



# THE CLIMATE OBSERVER

A publication of the Midwestern Regional Climate Center

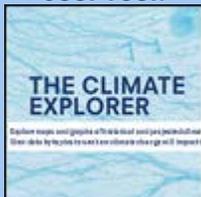
November 2016

## MRCC Product Highlight:



[Snowfall Climatology Tool](#)

## Climate Cool Tool:



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## Indoor Radon Concentrations – Does Climate Have Any Influence?

Dr. Beth Hall, MRCC and Leslie Stoecker, MRCC

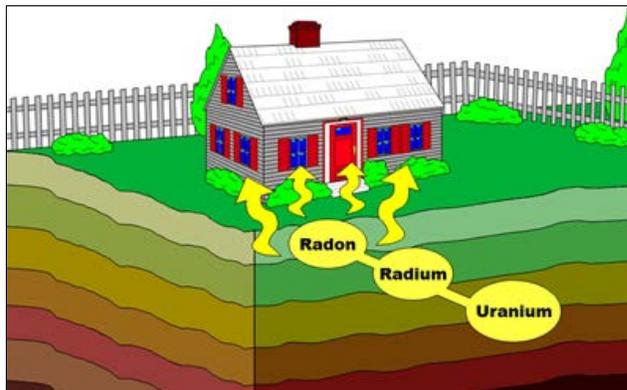


Figure 1. How radon develops and enters a home.

Source: [Homewiseinspections.com](#)

If you have ever bought or sold a house, or know someone who has, you may have heard of indoor radon tests that are often required for the transactions. Radon is a gas that comes from the ground and can eventually escape into the atmosphere. This is a natural process due to the breakdown of

uranium, and humans have been exposed to it for a very long time (Figure 1). There are concerns, however, that in confined spaces (for example, a building), the radon concentration could increase to dangerous levels. This is a serious concern since radon is a cancer-causing, radioactive gas that is the [second leading cause of lung cancer](#) in the United States. The [EPA states](#) that when a home's radon level is near or above 4 pCi/L, it has reached a dangerous level and that mitigation efforts should be taken to reduce the radon concentration.



Conventional wisdom, for literature is lacking on the subject, has assumed that indoor radon concentrations may be higher in the winter season. This could be due to in-ground radon preferring to travel a path toward warmer temperatures, and in winter, homes are often heated. However, indoor radon tests around Champaign County, Illinois (Figure 2) during the winter of 2013-14 suggested the opposite trend – indoor radon concentrations seemed to decrease for most homes as the winter progressed!

Figure 2. Location of Champaign County, Illinois where indoor radon concentrations were collected from 4 different research studies since fall 2013

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**On the Road:**

**FL** - Weather & Climate Decision Tools

**IA** - Midwest DEWS Regional Workshop #2

**IL** - Calumet Stormwater Collaborative, Midwest DEWS

Regional Workshop #3

**MO** - Missouri Crop Mgmt. Conference

**MN** - Midwest DEWS Regional Workshop #1,

Northern Plains Winter Weather Workshop

**OH** - Midwest DEWS Regional Workshop #4

**WA** - American Meteorological Society Annual Meeting

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The Illinois Emergency Management Association was intrigued with these initial findings that were collected by Dr. Paul Francisco's Indoor Climate Research and Training program at the University of Illinois at Urbana-Champaign. They offered to fund further research with his group and the Midwestern Regional Climate Center to see if there were environmental relationships to indoor radon concentrations across the county. Key questions explored included:

- Are indoor radon concentrations seasonally different?
- Does data support the current "conventional wisdom" that indoor radon concentrations are higher in the colder months?
- What atmospheric and/or soil parameters influence radon concentrations the most?

If environmental relationships were discovered from this study, then the contextual understanding of indoor radon would improve along with possible policy implications with respect to the seasonal timing of indoor radon testing.



