Midwest and Great Plains Climate-Drought Outlook 20 May 2020

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

Photo: Cheryl Todey

Ames, IA

Photo taken Feb 19, 2013

National Drought Mitigation Center

NOAA National Oceanic and Atmospheric Administration U.S. Department of Commerce

Regional Climate Centers

AASC American Association of State Climatologists

USDA United States Department of Agriculture Midwest Climate Hub

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.)

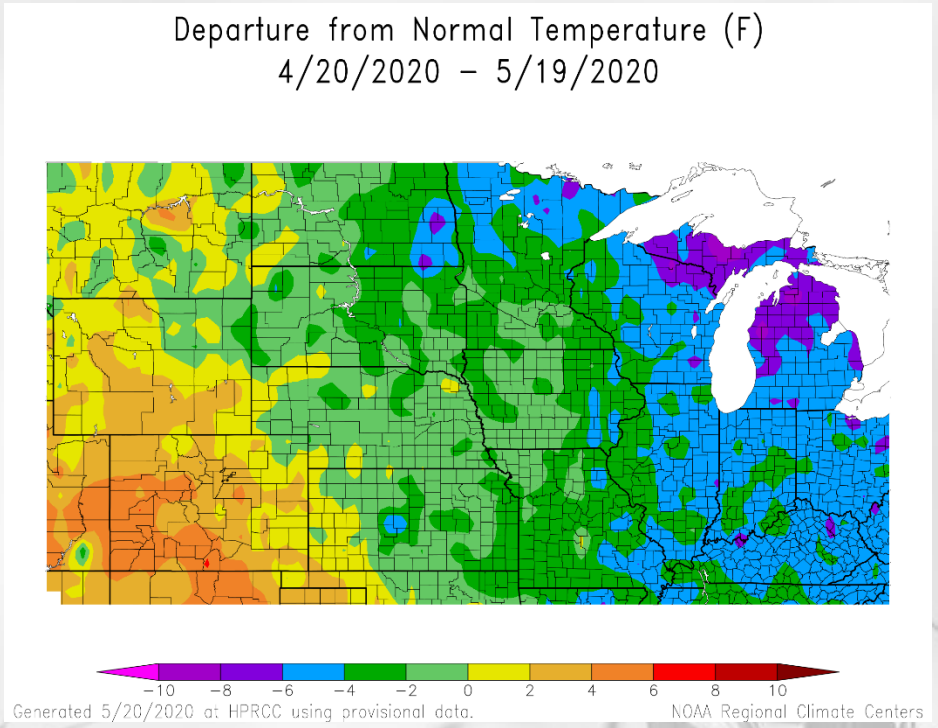
- **Access to Future Climate Webinars and Information**
- http://www.drought.gov/drought/content/regional-programs/regional-drought-webinars

- *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

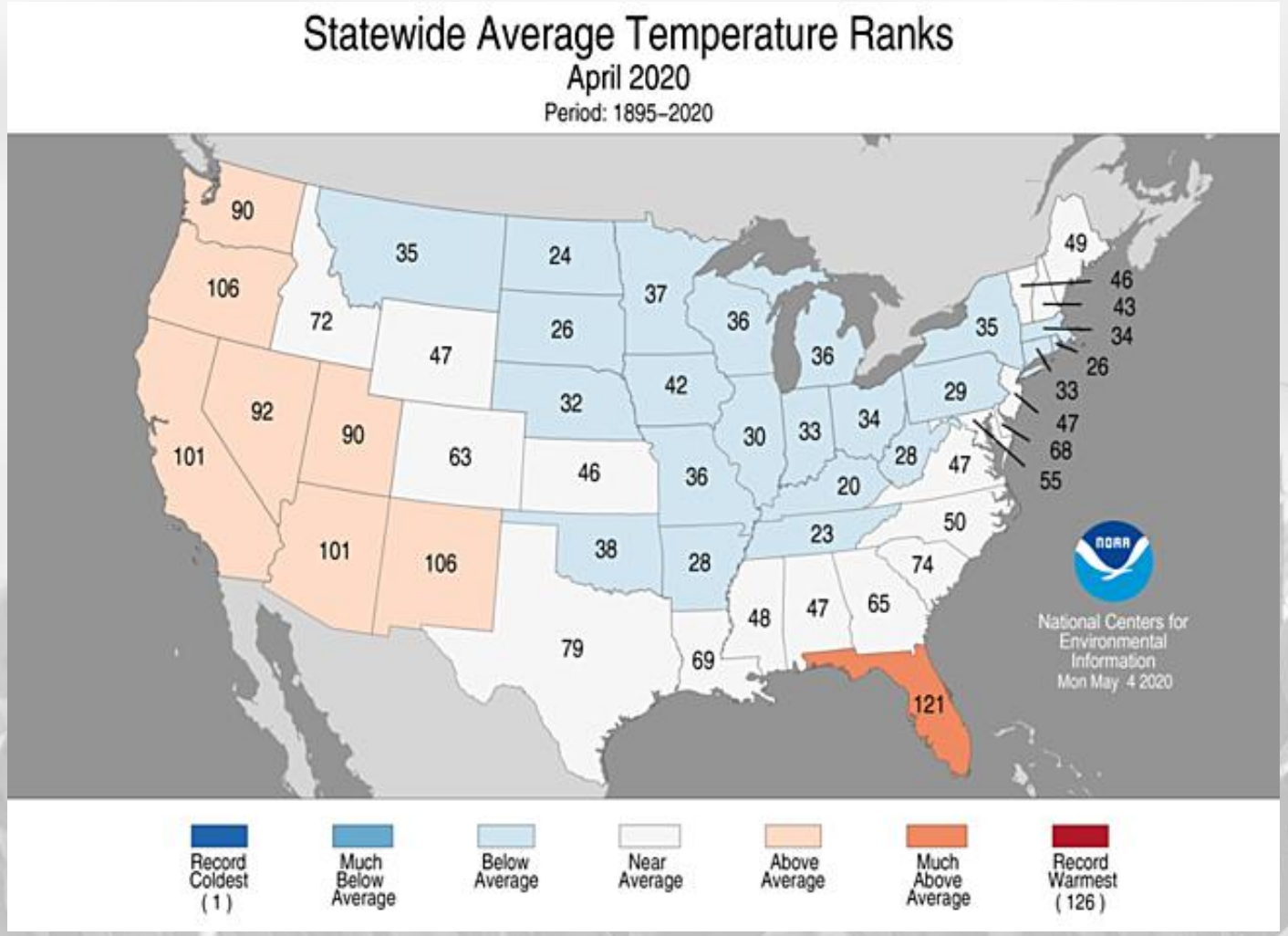


REVIEW/CURRENT CONDITIONS

April Temperature Recap

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

Cold was beneficial in some ways.

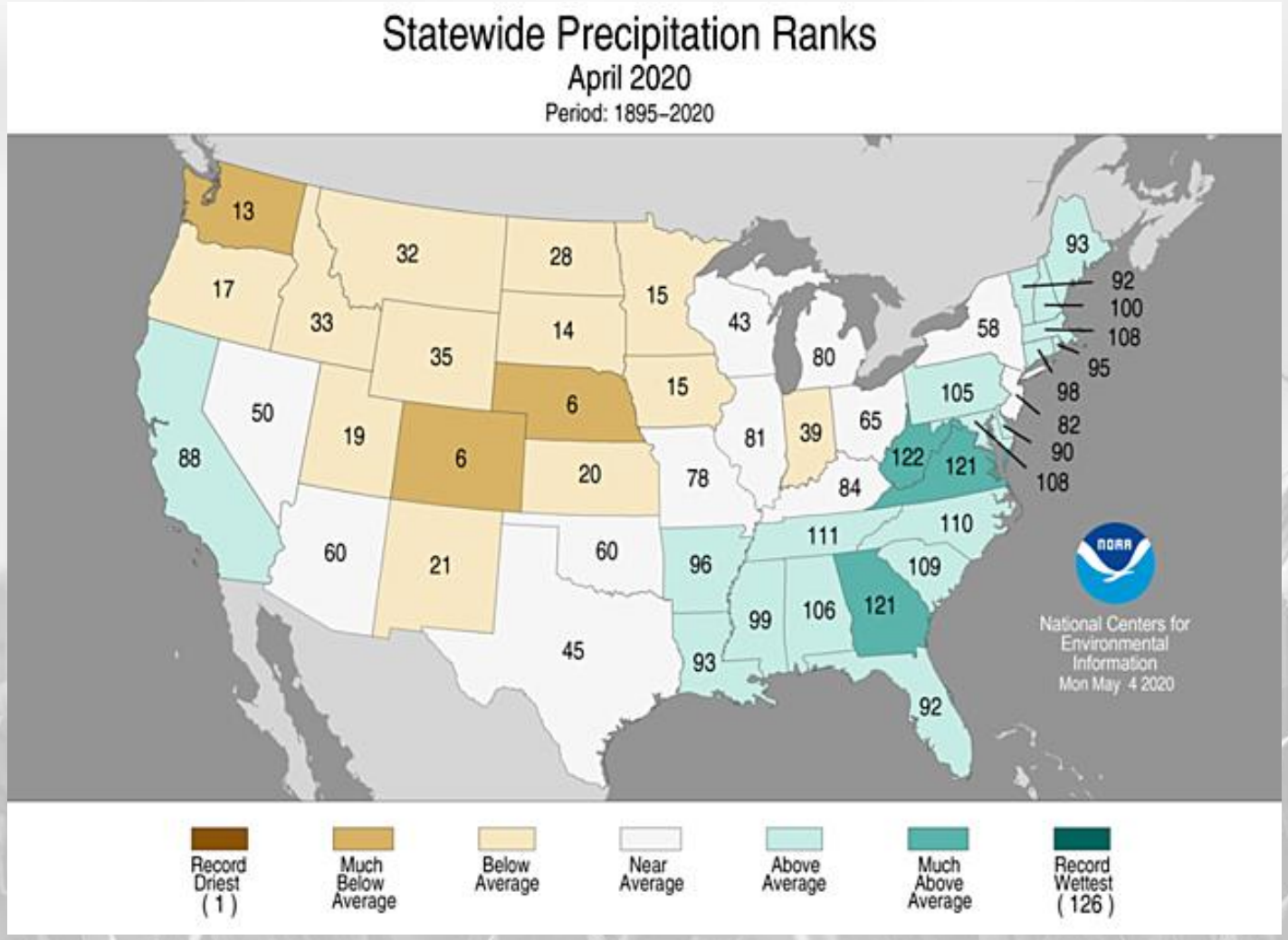


http://www.ncdc.noaa.gov/temp-and-precip/us-maps/

April Precipitation Recap

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

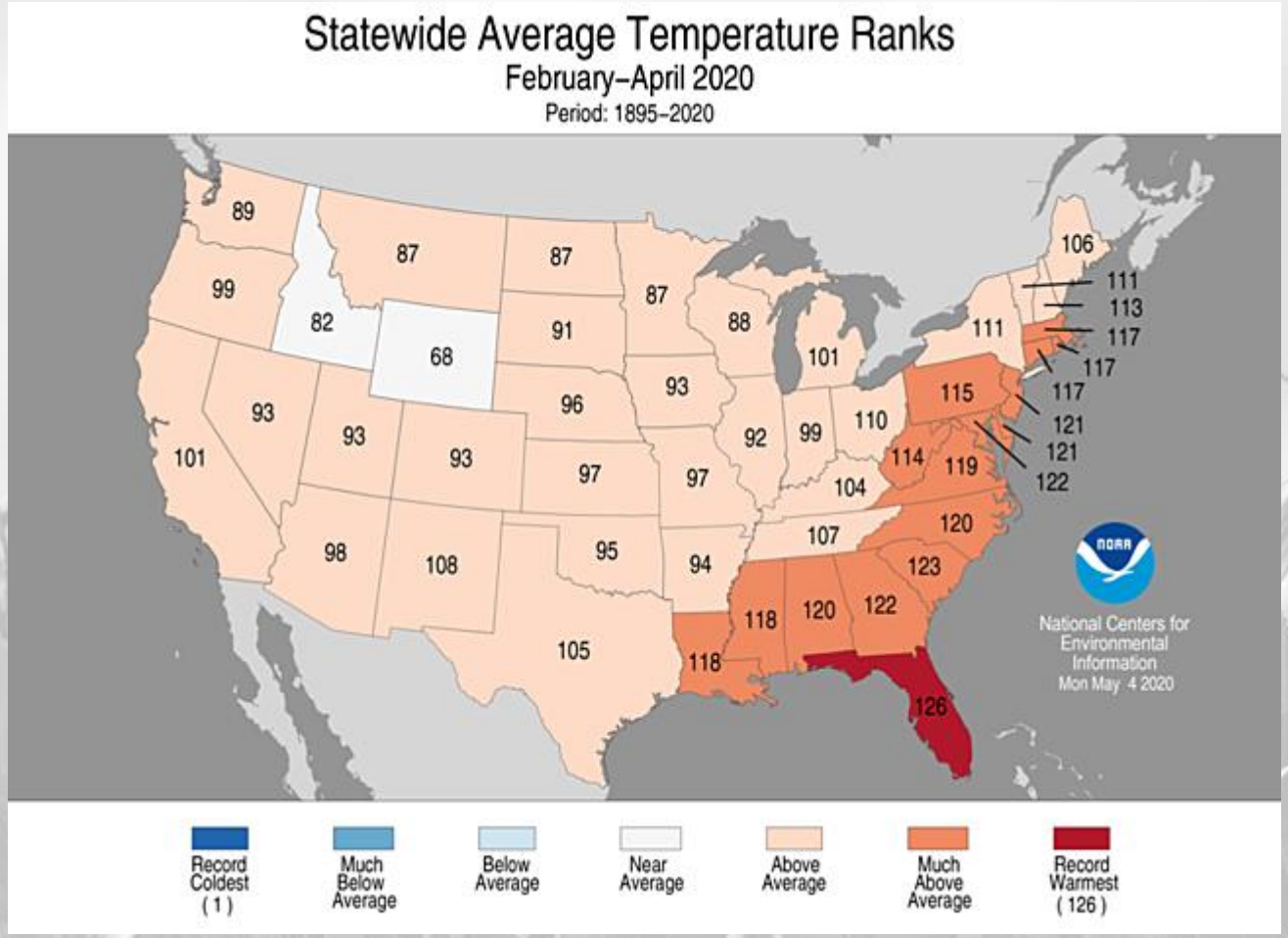
Top 6 driest Nebraska and Colorado.



http://www.ncdc.noaa.gov/temp-and-precip/us-maps/

February-April Temperature Recap

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

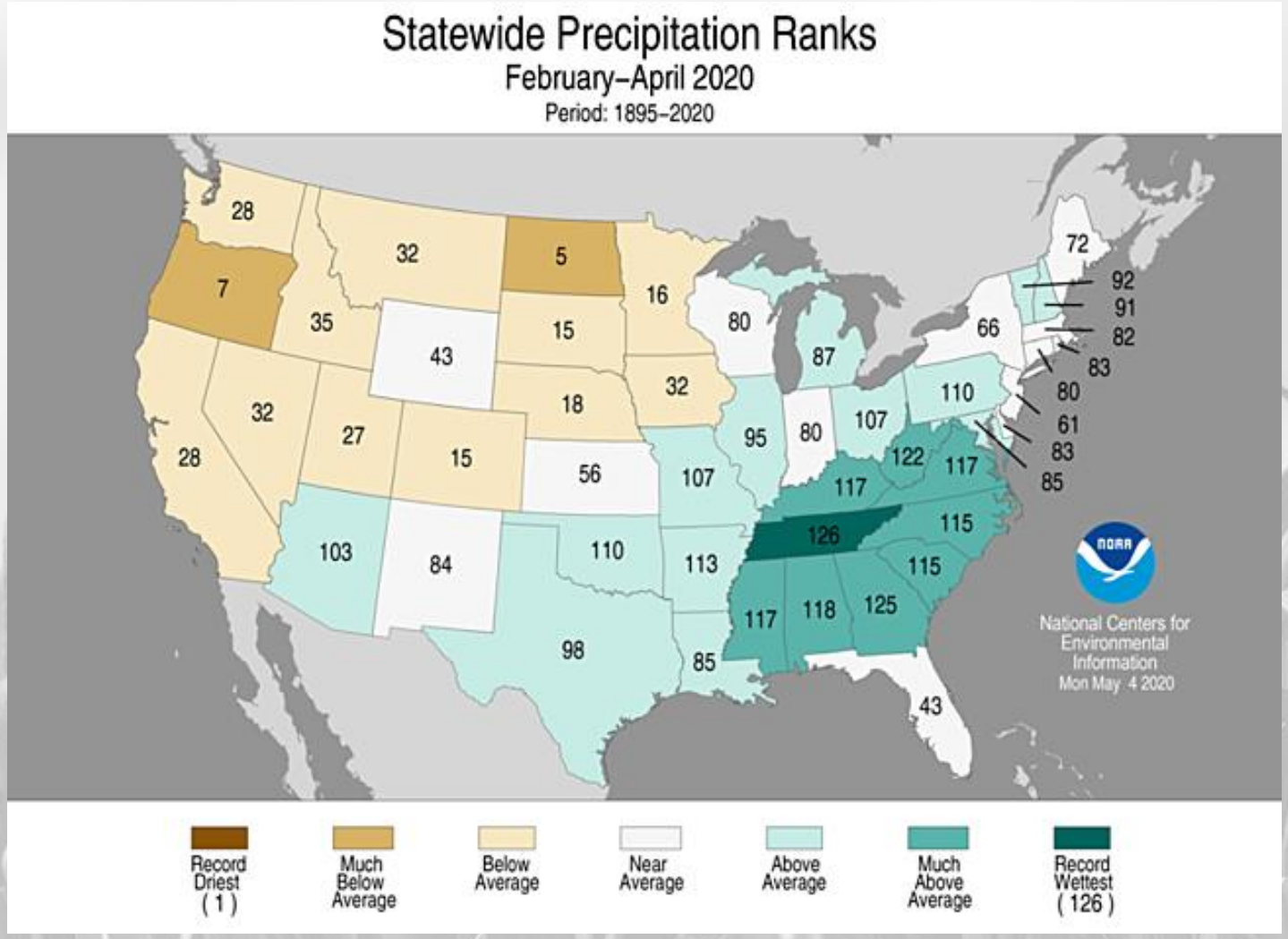


http://www.ncdc.noaa.gov/temp-and-precip/us-maps/

February-April Precipitation Recap

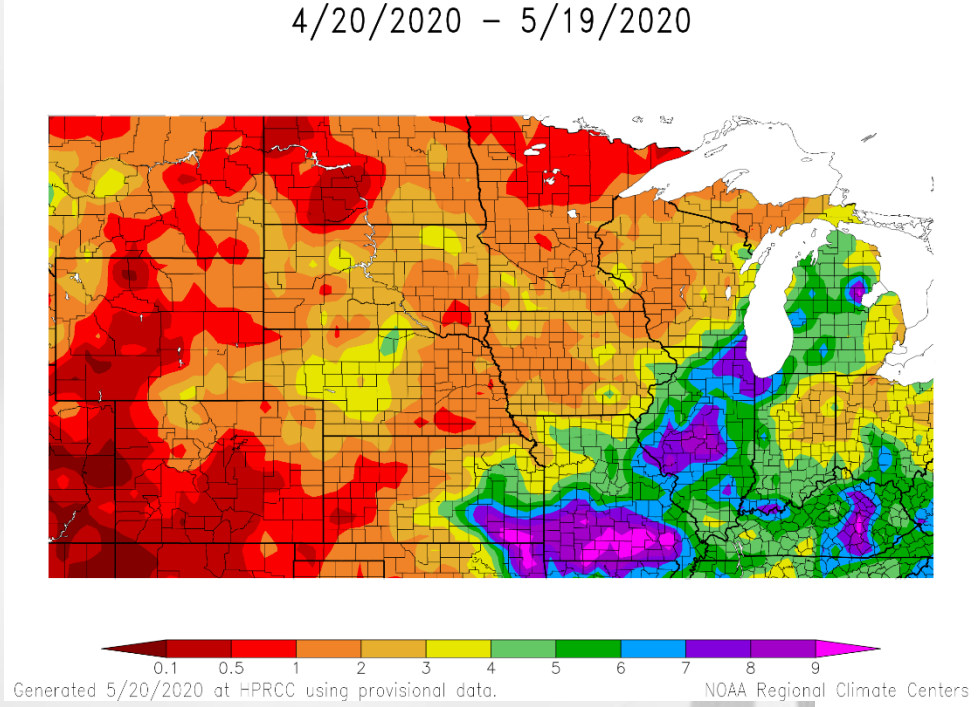
Clear contrast across region. Dry to west, wet to east.

