Midwest Climate Hub
U.S. DEPARTMENT OF AGRICULTURE

# Midwest CHU

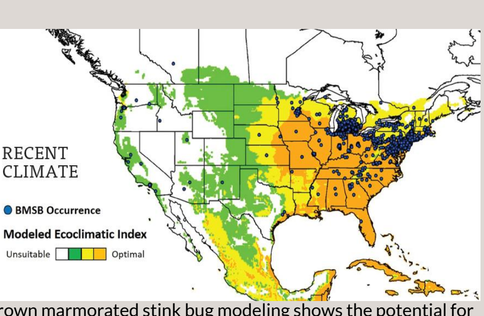
## Climate Hub Update

Fall 2018

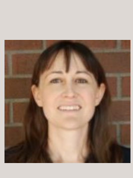
*Promoting Climate-Informed Decisions Since 2014.*

## Published: Climate Models Show Brown Marmorated Stink Bug's Growing Range of Destruction

Recently in American Fruit Grower Magazine: In less than the 20 years since its initial U.S. detection, the invasive brown marmorated stink bug (BMSB) has quickly emerged as a severe horticultural pest in the U.S. and climate change may further exacerbate agricultural losses from this pest. Using a process-oriented bioclimatic niche model, Dr. Kistner-Thomas simulated the potential distribution and abundance of BMSB under future climate change scenarios for the years 2050 and 2100. Her results indicate that crop losses from BMSB in Midwestern states may increase as rising temperatures will likely enable BMSB to further expand its range northward as well as enhance BMSB survival and reproduction. Therefore, Midwestern fruit tree growers should continue to carefully monitor BMSB populations around their orchards as future climate projections indicate the possibility for increased BMSB outbreaks in those regions.



Brown marmorated stink bug modeling shows the potential for further range expansion across the U.S., particularly in the Central and Southern states. The blue circles designate recorded BMSB occurrences.

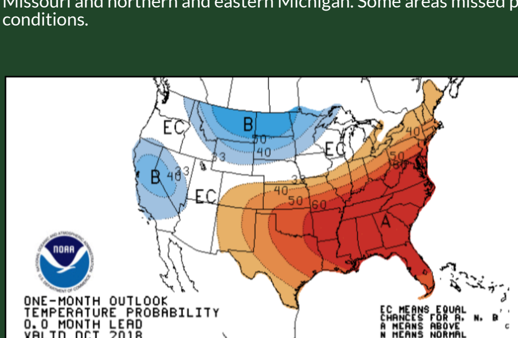


*Erica J. Kistner-Thomas is an ecologist with a strong background in invasion and population ecology and currently works for USDA Midwest Climate Hub. See all author stories here.*

# *CHU in Every Issue...*

## Midwest Ag Focus Climate Update: October 1st, 2018

Current Conditions and Impacts: Heavy precipitation in the Midwest has slowed the harvest progress and poses some yield-loss threat via molds, toxins and some stalk rots in the west areas. As soggy conditions continue, the soybean risks lodging (being knocked over) which can further delay the harvest. Drought conditions prevail over northern Minnesota, southern Iowa, most of Missouri and northern and eastern Michigan. Some areas missed precipitation or have had slow recovery from serious drought conditions.



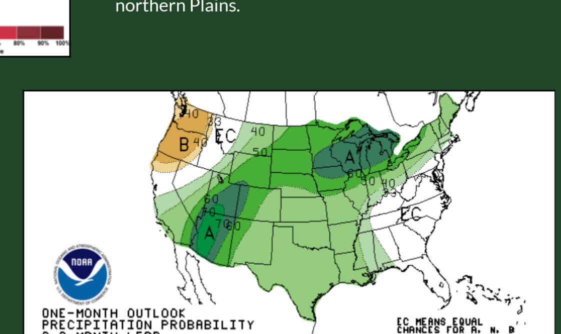

Outlook: The October climate outlook from the NOAA Climate Prediction Center indicates likely wetter-than-average conditions for the Corn Belt for at least the first half of the month with higher likelihoods further north. This will continue to cause problems for harvesting, with some areas still soggy from the previous month's rainy weather.

The precipitation could alleviate some drought conditions, but the relief will likely come too late for main crops but could help cover crops and planted winter wheat. Warmer-than-average conditions are more likely in the Ohio Valley with colder than average more likely in the northern Plains.

While the harvest will be slow for the start of October, conditions seem to be more favorable later in the month with cooler and drier days.

