North Central U.S. Climate and Drought Outlook
17 December 2020

Beth Hall, Ph.D.
Indiana State Climatologist
Purdue University
bethhall@purdue.edu
(765) 494-8060
General Information

• Providing climate services to the Central Region
  • State Climatologists/American Association of State Climatologists
  • NOAA NCEI/NWS/OAR/NIDIS
  • USDA Climate Hubs
  • Midwest and High Plains Regional Climate Centers
  • National Drought Mitigation Center

• Next Regular Climate/Drought Outlook Webinar
  • January 21 (1 PM CST): Presenter: TBD

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

• Recordings of Past Webinars
  • http://mrcc.isws.illinois.edu/webinars.htm
  • http://www.hprcc.unl.edu/webinars.php

• Open for questions at the end
Recent Conditions
  • Temperature and precipitation ranks
  • 30-day temperature and precipitation
  • Drought

Crops & Soils

Snow, Fire, Rivers and Lakes

Impacts and Notable Events

Outlooks
  • La Niña
  • Short-term
  • Winter season
Recent Conditions

November Temperature and Precipitation Ranks
Autumn Temperature and Precipitation Ranks
Departure from Normal Temperature and Precipitation
Soil Moisture, Streamflow and Drought
Statewide Precipitation Ranks
September – November 2020
Period: 1895–2020

Crops & Soils

• Winter Wheat
• Topsoil moisture
• Soil moisture percentiles
• Soil temperatures
Winter Wheat Conditions
Percent Good to Excellent
November 29, 2020

Winter Wheat Conditions
Percent Poor to Very Poor
November 29, 2020

National Condition
Good to Excellent 46
Change from Last Week +3

National Condition
Poor to Very Poor 18
Change from Last Week -3

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

Figure Credit: Brad Rippey – USDA OCE/USDA NASS data
Topsoil Moisture
Percent Short to Very Short
Week Ending - November 29, 2020

48 States
Short to Very Short  38
Change from Last Week  -4

Top # - Percent Short to Very Short
[Bottom #] - Change from Last Week

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

Figure Credit: Brad Rippey – USDA OCE/USDA NASS Data
Snow, Fire, Rivers and Lakes

Photo credit: Karen Nicolas
Accumulated Winter Season Severity Index (AWSSI)

**AWSSI Category**
- Extreme
- Severe
- Average
- Moderate
- Mild
- Not current
- Record

**Data Last Updated:**
12/16/2020 16:20 CST

[Pan/Zoom to Alaska]

[MRCC Midwestern Regional Climate Center]

[Map URL]
https://mrcc.illinois.edu/research/awssi/indexAwssi.jsp
Still early in season

Tracking slightly below normal

On December 15, 2020 the mountain Snow Water Equivalent (SWE) in the “Total above Fort Peck” reach was 4.3”, 76% of the December 15 average. On December 15, 2020 the mountain SWE in the “Fort Peck to Garrison” reach was 4.4”, 83% of the December 15 average. The normal peak for both reaches is near April 15.

*Generally considered the high and low year of the last 25-year period, respectively

Provisional data. Subject to revision.
• Low-Moderate fire danger
• Dry, windy conditions could cause erratic fire behavior
Missouri Mainstem Reservoir Status (as of 12/15/20):

- System storage is 56.2 million-acre feet
- Mountain snowpack is below average

[Diagram showing system storage comparison with labels: Maximum (1967-2019), Average (1967-2019), Minimum (1967-2019), Base of Exclusive Flood Control (67.7), Top of Exclusive Flood Control (72.4), Base of Multiple Use/Carryover = 17.6, 2011*, 2019.]

We are here.

28-day Average Streamflow

Great Lakes Water Levels

- All Great Lakes running well above their long-term averages
- Recently dropped from record levels in 2018-2019
- Forecasted levels over the next six months should remain above the long-term average
- Lake Ontario only lake with near-normal levels

https://www.glerl.noaa.gov/data/wlevels/data/superiorLevelsFeet.png
Great Lakes Temperatures

- All Great Lakes running warmer than their long-term averages
- Ice coverage slightly behind recent years

[Map image showing water temperatures and ice coverage across the Great Lakes]

https://www.glerl.noaa.gov/res/glcsfs/compare_years/2020_349_glsea.png
Great Lakes Ice Coverage

https://www.glerl.noaa.gov/res/glcsfs/compare_years/2020_349_glsea.png
Impacts and Notable Events
State Impacts

