



THE CLIMATE OBSERVER

September 6, 2012

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NWS Meteorologists Use Spare Time for Climate Work

National Weather Service Northern Indiana Climate Team



Northern Indiana NWS County Warning Area

When you think of a National Weather Service (NWS) Forecast Office, you might envision a group of dedicated men and women who work tirelessly 24/7, including holidays, preparing critical weather forecasts and issuing life-saving warnings. Despite all the time, work and stress required to complete these duties, many of these same meteorologists also act as “pseudo-climatologists”. In addition to their regular duties, they also perform daily climatological duties, work on climate related research projects, and answer a multitude of climate related questions from the public and media. This article describes the climate work at one particular NWS office, WFO Northern Indiana (KIWX).

Climate duties vary from one NWS office to another based on the needs of the local population. At KIWX, routine climate duties include the issuance of daily climatological reports (NWS PIL CLI) three times per day. Information in these daily reports are used by local newspapers, television and radio stations to inform their customers about high and low

temperatures, precipitation, and even heating and cooling degree days. The daily climate product is one of the most used routine products issued by NWS offices (we know this because of the number of phone calls received if this product is delayed or by some slight chance contains an error). The Northern Indiana office also issues monthly (CLM), seasonal (CLS) and annual (CLA) climatological reports with descriptive summaries of important and interesting weather conditions that occurred during those periods.

CLIMATE REPORT							
NATIONAL WEATHER SERVICE NORTHERN INDIANA							
126 AM EDT WED SEP 5 2012							
.....							
...THE FORT WAYNE CLIMATE SUMMARY FOR SEPTEMBER 4 2012...							
CLIMATE NORMAL PERIOD 1981 TO 2010							
CLIMATE RECORD PERIOD 1897 TO 2012							
WEATHER ITEM	OBSERVED TIME VALUE	(LST)	RECORD YEAR VALUE	NORMAL VALUE	DEPARTURE FROM NORMAL	LAST YEAR	
.....							
TEMPERATURE (F)							
YESTERDAY							
MAXIMUM	87	235 PM	95	1983	80	7	76
MINIMUM	65	411 AM	42	1997	57	8	58
				1946			
AVERAGE	76				69	7	67
PRECIPITATION (IN)							
YESTERDAY	T		4.17	1918	0.09	-0.09	0.04
MONTH TO DATE	0.81				0.39	0.42	0.11
SINCE SEP 1	0.81				0.39	0.42	0.11
SINCE JAN 1	19.67				27.23	-7.56	31.22

Example of daily climatological report (CLI) from KIWX.

On the Road:

- OH** - Great Lakes Week
- GA** - 2nd Annual CDC and NOAA Joint Symposium on Climate and Health
- WI** - Climate Impacts Strategy
- IL** -Prairie Lightning Mini-Symposium
- MI** -Carbon, Energy and Climate Conference
- MN** - Great Lakes Sea Grant Network Meeting
- WI** -National Weather Assn. Annual Conference

Each NWS office typically designates one person as the primary local climate program manager. This person is responsible for ensuring all local climate products are accurate and issued in a timely manner. This person also serves as the local liaison who works directly with media partners, state climatologists and other NWS offices. The Northern Indiana office has also formed a climate team made up of several local meteorologists who have an interest in climate data. These "pseudo-climatologists" perform local studies and write articles for the office web page and even climatology journals (sometimes they even write articles for really good newsletters). The team concept allows for faster responses to climate related inquiries when the primary program manager is away from the office. The team concept also allows for more local climate

projects to be completed with the workload divided between team members.

Since NWS meteorologists work rotating shifts, the team concept means there is usually at least one person from the climate team working on any given day, year round. What other government agency can answer phone calls, reply to email inquiries or conduct media interviews on holidays or in the middle of the night? The NWS Northern Indiana climate team prides itself on exemplary service by

Just How Dry and Warm has this Spring been?

This spring was marked by very dry conditions and above normal temperatures across the area. We decided to take a look at precipitation and temperature values for Fort Wayne and South Bend to assess how warm and dry this spring actually was compared to past years.

