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
July 16, 2020 (1 PM CDT) Martha Shulski – Nebraska State Climatologist

Access to Future Climate Webinars and Information
http://www.drought.gov/drought/content/regional-programs/regional-drought-webinars
https://mrcc.illinois.edu/multimedia/webinars.jsp
http://www.hprcc.unl.edu/webinars.php

Open for questions at the end
Climate Recap & Recent Conditions

**Impacts:** Hydrological, Snow/Water, Agricultural, Other

**Outlooks:** Short-term, July, and Summer Updates
RECENT CLIMATE CONDITIONS
May Temperature Recap

- Following in April’s footsteps, generally near to below average temperatures across the region
- 27th coldest in MO; many top 40 coldest
- Colorado/Wyoming exceptions – 9th warmest for CO

May Precipitation Recap

- Mixed conditions across the region
- Dry in the west and north (17th and 18th driest, respectively for WY and CO)
- Wetter than average across the eastern states (top 20-30)

March - May Temperature Recap

• Despite a chilly April and May, temperatures were near to above average for much of the region

• 12th warmest for CO

• ~Top 40th warmest in the east

March - May Precipitation Recap

- Dry West / Wet East
- 9th driest for CO and ND; Below average across the Northern Great Plains
- Top 20 wettest for MI, OH, and MO; IN sticks out in the East

Lack of Severe Weather Across the U.S.

Recent Climate Conditions

Fewest May Severe Weather Reports (2,627) since 2014 (2,406)

Fewest May Tornado Watches in Recorded History (1970-present)

<table>
<thead>
<tr>
<th>Number of May Tornado Watches</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>2020</td>
</tr>
<tr>
<td>12</td>
<td>2018</td>
</tr>
<tr>
<td>15</td>
<td>2014</td>
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<tr>
<td>16</td>
<td>2012</td>
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<tr>
<td>22</td>
<td>2016</td>
</tr>
<tr>
<td>24</td>
<td>1979</td>
</tr>
</tbody>
</table>
Recent Climate Conditions

Last 30 Days: Temperature

- Well above average (4-8°F) across the western states and northern Great Plains
- Multiple locations setting records for most days 90°F or greater (e.g., Sioux Fall, Sioux City)
- Not as hot in the east - a couple of degrees above average

Source: https://hprcc.unl.edu/maps.php?map=ACISClimateMaps
State Climate Office of Ohio (SCOО)

Recent Climate Conditions

May Cold → June Heat

Daily Records

Source: MRCC (http://mrcc.Illinois.edu)
Recent Climate Conditions

Last 30 Days: Precipitation

- Heavy rainfall (>5”) from MO northward through parts of IA and WI; also in KY and Southern/Central OH
- Less than 2” from West Central MN, through Dakotas, Western NE/KS, WY and CO
- Dry conditions also concentrated in Western KY, IL, and IN

Source: https://hprcc.unl.edu/maps.php?map=ACISClimateMaps
Hydrology
Soil Moisture

- Recent path of T.S. Cristobal clearly stands out (MO-WI)
- Elsewhere – rapidly drying soils; especially in S. KS

Soil Moisture

- Very dry in the upper portion of the soils across S. KS, western Dakotas, Central MN
- Drying rapidly across IN and NW OH, NE, KS, CO

Source: https://weather.msfc.nasa.gov/sport/case_studies/lis_CONUS.html
Evaporative Demand Drought Index

- “Thirst of the atmosphere” or precursor for water stress
- 1-month: Strong indication of drying-conditions across the west, northern Great Lakes, and parts of OH/KY
- 1-week: Rapidly increasing demand due to dry air, sunny skies, and heat: CO-western KS-southwest NE; southeast SD-southwest MN; northern IN-northwest OH
- Heat and very windy conditions leading to intense evaporation rates across Central and Northern Plains

Source: https://www.esrl.noaa.gov/psd/eddi/
Missouri River Snowpack

- Above average temperatures led to rapid snowmelt and some early flooding of upstream tributaries.

Thanks to Kevin Grode, P.E.
Northwestern Division
MRBWM Reservoir Regulation Team Lead
Platte River Snowpack

• Snowpack melted very quickly – note the higher than average peaks but rapid loss through May and June

• Flows on tributaries lower than normal for this time of year

Thanks to Kevin Grode, P.E.
Northwestern Division
MRBWM Reservoir Regulation Team Lead
7-Day Stream Flows

- Stream Flows generally falling across the region

- Below normal for parts of IN/OH, southern KS, central MN, and western ND

- Above the 90\textsuperscript{th} percentile in central MO northward through IA, WI, and MI

River Forecasts (Jun-Aug): Ohio River Valley

- No immediate concerns here for flooding
- Stream flows are dropping in this basin
River Forecasts (Jun-Aug): Upper Mississippi

