Weather Brew

VOLUME 3, ISSUE 2 WINTER 2011-2012

INSIDE THIS ISSUE:

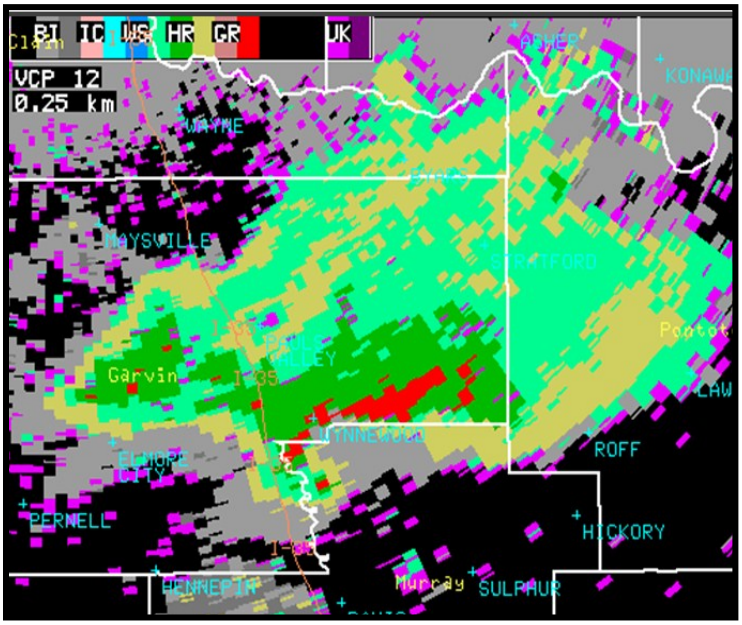
Dual-Pol Radar Coming in the Spring

By Denny VanCleve

The National Weather Service Milwaukee/Sullivan radar will be getting a big upgrade during the two weeks of April 2-15, 2012. This upgrade will incorporate dual-polarization technology, commonly referred to as dual-pol. The main benefits that will result from this improvement to the radar include:

- Better estimation of total precipitation amounts.
- Better estimation of the size distribution of hydrometeors (raindrops, snowflakes, hailstones, drizzle).
- Much improved ability to identify areas of extremely heavy rainfall that are closely linked with flash floods.
- Improved detection and mitigation of non-weather related radar echoes (chaff, smoke plumes, ground clutter).

Dual-Pol radar adds new information on the size and shape of a target.
Left - Large Raindrop: A larger horizontal than vertical component.
Right - Hail stone: Similar horizontal and Vertical components.



A new Dual-Pol product available to forecasters: Hydrometeor Classification. For example, red is identified as hail and dark green is identified as heavy rain.

- Improved ability to classify precipitation type.
- Easier identification of the melting layer (helpful for identifying snow levels in higher terrain).

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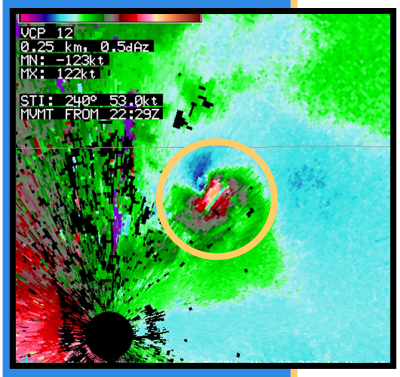
Dual-Pol (Continue)



A strong rotation signature in the storm relative motion radar product.

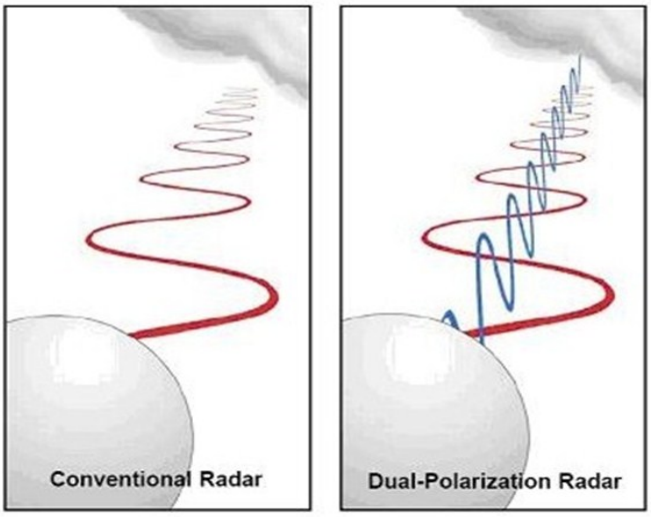
Credit: Wichita, KS Spring Seminar March 2011

Just in time:

Dual-Pol will be arriving here just in time for severe weather season. With an improved ability to: detect areas of hail and rain, estimate precipitation amounts, and identify features such as tornado debris balls, this upgrade should have a positive impact on forecaster decision making for warnings and advisories.

What is Dual-Pol?

Current NWS Doppler radars transmit and receive pulses of radio waves in a horizontal orientation. As a result, the radar only measures the horizontal dimensions of targets (e.g. cloud and precipitation droplets). Dual-pol radar transmits and receives pulses in both a horizontal and vertical orientation. Therefore, dual-pol radar measures both the horizontal and vertical dimensions of targets.



How the current Doppler Radar (Left) and Dual-pol Radar (right) transmits and receives pulses.

How will Dual-Pol Improve the Radar?

Being able to quantify vertical and horizontal aspects of targets will make it easier to classify what the radar is seeing. For instance, targets that appear more horizontal than vertical may be larger raindrops that flatten as they fall. Hail on the other hand is often spherical in nature and also tumbles as it falls, thus appearing spherical to the radar. This would produce similar horizontal and vertical dimensions. Additionally, smaller raindrops will flatten much less than large raindrops as they fall, resulting in a spherical appearance. This will help identify areas of large raindrops vs. areas of smaller drops.

The ability to better classify targets will lead to an improvement in the estimation of precipitation amounts. For example, the radar will better depict areas of mainly rain vs. rain mixed with hail, or may ignore echoes for precipitation estimation that it deems to be non-weather related, such as ground clutter (bugs, birds, etc.). One benefit of this improvement is expected to be better detection of areas of extremely heavy rainfall that can lead to flash flooding.

Improved classification of precipitation types will also lead to better depiction of the melting layer, identifying the transition between rain and snow. This is important because radar echoes are often too high in the melting layer, due to an effect known as bright banding, resulting in overestimation of precipitation amounts. For higher terrain areas, identification of the melting layer will also be helpful in figuring out the snow level (elevation at which the rain becomes snow).

Rusty's Roundup

By Rusty Kapela

2011 Wrap-up

As 2011 quickly comes to a close, the Milwaukee/ Sullivan NWS Office extends a **BIG** thanks to all of its partners for another successful weather year. We couldn't have done our job without your help! In a year of weather extremes, Wisconsin had a minimal number of weather-related fatalities and injuries thanks to your assistance!

