

Midwest and Great Plains Climate- Drought Outlook 20 May 2020

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United States Department of Agriculture
Midwest Climate Hub



Photo:
Cheryl
Todey

Ames, IA

Photo taken Feb 19, 2013

General Information

- **Providing climate services to the North Central US**
 - Collaboration Activity Among:
 - NOAA NCEI/NWS/OAR/NIDIS/
 - USDA Climate Hubs
 - American Association of State Climatologists
 - Midwest and High Plains Regional Climate Centers
 - National Drought Mitigation Center
- **Next Regular Climate/Drought Outlook Webinar**
 - June 18, 2020 (1 PM CDT) Aaron Wilson– Ohio State Climate Office (OSU Ext.)
- **Access to Future Climate Webinars and Information**
- <http://www.drought.gov/drought/content/regional-programs/regional-drought-webinars>
- <http://mrcc.isws.illinois.edu/webinars.htm>
- <http://www.hprcc.unl.edu/webinars.php>
- **Open for questions at the end**

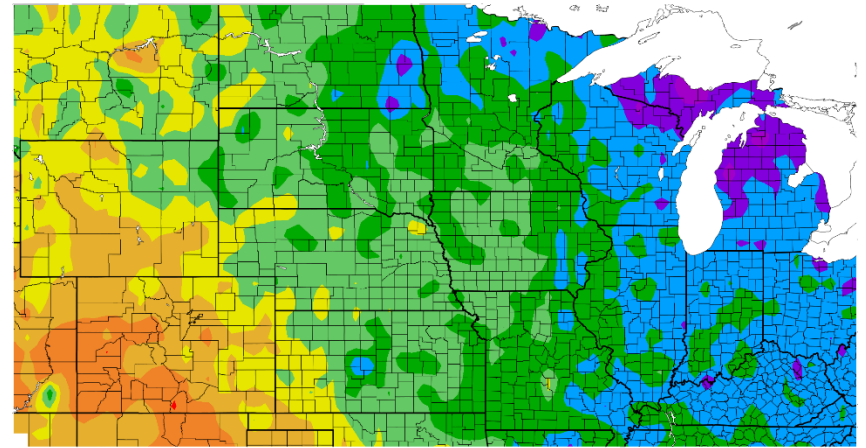
Agenda

- **Current Conditions**
- **Impacts**
 - Hydro
 - Ag (freeze, planting)
 - Snow/water
 - Other
- **Outlooks**
 - La Niña chances
 - Summer
 - Hurricanes



Photo:
Dennis Todey Ames, IA 15 April 2020

Departure from Normal Temperature (F)
4/20/2020 – 5/19/2020



Generated 5/20/2020 at HPRCC using provisional data.

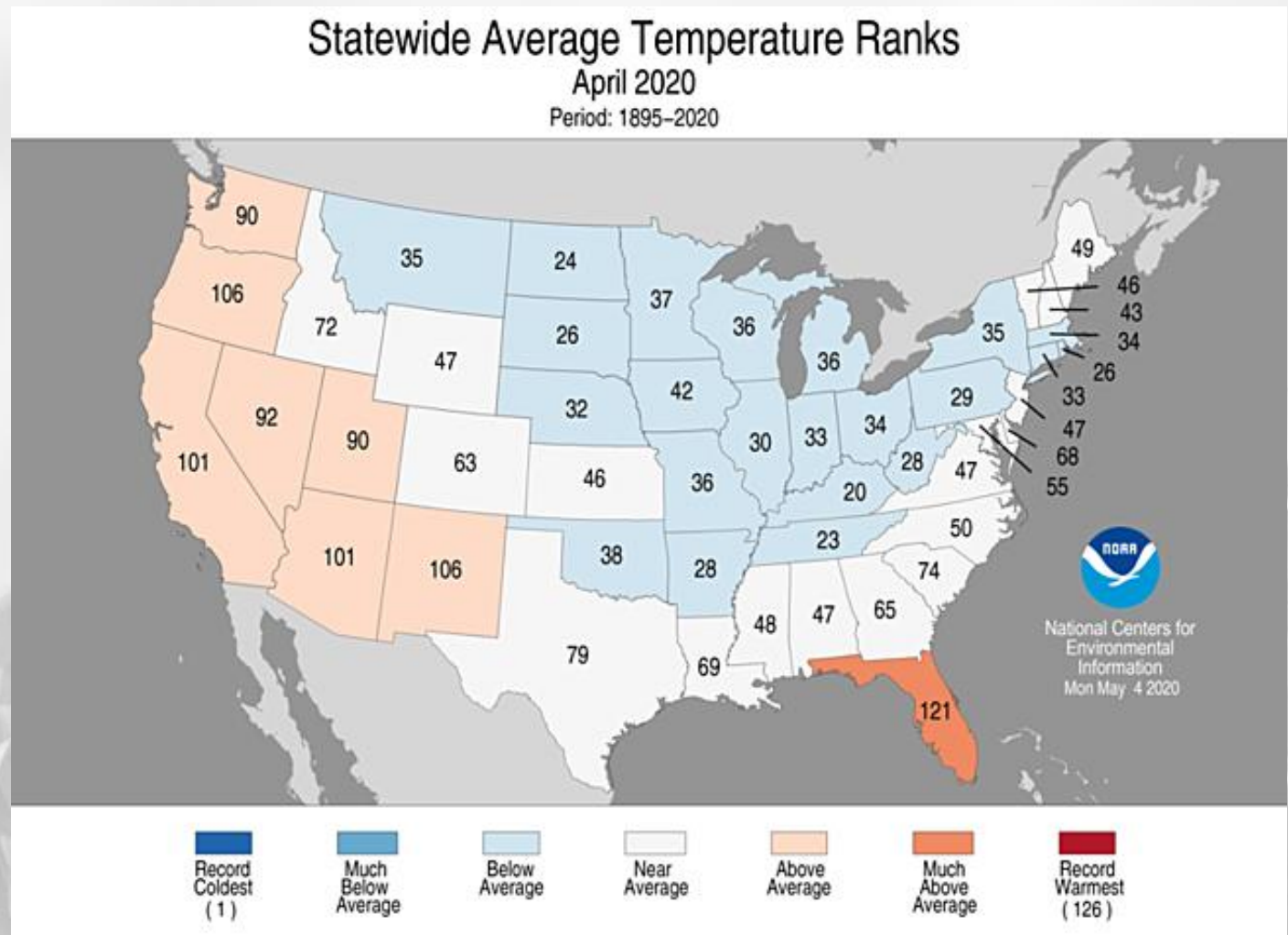
NOAA Regional Climate Centers

REVIEW/CURRENT CONDITIONS

April Temperature Recap

Mostly colder than average in the region. Top 30 coldest for several states.

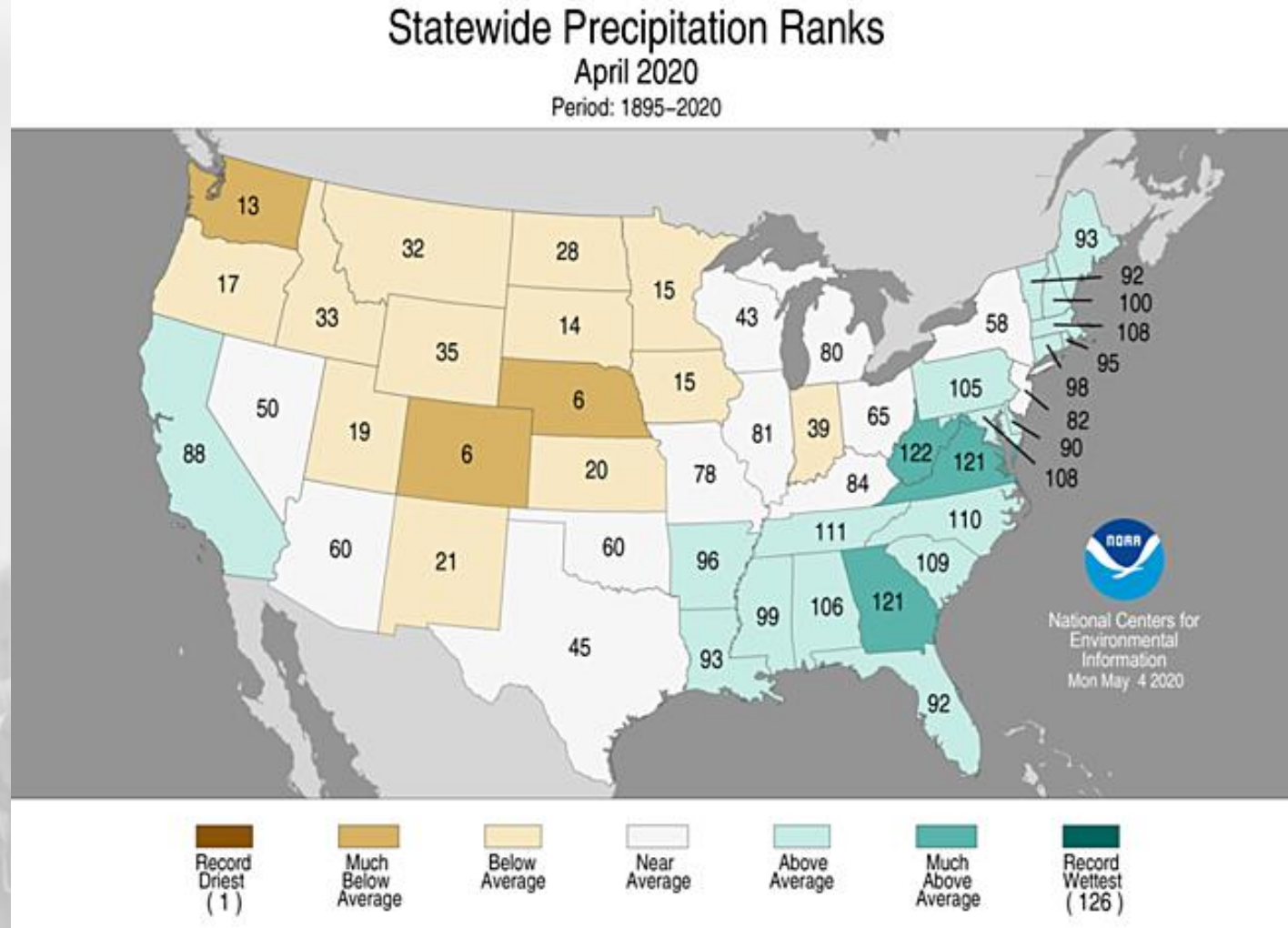
Cold was beneficial in some ways.



April Precipitation Recap

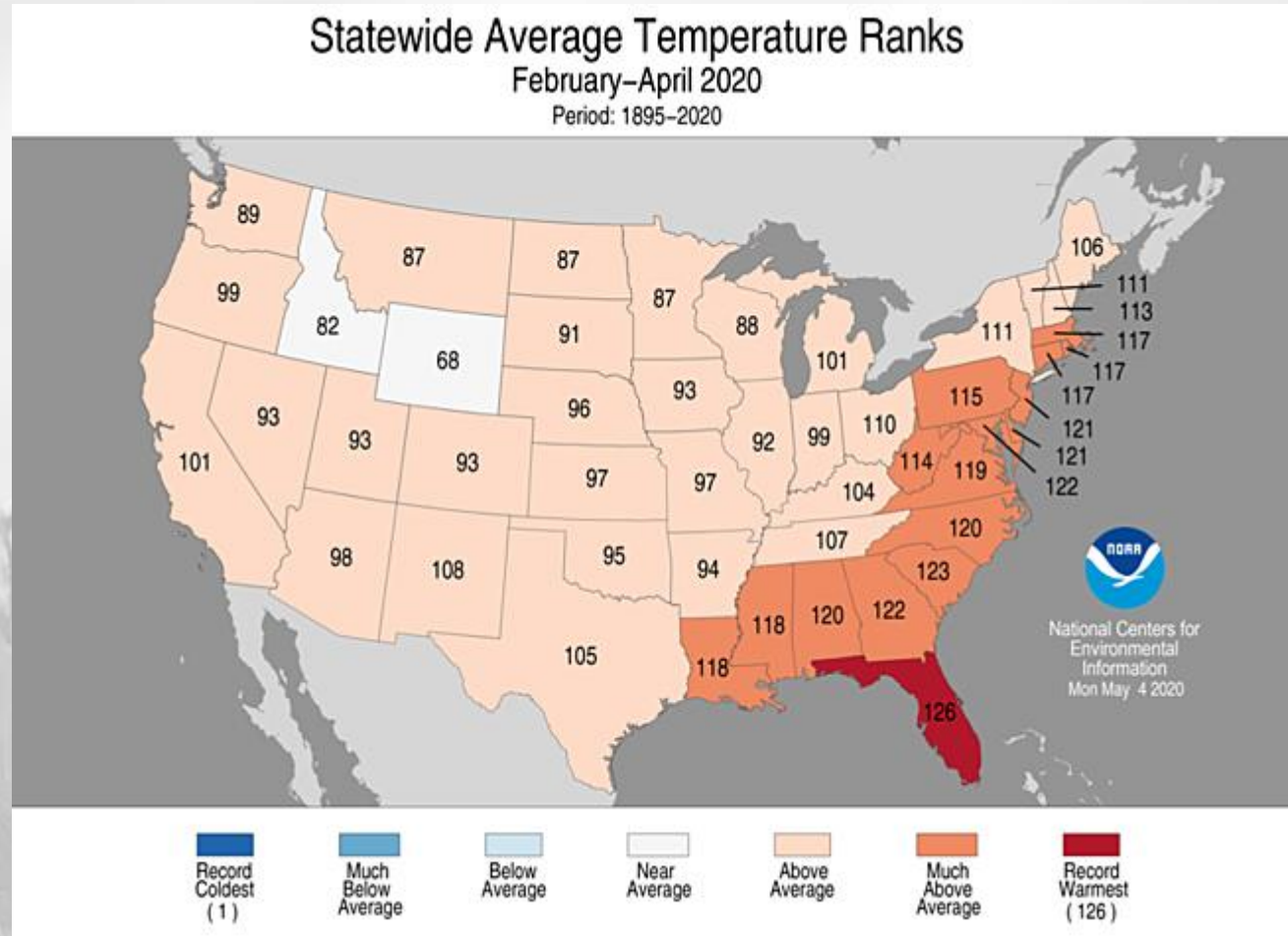
**Mostly drier than
avg. plains states
(and Indiana).
Wetter to the east
and south.**

Top 6 driest Nebraska and Colorado.



February-April Temperature Recap

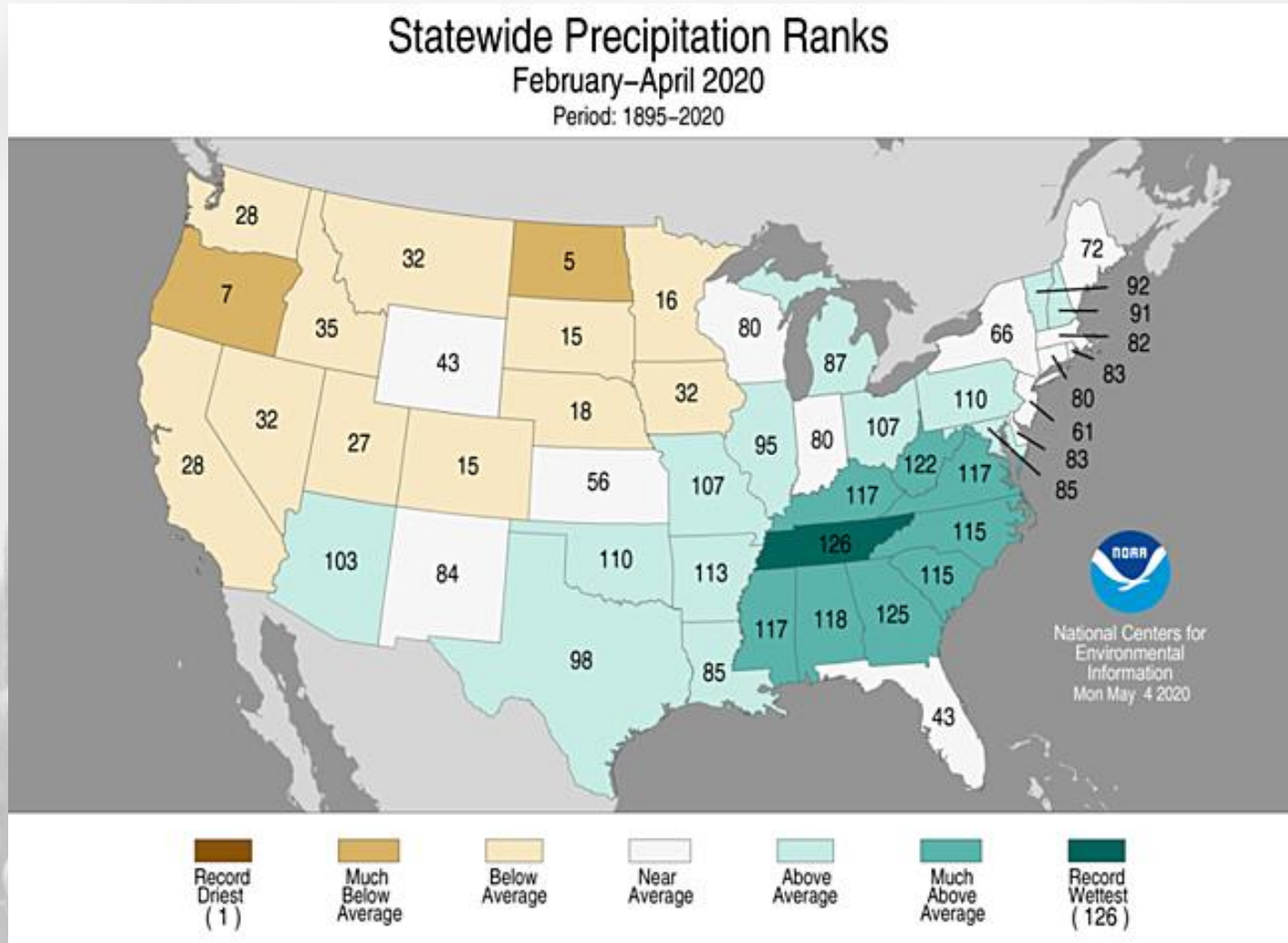
**Much warmer than average Feb-Apr.
Huge contrast to April showing how warm Feb-Mar were.**



