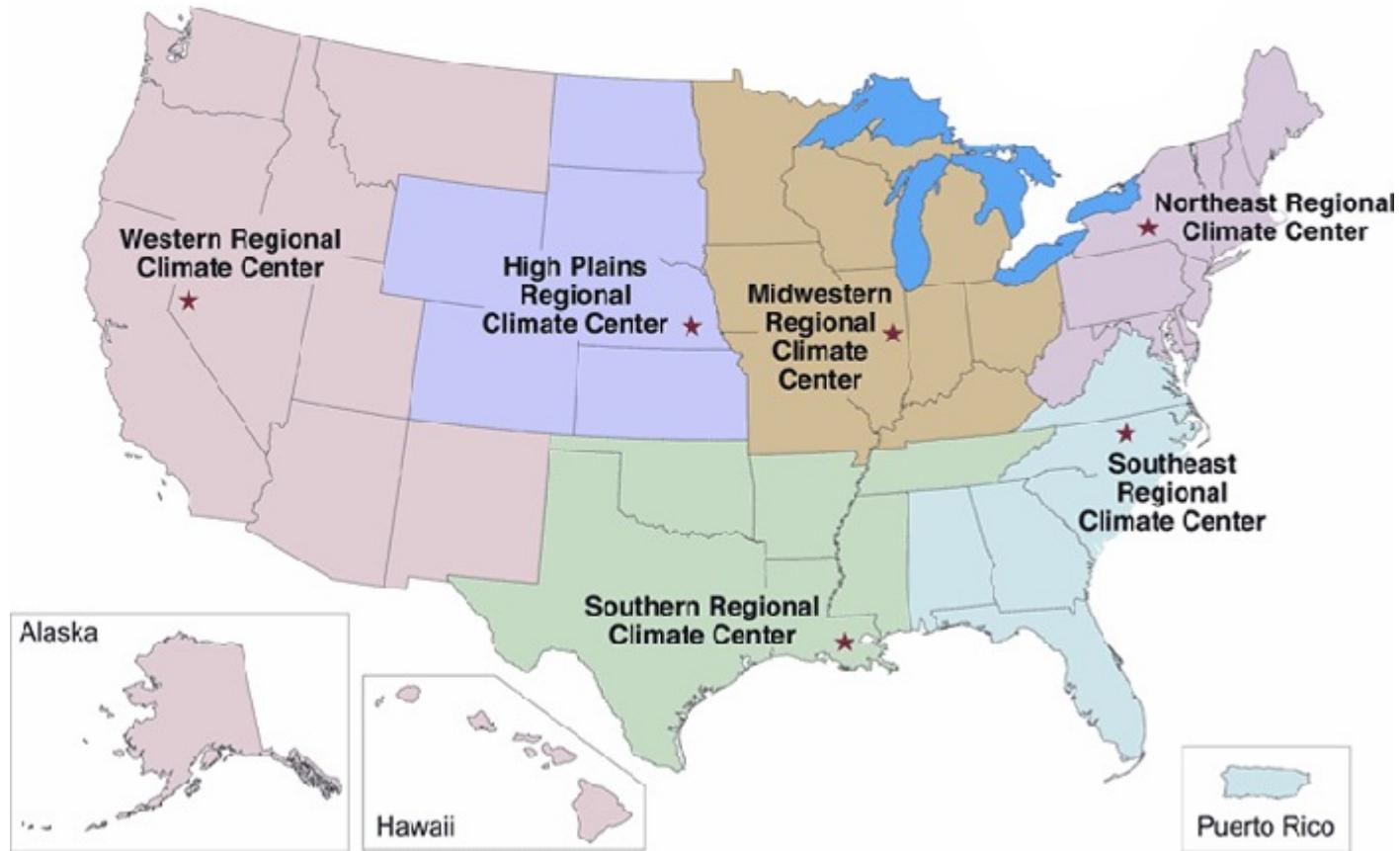


Vegetation Impact Program

Michael S. Timlin
Midwestern Regional Climate Center

WERA 1012
May 19, 2021



MRCC Vegetation Impact Program

<https://mrcc.illinois.edu/VIP/>

MRCC  **Vegetation Impact Program**

VIP Home | Frost Freeze Guidance | Vegetation Climate | GIS Maps | Resources

Welcome to the Vegetation Impact Program

The Vegetation Impact Program (VIP) is a monitoring, assessment, and networking program hosted by the Midwestern Regional Climate Center. Major impacts on vegetation are often driven by weather and climate conditions. For example, damaging frost events, drought, and even flooding can impact vegetation in areas of agriculture, horticulture, nurseries, or home gardening. Pests and disease are also driven by environmental conditions.

The VIP integrates online climate monitoring information, weather and climate outlooks, and stakeholder input to provide a suite of resources that can help minimize negative vegetation impacts, mitigate climate variability effects, and develop adaptation plans to better prepare for extreme and ever-changing environmental conditions.

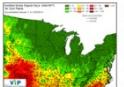
Frost/Freeze Guidance Project

 The Midwestern Regional Climate Center (MRCC) is providing collaboration among weather forecasters, University Extension specialists, state climatologists, and other vegetation experts to improve communication about the state of vegetation and its susceptibility to potentially damaging low air temperatures. To learn more, see our "About Frost/Freeze Guidance" page.

