



Midwest Climate Hub
U.S. DEPARTMENT OF AGRICULTURE

Weather/Climate Review/Outlook 2019

Dennis Todey
Director, Midwest Climate Hub
Dennis.todey@ars.usda.gov

Charlene Felkley
Coordinator, Midwest Climate Hub
Charlene.felkley@ars.usda.gov

Topics

- A brief Background of USDA Climate Hubs
 - The need, mission
 - More on the Midwest Climate Hub
- **Current conditions**
- **Crop Impacts**
- **Outlooks**
- Resources of the USDA Midwest Climate Hub
 - Website
 - For more Information

Topics

- A brief Background of USDA Climate Hubs

- The ne
- More c

- Current

- Crop In

- Outloo

- Resour

- Webs
- For m

The screenshot shows the USDA Climate Hubs website interface. At the top, there is a dark blue header with the USDA logo and 'Climate Hubs U.S. DEPARTMENT OF AGRICULTURE'. Navigation links include 'About Us', 'Original Site', and 'Contact Us'. Below the header is a light grey navigation bar with links for 'REGIONAL HUBS', 'ALL TOPICS', 'ALL CLIMATE IMPACTS', 'ALL ACTIONS & RESOURCES', and a search box. A dark grey sub-navigation bar for the 'Midwest Climate Hub' contains links for 'About', 'Topics', 'Climate Impacts', 'Actions & Resources', and 'Climate Outlooks', which is circled in red. A green notification bar states 'Hubs General Content *Climate Outlooks* has been updated.' Below this are buttons for 'View', 'Edit', 'Delete', and 'Revisions'. The main heading is 'Climate Outlooks'. To the right is a featured image titled 'A MIDWEST AG FOCUS CLIMATE OUTLOOK' showing various agricultural scenes. Below the heading is the sub-heading 'Midwest Ag Focus Outlook', which is circled in red, followed by the link '**Northeast Iowa Research Farm Growing Season Outlook June 2019'. A paragraph of text explains that the Midwest Ag-Focus Outlooks are produced monthly and provides a link to find the most current outlook and an email subscription link.

Intro to Climate Hub Work



Assessments and Syntheses

delivering relevant information

Outreach and Education

enabling climate-informed decisions

Technical Support

facilitating engagement, discovery and exchange



Here in the Midwest...



Our Goal

To provide information to help producers cope with climate change through **linkages of research, education and partnerships** in a region that represents one of the **most intense areas of agricultural production** in the world.

MCH Thematic Areas

Assessments and Syntheses

delivering relevant information



United States Department of Agriculture
National Institute of Food and Agriculture



AMERICAN
FRUIT GROWER



U.S. Global Change Research Program
**National Climate
Assessment**



AMERICAN
**Vegetable
GROWER.**

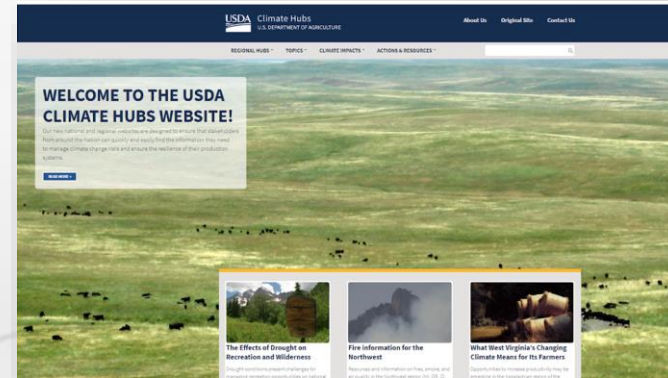
MCH Thematic Areas

Outreach and Education

enabling climate-informed decisions

MAC-T

Midwest Agriculture and Climate Team



USDA Midwest Climate Hub
U.S. DEPARTMENT OF AGRICULTURE
February 2, 2018

Midwest Ag Focus Climate Outlook

Current Conditions

The winter temperature in the Midwest was generally below normal, with a significant cold spell in the Midwest and Northeast. The Midwest was generally drier than normal, with a significant dry spell in the Midwest and Northeast. The Midwest was generally drier than normal, with a significant dry spell in the Midwest and Northeast.

Parameter	Normal	Actual
Temperature	32.0	30.0
Precipitation	30.0	25.0
Soil Moisture	0.5	0.3

National Integrated Drought Information System
drought.gov

Drought Status Update

MIDWEST & NORTHERN PLAINS

JUNE 21, 2018

Drought concerns linger with above-normal temperatures

- Recent satellite data have shown some immediate drought conditions. However, warmth and existing drought conditions will continue to pose potential problems for the region.
- Above-normal temperatures are likely to return in mid-summer, causing potential stress on crops during critical on-growth stages.

Parameter	Normal	Actual
Temperature	65.0	70.0
Precipitation	3.0	2.0
Soil Moisture	0.5	0.3

Midwest and Great Plains Climate & Drought Outlook

16 August 2018

Im Angel
Illinois State Climatologist, University of Illinois
Champaign, IL
jimangel@illinois.edu

Parameter	Normal	Actual
Temperature	65.0	70.0
Precipitation	3.0	2.0
Soil Moisture	0.5	0.3

Quarterly Climate Impacts and Outlook

Great Lakes Region

June 2018

Great Lakes Significant Events - for March - May 2018

Several strong weather events brought the season into an abnormally active period for much of the eastern portion of the basin. The sequence of events included a series of heavy rain events in the Great Lakes region, followed by a period of above-normal temperatures and a period of above-normal precipitation.

Parameter	Normal	Actual
Temperature	65.0	70.0
Precipitation	3.0	2.0
Soil Moisture	0.5	0.3

Regional Climate Overview for March - May 2018

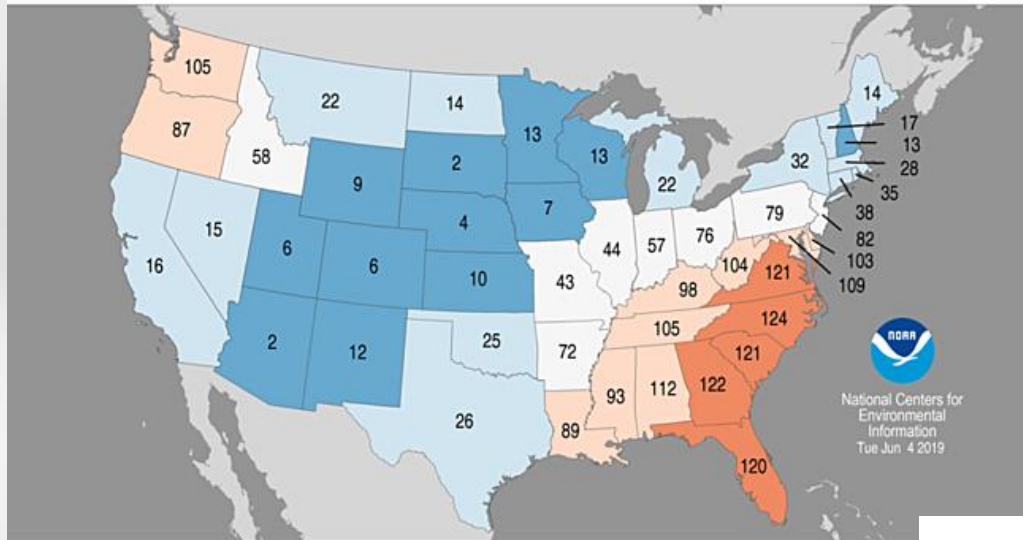
Great Lakes Water Levels

Parameter	Normal	Actual
Temperature	65.0	70.0
Precipitation	3.0	2.0
Soil Moisture	0.5	0.3

Statewide Maximum Temperature Ranks

May 2019

Period: 1895–2019



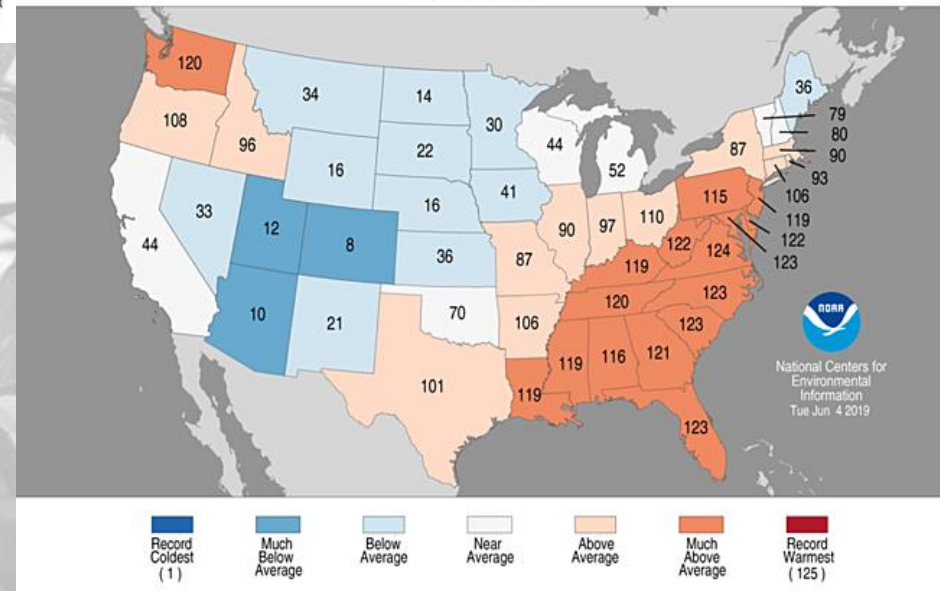
May

Temperature

Statewide Minimum Temperature Ranks

May 2019

Period: 1895–2019



- May temperatures mostly colder than average. Signal more in the max temps.
- Top 10 coldest average highs central/western US.
- Warmer minimums eastern US

Statewide Maximum Temperature Ranks

May 2019

Period: 1895-2019

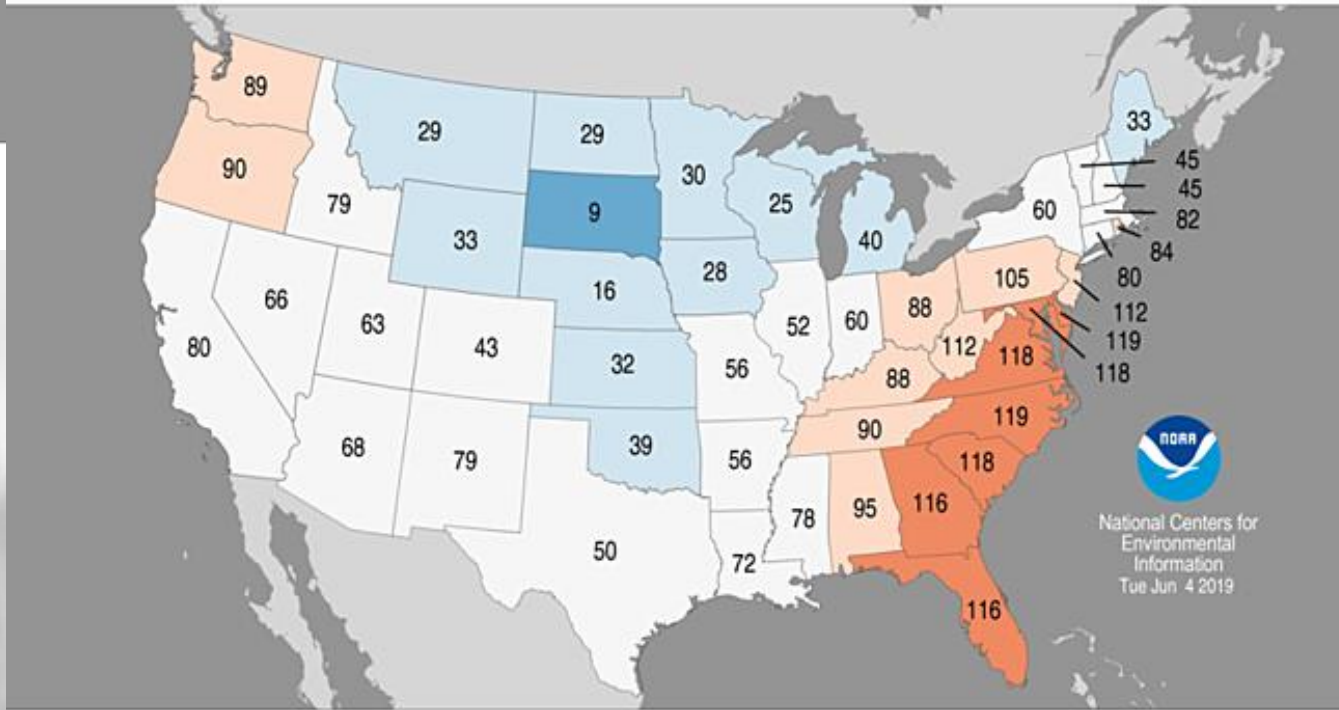


Spring Temperature

Statewide Average Temperature Ranks

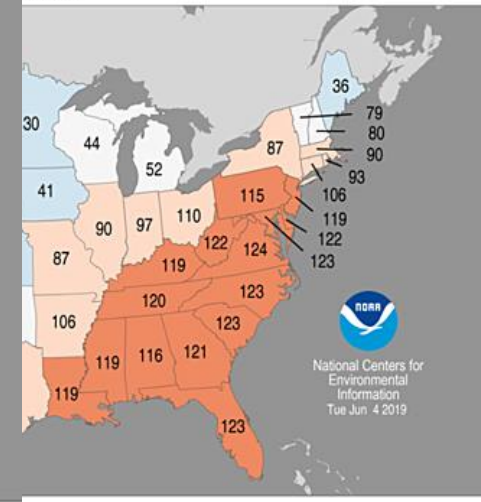
March-May 2019

Period: 1895-2019



Temperature Ranks

May 2019
Period: 1895-2019



Record Coldest
(1)

Much Below Average

Below Average

Near Average

Above Average

Much Above Average

Record Warmest
(125)

Near Average

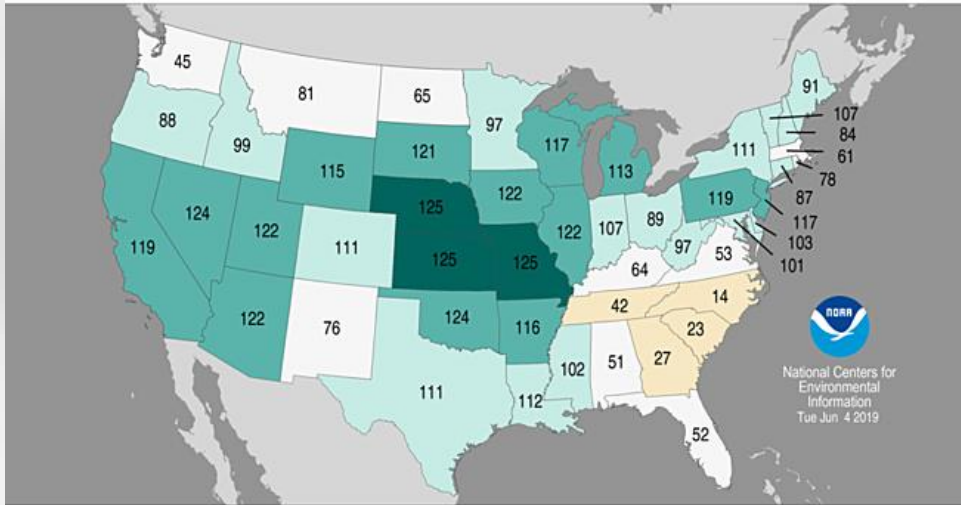
Above Average

Much Above Average

Record Warmest
(125)