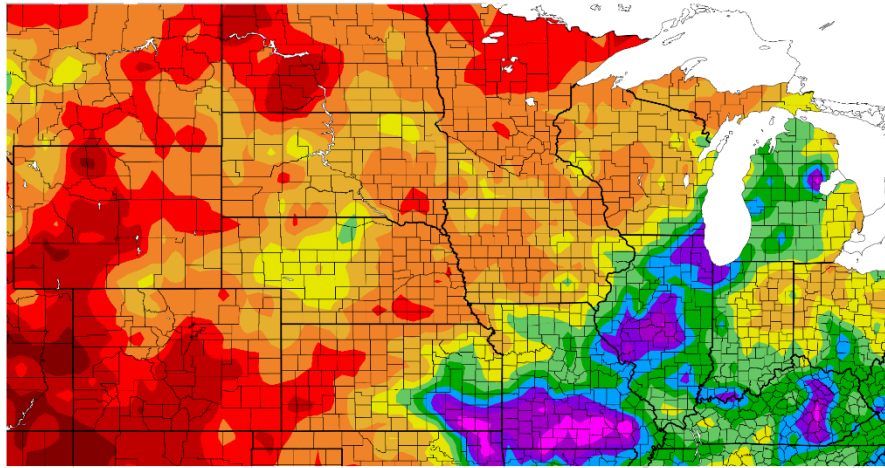
February-April Precipitation Recap

**Clear contrast
across region. Dry
to west, wet to east.**

**Top 20 driest many
plains states. Top
20 wettest a few
eastern states.**



Precipitation (in)
4/20/2020 – 5/19/2020

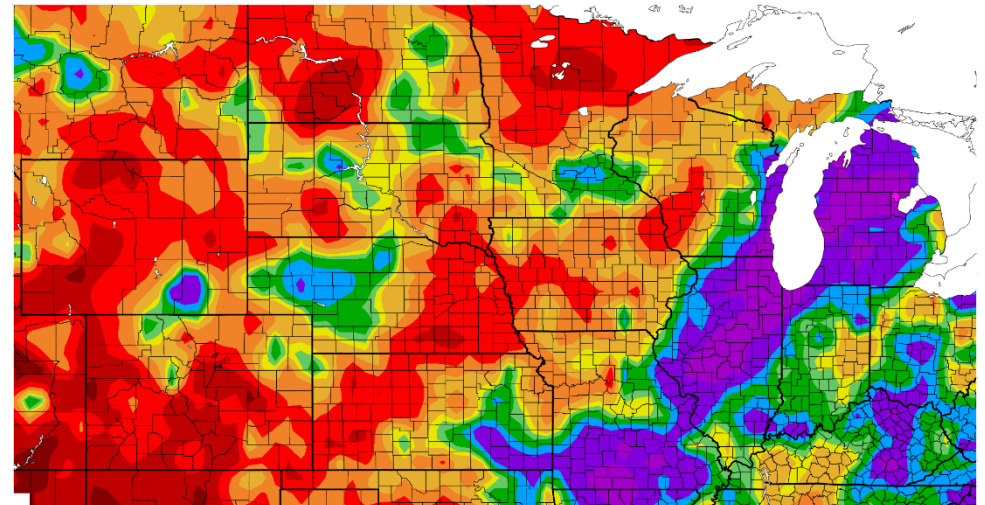


Generated 5/20/2020 at HPRCC using provisional data. NOAA Regional Climate Centers

Last 30 days Precipitation

Percent of Normal Precipitation (%)
4/20/2020 – 5/19/2020

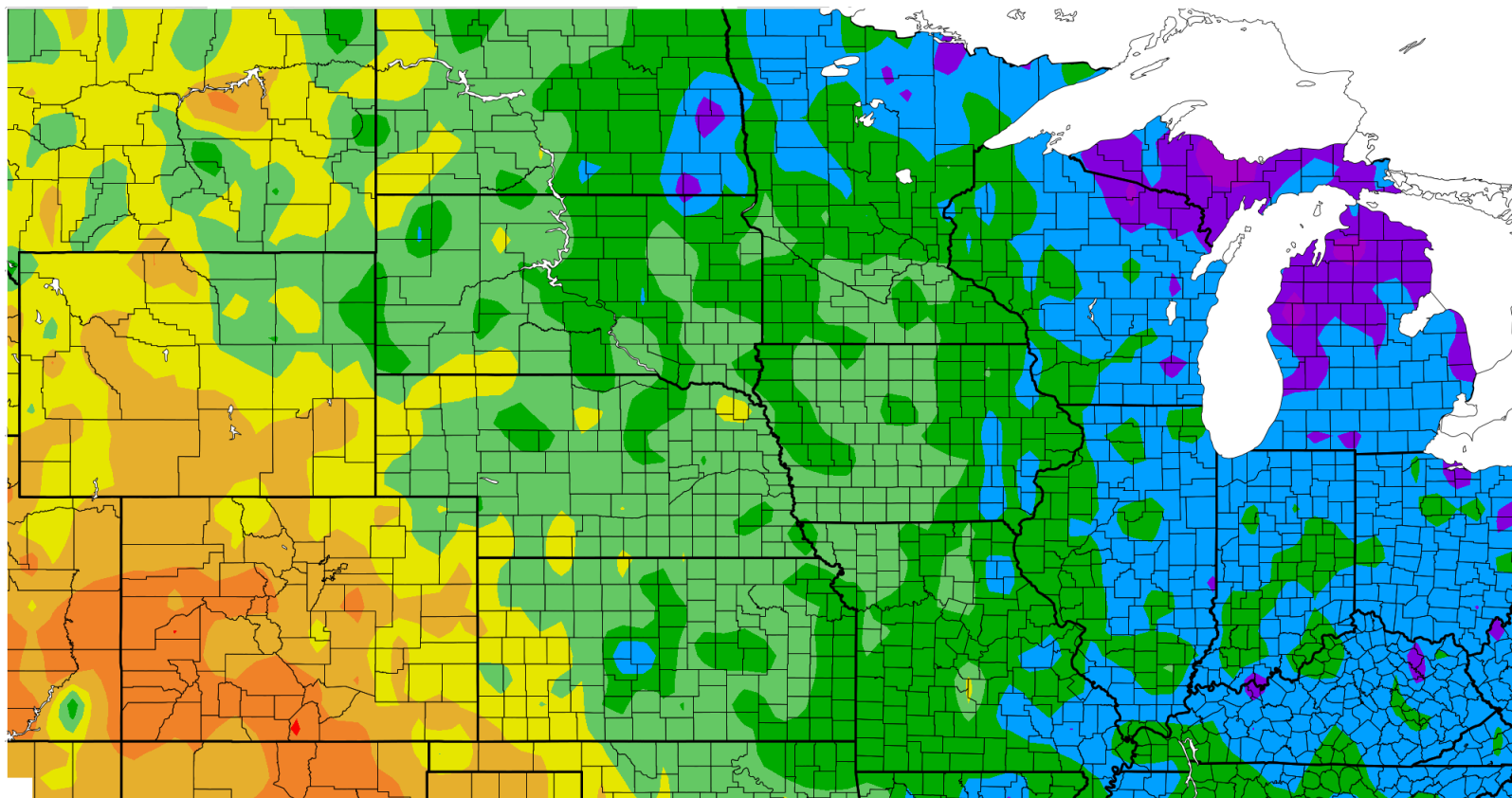
- Less than 2" much of west. Less than half avg. precip. this area.
- Pockets wetter than avg. west. More than double precip Missouri to Michigan.



Generated 5/20/2020 at HPRCC using provisional data. NOAA Regional Climate Centers

Departure from Normal Temperature (F)

4/20/2020 – 5/19/2020



Generated 5/20/2020 at HPRCC using provisional data.

NOAA Regional Climate Centers

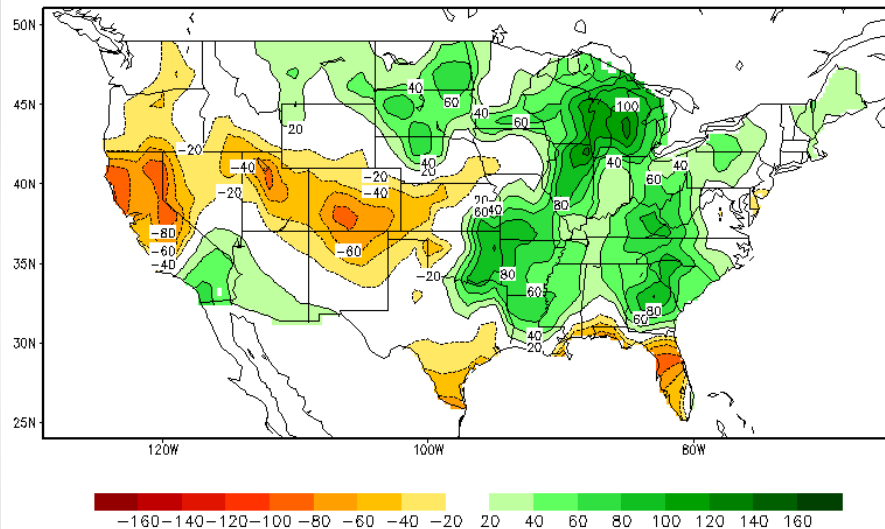


HYDROLOGY

Photo:
Sam Custer (OSU Extension Educator
for Darke County, Ohio)

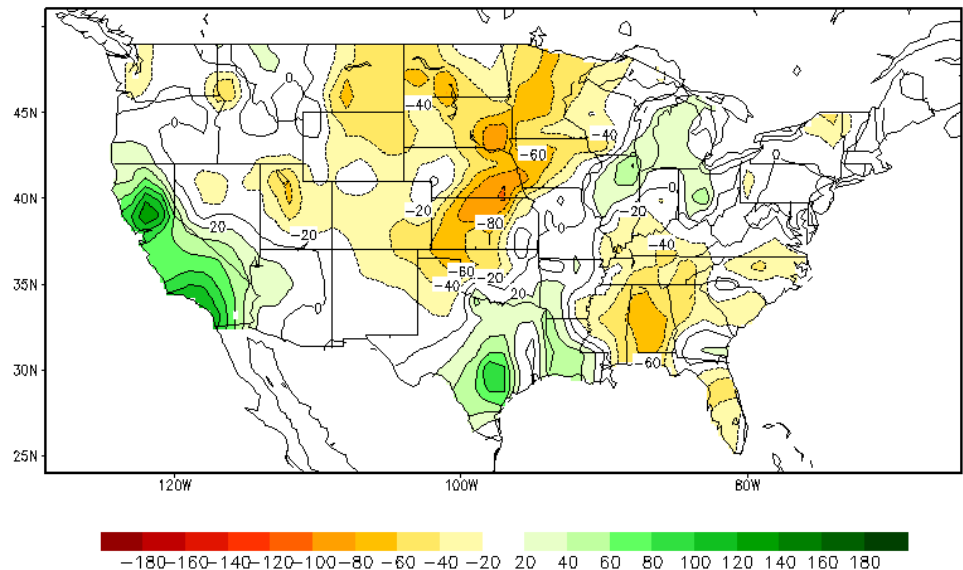
Soil Moisture

Calculated Soil Moisture Anomaly (mm)
MAY 19, 2020



- Overall soils drying – esp. plains.
- Wetter overall - Central plains to Iowa less wet.
- Still likely mostly surface soils dry.
- Recent rains rewet IL, MI, OH

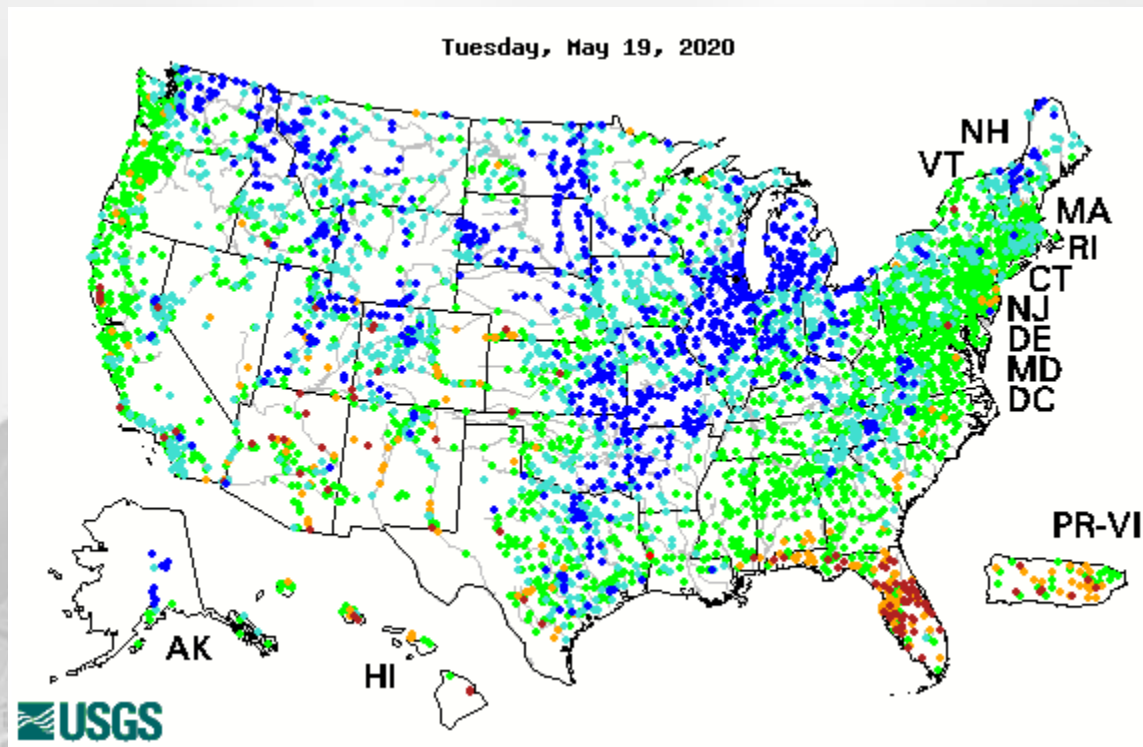
Calculated Soil Moisture Anomaly Change
MAY 19, 2020 from FEB.28



7-Day Average Streamflow

Tuesday, 19 May 2020

- Mostly wetter than avg.
- Above 90th percentile Great Lakes to SW and Dakotas.

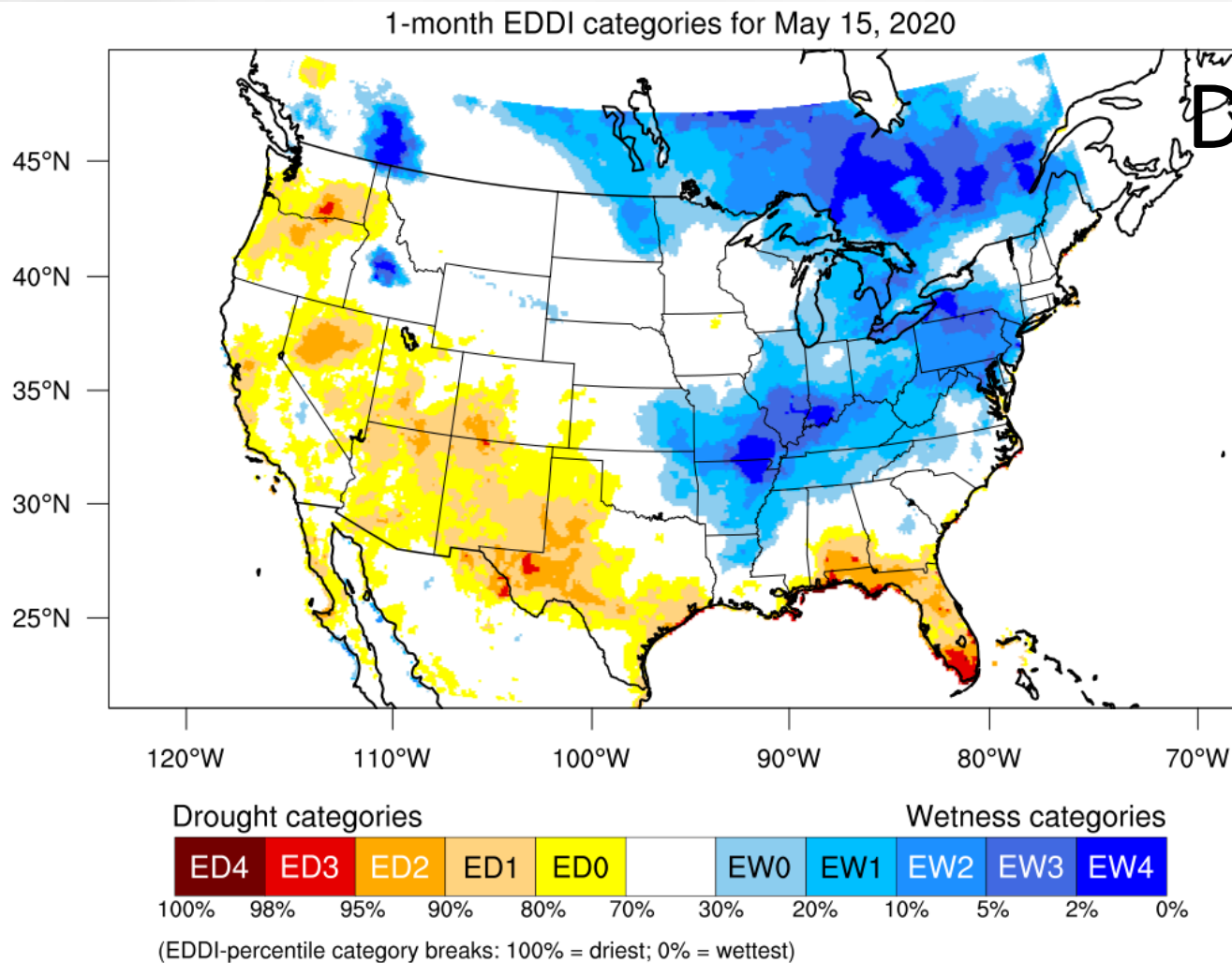


Explanation - Percentile classes						
Low	<10	10-24	25-75	76-90	>90	High
	Much below normal	Below normal	Normal	Above normal	Much above normal	