The year featured a historic blizzard February 1-2, known as the Groundhog Blizzard. On these two days, 12 to 26 inches of snow fell with winds gusts of 40 to 60 mph. Drifts grew to 10 to 15 feet in some locations of southern Wisconsin and some roads were closed. Even emergency first-responders couldn't reach some stranded motorists. Amazingly, only one person died from exposure during the blizzard. People must have paid attention to the forecasts and warnings!

Wisconsin	Deaths	Injuries
Blizzard	1	0
Excessive Heat	5	108
Lightning	1	0
Tornado	1	5
Thunderstorm Wind	1	11
Total	**9**	**124**

Deaths and injuries totals separated by weather hazard.

Of course, Wisconsin had to endure another weather extreme – known as a heat wave. A long-duration, 4-day heat wave affected the state during the period of July 17-21 with heat index values of 100 to 117. There were only 5 directly-related fatalities, thanks to a 3-day advance notice by the NWS, and preparedness efforts of state, county, and local officials in conjunction with excellent media coverage.

Wisconsin had a busy tornado season with most of them affecting central and northern areas. A total of 38 were documented, including 8 strong tornadoes. Only 1 directly-related fatality and 5 directly-related injuries occurred. Considering the number of tornadoes was well over the new 30-year average of 23, it could have been worse. Most of the tornadoes spun up on April 10th and May 22nd. Altogether, there were 10 calendar days with tornadoes in Wisconsin.

Tornado damage in Adams County Wisconsin April 10, 2011

"Wisconsin had a busy tornado season with most of them affecting central and northern areas."

Preliminary	2011
EF0	13
EF1	17
EF2	7
EF3	1
EF4	0
EF5	0
Total	38

Preliminary tornado totals for 2011.

Continue on next page.

Rusty's Roundup (Continue)

Hail Stone
June 6, 2011
Credit: Steve Vorpagel

"Total 2011 property and crop losses in Wisconsin due to tornadoes, severe thunderstorm winds, and hailstorms was close to $100 Million…"

2011 WI Tornadoes & Fatality/Injury/ Monetary Damage Estimates

For the year, Wisconsin had only 9 directly-related fatalities and about 124 injuries (heat illness – medical treatment). The majority of these were associated with the long-duration July 17-21st heat wave.

Total 2011 property and crop losses in Wisconsin due to tornadoes, severe thunderstorm winds, and hailstorms was close to $100 Million.

In late April, 2011, severe storms and tornadoes struck Missouri and the Gulf Coast States. After many years with low number of tornado-related fatalities in the U.S., things went through the roof in 2011, even though there were good tornado warning lead times. At least 748 tornadoes spun up in April alone, resulting in 361 deaths. For all of 2011 through August 30th, the U.S. experienced 1543 tornadoes and a related 552 fatalities.

Could there be a lot of tornado-related deaths/injuries in Wisconsin? Yes. Are all Wisconsin residents "StormReady?" No. I think we would see fewer fatalities and injuries in Wisconsin, tornado-pound for tornado-pound, because more of our homes and buildings have basements, we have fewer mobile homes, and preparedness efforts by everyone.

Our weather preparedness in Wisconsin is pretty good, but there is room for improvement.

Preparedness Webpages:

StormReady

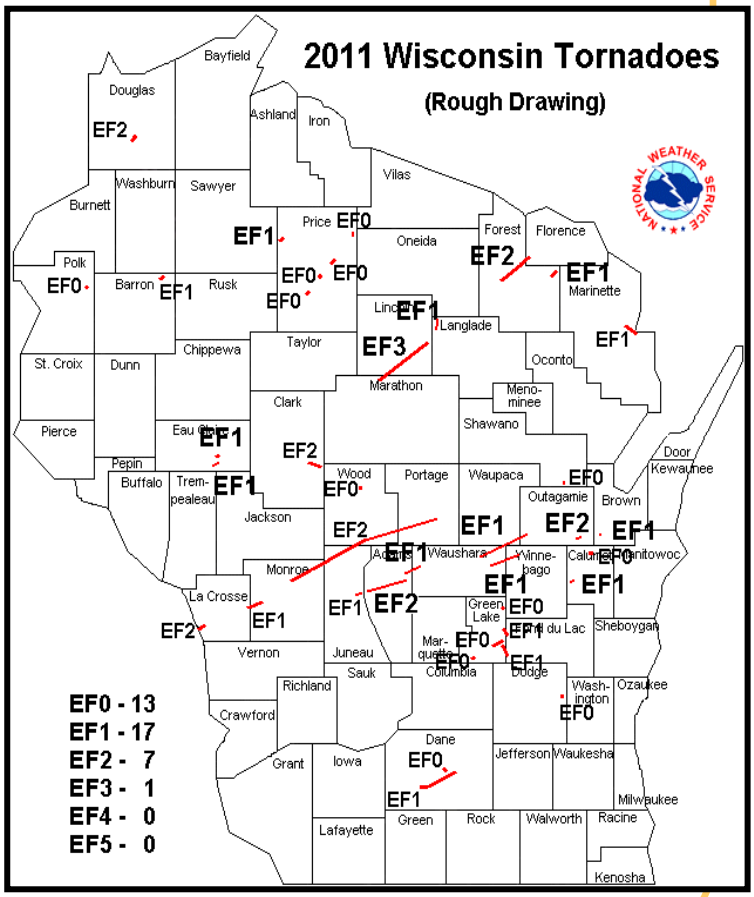
Weather-Ready Nation:

Announcement

Document

ReadyWisconsin

Severe Weather Reference



2011 Wisconsin Tornado Tracks (Preliminary)

Winter Weather Preparedness

By Morgan Brooks

This winter started off with a fairly quiet December, with only 1.1 inches of snowfall reported in Milwaukee, and 2.5 inches reported in Madison. Not to mention, monthly average temperatures were within the top 15 warmest on record at both locations. With such mild weather, it is easy to forget the turmoil winter weather can create. Here are a few tips to help you prepare for the next winter storm.

On the road:

Have your car winterized. Check your brakes, lights, battery, exhaust/heater connections, defroster, windshield washer fluid, and windshield wipers. Also, don't let your gas tank get too close to empty; you don't want to be stranded when it is bitterly cold.

Equip your car with an emergency kit. Make sure you have extra clothing and blankets, high calorie, non-perishable food, water, and a first aid kit. As well as a flashlight, booster cables, and a shovel. Some other things to consider are tire chains, matches, sand, and a NOAA Weather All Hazards Radio.