Statewide Precipitation Ranks

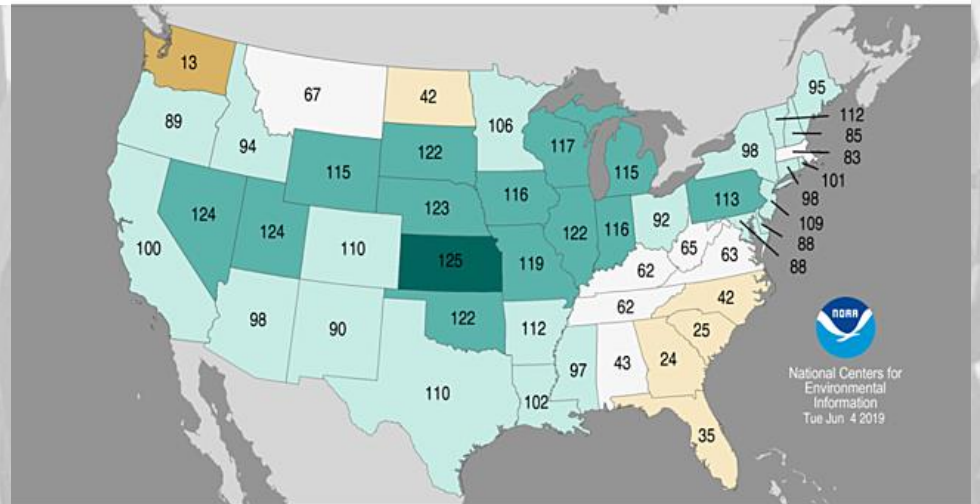
May 2019
Period: 1895–2019



May/Spring Precipitation

Statewide Precipitation Ranks

March–May 2019
Period: 1895–2019

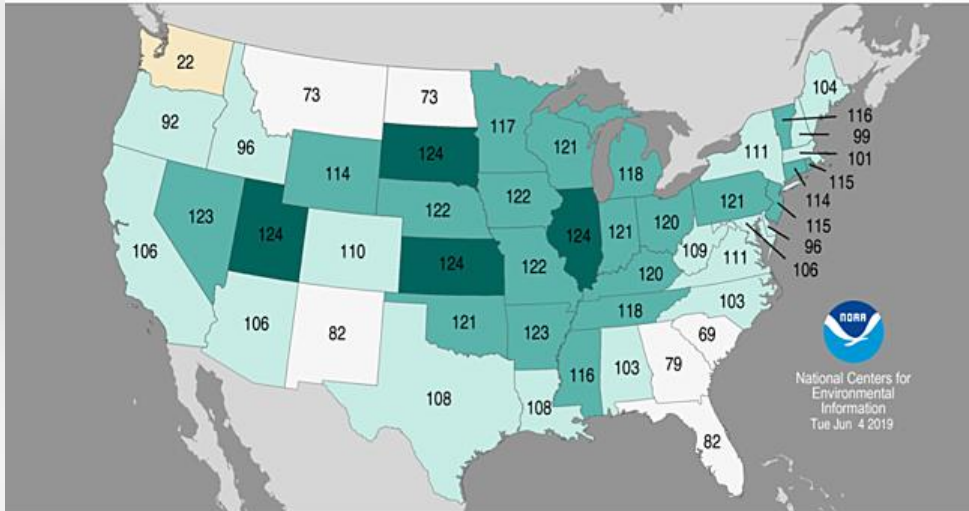


- May and spring precipitation well above average through middle US
- Top 10 and wettest all time for a few states at these time scales

Statewide Precipitation Ranks

December 2018–May 2019

Period: 1895–2019

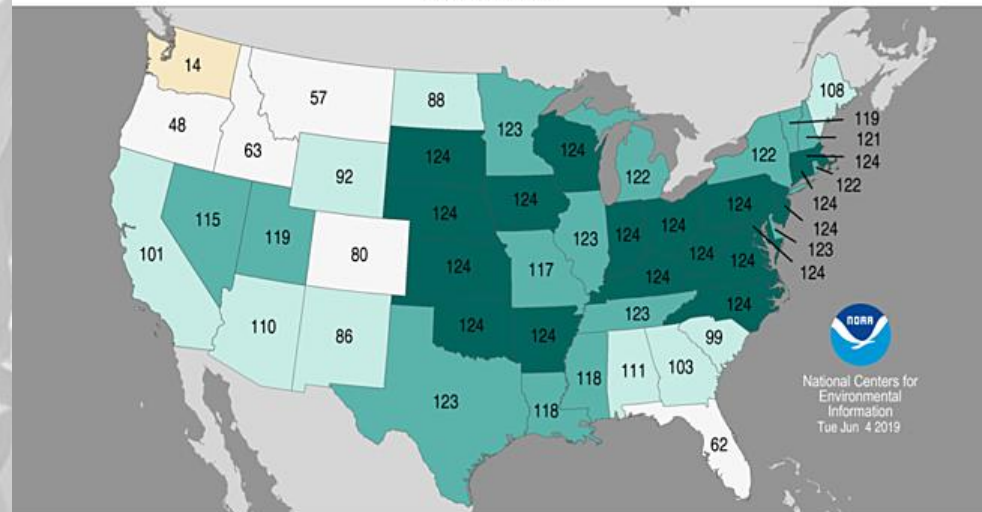


6/12 Month Precipitation

Statewide Precipitation Ranks

June 2018–May 2019

Period: 1895–2019

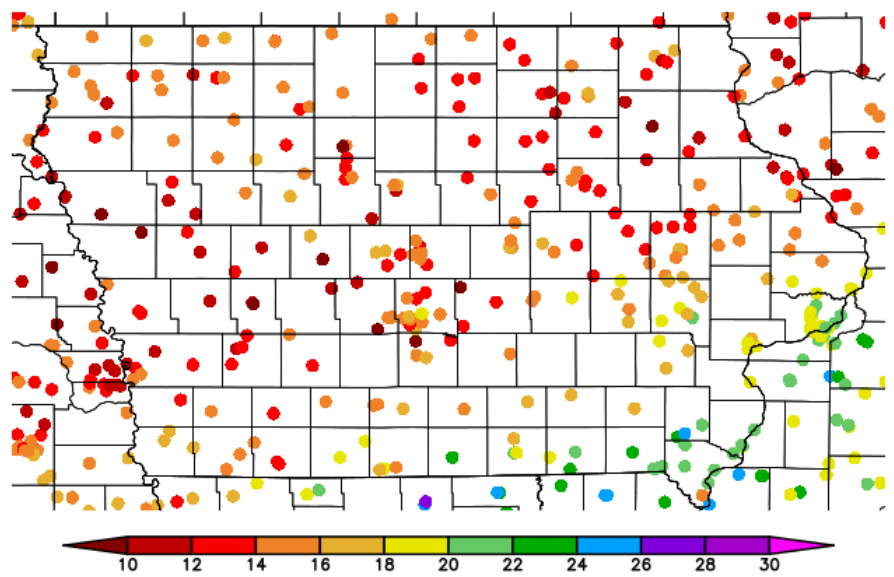


- Extended period of wetness back to a year.
- Top 10/record wettest in states back to a year.
- Wetness problems are long term issues.
- Iowa wettest June-May period on record (124 years)

<https://www.ncdc.noaa.gov/temp-and-precip/us-maps/>

90 Day Precip. Total/% Avg.

Precipitation (in)
3/29/2019 - 6/26/2019

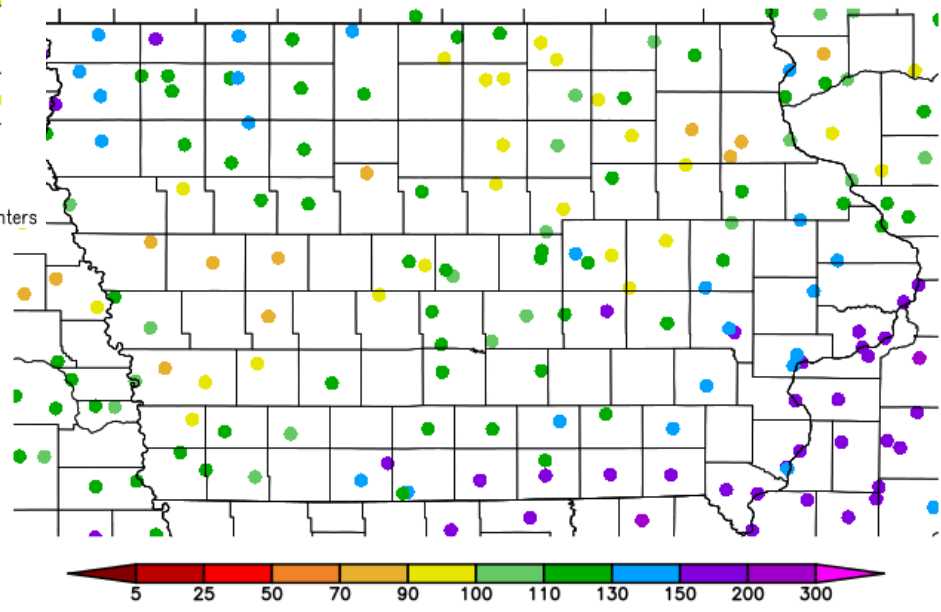


Generated 6/27/2019 at HPRCC using provisional data.

NOAA Regional Climate Centers

10-24" last 90 days. West central to north – pockets less than 70% average. Greater than 150% SE.

Percent of Normal Precipitation (%)
3/29/2019 - 6/26/2019

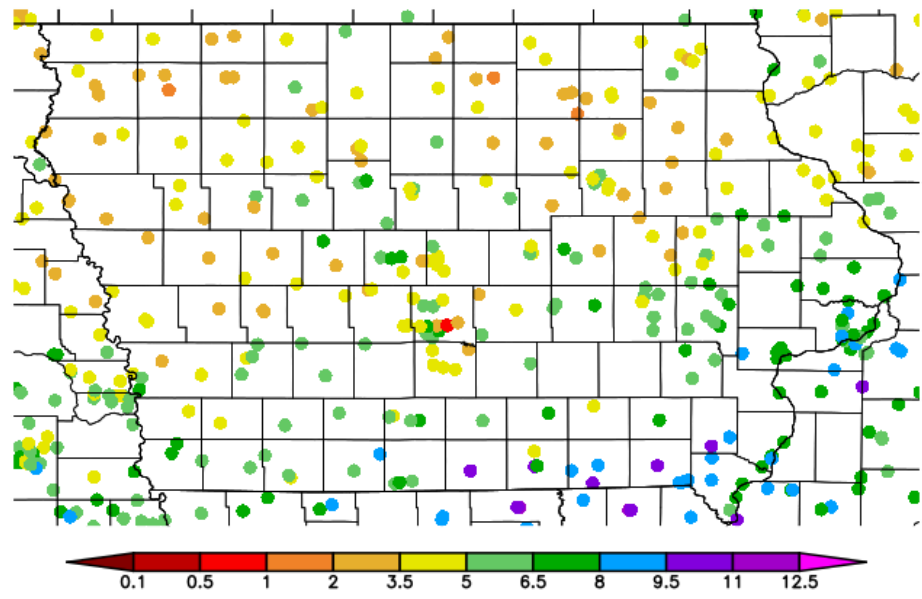


Generated 6/27/2019 at HPRCC using provisional data.

NOAA Regional Climate Centers

30 Day Precip. Total/% Avg.

Precipitation (in)
5/28/2019 - 6/26/2019

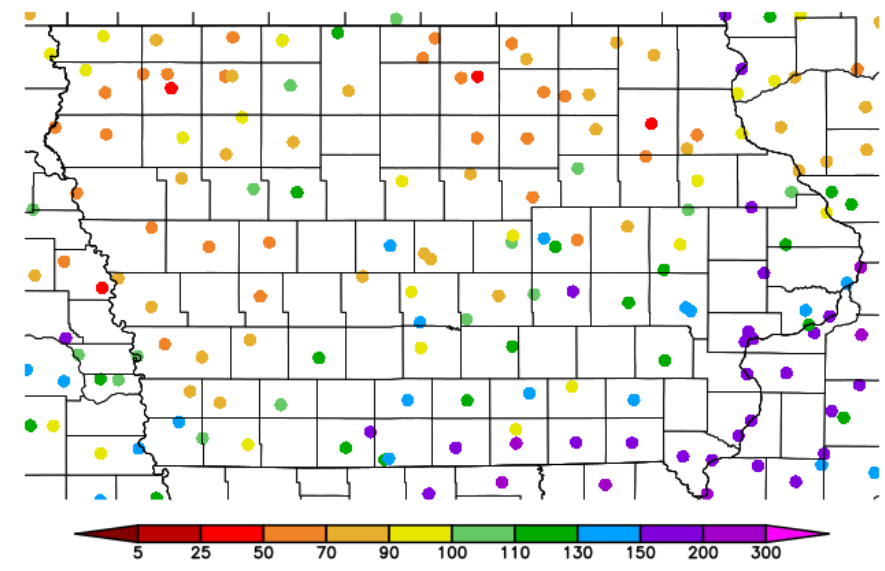


Generated 6/27/2019 at HPRCC using provisional data.

NOAA Regional Climate Cent

Totals less than 5" across northern IA to near 11" in the SE and SW. 150-200% of average in the south. Pockets below 50% avg. WC and N.

Percent of Normal Precipitation (%)
5/28/2019 - 6/26/2019

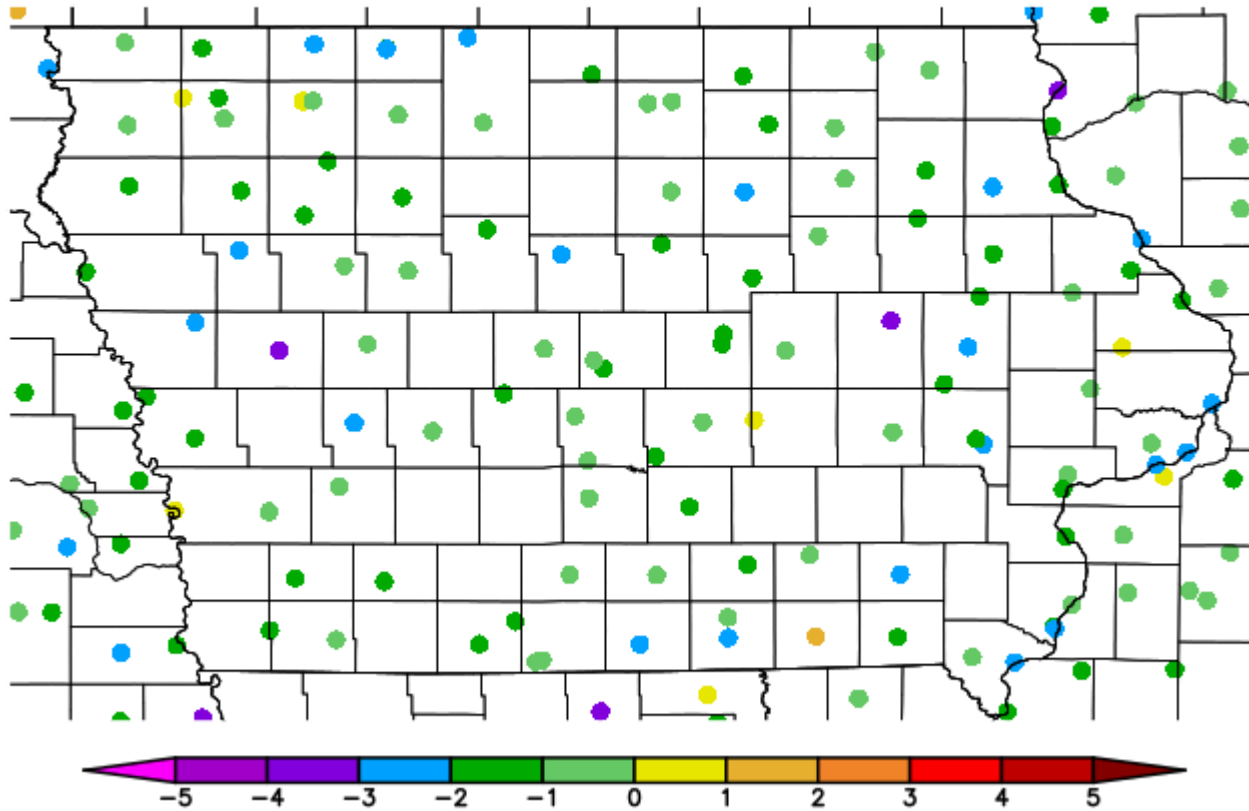


Generated 6/27/2019 at HPRCC using provisional data.