<http://waterwatch.usgs.gov/index.php?id=pa07d>

<https://www.weather.gov/erh/mmefs>

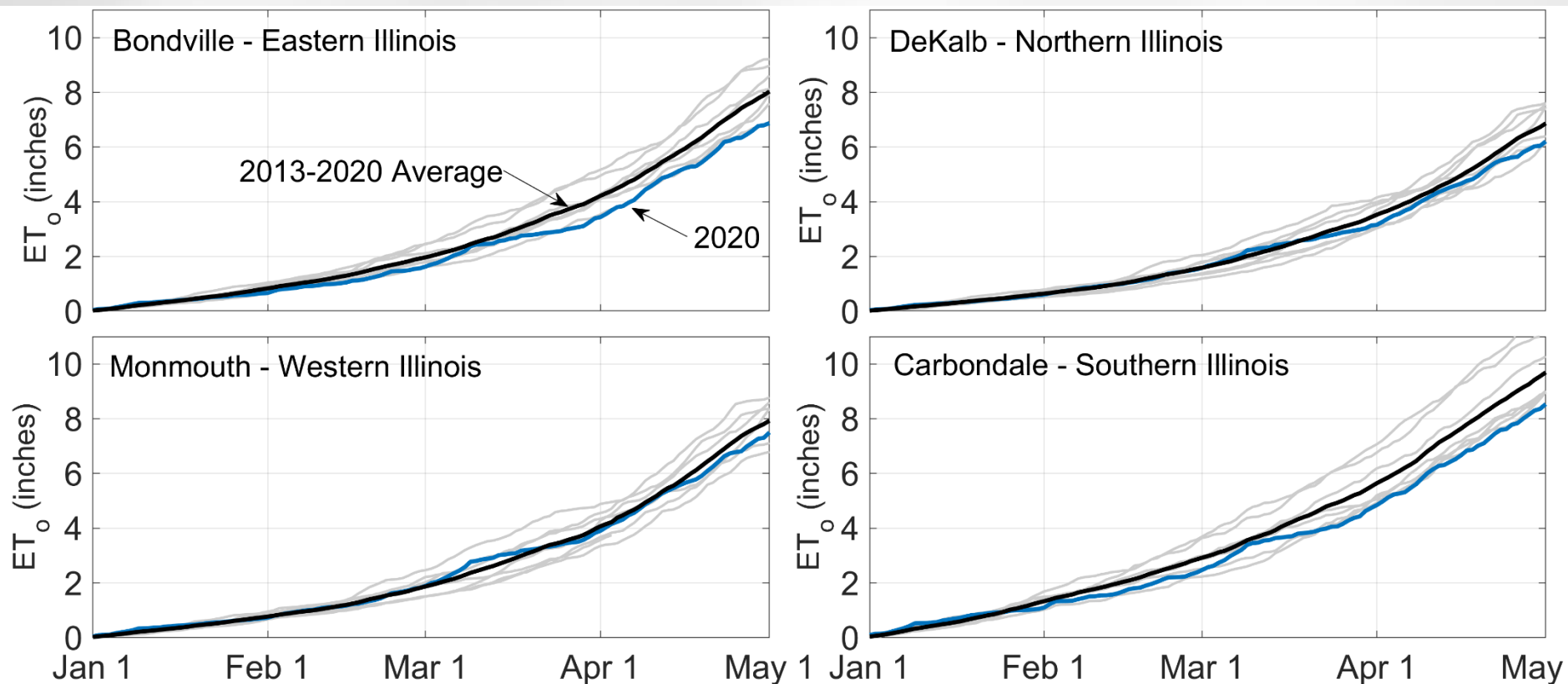
EDDI – Evaporative Demand Index



Generated by NOAA/ESRL/Physical Sciences Division

<https://www.esrl.noaa.gov/psd/eddi/>

Evapo-Transpiration Estimates



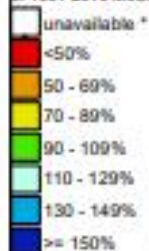
Estimate of
evaporation/transpiration from
temperature, humidity, wind solar
radiation.

Data from Illinois WARM network – plots
courtesy Trent Ford Illinois State
Climatologist

Westwide SNOTEL Current Snow Water Equivalent (SWE) % of Normal

May 21, 2020

Current Snow Water Equivalent (SWE) Basin-wide Percent of 1981-2010 Median



Data unavailable at time of posting or measurement is not representative at this time of year

Provisional data subject to revision



The snow water equivalent percent of normal represents the current snow water equivalent found at selected SNOTEL sites in or near the basin compared to the average value for those sites on this day. Data based on the first reading of the day (typically 06:00).

Prepared by:
USDA/NRCS National Water and Climate Center
Portland, Oregon
<http://www.nwcc.nrcs.usda.gov>

NRCS Snow Water Equivalent

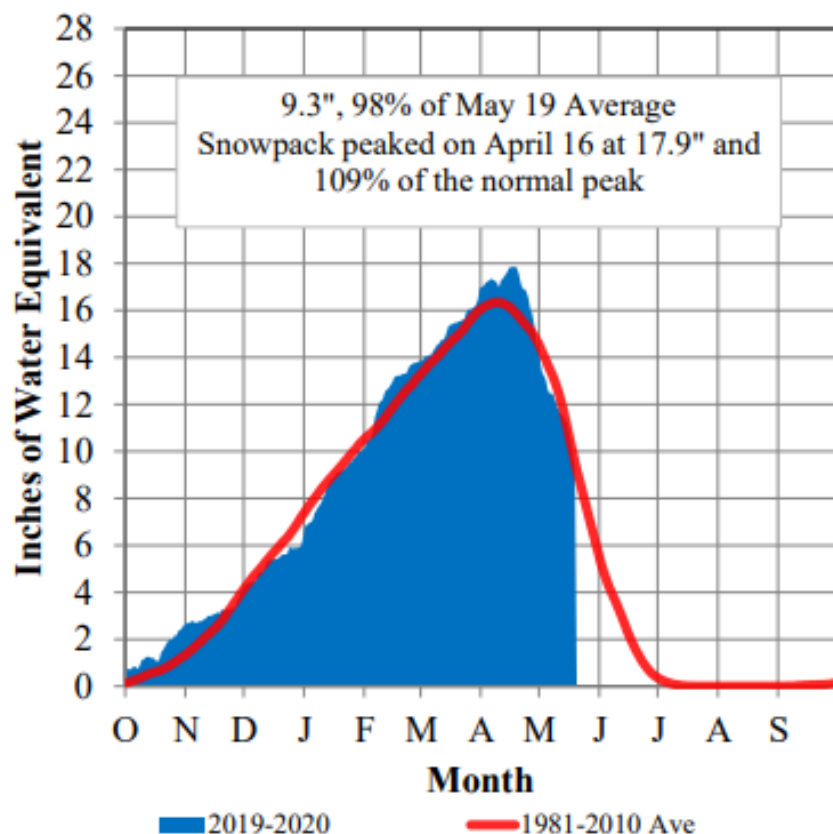
- MT-WY – Still above avg. snow water equivalent.
- CO – Platte closer to avg.

Missouri River Basin – Mountain Snowpack Water Content

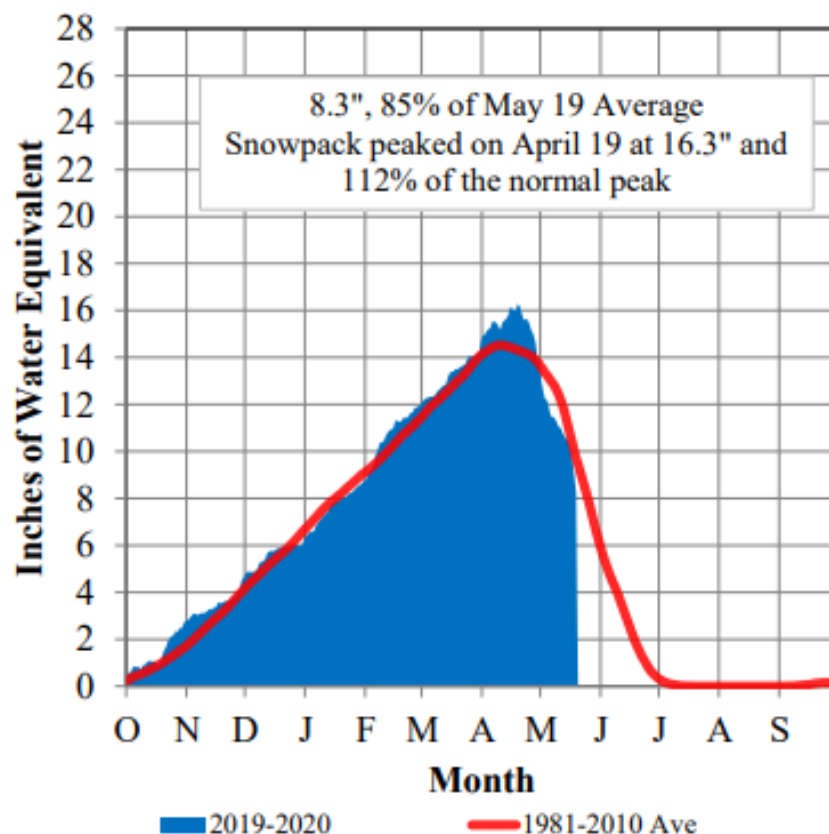
2019-2020

19-May-2020

Total above Fort Peck



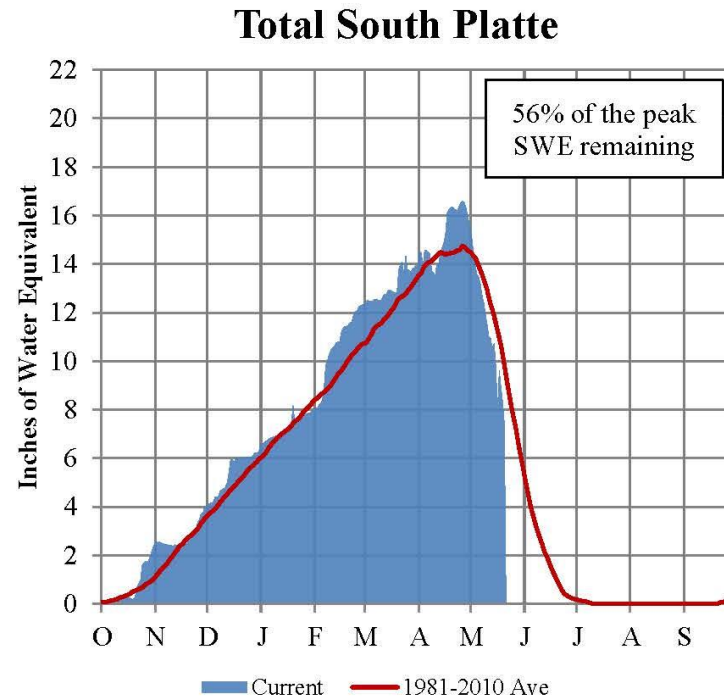
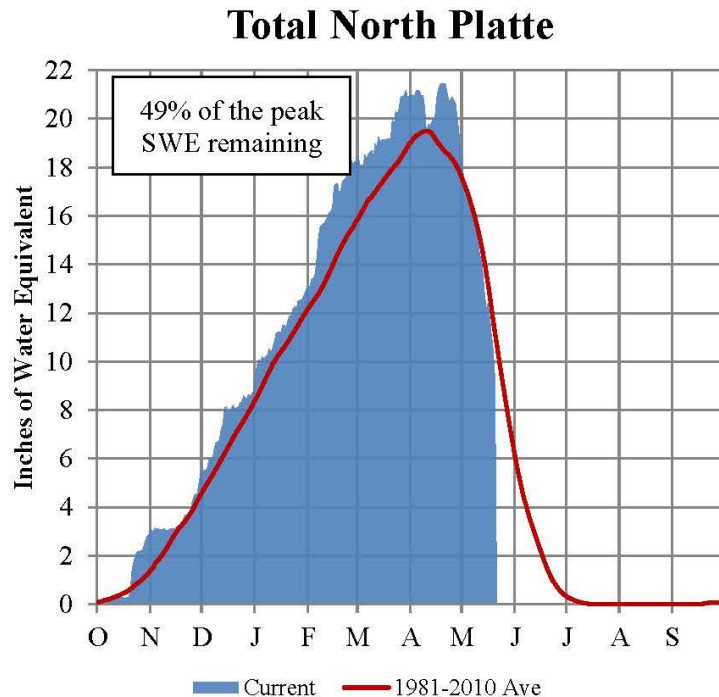
Total Fort Peck to Garrison



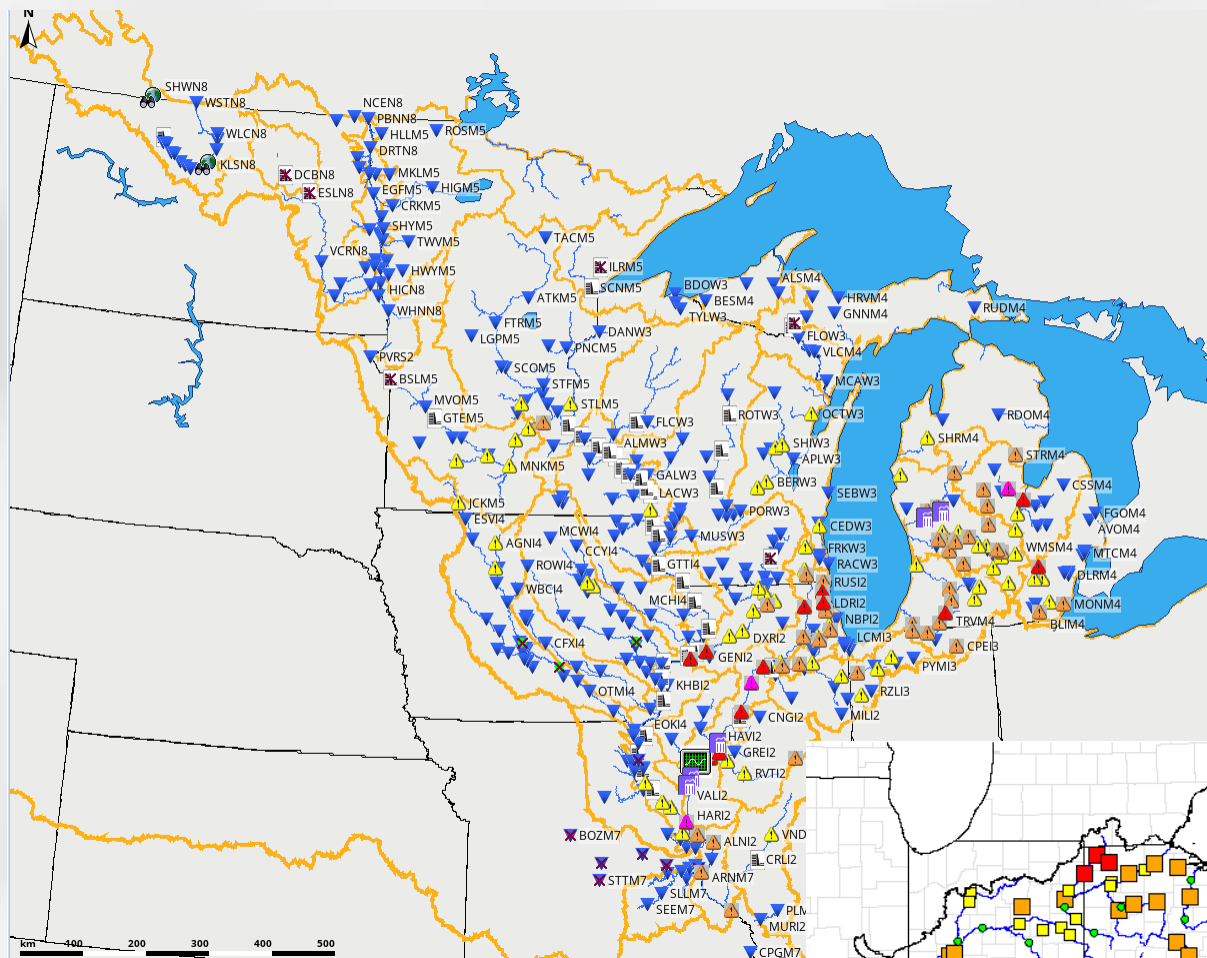
Platte River Basin - Mountain Snowpack Water Content

