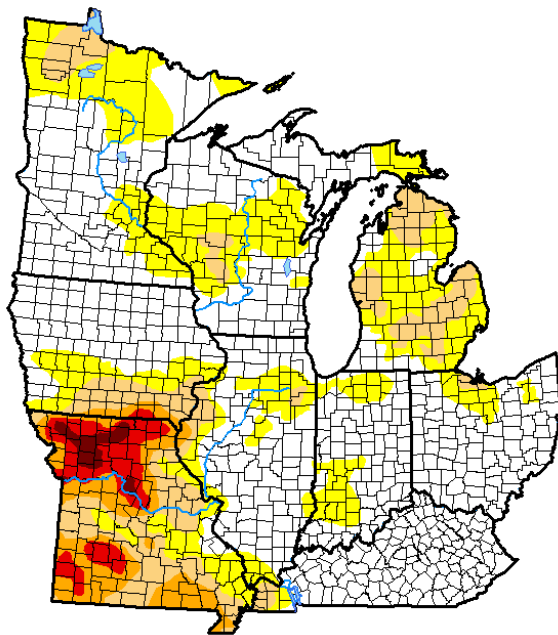


# Drought Monitoring Resources for Annual Vegetable Crops in the Midwest—Through the Seasons

## Fall/Winter

Many crop producers depend upon fall and winter precipitation for soil moisture and aquifer recharge. Agricultural droughts may emerge at any time of the year when below average rain or snowfall results in decreased soil moisture or snowpack. Drought monitoring information can help the grower plan fall cover crops, as well as the crops and varieties to be planted in the spring.

### U.S. Drought Monitor ([droughtmonitor.unl.edu](http://droughtmonitor.unl.edu))

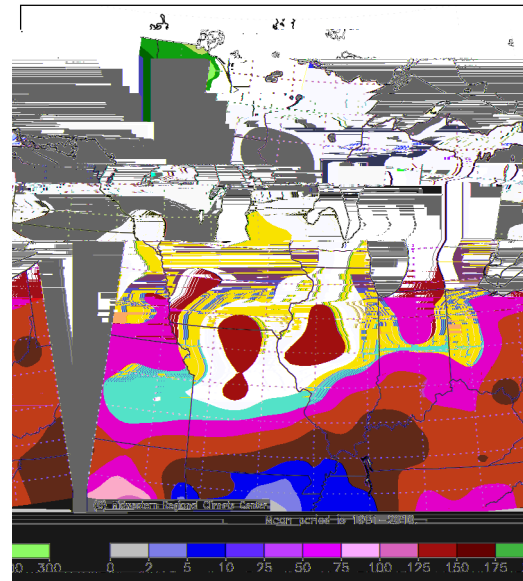


Areas in yellow are experiencing abnormally dry conditions that could develop into drought or are recovering from drought but are not yet back to normal. Areas in darker tan and red colors are currently experiencing moderate to extreme drought, indicating where it may be difficult to recharge soil moisture or aquifer levels before the growing season begins.

### Midwestern Regional Climate Center's Climate Watch ([mrcc.illinois.edu/cliwatch](http://mrcc.illinois.edu/cliwatch))

"Seasonal Maps" tab

Accumulated Snowfall: Percent of Mean  
July 1, 2019 to May 10, 2020



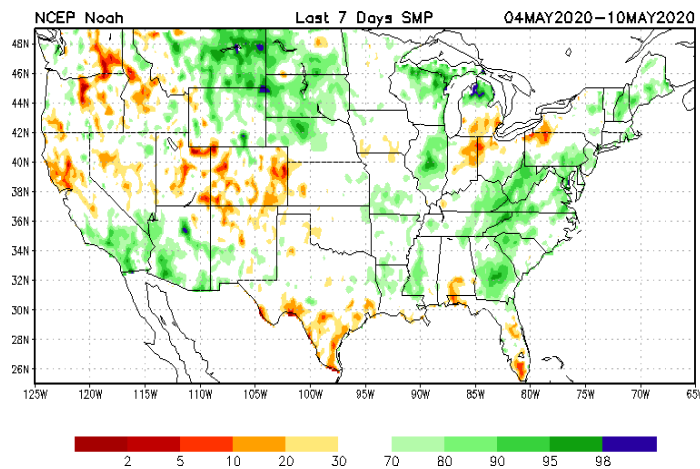
"Percent of Normal" maps show how current snowfall compares to the 30-year normal. Areas in green/blue have received more snow than normal, while areas in orange/red have received less snow than normal. These maps can provide an early indicator of soil conditions come spring.