Drive with extra caution. Each winter around 20,000 vehicle accidents occur in Wisconsin due to adverse weather conditions affecting the roads. Surprisingly, many of these accidents occur when just a few tenths to an inch of snow has fallen. The roads quickly become slippery before many drivers may even realize it. Be aware of vehicles pulled over to the side of the road, but avoid rubbernecking.

Watch out for freezing rain. Roads and sidewalks quickly become slippery during a freezing rain event. In addition, freezing rain may cause tree branches and power lines to fall onto the road, if the coat of ice becomes too heavy for the branches or power lines to support. This may result in live wires down on the roads, avoid these at all costs.

Watch out for dense fog. If you are caught in dense fog, be sure to have your headlights on so that other drivers may see you. However, do not turn on your bright lights, as this will make it increasingly difficult for you to see. Pull off the road if the fog becomes

Several cars stuck in the snow during the Groundhog Day Blizzard of 2011. Credit: Donnie Race

A snow plow keeps the streets safe during an event in January of 2007.

"Each winter around 20,000 vehicle accidents occur in Wisconsin due to *adverse weather conditions affecting the roads."*

Continue on next page.

Preparedness (Continue)

A door blocked by a snow drift during the Groundhog Day Blizzard of 2011. Credit: E. Johnson

"Keep a NOAA Weather Radio at home."

A tree succumbs to a heavy coat of ice after an ice storm in December of 2009.

too thick for you to drive safely.

If you are caught on the road when conditions become too hazardous for driving, pull off the road and remain inside your vehicle, turn on your hazard lights, and hang a distress flag. Do not allow the exhaust pipe to become blocked by snow, as this may cause carbon monoxide poisoning. Run your vehicle periodically to stay warm, but crack a window when you do to prevent carbon monoxide from building up inside your vehicle.

At home:

Stay home and off the roads when weather conditions are unfavorable, if possible.

Equip your home with an emergency supply. Some things you should include in your emergency supply are batteries, flashlights, heating fuel, a safe emergency heating source, a fire extinguisher and smoke detector, water, high calorie, non-perishable food, extra medication, first aid supplies, extra blankets, and extra jackets, mittens, or hats.

Keep a NOAA Weather Radio at home. This way you will be the first to know about updates, new warnings, or advisories, even if the electricity goes out.

Protect your family from carbon monoxide poisoning by putting a carbon monoxide detector in your home. Carbon monoxide may be released by faulty furnaces or space heaters.

Protect pets and livestock from the weather. Make sure they have shelter, fresh water, and food. They are susceptible to frostbite just as we are.

When doing outdoor activities:

Check the forecast and bundle up! Wind accelerates the rate at which we lose heat from our exposed skin. When exposed skin reaches 32 degrees, frostbite occurs. For example, when wind chills reach -18 degrees or colder, frostbite occurs in just 30 minutes. Extremities, like fingers and toes, are most at risk.

Dress properly. Several loose, lightweight layers are the best choice to keep you warm. Make sure the outside layer is water repellent and has a hood. Wear a hat; you can loose a great deal of body heat through an uncovered head.

Before heading out on the ice to ice skate, enjoy your snowmobile, or go ice fishing, *check the ice thickness with the DNR first.*

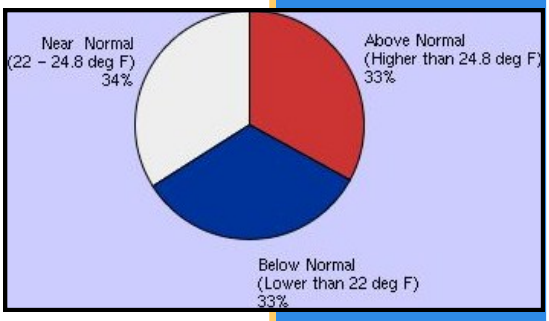
Keep a window slightly open in your fishing or hunting shack to prevent carbon monoxide build up.

Don't over-exert yourself shoveling snow or doing other activities, as this coupled with cold conditions may make you more susceptible heart attacks.

Winter storms and cold temperatures result in more deaths and injuries across Wisconsin than any other weather hazard. Prepare yourself and your family so that you are ready when the next big storm comes your way.

Climate Outlook

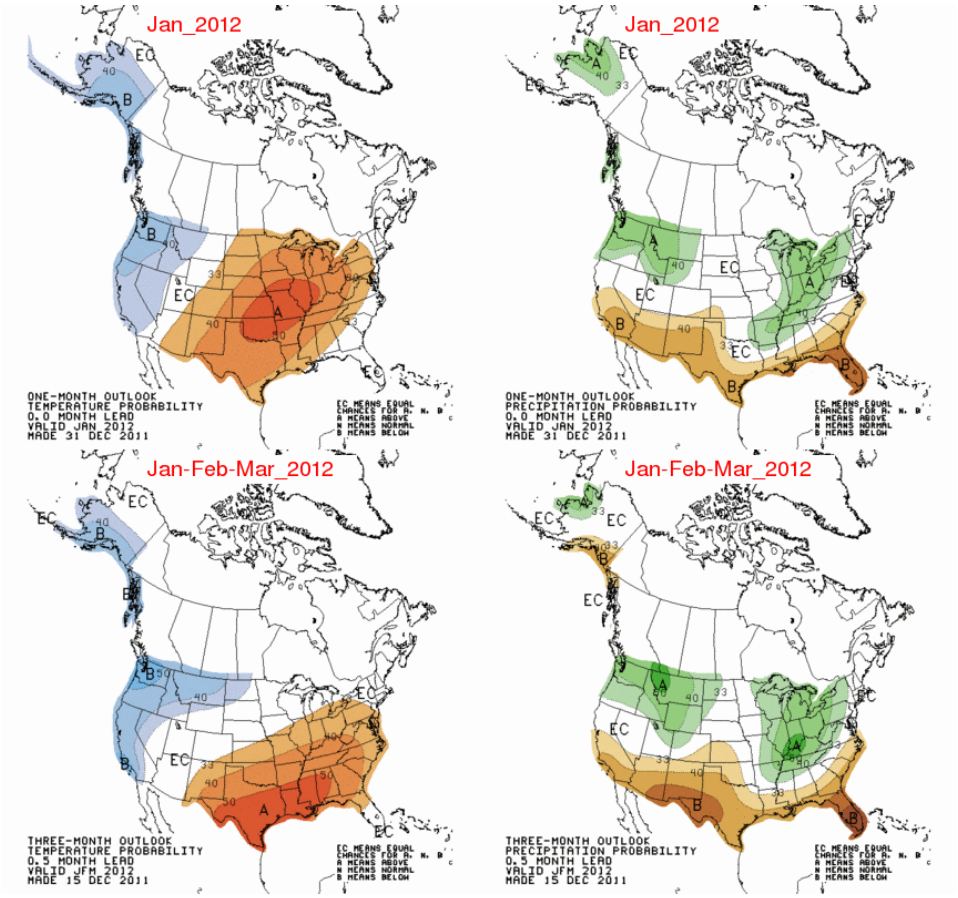
By Ed Townsend



Three Month temperature outlook for Jan.-Feb.-Mar. 2012 at Fond Du Lac (issued Dec. 2012)