Water Year 2018-2019

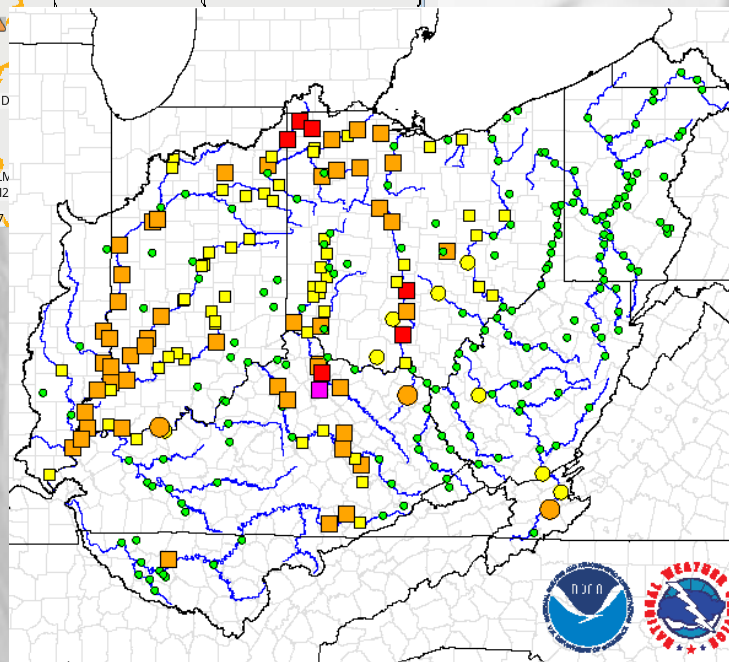
May 20, 2020



The North and South Platte River Basin mountain snowpacks normally peak near April 15 and the end of April, respectively. As of May 19, 2020, the mountain snowpack SWE in the "Total North Platte" reach peaked at 21.5" and currently has 49% of the peak SWE remaining. The mountain snowpack SWE in the "Total South Platte" reach peaked at 16.6" and currently has 56% of the peak SWE remaining.



precaster help 3.1: POT OVERVIEW



10-Day Potential River Levels 2020-05-20 - 2020-05-30 NWS Ohio River Forecast Center

- Normal Flow
- 30% Exceedance
- 70% Exceedance
- Action Stage
- Minor Flood
- Moderate Flood
- Major Flood

HEFS Model Cycle:
2020052012Z

Issued May 20 11:33 EDT

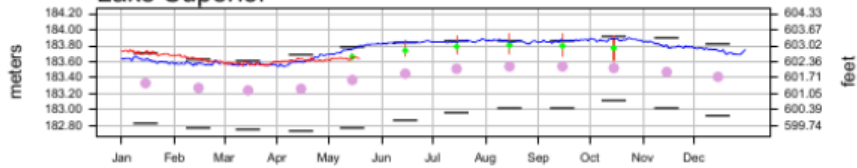




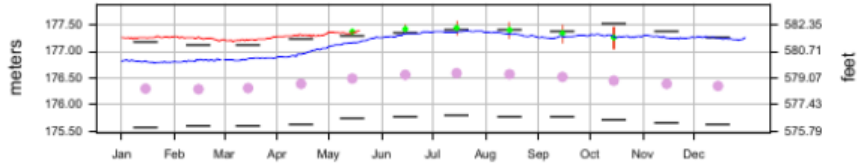
Daily Great Lakes Water Levels

— 2020
— 2019
— Coordinated Forecast
● LTA Monthly Mean
— Record High/Low Monthly Mean

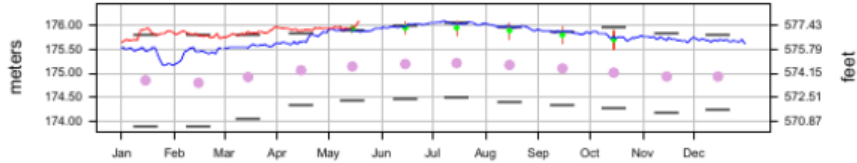
Lake Superior



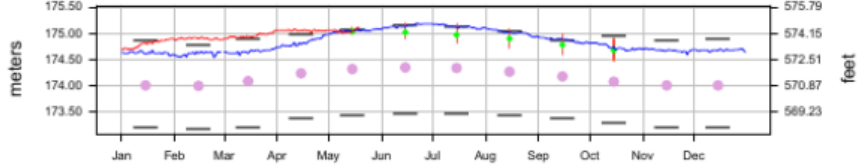
Lake Mich-Huron



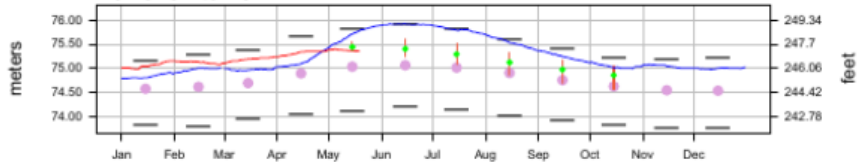
Lake St. Clair



Lake Erie



Lake Ontario



Lakewide average levels are based on a network of water level gages located around the lakes.
LTA and record levels are computed from a period of record of 1918 to 2019
Elevations are referenced to the International Great Lakes Datum (1985).

Updated 2020-05-20

Great Lakes Levels

- Superior and Michigan-Huron ticking up
- Others maintaining
- All near record levels.
- Recent precip will help hold them there.

<https://www.lre.usace.army.mil/Missions/Great-Lakes-Information/Great-Lakes-Information-2/Basin-Conditions/>

Auto Refresh: OFF



Print this map

Permalink



BOOKMARK



Greater than: 50% chance of exceeding river flood levels during May-Jun-Jul



Calgary

Regina

Winnipeg

Switch Basemap

Reset View

[Return to national map.](#)

Click on the map or select one of the data views below:

United States

NWS Weather Forecast Offices

Missouri Basin River Forecast Center

Water Resources Regions

421 total gauges

Show locations with 50% or greater chance of flooding during May-Jun-Jul (88)

3 Gauges: > 50% Major Long-Range Flood Risk

29 Gauges: > 50% Moderate Long-Range Flood Risk

56 Gauges: > 50% Minor Long-Range Flood Risk

332 Gauges: < 50% Long-Range Flood Risk

1 Gauges: No forecast within selected timeframe

[Show all locations](#)

Last map update:

05/21/2020 at 12:27:00 pm EDT

05/21/2020 at 16:27:00 UTC

[What is UTC time?](#)

[Map Help](#)

[Product Description](#)

[Feedback](#)

[Disclaimer](#)

Moderate Flood

Major Flood

HEFS Model Cycle:
2020052012Z

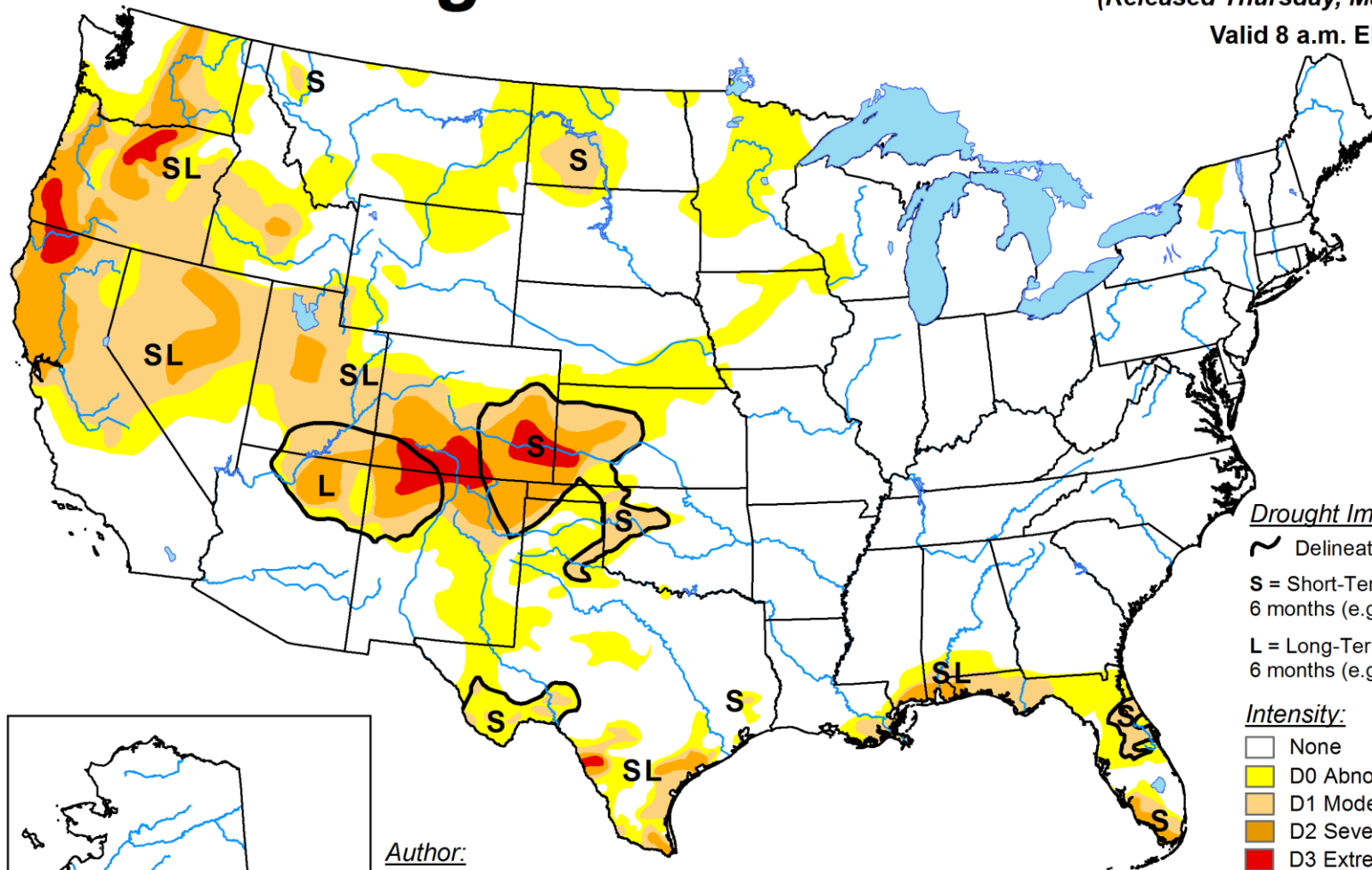
Issued May 20 11:33 EDT

U.S. Drought Monitor

May 19, 2020

(Released Thursday, May. 21, 2020)

Valid 8 a.m. EDT



Drought Impact Types:

~ Delineates dominant impacts

S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)

L = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)

Intensity:

None

D0 Abnormally Dry

D1 Moderate Drought

D2 Severe Drought

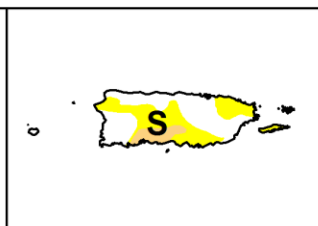
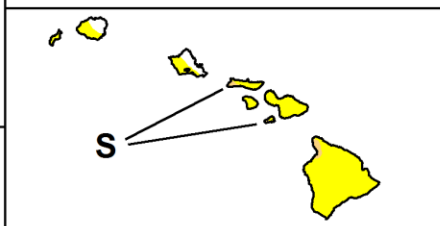
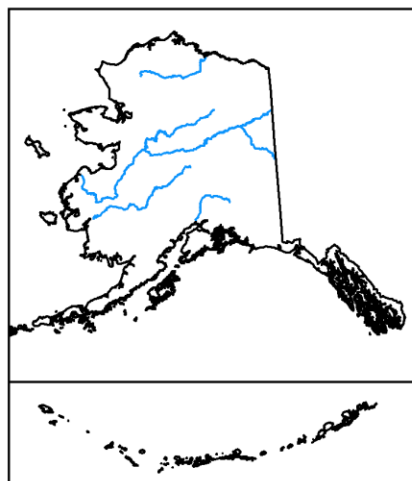
D3 Extreme Drought

D4 Exceptional Drought

Author:

Brian Fuchs

National Drought Mitigation Center



The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>



droughtmonitor.unl.edu

AGRICULTURE

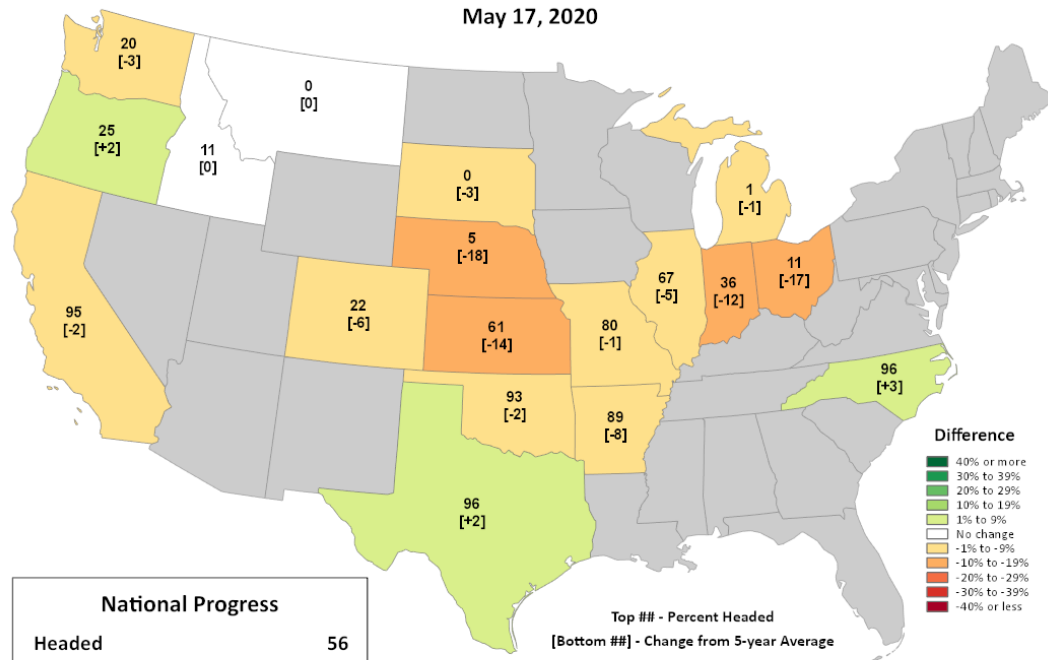


Photo:
Chuck Hanigan
Otero County – Southeast CO

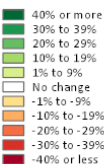
Winter Wheat Progress

Percent Headed

May 17, 2020



Difference



Top ## - Percent Headed
 [Bottom ##] - Change from 5-year Average

Data obtained from USDA National Agricultural Statistics Service weekly Crop Progress reports.

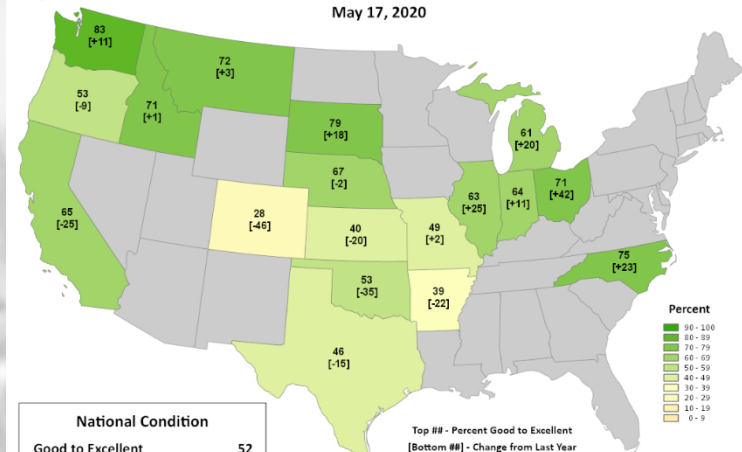
USDA NASS Crop Progress Winter Wheat

- Winter wheat progress a little behind 5 year avg (-6%).
- Freeze and drought impacting west
- Conditions in the east generally good.

Winter Wheat Conditions

Percent Good to Excellent

May 17, 2020



National Condition

Good to Excellent 52
 Change from Last Year -14

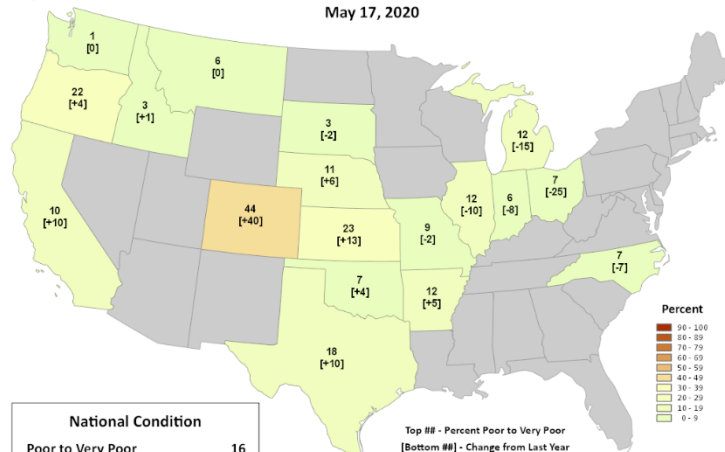
Top ## - Percent Good to Excellent
 [Bottom ##] - Change from Last Year

Data obtained from USDA National Agricultural Statistics Service weekly Crop Progress reports.