# Spring

Spring is a busy season of tillage, planting, and fertilization. Soil temperature and moisture information guides planting dates, and seasonal drought, precipitation, and temperature outlooks may be used to make final decisions about crop varieties, rotations, and timing. A spring flash drought bringing high temperatures, constantly-sunny skies, strong winds, and lack of precipitation can damage sprouts and seedlings.

## Soil Moisture Maps of the U.S.

([www.cpc.ncep.noaa.gov/products/Drought/Monitoring/smp\\_new.shtml](http://www.cpc.ncep.noaa.gov/products/Drought/Monitoring/smp_new.shtml))

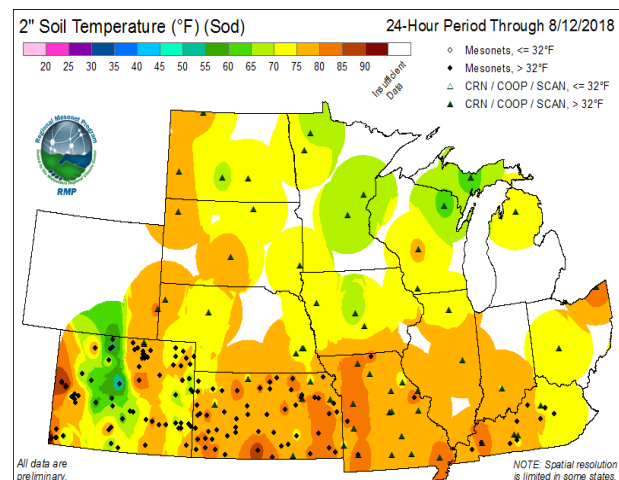


These maps show how soil moisture in different layers of the soil column differs from normal. The soil moisture data account for regional differences in soil moisture field capacity. Yellow and orange colors indicate where there is less soil moisture than normal for that time of the year, while green colors show that the soil conditions are wetter than normal. The user can view current conditions as well as the past week or month.

## Mesonet Soil Temperature Maps

([mrcc.illinois.edu/RMP/currentMaps.html](http://mrcc.illinois.edu/RMP/currentMaps.html))

Soil temperature can be affected by soil moisture conditions. Information gathered at Mesonet sites can provide clues to local soil temperature conditions.



**Climate Information Needs of Midwest Specialty Crop Growers** is a project of the National Drought Mitigation Center and the University of Wisconsin, with the U.S. Department of Agriculture Midwest Climate Hub and the National Integrated Drought Information System. We are grateful for the participation of advisors representing Iowa State University, the Iowa Winegrowers Association, University of Missouri Extension, University of Wisconsin-Madison Extension, Wisconsin Potato and Vegetable Growers Association, and Wisconsin State Cranberry Growers Association. The project was funded by the National Oceanic and Atmospheric Administration Sectoral Applications Research Program.

# Summer/Fall

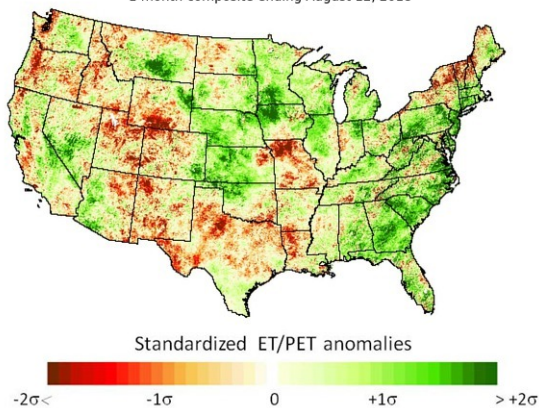
Drought can develop quickly in the summer when the atmospheric evaporative demand is higher than normal. This can be caused by warmer temperatures, sunnier skies, lower relative humidity, and strong winds. It is important to keep an eye on tools that can alert growers to emerging drought conditions.