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

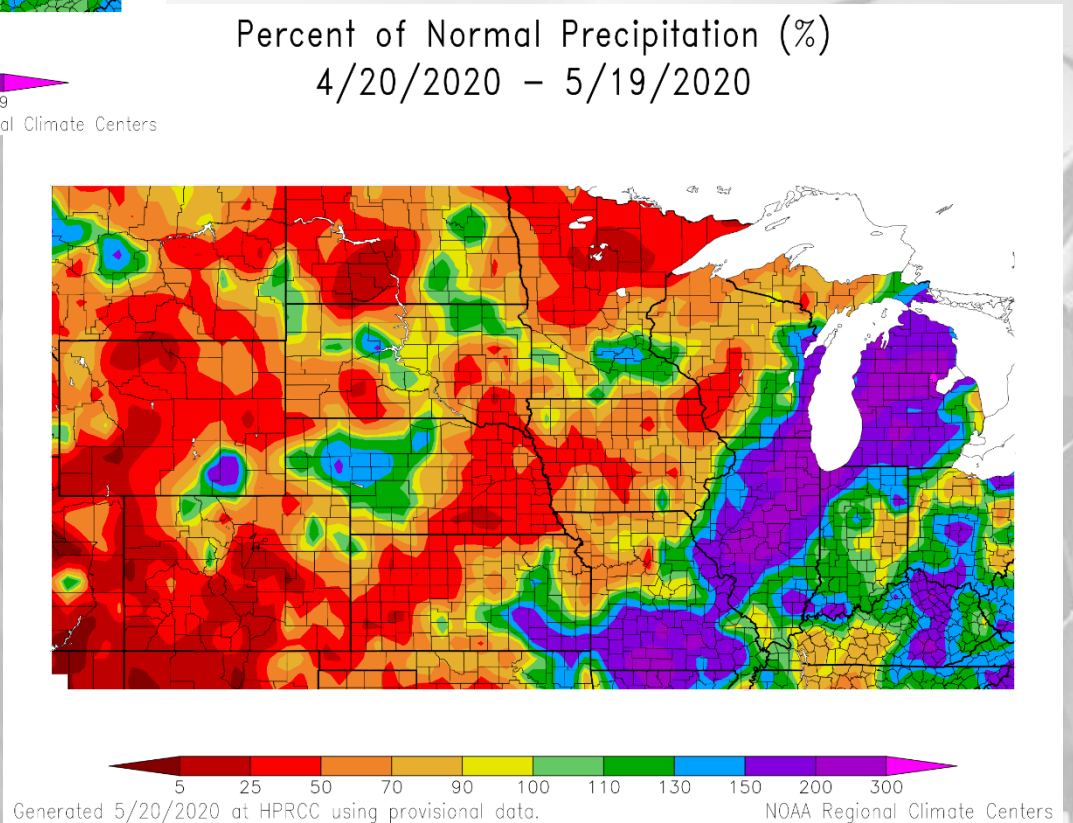


http://www.ncdc.noaa.gov/temp-and-precip/us-maps/

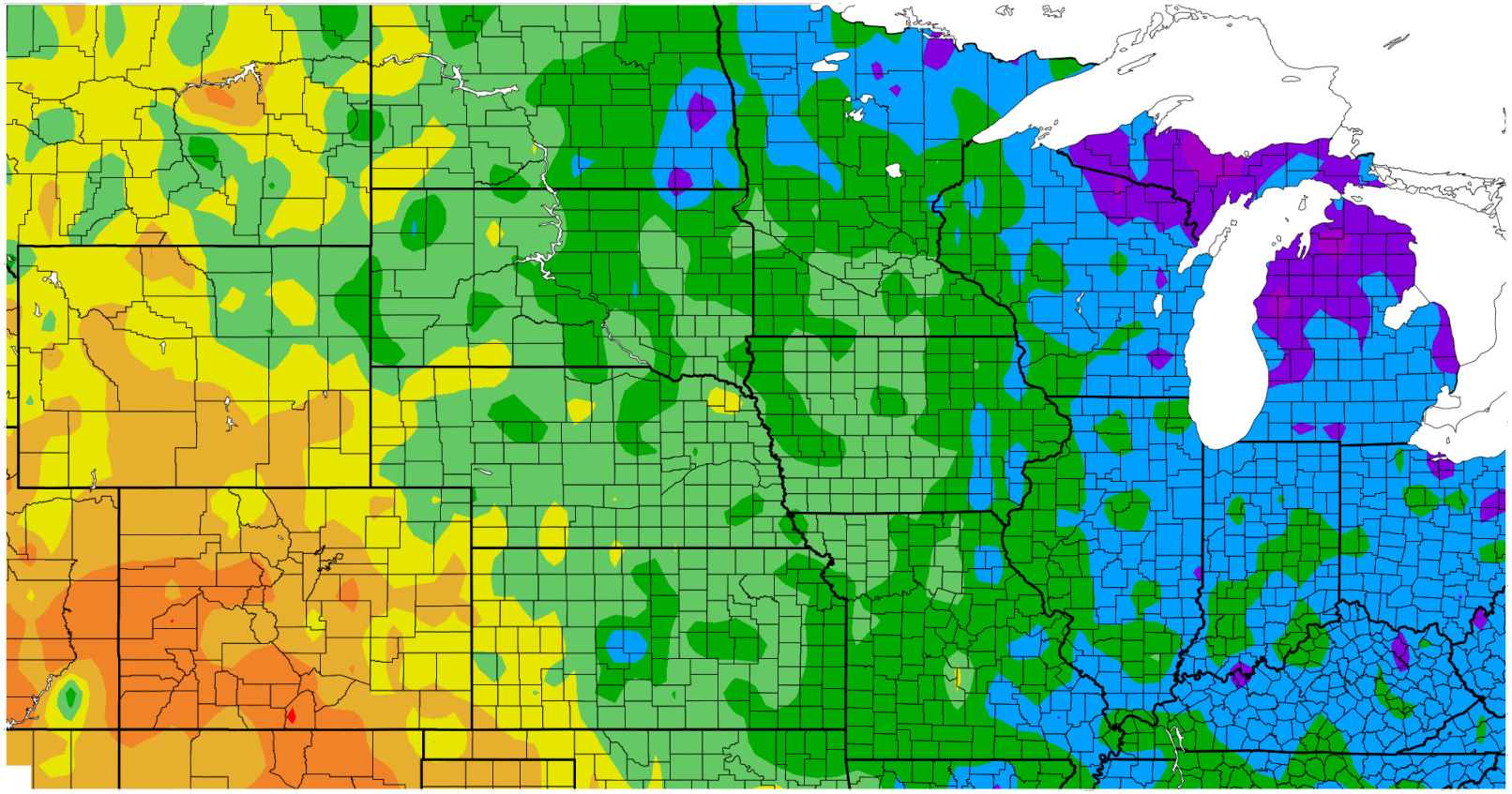
Last 30 days Precipitation



- 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.



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



−10 −8 −6 −4 −2 0 2 4 6 8 10

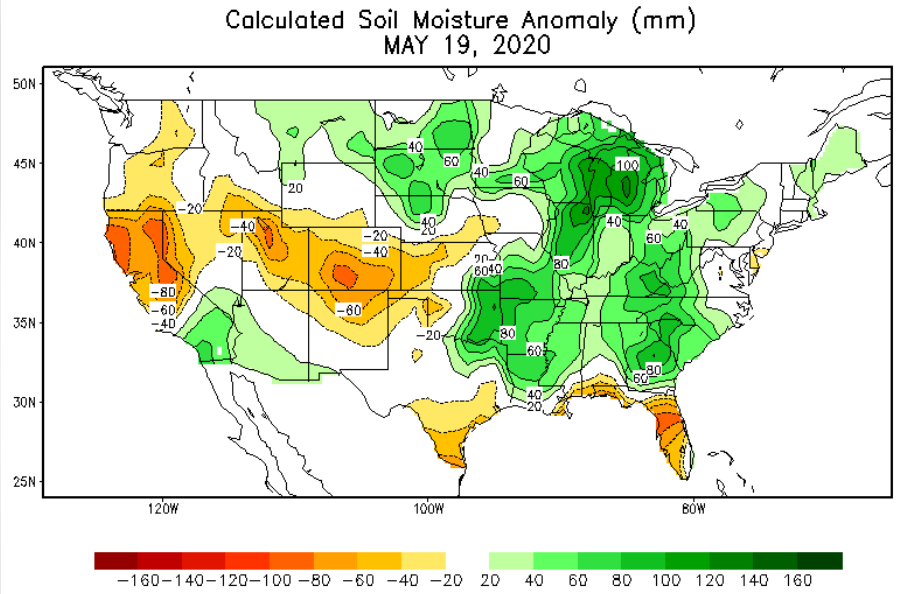
Generated 5/20/2020 at HPRCC using provisional data.

NOAA Regional Climate Centers

HYDROLOGY

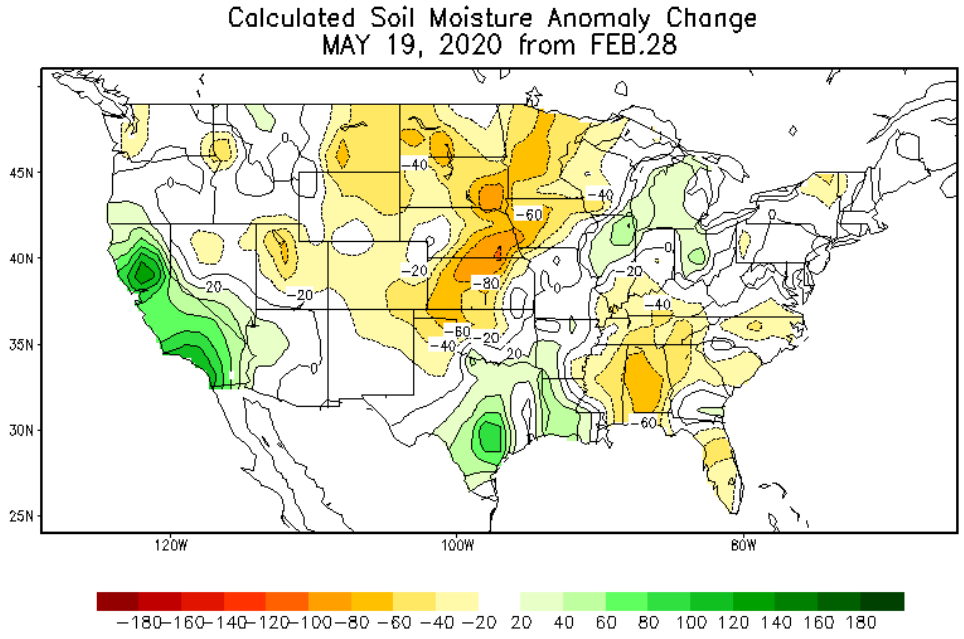
Photo:
Sam Custer (OSU Extension Educator for Darke County, Ohio)

Soil Moisture



- 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

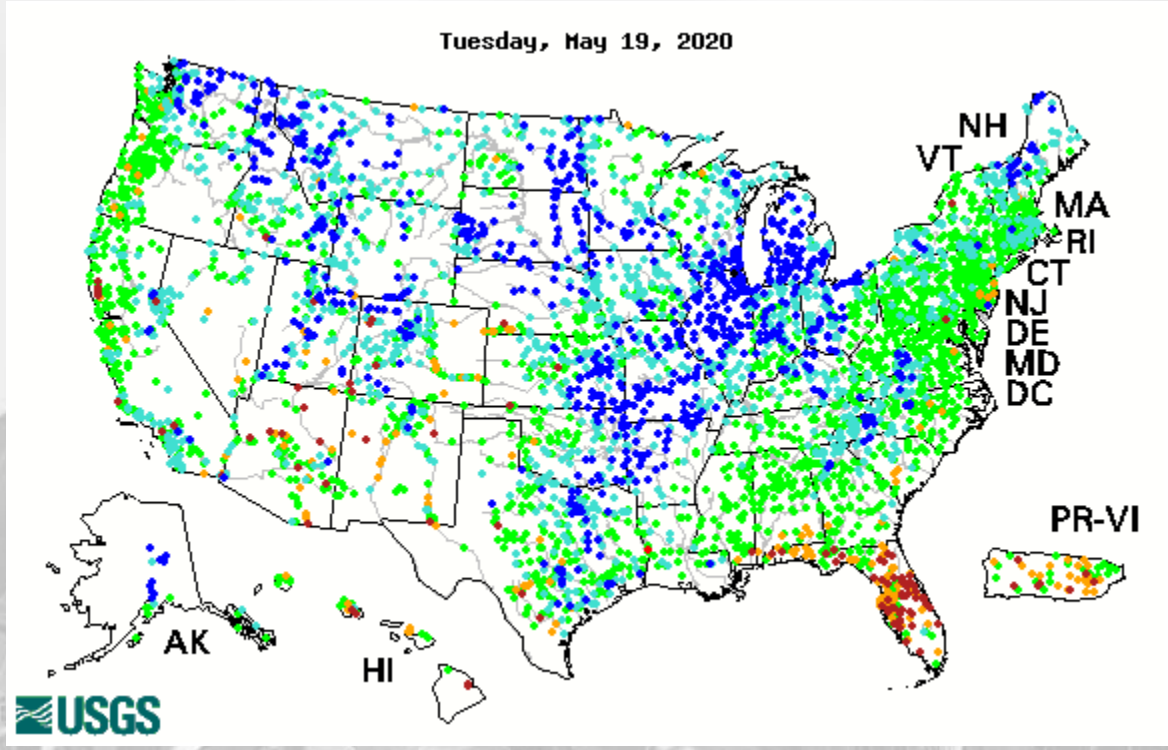


http://www.cpc.ncep.noaa.gov/products/Soilmst_Monitoring/US/Soilmst/Soilmst.shtml#

7-Day Average Streamflow

Tuesday, 19 May 2020

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

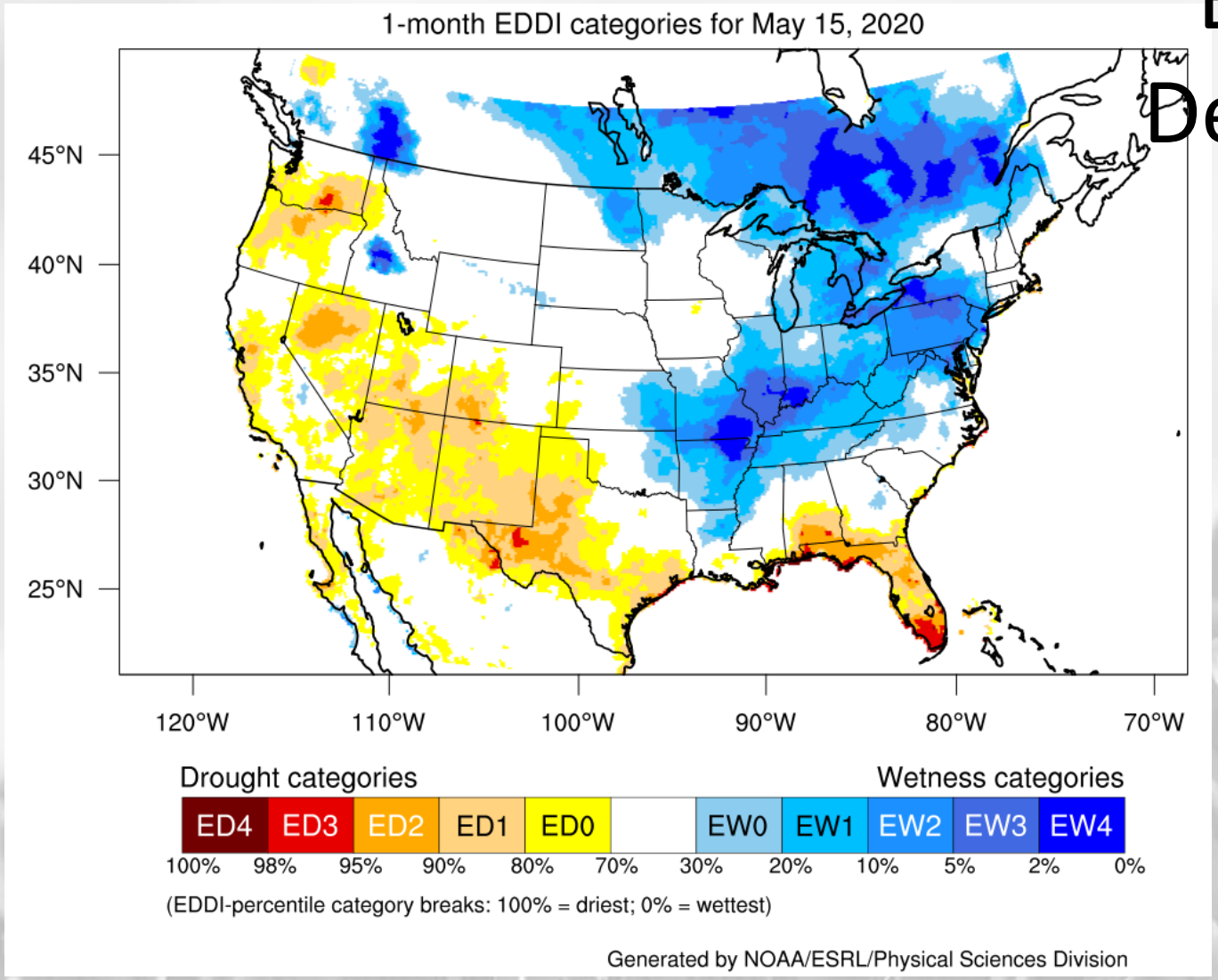


Explanation - Percentile classes						
Low	<10	10-24	25-75	76-90	>90	High
	Much below normal	Below normal	Normal	Above normal	Much above normal	