NOAA Regional Climate Centers

30 Day Temperatures

Departure from Normal Temperature (F)
5/28/2019 – 6/26/2019



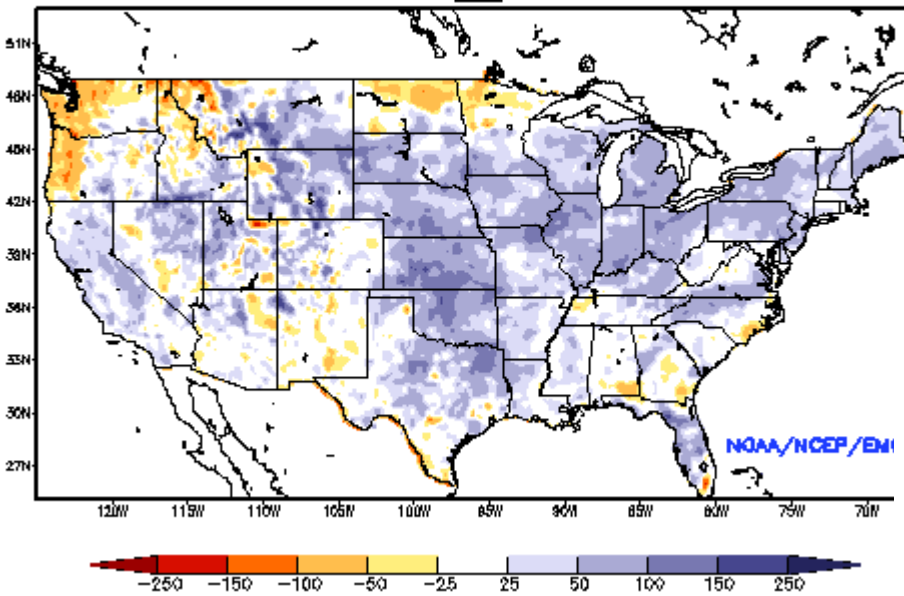
Slightly below average (1-2 F) for much of the state.
Mostly slightly below avg.

Generated 6/27/2019 at HPRCC using provisional data.

NOAA Regional Climate Centers

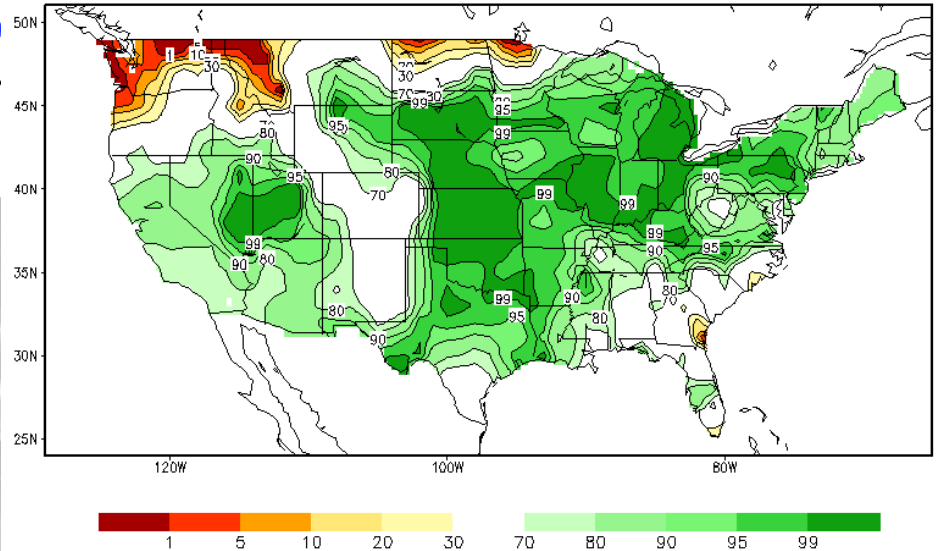
Soil Moisture

Ensemble-Mean - Current Total Column Soil Moisture Anomaly (mm)
NCEP NLDAS Products Valid: JUN 21, 2019



Soil moisture several inches above average – 95th percentile (basically still very wet)

Calculated Soil Moisture Ranking Percentile
JUN 24, 2019



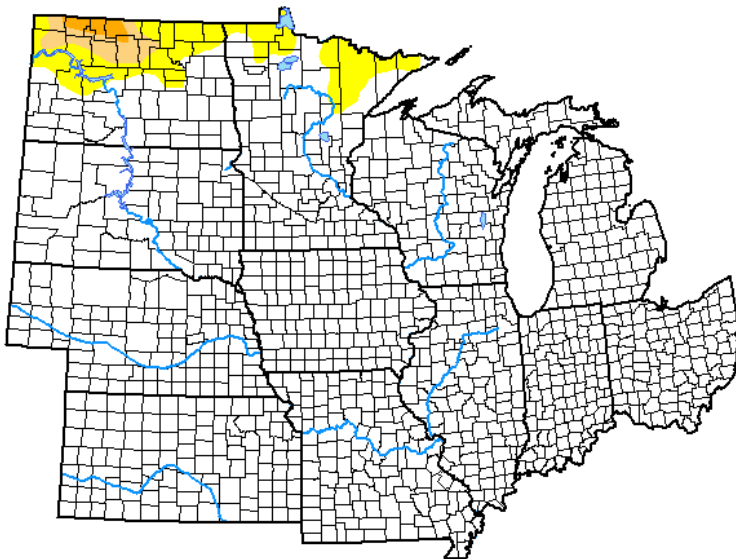
<https://www.emc.ncep.noaa.gov/mmb/nldas/drought/>

https://www.cpc.ncep.noaa.gov/products/Soilmst_Monitoring/US/Soilmst/Soilmst.shtml

US Drought Monitor

U.S. Drought Monitor North Central

June 25, 2019
(Released Thursday, Jun. 27, 2019)
Valid 8 a.m. EDT



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	94.22	5.78	1.34	0.35	0.00	0.00
Last Week 06-18-2019	94.22	5.78	2.00	0.63	0.00	0.00
3 Months Ago 03-26-2019	100.00	0.00	0.00	0.00	0.00	0.00
Start of Calendar Year 01-01-2019	95.93	4.07	1.43	0.00	0.00	0.00
Start of Water Year 09-25-2018	73.15	26.85	12.92	4.07	0.97	0.05
One Year Ago 06-26-2018	71.03	28.97	12.26	4.88	0.73	0.00

Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:

Brad Pugh
CPC/NOAA

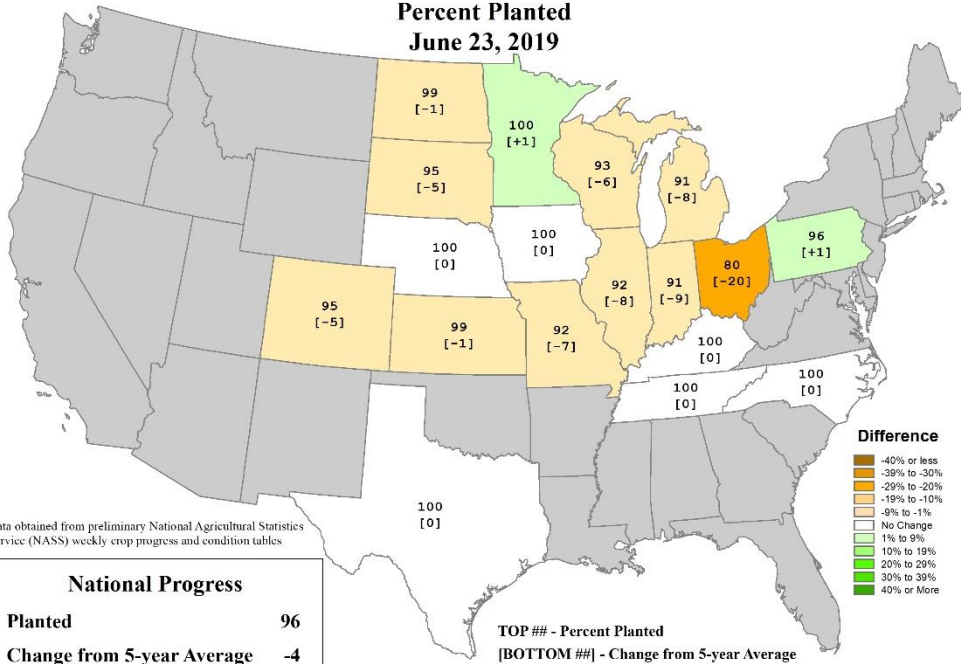


droughtmonitor.unl.edu

D0 pockets in Minnesota.
Northern North Dakota in D1/D2.

U.S. Corn Progress

Percent Planted
June 23, 2019



Data obtained from preliminary National Agricultural Statistics Service (NASS) weekly crop progress and condition tables

National Progress

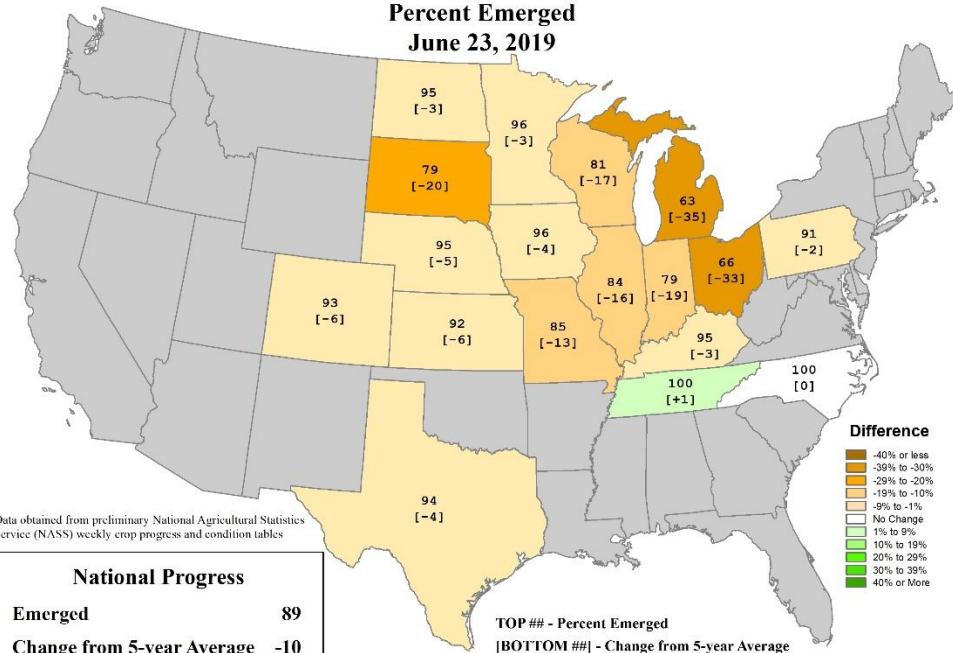
Planted	96
Change from 5-year Average	-4

TOP ## - Percent Planted
[BOTTOM ##] - Change from 5-year Average

USDA NASS Crop Progress (through June 23)

U.S. Corn Progress

Percent Emerged
June 23, 2019



Data obtained from preliminary National Agricultural Statistics Service (NASS) weekly crop progress and condition tables

National Progress

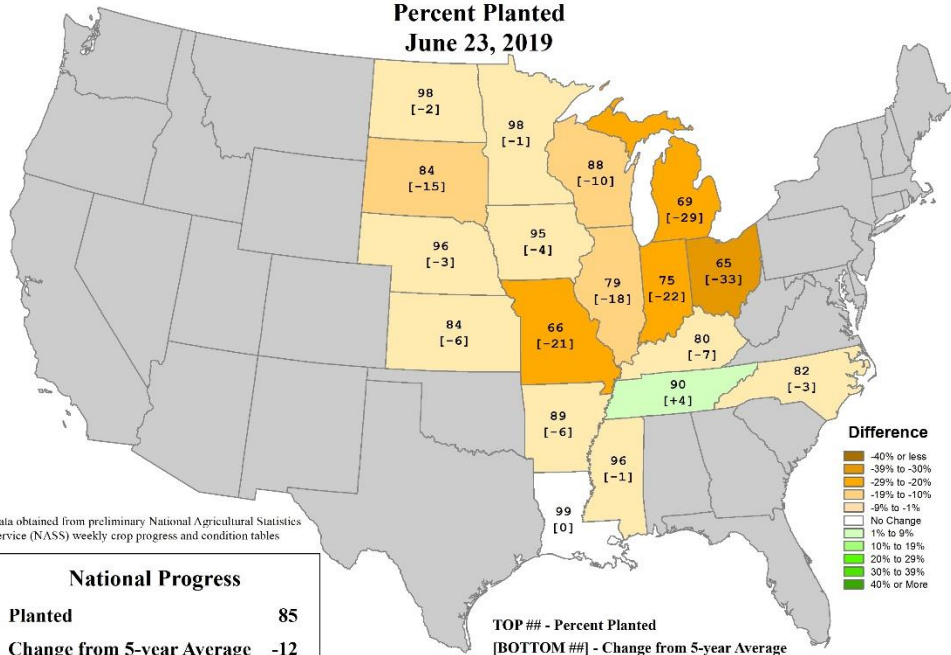
Emerged	89
Change from 5-year Average	-10

TOP ## - Percent Emerged
[BOTTOM ##] - Change from 5-year Average

Corn progress nationally through June 23 (96% planted -4%; 89% -10%). Iowa better than many states (100%; 96% -4%).

U.S. Soybeans Progress

Percent Planted
June 23, 2019



Data obtained from preliminary National Agricultural Statistics Service (NASS) weekly crop progress and condition tables

National Progress	
Planted	85
Change from 5-year Average	-12

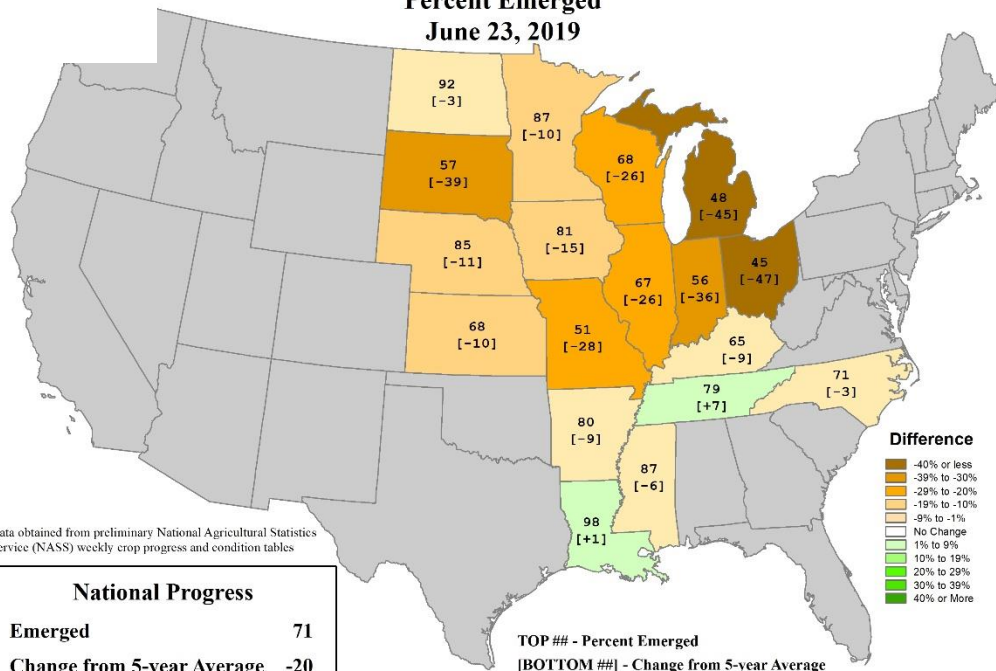
TOP## - Percent Planted
[BOTTOM##] - Change from 5-year Average



USDA NASS Crop Progress (through June 23)

U.S. Soybeans Progress

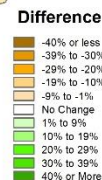
Percent Emerged
June 23, 2019



Data obtained from preliminary National Agricultural Statistics Service (NASS) weekly crop progress and condition tables

National Progress	
Emerged	71
Change from 5-year Average	-20

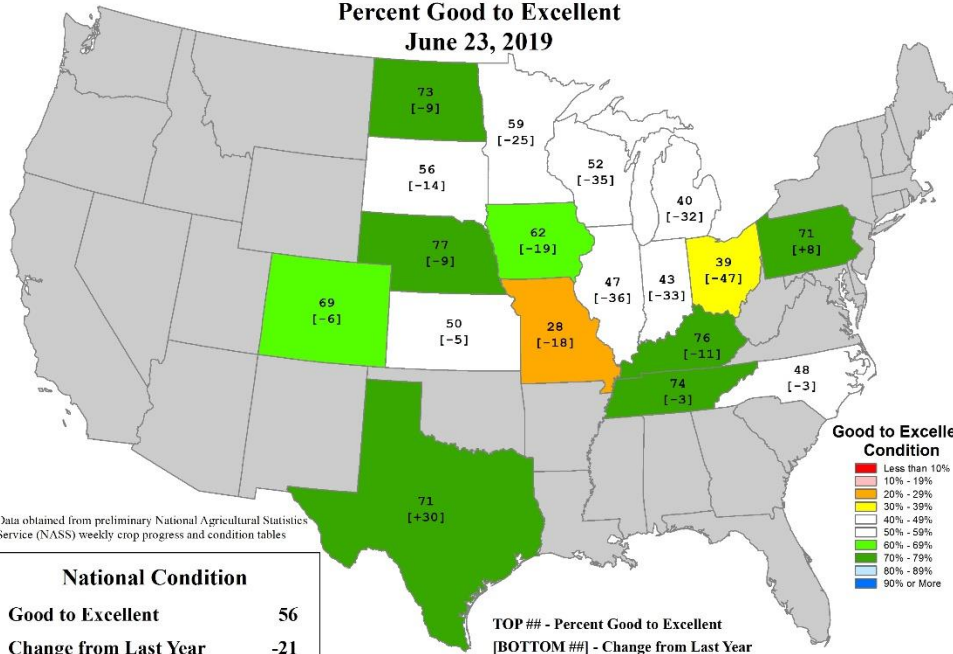
TOP## - Percent Emerged
[BOTTOM##] - Change from 5-year Average



Bean progress nationally through June 23 (85% planted -12%; 71% - 20%). Iowa still better than many states (95% - 4%; 81% -15%).