*Figure 3. A radon sampling instrument like those deployed in the study's homes.*

Radon sampling devices were deployed in 15 homes throughout Champaign County and recorded data from April through August 2016 (Figure 3). Champaign County is in the [EPA's highest radon risk zone](#). Atmospheric data such as temperature, winds, precipitation, air pressure, and atmospheric humidity from weather stations across the county were also collected along with soil temperature and moisture data at varying depths.

Data are still being analyzed, but initial findings suggest that there are many other factors that could influence indoor radon concentrations beyond atmospheric and soil conditions. While the soil parameters showed stronger correlations to indoor radon concentrations for some homes, the correlations were inconsistent across the

region. No atmospheric nor soil parameter had consistently strong correlations with indoor radon concentrations across all homes. Individual homes were more likely to have strong correlations with many different parameters rather than certain parameters having strong correlations across many locations. This suggested that the structural and siting characteristics of homes may have a stronger relationship to indoor radon concentrations than any particular environmentally changing parameter. Further analysis is needed, however, to better understand the environmental and structural factors that influence indoor radon concentrations. Initial results suggest that indoor radon may be higher in the fall season (Figure 4), and this could be due to ground conditions transitioning from the wetter growing season to the colder, possibly frozen season.

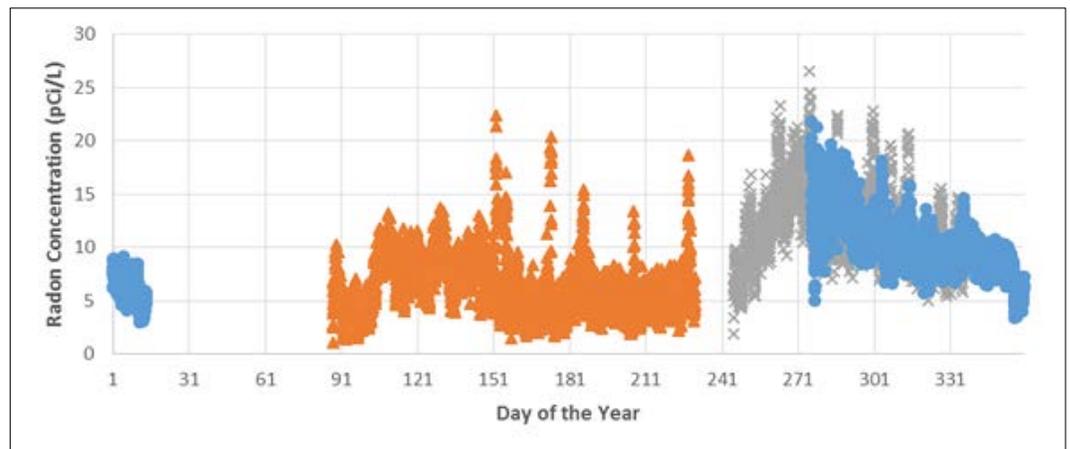


Figure 4. Indoor radon concentrations from 3 different study periods (2013, 2014, 2016) in Champaign County, Illinois. Trends show higher concentrations may occur in the fall months.

For more information on this article or the [Midwestern Regional Climate Center](#), please contact Dr. Beth Hall via email at [bethhall@illinois.edu](mailto:bethhall@illinois.edu).

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## The Development of a Midwest Drought Early Warning System

*Courtney Black, NIDIS and Molly Woloszyn, MRCC*

The National Integrated Drought Information System (NIDIS) and its partners launched the [Midwest Drought Early Warning System](#) (DEWS) in early 2016. The mission of the Midwest DEWS is to advance drought early warning and resiliency in the Midwest region (Figure 1) by improving the ability for communities to collaborate, plan, and be prepared for drought; understand the relationship between drought and high precipitation events; better utilize available tools and climate forecasts; and to proactively identify, mitigate,

and respond to drought impacts. The Midwest DEWS is a collaborative federal, tribal, state, and local interagency effort.