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

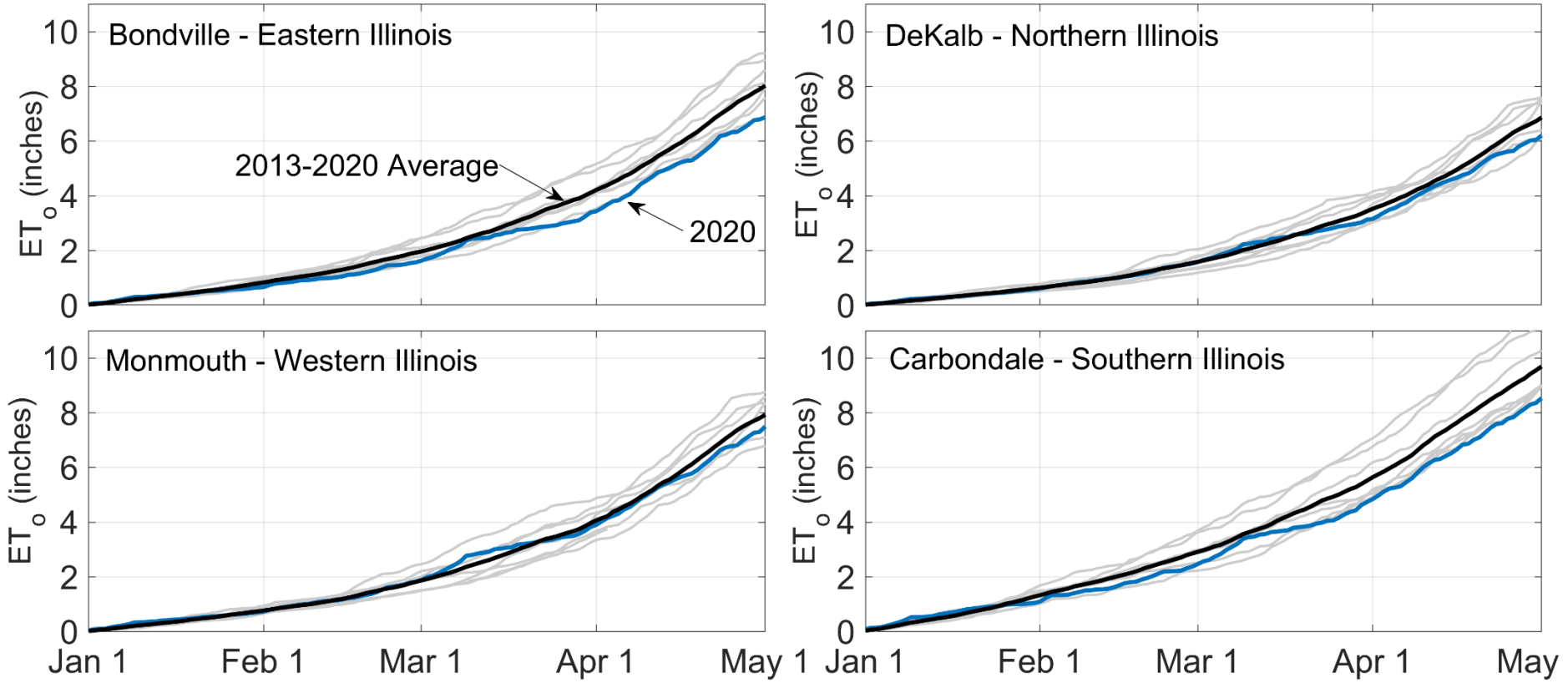
https://www.weather.gov/erh/mmefs

EDDI – Evaporative Demand Index



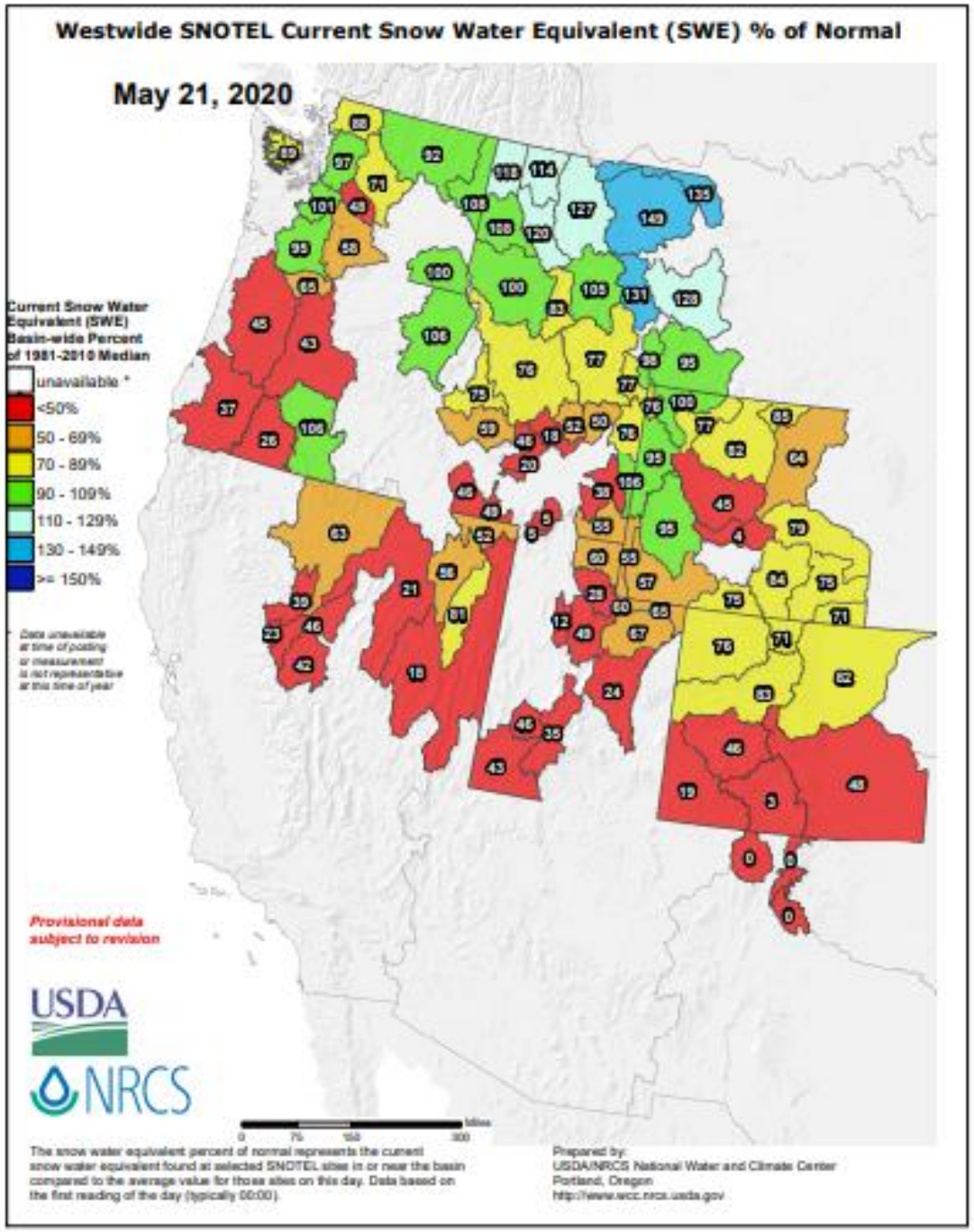
https://www.esrl.noaa.gov/psd/eddi/

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



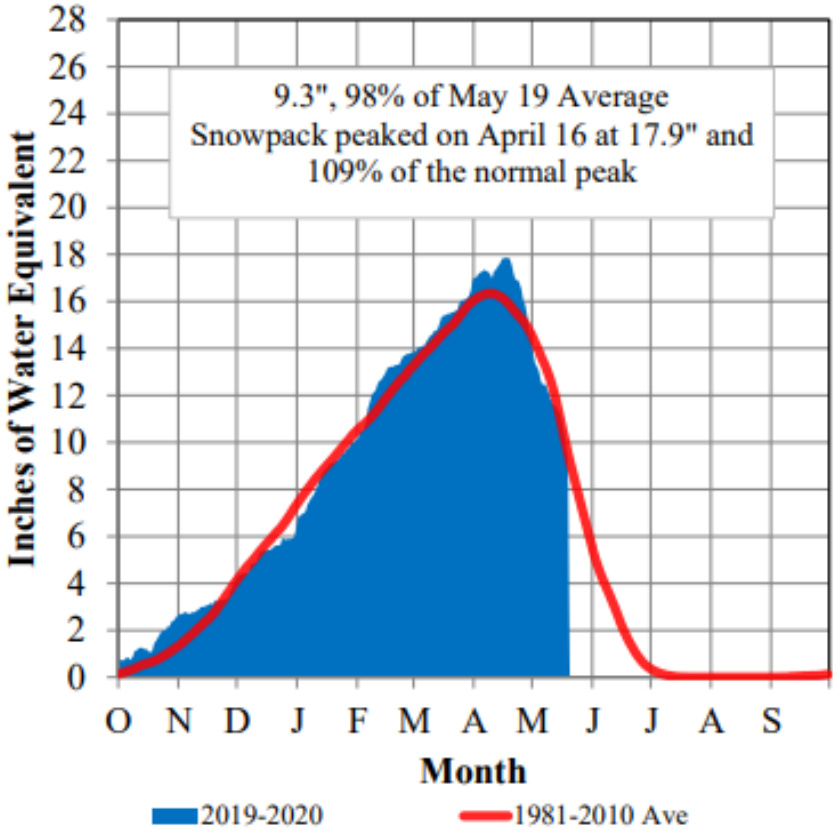
NRCS Snow Water Equivalent

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

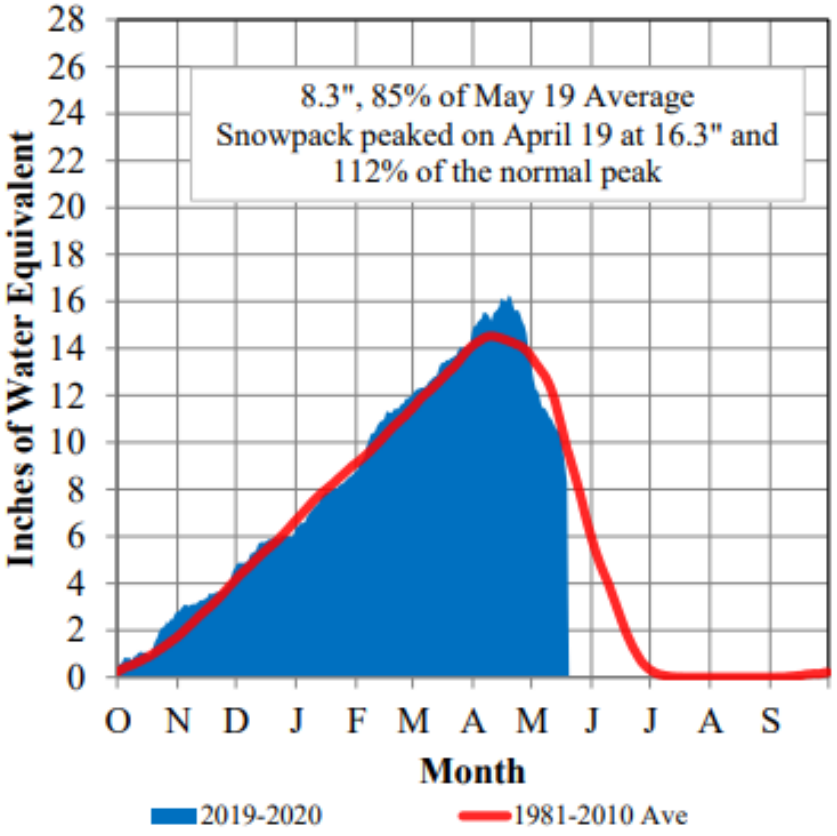
Missouri River Basin – Mountain Snowpack Water Content 2019-2020

19-May-2020

Total above Fort Peck



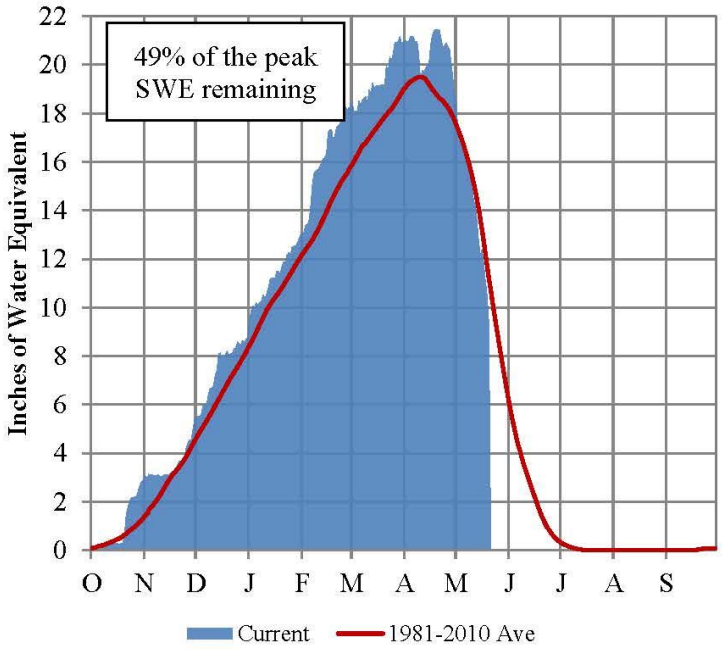
Total Fort Peck to Garrison



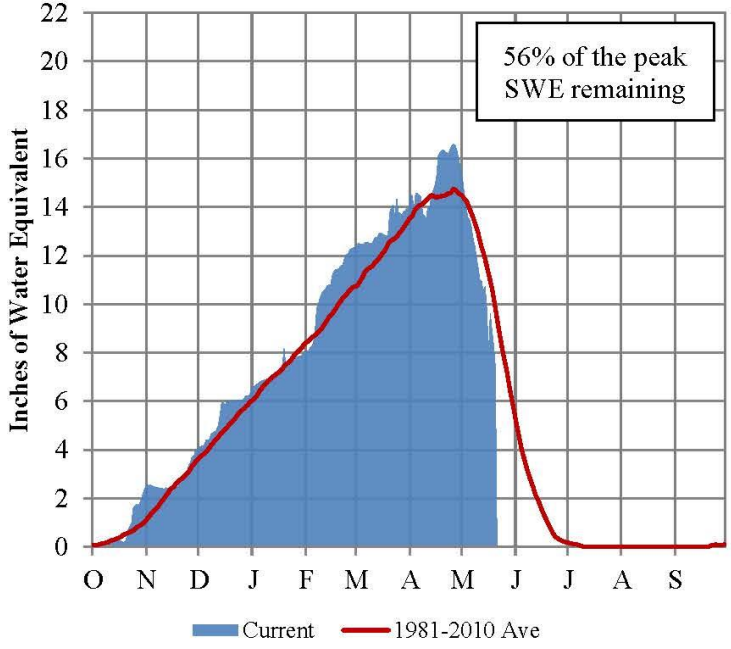
Platte River Basin - Mountain Snowpack Water Content
Water Year 2018-2019

May 20, 2020

Total North Platte



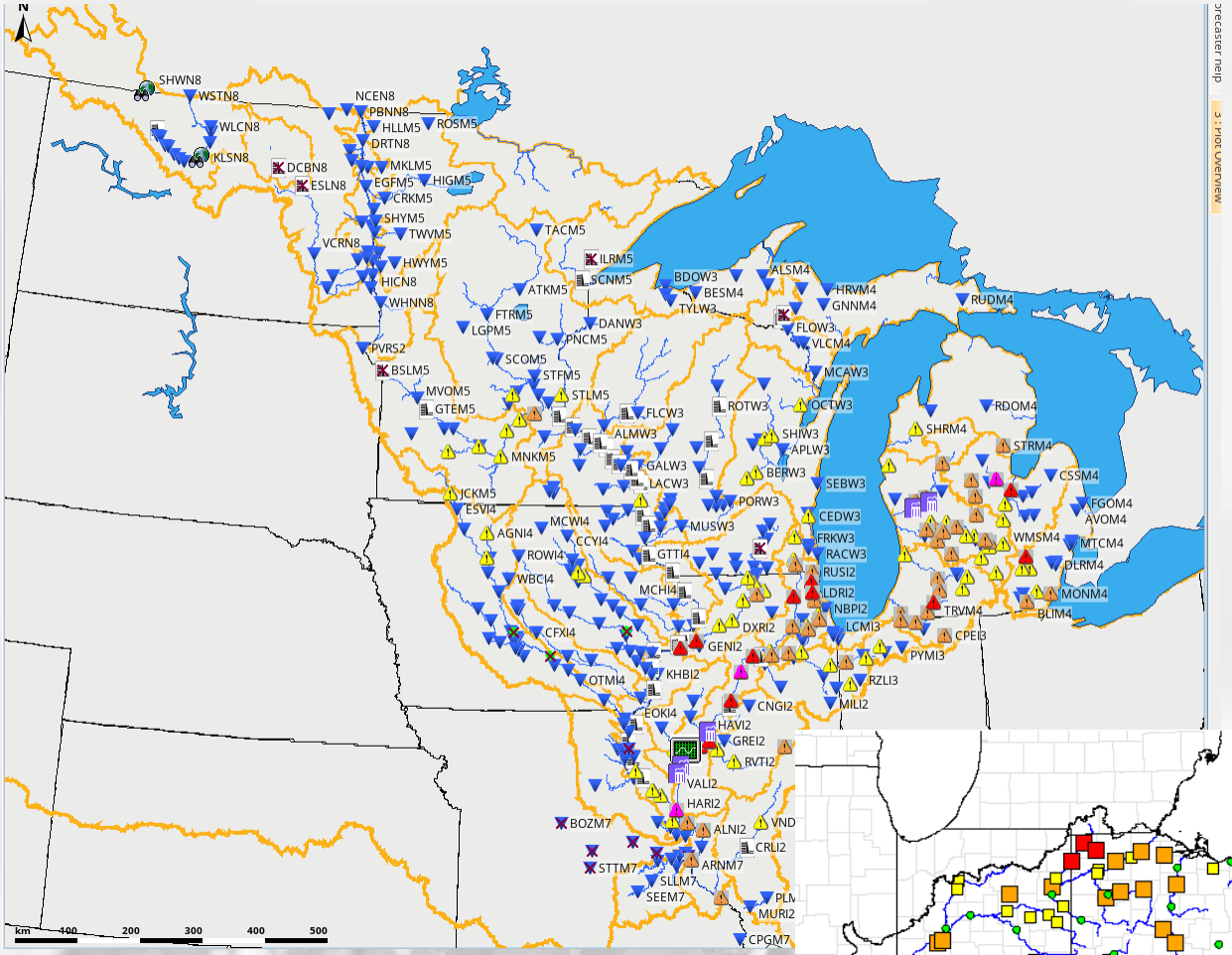
Total South Platte

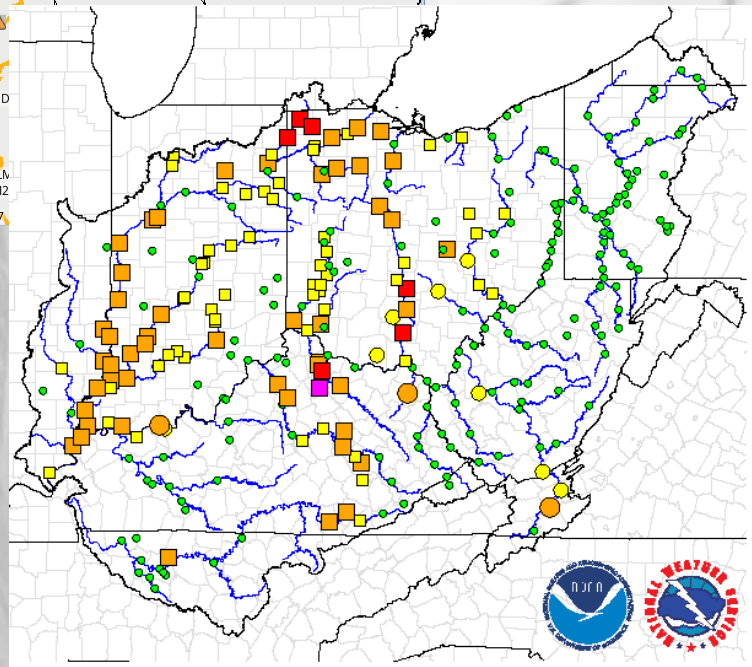


The North and South Platte River Basin mountain snowpacks normally peak near April 15 and the end of April, respectively. As of May 19, 2020, the mountain snowpack SWE in the "Total North Platte" reach peaked at 21.5" and currently has 49% of the peak SWE remaining. The mountain snowpack SWE in the "Total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