U.S. Corn Conditions

Percent Good to Excellent
June 23, 2019



Data obtained from preliminary National Agricultural Statistics Service (NASS) weekly crop progress and condition tables

National Condition	
Good to Excellent	56
Change from Last Year	-21

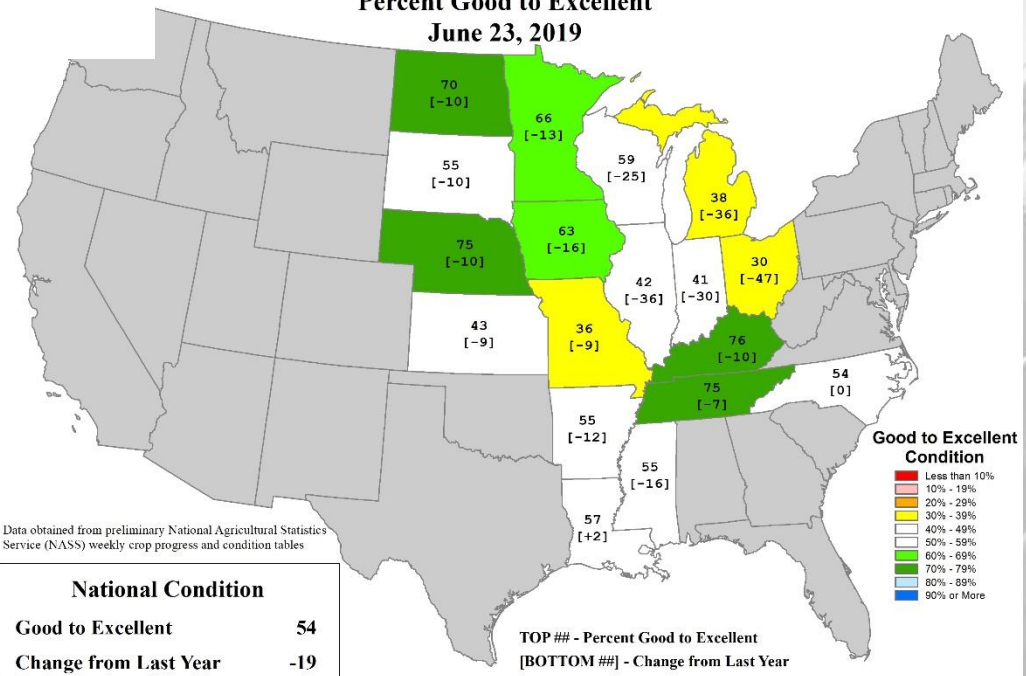
TOP## - Percent Good to Excellent
[BOTTOM##] - Change from Last Year



USDA NASS Crop Condition (through June 23)

U.S. Soybean Conditions

Percent Good to Excellent
June 23, 2019



Data obtained from preliminary National Agricultural Statistics Service (NASS) weekly crop progress and condition tables

National Condition	
Good to Excellent	54
Change from Last Year	-19

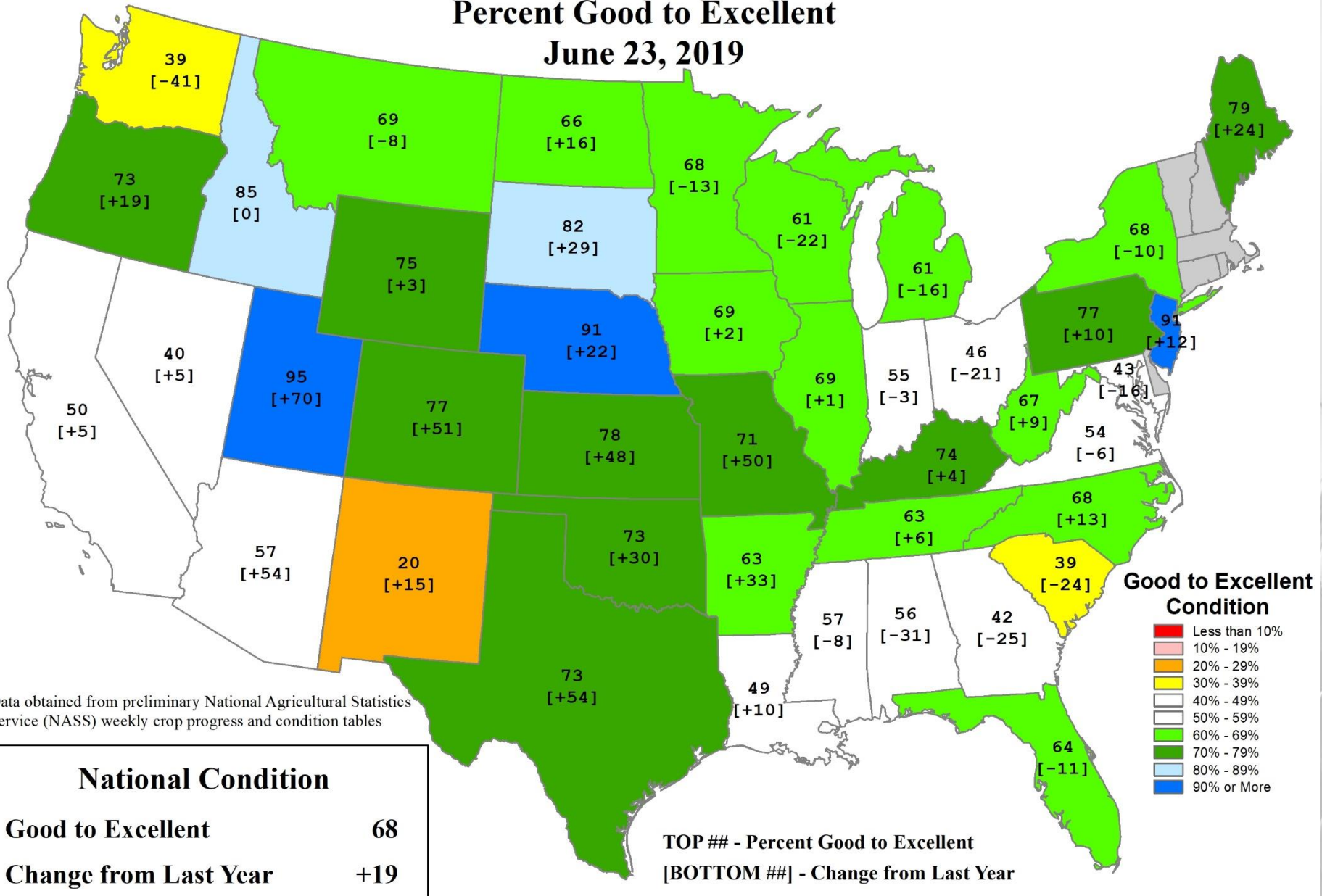
TOP## - Percent Good to Excellent
[BOTTOM##] - Change from Last Year



Condition indexed similar to 2012 and 1993 at this point. 2012 was dropping quickly.

U.S. Pasture and Range Conditions

Percent Good to Excellent
June 23, 2019

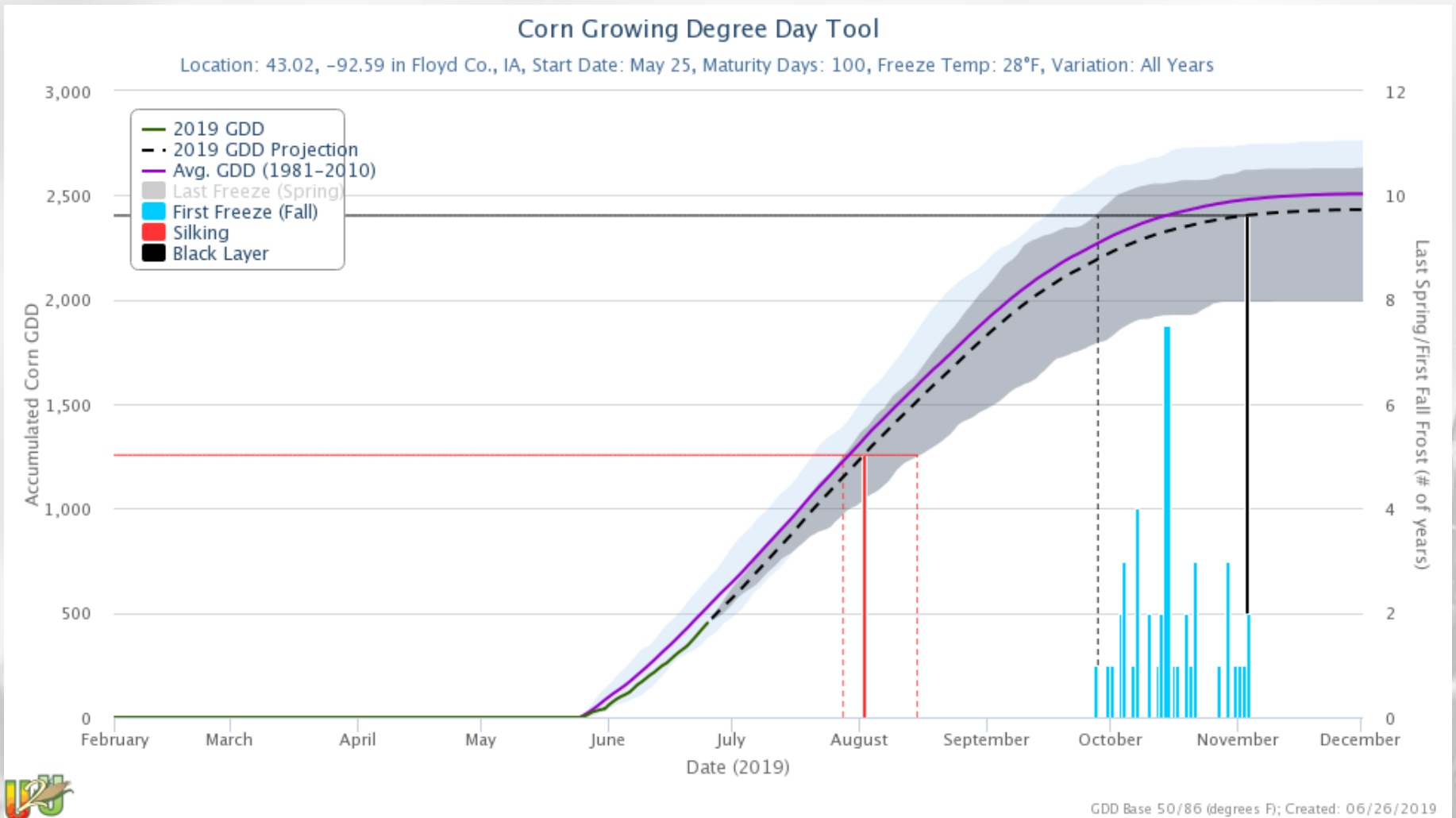


Data obtained from preliminary National Agricultural Statistics Service (NASS) weekly crop progress and condition tables

National Condition	
Good to Excellent	68
Change from Last Year	+19

TOP ## - Percent Good to Excellent
[BOTTOM ##] - Change from Last Year

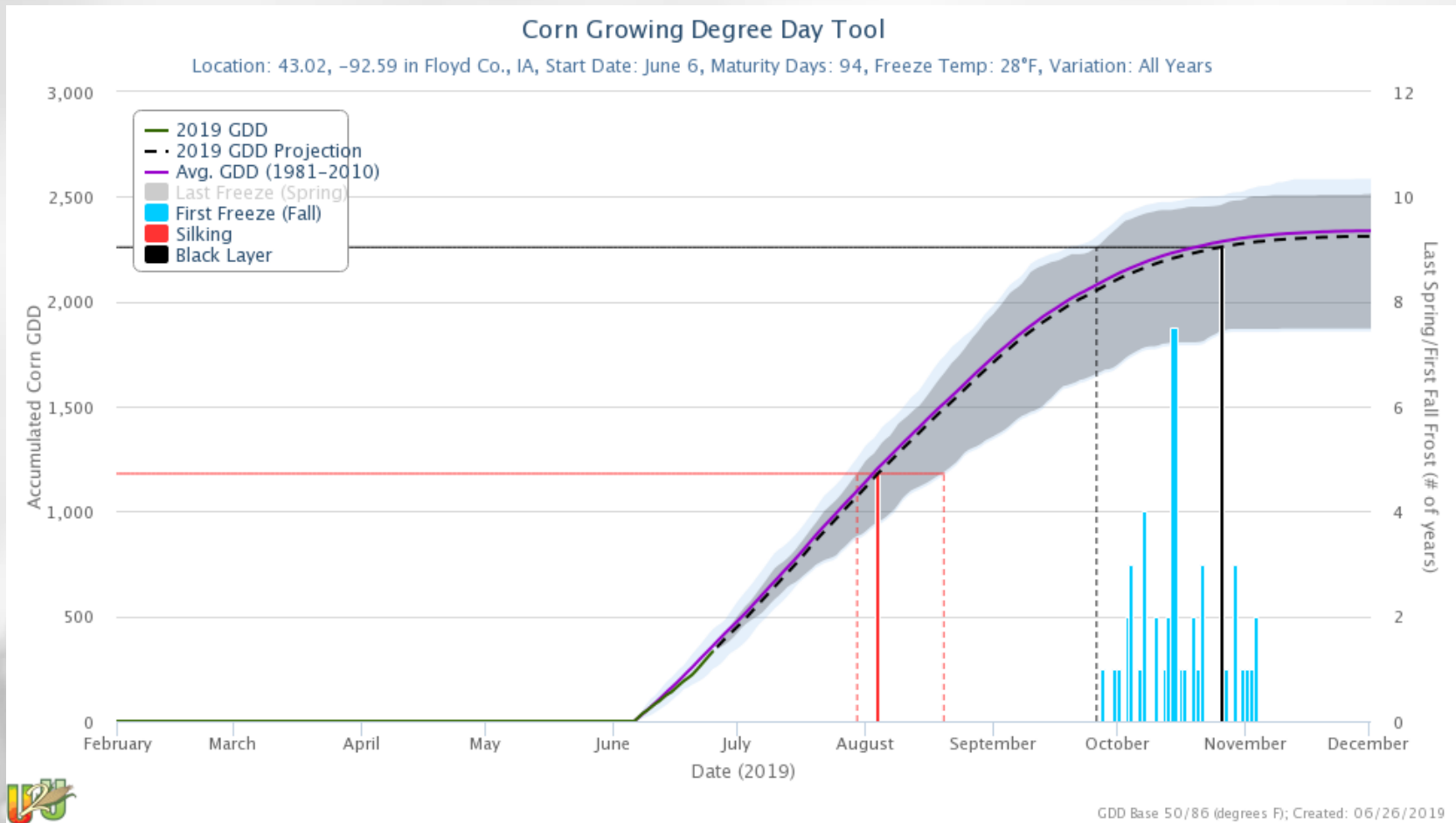
GDD Accumulation – Floyd County



Note: Both versions working.

