North Central U.S. Climate Summary and Outlook Webinar
December 19, 2019

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Vince Godon: Corn dryer in operation near Stephen, MN

Vince Godon: Harvesting soybeans after freeze near Oslo, MN
General Information

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

• Next Climate/Drought Outlook Webinar
  • Thursday, Jan 16, 2020: TBD

• Access to Future Climate Webinars & Past Recordings can be found here:
  • http://mrcc.isws.illinois.edu/multimedia/webinars.jsp
  • http://www.hprcc.unl.edu/webinars.php

• Open for questions at the end
Agenda

- Jan-Nov and Autumn Recap
- November Conditions
- Snow/Water/Flood/Drought
- Agriculture
- State Impacts
- Climate Outlooks
- Summary
- Questions/Comments
Jan-Nov Recap
U.S. Jan-Nov Temperature
0.4°F above the 20th century average
45th Warmest since 1895.

Statewide Average Temperature Ranks
January–November 2019
Period: 1895–2019

Midwest Jan-Nov temperature
33rd Coolest since 1895
Coolest since 2014

Regional Average Temperature Ranks
January–November 2019
Period: 1895–2019

Contiguous U.S., Average Temperature, January-November
Trend: 0.15°F per decade

Upper Midwest Climate Region, Average Temperature, January-November
Trend: 0.18°F per decade

https://www.ncdc.noaa.gov/sotc/national/201911
U.S. Jan-Nov Temperature
4.55” above the 20th century average
The wettest since 1895

Midwest Jan-Nov temperature
The wettest since 1895
Exceeds the old record in 1993 by 2.41”

Trend: 0.17” per decade

Trend: 0.35” per decade

https://www.ncdc.noaa.gov/sotc/national/201911
## State Number of Stations Breaking the Annual Precipitation Accumulation Records

<table>
<thead>
<tr>
<th>State</th>
<th>Number of Stations Breaking the Annual Precipitation Accumulation Records</th>
</tr>
</thead>
<tbody>
<tr>
<td>WI</td>
<td>25</td>
</tr>
<tr>
<td>IL</td>
<td>16</td>
</tr>
<tr>
<td>MN</td>
<td>15</td>
</tr>
<tr>
<td>MI</td>
<td>5</td>
</tr>
<tr>
<td>MO</td>
<td>5</td>
</tr>
<tr>
<td>IA</td>
<td>1</td>
</tr>
<tr>
<td>IN</td>
<td>1</td>
</tr>
<tr>
<td>KY</td>
<td>1</td>
</tr>
<tr>
<td>OH</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>70</strong></td>
</tr>
</tbody>
</table>

2019 annual accumulated precipitation of 54.28” for Rochester, MN already exceeded the previous record in 1990 by 10.34”

Rochester has been breaking a precipitation record since Sep 19.
Autumn Recap
U.S. Sep-Nov Temperature
0.36°F above the 20th century average
52nd Warmest since 1895.

Midwest Sep-Nov temperature
50th Coolest since 1895.

https://www.ncdc.noaa.gov/sotc/national/201911
U.S. Sep-Nov Temperature
0.58” above the 20th century average
The 36th wettest since 1895.

Midwest Sep-Nov temperature
The wettest since 1895
Exceeds the old record in 1941 by 0.61”

Trend: 0.1” per decade

https://www.ncdc.noaa.gov/sotc/national/201911
November Recap
U.S. Nov Temperature
0.46°F below the 20th century average
48th Coolest since 1895.

Statewide Average Temperature Ranks
November 2019
Period: 1895-2019

Midwest Nov temperature
33rd Coolest since 1895.

Regional Average Temperature Ranks
November 2019
Period: 1895-2019

Contiguous U.S., Average Temperature, November

Trend: 0.15°F per decade

Upper Midwest Climate Region, Average Temperature, November

Trend: 0.2°F per decade

https://www.ncdc.noaa.gov/sotc/national/201911
U.S. Nov Temperature
0.37" below the 20th century average
The 32th driest since 1895.

Midwest Nov temperature
61st driest since 1895

Trend: 0.03" per decade  Trend: 0.02" per decade

https://www.ncdc.noaa.gov/sotc/national/201911
Snow
Accumulated Snowfall in November (in)

November 01, 2019 to November 30, 2019

Accumulated Snowfall (in)

- 15-20" in Paradise, MI
- 65.2" in Paradise, MI
https://www.nohrsc.noaa.gov/nwa/
Mountain Snowpack
Missouri River Basin – Mountain Snowpack Water Content
15-Dec-2019

Total above Fort Peck

Total Fort Peck to Garrison

The Missouri River Basin mountain snowpack normally peaks near April 15. On December 15, the mountain Snow Water Equivalent (SWE) in the “Total above Fort Peck” reach was 5.4", 96% of the December 15 average. On December 15, the mountain SWE in the Fort Peck to Garrison reach was 5.7", 108% of the December 15 average.

