USDA Midwest Climate Hub
U.S. DEPARTMENT OF AGRICULTURE

Midwest CHU

Climate Hub Update

Spring 2019

Promoting Climate-Informed Decisions Since 2014.

USDA Assists Farmers, Ranchers, and Communities Affected by Recent Flooding

NASA Earth Observatory images by Joshua Stevens, using Landsat data from the U.S. Geological Survey. Story by Adam Voiland.

To help residents, farmers, and ranchers affected by the devastation caused by recent flooding, U.S. Secretary of Agriculture Sonny Perdue has directed the U.S. Department of Agriculture (USDA) to aid people in their recovery efforts. USDA staff in the regional, state, and county offices are responding and providing a variety of program flexibility and other assistance to residents, agricultural producers, and impacted communities at large.

Select here for USDA resource information to aid in recovery.

Nebraska has been particularly hard hit. On March 16, 2019, the Operational Land Imager(OLI) on Landsat 8 captured a false-color image that underscores the extent of the flooding on the Platte, Missouri, and Elkhorn Rivers. For comparison, the second image shows the same area in March 2018.

PUBLISHED: The Potential Global Distribution and Voltinism of the Japanese Beetle Under Current and Future Climates

Japanese beetle is a severe invasive insect pest of turf, landscapes, and horticultural crops. It has successfully colonized much of the United States and has recently established in mainland Europe. The distribution of this pest will undoubtedly change as a consequence of climate change, posing additional challenges to the management of this species. To assess these challenges, the Midwest Climate Hub Fellow, Erica Kistner-Thomas, developed a process-oriented bioclimatic niche model to examine its potential global distribution under current (1981–2010) and projected climatic conditions (2040–2059).

Model projections indicate a strong possibility of further range expansion throughout mainland Europe under both current and future climates. For the article in it's entirety, select here.

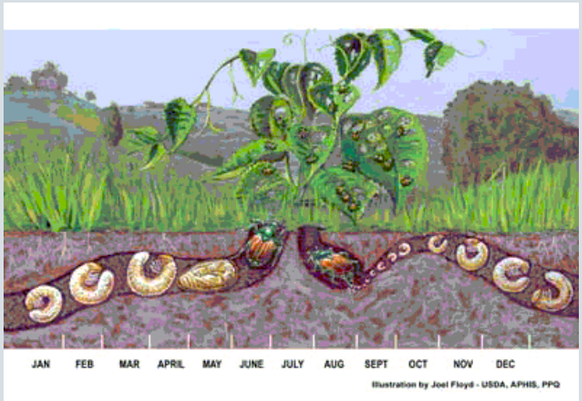
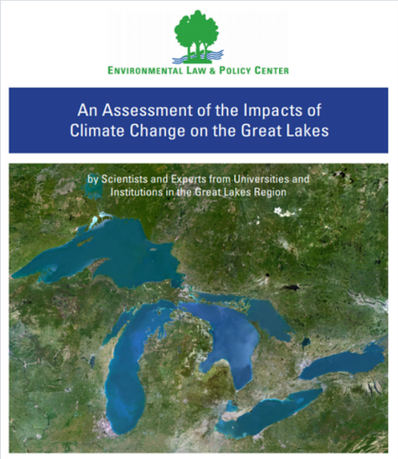


Illustration by Joel Floyd, USDA, APHIS

An Assessment of the Impacts of Climate Change on the Great Lakes



The largest and most robust freshwater ecosystem in the world is succumbing to the stresses of climate change, according to a sweeping new report from U.S. and Canadian scientists who closely monitor the region. The study, commissioned by the Chicago-based Environmental Law and Policy Center and the Chicago Council on Global Affairs, found that rising average temperatures are damaging the region's environment and economy while also eroding social and cultural institutions and health outcomes. "Climate change is already affecting both the climate of the Great Lakes region and the physical behavior of the Great Lakes themselves," said Don Wuebbles, a professor of atmospheric sciences at the University of Illinois and lead author of the 70-page report. "The region has extensively warmed over the last century, and more warming is expected to occur in the future." Climate change's effects on the Great Lakes don't stop at the water's edge. The basin is home to roughly 34 million people, including 8 percent of the U.S. population and nearly a third of all Canadians, according to researchers.

Select here to access the report.

