Central Region Climate & Drought Outlook

18 February 2021

Becky Bolinger
Assistant State Climatologist
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
  • March 18, 2021 (1 PM CDT), Pat Guinan, State Climatologist, University of Missouri, MO Extension

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

• Recordings of Past Webinars
  • https://mrcc.illinois.edu/multimedia/webinars.jsp
  • https://hprcc.unl.edu/webinars.php

• Open for questions at the end
Today’s Agenda

• Recent Conditions
  • January ranks
  • Extreme February cold
  • Snowpack, ice cover, soils

• Impacts
  • Extreme cold, snow, ice
  • Urban, hydrologic, ag
  • Drought impacts

• Outlooks
  • La Niña Continues
  • Spring and Potential Impacts

Up close snowflakes – Becky Bolinger
Recent Conditions…
9th warmest January on record for U.S.

Much of the cold season has been warmer than average…

Departure from Normal Temperature (F)  
11/1/2020 – 1/31/2021

https://hprcc.unl.edu/maps.php?map=ACISClimateMaps
And a lot of the north central U.S. has been drier than average...

Departure from Normal Precipitation (in)
10/1/2020 – 2/16/2021

https://hprcc.unl.edu/maps.php?map=ACISClimateMaps
A major cold event swept across the country over the last week.

Cold extremes were observed across the entire Central Region.
Both maximum and minimum temperatures have been well below average for February.

In the Central Region, maximum temperatures were as much as 40°F below normal or more, averaged over the 4 days of February 12-16.
Was the cold record breaking?
Was the cold record breaking?

New February Record Low Maximum Temperature

Map by Becky Boeinger, data from ACIS
Was the cold record breaking?

### U.S. Daily Records Summary

<table>
<thead>
<tr>
<th>PERIOD</th>
<th>HIGH MAX</th>
<th>HIGH MIN</th>
<th>LOW MAX</th>
<th>LOW MIN</th>
<th>PRECIPITATION</th>
<th>SNOWFALL</th>
<th>SNOW DEPTH</th>
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<tr>
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https://www.ncdc.noaa.gov/cdo-web/datatools/records
Was the cold record breaking?

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Recent snow has increased seasonal snowfall.

Areas in the dark green have ample seasonal snowfall totals compared to normal.

Snowfall in eastern CO is closer to average and a bit low in the Dakotas.
2-4 inches of snowpack in Upper Midwest, 10-20 inches in the Rockies

The North and South Platte River Basin mountain snowpacks normally peak near April 15 and the end of April, respectively. As of February 15, 2021, the mountain snowpack SWE in the "Total North Platte" reach is currently 12.1", 87% of average. The mountain snowpack SWE in the "Total South Platte" reach is currently 7.5", 79% of average.

Source: USDA, Natural Resource Conservation Service

Provisional Data. Subject to Revision

https://www.nwd-mr.usace.army.mil/rcc/reports/platte_snow.png
15-Feb-2021

On February 15, 2021 the mountain Snow Water Equivalent (SWE) in the “Total above Fort Peck” reach was 10.7", 90% of the February 15, average. On February 15, 2021 the mountain SWE in the “Fort Peck to Garrison” reach was 9.3", 91% of the February 15 average. The normal peak for both reaches is near April 15.

https://www.nwd-mr.usace.army.mil/rcc/reports/snow.jpg
Widespread increases in frost depth across the Midwest.

Soil temperatures have cooled, with more significant coverage of frozen soils.

Precipitation events are more likely to result in runoff, instead of infiltrating soils.

More risk of flooding in areas, less potential for soil recharge in drought areas.
28-day averaged streamflow
GREAT LAKES SURFACE ENVIRONMENTAL ANALYSIS (GLSEA)

Analysis Date: JD 032 02/01/2021
Percent Pixels with Data within +/-10 Days: 93.2%
Date of last ice analysis: 2/1/2021
NOAA CoastWatch

Great Lakes Total Ice Cover: 10.7%

Median Ice Concentration
- <10%
- 10-39%
- 40-69%
- 70-85%
- 90-99%
- 100%

Water Temperature

Great Lakes Environmental Research Laboratory
National Ice Center

Cloud Free - Superior: 5.7 %, Michigan: 13.8 %, Huron: 2.7 %, Erie: 1.6 %, Ontario: 7.2 %, St Clair: 0.0 %

https://www.glerl.noaa.gov/data/ice/
Impacts

https://www.wqad.com/article/weather/rare-pancake-ice-make-an-appearance-in-the-quad-cities/526-b54f207a-8d47-44c2-9674-b6355f2dc9bf
Some cold stats…. Des Moines, Iowa – 66 hours spent below zero, ranks in the top 5

Twin Cities in Minnesota – 3rd place all time for total number of hours at or below zero. Streak of 116 consecutive hours

Currently, Austin TX has more snow on the ground than Aberdeen SD!