Winter Wheat Conditions

Percent Poor to Very Poor

May 17, 2020



National Condition

Poor to Very Poor 16
 Change from Last Year +8

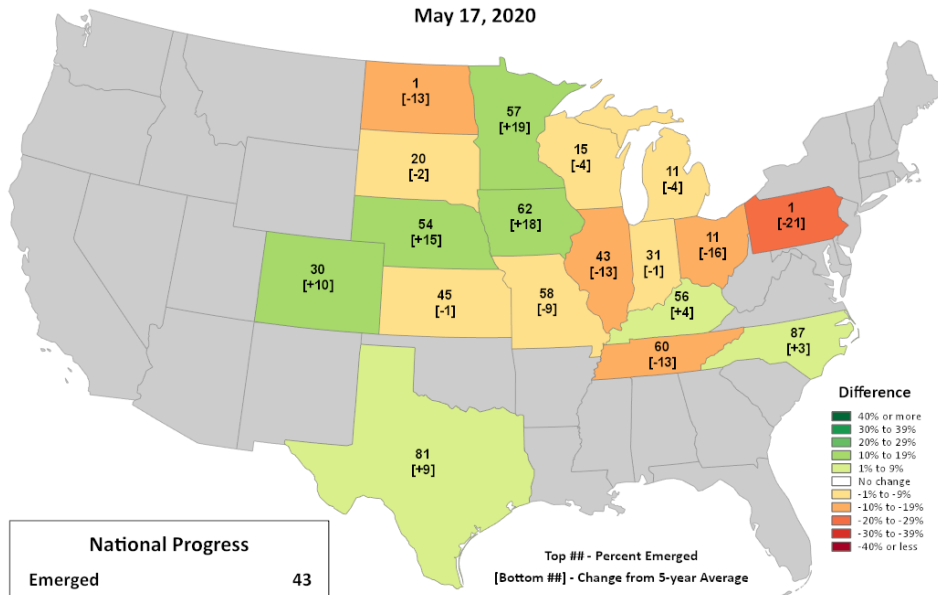
Top ## - Percent Poor to Very Poor
 [Bottom ##] - Change from Last Year

Data obtained from USDA National Agricultural Statistics Service weekly Crop Progress reports.

Corn Progress

Percent Emerged

May 17, 2020



USDA NASS

Crop Progress

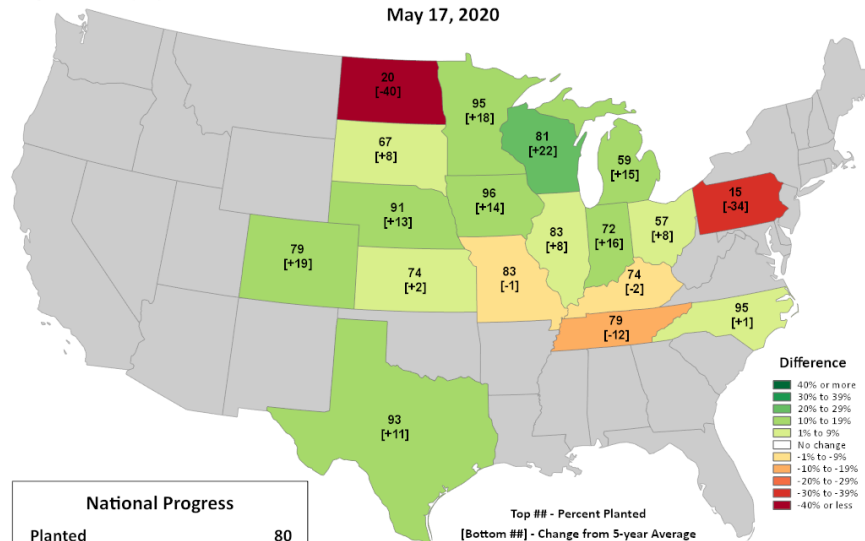
Corn

- Planting ahead of 5 year avg except ND-MO (+9%).
- Emergence much better NE-MN, not in eastern Corn Belt (+3%).
- 6% corn in ND still in ground (2019)

Corn Progress

Percent Planted

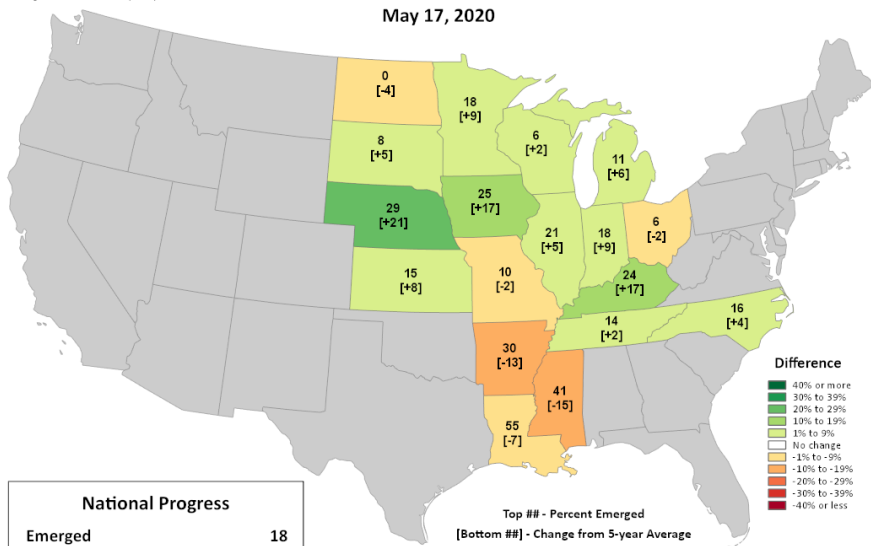
May 17, 2020



Soybeans Progress

Percent Emerged

May 17, 2020



National Progress

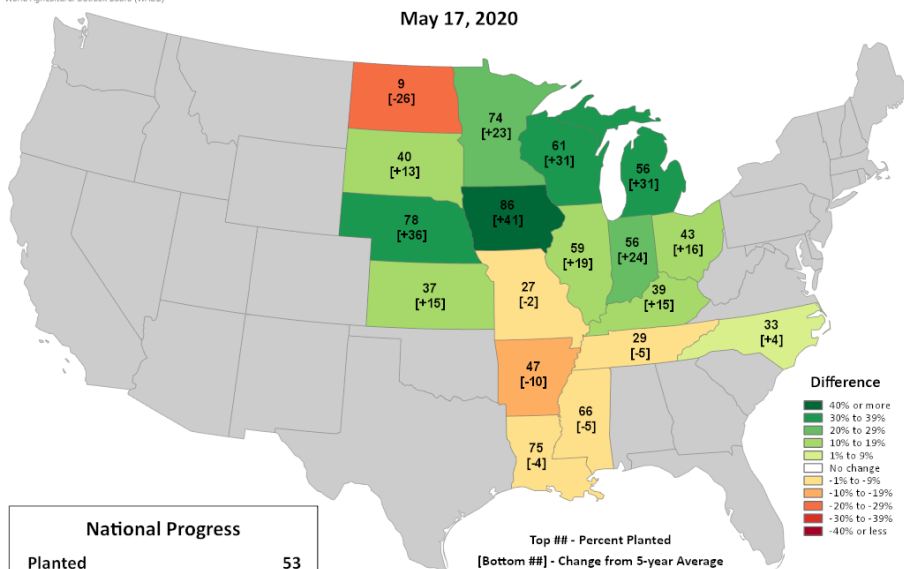
Emerged **18**
 Change from 5-year Average **+6**

Data obtained from USDA National Agricultural Statistics Service weekly Crop Progress reports.

Soybeans Progress

Percent Planted

May 17, 2020



National Progress

Planted **53**
 Change from 5-year Average **+15**

Data obtained from USDA National Agricultural Statistics Service weekly Crop Progress reports.

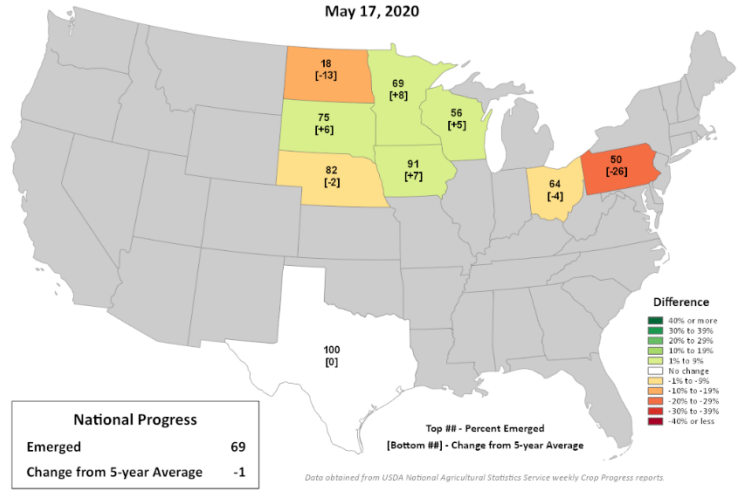
USDA NASS

Crop Progress

Beans

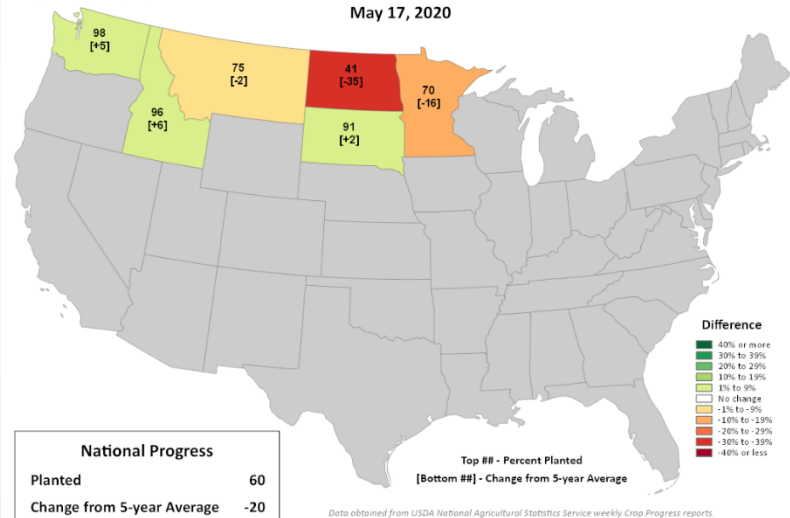
- Planting ahead of 5 year avg except ND-MO) – similar to corn (+15%).
- Emergence much better NE-MN, not in eastern Corn Belt (+6%).
- 6% corn in ND still in ground (2019)

Oats Progress Percent Emerged May 17, 2020



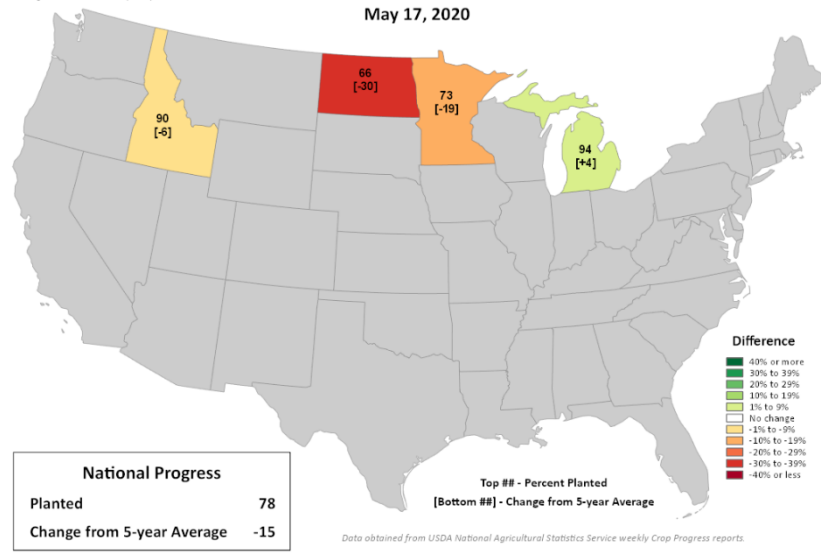
USDA NASS Crop Progress

Spring Wheat Progress Percent Planted May 17, 2020

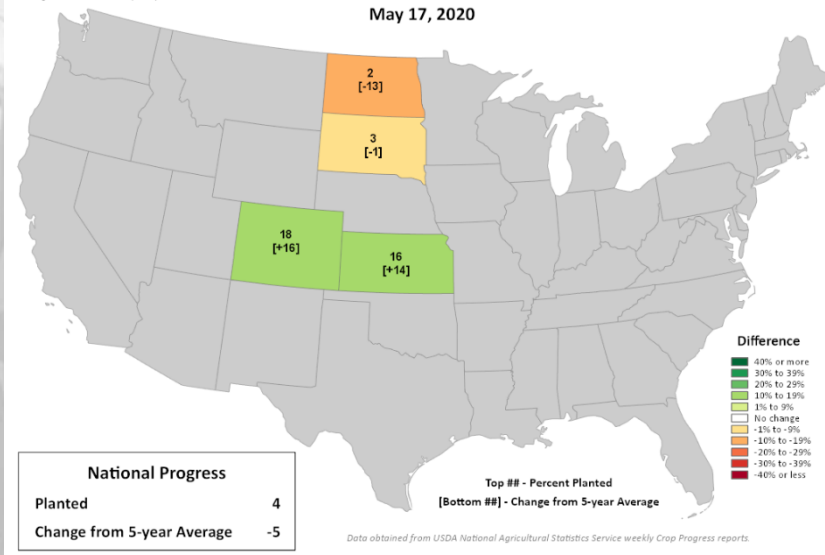


- Sample of other progress maps.

Sugarbeets Progress Percent Planted May 17, 2020

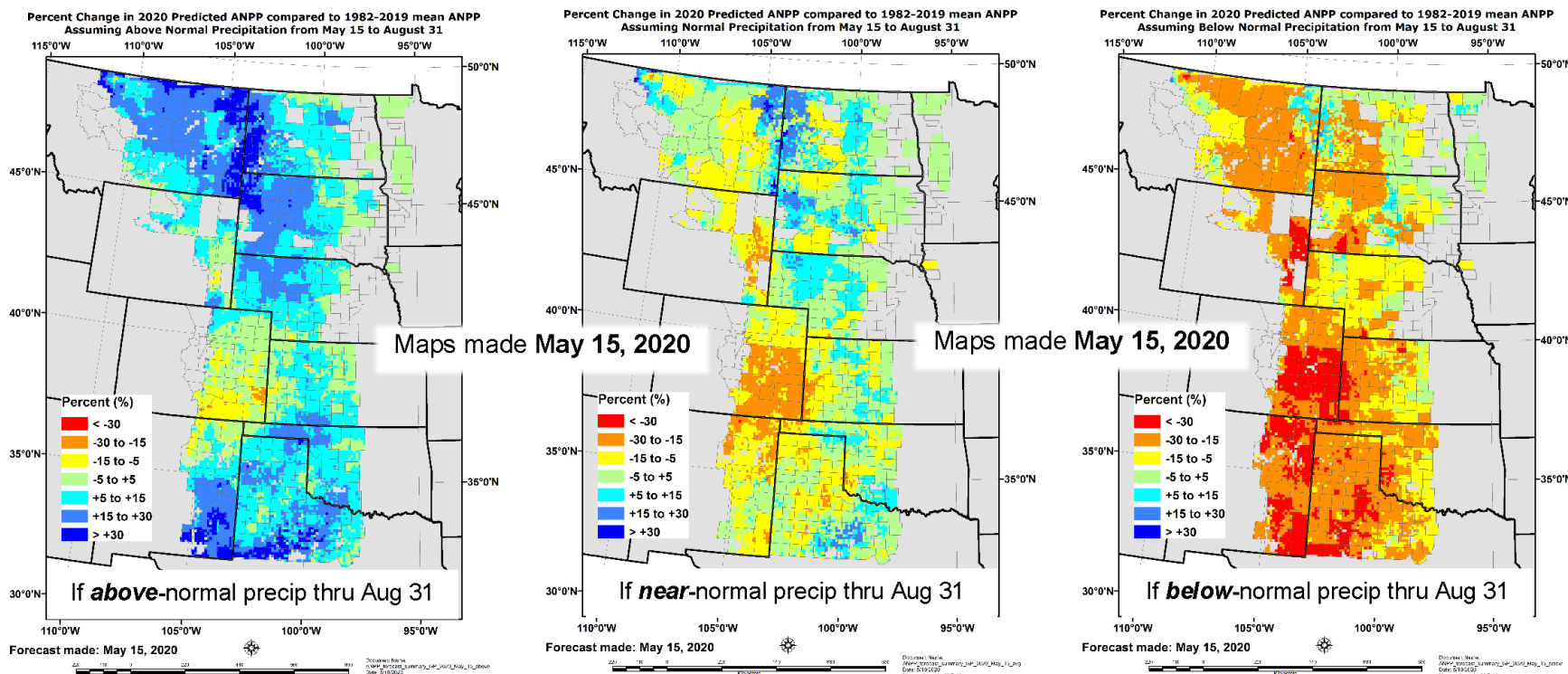


Sunflowers Progress Percent Planted May 17, 2020



% Change in Grassland Production (lbs/ac) this Summer, Compared to an Area's 38-yr Average

For the 3 maps (scenarios) below: "If precipitation between now & Aug 31st is **above** (left map), **near** (middle), or **below** (right) normal, grassland production in your grid-cell will be ____% more or less than its 38-year average."



NOAA's 3-month precipitation outlook for May-Jun-Jul (updated Apr 16, 2020) is leaning *slightly* (33-50% chances) towards **above-normal** for southern ND, all of SD, NE, and KS, much of OK, as well as northeastern CO, eastern WY, and southeastern MT. So the **left map** might be *slightly more likely* for these states. For **all other areas**, the outlook currently shows **equal chances**, so the **three maps** above are **equally likely**. To check the seasonal precipitation outlook for your specific location, please visit NOAA's outlook at: https://www.cpc.ncep.noaa.gov/products/predictions/long_range/lead01/off01_prpc.gif.