<http://mrcc.isws.illinois.edu/U2U/gdd/> or <https://hprcc.unl.edu/gdd.php>

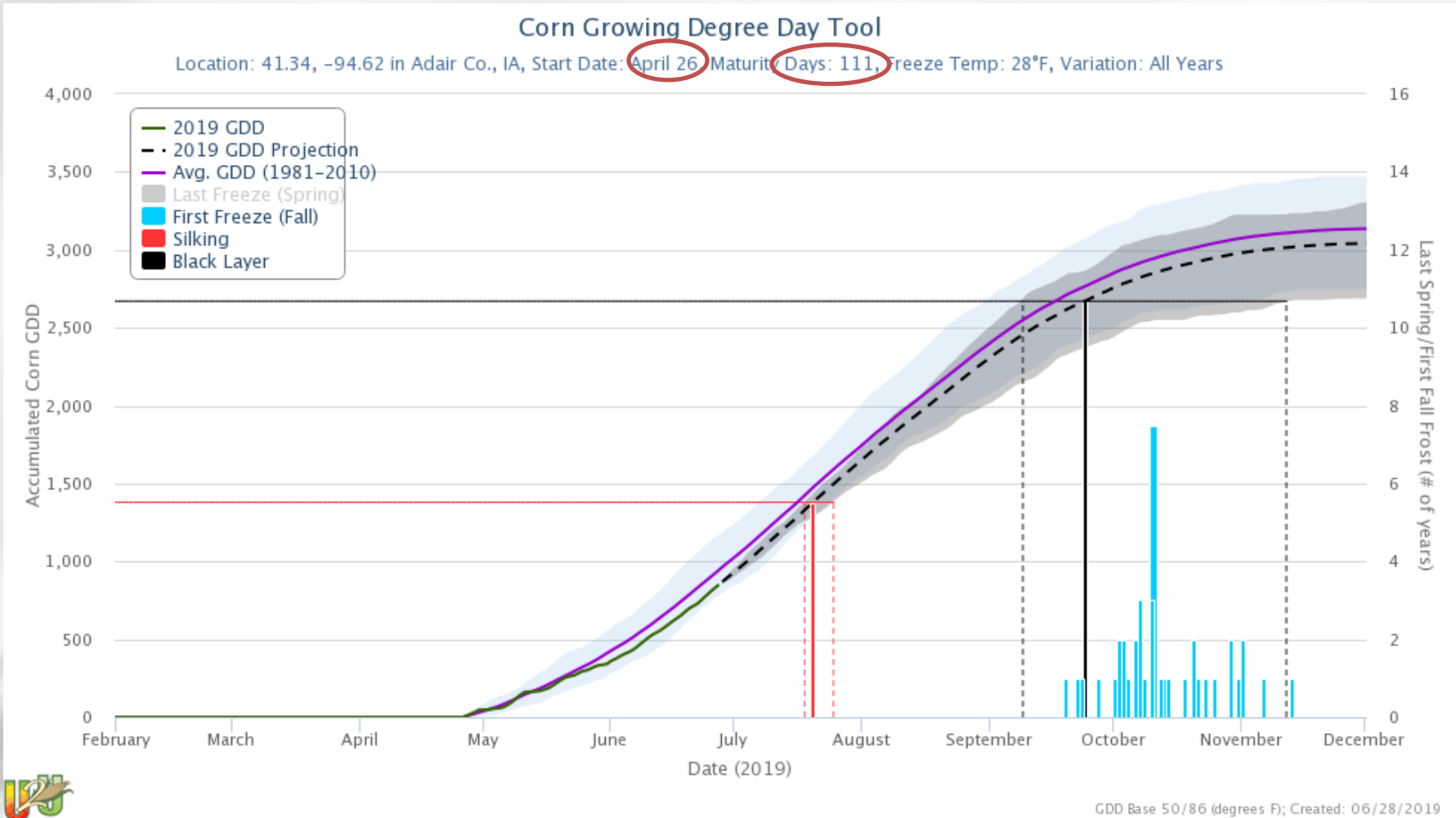
GDD Accumulation – Floyd County



Note: Both versions working.

<http://mrcc.isws.illinois.edu/U2U/gdd/> or <https://hprcc.unl.edu/gdd.php>

GDD Accumulation – Adair County



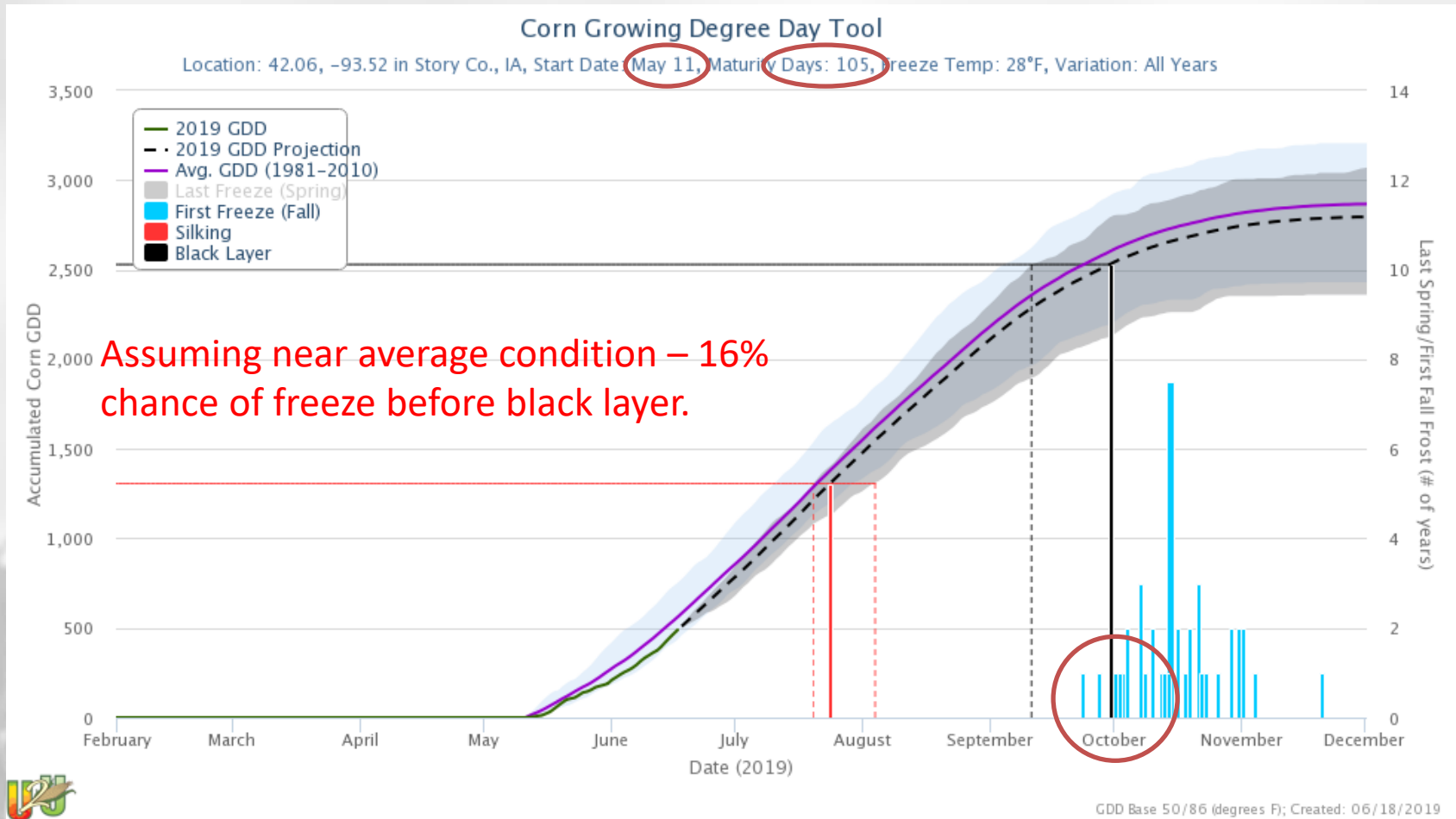
Note: Both versions working.

<http://mrcc.isws.illinois.edu/U2U/gdd/> or <https://hprcc.unl.edu/gdd.php>

Assumptions

- Assumes avg. GDD accumulation rest of season (that is a big question right now)
- Does not incorporate shortening of GDD requirement for late planted corn.

GDD Accumulation – Story County



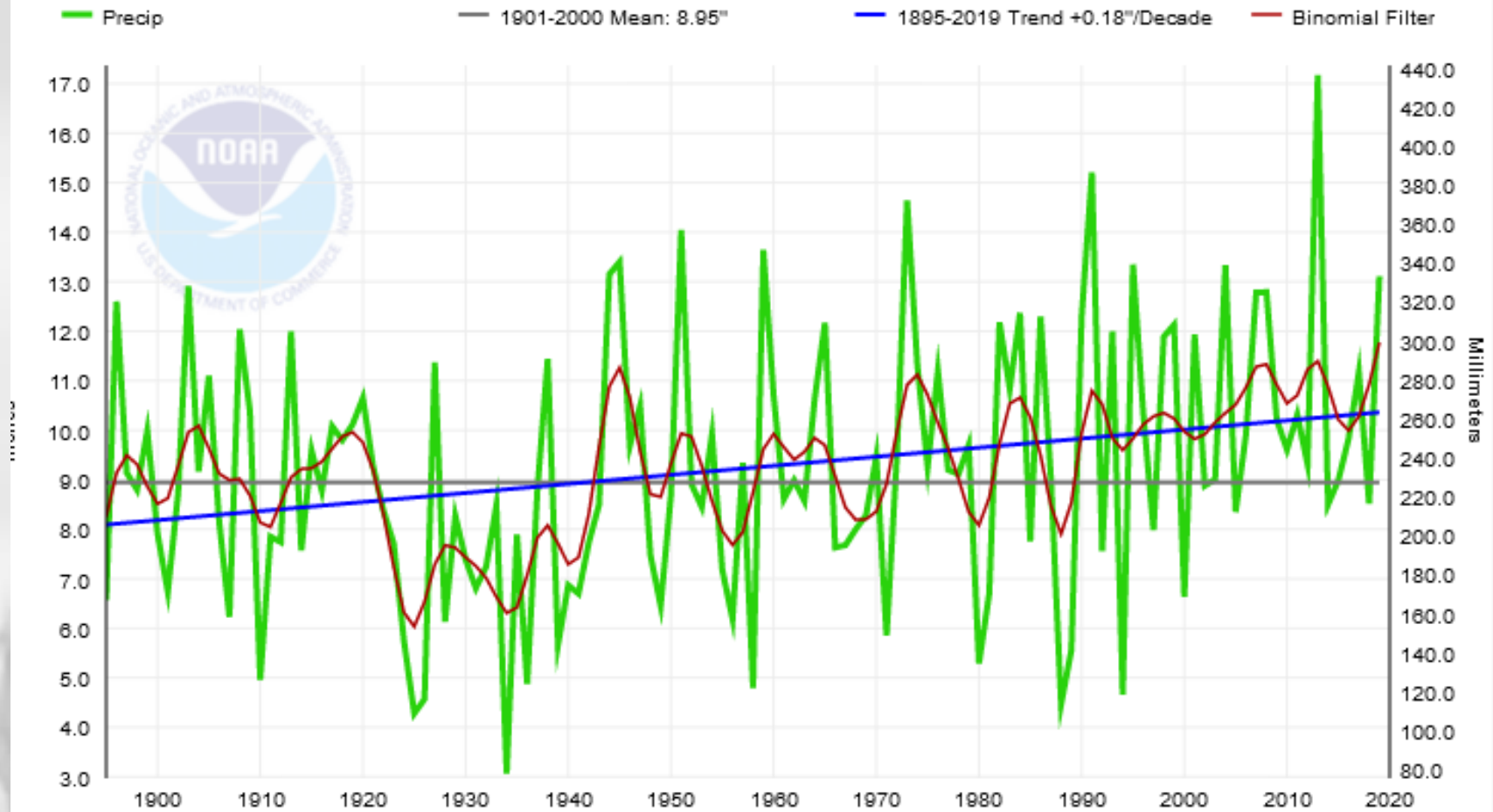
<http://mrcc.isws.illinois.edu/U2U/gdd/> or <https://hprcc.unl.edu/gdd.php>

Crop/Harvest issues

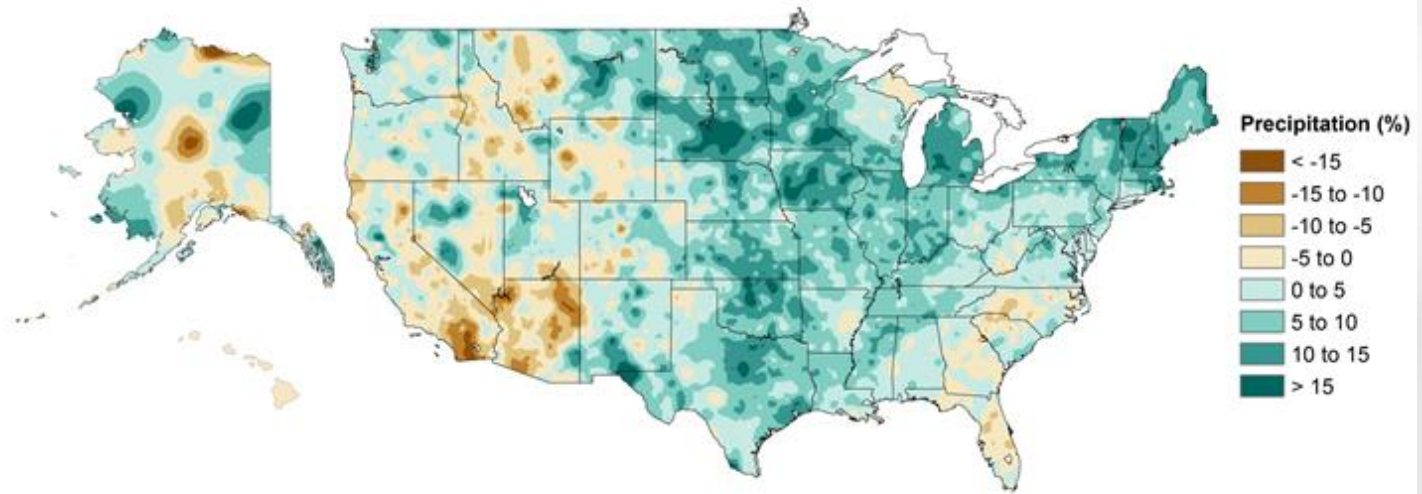
- Growing season:
 - Slow development
 - Disease
 - Weed issues
 - Lack of sunlight (don't have good data on this)
- Harvest:
 - Some potential freeze concerns
 - More likely lots of immature high moisture corn
- GDD Tool - Keep checking back on progress