-31°F in Lincoln Nebraska on February 16 comes in 2nd place for their all-time coldest temperature.

Chicago broke the record for consecutive days of measurable snowfall with 9 days.
Cold, snow, ice impacts - Urban

- Rolling blackouts reported in Nebraska, Iowa, Kansas due to extreme cold temperatures
- Water-main breaks in Illinois and Indiana
- Tens of thousands in Kentucky without power, trees downed, from ice storm
- Concern sheltering homeless, Chicago shelters at capacity
- Building collapses from snow
- Large pileup on Interstate 80 in Iowa, approx 40 vehicles.
Cold, snow, ice impacts - Hydrologic

- Army Corps has increased releases to help alleviate ice conditions
- Ice jam on February 17 near Jefferson City Missouri
- Some ice jams on the Platte in Nebraska, but pretty typical for this time of year
- Further north, ice jams not yet an issue, because it’s too cold

Potential Future Impacts:
- Waiting game right now
- Fast warmup will result in more problematic ice jams
- A rain event would also increase ice break up and jams
- Risk of flooding in the Ohio River basin

Missouri River ice jam 'not an immediate threat'

https://news.prairiepublic.org/post/missouri-river-ice-jam-not-immediate-threat
Mountain Avalanches

Utah mountain region seeing unprecedented level of avalanche danger

“So far this winter season, 25 people have died in avalanches in the U.S., according to the Colorado Avalanche Information Center. The deadliest was Feb. 6 in Utah, when four people died while skiing in the Salt Lake backcountry.”

An elementary school principal was killed in an avalanche in Montana on Valentine’s Day

“All year's avalanche season has likely been more active because of a "persistent weak layer" of snow, according to Champion.” (Nikki Champion of the Utah Avalanche Forecast Center)
Potential for Agriculture Impacts from Cold

- Deep cold was well forecast so only minor impacts on livestock and calving
- Iowa fruit trees impacted by cold – 18° below zero is killing for peach blossoms, not expecting a good peach crop this year
- Fruit trees in Michigan have reached their chilling requirements, so they can break dormancy when the temperature warms
- Winter wheat is still dormant, but extreme cold with little snow cover for protection is likely to cause widespread damage. Won’t know the extent until the spring.
Impacts from Drought

- **Agricultural**
  - Lack of deep moisture profiles in soils from 2020 drought
  - Expect winter wheat damage from drought conditions, will be difficult to separate damage from cold vs. damage from drought
  - Lack of adequate pasture and forage is expected in drought-stricken areas

- **Fire**
  - Extended dry conditions and high winds increased fire danger in parts of Colorado and Kansas in early February
  - Brush fire near the Denver Metro area resulted in an evacuation of neighborhoods nearby
  - Extended drought combined with upcoming windy season in March-April – expect high fire danger on the plains in Eastern CO and western KS.
Outlook
7-day Precip Forecast

Expect colder temperatures through the end of this week, with some warmer, or more seasonal, temperatures early next week.
La Niña is expected to continue through the spring…

IRI/CPC ENSO Forecasts:
https://iri.columbia.edu/our-expertise/climate/forecasts/enso/current/
March Outlook

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

ONE-MONTH OUTLOOK TEMPERATURE PROBABILITY
0.5 MONTH LEAD
VALID MAR 2021
MADE 18 FEB 2021

ONE-MONTH OUTLOOK PRECIPITATION PROBABILITY
0.5 MONTH LEAD
VALID MAR 2021
MADE 18 FEB 2021

COLORADO CLIMATE CENTER
Further Information - Partners

• Today’s and Past Recorded Presentations:
  • https://mrcc.illinois.edu/multimedia/webinars.jsp
  • https://hprcc.unl.edu/webinars.php

• NOAA’s National Centers for Environmental Information: 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: https://drought.unl.edu/

• State climatologists: https://www.stateclimate.org

• Regional climate centers
  • https://mrcc.illinois.edu
  • https://hprcc.unl.edu
Thank you

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