El Niño would influence temperatures and snow amounts. Visitors to the booth also asked about information about our all hazards weather radio. Display items included aviation weather posters, a weather radio, brochures, and weather instruments.

Forecaster Roy Eckberg shows children how a tornado forms

NWS Participates at the Super Bowl of Safety 2015

Members of the National Weather Service in Green Bay staffed a booth at the 2015 Super Bowl of Safety. Local organizations as well as volunteer members of the Green Bay community gathered at the KI Center on February 21 to provide a wide range of winter safety activities for children. The National Weather Service booth focused on weather safety for both winter and summer hazards. This included a live demonstration of a flash flood (left side of the photo), brochures with winter and severe weather information, and cloud charts.

Observation Program Leader Scott Cultice pours water into the flash flood demo

Winter Weather Safety Info:
http://www.nws.noaa.gov/om/winter/index.shtml

Severe Weather Safety Info:
http://www.nws.noaa.gov/om/severeweather/index.shtml

Storm Spotters: Time to Dust Off Your Yardsticks

Before you know it, bitter cold and snow will return to the area. Your accurate snowfall measurements will again be needed this season. Timely reports during and after snow, ice, blowing/drifting snow, and wind events provide important information to National Weather Service forecast staff and result in more accurate warnings and advisories.

It's 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 our online reporting system: **www.weather.gov/grb/report**

DID YOU KNOW???

You can find the NWS Green Bay on Facebook & Twitter:

www.facebook.com/NWSGreenBay
twitter.com/NWSGreenBay

NWS Green Bay Participates in "NWS Week of Service"

The staff at the NWS in Green Bay once again participated in the "NWS Week of Service" which makes a concerted effort to reach out in our communities to help those in need.

This year, the NWS Green Bay staff collected and donated 300 food and personal items, weighing over 260 pounds. The food/toiletry items were delivered to Paul's Pantry.

Cooperative Observer Program Award!

Name	Location	Years
Jeff Mayon & Rich Sparks	Peshtigo	15

Rich Sparks (left) and Jeff Mayon (middle) from the City of Peshtigo Wastewater Treatment Facilities receive a 15 year award from Observation Program Leader Scott Cultice (right).

Weather equipment at Peshtigo

Winter Word Search

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

ACCUMULATION	DUSTING	SNOW
ARCTIC	FREEZINGRAIN	WARNING
BLIZZARD	FROSTBITE	WATCH
BLUSTERY	GLOOMY	WHITEOUT
CHILLY	ICESTORM	WINDCHILL
COLD	ICING	WINDY
DRIFT	SLEET	WINTERSTORM

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