Current outlooks indicate a reasonable chance for El Nino conditions for the winter, with a 50-55% chance of development this fall, and increasing 65-70% chance of development over the winter months.

**For the entire Midwest Ag-Focus Outlook, select here.**




*Maps are generated at the NOAA Climate Prediction Center. Select here for more information.*

## Quarterly Climate Impacts and Outlooks

In collaboration with NOAA, NIDIS, and the Midwest Regional Climate Center, we are pleased to provide the following June 2018, Regional Outlooks and Drought Status Update. These can be accessed by clicking on their titles to the right. Select here for a list of all regions.

Missouri River Basin
Midwest Region
Great Lakes Region
Drought Status Update

## Meet the Climate Hub Partners: Justin Glisan State Climatologist of Iowa

The success of the Midwest Climate Hub in transferring management practices, decision tools and information to our stakeholders can only be achieved through coordination via a diverse array of regional partners. In that spirit, we would like to highlight one of our partners: Iowa State Climatologist, Justin Gleason.

Justin Glisan hails from St Charles, MO and from an early age was interested in weather. Some of his first memories are being terrified of thunderstorms and noticing the differences in cloud shapes before storms hit. "My father took me aside and said I could either be afraid all of my life or learn all I could about weather." So, Justin did just that and set out to learn all he could about weather. He is currently the State Climatologist of Iowa.

The job of a Climatologist is varied, and Justin is expected to wear many different hats. As the State Climatologist of Iowa, Justin issues weekly recommendations to the U.S. Drought Monitor for Iowa, writes weekly and monthly weather and climate summaries, and in general interacts with a wide variety of groups and people. One group he truly enjoys working with are farmers: "Farmers are extremely knowledgeable about weather and climate and offer valuable insight in terms of past behavior and trends."

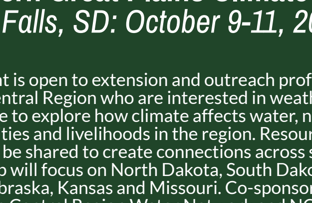
State climatologists work with the USDA Climate Hubs in many ways. Here in Iowa, Justin depends on interactions with the Midwest Hub in obtaining a more robust understanding of regional impacts. For example, during this past year's drought in southern Iowa: "The Hub has been a vital resource during my spin-up as Iowa's new State Climatologist, especially acquainting me with the community. The Climate Hub provides me with an efficient means of disseminating information as well as finding answers to questions that I may not have direct knowledge of or expertise to answer."

> "One of the best parts of my position is getting out into the state! I get to interact with various stakeholders across Iowa including farmers, individuals in the agriculture sector, universities, you name it".
>
> -Justin Glisan

IOWA DEPARTMENT OF AGRICULTURE AND LAND STEWARDSHIP

Justin has a BS and MS in Soil, Environmental and Atmospheric Sciences from the University of Missouri and a PhD in Atmospheric Science from Iowa State University, where he researched extreme temperature and precipitation events and their dynamic mechanisms. For more information on the Iowa Department of Agriculture Climatology office, or to contact Justin Glisan select here.

## On the RADAR....



### Tribal Water Workshop 2018
*Crandon, WI: October 2-4, 2018*

This workshop will focus on tribal Water Resource Management and the Clean Water Act on Oct 2-4, in Carter & Crandon, WI. More information here.

### Northern Great Plains Climate Workshop
*Sioux Falls, SD: October 9-11, 2018*

This event is open to extension and outreach professionals in the North Central Region who are interested in weather and climate, and would like to explore how climate affects water, natural resources, communities and livelihoods in the region. Resources, programs and tools will be shared to create connections across states. This workshop will focus on North Dakota, South Dakota, Minnesota, Iowa, Nebraska, Kansas and Missouri. Co-sponsors of this workshop are North Central Region Water Network and NOAA's National Integrated Drought Information System. Find out more here.

MCAP Minnesota Climate Adaptation Partnership

### Minnesota Climate Adaptation Conference
*St. Paul, MN: November 14, 2018*

The Climate Adaptation Conference is designed for local officials, planners, engineers, natural resource practitioners and others who want to know more about climate adaptation strategies. Learn about new plans that have been implemented or tested in various sectors, including human health, local governmental entities, college campuses, resources, recreation, and agriculture. Find out more here.