Not only were conditions very dry across the area but temperatures were very warm during the spring. The hottest all time May temperature records were set on May 27th at both Fort Wayne and South Bend. Fort Wayne reached 96 degrees which broke the old record of 95 degrees set on May 27, 1911. South Bend reached 97 degrees which broke the old record of 96 set on March 31, 1934. Incredibly, the average temperature in April was cooler than March, albeit still slightly above normal at both Fort Wayne and South Bend.

Top 10 Driest Springs on Record (March 1 - May 31)

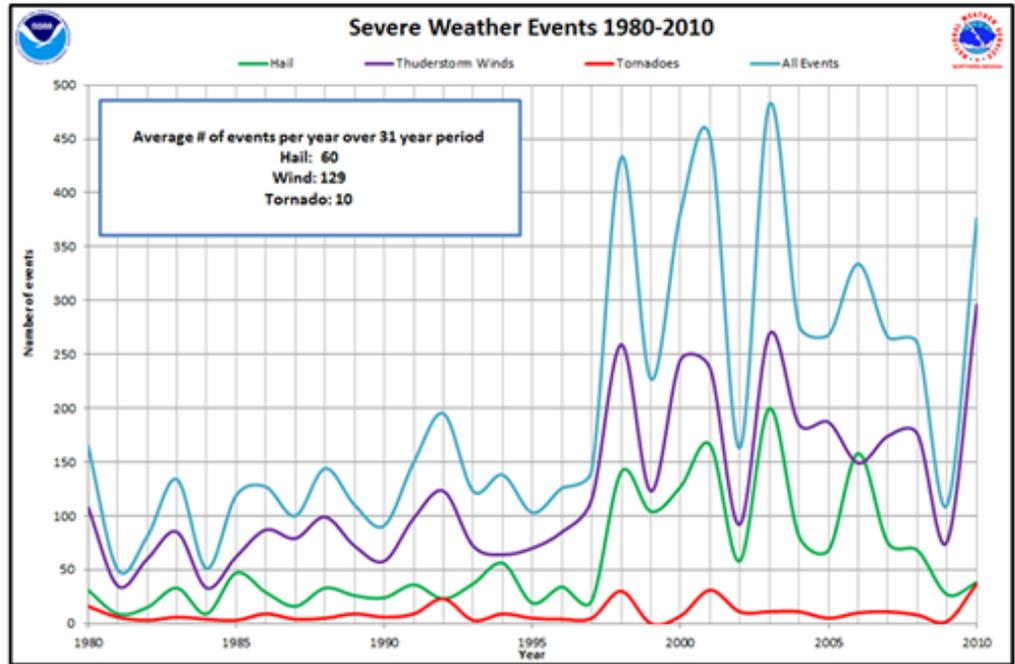
Fort Wayne	Rank	South Bend
10.50"	Normal	9.48"
5.07" - 1958	1	4.24" - 1971
5.25" - 2012	2	4.25" - 2005
5.31" - 2005	3	4.40" - 1994
5.39" - 1932	4	4.42" - 1958
5.54" - 1941	5	5.37" - 1900

Snapshot of a climate article from the KIWX webpage.

answering all climate requests as soon as possible, no matter what day of the year or time of day.