Natural Resources Conservation Service
Agricultural Research Service



Find current maps at: <https://grasscast.unl.edu>

See NOAA outlooks at: <http://www.cpc.ncep.noaa.gov/products/forecasts/>

For additional drought info & resources: <http://drought.unl.edu/>

USDA is an equal opportunity provider, employer, and lender.

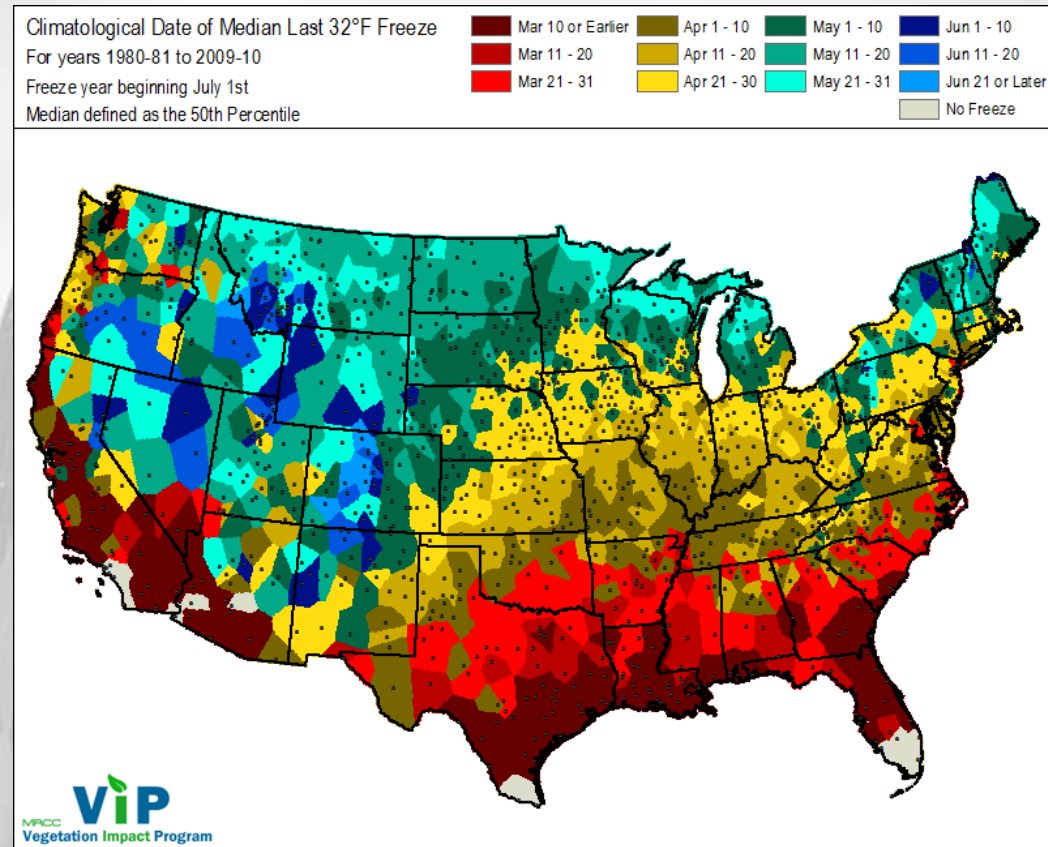
Various ag

- Row crops largely ahead of 5 year avg. and well ahead of last year because of big drying this spring
- Missouri and North Dakota two outliers – wet and still some corn in ground in North Dakota.
- Recent heavy rain east may force some replanting and lead to loss of nutrients – possible impact on Great Lakes water quality.

2020 Central US Freeze Events

- 2 events
 - April 12-18 (not late but very cold; teens in plains freezing into Ohio Valley)
 - May 8-12 (not as cold but, very late eastern areas)

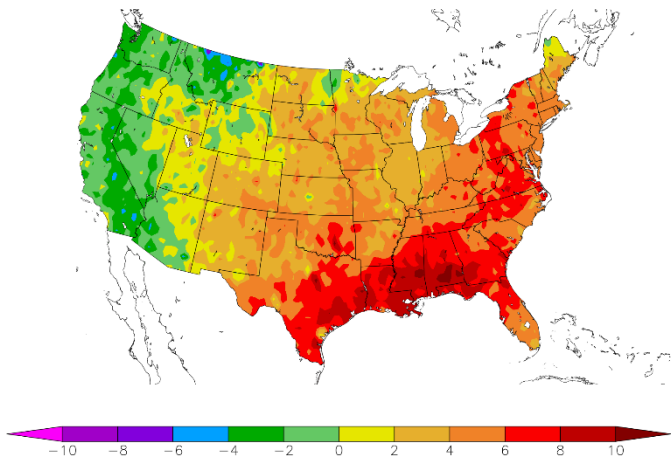
Freeze events are combinations of climatology and phenology. Freeze damage affected by severity of cold, period of time, crop phenology and crop types.



Spring 20 Freeze Events Background

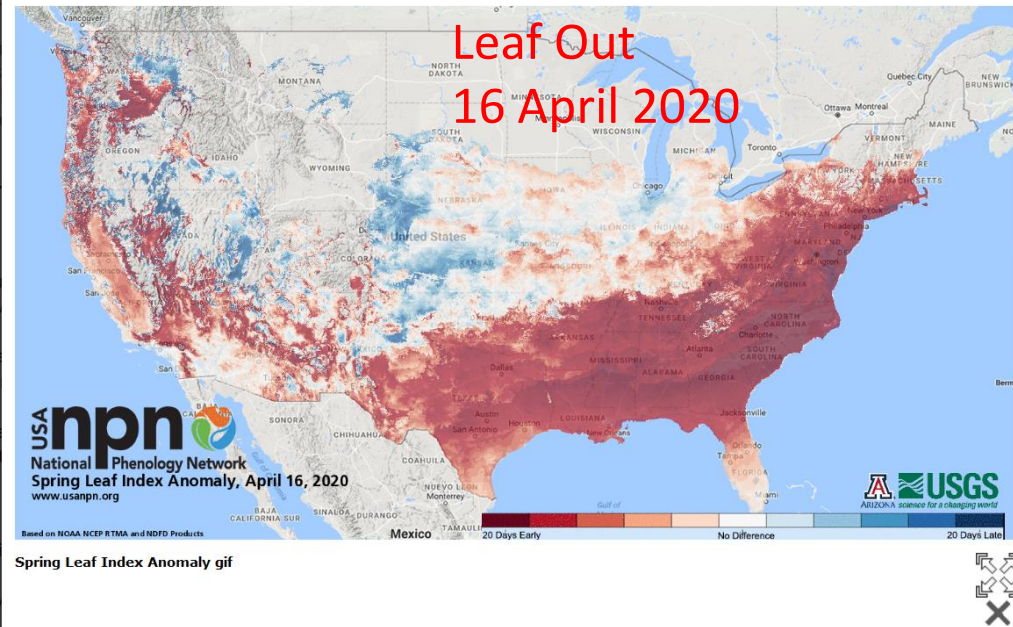
- Warm winter/early spring helped push vegetation earlier than average.

Departure from Normal Temperature (F)
3/1/2020 – 3/31/2020



Generated 4/30/2020 at HPRCC using provisional data.

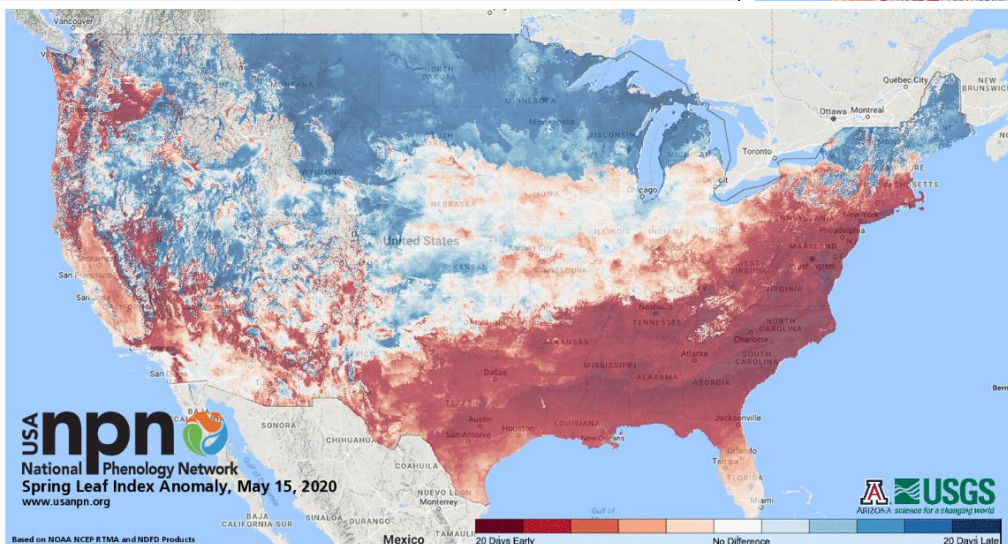
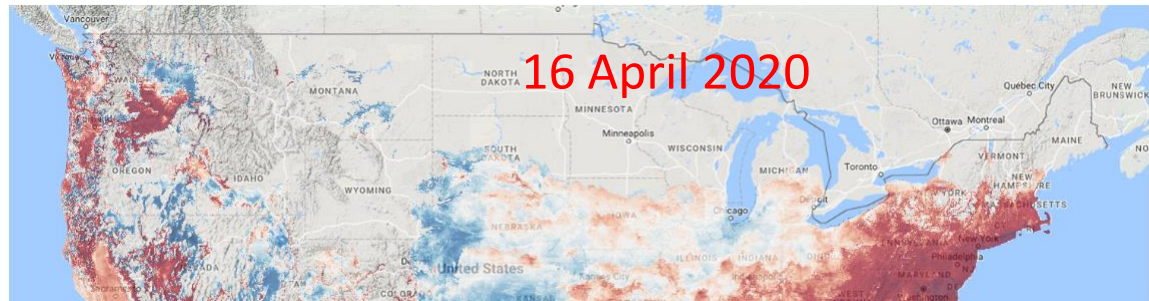
NOAA Regional Climate Centers



Southeast US to eastern Corn Belt/northeast US, plants emerged early 2-3 weeks in places. Northern tier of states had delayed emergence with spring cold (reduced losses.)

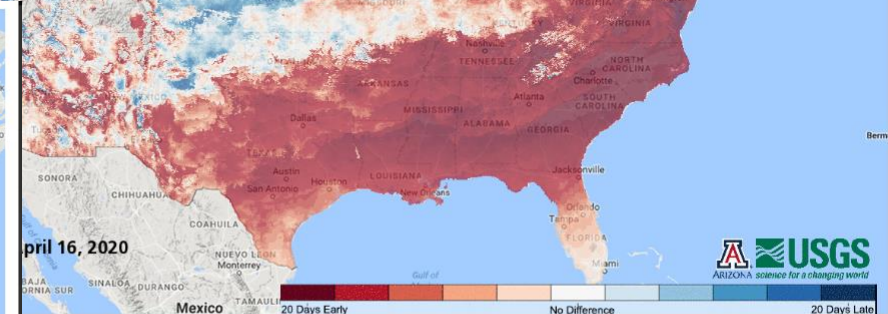
Spring 20 Freeze Events Background

- Warm winter/early spring helped push vegetation emergence earlier than average.



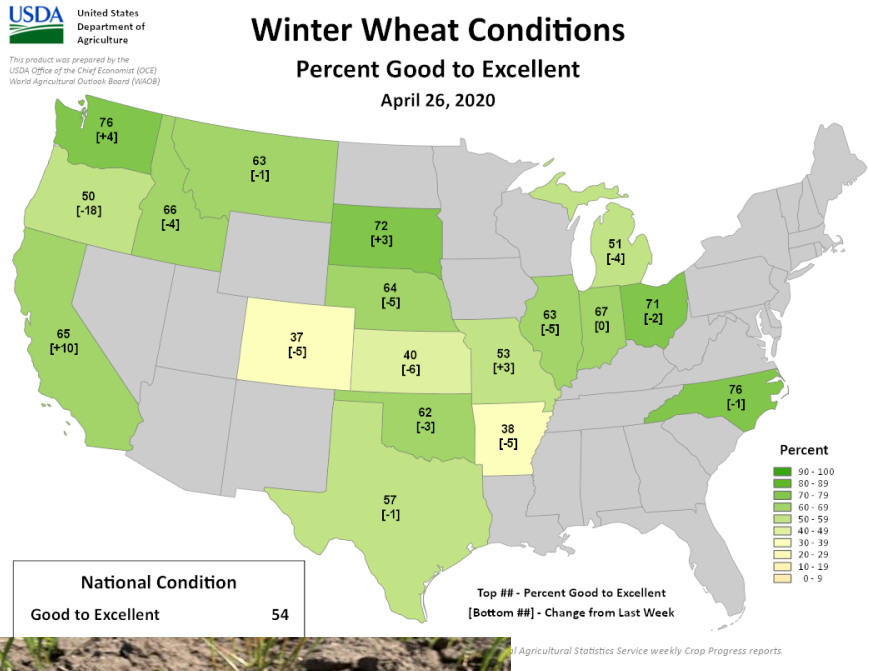
Spring Leaf Index Anomaly gif

15 May 2020

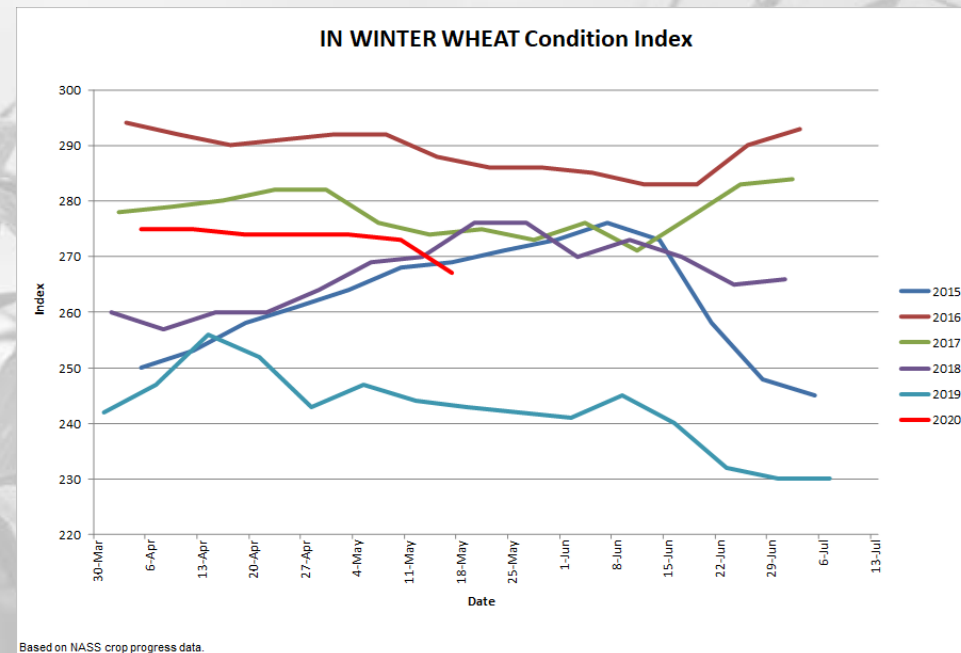


Plants emerged early 2-3 weeks in places.
Northern tier of states had delayed emergence
due to spring cold (reduced losses.)

Wheat Impacts



- Wheat impacts varied
- Worst in central plains
- Slight in eastern Corn Belt



Based on NASS crop progress data.



Freeze damage to hard red spring wheat from May 2020 freeze event, Greg Enders (NDSU Extension Crop Specialist, Carrington, ND).

Specialty Crops Impacts

Western slope peaches in CO 90% losses reported.



- Specialty crops reports
 - Tree fruits: peaches, apples (varietal), apricots (MI, IN, IA, OH)
 - Vegetables: some not planted yet (9000 peppers killed in OH).
 - Sweet corn: OK if not too far along (srn OH hit badly)
 - Grapes: seem less impacted more impacted south. Juice grapes MI.