### AGU Fall Meeting
*Washington, D.C.: December 10-14, 2018*

The AGU 2018 Fall Meeting will mark another dynamic year of discovery in Earth and space science, serve as the advent of AGU's Centennial year, and provide a special opportunity to share our science with world leaders in Washington, D.C. As the largest Earth and space science gathering in the world, the Fall Meeting places you in the center of a global community of scientists drawn from myriad fields of study whose work protects the health and welfare of people worldwide, spurs innovation, and informs decisions that are critical to the sustainability of the Earth. Find out more here.

AGU100 ADVANCING EARTH AND SPACE SCIENCE
FALL MEETING
Washington, D.C. | 10–14 Dec 2018

### Great Lakes Big Rivers Climate Workshop
Indianapolis, Indiana: *December 11-13, 2018*

The workshop will help educators, conservation professionals, natural resource managers, and outreach professionals recommend management practices that respond to changes in climate. Workshop topics include: Agriculture and Natural Resources, Community Development, Human Health, Youth Engagement in Climate, Communicating about Climate. Select here for more information.

This workshop is a part of the North Central Region One Water Action Forum taking place December 11-13, 2018. The Great Lakes Big Rivers Climate Workshop, hosted by the North Central Climate Collaborative, will be held on the first day of the forum, Tuesday December 11th. For more information on the North Central Region One Water Action Forum, select here.

North Central Region ONE WATER ACTION FORUM

# *Additional Resources*

### Blog Article: Conservation System Helps Missouri Farmer Weather Drought

Much of Missouri is now suffering from drought. But one farmer said a change in his management system has made his land more resilient to it. Adam Boman, owner of Good Life Grass Farms, raises grass-fed beef under a rotational grazing system that is providing plenty of forage for his herd despite the drought. Read his story here.

### Explore: Climate maps, data, products, and services

NOAA Climate.gov science & information for a climate-smart nation

Explore the number of weather records broken over recent periods. Compare counts of high maximum, high minimum, low maximum, and low minimum temperature records as well as records for precipitation, snowfall, and snow depth in the United States or across the globe. Be aware that these counts can provide insight into recent climate behavior, but they do not offer a definitive way to identify trends in the number of records set over time.

Where do these data come from?
Broken and tied records counted or displayed by this tool are compiled from a subset of stations in the Global Historical Climatological Network. For a station to be counted as having broken or tied a record, it must have a minimum of 30 years of observations for that variable, with more than 182 days complete during each of the 30 years.

### Blog: Changes in ENSO impacts in a warming world

At the ENSO blog we've spoken previously of the latest research into human-caused climate change and El Niño Southern Oscillation (ENSO). So you might be thinking, "Why another article? Didn't you cover everything already?" Well, first of all, new science comes out all the time and, second, this time instead of looking at ENSO itself, we are going to talk about climate change's influence on ENSO's impacts far away from the tropical Pacific Ocean.

Specifically, we are going to look at provocative recent research that suggests that while we may not know exactly how ENSO itself will change in the future, ENSO's impacts on temperature and wildfire probability in places like North America are likely to get stronger thanks to climate change. Oh, and we're also going to talk with the lead author of the paper, Dr. John Fasullo.

### Book: Agroclimatology: Linking Agriculture to Climate

American Society of Agronomy | Crop Science Society of America | Soil Science Society of America

Abstract: Crops as part of agroecosystems are dependent on natural resources for water, carbon dioxide, and a temperature regime in which they experience no harmful effects. How the plant responds to this environment determines the capability of a particular species to thrive. Temperature and precipitation are the two primary climate variables that determine the range of plants along with the productivity of plants. The development and utilization of agroclimatic indices incorporating climate variables have been used extensively to estimate where plants can be grown. These indices utilize a combination of temperature to define the optimum environment for a plant and precipitation to define whether the water resources are sufficient to allow for plant growth. The temperature response in these indices utilizes the fact that each species has a unique temperature range with a lower and upper threshold and an optimum temperature. For example, cool-season species with optimums near 15 to 20 °C will exist in different areas or at different times of the year than warm season species with optimum temperatures between 27 and 32 °C. Defining the proper environment may not be only a function of the optimum temperatures but for some species the exposure to temperatures below a given threshold before they can flower and set fruit. The linkage between plants and the climate centers on the energy balance of the plant which determines its temperature and rate of water use in a given environment. Understanding these linkages provides the framework needed to evaluate all agricultural systems and their response to a changing climate.

To remove your name from our mailing list, please email midwestclimatehub@ars.usda.gov.
Questions or comments? E-mail us at midwestclimatehub@ars.usda.gov or call 515-294-0136.

USDA Midwest Climate Hub
U.S. DEPARTMENT OF AGRICULTURE