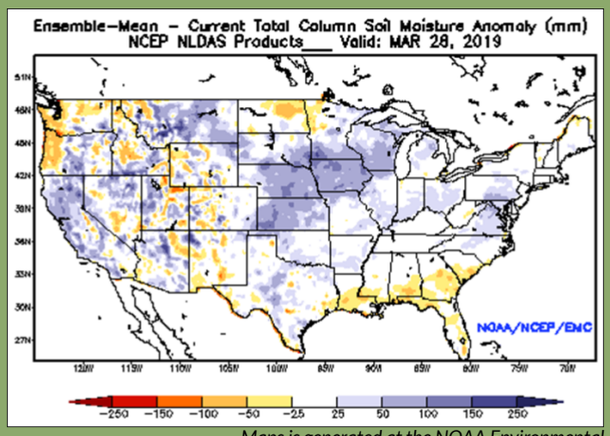
CHU in Every Issue...

Midwest Ag Focus Climate Update: April 1, 2019

Impacts: Flooded and damaged fields, livestock losses and feeding needs are the main impacts ongoing from the flooding event in the plains, particularly in parts of Nebraska as well as parts of Iowa and South Dakota. Significant flooding in the Red River of the North will cause problems in eastern ND and northwest MN because of the large snow pack in that region, which is just starting to melt. Over much of the rest of the region, river flooding and soil moisture are the main concerns. How soil moisture and additional precipitation will impact the upcoming field season is the most significant concern. Carry-over soil moisture from the fall still impacts soils from the central plains to Wisconsin. Wet soils will warm slowly and could contribute to potential seedling disease and potential for compaction in soils.

Outlook: Finally, some better chances for above-average temperatures are in store for April including early in the month. Slightly higher chances for precipitation cover the central Midwest and much of the plains. The eastern Corn Belt has equal chances on precipitation. For the entire update, select here.

To sign up to receive these outlooks in your inbox, email charlene.felkley@ars.usda.gov.



Maps is generated at the NOAA Environmental Modeling 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 March 2019, 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

Meet the Climate Hub Partners:Tonya Haigh, NDMC

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: Tonya Haigh, National Drought Mitigation Center (NDMC).

"I really enjoy working directly with farmers and ranchers, and connecting their needs to available drought and climate information."
-Tonya Haigh

Tonya Haigh is a Rural Sociologist and Project Manager for the NDMC. Since 2016, NDMC and the Midwest Climate Hub have worked to learn more about the climate information needs of specialty crop farmers. Currently Tonya and the Midwest Climate Hub are partnering on a project investigating how "too dry" and "too wet"conditions affect specialty crop growers decisions year round, and how climate and drought monitoring information might help them achieve better outcomes during challenging years. Tonya specifically does a lot of survey and evaluation work, the ultimate goal being to supply better information to improve climate resiliency of producers. Tonya says of the work, "It's fun! We've met grape and apple growers in Iowa, potato and cranberry growers in Wisconsin, and diversified fruit and vegetable growers in Missouri – and they've all been interested in how new monitoring tools might help them".

Tonya has worked with NDMC since 2008. She has a background in Human Ecology and Rural Sociology, and is working slowly on a Doctorate in Natural Resources Management. Outside of work, she enjoys 'the spring part' of gardening, and hiking or walking in places of subtle beauty.

NDMC NATIONAL DROUGHT MITIGATION CENTER
UNIVERSITY OF NEBRASKA

For more on the NDMC, select here.

On the RADAR....

2019 ERME National Conference
Louisville, KY: April 3-4, 2019

NORTHEAST EXTENSION RISK MANAGEMENT EDUCATION

The Extension Risk Management Education National Conference brings together public and private sector educators, crop insurance agents, lenders, and other agricultural professionals to share ongoing and emerging successful risk management education efforts which target agricultural producers and their families. Conference participants learn about what is working to help producers effectively manage the financial, production, marketing, legal and human risks associated with their agribusinesses.

NATIONAL ADAPTATION FORUM
ACTION TODAY FOR A BETTER TOMORROW

National Adaptation Forum
Madison, WI: April 23-25, 2019

The National Adaptation Forum (NAF) is the gathering of the adaptation minded. Since the Forum is created by and for the members of the adaptation community, the meeting focuses on issues of the day - *established and emerging*.

The Midwest Climate Hub is organizing a symposium within NAF that will include presentations with examples of collaborative efforts and impacts of federal agencies working together through information sharing (i.e. CoCoRAHS, drought monitor reporting etc.) and an interactive discussion using climate scenarios and team building responses.

Success in obtaining resilient and sustainable agroecosystems within the Midwest Region can only be obtained through collaborative efforts. This symposium will bring together a well-oiled, climate-science-focused and information-sharing team from the Midwest Region to better understand the importance of and efficiency in working together: Sharing and formatting climate information for many different sectors to improve decision-making in a changing climate. The symposium will address: The impact of collaboration at the regional scale; How collaboration influences adaptation; The efficiencies gained in collaboration; How collaboration improves information transfer.