Satellite-based monitoring tools track vegetation health with high spatial resolution, showing the cumulative impact of elevated evaporative demand and dry soils. These tools monitor relatively fast changes in vegetation conditions, and can act as an "alarm" of rapidly developing drought.

## Evaporative Stress Index (ESI)

([hrrsl.ba.ars.usda.gov/drought/index.php](https://hrrsl.ba.ars.usda.gov/drought/index.php))

Evaporative Stress Index 4km  
1 month composite ending August 12, 2018

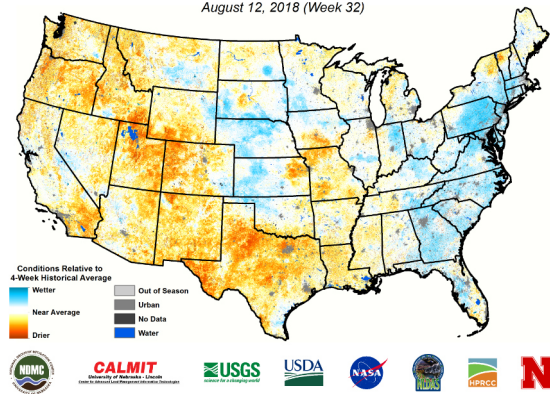


Orange-to-red colors indicate plant stress due to abnormally high evaporative demand. Green colors show areas where the vegetation is healthy.

## Quick Drought Response Index (QuickDRI)

([quickdri.unl.edu](http://quickdri.unl.edu))

Quick Drought Response Index (QuickDRI)  
August 12, 2018 (Week 32)



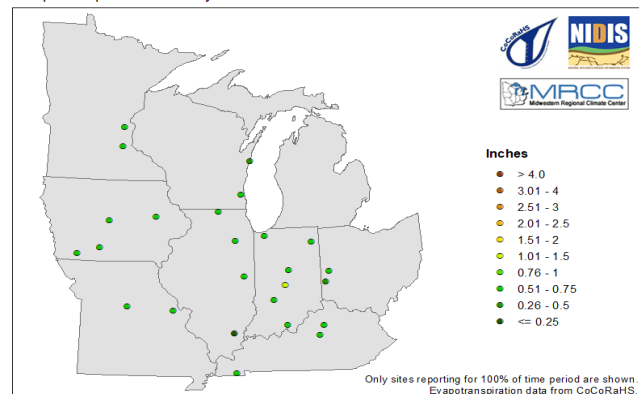
Regions in yellow-orange-red are rapidly becoming drier while regions in blue shades are rapidly becoming wetter.

## Evapotranspiration and Water Balance Maps

([mrcc.illinois.edu/cliwatch/drought/drought.jsp](http://mrcc.illinois.edu/cliwatch/drought/drought.jsp))

While many growers of irrigated high-value crops have in-field monitoring equipment, there are some tools that can help monitor daily evapotranspiration rates. Use of these tools can improve the efficiency of variable rate irrigation, and help the grower conserve water when possible while protecting plant health and yield. These of course tend to be very specific to conditions at the station location and will not provide anything close to the spatially continuous, high-resolution data provided by satellites and models.

Evapotranspiration for 7-day Period: 5/4/2020 - 5/11/2020



# Looking to the Future

Outlooks can provide vegetable growers with information on what the coming weeks, month, and season might bring as far as precipitation, temperatures, soil moisture, and drought development.

## Find Monthly and Seasonal Outlooks at Any of These Websites:

U.S. Drought Monitor Outlooks tab  
([droughtmonitor.unl.edu/ConditionsOutlooks/Outlooks.aspx](http://droughtmonitor.unl.edu/ConditionsOutlooks/Outlooks.aspx))