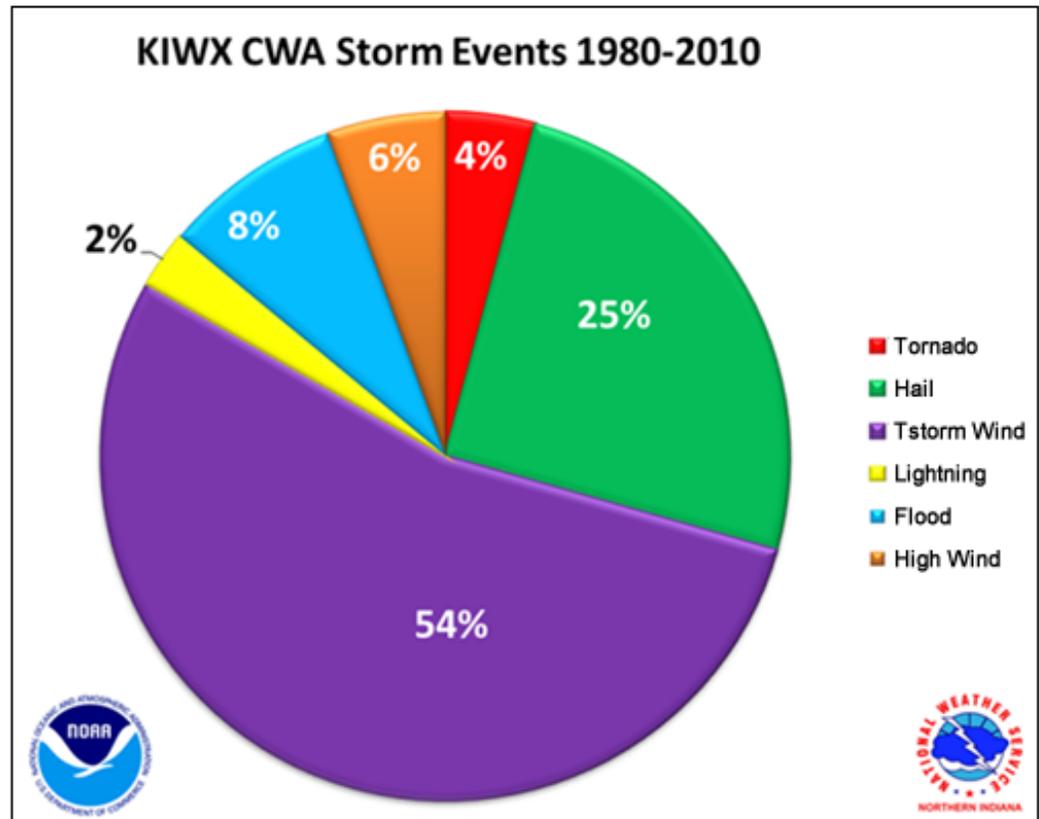
Senior Meteorologist Sam Lashley is the Climate Program Manager at the Northern Indiana office. The climate team members include meteorologists Nick Greenawalt, Courtney Obergefell, Evan Bentley and Mark Steinwedel (who all contributed to this story). The team is open to anyone in the office but this specific group has shown keen interest in climate related projects and a thirst to look at past historical trends and data to create interesting stories and research projects. A miniscule sample of their work is detailed below but many of their web articles on local historical climate data for Northern Indiana, Southwest Lower Michigan and Northwest Ohio can be found at: http://www.crh.noaa.gov/news/display_cmsarchive.php?wfo=iwx .

A major project recently completed involved a climatology study of severe weather during the 31-year period of 1980-2010 for the Northern Indiana Country Warning



Severe weather for the Northern Indiana County Warning Area from 1980-2010.

Area (KIWX CWA). This served as an update to an earlier paper written in 1999. The main focus of the study was on tornadoes, hail (1" diameter or larger), and severe thunderstorm winds (58 mph or greater), but also included other weather phenomena. The results found that severe thunderstorm winds and associated wind damage accounted for roughly 54% of all severe weather with hail in second place



Northern Indiana County Warning Area storm events by type from 1980-2010.