Looking ahead to January and February

The January mean temperature outlook indicates increased chances (i.e., greater probability) for southern Wisconsin to have *above normal temperatures* (top left image in the four-panel). This would also imply a reduction in the probability for below normal temperatures for southern Wisconsin. For total precipitation amounts, the outlook is indicating a stronger signal for a portion of southeast Wisconsin to have increased chances for *above normal precipitation* for January (top right image in the four-panel). However, the western half of the state falls into the equal chances class. That is to say, that the forecast situation made it difficult to accurately predict the climate and that this period has equal chances for above, near, or below normal precipitation. Note that when referencing above, near, or below normal mean temperatures or total precipitation amounts, these values are defined by the climatological normal data set cur-



It is possible for you to get a site specific three month outlook for over 30 locations in southeast Wisconsin at our website.

One and three month outlooks from the Climate Prediction Center.

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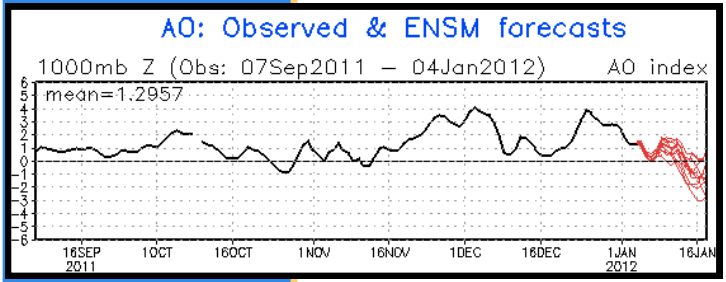
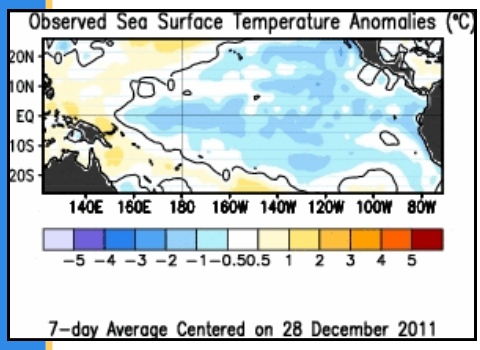
Climate Outlook (Continue)



AO indices for the last 120 days. Observed AO is marked by the black line and forecasts from multiple members of an ensemble are the red lines.

La Niña is a climatic cycle that is associated with cooler than normal water temperatures in the equatorial eastern Pacific.



A map showing the cooler waters in the equatorial Pacific, hence our weak to moderate La Niña conditions currently present.

rently used -- 1981-2010 -- after breaking them into thirds.

Looking into mean temperatures for the next three month period (January, February, and March), uncertainty exists and *equal chances* were assigned (bottom left image in the four-panel). For total precipitation during this period, the outlook is indicating a stronger signal and increased chances for *above normal precipitation* (bottom right image in the four-panel).

[What influences these outlooks?]

Many factors come into play when determining a long range outlook. Furthermore, some climate patterns are more predictable further out in time than others. Main factors include: current conditions of the soil and the atmosphere, El Niño/La Niña and various other climatic patterns [e.g., Arctic Oscillation (AO) and North Atlantic Oscillation (NAO)], climatic trends, model or ensemble forecasts, and statistical tools. Right now, La Niña conditions are ongoing and the AO is currently positive. Of note, this is the second consecutive year where La Niña conditions were on going. Not much data is available on successive La Niña years and what it means for the U.S. -- this only adds to the difficulty when making a long range forecast. Whereas, the effects of La Niña conditions for a single year are documented.

However, there is also the AO and NAO that are always present and changing. When negative, the AO pushes colder air into the U.S. from Canada. Conversely, a positive AO is associated with above average temperatures over the middle latitude. All this results from differences in pressure between the polar region and the middle latitudes. These differences in pressure are currently below average and above average over the northern polar region and middle latitudes, respectively, and why we are currently experiencing a positive-phase AO. Of note, a non-negative AO is predicted to continue through at least Jan. 10. This was a contributing factor in the January outlook and was one reason why Wisconsin is expected to have increased chances for above normal temperatures. While La Niña will be a factor in regard to the one month and three month outlook, the AO will have less of an impact as we move further out in time. Because the AO is harder to predict outside one or two weeks, given the limitations in technology and understanding, La Niña and other tools are relied on more so in the three month outlook.

Waterspouts in 2011

By Marc Kavinsky

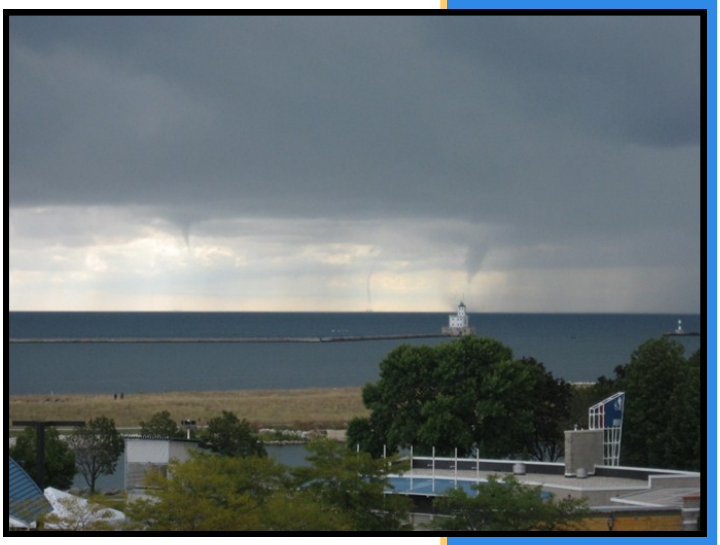
An uncommon event occurred on September 24th, 2011 when a series of waterspouts developed over the near shore waters of Lake Michigan, from Milwaukee Harbor south to just east of downtown Chicago. Due to the mild inland conditions, many people were enjoying the Lake Michigan shore, and were readily on hand to observe and record this wondrous waterspout event.

On September 24th, 2011 an unseasonably cold air mass flowed over the warm waters of Lake Michigan creating very unstable conditions in the low levels of the atmosphere. The lake surface temperature was in the lower to middle 60s. Meanwhile, the ambient air around 4000 feet was estimated to be about 40° F. This temperature difference of 20 to 25° F created very unstable conditions over the low levels of Lake Michigan.