Rising Voices
Boulder, Colorado: May 15-17, 2019

NCAR UCAR | Rising Voices
Climate Resilience through Indigenous and Earth Sciences

The 7th annual workshop of Rising Voices at the National Center for Atmospheric Research in Boulder, Colorado. The theme of the 7th Annual Workshop is Converging Voices: Building relationships and practices for intercultural science. For more details see the workshop announcement click here. Please register by February 22, 2019. To register, click here. The Rising Voices program facilitates cross-cultural approaches for adaptation solutions to extreme weather and climate events, climate variability and climate change. The program brings social and physical scientists and engineers together with Native American community members to assess critical community needs and to pursue joint research aimed at developing optimal plans for community action towards sustainability. Indigenous communities are particularly adversely affected by weather and climate impacts. They understand the local changes that are occurring and how their societies are impacted; scientists can provide insight on the underlying larger-scale causes and how these might change in the future. NCAR scientists and leading community members established the Rising Voices program to identify and define research and community priorities and to enable and promote important collaboration with Indigenous communities in Colorado and beyond.

Ohio Summit on Tools for Extreme Weather and Climate Resilience

Columbus, OH: June 4-5, 2019

We are pleased to announce the Ohio Climate Services Summit scheduled for June 4 to 5, 2019 in Columbus, OH. Many sectors and organizations have direct or indirect interest in climate. Collaboration and relationship building are necessary to ensure effective climate services for Ohio. We envision that the Ohio Climate Summit will be an opportunity for providers and users of climate services to: Build increased awareness of existing climate tools, data, individuals, and expertise; Identify climate service needs or gaps within the state; Improve coordination and collaboration among climate service providers and users at the local, state, regional, and national levels; and Identify opportunities to seek out additional resources

ON DEMAND Webinar: Carbon, Crops and Covers

Anyplace: Anytime, 2019

Participants will join to determine the role carbon plays in crop rotations with cover crops. Participate in this training to learn how carbon enters the plant and ultimately the soil. Also, learn where the carbon is located in a plant and the role exudates or rhizodeposition plays. Managing carbon with a systems approach. This webinar is presented by the USDA NRCS Soil Health Division. Contact Candy Thomas, Regional Soil Health Specialist, Soil Health Division for more information about this webinar.

For all On-Demand webinars offered via NRCS, select here.

Additional Resources

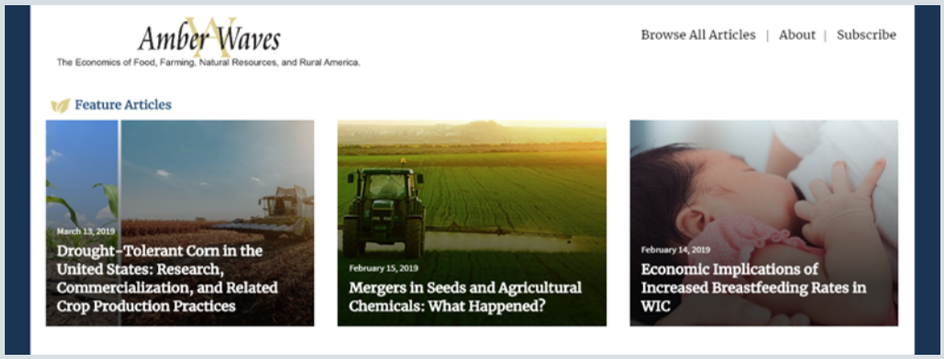
In the News: Midwest Farmers Experience Toll of Climate Change on Food Supply

"It's not news to Midwestern farmers that the weather is getting weird. Last spring was more like winter through the end of April, as late snow delayed planting by several weeks, followed by a blazing hot May. It was dry during the growing season, when farmers would have liked rain, and wet again through a cold fall that delayed the harvest. Some farmers couldn't bring in their crops until mid-December, weeks behind schedule...

A CHANGING CLIMATE PATTERN
University of Missouri Extension State Climatologist Pat Guinan said Missouri has been warming since the late 1990s, and 2012 stands as the warmest year on record. The date of the last spring freeze is about a week earlier on average over the past 20 years, and the first fall freeze occurs a week later, adding about two weeks to the growing season. Most notably: "We're in an unprecedented wet period," Guinan said, and that means more rain and more flooding. Despite periods of drought, Missouri has seen a 37 percent increase in 3-inch rainfall events in the past 20 years, he said."
Read more here.

