North Central Drought Outlook
20 December 2018

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General Information

• Providing climate services to the Central Region
  • Collaboration Activity Between:
    • 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 17, 2018 (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
Presentation Outline

• Recent Conditions
  • Temperature and precipitation ranks
  • 30-day temperature and precipitation
  • Modeled soil moisture
  • Stream flow
  • Drought
  • Snow

• Impacts

• Outlooks
  • El Niño
  • Short-term
  • Winter season
Recent Conditions
Year-To-Date Temperature Ranks

Statewide Average Temperature Ranks
January–November 2018
Period: 1895–2018

November Precipitation Ranks

Statewide Precipitation Ranks
November 2018
Period: 1895–2018

Ensemble-Mean - Current Total Column Soil Moisture Anomaly (mm)
NCEP NLDAS Products Valid: DEC 15, 2018

https://www.emc.ncep.noaa.gov/mmb/nldas/drought/
28-Day Average Streamflow

http://waterwatch.usgs.gov/index.php?r=us&m=pa28d&w=map
Valid: 13 November 2018

Valid: 18 December 2018

http://droughtmonitor.unl.edu
Modeled Snow Depth for 2018 December 19, 0:00 UTC

https://www.nohrsc.noaa.gov/nsa/
Missouri River Basin
Mountain Snowpack Water Content
December 17, 2018

The Missouri River Basin mountain snowpack normally peaks near April 15.

- Snowpack water content running below average for this time of year
- Still time to catch up, as we’re only a third of the way into the accumulation period
The North and South Platte River Basin mountain snowpacks normally peak near April 15 and the end of April, respectively. As of December 19, 2018, the mountain snowpack SWE in the "Total North Platte" reach is currently 6.8", 103% of average. The mountain snowpack SWE in the "Total South Platte" reach is currently 5.1", 104% of average.
Missouri River

Missouri Mainstem Reservoir Status (as of 12/17/18):

• 2018 will be 3rd highest runoff year for the Upper Missouri River basin, behind 1997 and 2011.

• Project releases will be above average through November to evacuate the bulk of the stored flood waters before reducing to winter releases.

*In January 2011, the Base of Flood Control was 56.8 MAF, and the Top of Exclusive Flood Control was 73.1 MAF.

• All Great Lakes running above their long-term averages
  • Superior, Michigan-Huron, and Erie near last year’s levels
  • Ontario lower than same time in 2017
• Forecasted levels over the next six months should remain above the 1918-2018 long term average

https://www.glerl.noaa.gov/data/wlevels/data/superiorLevelsMeters.png
GREAT LAKES SURFACE ENVIRONMENTAL ANALYSIS (GLSEA)

Analysis Date: JD 352 12/18/2018
Percent Pixels with Data within +/-10 Days: 99.0%
Date of last ice analysis: 12/18/2018
NOAA CoastWatch

Great Lakes Total Ice Cover: 1.2%

Median Ice Concentration
- <10%
- 10–39%
- 40–69%
- 70–89%
- 90–99%
- 100%

Water Temperature
- °F
- °C

Great Lakes Environmental Research Laboratory
National Ice Center
- Slightly behind last year at this time, though there’s plenty of time in the season for freeze up
Record and Near-Record Wetness

- **TOP 10 ON RECORD**
- **WETTEST ON RECORD**

Data retrieved on Dec 10, 2018
Source: Applied Climate Information System
State Impacts

- Unseasonably high snowfall totals for November (IA, KS, NE, MI, MO)
  - Many locations across SE and SC NE have already received over 50% of their average seasonal snowfall by the end of November.
  - Stations along the Kansas border have already exceeded last season’s snow totals
    - Concordia, KS (2nd snowiest)
    - Topeka, KS (4th snowiest)
    - Lincoln, NE (7th snowiest)
    - Grand Island, NE (10th snowiest)
Soybean Harvest

• 2018 is now the slowest soybean harvest over the 1995 – 2018 period

• U.S. Soybeans Harvested by Nov. 25
  1. 2018  94.0%  (reached 94% on Nov. 25)
  2. 1996  94.3%  (reached 94% on Nov. 24)
  3. 2009  94.9%  (reached 94% on Nov. 22)

• Some fields across the region remain unharvested (IA, IN, MI, NE, OH)

• A lot of soybeans have been binned due to low commodity prices, moisture dockage and quality issues (IN, NE, OH).
Kansas Wheat Crop