• Water conservation requested in Illinois due to drought
• Drought lowered soybean yields by 10-15 bushels in northern Illinois
• Large fire ‘leftovers’ (WY & CO)
• Low sub-soil moisture raises concerns for spring preparations in Iowa

Photo Credit: Greg Sanders via Medicine Bow-Routt National Forest
State Impacts

- **Great Plains** - Winter wheat in poor condition; little pasture available
  - *Some hay/water hauling*

- Drought and warmth are causing stock ponds to evaporate, lower – **High Plains**

- **MN** – lack of snow for recreation

- Many small to medium lakes in **MN** froze over from Nov 30 – Dec 3

*Wild ice on Clearwater lake in the BWCA (Kjersti Vick, Visit Cook County)*
Daily Snowfall Records broken or tied
During the Month of November 2020

# Records: 71

Daily Snowfall Records broken or tied
Month-to-Date: 12/1/2020 - 12/16/2020

# Records: 40

Powered by ACIS
Regional Climate Centers
Minimum 30 years of data
All Reports are considered preliminary.
Station Extremes:

• Widespread snow event Nov 30 – Dec 2 – Lake effect snow

• Waseca, MN – 33+ days without precipitation
Climate Outlooks

• La Niña
  • 7-day Precipitation Forecast
    • 8 – 14 day Outlook
  • December temperature and precipitation
    • JFM temperature and precipitation
    • AMJ temperature and precipitation
La Niña Advisory

- La Niña is likely to continue across the Northern Hemisphere 2020-21 winter
  - ~95% chance during January-March and into spring 2021
  - ~50% chance of Neutral during April-June
- A LOT of variability for T and Precip with La Ninas

https://www.climate.gov/news-features/blogs/enso/november-2020-la-ni%C3%B1a-update-just-us-chickens
Figure 6. Forecasts of sea surface temperature (SST) anomalies for the Niño 3.4 region (5°N-5°S, 120°W-170°W). Figure updated 19 November 2020.

https://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/figure06.gif
7-day Quantitative Precipitation Forecast

https://www.wpc.ncep.noaa.gov/qpf/day1-7.shtml
8-14-Day Outlook

Temperature

Precipitation

http://www.cpc.ncep.noaa.gov/products/predictions/814day/
AMJ 2021 Outlooks

Temperature

Precipitation

https://www.cpc.ncep.noaa.gov/products/predictions/90day/
Outlook Summary

• **Short-term** outlooks showing high probabilities of:
  • Above average temperatures – more records broken?
  • Below-average precipitation

• **Winter**
  • Enhanced changes for above-normal temperatures -- Lower MO, MS, and OH basins
  • Leaning toward above-average precipitation -- Ohio and Great Lakes areas

• **Continued drought** across High Plains = Soil moisture likely to stay low heading into spring

• **Classic La Niña signal** showing in updated monthly and seasonal outlooks
  • *High probability of a moderate/strong La Niña*
  • *Analog years show high variability in temperature and precipitation vs. El Niño phase*
  • *Some of the biggest signals from La Niña will be late winter and early spring, especially across the Ohio Valley and Great Lakes – wet.*
Further Information – Partners

- **Today’s and Past Recorded Presentations:**
  - [http://mrcc.isws.illinois.edu/webinars.htm](http://mrcc.isws.illinois.edu/webinars.htm)
  - [http://www.hprcc.unl.edu](http://www.hprcc.unl.edu)

- **NOAA’s National Centers for Environmental Information:** [www.ncdc.noaa.gov](http://www.ncdc.noaa.gov)

- **NOAA’s Climate Prediction Center:** [www.cpc.ncep.noaa.gov](http://www.cpc.ncep.noaa.gov)

- **Climate Portal:** [www.climate.gov](http://www.climate.gov)

- **U.S. Drought Portal:** [www.drought.gov](http://www.drought.gov)

- **National Drought Mitigation Center:** [http://drought.unl.edu](http://drought.unl.edu)

- **State climatologists**
  - [http://www.stateclimate.org](http://www.stateclimate.org)

- **Regional climate centers**
  - [https://mrcc.illinois.edu](https://mrcc.illinois.edu)
  - [http://www.hprcc.unl.edu](http://www.hprcc.unl.edu)
Thank you & Questions?

• Climate:
  • Beth Hall: bethhall@purdue.edu; 765-494-8060
  • 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