- Peaked last week from early June rains
- Fall below flood levels next week and not likely to return soon
River Forecasts (Jun-Aug): Missouri River Valley

- Past peak mountain snowmelt
- Flood potential is normal as drier conditions have allowed soils to dry out
- Episodic minor-to-moderate flood in the lower third of the basin
Great Lakes

- Lakes Superior and Michigan-Huron are slowly climbing
- Lakes St. Clair and Erie are maintaining near-record levels
- Lake Ontario dropping a bit and below 2019
- Navigation problems (strong currents when high flow pulses move through) and flooding, erosion
- Forecasts show levels peaking in June/July then falling, but staying near record levels

U.S. Drought Monitor

June 16, 2020
(Released Thursday, Jun. 18, 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)

Intensities:
- 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. For more information on the Drought Monitor, go to https://droughtmonitor.unl.edu/about.aspx

Share impacts with local experts and/or the Drought Impact Reporter (https://droughtreporter.unl.edu/map/)
Agriculture

Top and Right Pictures reflecting the contrasting conditions across Kansas (Top): Romulo Lollato (Wheat Specialist, KSRE); (Right): Ignacio Ciampitti (Crop Specialist, KSRE).

Background Picture courtesy of Kenzie Johnston with OSU Extension
USDA NASS Crop Progress: Winter Wheat

Winter Wheat Conditions
Percent Good to Excellent
June 14, 2020

- Progress a little behind 5-year average (-3%)
- Harvest behind in MO-IL-IN
- Crop conditions in Good-to-Excellent ~50%; down from 2019

Thanks to Brad Rippey – USDA OCE
Washington D.C.
Corn progress is ahead of 5-year average (well behind in ND as residual 2019 issues continue – dry surface but too wet below)

Corn conditions much improved over 2019

Thanks to Brad Rippey – USDA OCE Washington D.C.
USDA NASS Crop Progress: Soybean

- Soybean progress is ahead of 5-year average (well behind in ND as residual 2019 issues continue – dry surface but too wet below)
- Soybeans arefairing well (72% Good to Excellent)

Thanks to Brad Rippey – USDA OCE Washington D.C.
USDA NASS Crop Progress: Soybean

- Soybean progress is ahead of 5-year average (well behind in ND as residual 2019 issues continue – dry surface but too wet below)
- Soybeans are fairing well (72% Good to Excellent)

Far Right: Soybean field near the Twin Cities. Courtesy of Pete Boulay - Climatologist MNDNR Ecological and Water Resources

Thanks to Brad Rippey – USDA OCE Washington D.C.
USDA NASS Crop Progress: Pasture/Rangeland

- Deteriorating conditions across the western states (CO, KS, NE, ND)
- Worse conditions compared to last year (+16% Poor to very poor – not shown)

Thanks to Brad Rippey – USDA OCE Washington D.C.
Pasture/Rangeland (Montana)

- No green-up on mid-to-low elevation cool season grasses
- Hot, dry, and windy weather does not bode well

Photos Courtesy of Michael Downey, Water Planning Section Supervisor - MT DNRC
Other Issues

• 50% hay yields in western SD due to dry spring conditions; similar conditions in western KS/NE – future cuttings in jeopardy; better in the east
• Some cattle being sold in the west; hauling water for livestock (e.g., in Colorado)
• Reduced alfalfa in spots as well (e.g., IA and SD – alfalfa weevil pressure)
• Michigan tart cherry loss of 65 million lbs compared to 2019
  • Using 5-year (2015-2019) average Michigan tart cherry production of 189 million pounds, the state alone has lost about 66 million pounds of production potential – worth about $13.2 million.
  • Early season heat has also led to poor pollination in stonefruits/apples
  • Large fruit drop from combined impacts – likely low yields
Other Issues

- Replant taking place in some of the wetter areas but close to wrapping up
- Driest areas starting to stress crops – may help others develop good root structure
- Heat and wind are making conditions worse – large demand for moisture

Pictures: Corn in NE Guthrie County, Iowa mostly hilltops and poorer soils. Courtesy of Craig Cogil Senior Forecaster-National Weather Service
Rare Western Derecho

Major Events

- The most significant wind gusts (75+ mph) in a single day (44)
- Exceptionally rare occurrence for this region
- 110 mph wind gust at Winter Park Ski Area in Grand County, CO
Early Tropical Activity

Major Events

- T.S. Cristobal (June 8-10) Swath of locally heavy rain from LA northward into WI and MI
- T.S. Cristobal is the second tropical system on record to move through Iowa. The last was an unnamed T.S. that made landfall in Galveston, TX and entered Iowa on September 11th, 1900.
- Power outages numerous throughout the region; Mudslides reported in MN; Floods and inundated fields in Iowa (band of 3-6” of rain)

Springtime in the Rockies!