Vegetation Climate Maps

 **Chilling Hours:** Maps of accumulated chilling hours and chilling hours departure have been developed for growers to monitor the number of chilling hours over a dormant season based upon popular chilling temperature ranges.

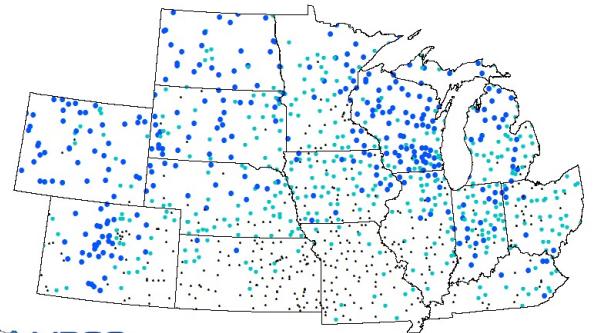
 **Keetch-Byram Drought Index:** Keetch-Byram Drought Index (KBDI) is one of the few daily indices used to monitor drought, and is most often utilized in the wildfire community, for it can give a real-time indication of the drying potential for the finer fuels such as grasses and shrubs.

 **Stress Degree Days:** All plants have an optimum range of temperatures for growth and Stress Degree Days (SDD) are a way of tracking how much stress a type of plant has been subjected to within its growing season.

 **GIS Vegetation Climate Map:** This GIS version contains the Chilling Hours, Keetch-Byram Drought Index, and Stress Degree Days maps, all in one GIS interface.

Fall Freeze Locations
as of 10/23/2010

- Freeze (<= 28°F)
- Freeze (<= 32°F)
- No Freeze



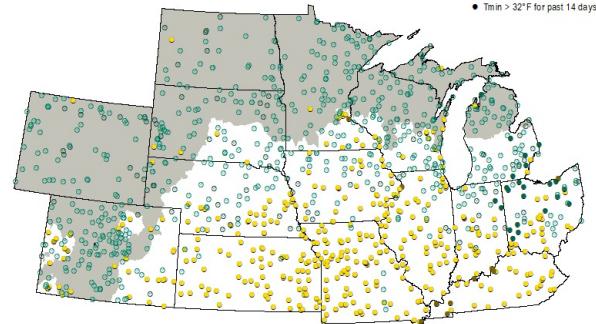
Date of Last 32°F Freeze

through 5/17/2021

Shaded areas have accumulated less than 150
Growing Degree Days since Feb 1st (Base 50°F)

- Mar 10 or Earlier
- Mar 11 - 20
- Mar 21 - 31
- Apr 1 - 10
- Apr 11 - 20
- Apr 21 - 30
- May 1 - 10
- May 11 - 20
- May 21 - 31
- Jun 1 - 10
- Jun 11 - 20
- Jun 21 or Later

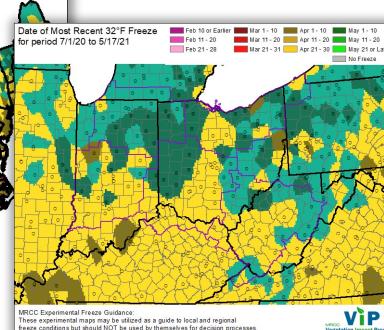
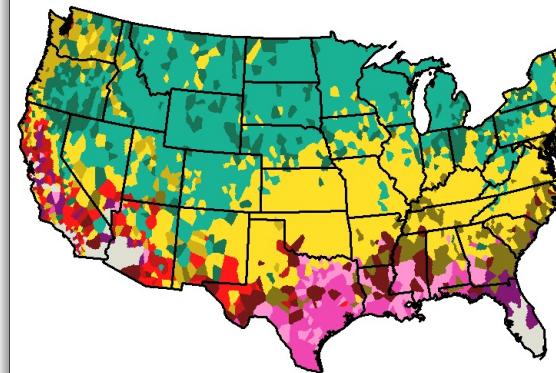
- Tmin yet to exceed 32°F
- Tmin < 32°F within 14 days
- Tmin > 32°F for past 14 days



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Climate Center

Date of Most Recent 32°F Freeze
for period 7/1/20 to 5/17/21

Feb 10 or Earlier	Mar 1 - 10	Apr 1 - 10	May 1 - 10
Feb 11 - 20	Mar 11 - 20	Apr 11 - 20	May 11 - 20
Feb 21 - 28	Mar 21 - 31	Apr 21 - 30	May 21 or Later
No Freeze			



MRCC Experimental Freeze Guidance:

These experimental maps may be utilized as a guide to local and regional

freeze conditions but should NOT

VIP
Vegetation Impact Program

MRCC Experimental Freeze Guidance:
These experimental maps may be
freeze conditions but should NOT

Maps Legend Export About

Station Data Valid Morning of:
5/17/2021
Guidance Data Last Run:
5/17/2021 09:10:00 CT

Zoom in to view Stations

Layers

Point Shading

None
Guidance since 7/1/01
Guidance since 7/1 (Wint only)
Impact Reports since 7/1/01
Lowest Min Temp (10 to 50°F)
Lowest Min Temp (30 to 100°F)