Illustration by Larry Moore

Subscribe to Amber Waves

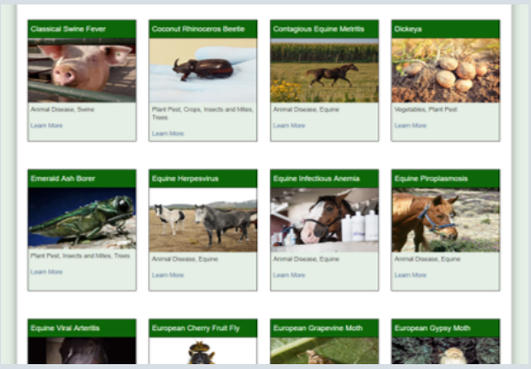


USDA's Amber Waves presents the broad scope of Economic Research Service's (ERS's) research and analysis on the economics of food, farming, natural resources, and rural America. The March 2019 issue includes articles on: the development and adoption of genetically engineered drought-tolerant corn; how China's rice stocks could impact global markets; grocery store price increases; vehicle exclusions and asset limits in SNAP; and no-till and strip-till conservation practices in crop production.

Select here to subscribe.

Launch of New USDA Webpage: Pests and Diseases

The U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS) is launching a new "Pests and Diseases" webpage. The new page lists all pest and disease programs managed by APHIS as part of its mission to protect American agriculture and natural resources. On this new page, users can search by type (plant, animal), keyword (avian, fruit fly, cotton), or by the specific pest or disease (coconut rhinoceros beetle, brucellosis). You can also scroll through the page, which lists the pests and diseases alphabetically and includes a corresponding image. APHIS created the webpage to make it easier for its customers to find critical information on pests and diseases of concern. With this tool, members of the public will have the information they need to report pests and diseases and together we can protect America's agriculture and natural resources.



Published: Water-Use Efficiency: Advances and Challenges in a Changing Climate

Water use efficiency (WUE) is a concept introduced 100 years ago showing a relationship between plant productivity and water use. The term was introduced as a measure of the amount of biomass produced per unit of water used by a plant. Since that time, there have been countless original papers and reviews written on the topic with the most recent one demonstrating that maize (Zea mays L.) productivity could be increased with no change in water use rate and result in increased WUE.

This is a critical observation because the prevailing hypothesis for WUE is based on plant productivity increasing with increasing water use and in order to increase WUE will require increased crop water use. To understand how WUE could be affected by a changing climate it will be necessary to determine how climate change will impact plant growth and water use of the plant. For the entire publication, select here.

Published: Climate risk management and rural poverty reduction

Climate variability is a major source of risk to smallholder farmers and pastoralists, particularly in dryland regions. A growing body of evidence links climate-related risk to the extent and the persistence of rural poverty in these environments... The resulting uncertainty impedes progress out of poverty by acting as a disincentive to investment in agriculture – by farmers, rural financial services, value chain institutions and governments. This publication assesses evidence published in the last ten years that a set of production technologies and institutional options for managing risk can stabilize production and incomes, protect assets in the face of shocks, enhance uptake of improved technologies and practices, improve farmer welfare, and contribute to poverty reduction in risk-prone smallholder agricultural systems...And this publication discusses the roles that climate-risk management interventions can play in efforts to reduce rural poverty, and the need for further research on identifying and targeting environments and farming populations where improved climate risk management could accelerate efforts to reduce rural poverty. For the entire publication, select here.

Report: The greenhouse gas benefits of corn ethanol – assessing recent evidence

In 2010, the U.S. Environmental Protection Agency (EPA) released a life-cycle analysis of the greenhouse gas (GHG) emissions associated with the production and combustion of corn ethanol. EPA projected that by 2022, the emissions profile of corn ethanol from a new refinery would be 21% lower than that of an energy equivalent quantity of gasoline. Since 2010, the 21% value has dominated policy discussions and federal regulations related to corn ethanol as a renewable fuel and a GHG mitigation option. It is now 2018 and new data, scientific studies, technical reports, and other information allow us to examine the emissions pathway corn-ethanol has actually followed since 2010. Using this information, we assess corn ethanol's current GHG profile at 39–43% lower than gasoline. We also develop two projected emissions scenarios for corn ethanol in 2022. These scenarios highlight opportunities to produce ethanol with emissions that are 47.0–70.0% lower than gasoline. Many countries are now developing or revising renewable energy policies. Typically, biofuel substitutes for gasoline are required to reduce GHG emissions by more than 21%. Our results could help position U.S. corn ethanol to compete in these new and growing markets. For the entire publication, select here.

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