Updrafts from nearby showers and thunderstorms produced convergent boundaries over the near shore waters of Lake Michigan. The combination of a very unstable atmosphere and these boundaries caused five "observed" waterspouts just offshore of downtown Milwaukee, and two "observed" waterspouts just offshore of Kenosha. These waterspouts were well photographed, and were even caught by local television webcams. More waterspouts were sighted farther south from Waukegan Illinois south to Chicago.

The waterspouts remained offshore and did not cause any property damage.

Five waterspouts were observed in Milwaukee Harbor. The first waterspout was estimated to have developed at 9:45 am CDT about 2 miles northeast of downtown Cudahy. All the waterspouts moved in a north to northwest direction. The last waterspout to be observed lifted off the water surface around 10:45 am CDT, about 4 miles southeast of North Point Lighthouse.



Three waterspouts simultaneously in contact with the lake surface.

Wisconsin Department of Transportation construction crews were working on the Hoan Bridge that morning. The Hoan Bridge is just south of downtown Milwaukee, overlooking the lakeshore. The DOT personnel had a great vantage point for observing the waterspouts.

The unsettled conditions continued over the near

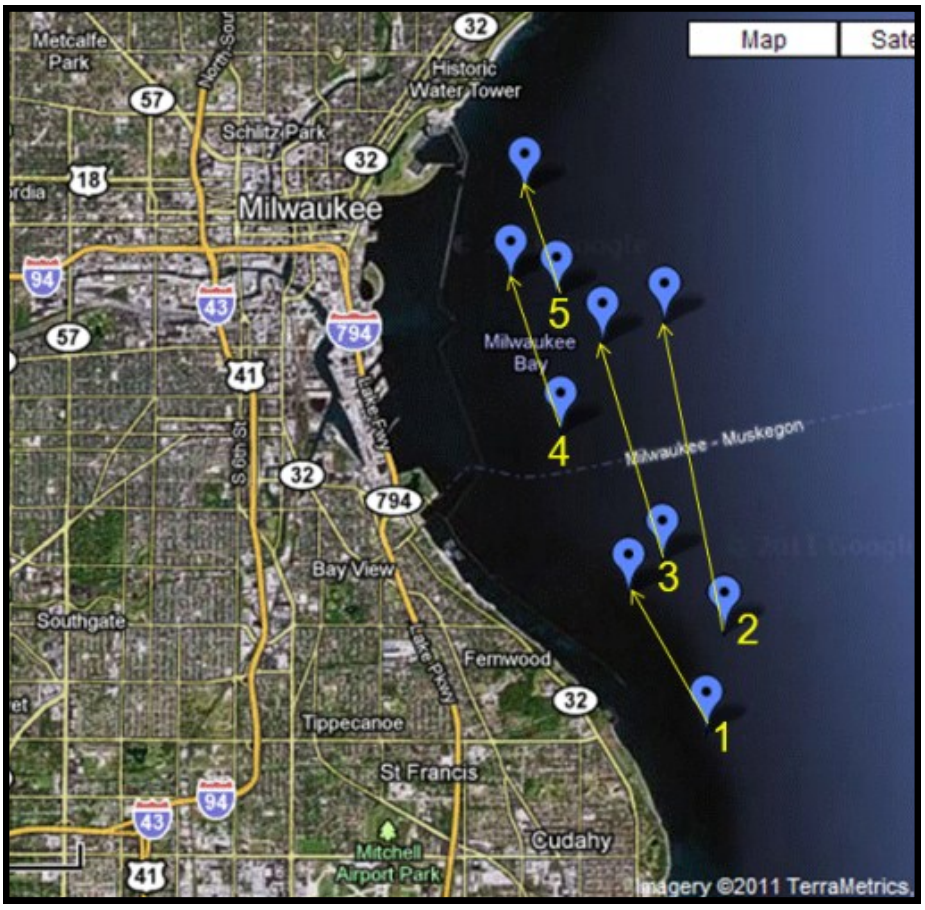
Continue on next page.

"The waterspouts remained offshore and did not cause any property damage."

Waterspouts (Continue)

October 19, 2011: Waterspouts looking southeast from downtown Sheboygan. Red oval denotes a waterspout that lifted off the lake surface. Yellow oval indicates a funnel.

Two waterspout events occurred right in the Fall of 2011: September 24 and October 19.



September 24, 2011 Waterspout tracks in the Milwaukee Harbor.

shore waters of Lake Michigan into the afternoon. Two more waterspouts were reported between 3 and 4 pm CDT just east of Kenosha. They also remained offshore and did not cause any damage.

A similar scenario played out about a month later. On October 19th, a weak trough of low pressure was situated over Lake Michigan. This trough was a northern extension of stronger low pressure system over the Tennessee and Ohio Valleys.

The trough acted as a weak convergent boundary and worked in tandem with unstable conditions over the lake to produce several more observed waterspouts over the near shore waters of Lake Michigan. Three weak waterspouts were observed just southeast of Sheboygan between 9 and 9:30 am CDT.

At the time of the Oct. 19, 2011 Sheboygan picture, one of the waterspouts indicated by the red oval had recently lifted off the lake

Waterspouts (Continue)

surface. A second funnel indicated by the yellow oval may also have been in contact with the lake surface prior to the picture being taken. Unfortunately on this day, the pictorial record of the waterspouts was severely limited. However, other clues favoring waterspout development are revealed on p. 10. The rain showers to the south and the lower cloud edge extending northward over the near shore waters off Sheboygan, are both indicative of a nearby weak convergent boundary.

Temperatures over southeast Wisconsin during the first two weeks of October 2011 averaged well above normal. The southern Lake Michigan buoy reported the lake surface temperature on this day to be 52° F. The ambient air about 4000 feet above the lake surface was about 30° F. These very unstable conditions also contributed to this second waterspout event over Lake Michigan.