Date of First Freeze
Date of Most Recent Freeze
Days since Last Recent Freez
Days Below Temp >= 24 hrs

Choose Temp: 23°F

NPW Spring Index:

Chosen: First Leaf

Growing Degree Days:

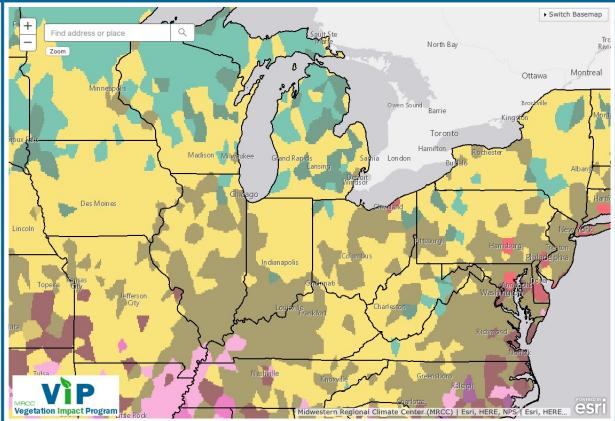
Base Temp: 42°F

Start Date: Last 32°F

Climatology:

Earliest
First (Fall) 32°F
based on years 1980-81 to 2009-10
Freeze beginning July 1st

Freeze Probabilities (New Window)



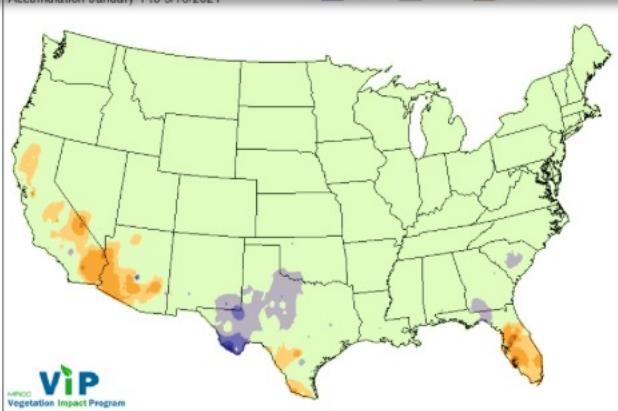
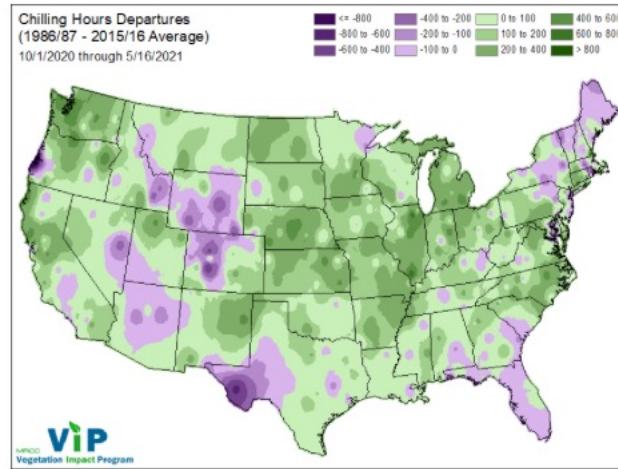
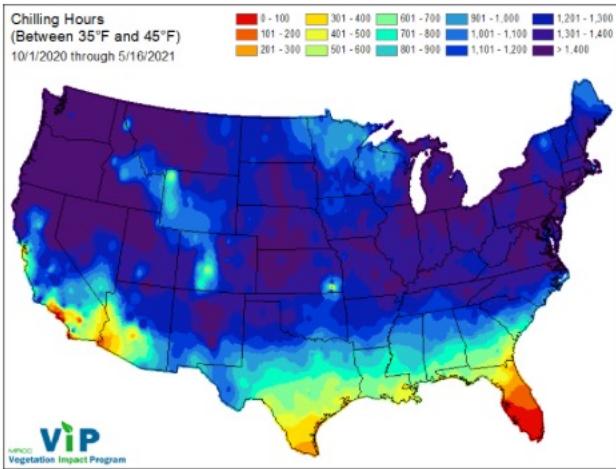
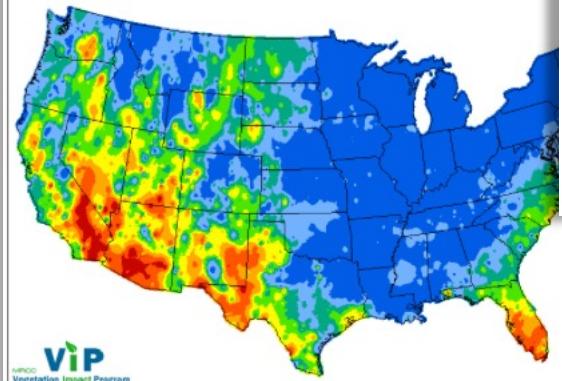
VIP
Vegetation Impact Program

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MRCC
Vegetation Impact Program