*Figure 1, right: The Midwest DEWS activities will focus on areas throughout the upper Mississippi River and Ohio River basins in Minnesota, Iowa, Missouri, Wisconsin, Illinois, Indiana, Kentucky, and Ohio.*



The [Midwest DEWS Kick-Off](#) meeting took place in St. Louis in February 2016. As a result of this meeting, the Midwest DEWS Strategic Plan is currently being developed and will be available by the end of 2016. It will provide a framework of priority actions to continue to develop and implement the Midwest DEWS over the next two years.

While much information was gathered at the kick-off meeting, more state and local information regarding the status of monitoring, drought planning, use of drought indicators and triggers, challenges and impacts of recent droughts, and drought response mechanisms would be beneficial to further inform DEWS-related actions to improve drought early warning and resiliency. Four regional workshops are being held this fall (2016) across the region, each focusing on two states. Stakeholders invited will include federal and state agencies and local entities representing a broad range of sectors (*e.g.*, energy, navigation, tourism, ecosystems, agriculture, and health). The Fall 2016 Regional Workshops location and times are below:

- Minnesota & Wisconsin Regional Workshop: November 7-8 in Rochester, Minnesota
- Iowa & Missouri Regional Workshop: November 9-10 in Cedar Rapids, Iowa
- Illinois & Indiana Regional Workshop: December 5-6 in Champaign, Illinois
- Ohio & Kentucky regional Workshop: December 7-8 in Cincinnati, Ohio



*Figure 2: Midwest DEWS Partners*

One overall goal of the Midwest DEWS is to build a diverse professional network of federal, tribal, state, and local representatives that connects climate science with water

and land resource managers, in addition to other decision makers across all economic sectors impacted by drought. The Fall 2016 Regional Workshops are aiming to continue to build this Midwest DEWS network and will result in a series of strategies to improve drought early warning and resiliency in the Midwest.

If you are interested in becoming more involved in the Midwest DEWS, or attending one of the workshops this fall, please contact Courtney Black, the NIDIS Midwest Regional Drought Information Coordinator ([courtney.black@noaa.gov](mailto:courtney.black@noaa.gov)).

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## **Great Lakes Adaptation Forum Outcomes**

### ***Great Lakes Integrated Sciences and Assessments (GLISA)***



*Kimberly Knott, Detroiters for Environmental Justice, speaks at the Great Lakes Adaptation Forum (Photo via Twitter, Nicholas Rajkovich).*

As part of its broader effort to facilitate information exchange across the Great Lakes region, GLISA and partners recently hosted the Great Lakes Adaptation Forum on October 5-7, 2016 in Ann Arbor. Titled “A Network of Networks,” the event brought together more than 150 researchers and practitioners from eight states, three countries, and numerous organizations to share climate adaptation and resilience solutions in an engaged learning program.

An opening plenary featured five “Ignite” speakers: Alex Bryan from the Northeast Climate Science Center, Kimberly Hill Knott from Detroiters for Environmental Justice, Wendy Leger from Environment and Climate Change Canada, Heather Stirratt from the National Oceanic and Atmospheric Administration’s Office for Coastal Management, and Chris Swanston from the Northern Institute for Applied Climate Science. In addition to

climate science presentations, forum participants engaged in panels, working groups, and training sessions in a lively format emphasizing collaboration and exchange.

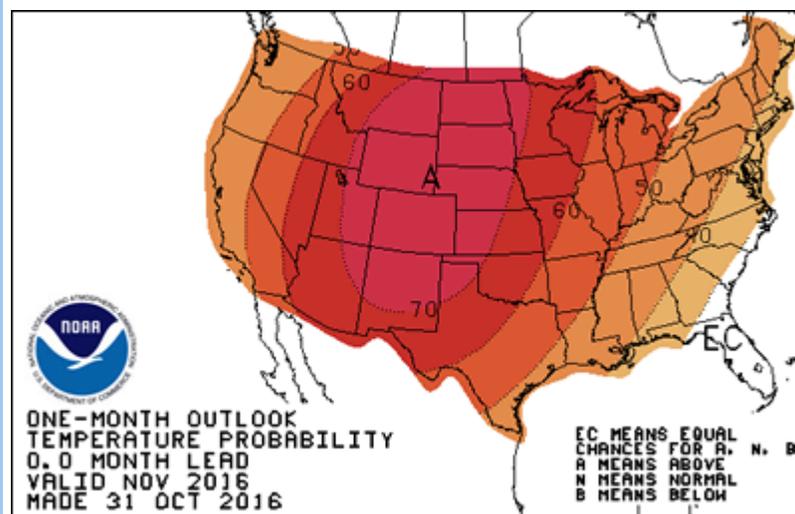
Several innovative features of the forum included a “Climate 101” session with an introduction to climate change adaptation across the United States and a deep dive into issues specific to the Great Lakes region; tours led by local experts of storm-water management innovations across Ann Arbor’s urban watershed; and a Tools Café, where event participants could gain hands-on experience with climate adaptation tools used by Great Lakes researchers and practitioners.