Crop/Harvest issues

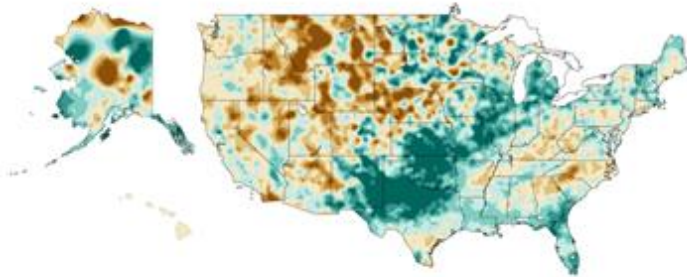
Iowa, Precipitation, March-May



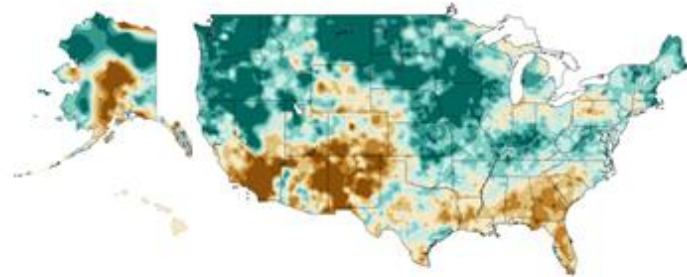
Annual Precipitation



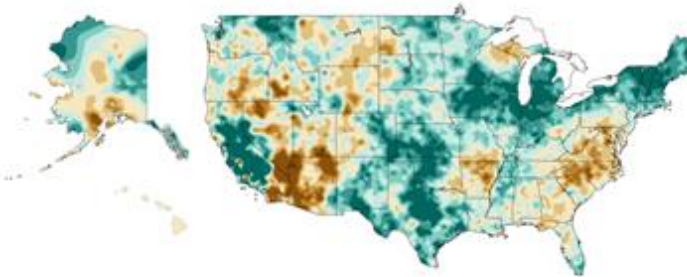
Winter Precipitation



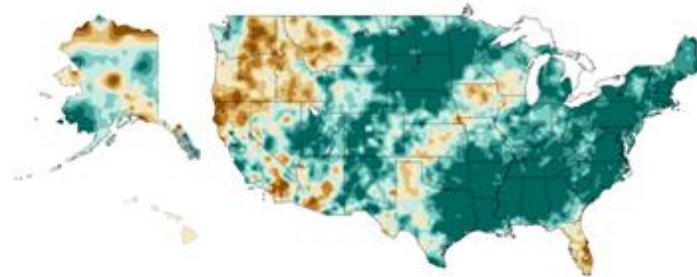
Spring Precipitation



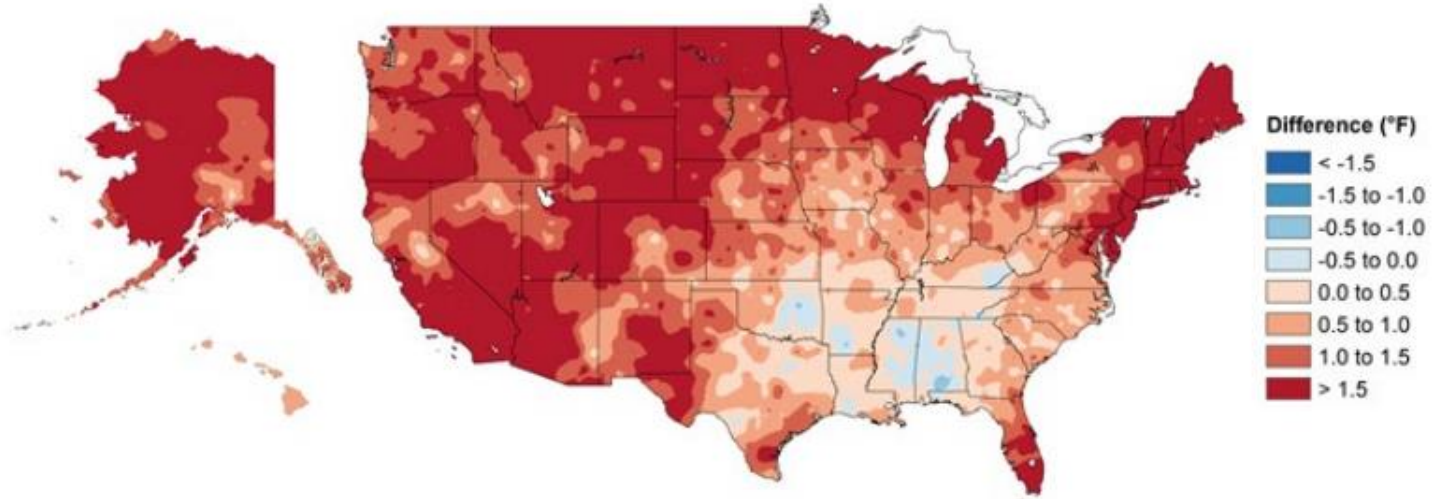
Summer Precipitation



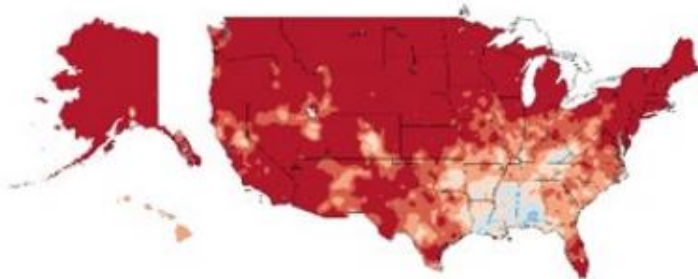
Fall Precipitation



Annual Temperature



Winter Temperature



Summer Temperature

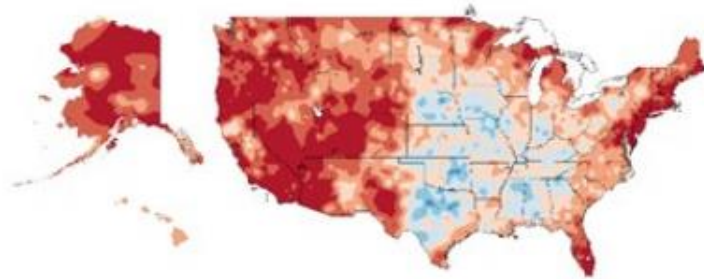
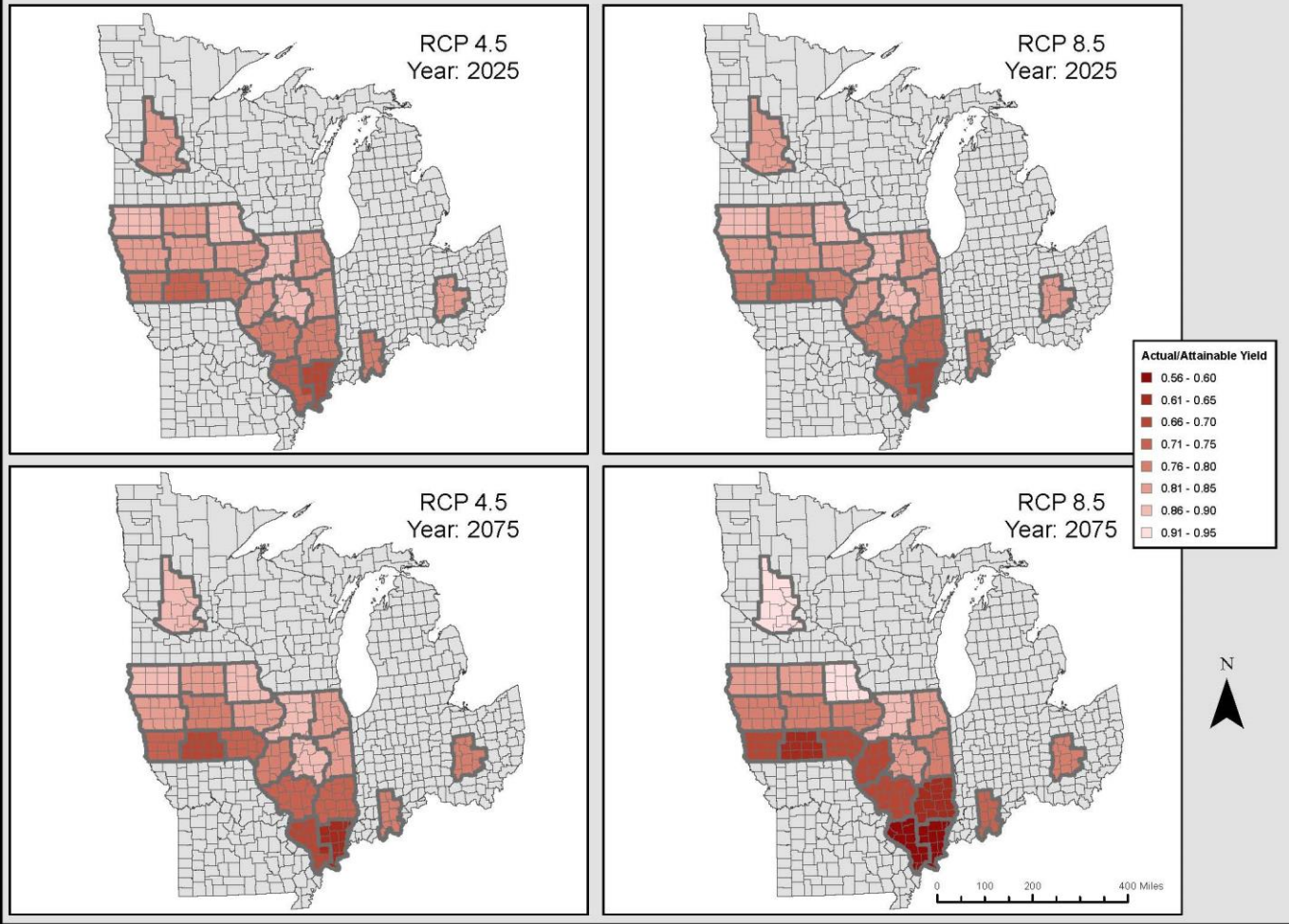
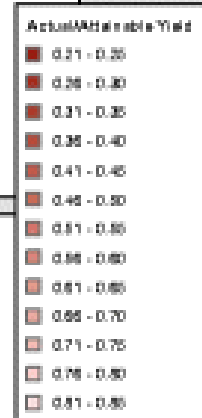
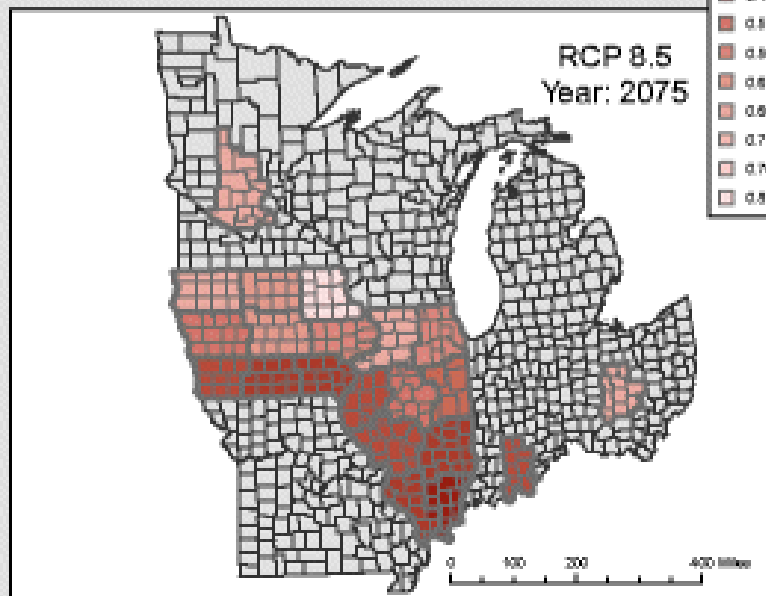
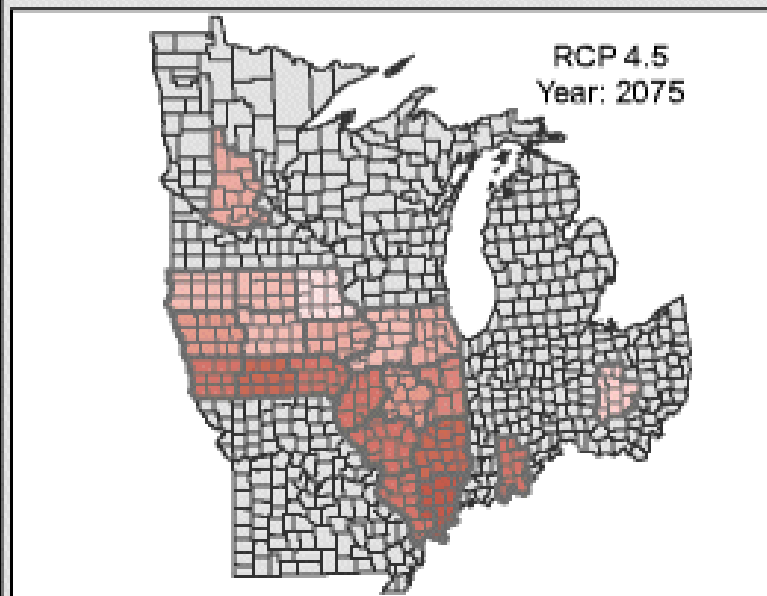
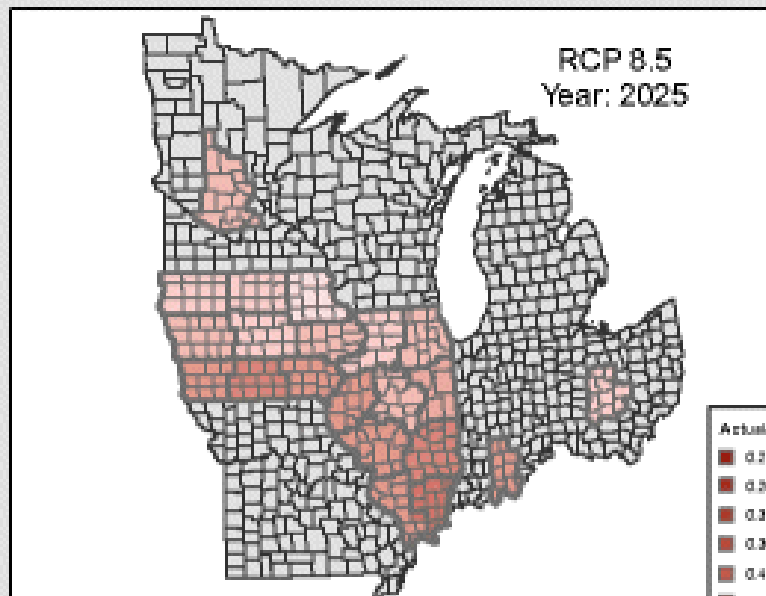
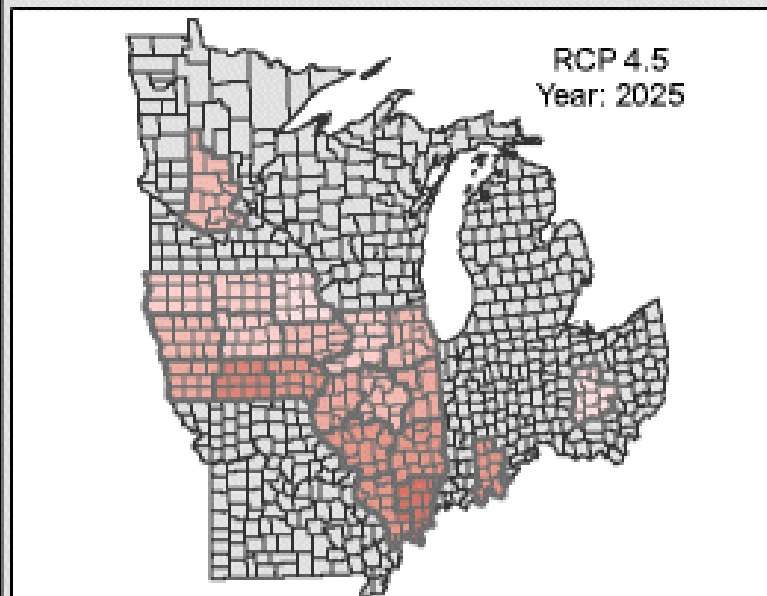


Figure 6.1. Observed changes in annual, winter, and summer temperature (°F). Changes are the difference between range for present-day (1986–2016) and the average for the first half of the last century (1901–1960 for the con-United States, 1925–1960 for Alaska and Hawai'i). Estimates are derived from the nClimDiv dataset.^{1,2} (Figure NOAA/NCEI).