Source: USDA, Natural Resource Conservation Service

Provisional Data. Subject to Revision





10-Day Potential River Leve

2020-05-20 - 2020-05-30

NWS Ohio River Forecast Center

Normal Flow

30% Exceedance 70%

Action Stage

Minor Flood

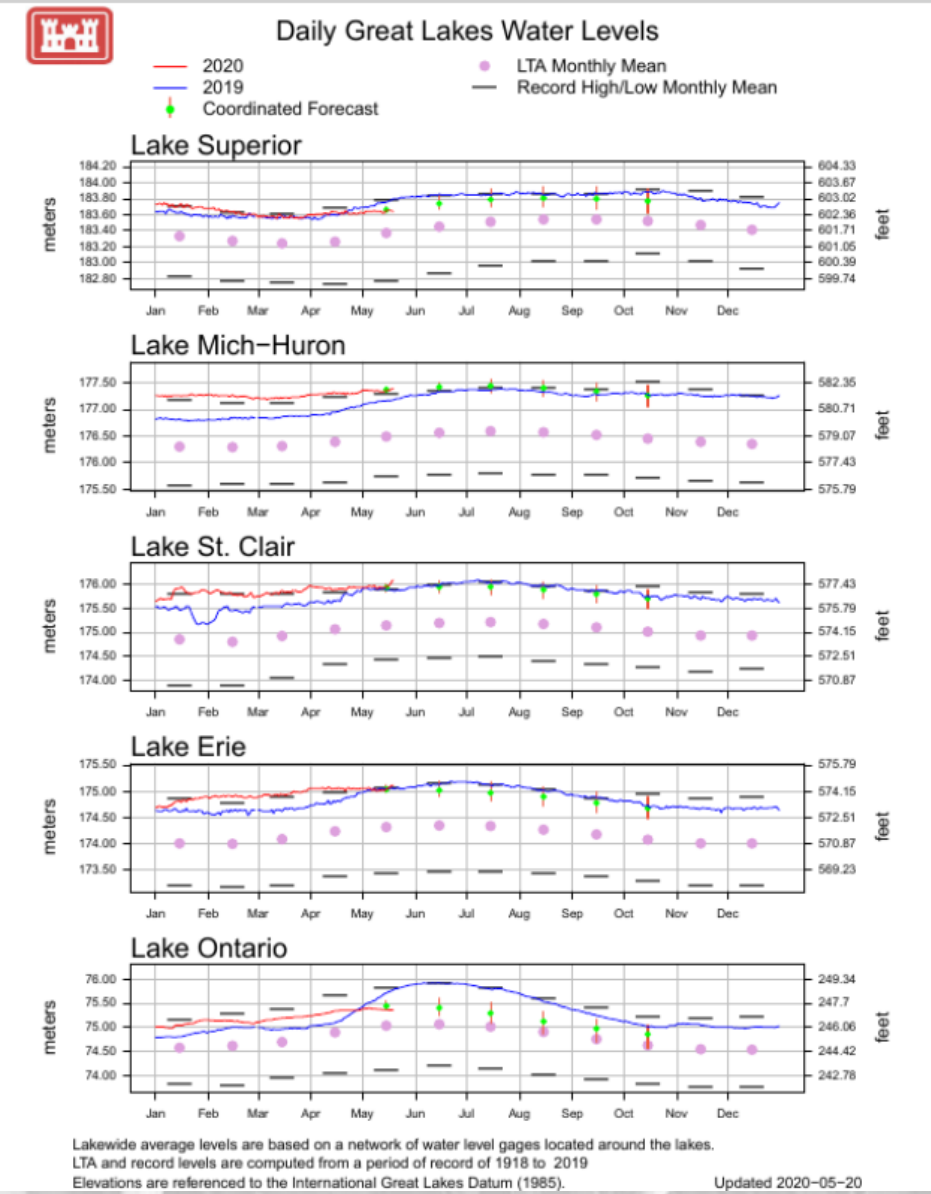
Moderate Flood

Major Flood

HEFS Model Cycle:
2020052012Z

Issued May 20 11:33 EDT

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

Switch Basemap

Reset View

Calgary
Regina
Winnipeg
Lake Nipigon
Lake Superior
MONTANA
NORTH DAKOTA
MINNESOTA
SOUTH DAKOTA
WISCONSIN
IDAHO
WYOMING
Minneapolis
Milwaukee
Chicago
IOWA
NEBRASKA
ILLINOIS
Salt Lake City
Denver
UTAH
COLORADO
Indianapolis
St Louis
Las Vegas
COLORADO PLATEAU
Oklahoma City
Nashville

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

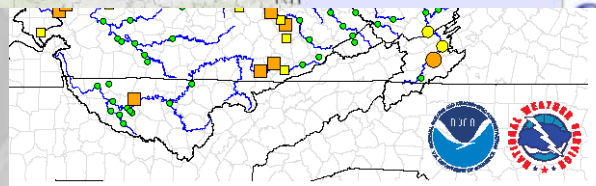
What is UTC time?

Map Help

Product Description

Feedback

Disclaimer



Moderate Flood

Major Flood

HEFS Model Cycle:
2020052012Z

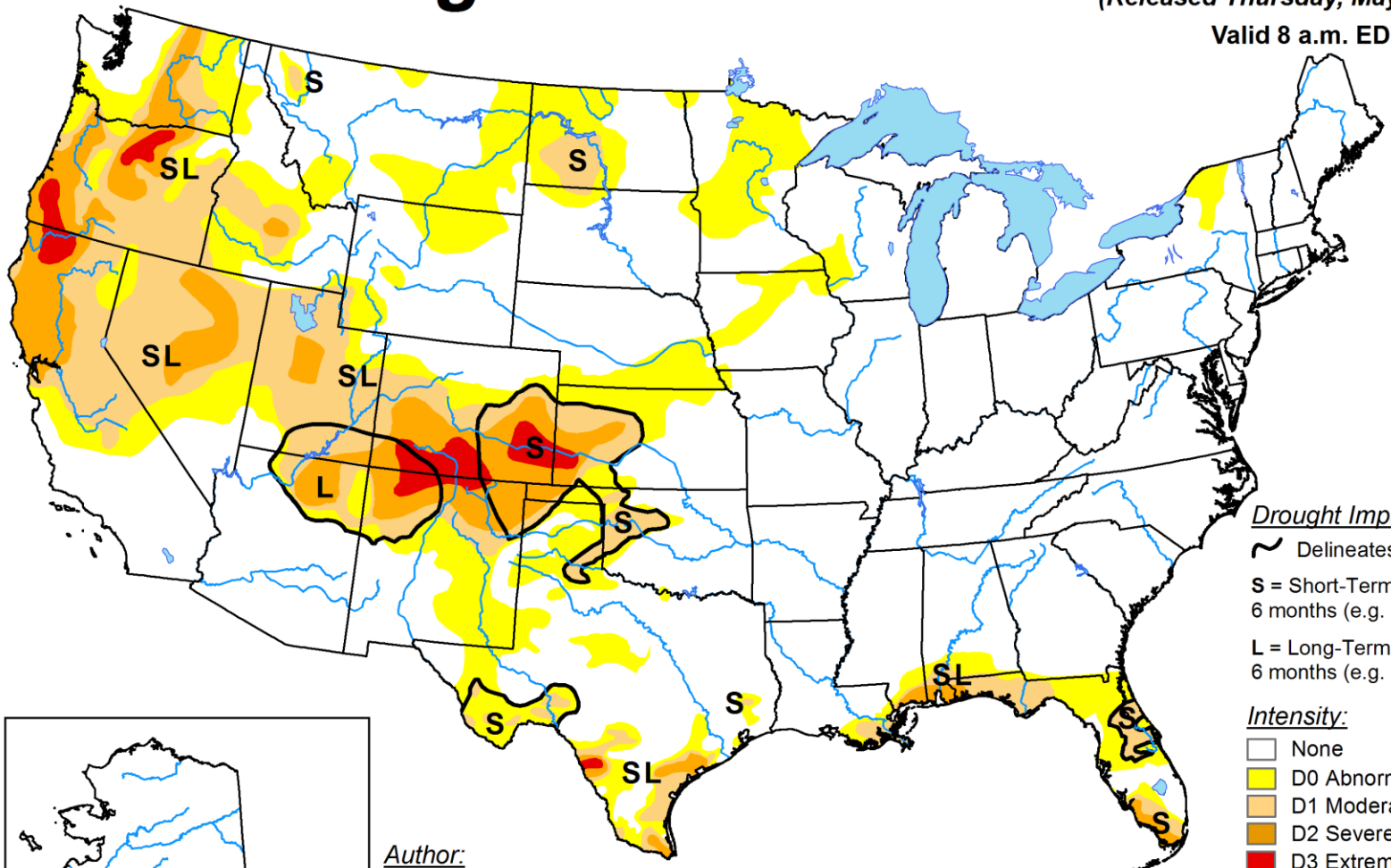
Issued May 20 11:33 EDT

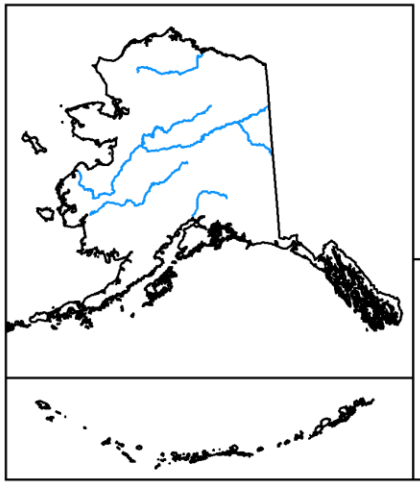
U.S. Drought Monitor

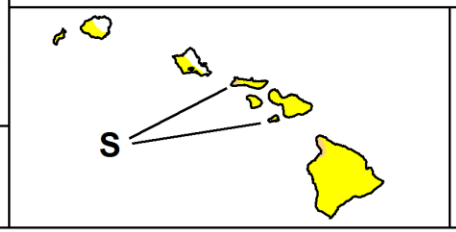
May 19, 2020

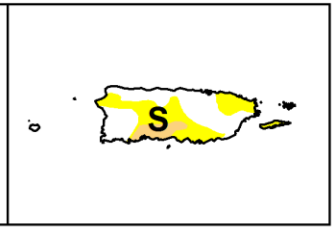
(Released Thursday, May. 21, 2020)

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

USDA NDMC NOAA

droughtmonitor.unl.edu

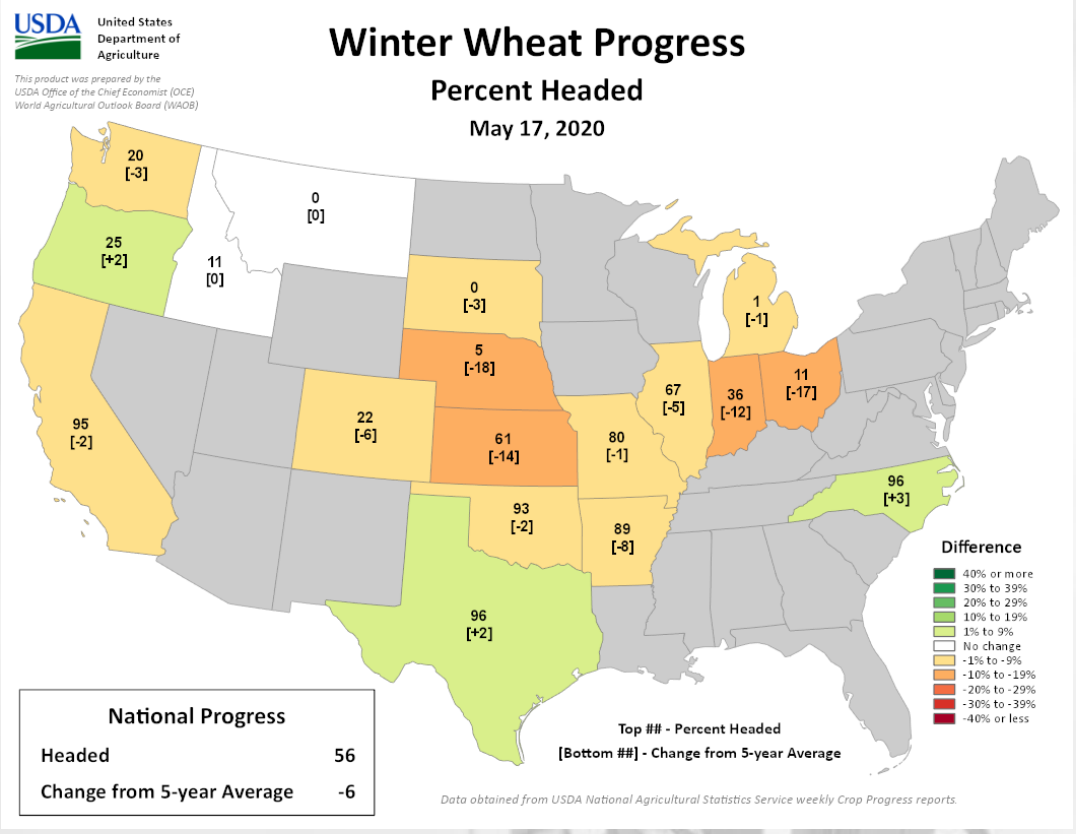
AGRICULTURE

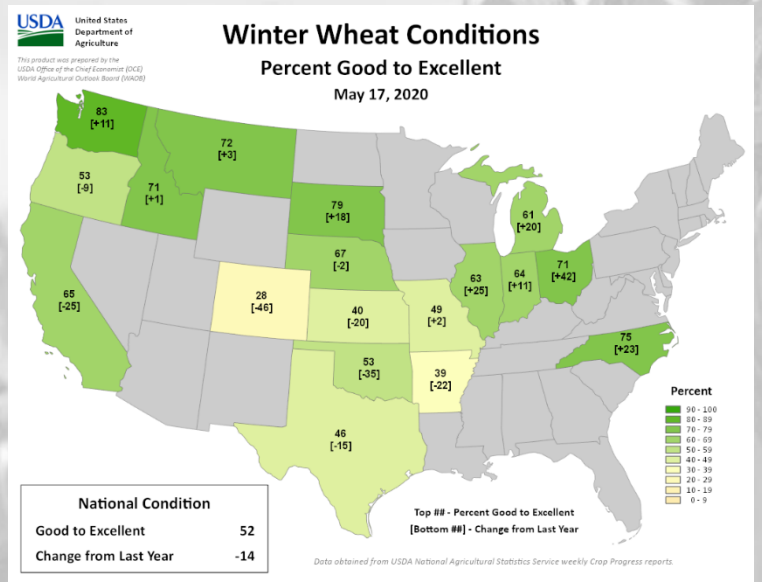
Photo:
Chuck Hanigan
Otero County – Southeast CO

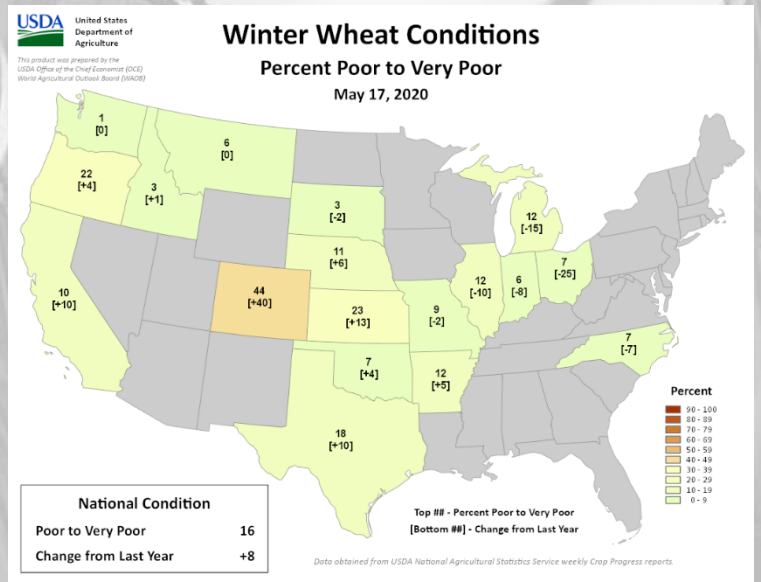
USDA NASS Crop Progress

Winter Wheat

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



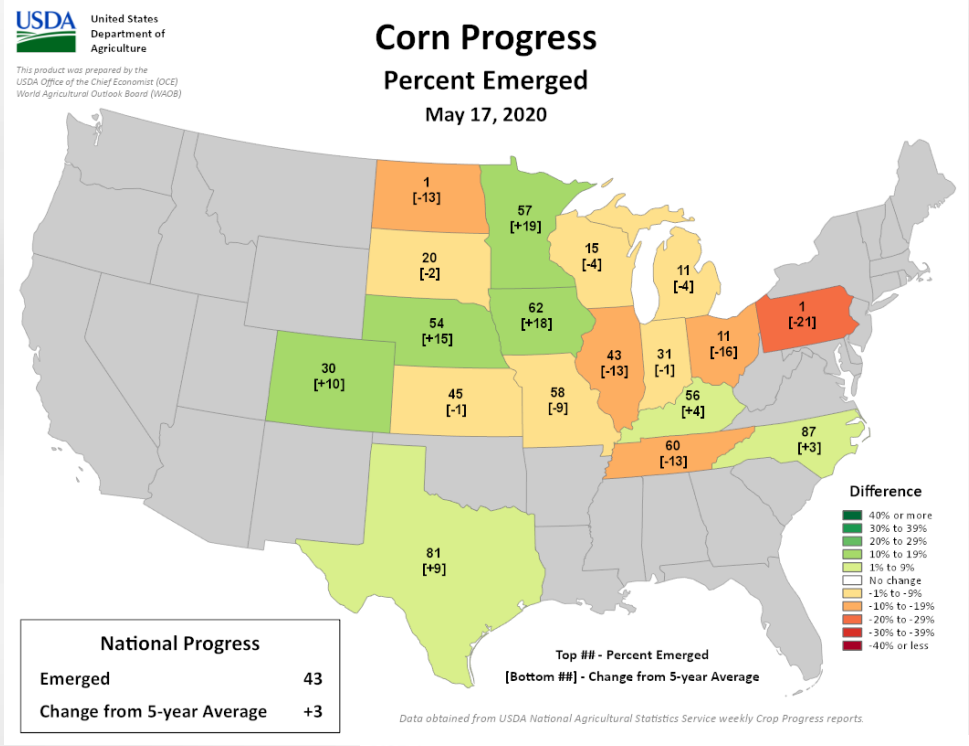


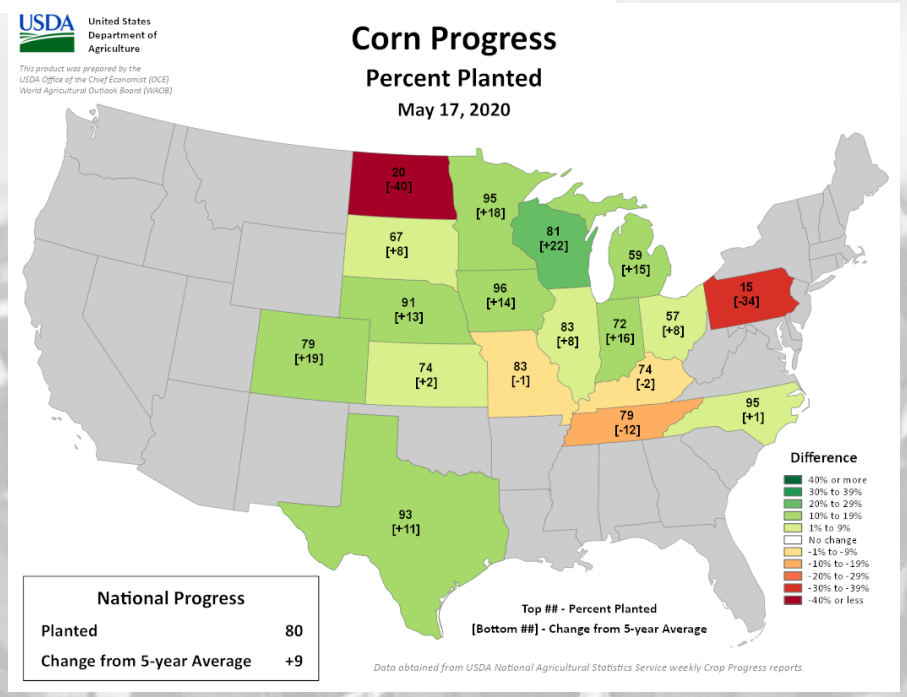


USDA NASS Crop Progress

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)