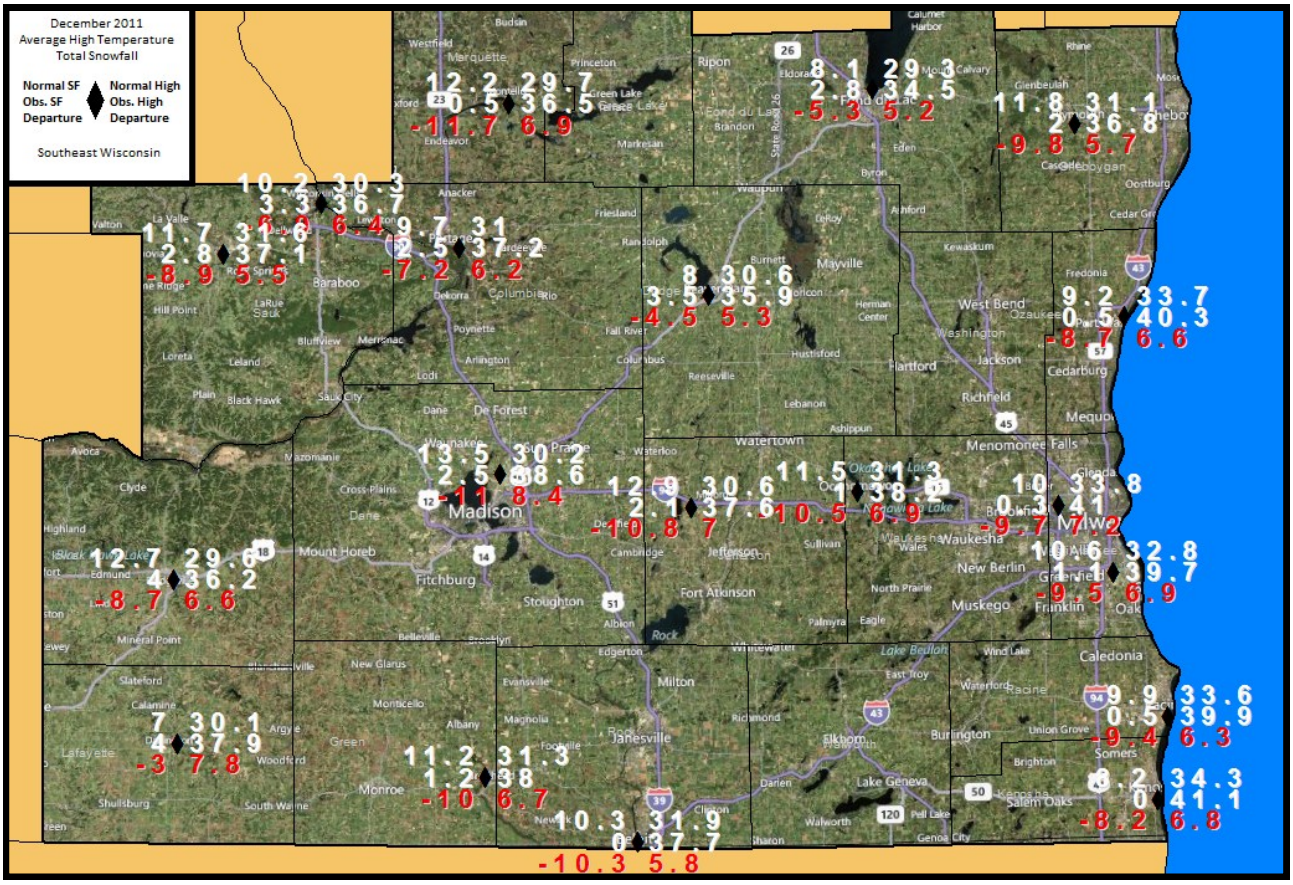
Cool season, weak waterspouts are uncommon and are typically unobserved and unreported. Reviewing data records dating back to 1994, less than 10 of these weak, non-severe thunderstorm related waterspouts have been observed, and reported to the National Weather Service in Milwaukee/Sullivan.

"Cool season, weak waterspouts are uncommon and are typically unobserved and unreported. "

**Waterspout from a UW Campus dorm room.
Credit: Cassandra Lynne Hoglund.**

December 2011 at a Glance

By Ed Townsend



December Snowfall

Little in terms of snowfall was observed in southeast WI with most locations having a green Christmas.

December Temperatures

Wisconsin, as a whole, experienced an unseasonable warm December.

The map above shows corresponding stations and their monthly average high temperature and total snowfall. On the right side of a station (denoted by a diamond) is the: normal high temperature (top), average high temperature (middle), and their departure from normal (bottom) for the month. A positive number denotes how many degrees **above** normal the station was and vice-versa. On the left side of a station is the: normal total snowfall for December (top), observed total snowfall (middle), and their departure from normal (bottom) for the month. A negative number denotes how many inches below normal a station was and vice-versa. All stations had above normal monthly average high and low temperatures (not shown). In addition, all stations observed a lower than normal total snowfall during the month.

Improve Your Weather Knowledge

Aurora Borealis Seen Over Wisconsin

By Jake Wimberley

After sunset on the evening of October 24, the *aurora borealis (*also called the Northern Lights) were visible over much of the Midwest, including Wisconsin. This phenomenon is reasonably common in the subarctic latitudes of Alaska and northern Canada, Europe and Asia, but is rarely visible in the continental United States.

The Northern Lights occur when high-energy atomic particles emitted from the Sun interact with atoms in the outer levels of the Earth's atmosphere, causing the atmospheric atoms to emit light of various colors. The Earth's magnetic field causes the solar particles to be deflected toward the magnetic poles, the places where the magnetic field pushes in a direction perpendicular to the Earth's surface. One can also define the magnetic poles as the locations pointed to by the needle of a compass. (Note that the magnetic poles do not exactly correspond to the North and South Poles, through which the Earth's axis of rotation passes.) With the magnetic field pushing the solar particles downward into the atmosphere, they are able to collide with the atoms there and produce the lights.

Photo by Brian Weinberg along Highway 106 near Palmyra, in Jefferson County (October 24, 2011).

The extent and intensity of aurora events is usually related to variations in solar activity that cause bursts of particles to be ejected from the Sun into space. One such solar phenomenon is a *coronal mass ejection* (CME), and it was this type of event that caused the exceptionally widespread October 24 aurora. Reports came in of aurora sightings from all over the Midwest as well as locations in the eastern and

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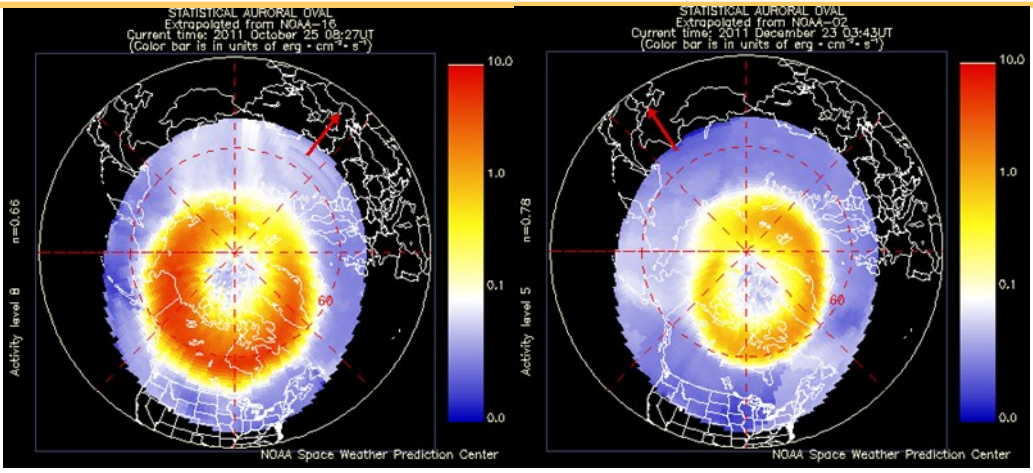
Improve Your Weather Knowledge (Aurora — Continue)



NOAA satellite observations of auroral activity.
Image Left: 3:27 am CDT Oct. 25, 2011, Right: 9:43 pm CDT Dec. 23, 2011.

even southern states.