Other Crop Impacts



Frozen soybeans IL Chelsea Harbach, Director of the U of I Northwestern Illinois Ag R&D Center

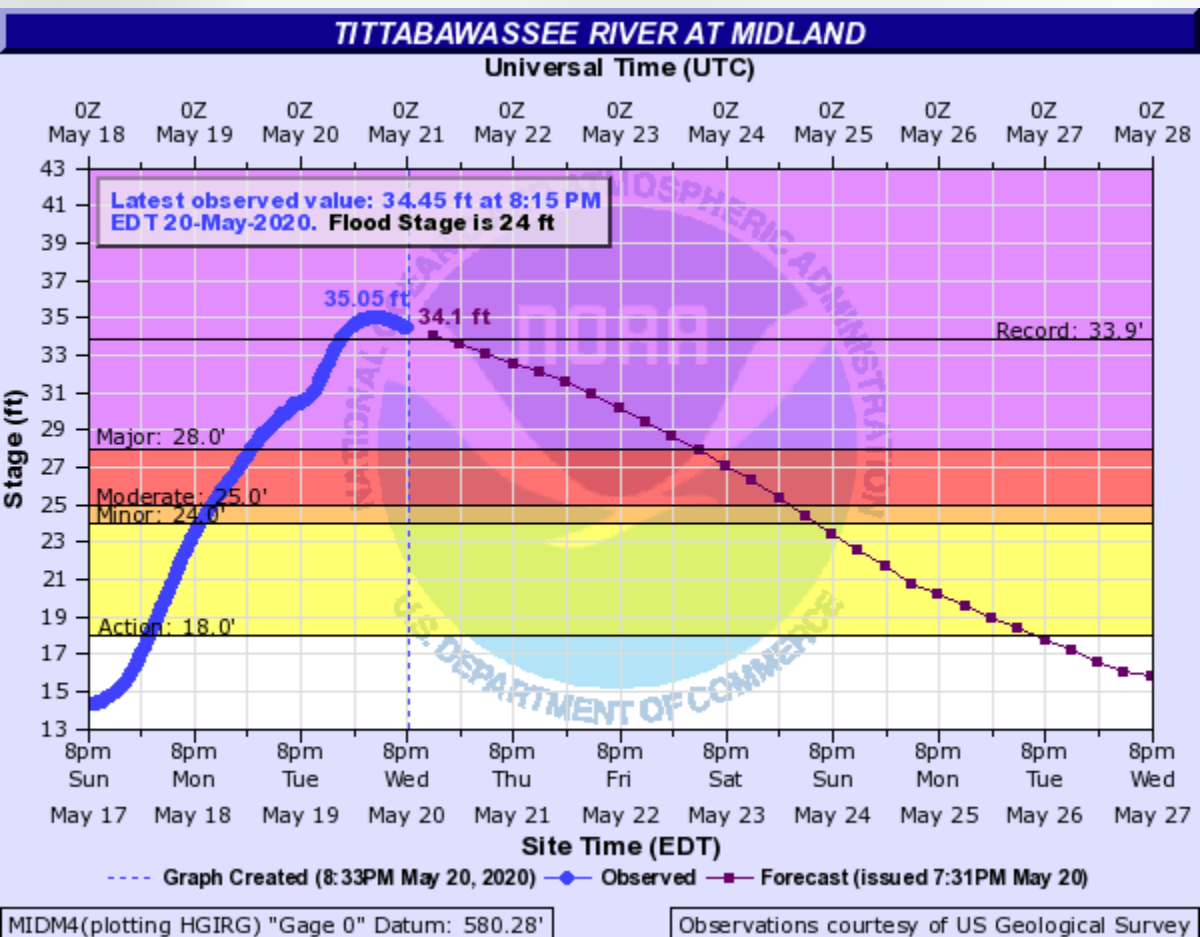
- Other crop reports
 - Some small grain/cover crop damage in Northern Plains
 - Row crops mostly unaffected (corn, soybeans, others). Some early planted soybeans in IL probably lost.
 - Not emerged from soil or can recover from freeze

***Les Ober (OSU Extension
Educator Geauga County) –
Snow on May 9th across N.
Ohio***



MAJOR EVENTS

Michigan Flooding



- Dam breaks near Midland, MI. 11K people evacuated
- Chemical facility threatened

Chicago Flooding

- Flooding
- Interstates
- Record flows
- Record rains

Preliminary Look at May 17, 2020 Event



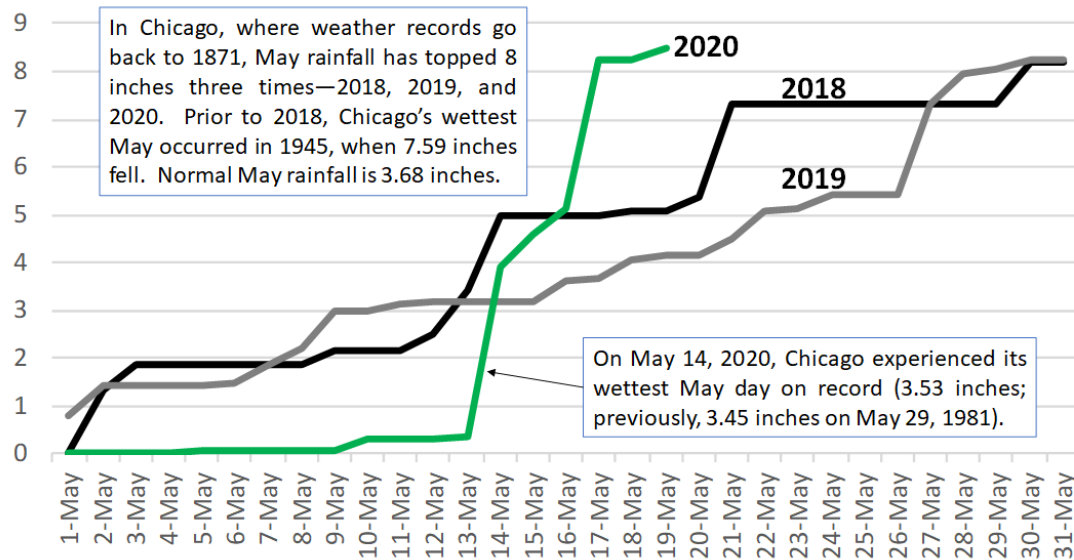
Preliminary Flooding & Severe Weather Reports



Flash flooding in Chicago. Courtesy: Rebecca McCann

- Major flash flooding in parts of the Chicago metro area late in the day into the evening, including major thoroughfares, and flooded structures including along the Chicago River
- Two brief tornadoes occurred based on spotter reports with no damage reported
 - South of Sandwich, IL in far northeast LaSalle Co.
 - Near Braidwood, IL along Grundy/Will Co. border

Cumulative May Rainfall (Inches) in Chicago



Sunday, May 17, 2020 11:22 PM

OUTLOOKS

Photo: Cheryl Todey
Ames, IA



Climate Outlooks

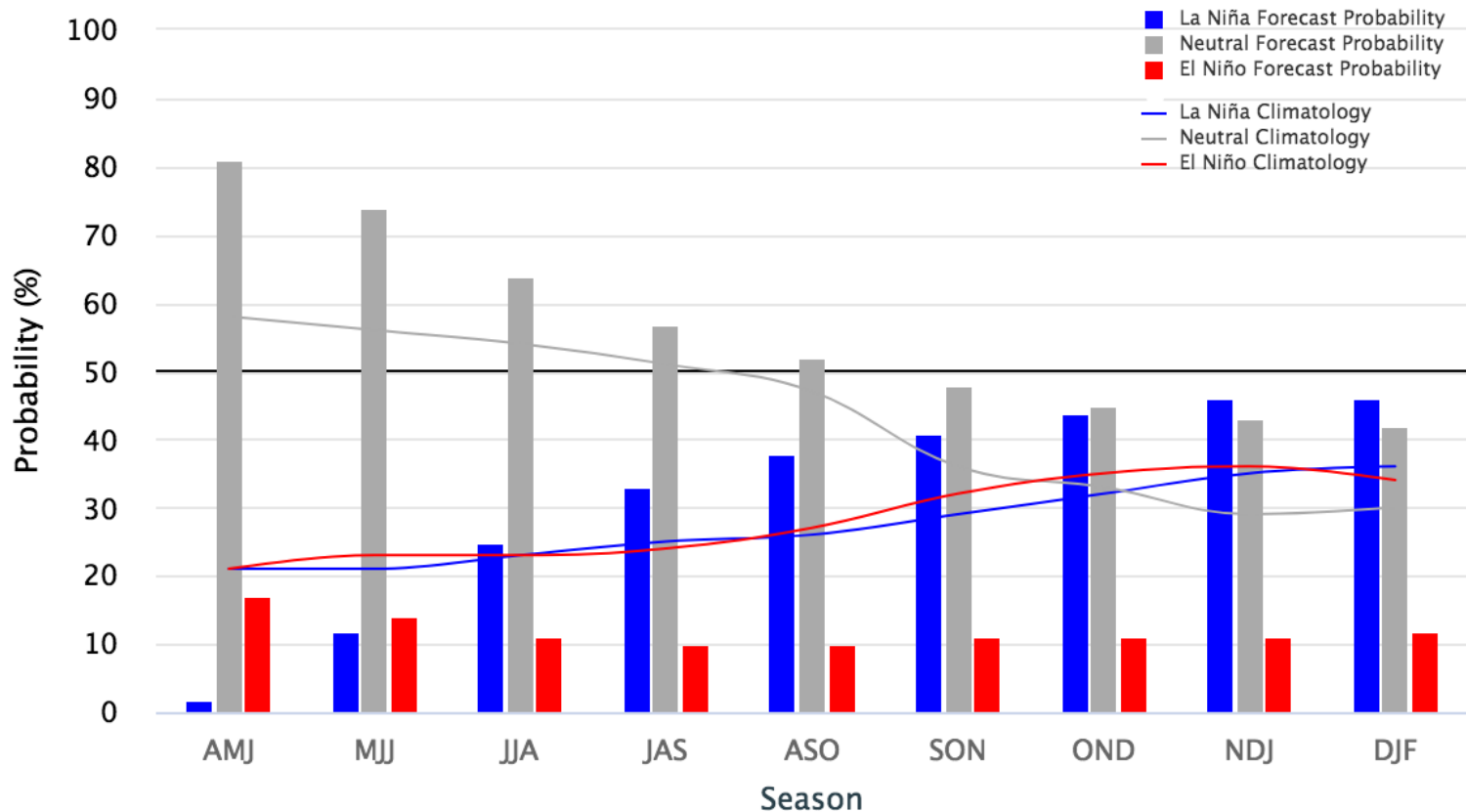
- **La Niña/El Niño in status.....**
- **7-day precipitation forecast**
- **8-14 day outlook**
- **June**
- **Summer/growing season**
- **Hurricane outlooks**

ENSO Outlook Status

Early-May 2020 CPC/IRI Official Probabilistic ENSO Forecasts

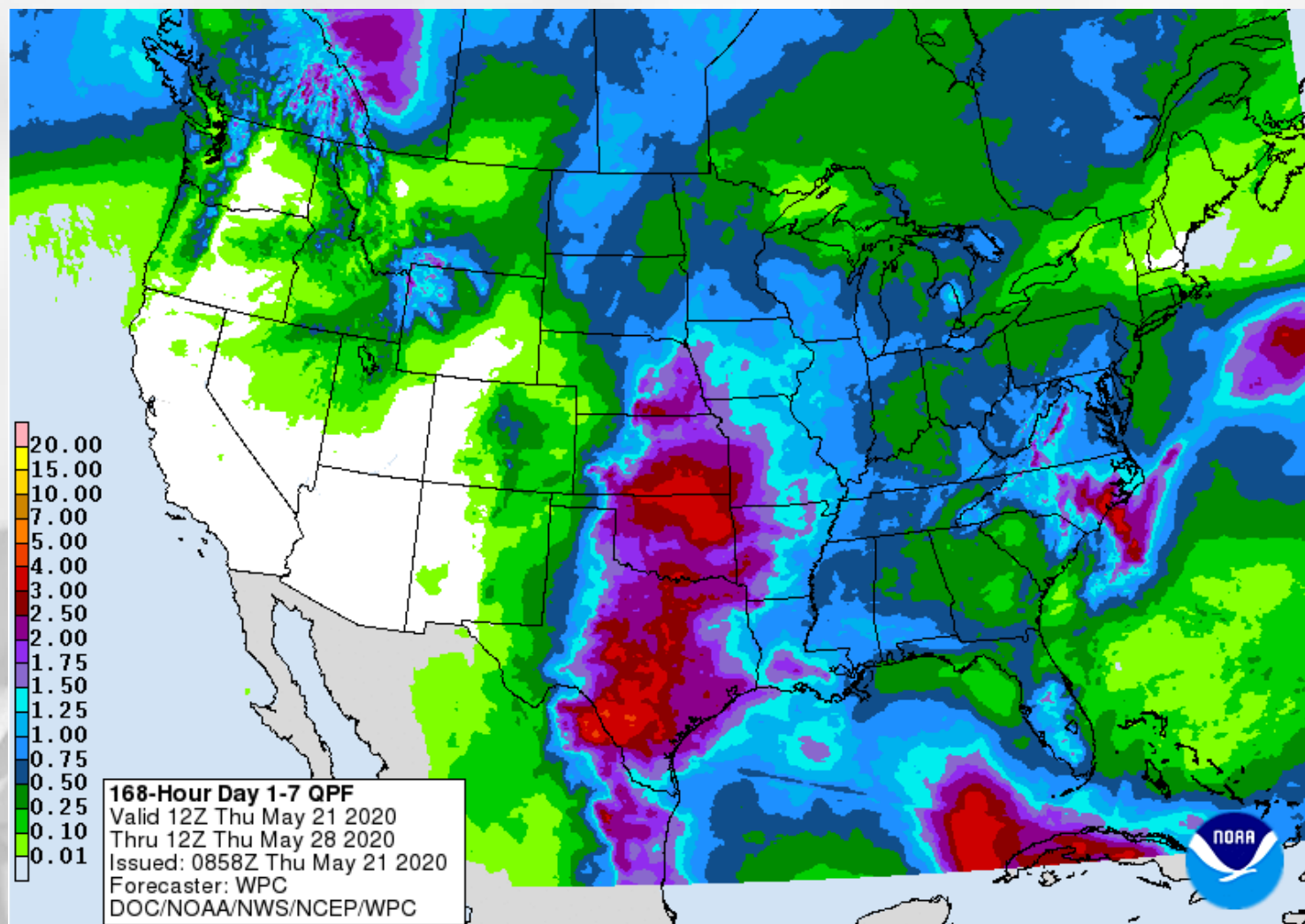
ENSO state based on NINO3.4 SST Anomaly

Neutral ENSO: -0.5°C to 0.5°C



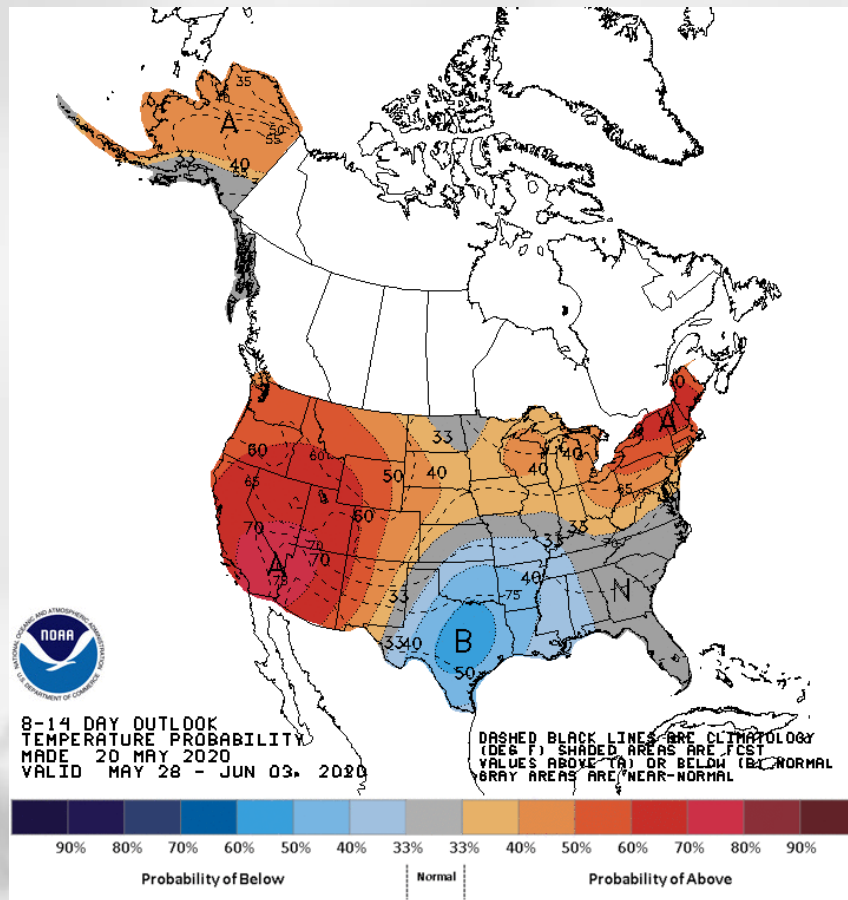
7-day Quantitative Precipitation Forecast