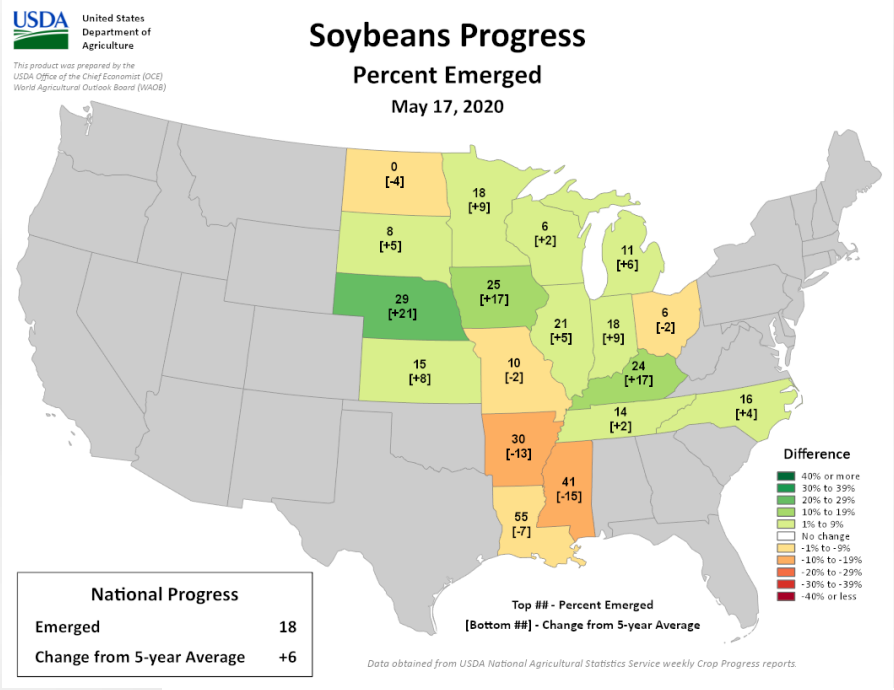


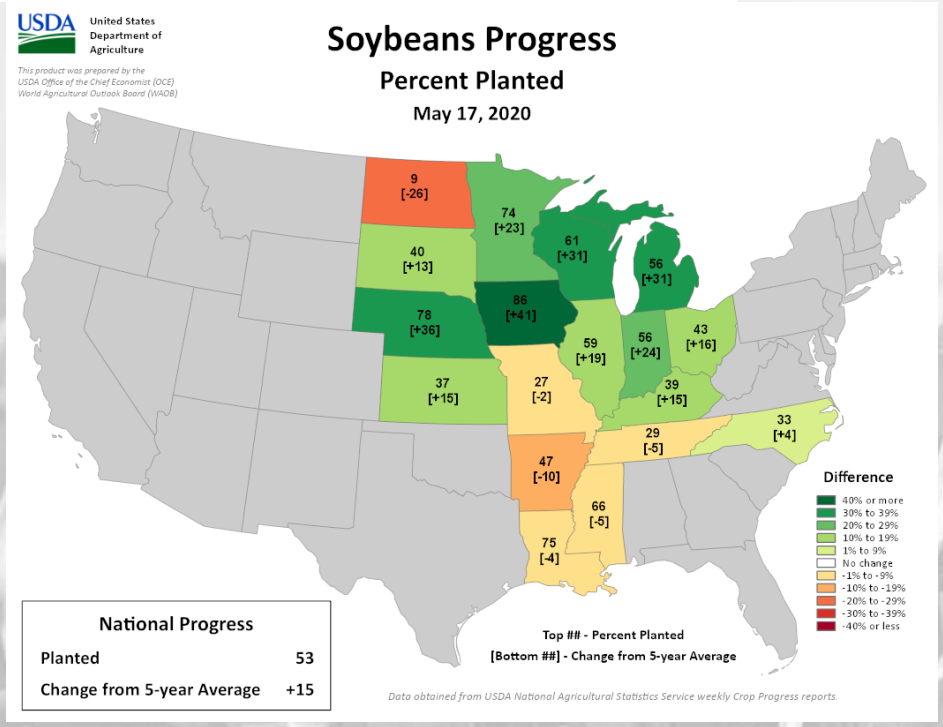


USDA NASS Crop Progress

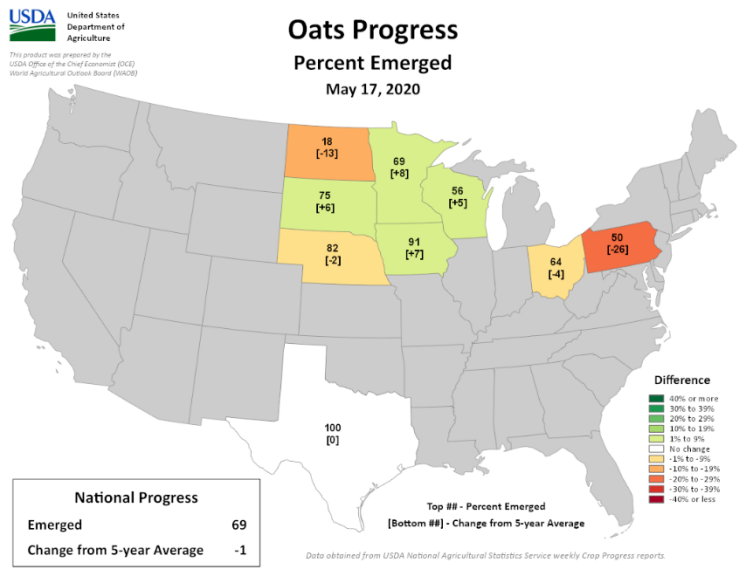
Beans

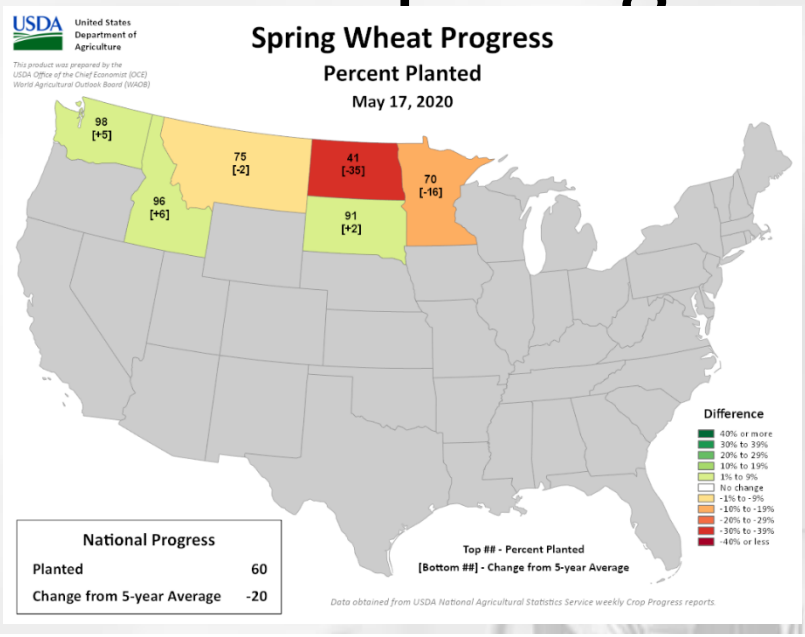
- Planting ahead of 5 year avg except ND-MO) – similar to corn (+15%).
- Emergence much better NE-MN, not in eastern Corn Belt (+6%).
- 6% corn in ND still in ground (2019)



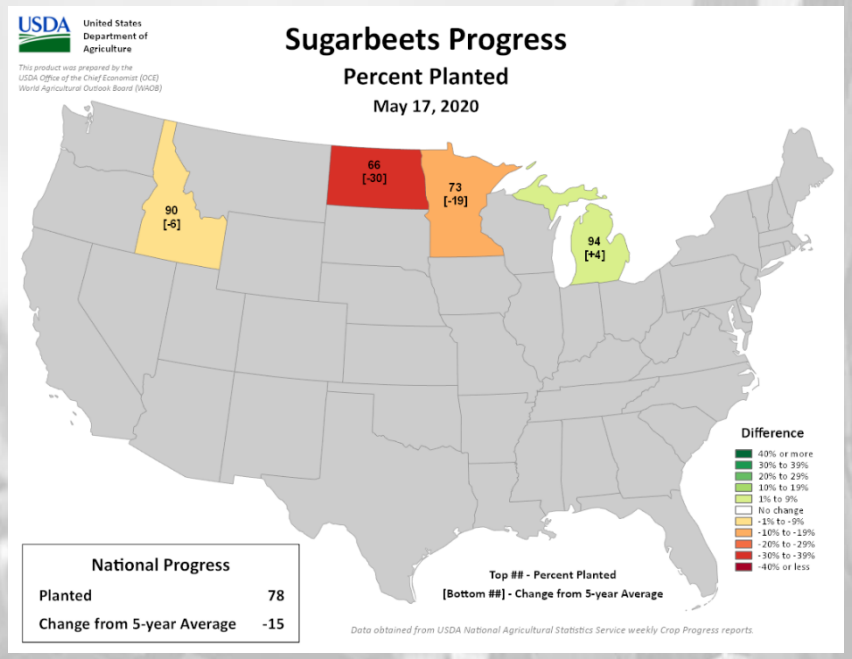


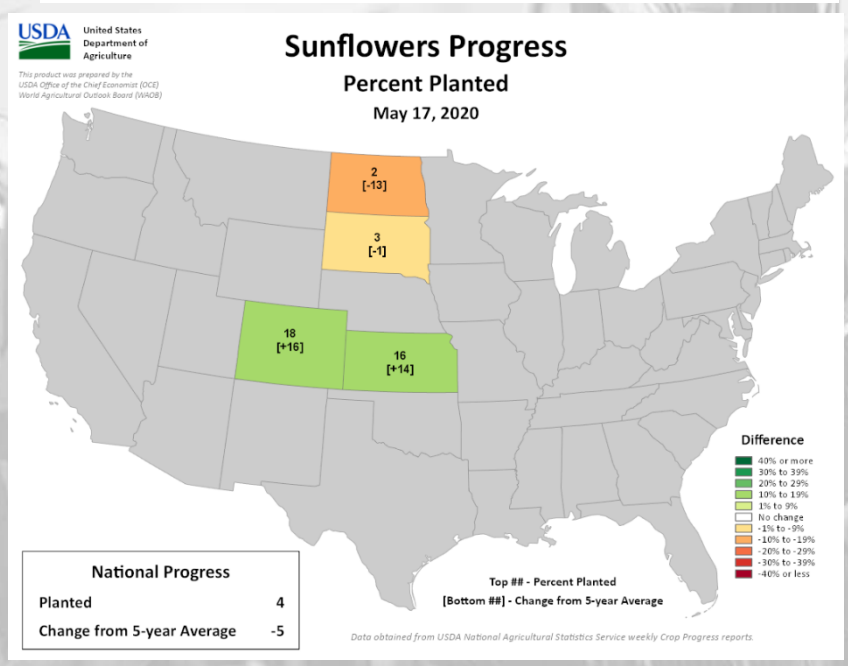
USDA NASS Crop Progress





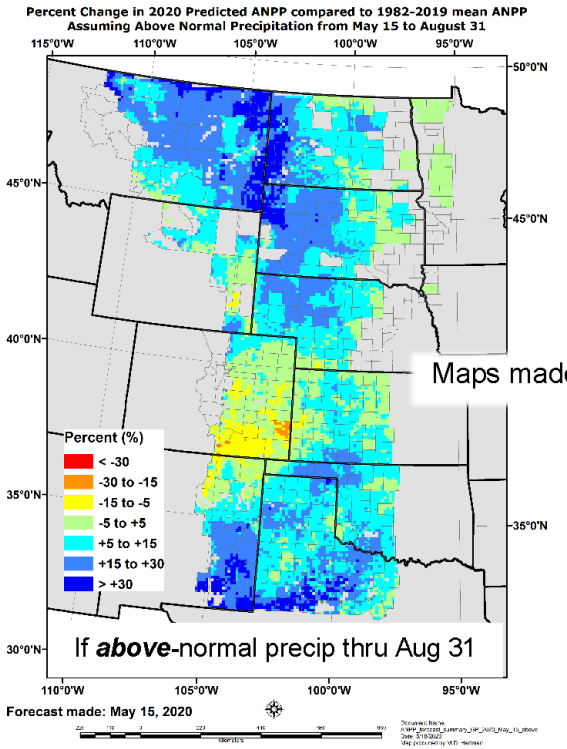
- Sample of other progress maps.

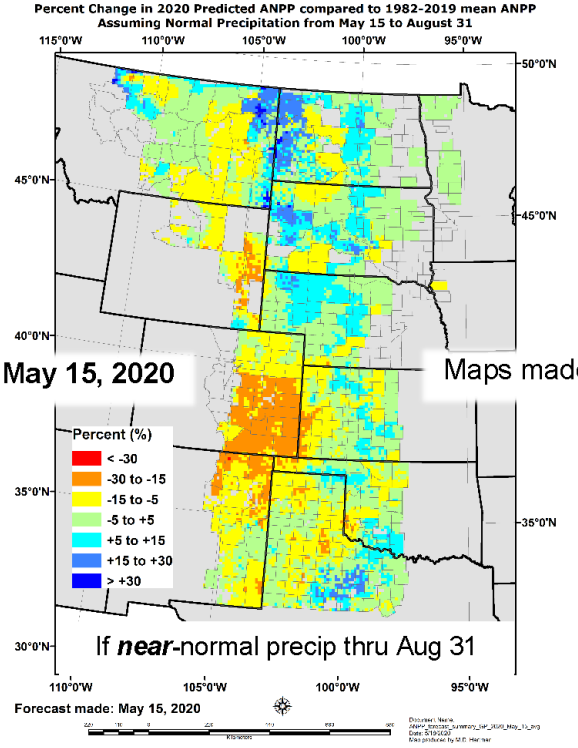


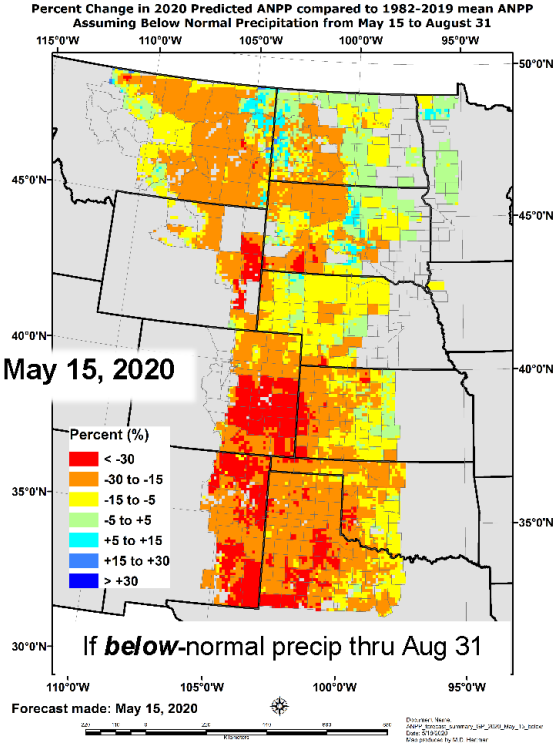


% Change in Grassland Production (lbs/ac) this Summer, Compared to an Area's 38-yr Average

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_prcp.gif.