Fraction of Actual/Attainable Yield for Midwest Soybean



Fraction of Actual/Attainable Yield for Midwest Maize



Climate Change and Agricultural Pests



1) Expanding geographic ranges northward

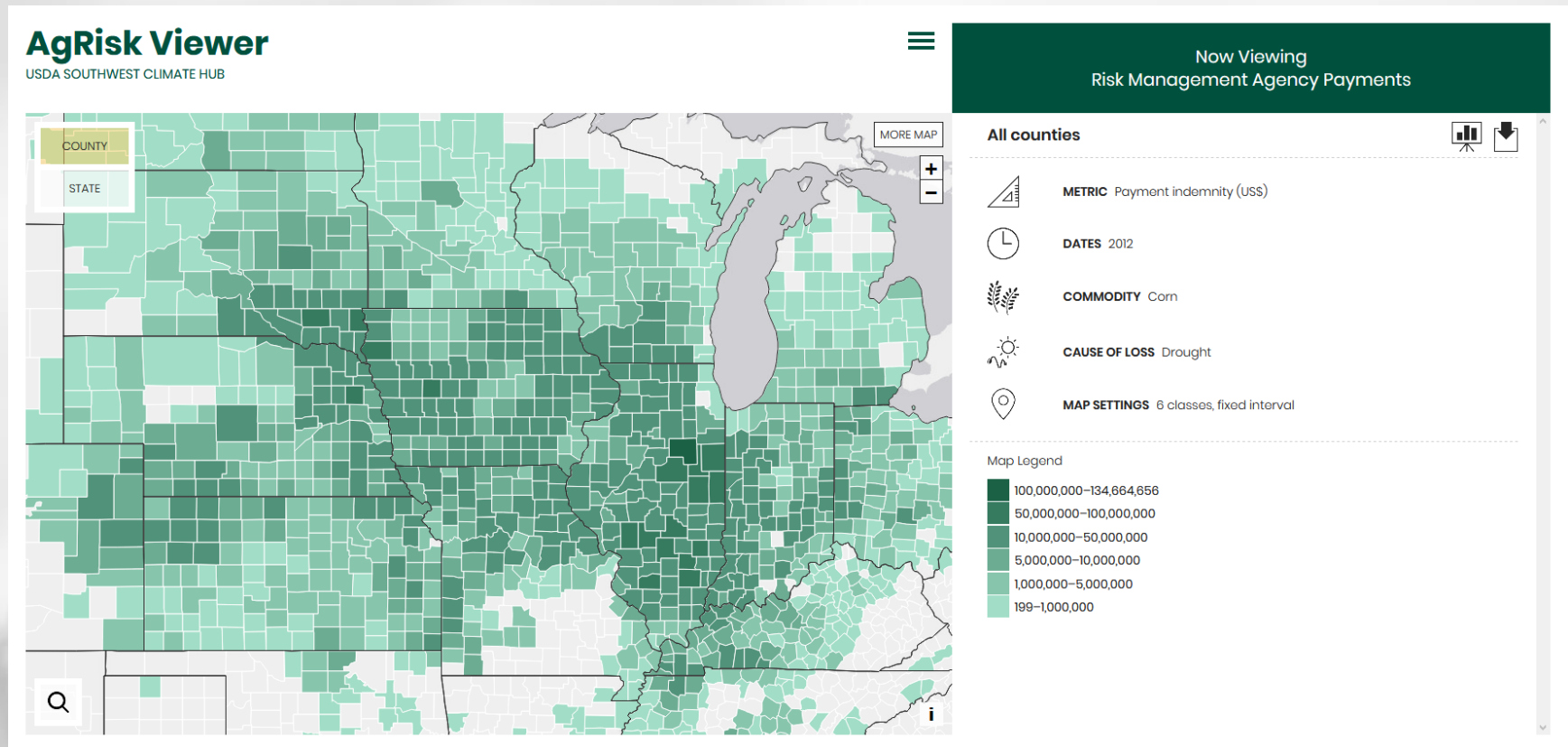
2) Reducing winter die offs

3) Earlier spring emergence

4) Increased generations per year

- Invasive insects are of particular concern since they often limited more by climate in their non-native ranges (no natural enemies and abundant food)**

AG Risk Viewer – Cause of Loss Data

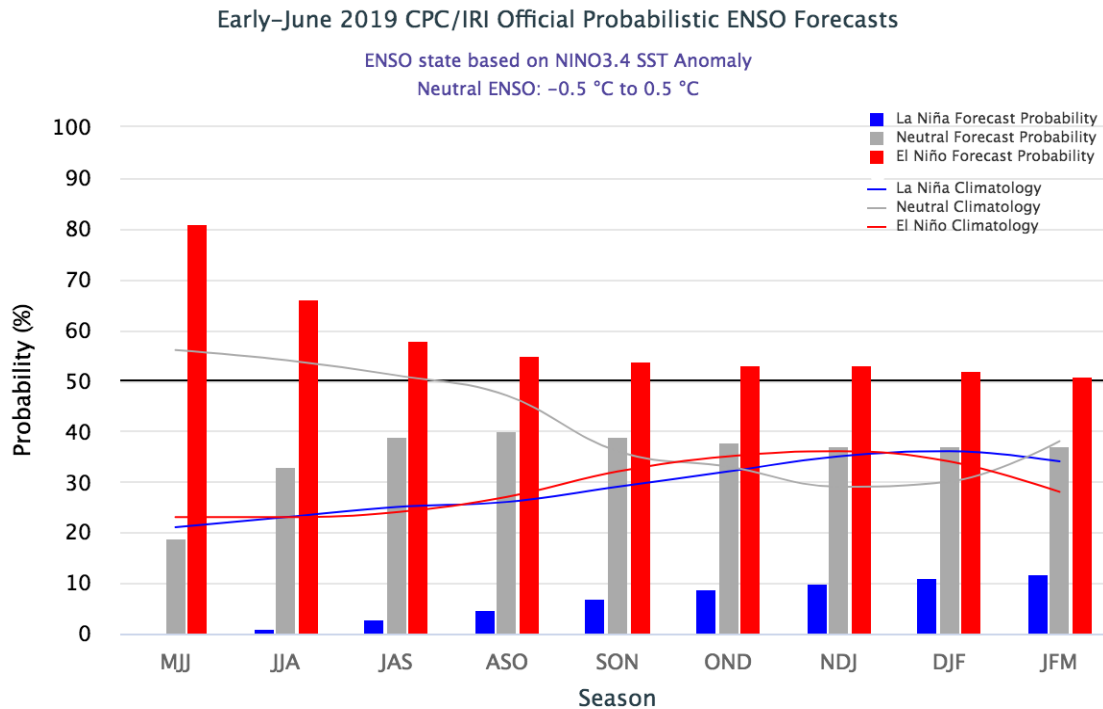


<https://swclimatehub.info/rma/rma-data-viewer.html>

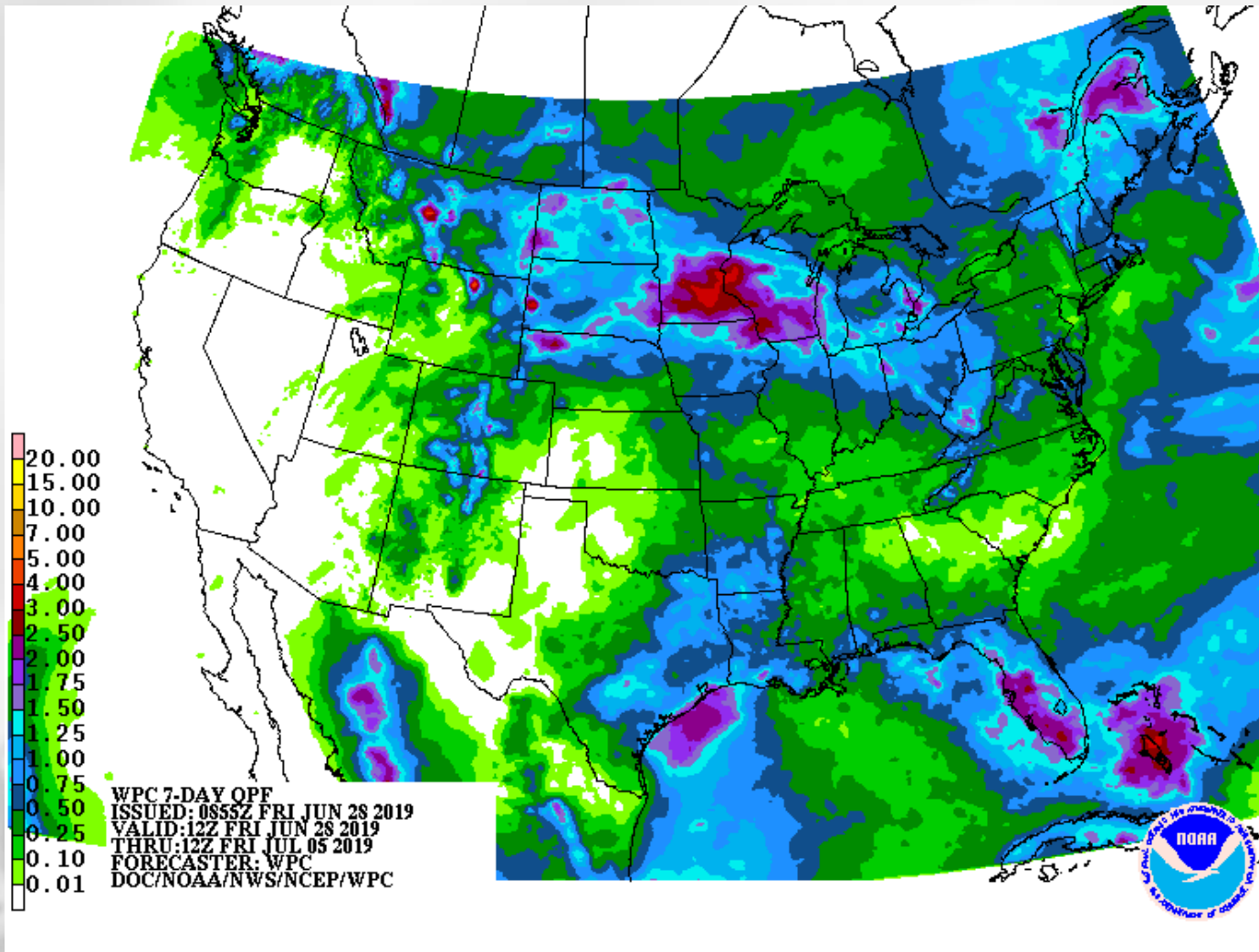
CPC/IRI Probabilistic ENSO Outlook

Updated: 13 June 2019

El Niño is favored to continue with chances nearing 50% in Northern Hemisphere fall and winter.

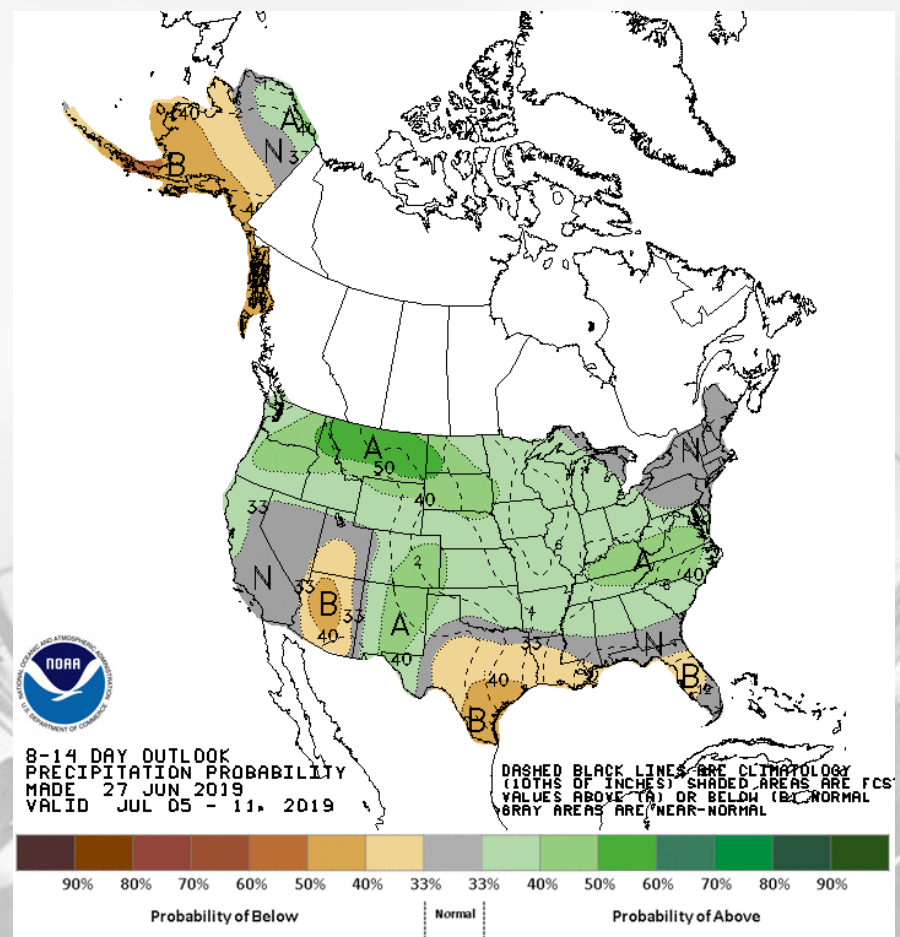
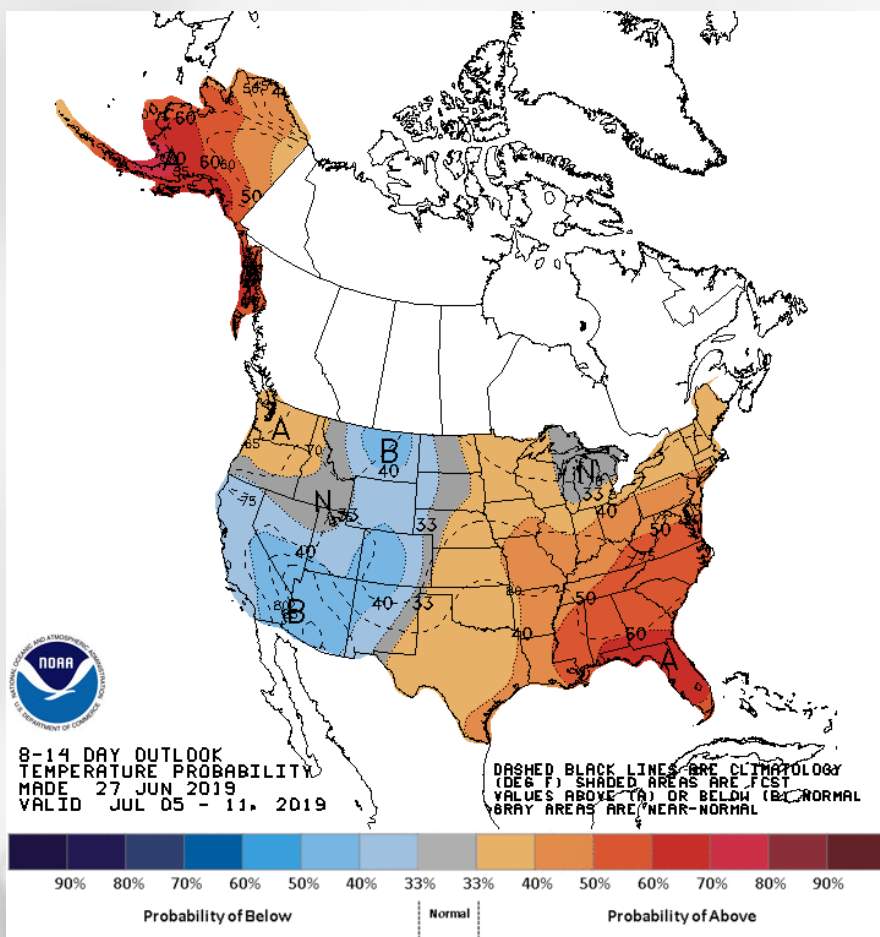


7 Day Forecast Precip.



Areas of heavy rain
more northern
Midwest. Pockets of
3-4" possible.