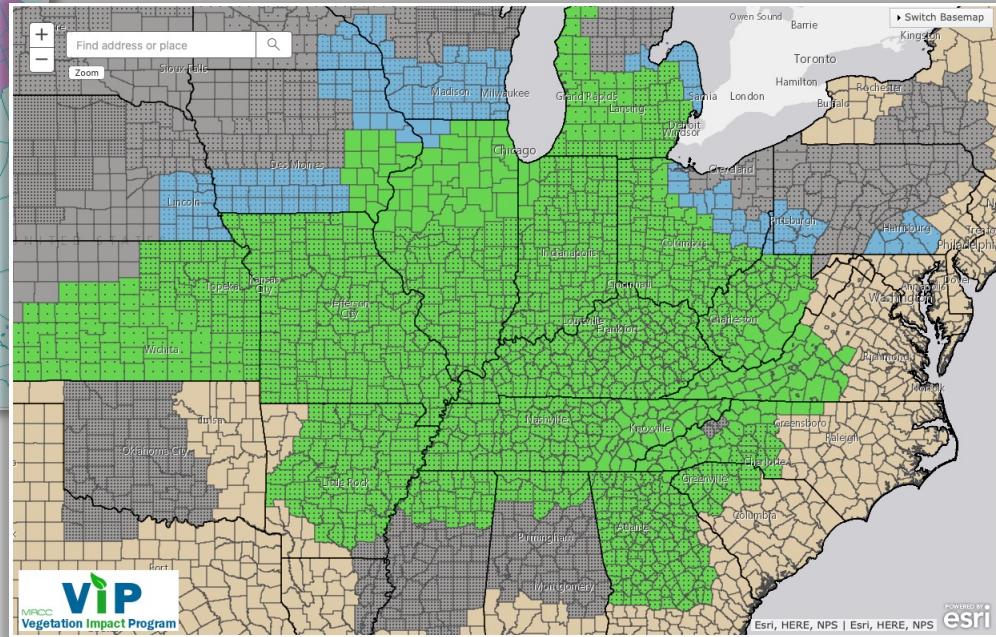
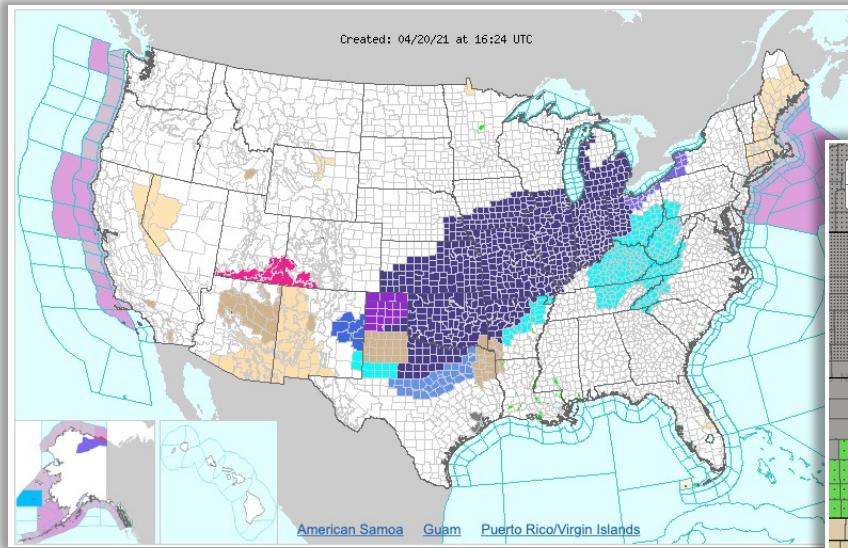