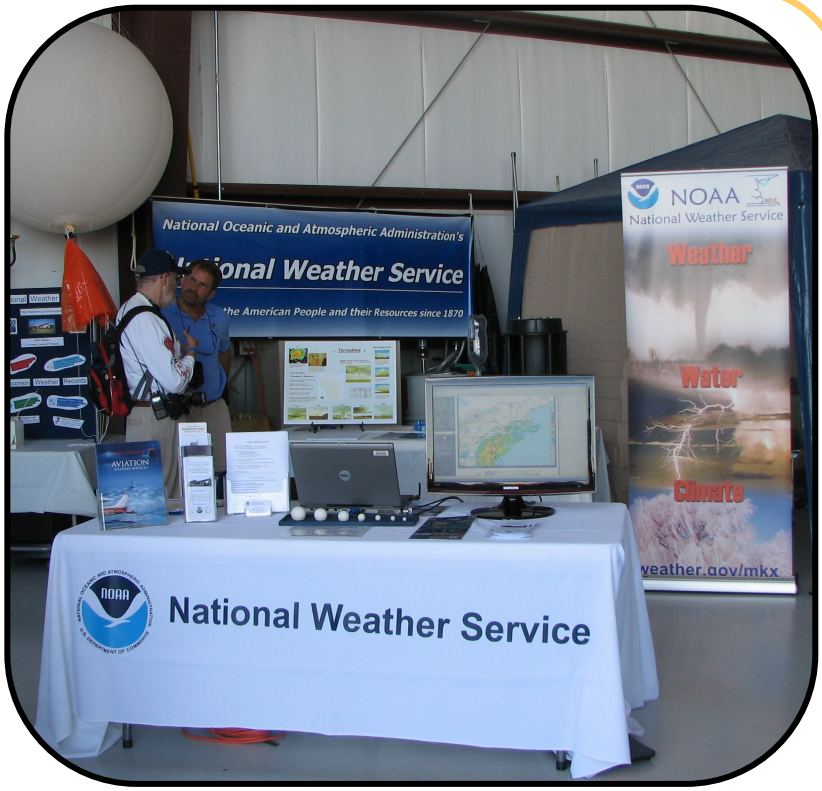
The image on top shows NOAA satellite observations of the amount of auroral activity from 3:27am CDT October 25, 2011 (the night of the event, left), and the same type of image from 9:43pm December 23, 2011 (right). Yellow and orange shades indicate higher potential for visible aurora. The wider ring of these shades in the October 25 image shows how much stronger and more expansive the aurora was during this event than during a time of more settled solar conditions (e.g., December 23).

Photo by Scott Weberpal just north of Eagle in Waukesha County (October 24, 2011). Note: Photo was taken with a long exposure, which partly accounts for the brighter colors.

Wings Over Waukesha

By Marcia Cronce

The NWS attended the third annual Wings over Waukesha event that took place at the Waukesha County Airport/"Crites Field" on the weekend of August 27-28, 2011. The Wings over Waukesha event drew a crowd over 7,000 people. Wings over Waukesha is a family-friendly and affordable aviation expo and air show event that is dedicated to promoting aviation and honoring aviation history. Aviation and military enthusiasts were able to walk around and through various aircraft, and observe both contemporary and vintage World War II aircraft in flight. The class-act air show also featured some of the best aviation aerobatics performers in the country, as well as sky divers and Warbirds.



Steve Brueske talks with an aviation enthusiast.

The NWS booth was set up in a large hangar and featured an inflated weather balloon and instrument package, hands-on tornado machine, Wisconsin weather statistics, real-time weather information display, and much more.

WINGS OVER WAUKESHA AIRSHOW
AUGUST 27TH & 28TH, 2011

For more information about this event, visit the official website:
www.wingsoverwaukesha.com

2011 Wisconsin State Fair

By Marc Kavinsky

For the third successive year, the National Weather Service serving south central and southeast Wisconsin staffed an exhibition booth at the Wisconsin State Fair. With cooperation from the Wisconsin Department of Natural Resources, the NWS was allowed to share space in the south pavilion of the DNR Park at the state fairgrounds. The DNR Park is located just west of the Wisconsin Exposition Center.

New this year to the NWS exhibition booth was an inflated weather balloon and an accompanying radiosonde. The radiosonde is the instrument package carried aloft by a weather balloon. The package consists of a radio transmitter, GPS, temperature, humidity and pressure sensors. The data obtained from this instrument gives meteorologists a valuable, near real-time picture of the atmosphere, up to nearly 100,000 feet above the ground.

Also on display were our tornado simulation chamber and a variety of All-Hazards NOAA Weather Radios.

NWS MKX 2011 State Fair Exhibit

Of the 800,000 people who attended the eleven day run of the fair, an estimated 10,000 people stopped by the NWS exhibition booth. Besides the tornado chamber, the MKX website display and office PowerPoint presentation were popular attractions.

The 2011 Wisconsin State Fair ran from Thursday, August 4th through Sunday, August 14th.

NWS Meteorologists Steve Davis (left) and Ashlie Sears (right) talk to a fan.

New MKX Employees

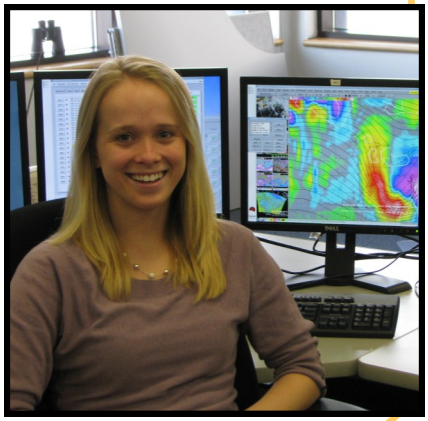
A New Electronic Technician and Three New Meteorological Interns

Tim Enright — Electronic Technician

Tim comes all the way from Turkey, and previously held a position in the Air Force as an Air Traffic Control and Landing Systems (ATCLAS) Section Chief. Originally from Connecticut, Tim had a 22 year career with the United States Air Force and has an extensive radar background. As a ATCLAS Section Chief, Tim supervised multiple technicians and managed the maintenance operations and budget for over 100 air traffic control equipment assets while assigned in Turkey. Specifically, equipment consisted of radar, instrument landing systems, and ATC radios. While in the Air Force, Tim has visited Turkey, the Republic of Panama, England, the Republic of Honduras, and has traveled across the United States. Tim is filling a spot left open by Chris Kornkven who accepted a position as an Electronic Systems Administrator at the NWS office in Grand Junction, Colorado.