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

Provisional data. Subject to revision.
The North and South Platte River Basin mountain snowpacks normally peak near April 15 and the end of April, respectively. As of December 16, 2019, the mountain snowpack SWE in the "Total North Platte" reach is currently 7.9", 122% of average. The mountain snowpack SWE in the "Total South Platte" reach is currently 5.8", 120% of average.

Source: USDA, Natural Resource Conservation Service  Provisional Data. Subject to Revision
AHPS Observed Gauge Map

Legend:
- Purple: 7 Gauges: Major Flooding
- Red: 5 Gauges: Moderate Flooding
- Orange: 22 Gauges: Minor Flooding
- Yellow: 90 Gauges: Near Flood Stage
- Green: 5721 Gauges: No Flooding
- Blue: 2651 Flood Category Not Defined
- Brown: 32 At or Below Low Water Threshold
- Gray: 607 Gauges: Observations Are Not Current
- Black: 158 Gauges: Out of Service
Regional Long-Range Flood Outlook
Lake Superior

LAKE SUPERIOR WATER LEVELS – DECEMBER 2019

CHART DATUM 691.1 FEET (183.2 METERS)

LAKE SUPERIOR

LEGEND
RECORDED
PROJECTED

AVERAGE
1985 1985
1985 1985
1985 1985
1985 1985

MAXIMUM
1936 1934
1936 1934
1936 1934
1936 1934

MINIMUM
1926 1934
1926 1934
1926 1934
1926 1934

** Average, Maximum and Minimum for period 1918-2018
Lake Michigan-Huron

![Graph showing water levels in Lakes Michigan-Huron from December 2019 with data points from 1984 and projected lines to 2014. The chart includes a legend for recorded and projected lake levels, as well as average, maximum, and minimum water levels from 1973 to 1976.](image)
Lake Erie
Lake Ontario

LAKE ONTARIO WATER LEVELS – DECEMBER 2019

CHART DATUM 243.3 FEET (74.2 METERS)

LAKE ONTARIO

LEGEND

RECORDED
PROJECTED

AVERAGE **
MAXIMUM **
MINIMUM **

1936 1934 1926 1934

*** Average, Maximum and Minimum for period 1918-2018
### US Drought Monitor

**NWS Central Region**

**December 10, 2019**
*(Released Thursday, Dec. 12, 2019)*

**Valid 7 a.m. EST**

#### Drought Conditions (Percent Area)

<table>
<thead>
<tr>
<th></th>
<th>None</th>
<th>D0-D4</th>
<th>D1-D4</th>
<th>D2-D4</th>
<th>D3-D4</th>
<th>D4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current</td>
<td>87.57</td>
<td>12.43</td>
<td>7.00</td>
<td>3.31</td>
<td>0.11</td>
<td>0.00</td>
</tr>
<tr>
<td>Last Week</td>
<td>88.65</td>
<td>11.35</td>
<td>6.34</td>
<td>3.12</td>
<td>0.11</td>
<td>0.00</td>
</tr>
<tr>
<td>3 Months Ago</td>
<td>80.75</td>
<td>19.25</td>
<td>3.74</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Start of Year</td>
<td>85.98</td>
<td>14.02</td>
<td>8.17</td>
<td>5.23</td>
<td>2.44</td>
<td>1.01</td>
</tr>
<tr>
<td>Start of Water Year</td>
<td>79.05</td>
<td>20.95</td>
<td>8.02</td>
<td>2.19</td>
<td>0.14</td>
<td>0.00</td>
</tr>
<tr>
<td>One Year Ago</td>
<td>84.58</td>
<td>15.32</td>
<td>8.48</td>
<td>5.22</td>
<td>2.44</td>
<td>1.01</td>
</tr>
</tbody>
</table>

**Intensity**
- 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.

**Author:**
Deborah Batch
National Drought Mitigation Center

droughtmonitor.unl.edu
Agriculture
4-in Bare Soil Temperatures

4" Soil Temperature (°F) (Bare) 24-Hour Period Through 12/16/2019

- Mesonets, <= 32°F
- Mesonets, > 32°F
- COOP, <= 32°F
- COOP, > 32°F

NOTE: Spatial resolution is limited in some states.

https://mrcc.illinois.edu/RMP/currentMaps.html#banner
CPC Soil Moisture

Departure from Average

Calculated Soil Moisture Anomaly (mm)
DEC 17, 2019

Calculated Soil Moisture Ranking (Percentile)
DEC 17, 2019

Less than 1% of the times the soil moisture was greater than it is now, this time of the year

Corn Progress

2nd slowest corn harvest (through Nov. 17) in the last 25 years. Only 2009 was slower.
Sunflower Progress

U.S. Sunflowers Progress
Percent Harvested
December 8, 2019

Data obtained from preliminary National Agricultural Statistics Service (NASS) weekly crop progress and condition tables