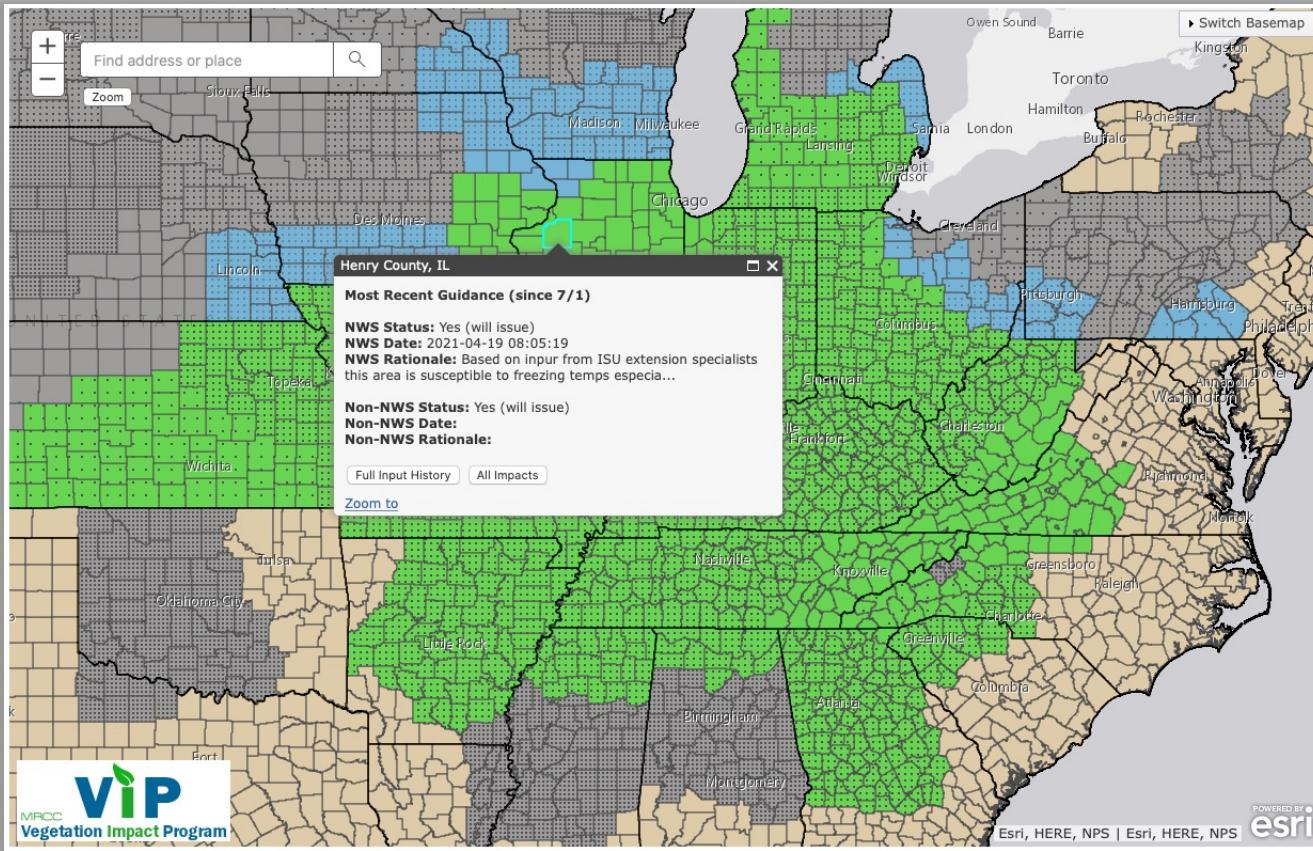
Keetch-Byram Drought Index

Values calculated for 5/16/2021



Back to the freeze products:





Users can submit guidance for susceptibility.
Also have option to report impacts.

Vegetation Frost/Freeze Guidance: Reports

Forms Home All Frost/Freeze Products  

Vegetation Guidance - All [TEST/under development]

Click ID# to see full details

ID#	Date Added	Area	Status	User Name	User Type	Counties (FIPS)
3482	05-16-2021	DLH	Yes	Steve Gohde	NWS	27001,55003,55007,55013,27017,27021,27031,27035,55031,55051,27061,27071,27075,27115,55099,55113,27137,55129,
3481	05-15-2021	BIS	Yes	Todd Hamilton	NWS	38001,38007,38009,38011,38013,38015,38021,38023,38025,38029,38031,38033,38037,38041,38043,38045,38047,38049,38051,38053,38055,38057,38059,38061,38065,38069,38075,38079,38083,38085,38087,38089,38093,38101,38103,38105,
3480	05-15-2021	FGF	Yes	Brad Hopkins	NWS	38003,27005,27007,38005,38017,38019,27027,27029,38027,38035,27051,38039,27057,27069,27077,27087,27089,38063,27107,27111,38067,27113,27119,38071,38073,27125,38077,27135,38081,38091,38095,38097,27159,38099,27167,

Users can submit guidance for susceptibility.
Also have option to report impacts.

Vegetation Frost/Freeze Guidance: Forms

[Forms Home](#) [All Frost/Freeze Products](#)



Vegetation Guidance / Freeze Impact Report

Information entered in Guidance form will update "Vegetation Guidance Status" freeze

Choose Form Type: Vegetation Guidance Freeze Impact Report

Choose which counties to display:

Counties by State

[Select a State:](#)

Counties by Crop Reporting District

Counties by NWS County Warning Area

[Get Form](#)

Vegetation Frost/Freeze Guidance: Forms

[Select Different Area](#) [Forms Home](#) [All Frost/Freeze Products](#)

Vegetation Guidance Form - By County Warning Area: OAX-Omaha (NE)

Current vegetation susceptible? (select one):

- VEGETATION NOT SUSCEPTIBLE: vegetation is not currently susceptible to freezing temperatures
- MIXED SUSCEPTIBILITY: Some vegetation may be susceptible to freezing temperatures
- VEGETATION SUSCEPTIBLE: vegetation is susceptible to freezing temperatures

Enter rationale for guidance:

Select your user group:

[Regional Climate Center](#)

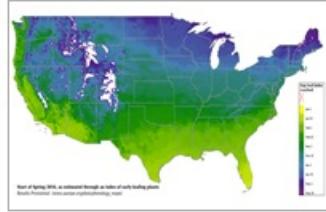
Counties:

- Check All
- Uncheck All
- Antelope, NE
- Boone, NE
- Burt, NE
- Butler, NE
- Cass, NE
- Cedar, NE
- Colfax, NE
- Cuming, NE
- Dodge, NE
- Douglas, NE
- Fremont, IA
- Gage, NE
- Harrison, IA
- Jefferson, NE
- Johnson, NE
- Knox, NE

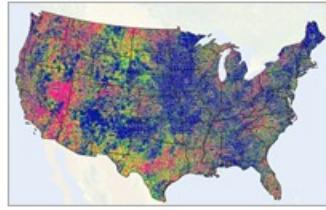
Click on map for interactive version:



Other links:



National Phenology Network: Phenology refers to key seasonal changes in plants and animals from year to year—such as flowering, emergence of insects and migration of birds—especially their timing and relationship with weather and climate.