USDA United States Department of Agriculture
Natural Resources Conservation Service
Agricultural Research Service

NDMC NATIONAL DROUGHT MITIGATION CENTER AT THE UNIVERSITY OF NEBRASKA-LINCOLN
Colorado State University

Find current maps at: **https://grasscast.unl.edu**

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

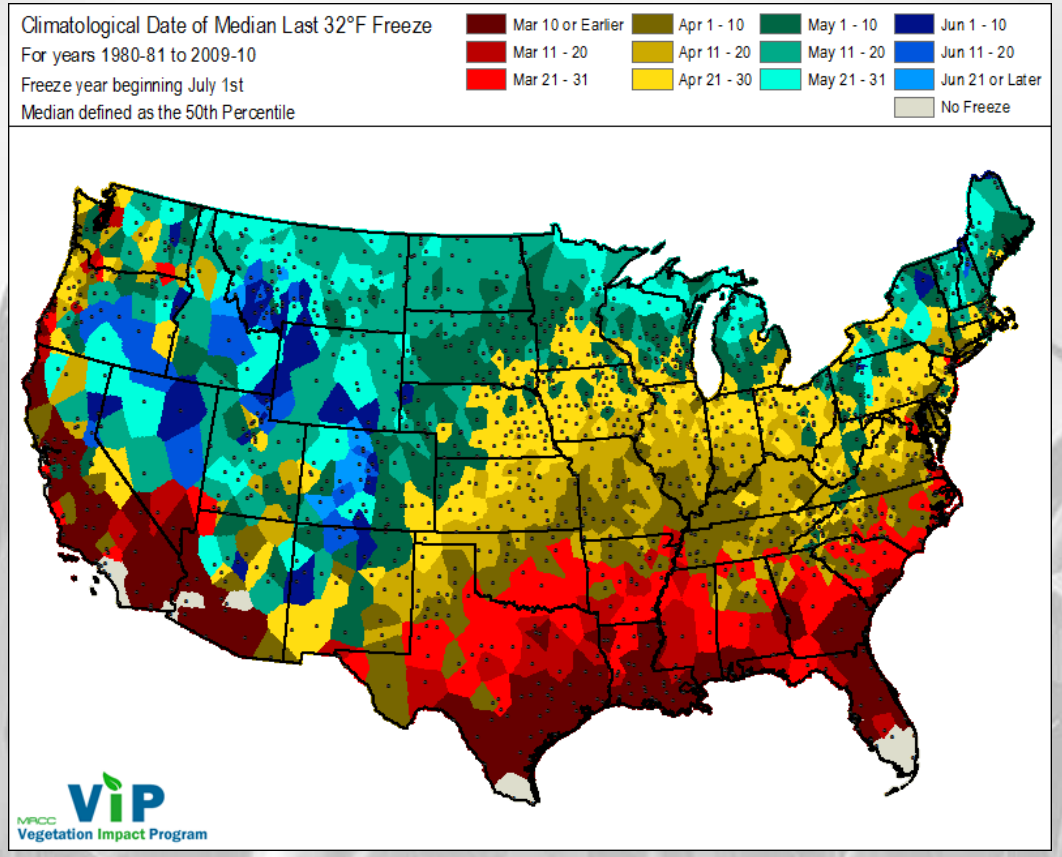
For additional drought info & resources: http://drought.unl.edu/

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)

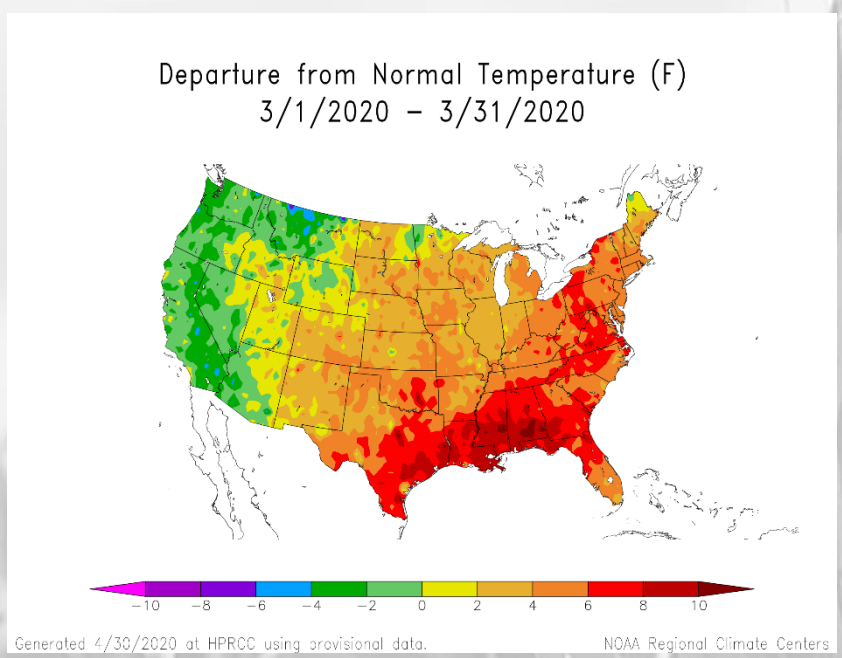


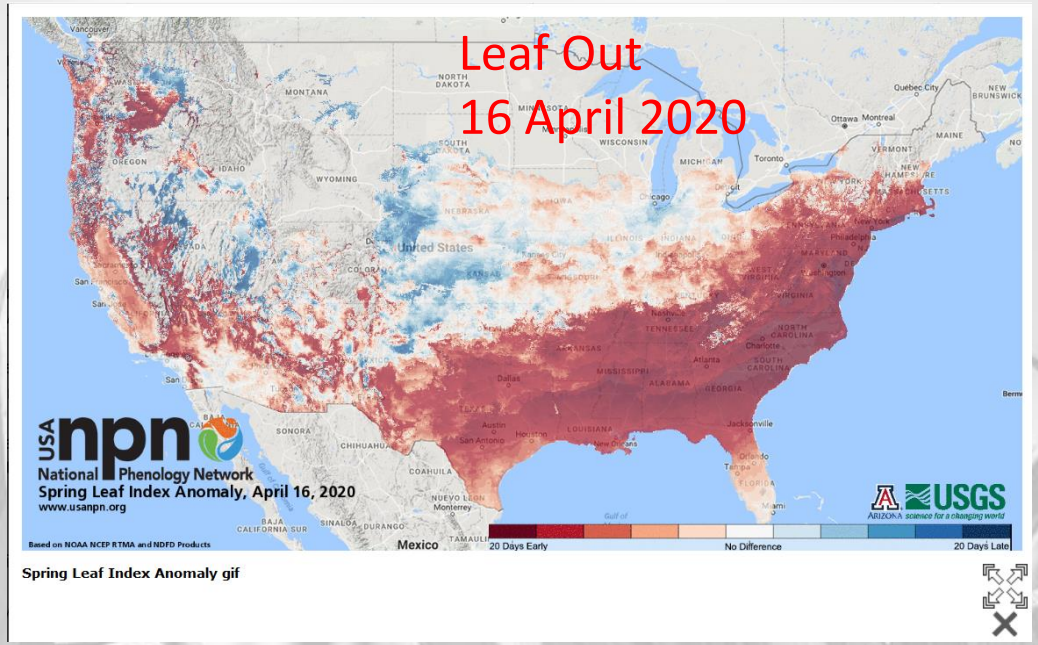
Freeze events are combinations of climatology and phenology. Freeze damage affected by severity of cold, period of time, crop phenology and crop types.

https://mrcc.illinois.edu/VIP/index.html

Spring 20 Freeze Events Background

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



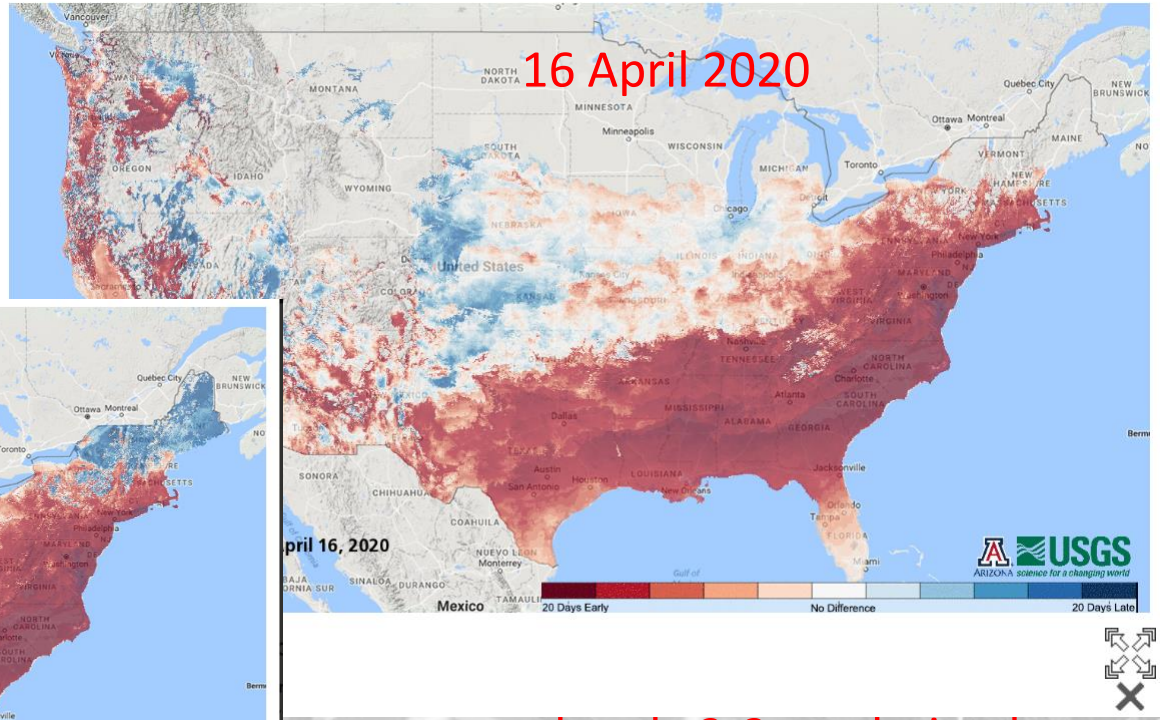


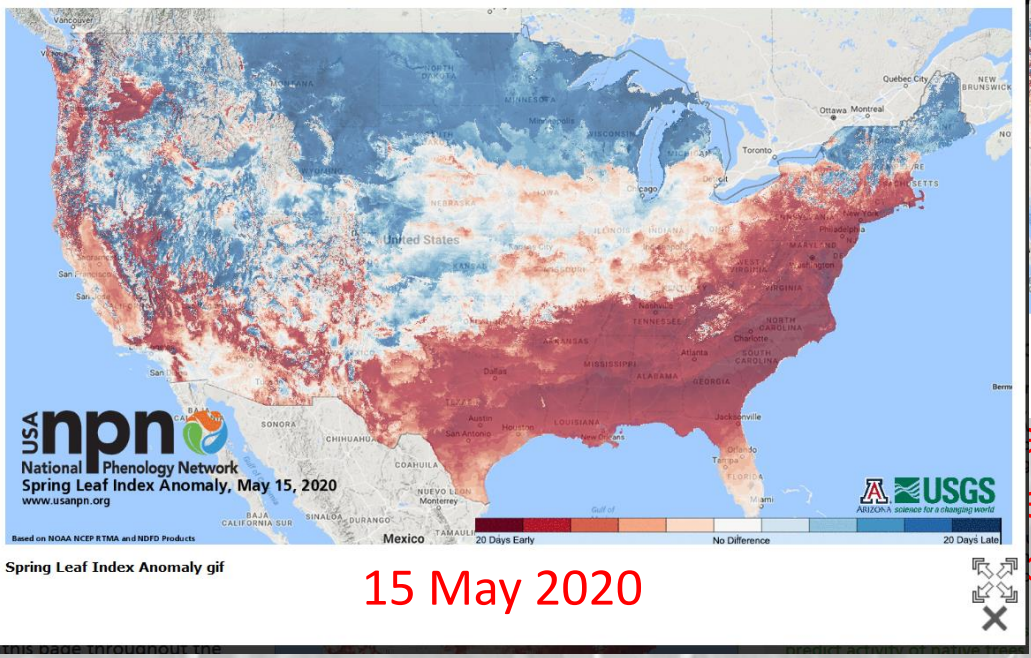
Southeast US to eastern Corn Belt/northeast US, plants emerged early 2-3 weeks in places. Northern tier of states had delayed emergence with spring cold (reduced losses.)

https://www.usanpn.org/news/spring
https://hprcc.unl.edu/maps.php?map=ACISClimateMaps

Spring 20 Freeze Events Background

- Warm winter/early sp
  helped push vegetatic
  earlier than average.



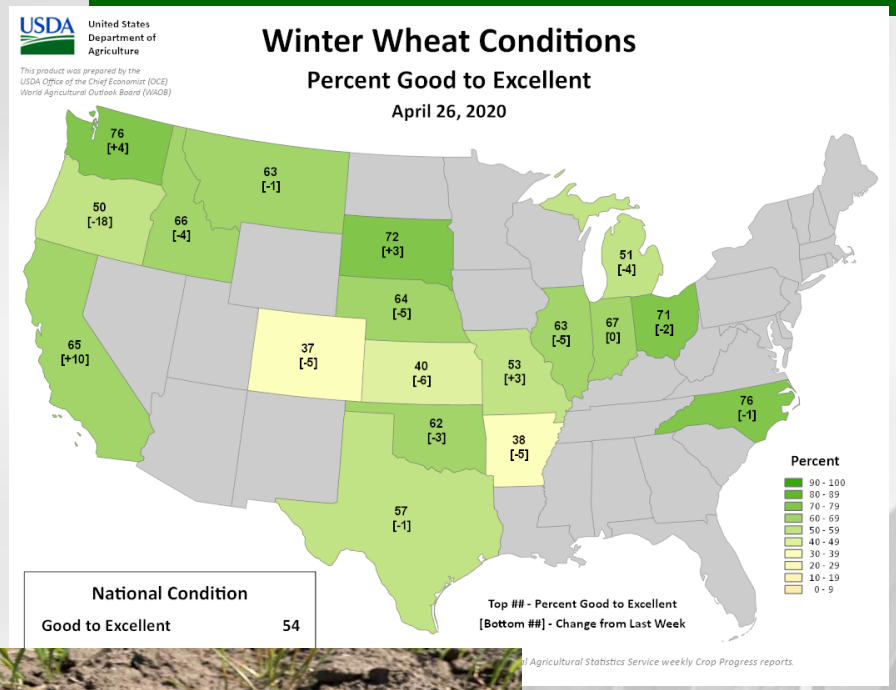


15 May 2020

ants emerged early 2-3 weeks in places.
ern tier of states had delayed emergence
pring cold (reduced losses.)

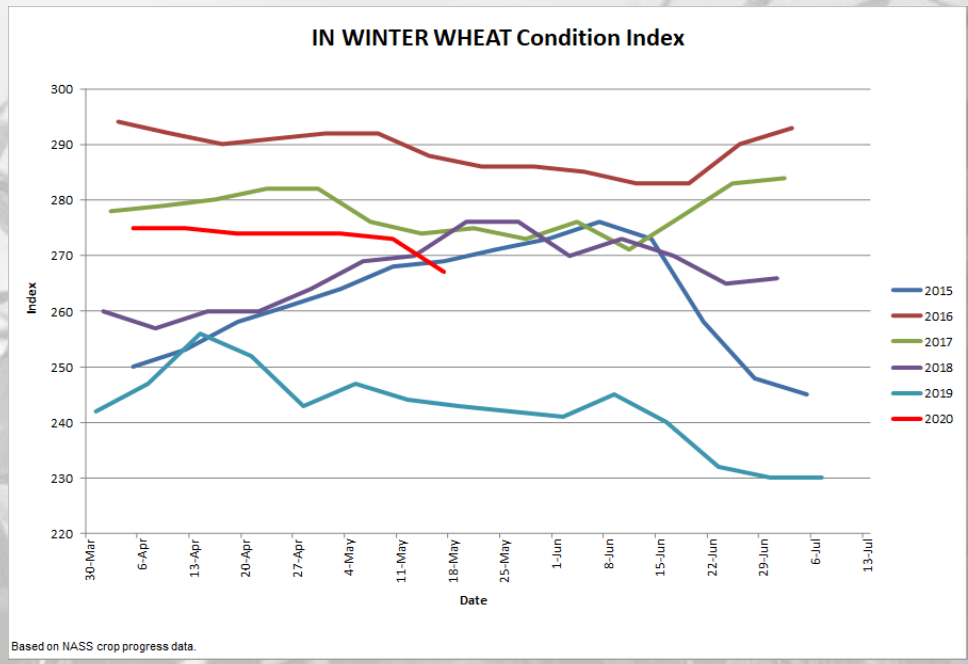
https://www.usanpn.org/news/spring
https://hprcc.unl.edu/maps.php?map=ACISClimateMaps

Wheat Impacts



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

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



USDA Midwest Climate Hub
U.S. DEPARTMENT OF AGRICULTURE

USDA-NASS data – Graphic Thanks to Brad Rippey USDA-OCE

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.

Freeze damage in apples from 9 May 2020 freeze event, Berrien County, MI. Photo by Mike Reinke, MSU Extension