For more information on the event, please visit the event website:

<http://graham.umich.edu/climate/forum-2016>. For more information on this article or the Great Lakes Integrated Sciences & Assessments center, please contact GLISA at [glisa-info@umich.edu](mailto:glisa-info@umich.edu)

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## Midwest Climate at a Glance - Fall

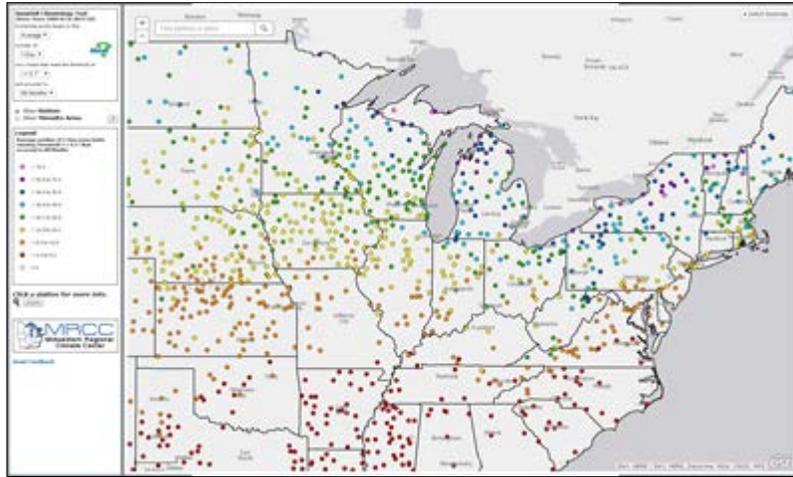


Fall of 2016 got off to a warm start with above-normal temperatures in September and October across the Midwest. The [CPC outlook](#) for November also called for an increased chance of above-normal

temperatures. September and October ranked among the warmest 10% on record (1895-2016) for each respective month. If November is indeed also above normal, the season will rank among the warmest autumns as well. Precipitation totals were generally on the dry side in October. Kentucky was the driest October spot with less than 50% of normal for nearly the entire state. Drought was introduced in southeast Kentucky during mid-October and then expanded west and north in the following weeks. [See the Midwest Climate Watch for more...](#)