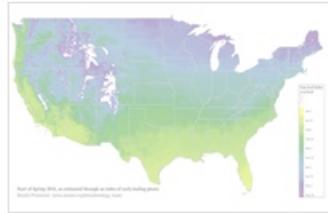
USDA VegScape: From the National Agricultural Statistics Service of the USDA, this tool allows you to view vegetation indices in a GIS format for years back to 2000. The GIS format allows you to zoom far into the county level, get statistics for the chosen area, and output into a pdf file.



NOAA STAR Global Vegetation Health Products:

The Center for Satellite Applications and Research at NOAA has a tool with 17 vegetation health products, ranging from Vegetation Health and Greenness to Fire Risk and Thermal Stress. Output is a large image in png format.

Other links:



National Phenology
year to year—such as the relationship with



USDA VegScape
view vegetation phenology at the county level,

Specialty Crop Information

The Specialty Crop Information section of VIP is meant as a general source of information pertaining to climate impacts on specialty crops and vegetation. VIP users are welcome to submit anything they wish to help better communicate these interactions. Please contact info@illinois.edu.

(+/-) Chilling Hour requirements by type of fruit

(+/-) How susceptible are fruits and vegetables to cold temperatures?

(+/-) Extreme cold impacts on fruit crops

Critical low temperatures for specialty crops:

(+/-) Critical temperatures for fruit flower buds



NOAA STAR Global Vegetation Health Products:

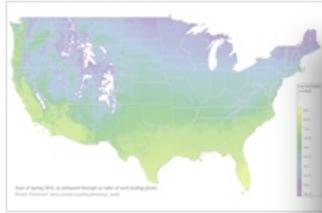
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Other links:

Specialty Crop Information

National Phenology

year to year—such as the timing of flowering and fruiting. The Specialty Crop Information section of VIP is meant as a general source of information pertaining to climate impacts on agriculture and other sectors. P



Illinois Climate Network

Illinois Climate Network:

On the left-hand menu, there is a list of products and tools for agricultural weather applications across Illinois, including a Pest Degree Day calculator.



Iowa Environmental Mesonet:

Growing Degree Days, precipitation, soil moisture and temperature, Stress Degree Days, freeze risk, and aridity index are a few products available for Iowa.



Kentucky Mesonet:

Live soil moisture data and graphs and other weather and climate information, serves diverse needs in communities across Kentucky.



University of Kentucky Ag:

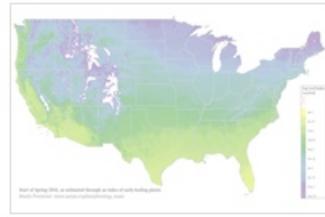
Weather website devoted to agricultural weather applications and tools across Kentucky.



Michigan State University Enviro-weather:

Provides weather-based pest, natural resources, and production management tools for Michigan.

Other links:



National Phenology

year to year—such as the start of spring. The Specialty Crop Information section of VIP is meant as a general source of information pertaining to climate impacts on agriculture and other sectors, such as water resources, energy, and health. This page provides links to state agricultural weather resources, including maps and data from the National Phenology Network, the U.S. Environmental Protection Agency, and the U.S. Geological Survey.

State Agricultural Weather Resources

Weather and

Illinoi
Clima

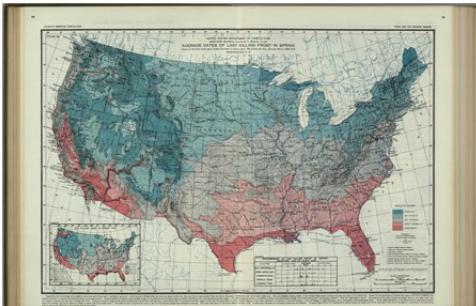
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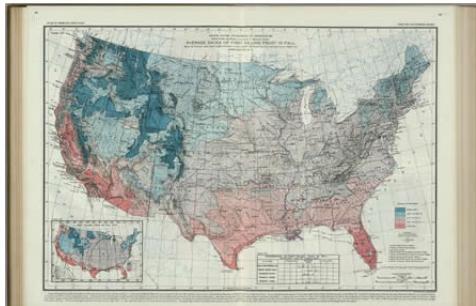
Specialty Crop Information

Average Dates of First & Last Killing Frost in 1916

From the David Rumsey Map Collection, more information on frost and the growing season, and other portions of the *Atlas*, can be found on their website.



Average Dates of Last Killing Frost in Spring, 1916 – click for large image



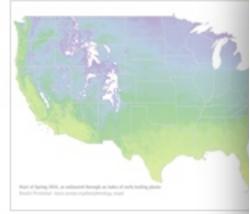
Average Dates of First Killing Frost in Fall, 1916 – click for large image

MICHIGAN STATE
UNIVERSITY
Enviro-weather

Michigan State University Enviro-weather:

Provides weather-based pest, natural resources, and production management tools for Michigan.