Valid: 7 PM Thu 21 May– 7 PM Thu 28 May

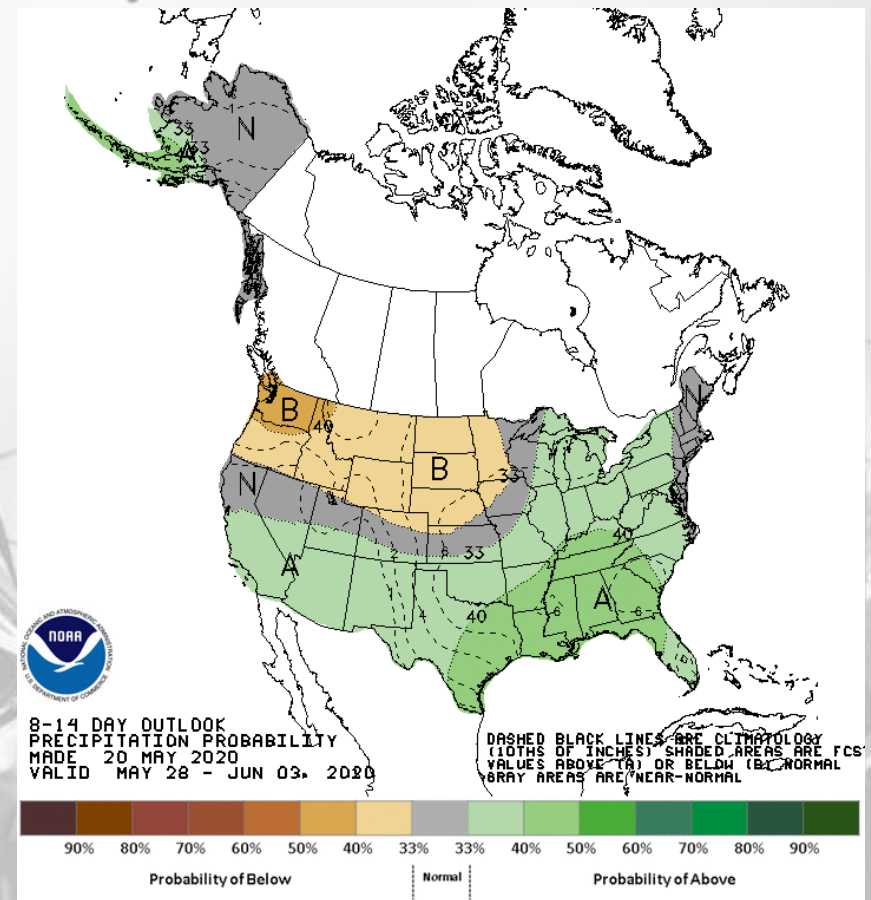


<http://www.wpc.ncep.noaa.gov/qpf/day1-7.shtml>

Temperature and Precipitation Probabilities for 28 May – 3 June 2020



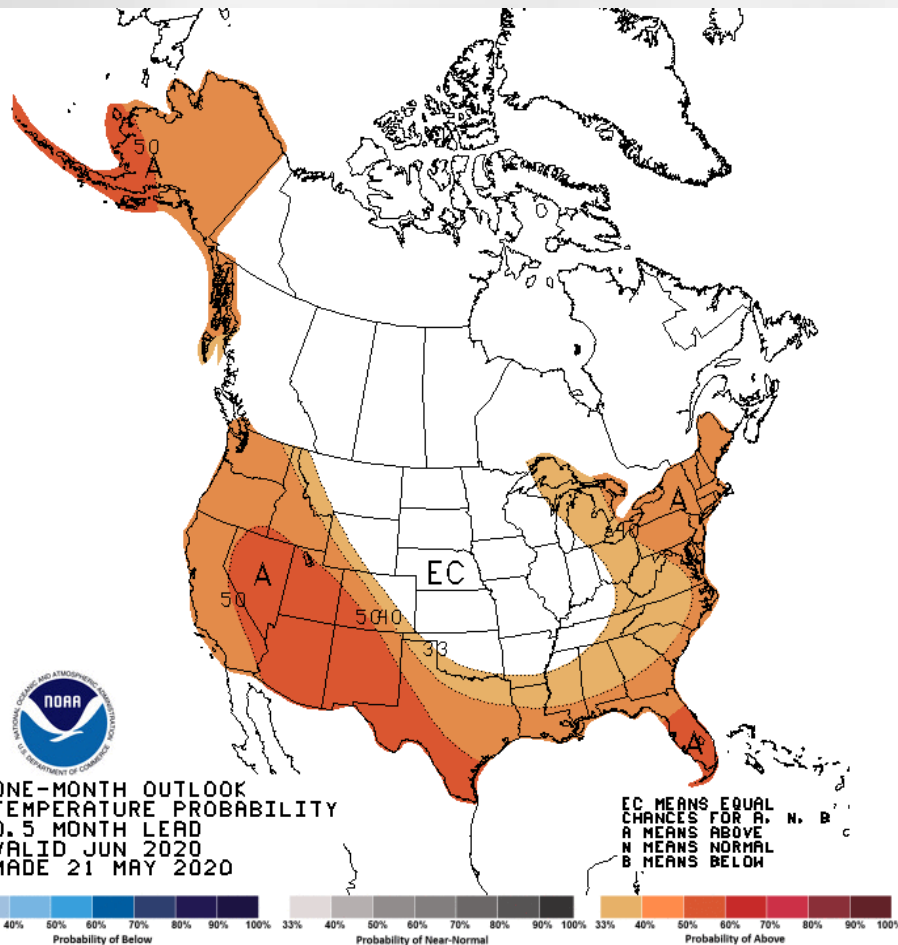
Temperature



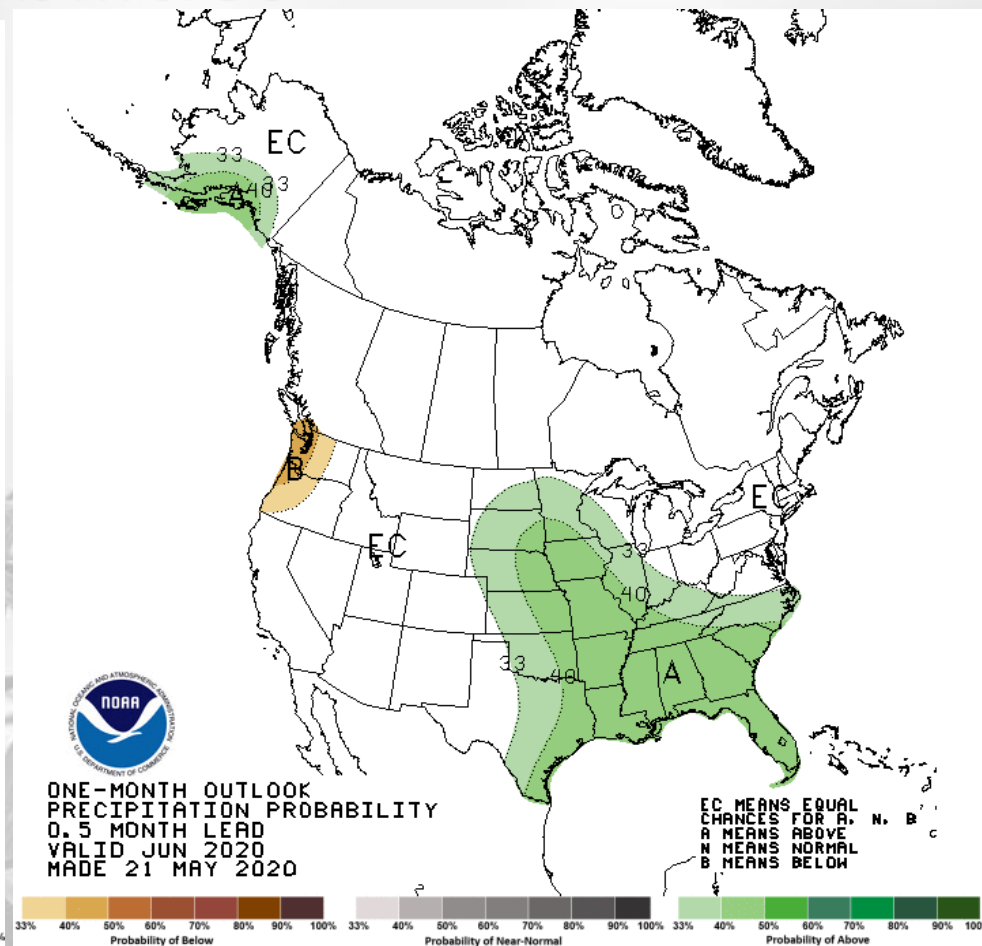
Precipitation

<http://www.cpc.ncep.noaa.gov/products/predictions/814day/index.php>

June Temperature and Precipitation Probabilities



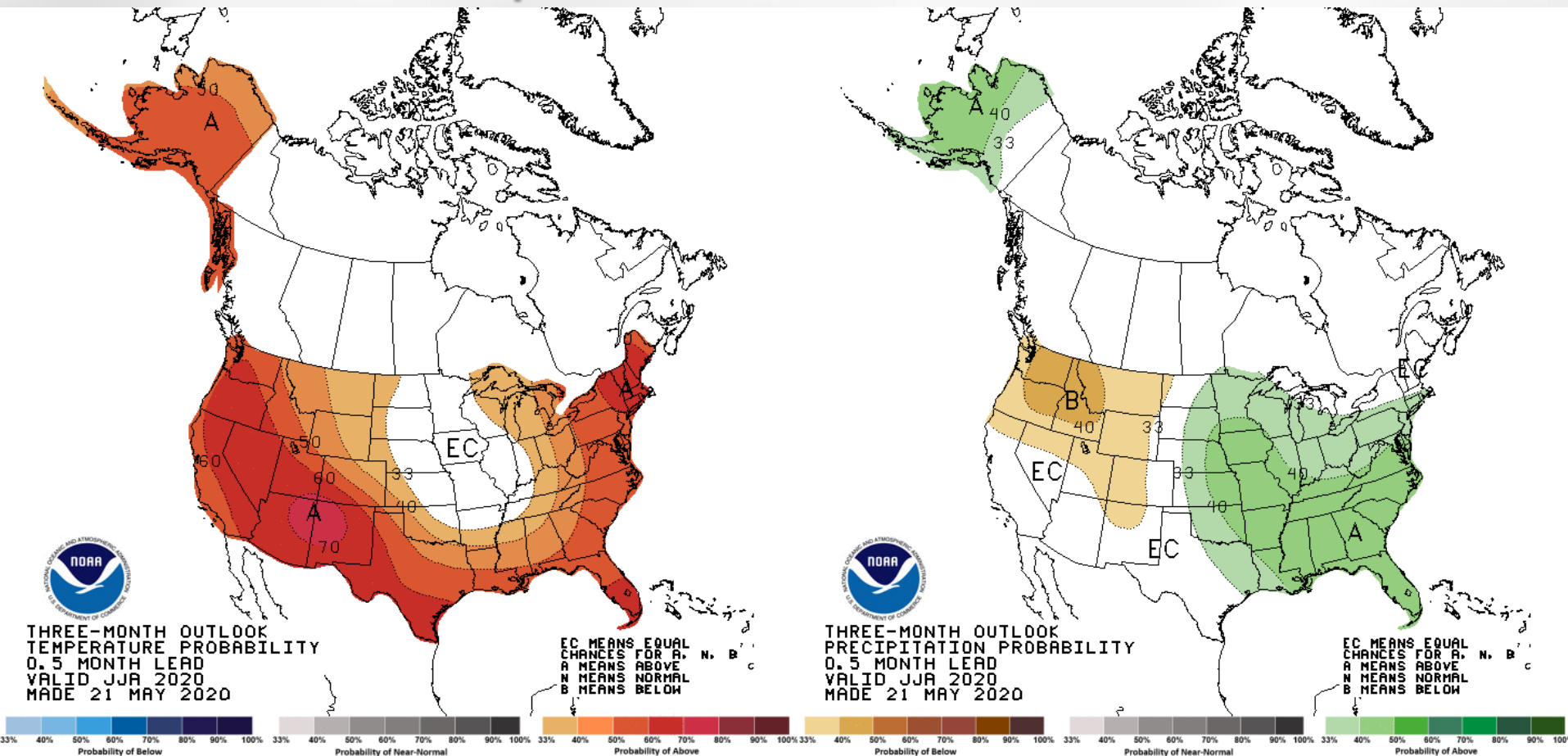
Temperature



Precipitation

<http://www.cpc.ncep.noaa.gov/products/predictions/30day/>

3 Month Temperature and Precipitation Probabilities



Temperature

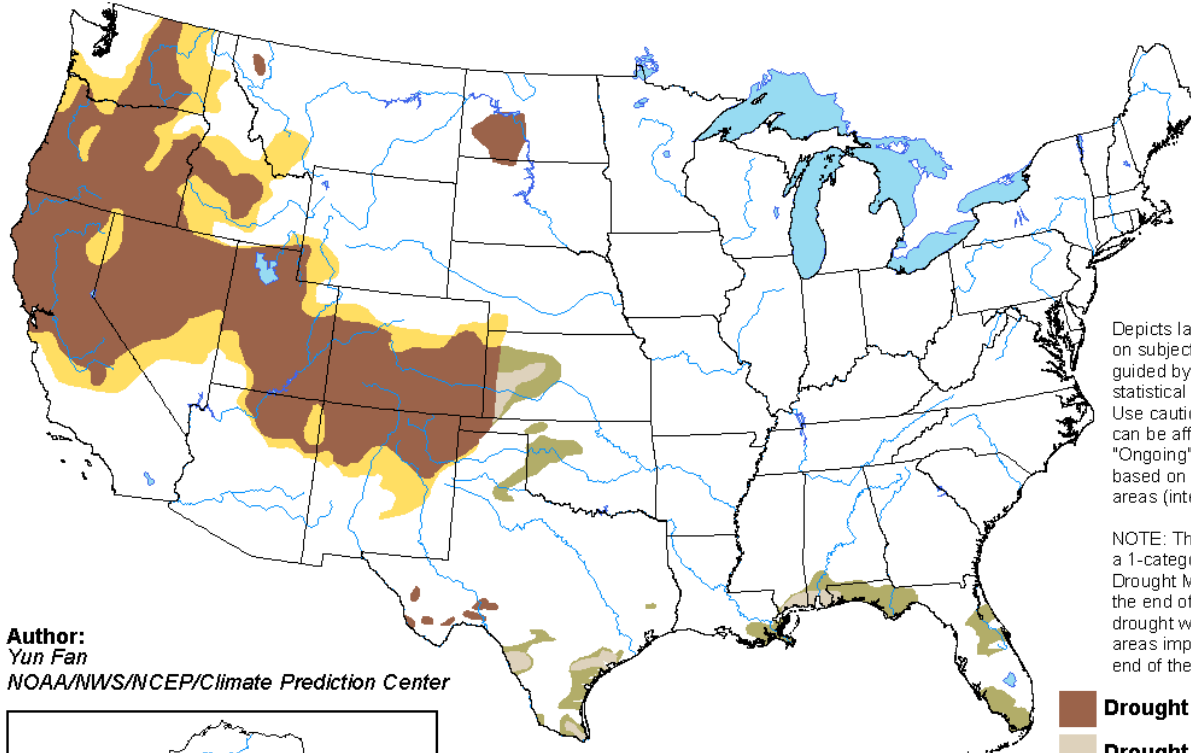
Precipitation

http://www.cpc.ncep.noaa.gov/products/predictions/long_range/seasonal.php?lead=2

Drought Outlook through 31 August

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

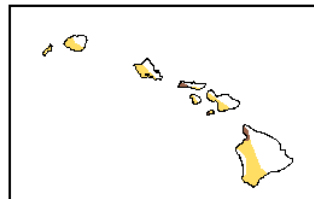
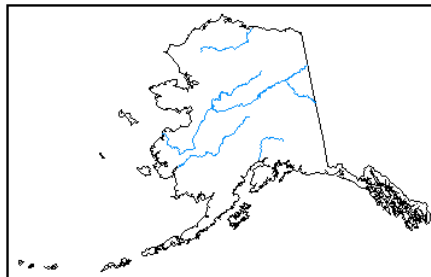
Valid for May 21 - August 31, 2020
Released May 21



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).

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



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



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

Summary - Conditions

- * Warm late winter/early spring has given way to cooler spring.
- * Largely drier west and wetter east – with variability
- * Double freezes did large damage to mostly specialty crops
- * Spring dryness helped other ag planting
- * Great Lakes still very high
- * Recent flooding in the region has caused localized serious issues and will keep lakes higher.

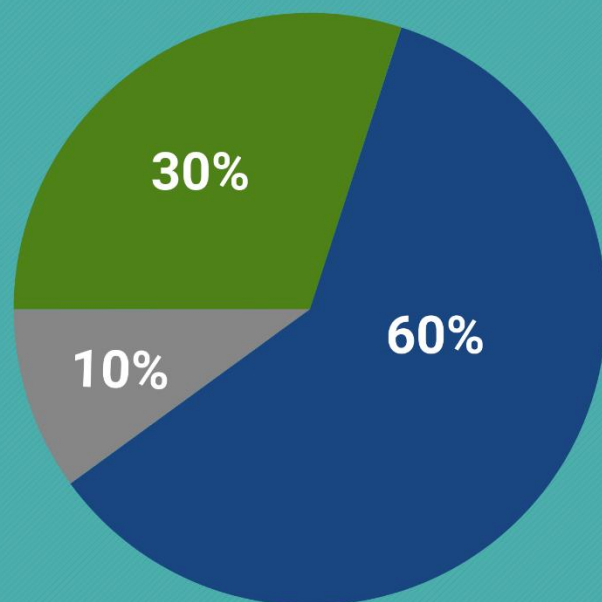
Summary - Outlooks

- * Marginal El Niño transitioning colder water.
- * Officially still neutral conditions - lack of ENSO leaves outlooks to trend and models
- * Warmer likely far east June with large EC into summer
- * Small increased chance of wetness much of the region June and summer.
- * Some drought ongoing in Plains. Mostly CO/KS and maybe north.

Atlantic Hurricane Season



2020 Atlantic Hurricane Season Outlook



■ Above-normal ■ Near-normal ■ Below-normal season

Season probability

Named storms

13-19

Hurricanes

6-10

Major hurricanes

3-6

Be prepared: Visit [hurricanes.gov](https://www.noaa.gov/hurricanes) and follow @NWS and @NHC_Atlantic on Twitter.

May 2020

<https://www.noaa.gov/media-release/busy-atlantic-hurricane-season-predicted-for-2020>

Further Information - Partners

- **Today's and Past Recorded Presentations and :**
- <http://mrcc.isws.illinois.edu/webinars.htm>
- <http://www.hprcc.unl.edu>
- NOAA's National Climatic Data Center: www.ncdc.noaa.gov
 - Monthly climate reports (U.S. & Global): www.ncdc.noaa.gov/sotc/
- NOAA's Climate Prediction Center: www.cpc.ncep.noaa.gov
- Climate Portal: www.climate.gov
- U.S. Drought Portal: www.drought.gov
- National Drought Mitigation Center: <http://drought.unl.edu/>
- State climatologists
 - <http://www.stateclimate.org>
- Regional climate centers
 - <http://mrcc.isws.illinois.edu>
 - <http://www.hprcc.unl.edu>

Thank You and Questions?

- Questions:
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 - **Weather:**
 - crhroc@noaa.gov

For More Information



Midwest Climate Hub



@dennistoday



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



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