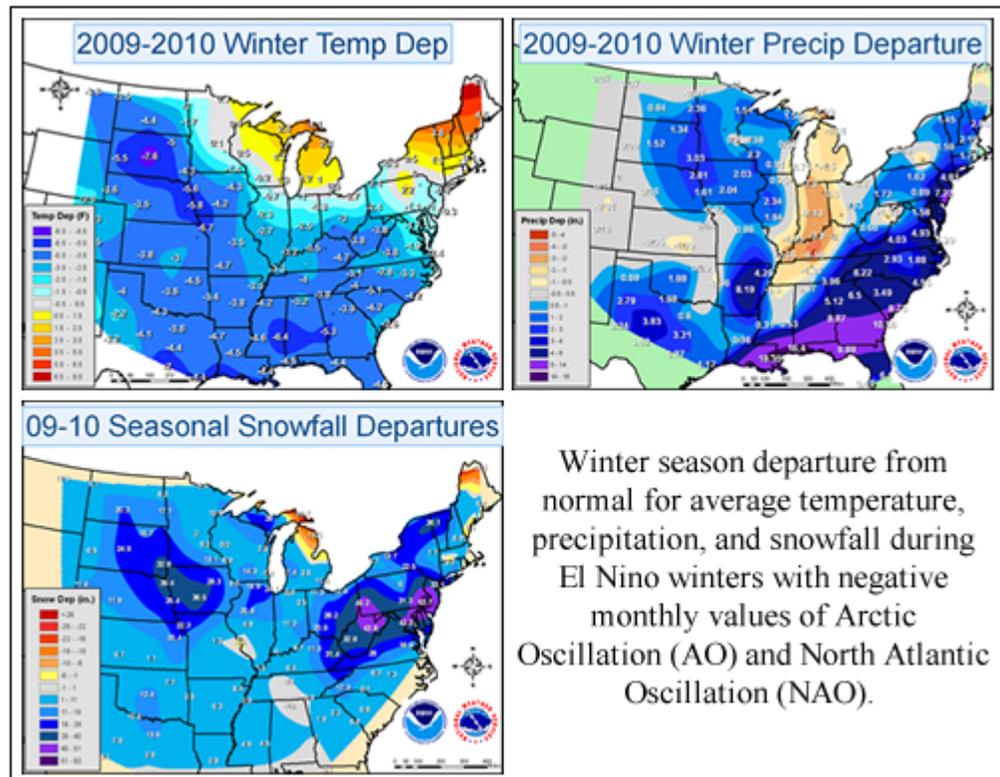
at 25%. This was followed by flooding at 8%, non-thunderstorm winds at 6%, tornadoes at 4%, and lightning at 2%. The data also revealed a secondary peak in severe weather during the October to November time frame, accounting for a short autumn severe weather season. Lastly, we found that the frequency and occurrence of severe weather

was biased toward more populated counties which can largely be attributed to the fact that more storm reports are received from more densely populated areas. The results of this study will go a long way in strengthening our situational awareness and understanding of the type, frequency, time and location of future severe weather events. We hope to have the paper explaining these results published in the near future, but in the meantime, some of the results can be found on our website at <http://www.crh.noaa.gov/iwx/?n=svrwxclimo>.

While many meteorologists thrive on forecasting and witnessing severe weather, some meteorologists love the significance of extreme climate. Keeping track of climate records is another function of the Northern Indiana climate program. The office is responsible for managing two first order climate sites in Indiana: Fort Wayne and South Bend, with climate records dating back to 1897 and 1893 respectively. The office is also responsible for collecting and managing data for several cooperative observer sites in southern Lower Michigan, northern Indiana and northwest Ohio.

Daily, monthly and annual weather statistics and records are compiled from data obtained through the Regional Climate Centers and the National Climatic Data Center. This information is used to produce web pages highlighting significant climate extremes and trends. During a time of seemingly "boring" weather this summer, the KIWX climate team stayed very busy with questions and research projects related to the extreme heat and drought. The most efficient way to compile data and make it accessible to our customers was through a top news story found on all NWS webpages. For the majority of the summer, heat and drought related stories were posted to the KIWX webpage, which was then updated on a daily basis due to the high demand for the latest data.

Members of the KIWX climate team have also looked into how much influence the El Niño/La Niña Southern Oscillation (ENSO), Arctic Oscillation (AO), and North Atlantic Oscillation (NAO) have had on winter weather synoptic patterns across the Great Lakes and Midwest. Results across the region varied and were researched by comparing climate data (area LCD's), such as temperature and precipitation



Snapshot from the KIWX analysis on teleconnections and winter synoptic patterns.

departures from normal, with the teleconnection indices. There were a few trends in the data that stood out. One such trend was the more obvious correlation between ENSO and precipitation anomalies, with the Southern Oscillation having a greater influence on

the subtropical jet and moisture transport into the Eastern United States. On the other hand, the NAO/AO indices correlated relatively well with temperature anomalies, and to some extent snowfall departures. Unfortunately, the predictability of the AO/NAO beyond two weeks is low, while the ENSO cycle can be forecast well in advance. This makes long range winter forecasting very difficult across the region.