Other links:



Specialty Crop Information

VIP Training & Materials

Training

Frost/Freeze Guidance Training Webinars

FROST/FREEZE GUIDANCE PROJECT
WHAT IS IT AND HOW CAN YOU BE INVOLVED?

VIP
Midwestern Regional Climate Center
Vegetation Impact Program

National Weather Service Climate Services Training – 9/2019

Materials

Brochure: [About the MRCC Frost/Freeze Guidance Project](#)

Brochure: [About the Vegetation Impact Program](#)

Specialty Crop Information

source of information pertaining to climate impacts. P

ns of the *Atlas*, can be found

across

risk, and

seeds in

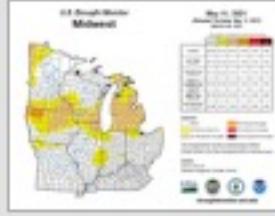
in Fall, 1916 – click for large

management tools for Michigan.

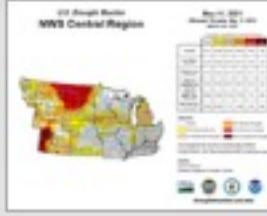
Future additions to ViP?



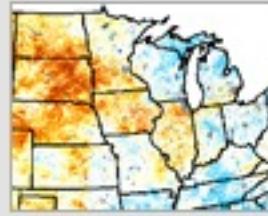
Drought Monitoring Maps



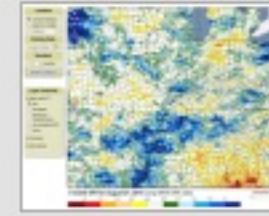
Midwest
Drought Monitor



Central Region
Drought Monitor



Quick Drought
Response Index



High Resolution
Drought Trigger
Tool

Future additions to ViP?

Soil Temperature Maps

info

4" Soil Temperature (°F) (Bare)
24-Hour Period Through 3/18/2021

• Below 40°F
• 40°F - 50°F
• 50°F - 60°F
• 60°F - 70°F

4" Soil Temperature (°F) (Sod)
24-Hour Period Through 3/18/2021

• Below 40°F
• 40°F - 50°F
• 50°F - 60°F
• 60°F - 70°F

Regional Mesonet Program (RMP)

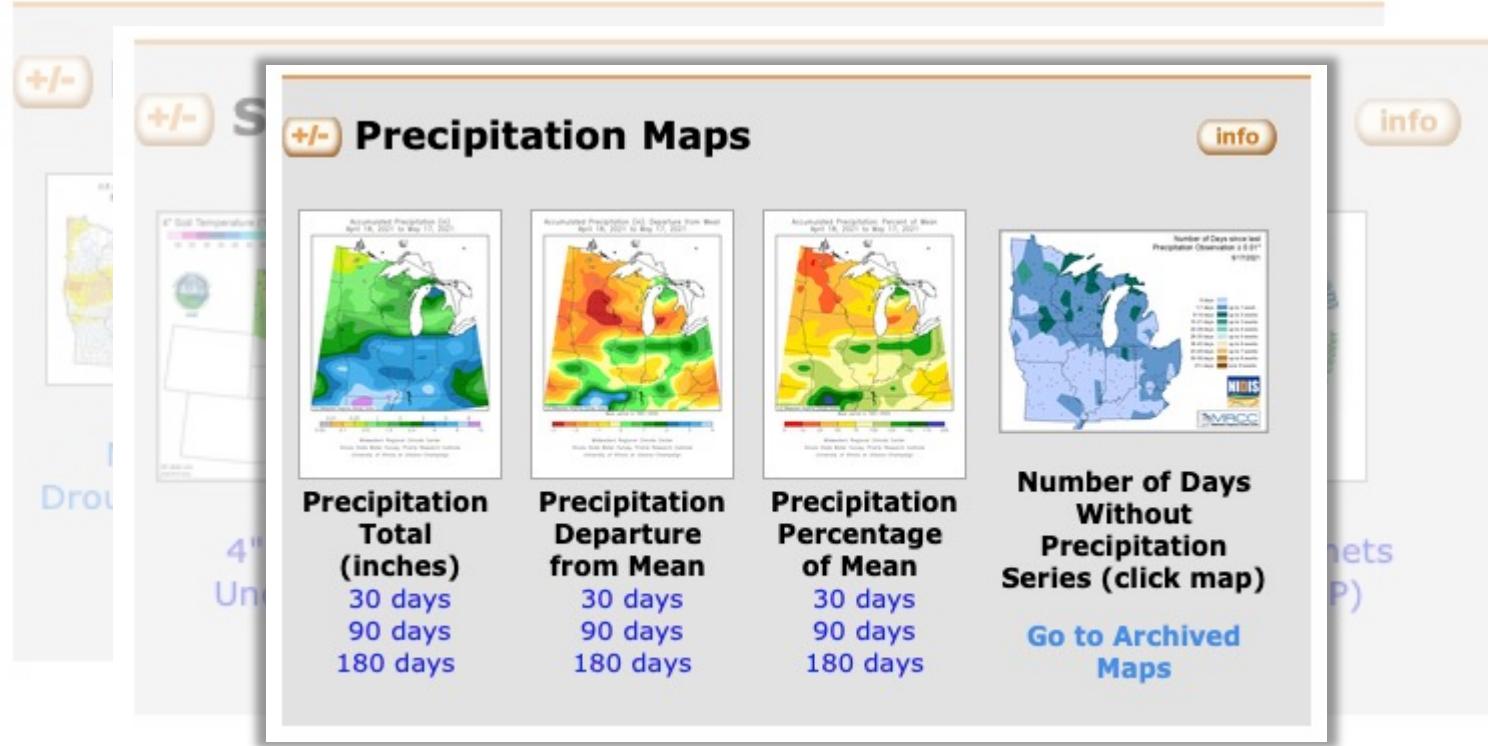
4" Soil Temp: Under Bare Soil

4" Soil Temp: Under Sod

Regional Mesonets Program (RMP)