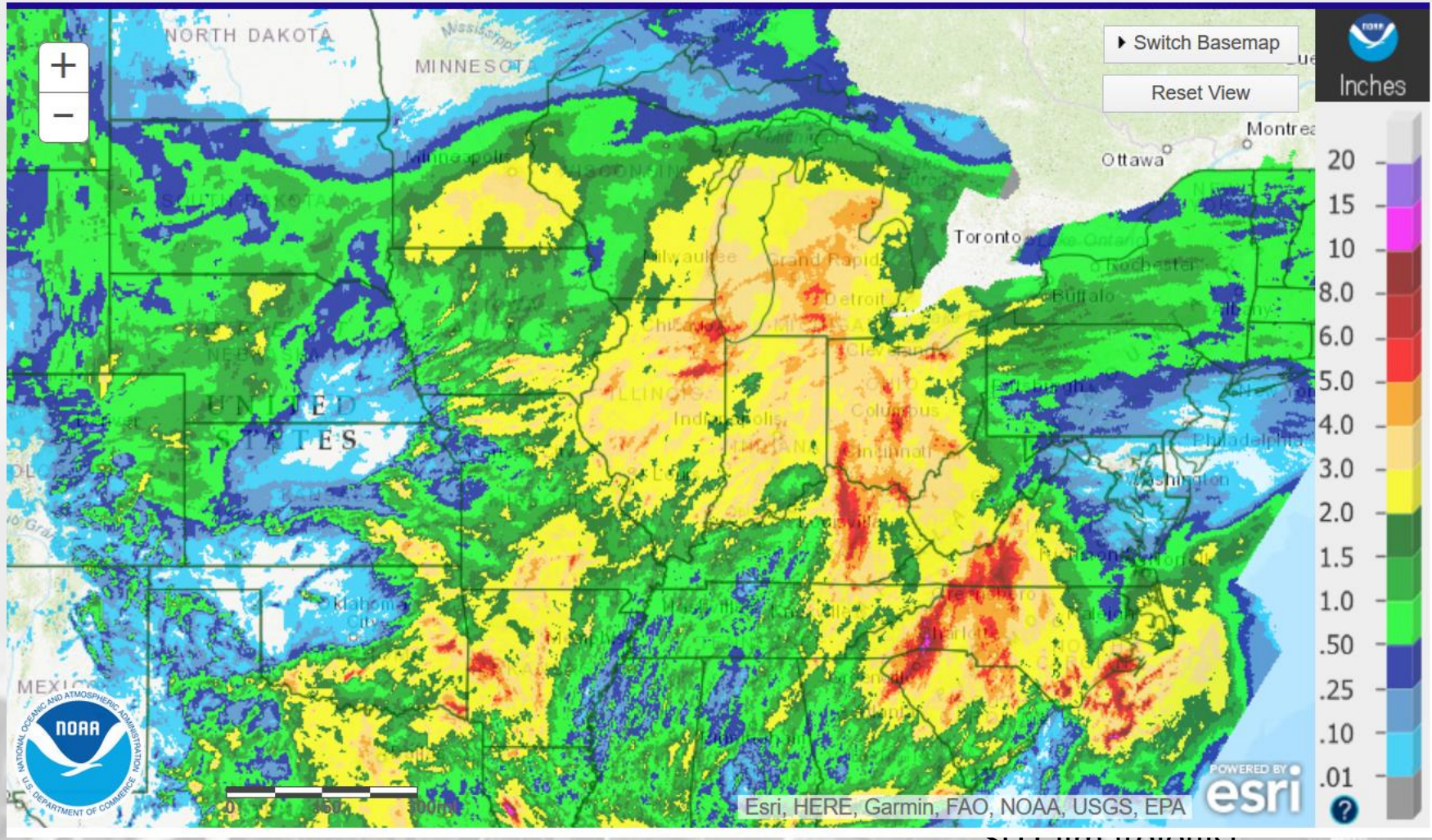
Other Crop Impacts

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

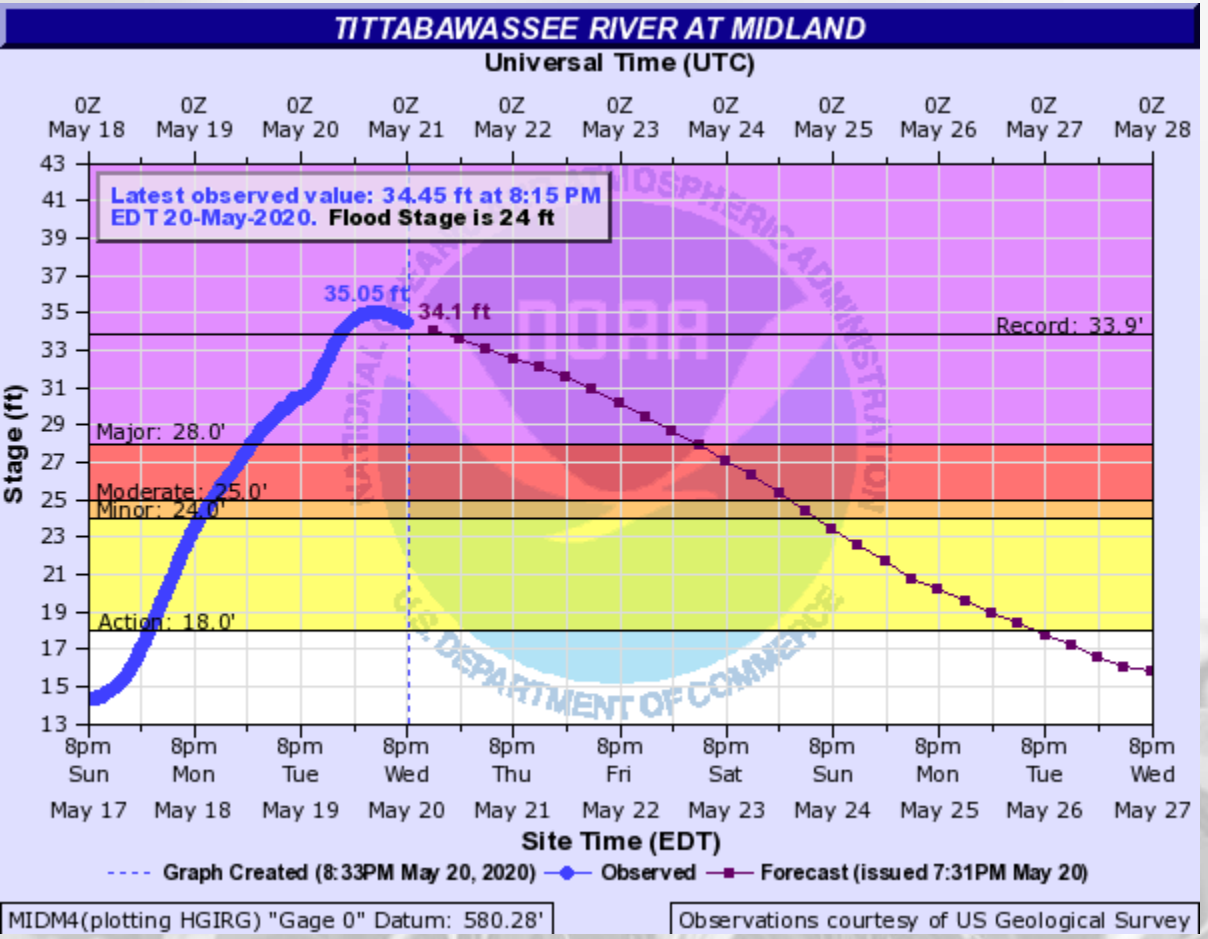
MAJOR EVENTS



SD Climatologist

FLOODING

Michigan Flooding



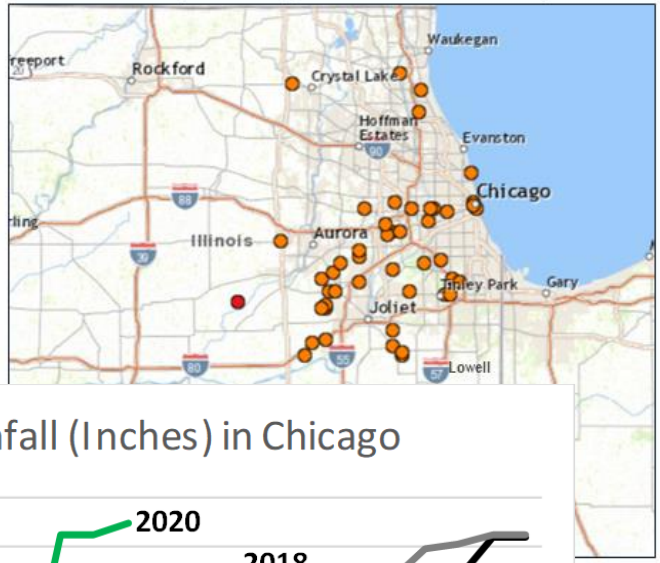
- Dam breaks near Midland, MI. 11K people evacuated
- Chemical facility threatened

Chicago Flooding

- Flooding
- Interstates
- Record flows
- Record rains

Preliminary Look at May 17, 2020 Event

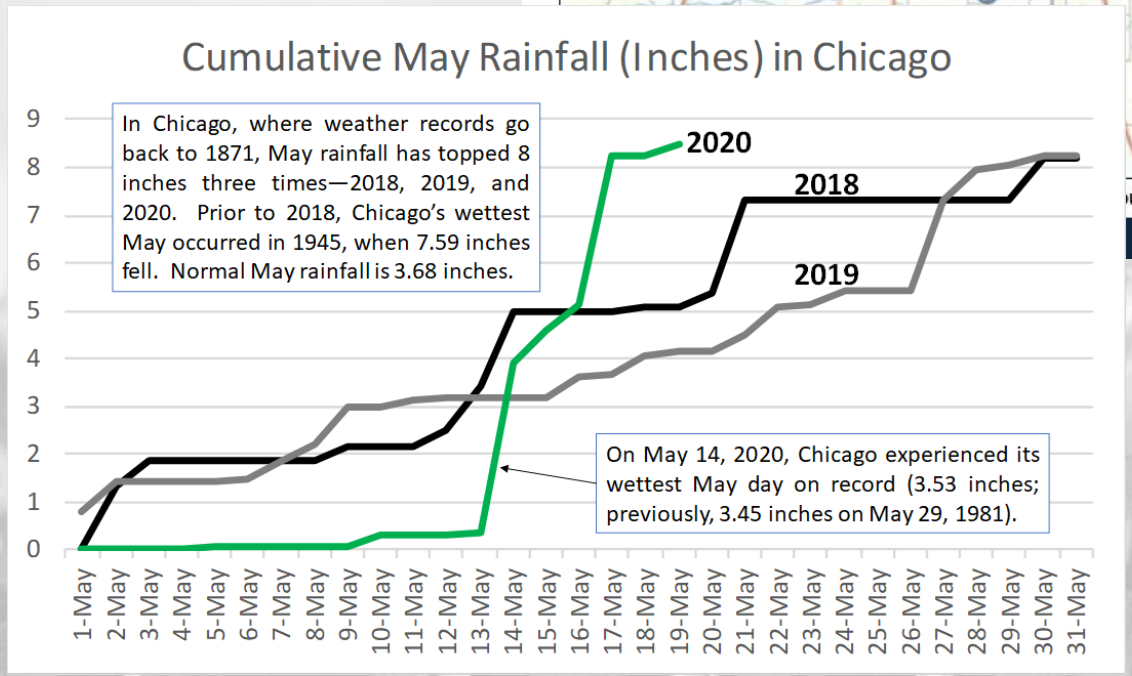
Preliminary Flooding & Severe Weather Reports



- 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

ur reports!

Sunday, May 17, 2020 11:22 PM



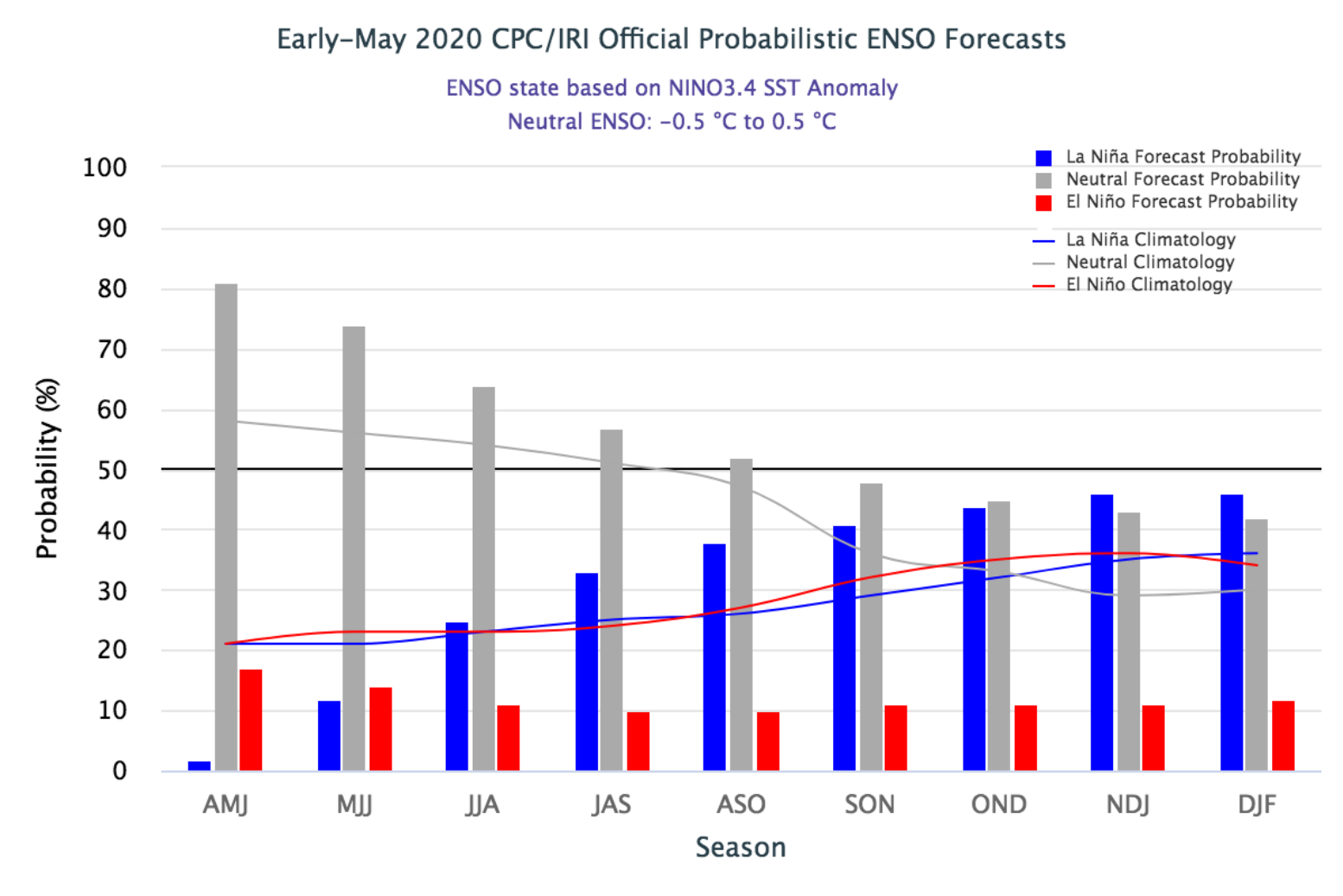
OUTLOOKS

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**

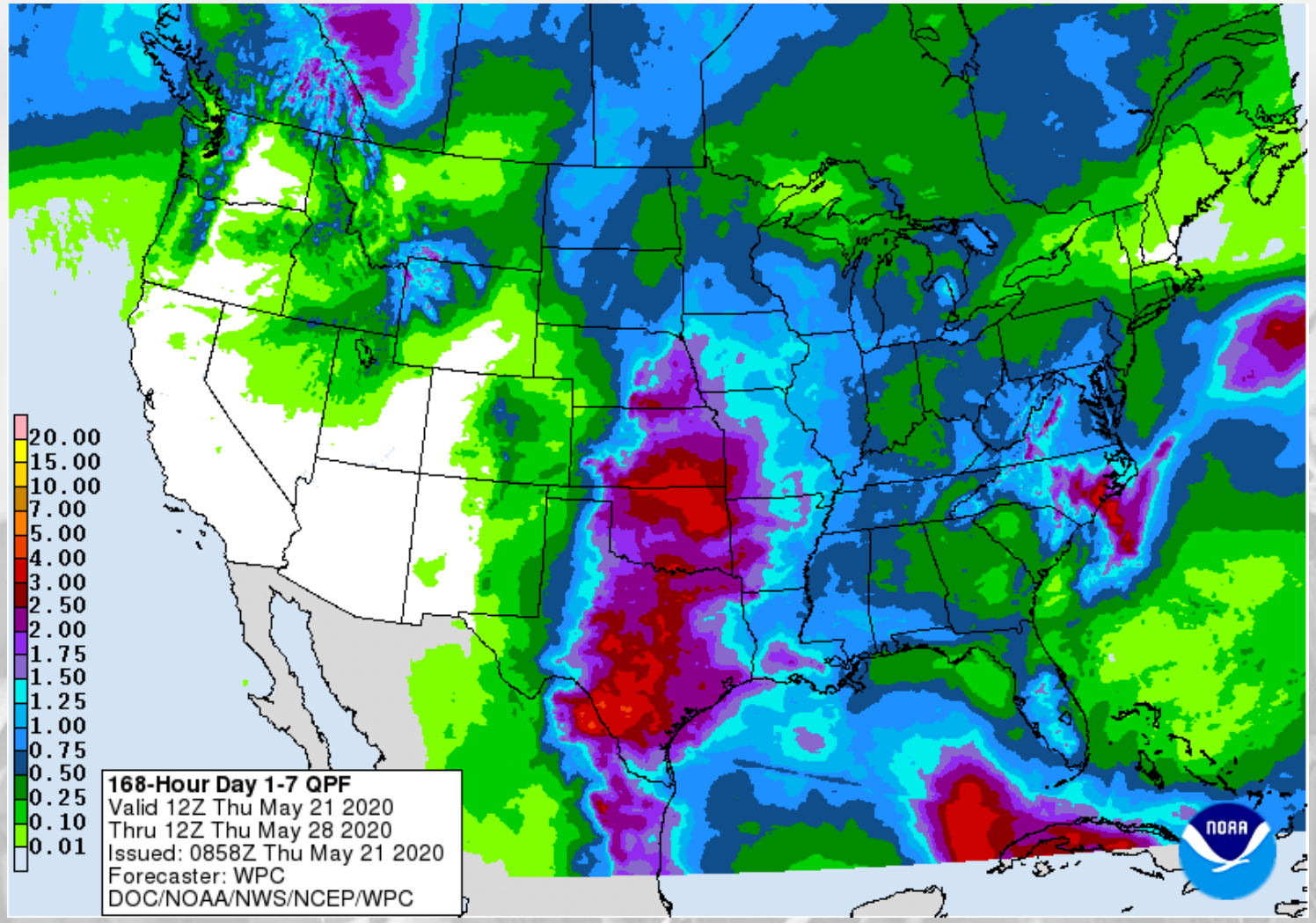
ENSO Outlook Status



https://iri.columbia.edu/our-expertise/climate/forecasts/enso/current/?enso_tab=enso-cpc_plume

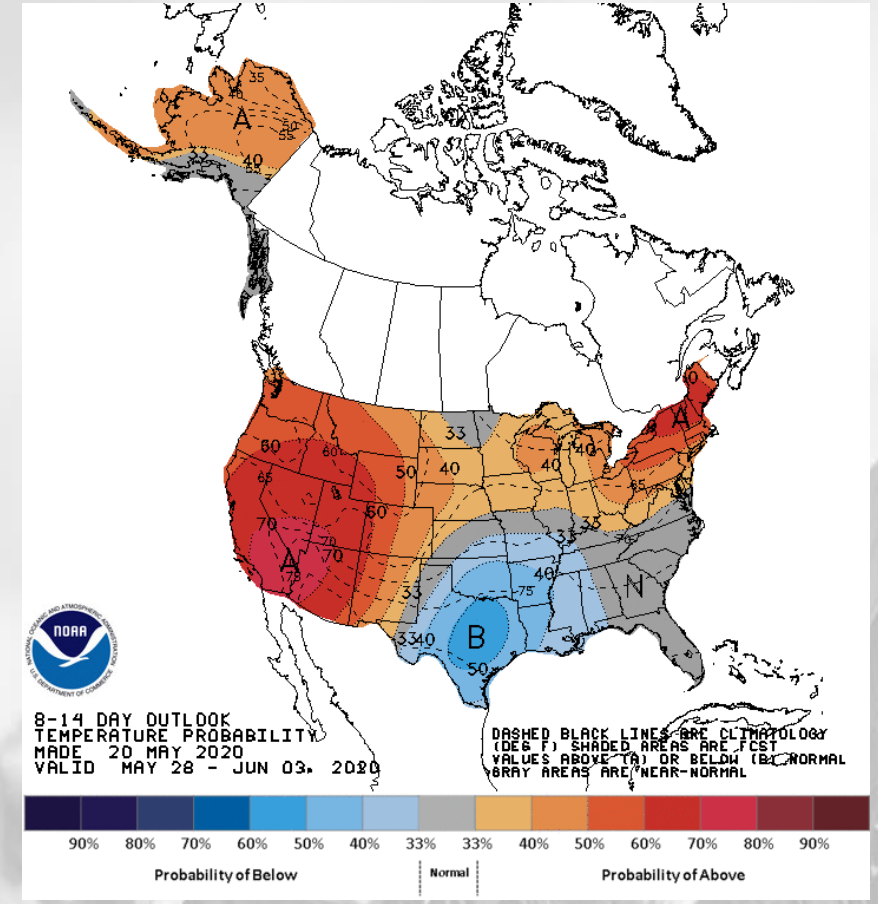
7-day Quantitative Precipitation Forecast