Working on local climate projects and writing articles on local historical trends is fun and interesting, yet challenging. The challenge is often a product of our skill level and training since we are still meteorologists and not climatologists. We do not necessarily possess the training or knowledge of highly skilled climatologists who may better understand the statistical significance of raw data and how to correctly analyze it. This is why interdisciplinary collaborative partnerships between meteorologists, climatologists and even sociologists are important to help bridge the gap and better understand the relationship between weather patterns, climate data and people. In Indiana, we have recently organized the Indiana State Climate Team, made up of NWS meteorologists, the Indiana State Climate Office, broadcast meteorologists, Department of Natural Resources, and several other institutions with weather and climate related issues. Our hope is to fuse our individual knowledge and skills into a cohesive pool of expertise, which will allow us to solve many climate related problems that we may encounter.

For more information on the Northern Indiana NWS office or this article, please contact Sam Lashley via email at sam.lashley@noaa.gov

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Wisconsin Initiative on Climate Change Impacts

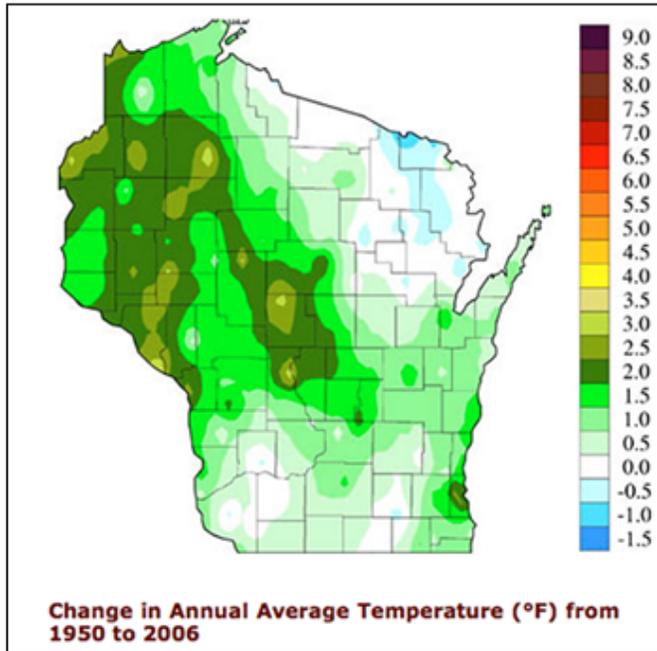
Carolyn Rumery Betz, WICCI Program Manager

Earlier this summer, the Wisconsin Initiative on Climate Change Impacts (WICCI) was happy to host Beth Hall and Mike Timlin as part of MRCC's four-state tour. The two were interested in learning more about how Wisconsin is approaching climate change and is developing a strategy for adaptation management.

WICCI was formed in 2007 through a partnership between the University of Wisconsin-Madison and the Wisconsin Department of Natural Resources, and now includes numerous state agencies and institutions, federal agencies, NGOs, tribal organizations, professional associations and businesses. About 200 scientists, policy-makers, natural resource managers and educators comprise WICCI. The organization assesses recent and anticipated climate change impacts on Wisconsin's natural and built environments, human health, industry, tourism and other activities, and develops and recommends adaptation strategies.

The organizational structure serves as a model to other states who are interested in developing a collaborative effort that blends science and policy-making. All of our efforts are based on grass-roots participation of members who volunteer their time and expertise. WICCI is governed by a *Science Council* co-chaired by Dan Vimont, Associate Professor of Atmospheric and Oceanic Sciences at the University of Wisconsin-Madison, and Dick Lathrop, Research Scientist at the Department of Natural Resources. Its *advisory committee* is made up of members representing a variety of interests including the insurance industry, recreation industry, businesses, educators and others who may be affected by our changing climate. The *Operations and Outreach* group takes care of daily activities including maintaining our website, preparing a newsletter, staffing