For 2", 4" 7-day averages, and PET, see the RMP section

Future additions to ViP?



Future additions to ViP?

EVAPOTRANSPIRATION

1-Day

7-Day



WATER BALANCE

7-Day

14-Day

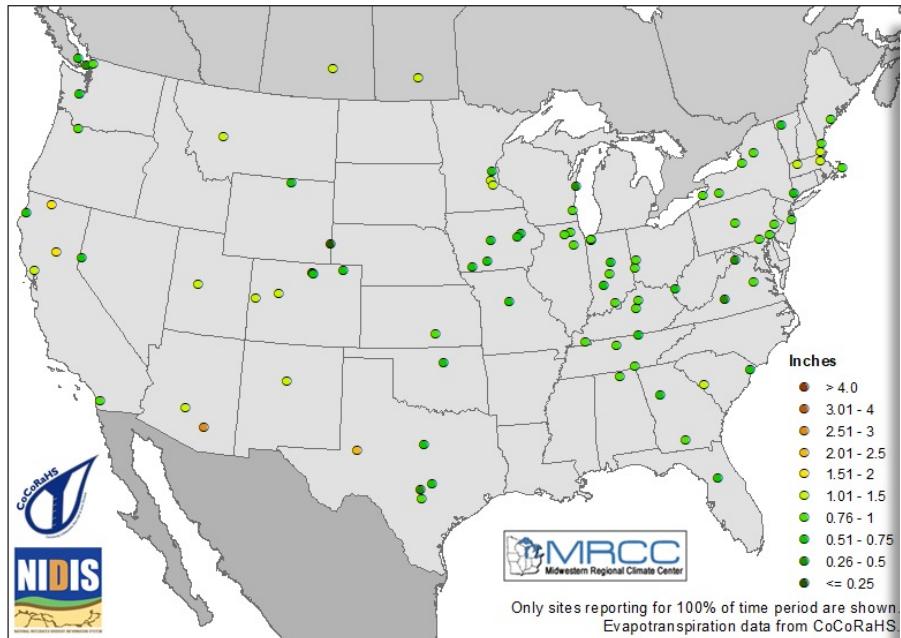
30-Day

60-Day

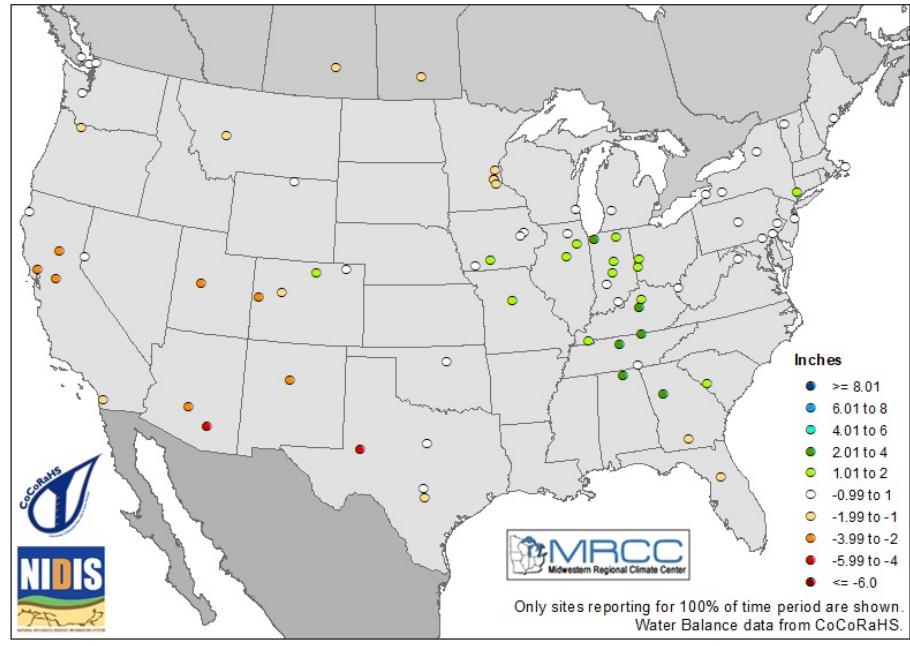


Future additions to ViP?

Evapotranspiration for 7-day Period: 5/10/2021 - 5/17/2021



Water Balance for 14-day Period: 5/3/2021 - 5/17/2021



Thanks!

mtimlin@Illinois.edu

<https://mrcc.Illinois.edu>