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## MRCC Product Highlight

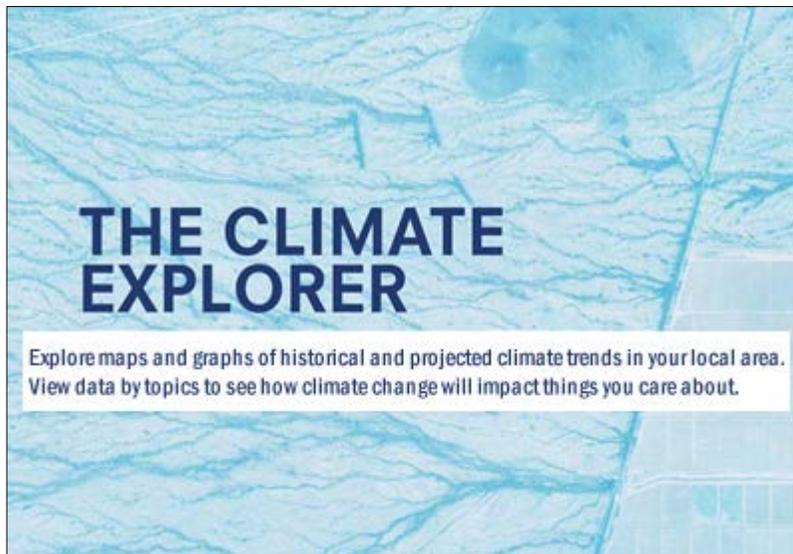


**Snowfall Climatology Tool:**  
Ever wondered what the average number of days with snowfall is at your location? What about how often two or more inches of snow usually falls in January?

The MRCC's new national [Snowfall Climatology Tool](#) can answer those questions and more! This snowfall total climatology has over 1,800 stations available nationwide. Snowfall thresholds include 0.1 (measurable), 1, 2, 3, 6, 8 and 12 inches and one-, two-, and three-day snowfall totals can be selected for any month. Use this climatology [tool](#) to help plan for the winter season!

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## Climate Cool Tool



**The Climate Explorer:**  
Individuals, businesses, and communities of all sizes can use the [Climate Explorer](#) to understand how climate conditions in their location may change over the next several decades. The

Climate Explorer offers customizable graphs and maps of observed and projected temperature, precipitation, and related climate variables for every county in the contiguous U.S. The Climate Observer was developed by NOAA and partners to accompany the [U.S. Climate Resilience Toolkit](#).

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## MRCC On The Road



### **Chicago, IL (Nov 4) – Calumet Stormwater Collaborative**

Mike Timlin will be attending the monthly Calumet Stormwater Collaborative (CSC) meeting. The CSC's core purpose is to better coordinate and increase communication on storm water management efforts in the Millennium Reserve area of Illinois.

### **Rochester, MN (Nov 7-8) – Midwest DEWS Regional Workshop (Minnesota and Wisconsin)**

Beth Hall, Molly Woloszyn, and Mike Timlin will be attending this Midwest DEWS workshop (see story above on the Midwest DEWS).

### **Cedar Rapids, IA (Nov 9-10) – Midwest DEWS Regional Workshop (Iowa and Missouri)**

Beth Hall, Molly Woloszyn, and Mike Timlin will be attending the second Midwest DEWS workshop (see story above on the Midwest DEWS).

### **St. Cloud, MN (Nov 14-15) – Northern Plains Winter Weather Workshop**

Steve Hilberg and Bryan Peake will be attending this workshop, sponsored by St. Cloud State University. Steve will be presenting on the Accumulated Winter Weather Severity Index (AWSSI) and Bryan on the MRCC's Snowfall Climatology Tool.

### **Gainesville, FL (Dec 5-7) – Weather & Climate Decision Tools for Farmers, Ranchers, and Land Managers**

Leslie Stoecker will be attending this meeting to present a poster on the MRCC's Vegetation Impact Program (VIP).

### **Champaign, IL (Dec 5-6) – Midwest DEWS Regional Workshop (Illinois and Indiana)**

Beth Hall, Molly Woloszyn, Mike Timlin, and Steve Hilberg will be attending the third Midwest DEWS workshop (see story above on the Midwest DEWS).

### **Cincinnati, OH (Dec 7-8) – Midwest DEWS Regional Workshop (Ohio and Kentucky)**

Beth Hall and Molly Woloszyn will be attending the fourth Midwest DEWS workshop (see story above on the Midwest DEWS).

## Columbia, MO (Dec 15-16) – Missouri Crop Management Conference

Beth Hall will be presenting on agricultural weather and climate tools and products in partnership with Patrick Guinan, Missouri's state climatologist.

## Seattle, WA (Jan 23-26) – American Meteorological Society Annual Meeting

Mike Timlin will be attending the 97th annual meeting, which has a theme of "Observations Lead the Way".

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The MRCC is a partner in a national climate service program that includes the [NOAA National Centers for Environmental Information](#), [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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