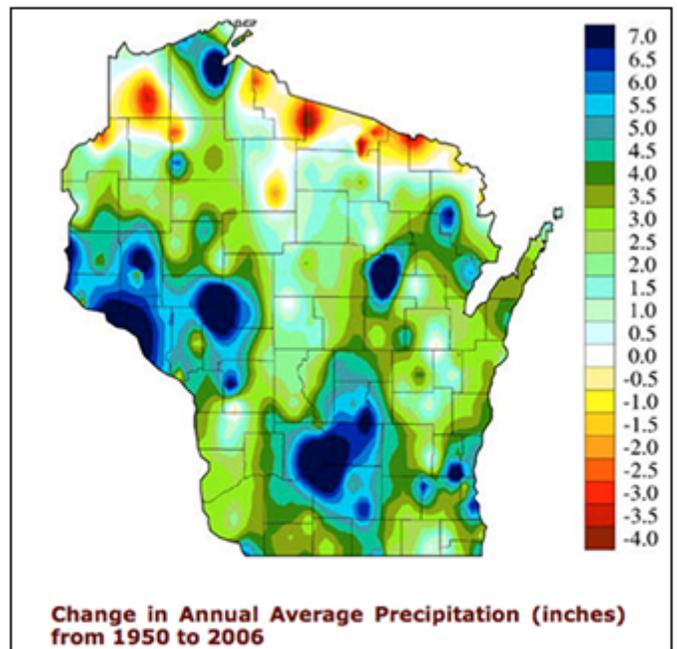
Except for northeastern Wisconsin, most of Wisconsin has warmed since 1950. Averaged across the state, the warming has been +1.1°F, with a peak warming of 2-2.5°F across northwest Wisconsin. Wisconsin is becoming "less cold", with the greatest warming during winter-spring and nighttime temperatures increasing more than daytime temperatures.
 Source: Wisconsin Initiative on Climate Change Impacts

regularly scheduled meetings, writing grant applications and disseminating information to user groups. The bulk of work is done through sixteen *working groups* organized around natural resource topic areas such as Agriculture, Water Resources, Stormwater and Forestry or geographic locations such as Green Bay and Milwaukee.

Each working group prepared reports in 2010 on climate change impacts and adaptation strategies that were collated into the state's first assessment report, *Wisconsin's Changing Climate: Impacts and Adaptation*. The report, published in February 2011, is available on our website, www.wicci.wisc.edu or in print upon request.

WICCI is now moving into its second phase of working on more place-based regions of the state, including the Driftless Area in southwest Wisconsin and on the Northern Forested region. Our additional priority is to disseminate our findings about climate change impacts and adaptation strategies to the public, resource managers, educators and specific communities. The group has made hundreds of presentations about climate change to a wide variety of groups and has provided educational workshops to 120 managers at the Department of Natural Resources and all of the University of Wisconsin's Extension Agents. WICCI is also interested in forming more regional partnerships in the Midwest and in the Great Lakes Basins.

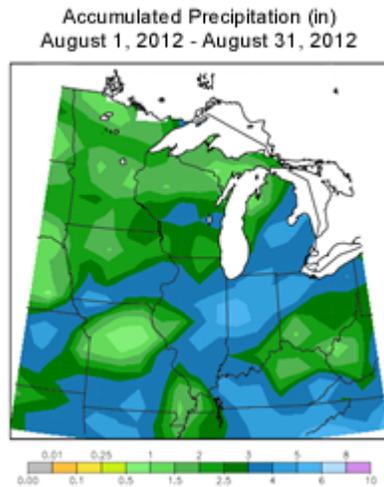
If you would like to learn more about WICCI, please check out their website, www.wicci.wisc.edu, or contact Carolyn Betz at cbetz@wisc.edu.



From 1950 to 2006, Wisconsin as a whole has become wetter, with an increase in annual precipitation of 3.1 inches. This observed increase in annual precipitation has primarily occurred in southern and western Wisconsin, while northern Wisconsin has experienced some drying.
 Source: Wisconsin Initiative on Climate Change Impacts

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Midwest Climate at a Glance - August



August was much different from the previous summer months, with precipitation returning to some portions of the Midwest that were significantly deprived of rainfall in June and July and widespread near normal temperatures across the region.