- June 8: 7 to 8 inches in the Laramie Valley.
- The event broke the daily snowfall record as well as the June monthly snowfall record, both of which had been set in 1974.
- Around 10,000 were without power for about 12 hours.
- More snow in the high country of NW Wyoming
Outlooks
**ENSO Status and Projection**

- ENSO-neutral is most likely to continue through the Northern Hemisphere summer 2020, with roughly equal chances of ENSO-neutral or La Niña beginning in August-October 2020.

- Not forecasting La Niña at this time

Source: https://www.cpc.ncep.noaa.gov/products/precip/CWlink/MJO/enso.shtml#discussion
7-Day Quantitative Precipitation Forecast

Valid 7am Thu June 18 – 7 am Thu June 25

- Actual precipitation is likely to be more isolated than indicated

- Given current evaporation rates, only the heaviest rainfall will ease drying conditions long-term; lighter rains will not likely to have big impact

Source: https://www.wpc.ncep.noaa.gov/#
8-14 Day Temperature/Precipitation Probabilities

June 25 – July 1, 2020

Source: http://www.cpc.ncep.noaa.gov/products/predictions/814day/index.php
8-14 Day Risks

Risk of Hazardous Temperatures
Valid: 06/25/2020-07/01/2020

***Experimental***

Excessive Heat
Moderate 6/25/2020 - 6/26/2020

Excessive Heat
Slight 6/27/2020 - 7/1/2020

NO HAZARDS POSTED

Climate Prediction Center
Made: 06/17/2020 3PM EDT
Follow us: www.cpc.ncep.noaa.gov

Source: https://www.cpc.ncep.noaa.gov/

Outlooks

June 25 – July 1, 2020

Risk of Heavy Precipitation
Valid: 06/25/2020-07/01/2020

***Experimental***

Slight 6/25/2020 - 6/27/2020

Climate Prediction Center
Made: 06/17/2020 3PM EDT
Follow us: www.cpc.ncep.noaa.gov
Outlooks

July Temperature/Precipitation Probabilities

Source: https://www.cpc.ncep.noaa.gov/products/predictions/long_range/lead14/
Jul - Sep Temperature/Precipitation Probabilities

Outlooks

Source: https://www.cpc.ncep.noaa.gov/products/predictions/long_range/seasonal.php?lead=1/
Drought Outlook

• Generally across the region – conditions will like deteriorate before improving in September.

Source: http://www.cpc.ncep.noaa.gov/products/expert_assessment/season_drought.gif/
- High wildland fire danger present in SW Colorado; Above normal potential to expand throughout western Colorado and western Montana during July
- Emergency declaration made in western Kansas to prepare; may not be capturing concerns across the Northern Plains

Source: https://www.weather.gov/iln/fireweather
Conditions Summary

- Transitioned from cooler to warmer than average across the North Central Region
- Very warm and windy across the central and northern Plains
- Rapidly increasing demand for water with intense evaporation occurring
- Soils are drying; stream flows are dropping; fire danger is increasing in the west
- Great Lakes continue their record or near-record levels
- Row crops (corn and soybean) fairing well – much better than 2019
- Some issues with specialty crops, pastures/rangelands deteriorating
Outlook Summary

- ENSO neutral through summer then…?
- Summer outlooks based on in-situ soil moisture and trends

- Warmer than average conditions likely across the region in July – greater confidence in the western states
- Slightly elevated probability of above average precipitation in the far southern and eastern reaches of the North Central Region

- Drought likely to expand and intensify across Colorado, Wyoming, Montana, and the western Dakotas
Today’s and Past Recorded Presentations and
http://mrcc.isws.illinois.edu/webinars.htm should be
https://mrcc.illinois.edu/multimedia/webinars.jsphttp://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
National Drought Mitigation Center: http://drought.unl.edu/
State climatologists: http://www.stateclimate.org
Regional climate centers: http://mrcc.illinois.edu and http://www.hprcc.unl.edu
Updated Great Lakes Climate and Water Levels Update and Outlook Webinar - June 22, 12:30-2pm CT

Topics covered include:

• The conditions that contributed to the high water levels
• The climate outlook from 2 weeks through the next season
• Some of the impacts from high lake levels
• The typical watches and warnings that may occur around the Lakes due to high levels
• An outlook for the lake levels themselves

Register at https://attendee.gotowebinar.com/register/7783082580408145934
Climate:
Aaron Wilson: wilson.1010@osu.edu, 614-292-7930
Dennis Todey: dennis.todey@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
THANK YOU!

Aaron Wilson
(wilson.1010@osu.edu)