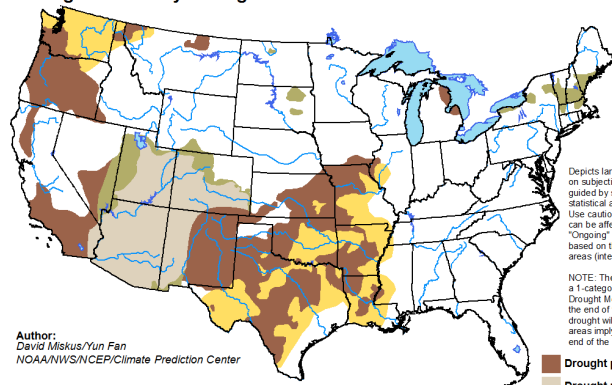
National Weather Service's Climate Prediction Center  
([www.cpc.ncep.noaa.gov](http://www.cpc.ncep.noaa.gov))

Midwest Regional Climate Center Drought Information Page  
([mrcc.illinois.edu/cliwatch/drought/drought.jsp](http://mrcc.illinois.edu/cliwatch/drought/drought.jsp))

National Integrated Drought Information System Outlooks and Forecasts  
([www.drought.gov/drought/data-maps-tools/outlooks-forecasts](http://www.drought.gov/drought/data-maps-tools/outlooks-forecasts))

### U.S. Seasonal Drought Outlook Drought Tendency During the Valid Period

Valid for July 19 - October 31, 2018  
Released July 19, 2018



Author:  
David Miskus/Yun Fan  
NOAA/NWS/NCEP/Climate Prediction Center



Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Use caution for applications that can be affected by short-lived events. "Ongoing" drought areas are based on the U.S. Drought Monitor areas (intensities of D1 to D4).

NOTE: The tan areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period, although drought will remain. The green areas imply drought removal by the end of the period (D0 or none).

- Drought persists
- Drought remains but improves
- Drought removal likely
- Drought development likely



<http://go.usa.gov/3eZ73>

## Monthly Drought and Climate Webinar and Climate Outlook Summary

Want more context and discussion? NOAA and the U.S. Department of Agriculture's Midwest Climate Hub offers a monthly webinar and two-page climate outlook summary that can help put the current conditions into context with prior years. Register for the webinars and find outlook summaries here:

([www.climatehubs.usda.gov/hubs/midwest/climate-outlooks](http://www.climatehubs.usda.gov/hubs/midwest/climate-outlooks))

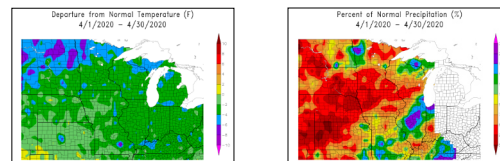
### USDA Midwest Climate Hub U.S. DEPARTMENT OF AGRICULTURE

May 1, 2020

#### Midwest Ag-Focus Climate Outlook

Current Conditions

Conditions have taken a fairly remarkable shift across much of the Corn Belt which has allowed planting to move ahead much more quickly than expected. Precipitation has been pretty limited with well-below-average precipitation over the last 30 days (and much longer in some areas – not pictured). The totals for the last 30 days have been less than an inch in some areas of the plains which is less than half or even to 25% of average in places. The mid-month cold still dominates the 30-day temperature averages with 2-4°F below average common around the region.

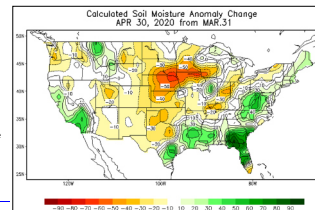


Images from High Plains Regional Climate Center (HPRCC) Online Data Service: ACIS Climate Maps. Generated: 5/2/2020

#### Impacts

The limited precipitation has allowed the surface soils to dry despite the colder-than-average temperatures. Winds have also helped the drying process. One soil moisture model from NOAA's Climate Prediction Center shows a 50 mm ("2 in") loss of moisture in the last month in part of the region as well as decent drying elsewhere. This change has dried surface soils sufficiently to allow more widespread planting than was expected even a few weeks ago. Most of the drying is at the surface. Most soil moisture profiles are still quite full. The drier surface soils are somewhat beneficial in allowing planting and starting to develop root systems, which can reach the soil moisture below.

For additional May monthly climate outlooks, visit the [Climate Prediction Center](http://www.climatehubs.usda.gov/hubs/midwest)



For more information, please visit:  
<https://www.climatehubs.usda.gov/hubs/midwest>