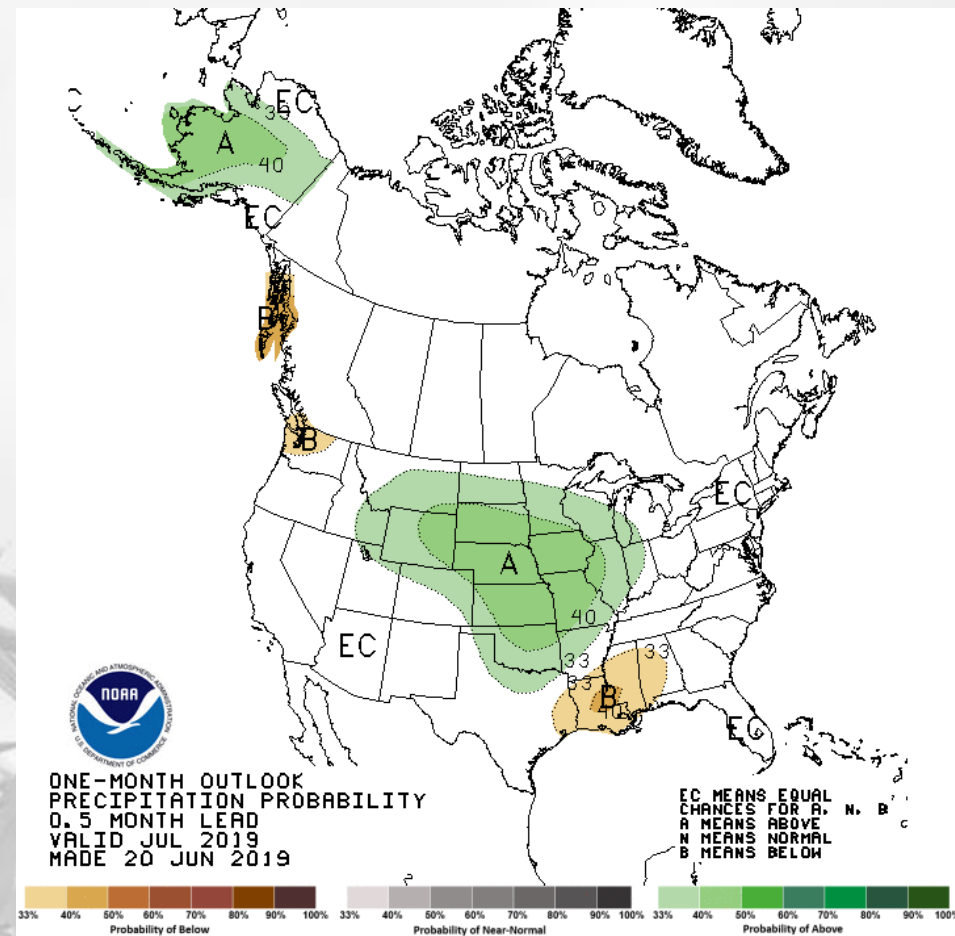
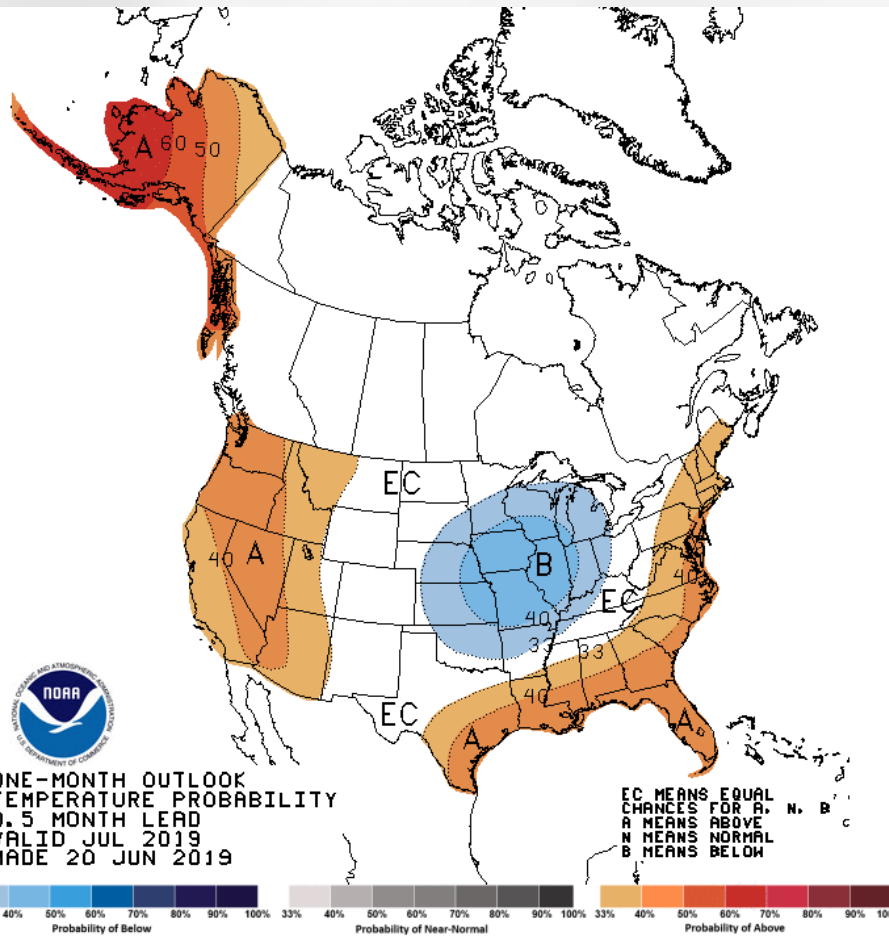
8-14 Day Temp and Precip. Outlook



Early July – above average precip chances continue. Likely warmer than average temperatures good news for crops.

<http://www.cpc.ncep.noaa.gov/>

30 Day Temp and Precip. Outlook

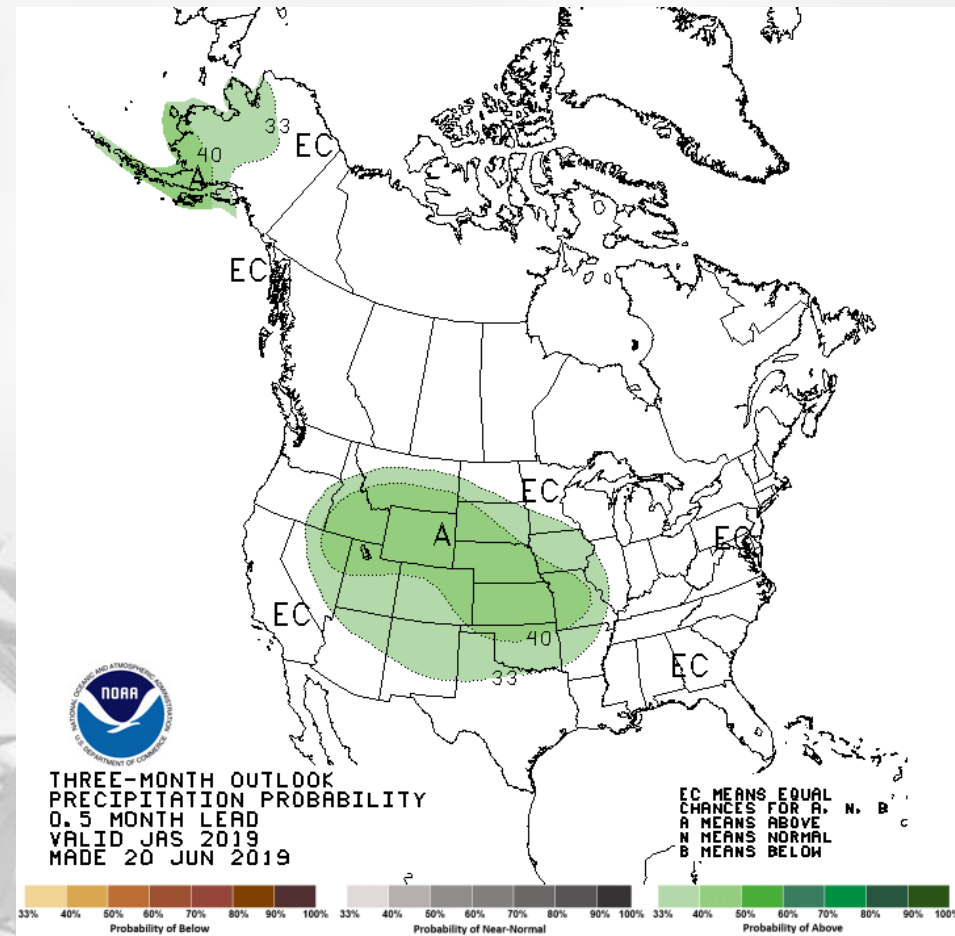
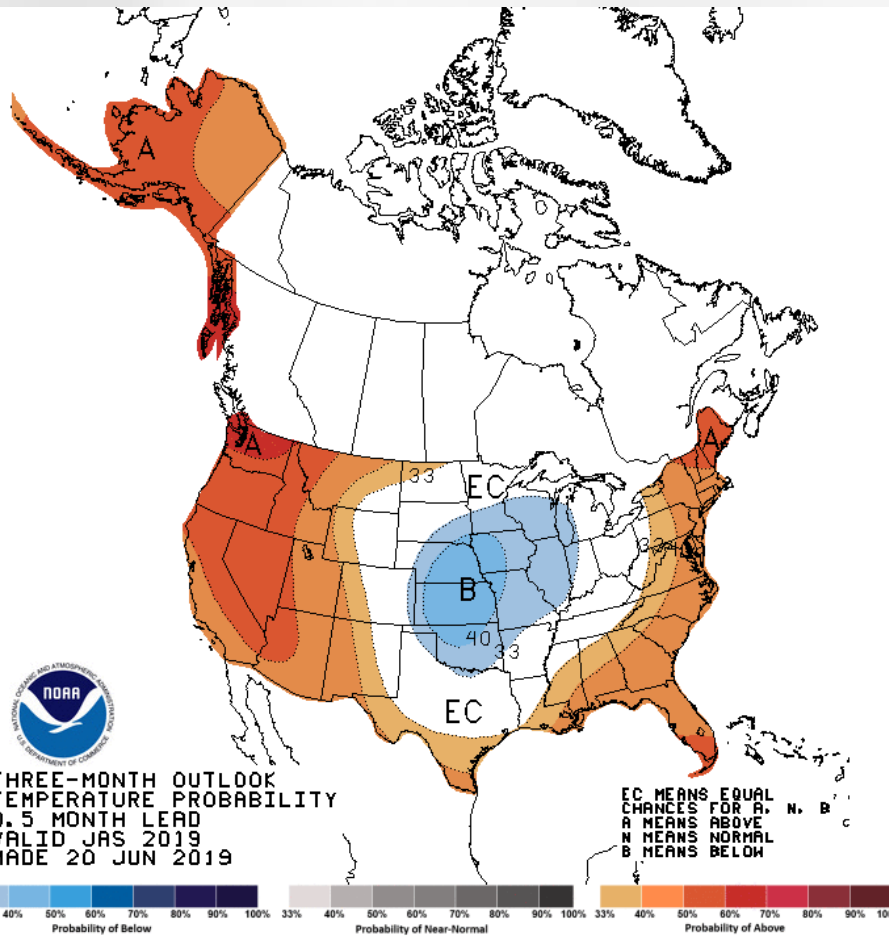


Persistence of cooler and wetter more likely through July.

Will update Sunday – check back then....

<http://www.cpc.ncep.noaa.gov/>

90 Day Temp and Precip. Outlook

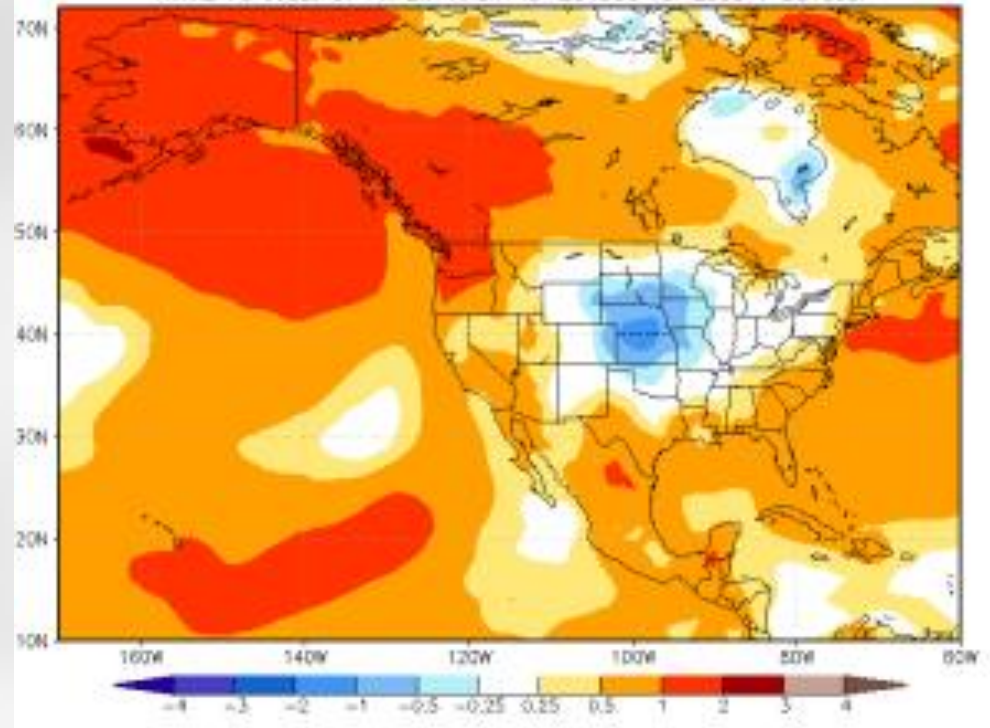


Persistence of cooler and wetter still more likely through the summer.
Soil moisture, El Niño and persistence from spring are main drivers.

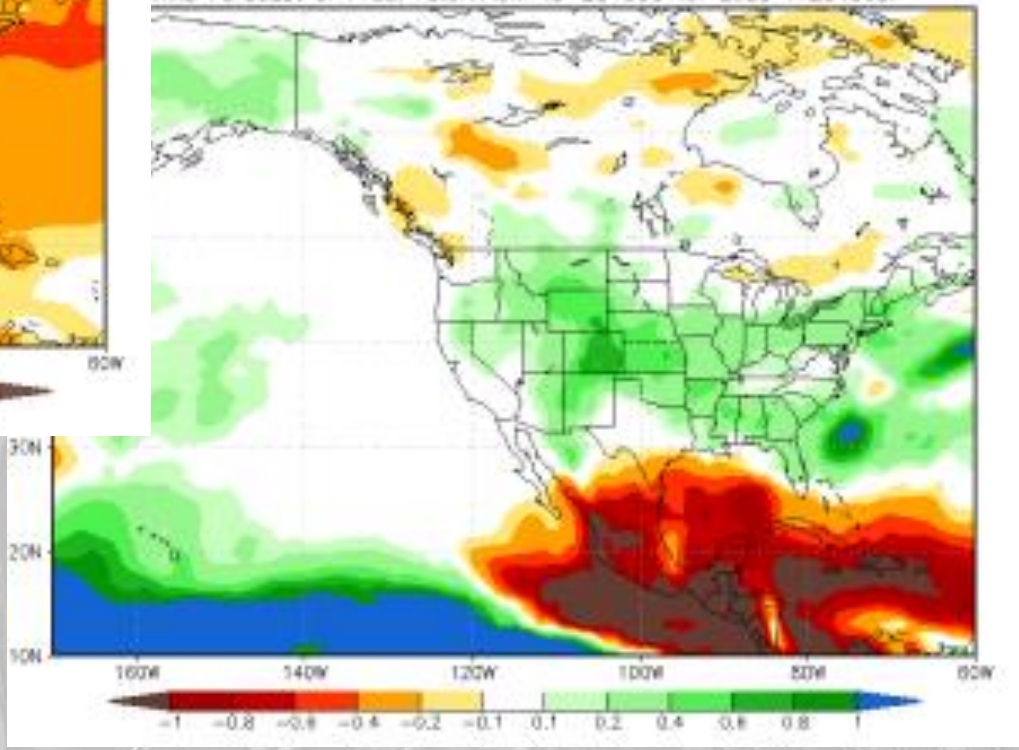
<http://www.cpc.ncep.noaa.gov/>

July Temp./Precip. Outlook (model)

NMME Forecast of TMP2m Anom IC=201906 for Lead 1 2019Jul



MME Forecast of Prec. rate Anom IC=201906 for Lead 1 2019Jul



<http://www.cpc.ncep.noaa.gov/>

Take Home

- Current conditions:

- Lighter rains during last week.
- Some additional crop progress
- Mostly wetter than average in the state but some slightly drier areas west central at 30-90 days

- Outlook info:

- Rain issues more likely north. But convective chances statewide next week.
- Temperatures warm into early July. Need some above average to push crop development.
- Longer concerns about cool/wet staying with us.
- Crop issues still developing
 - Delayed development
 - Disease
 - Weeds
 - Insects

And the fall.....

Some concern on wetness
persisting into fall
Nothing on early freeze

Midwest and Great Plains Climate- Drought Outlook 15 September 2016

Dr. Dennis Todey
Director – USDA Midwest
Climate Hub
Nat'l Lab. for Ag. and Env.
Ames, IA
dennis.todey@ars.usda.gov
515-294-2013

Sign up:

<https://www.drought.gov/drought/dews/midwest>

Archives:

<http://mrcc.isws.illinois.edu/multimedia/webinars.jsp>.



United States Department of Agriculture
Midwest Climate Hub

For More Information



Midwest Climate Hub



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<https://www.climatehubs.ocs.usda.gov/hubs/midwest>



Charlene Felkley, Coordinator

515-294-0136

Charlene.felkley@ars.usda.gov

Dennis Todey, Director

515-294-2013

Dennis.todey@ars.usda.gov

Erica Kistner, Fellow

515-294-9602

Erica.kristner@ars.usda.gov

National Laboratory for Agriculture and the Environment

Attn: Midwest Climate Hub

1015 N University Blvd

Ames, Iowa 50011-3611



Midwest Climate Hub
U.S. DEPARTMENT OF AGRICULTURE