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

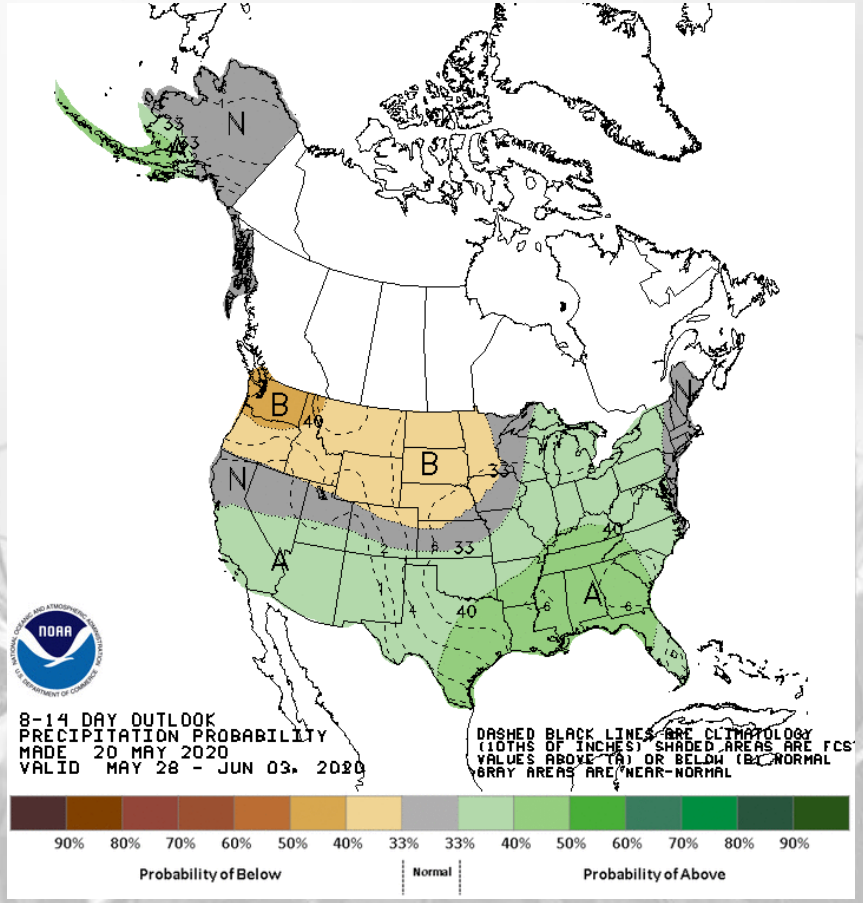


http://www.wpc.ncep.noaa.gov/qpf/day1-7.shtml

Temperature and Precipitation Probabilities for 28 May – 3 June 2020



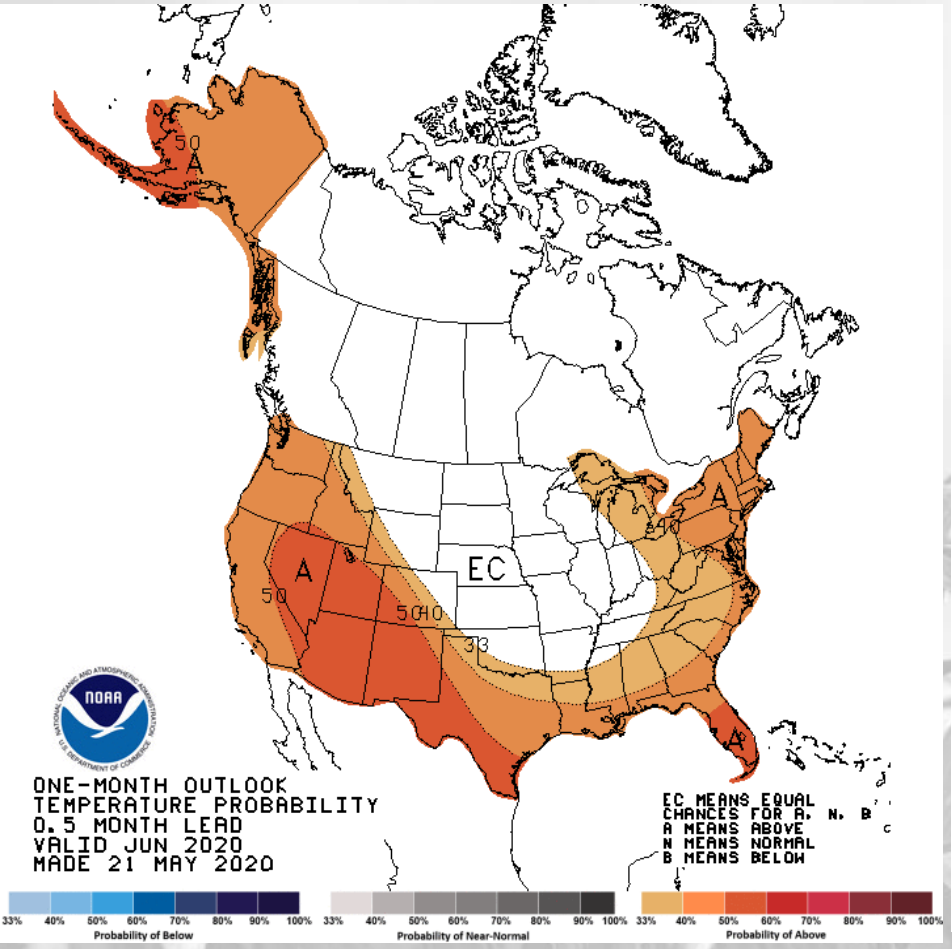
Temperature



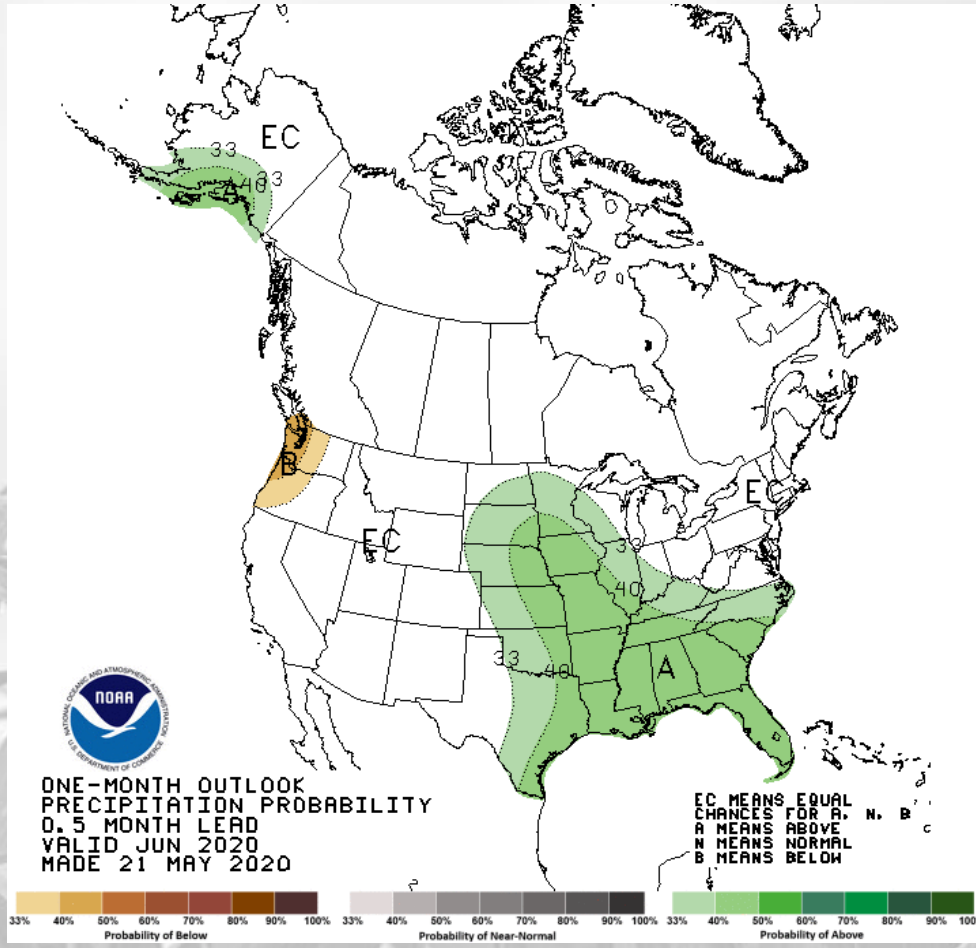
Precipitation

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

June Temperature and Precipitation Probabilities



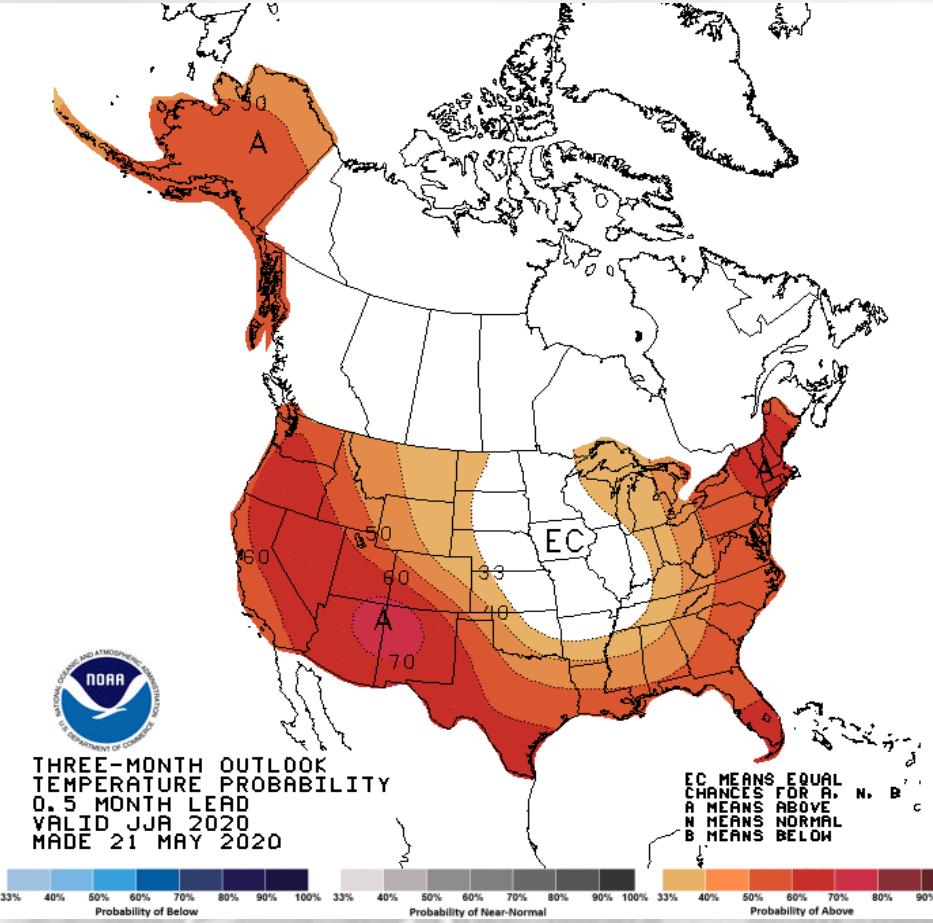
Temperature

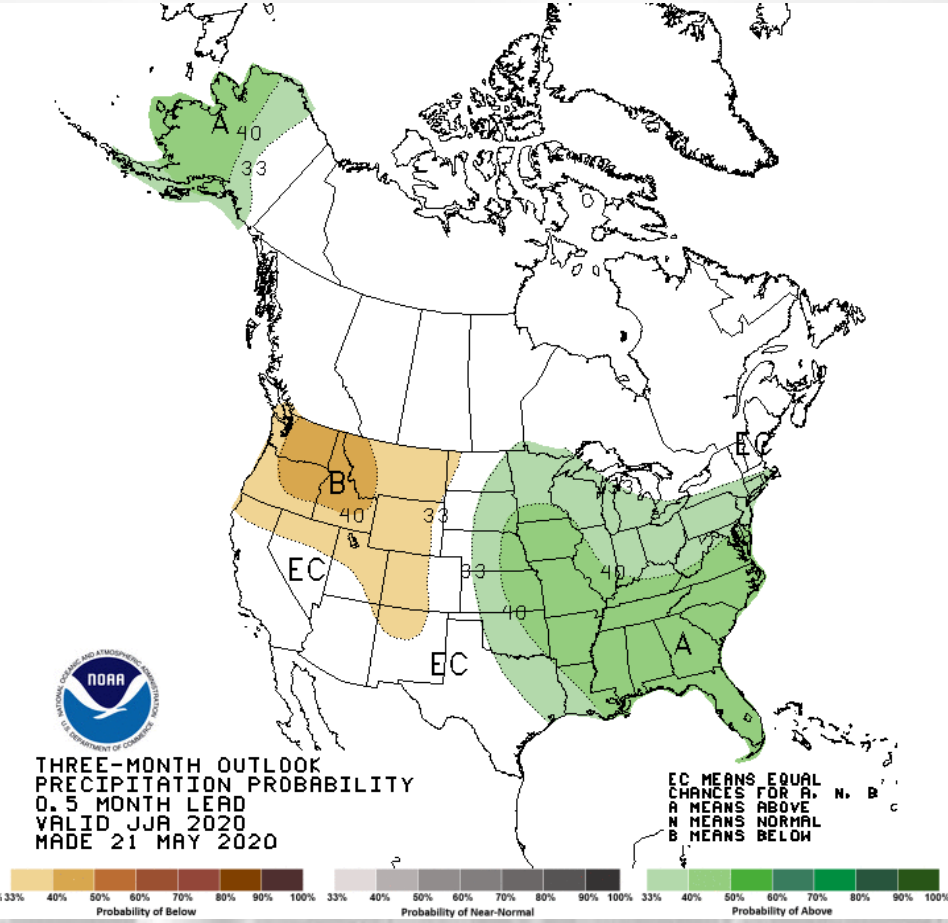


Precipitation

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

3 Month Temperature and Precipitation Probabilities

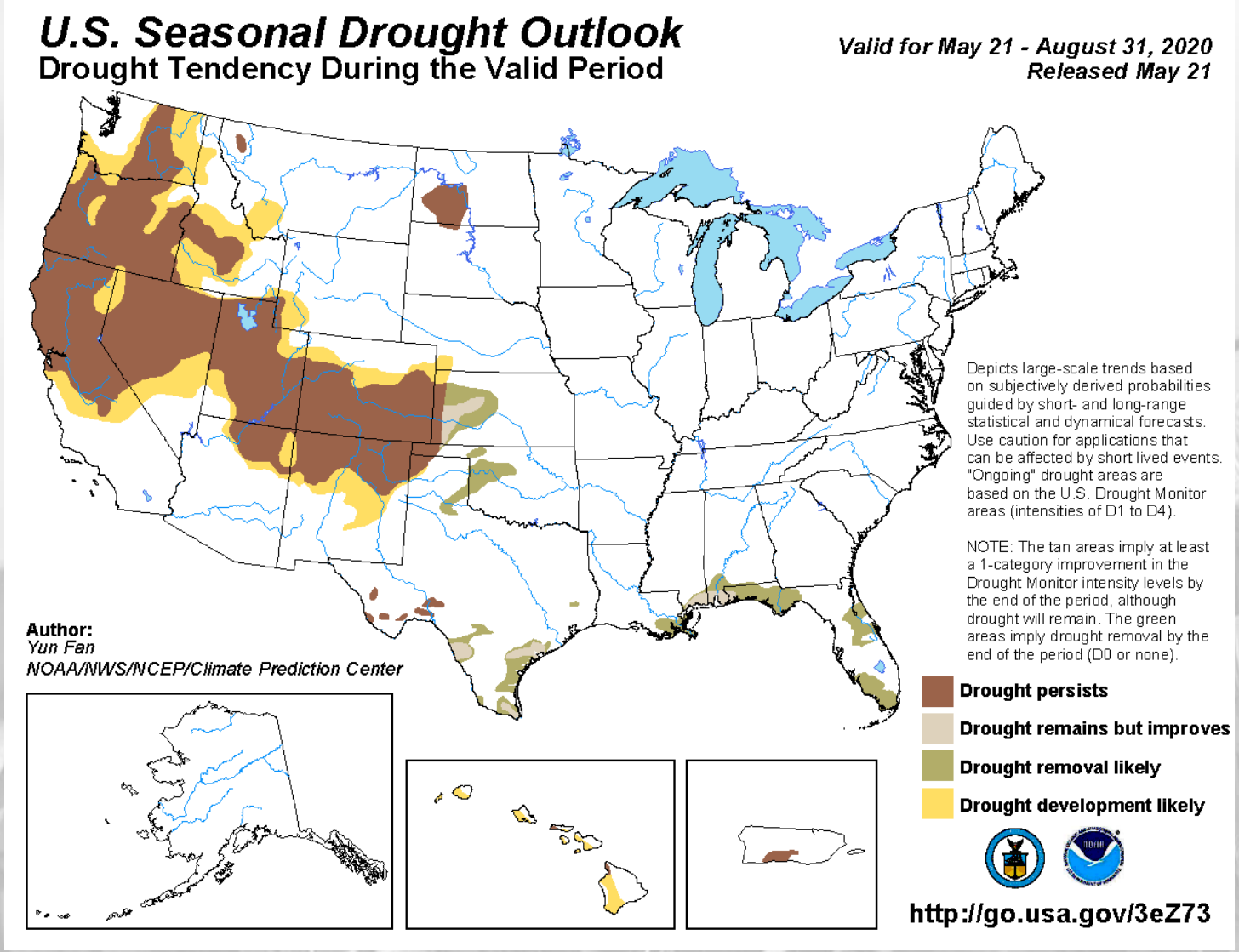




Temperature **Precipitation**

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

Drought Outlook through 31 August



http://www.cpc.ncep.noaa.gov/products/expert_assessment/season_drought.gif/

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.

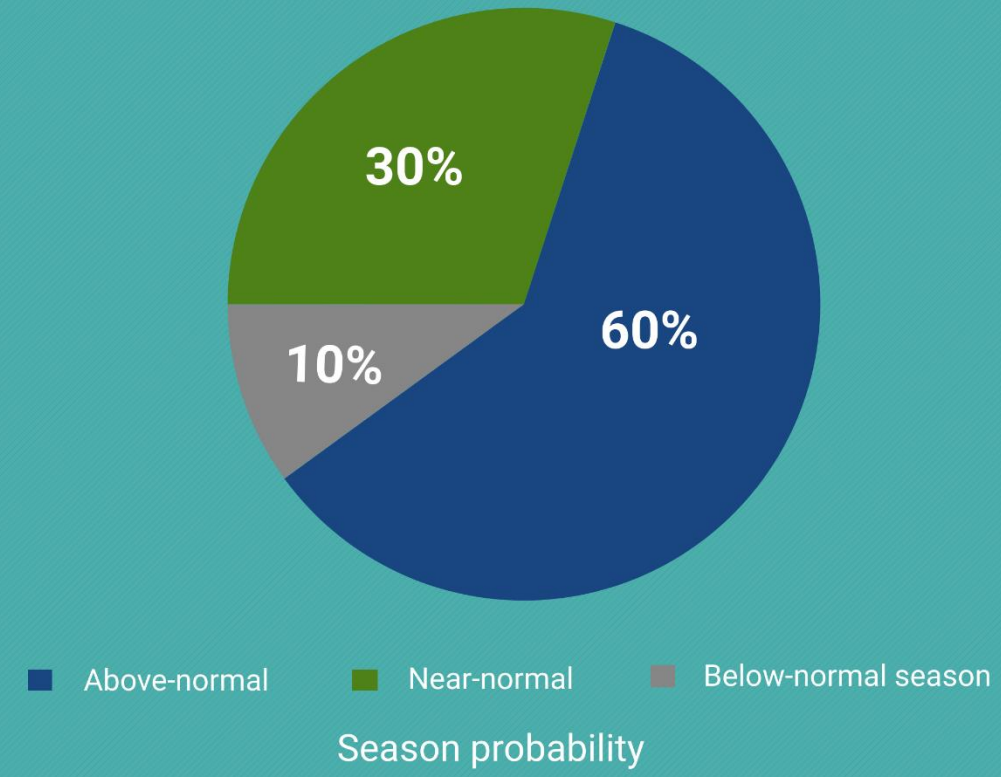
Summary - Outlooks

* 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



Named storms
13-19

Hurricanes
6-10

Major hurricanes
3-6

Be prepared: Visit hurricanes.gov 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:
  - **Climate:**
  - Dennis Todey: dennis.todey@ars.usda.gov , 515-294-2013
  - Doug Kluck: doug.kluck@noaa.gov, 816-994-3008
  - Mike Timlin: mtimlin@illinois.edu; 217-333-8506
  - Natalie Umphlett: numphlett2@unl.edu ; 402 472-6764
  - Brian Fuchs: bfuchs2@unl.edu 402 472-6775

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

For More Information

Midwest Climate Hub

@dennistodey

https://www.climatehubs.oce.usda.gov/hubs/midwest

Charlene Felkley, Coordinator
515-294-0136
Charlene.felkley@usda.gov

Dennis Todey, Director
515-294-2013
Dennis.todey@usda.gov

Erica Kistner, Fellow
515-294-9602
Erica.kristner@usda.gov

National Laboratory for Agriculture and the Environment
Attn: Midwest Climate Hub
1015 N University Blvd
Ames, Iowa 50011-3611