- Extremely wet fall conditions (+ 3.86 inches; 7th wettest)
- ~65% of the wheat crop planted late
- Reports from the field indicate more acres will not be planted with wheat

The impacts of early vs. late planting on wheat development. Photo courtesy: Mary Knapp, KSU
Ohio/Kentucky Ice Storm

• 14 - 15 November 2018
• SW Ohio – northern Kentucky
• Between 0.25 and 0.40’ of ice accretion; 1 – 2 inches of snow
  • Unusual November weather
  • Down trees and power lines
  • Wide-spread power outages
    • 19 outages in Lexington
• Murray State University canceled classes at six campuses
• Boone County Arboretum (southwest of Cincinnati) sustained significant ice damage
  • Half of over 3600 trees and shrubs experienced damage
  • 10 – 15% severe damage
Thanksgiving Blizzard

• The Thanksgiving Weekend storm was particularly impactful.
  • In our region, portions of Interstates 35 (KS), 70 (CO & KS), and 80 (WY & NE) were closed down due to blizzard conditions.
  • The governor of Kansas declared a state of emergency and the KU and UMKC canceled classes the Monday after Thanksgiving.
Wetness Issues

• Cattle feedlots have been battling mud, impacting feeding operations. (NE, KS, IA, IL, I
  • Any addition moisture will not soak into already saturated soil
  • Wet pastures and mud are keeping cattle in barns where they have to be fed
• Many farmers may need extension of 10 Dec. crop insurance reporting deadline as a result of bad weather and slow harvest (NE, IA, KS)
El Niño 2018 – 2019

El Niño briefings:


El Niño Watch

• 90% chance of formation though the Northern Hemisphere winter and 60% chance of continuation through spring

• ENSO-neutral continued during November, despite the continuation of above-average SSTs

• Atmospheric anomalies largely reflected intra-seasonal variability related to the MJO, and have not yet shown a clear coupling to the above-average ocean temperatures
ENSO Probabilities

Early-December 2018 CPC/IRI Official Probabilistic ENSO Forecasts

ENSO state based on NINO3.4 SST Anomaly
Neutral ENSO: −0.5 °C to 0.5 °C

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

• 7-day QPF
• U.S. Hazard Outlooks
• 6 – 10; 8 – 14 day outlooks
• Holiday Storm System
• January temperature and precipitation
• JFM temperature and precipitation
• AMJ temperature and precipitation
7-day Quantitative Precipitation Forecast

https://www.wpc.ncep.noaa.gov/qpf/day1-7.shtml
6-10 Day Outlook

Temperature

Precipitation

http://www.cpc.ncep.noaa.gov/products/predictions/814day/
8-14 Day Outlook

Temperature

Precipitation

http://www.cpc.ncep.noaa.gov/products/predictions/814day/
Plains Storm System just after Christmas

- Numerous ECMWF and GFS runs through Dec 19th pointing to a significant storm system in the Plains Dec 26-27
- NAEFS pattern and standardized anomaly (at right) reflect this too
- MJO entering phase 5 aligns with this pattern shift
Concerns - Heavy Precipitation

- Precipitable water anomaly already near 2” - given how far out it is in the forecast it is worth monitoring
- 24 hr QPF forecast from Dec 19th 12Z NBM picking up on that anomalous moisture with up to 3” potential
  - Amounts will likely differ what is shown here, but gives that idea of heavy rainfall possible
  - East TX into Lower MS Valley currently seems to be area of most concern
Concerns - Winter Weather

- Crude snowfall map from GFS using 10 to 1 ratio
- GFS and ECMWF consistently showing heavy snow band on northwest side of storm system
- Eventual amounts and location to be determined but signal for heavy snow there, especially given previously shown high PW anomaly
- May have to watch for a leading edge freezing rain/sleet on nose of warm conveyor belt

Dec 19 12Z GFS total snowfall. Eastern CO through Upper MI mainly 27-28th
January Outlook

Temperature

Precipitation

http://www.cpc.ncep.noaa.gov/products/predictions/long_range/lead14/
Seasonal Drought Outlook

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

Valid for December 20, 2018 - March 31, 2019
Released December 20, 2018

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).

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http://www.cpc.ncep.noaa.gov/products/expert_assessment/season_drought.png
Outlook Summary

• 90% of a weak El Niño formation through NH DJF and 60% chance through spring
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 and Questions?

• Questions:

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