The highest precipitation amounts of 3" or greater were found in a band that stretched from southeast Missouri up through northern Ohio and eastern Michigan, bringing precipitation to many drought-stricken areas. For many locations across the Midwest, August broke a string of warmer than normal months that have been trending since last fall. Overall, average temperatures were close to normal across a majority of the region during August. [Read more...](#)

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MRCC Product Highlight

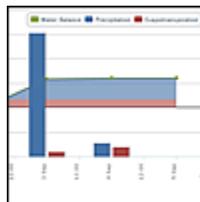


The [Be a Weather and Climate Watcher](#) activity will inspire a student's interest in the day-to-day weather as well as climate by giving them the opportunity to measure and observe the weather on a daily basis. The activity includes information on how to build your own weather station, activity instructions and materials, some creative and fun ideas to expand upon the information that has been collected, and pre-activity information sheets for both the teacher and students. This educational resource was developed through support from the

Midwestern Regional Climate Center, Illinois-Indiana Sea Grant program, and the Illinois State Water Survey.

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Climate Cool Tool



[Water Balance charts](#) are now available for selected locations in the U.S. thanks to the Community Collaborative Rain, Hail and Snow network (CoCoRaHS) at Colorado State University. Daily precipitation and grass-reference evapotranspiration (ET_o) are currently monitored and reported by volunteers at over 100 locations. The charts simply show the difference between accumulated precipitation and accumulated evapotranspiration, making it very easy to visualize the onset and continuation of drought as well as drought recovery.

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MRCC On The Road



Cleveland, OH (Sept. 10-12) - Great Lakes Week

Molly Woloszyn will be representing the MRCC at Great Lakes Week, which is an effort to consolidate the numerous annual meetings of many Great Lakes organizations. It is a combined meeting of the Great Lakes Commission, International Joint Commission, Healing our Waters Coalition (HOW) and the annual Area of Concern conference with a bit of the Great Lakes Restoration Initiative added in.

Atlanta, GA (Sept. 12-13) - 2nd Annual Centers for Disease Control (CDC) and NOAA Joing Science Symposium on Climate and Health

Nancy Westcott will be giving a talk entitled "Climate, Weather and West Nile Virus in Illinois."

Racine, WI (Sept. 12-14) - Climate Impacts Strategy

Beth Hall will be an invited participant to discuss the impacts of climate change and variability, including frequency and magnitude of such impacts, in order to prepare for these impacts in our changing world.

Champaign, IL (Sept. 20) - Prairie Lightning Mini-Symposium

Come visit the MRCC at the Prairie Research Institute's Mini-Symposium at the Illini Union on the University of Illinois campus! Students, faculty, staff, and community members are invited to enjoy a morning of fast-paced lightning talks and posters by the scientists of the Prairie Research Institute (which is comprised of the Illinois Natural History Survey, Illinois State Archaeological Survey, Illinois State Geological Survey, Illinois State Water Survey, and the Illinois Sustainable Technology Center). If you are interested in attending, [click here for more information](#).

Hickory Corners, MI (Sept. 26-28) - Carbon, Energy and Climate Conference

Molly Woloszyn will be attending and presenting at the North Central SARE (Sustainable Agriculture Research & Education) Carbon, Energy, and Climate Conference. This conference is the kick-off event for a two-year professional development and training initiative around climate and energy issues by the North Central SARE program. Molly will be speaking about the role of the Regional Climate Centers in climate service and opportunities for collaboration.

Duluth, MN (Oct. 2-5) - Great Lakes Sea Grant Network Meeting

Molly Woloszyn, who shares a joint position with the MRCC and Illinois-Indiana Sea Grant, will be attending the 2012 Great Lakes Sea Grant Network Meeting in Duluth. At this meeting, she will be co-coordinating a half-day workshop for meeting attendees called "Gearing up for Change: Climate Training for Outreach Professions." In addition to organizing and presenting at the workshop, she will also have the opportunity to network with other extension educators in the Great Lakes region.

Madison, WI (Oct. 6-11) - National Weather Association Annual Conference

Mike Timlin will be presenting a lecture on climate information and resources to broadcast meteorologists as well as a poster on some of the climate tools available to the public through the MRCC.

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[Email us](#) your local climate impacts! We are constantly keeping a log of how climate is impacting our region, and our information would not be complete with YOUR help!

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The MRCC is a partner in a national climate service program that includes the [NOAA National Climatic Data Center](#), [Regional Climate Centers](#), and [State Climate Offices](#).

MRCC is based at the Illinois State Water Survey, a division of the Prairie Research Institute

at University of Illinois Urbana-Champaign.
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