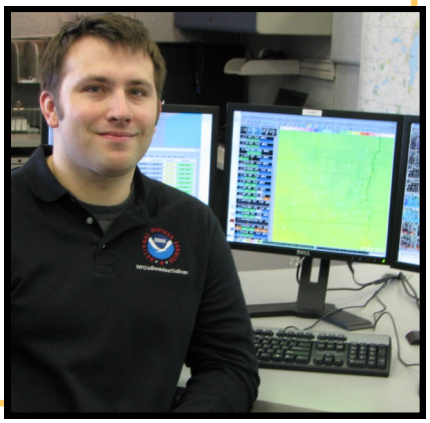
Morgan Brooks — Meteorologist Intern

Morgan comes to Wisconsin from the Eastern Shore of Maryland. However, she spent the last four years studying at North Carolina State University, where she earned a Bachelor's degree in Meteorology with a minor in Physics. During her time as a student, she volunteered at the National Weather Service office in Sterling, VA. While she was there, she performed a verification study of Small Craft Advisories issued by the office. The results were later used in operations and presented at a National Weather Association Annual meeting. The following year Morgan joined the Raleigh, NC Weather Forecast Office as a Student Career Experience Program (SCEP) student. During her time at Raleigh, Morgan became fully trained on intern duties and worked several shifts a week. She also worked with Raleigh's Science Operations Officer to construct a lightning flash density climatology of North Carolina using ArcGIS and Excel. Morgan is filling a spot left open by Penny Zabel, who accepted a position at the NWS office in Corpus Christi.



Ed Townsend — Meteorologist Intern

Ed is originally from Upstate NY and most recently comes from Grand Forks, ND. Ed is a graduate of the State University of New York at Oswego, where he received a Bachelor's in Meteorology (Spring 2008). Ed received his first experience with the NWS while completing his undergraduate degree through a Student Temporary Employment Position (STEP) at the Anchorage Forecast Office. Afterward, Ed attended the University of North Dakota and earned a Master of Science degree in Atmospheric Sciences (Summer 2011). Ed's research and thesis focused on coupling data from multiple observation platforms (surface observations and radar) to improve wintertime estimates of precipitation occurrence and rate. In addition, Ed completed research on unmanned aircraft systems where he focused on analyzing Sentinel radar data, collected from a field mission, to develop an airspace climatology. While completing his graduate degree, Ed worked at the Grand Forks Forecast Office as part of the Student Career Experience Program (SCEP). Ed is filling a spot left open by Chris Kuhlman, who accepted a position at the NWS office in Phoenix.



Olivia Kellner — Meteorologist Intern

Olivia is from Indianapolis, Indiana and began working at the Milwaukee/Sullivan office after completing the SCEP program and obtaining her Master of Science degree from Purdue University in August 2011. She obtained her undergraduate degree from Ball State University in 2008. At both universities her research focused on land atmosphere interactions with convection and tropical meteorology and incorporated GIS and the WRF model. Severe convective weather is her primary forecast passion after completing two field courses in the Great Plains in 2005 and 2006, during which she forecasted and chased severe storms all across the plains for a month at a time. Olivia is filling a spot left open by Ashlie Sears, who accepted a position at the NWS office in NYC.

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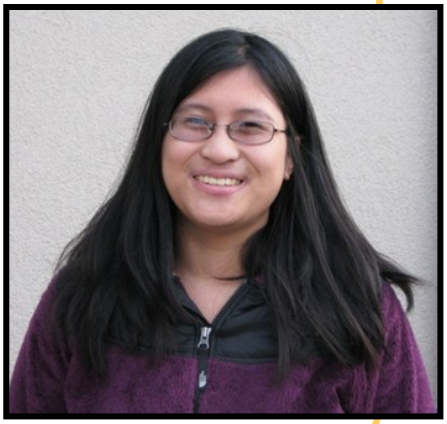
Student Volunteers

Ashley Walz

Ashley Walz, a sophomore at the University of Wisconsin-Milwaukee, began volunteering at the office in November. So far, Ashley has worked with Service Hydrologist, Brian Hahn. She has created monthly total precipitation and snowfall maps in ArcGIS and while she is here she will also perform database management tasks. As a part of database management, Ashley will sort through and consolidate a host of local observation stations. Also, she will work with Warning Coordination Meteorologist, Rusty Kapela, on storm data. Ashley is currently majoring in Atmospheric Science and minoring in Geology. She hopes to become a Student Career Experience Program (SCEP) student at a National Weather Service Forecast Office. After graduation, she would like to become a full time government employee, possibly at a National Weather Service Forecast Office.

Brigette Lim

Brigette is a sophomore majoring in Computer Science at Loyola University Chicago. She found out about the local volunteer program via a Top News Story on the office website. Brigette has been working on forecast verification scripts with Information Technology Officer, Jerry Wiedenfeld. The verification scripts are used for various forecasted meteorological parameters including temperature, dew point, and probability of precipitation. She has constructed a script that will allow forecasters to evaluate the accuracy of their forecast for different time periods. These scripts rate the average forecast difficulty, mean absolute error in the forecast, and percent improvement over model output statistics. In the future, Brigette would like to join a National Weather Service Forecast Office as a Student Career Experience Program (SCEP) student. She is also contemplating furthering her education with graduate school.



Want to be a volunteer?

Announcements are typically placed in the Top News section of our website, so keep an eye out! For further information contact our office at: w-mkx.webmaster@noaa.gov.

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Weather Brew Vol. 3 Issue 2
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Stephen Brueske	*Meteorologist-In-Charge*
Kathy Elliott	*Administrative Support Assistant*
Rusty Kapela	*Warning Coordination Meteorologist*
Jeffrey Craven	*Science Operations Officer*
Brian Hahn	*Service Hydrologist*
Jerry Wiedenfeld	*Information Technology Officer*
Curt Backlund	*Electronic System Analyst*
Rudy Schaar	*Data Acquisition Program Manager*
Steve Hentz	*Senior Forecaster*
Steve Davis	*Senior Forecaster*
Marc Kavinsky	*Senior Forecaster*
Bob McMahon	*Senior Forecaster*
Mark Gehring	*Senior Forecaster*
Marcia Cronce	*General Forecaster*
Paul Collar	*General Forecaster*
James Wood	*General Forecaster*
Denny VanCleve	*General Forecaster*
Jake Wimberley	*Meteorologist Intern*
Morgan Brooks	*Meteorologist Intern*
Ed Townsend	*Meteorologist Intern*
Olivia Kellner	*Meteorologist Intern*
Travis Unkel	*Electronic Technician*
Tim Enright	*Electronic Technician*

Comments and suggestions are always welcome. Your feedback is important to us.