<table>
<thead>
<tr>
<th>National Progress</th>
<th>73</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harvested</td>
<td></td>
</tr>
<tr>
<td>Change from Last Week</td>
<td>+8</td>
</tr>
</tbody>
</table>

TOP ## - Percent Harvested
[BOTTOM ##] - Change from Last Week

Crop Progress
- Less than 10%
- 10% - 19%
- 20% - 29%
- 30% - 39%
- 40% - 49%
- 50% - 59%
- 60% - 69%
- 70% - 79%
- 80% - 89%
- 90% or More

Slides courtesy of Brad Rippey, USDA/OCE
Impacts

- Cold Oct-Nov conditions across the region in combination with wet and snowy periods have made it challenging for farmers this year. Crop harvest was running several weeks behind normal across the region and the extreme wetness was creating other problems related to;
  - crop disease,
  - grain dry down,
  - stalk lodging,
  - compaction, and
  - fieldwork preparation for next year.
- Reports of propane shortages and propane distribution problems in region with grain drying and livestock in some states. Cold and wet conditions have led to high moisture content in seed, and slowing natural dry-down in fields.
Impacts on Social Media

Satellite image from Dec 3. Brown squares are corn still in the fields. Daryl Ritchison (@DarylRitchison), NDAWN, NDSU.

Tweet
Miranda Meehan
@NDSU_eX_Steward

According to data collected by @NDSUExtension agents, the majority of #livestock producers in the state are facing #forage shortages going into the #winter. Here are some tips from NDSU Extension Specialist Janna Block on stretching forage supplies. ag.ndsu.edu/news/newsrelea...
Impacts on Social Media

YTD 2019 Flood-related Crop Insurance Payments as of December 2.

Graphic and Analysis: @SteveBowenWx

Flood-Related Crop Insurance Payments
YTD 2019; As of December 2

TOTAL PAYOUT: $5.3 billion

Payouts by State
South Dakota: $957M
Illinois: $473M
Ohio: $423M
Minnesota: $400M
Missouri: $358M
North Dakota: $306M
Texas: $295M
Indiana: $290M
Arkansas: $254M
Michigan: $214M

Graphic and Analysis: @SteveBowenWx
Increasing drought/dryness on the south and west edges of the region causing concern for winter wheat establishment, and increasing fire danger. Attached is an image from the Goodland NWS office of a fire in Cheyenne County, KS (M. Knapp)

- The sugarbeet harvest ended as ACSC found beets uneconomical to process because of poor beet conditions, along with high levels of mud.
- Earlier in Nov, ACSC charged producers $343 per acre for the undelivered beets to cover the companies fixed cost.

A major flood along the Red River Valley is a major concern as the wettest fall is considered as a precursor of a major flood in the following spring.
• ND is seeking for a presidential disaster declaration in response to spring flooding, and then a Secretarial Disaster Designation for 47 of 53 counties following an October precipitation event that culminated in at least $423 million in crop damages for the ND producers and $5.9 million in infrastructure damages.

• In response to the flooding, Jamestown and Pipestem Dams have been in flood operations since September, and will continue to evacuate flood storage through the winter.

• Because the conditions in the upper MO River basin, USACE plans to be as aggressive with spring releases as downstream conditions allow. However, if the unregulated tributaries are flowing full and contributing a significant amount of flow to the Missouri River, the Corp will reduce releases to mitigate downstream flooding conditions.
Climate Outlooks

- 8 to 14-day Outlook
- 16-day QPF
- Jan Outlook
- ENSO Outlook
- Rest of the Winter
- Spring
8 to 14-day Outlook

Temperature

Precipitation

https://www.cpc.ncep.noaa.gov/products/predictions/814day/
16-Day Total Precipitation Outlook
(From Midnight Thu, Dec 19 through Midnight Sat, Jan 4)

https://weather.cod.edu/forecast/
• The majority of models including CPC CONSOL, DYN AVG and STAT AVG continue to favor ENSO-neutral through the Northern Hemisphere spring and summer.

https://iri.columbia.edu/our-expertise/climate/forecasts/enso/current/?enso_tab=enso-sst_table
January – March Outlook

Temperature

Precipitation

https://www.cpc.ncep.noaa.gov/products/predictions/long_range/
March – May (spring) Outlook

Temperature

Precipitation

https://www.cpc.ncep.noaa.gov/products/predictions/long_range/
April – June Outlook

Temperature

Precipitation

https://www.cpc.ncep.noaa.gov/products/predictions/long_range/
Despite the early snow, and the saturated soil, there is still a little progress with the corn being harvested in the Northern Plains.

Much of the region experienced cold to near-average temperatures in November in terms of precipitation with few exceptions (SD & KY were wet; KS was Dry).

Concerns for rivers freezing above flood stage as we go into winter;

Spring ice jams especially along rivers flows to North;

Dryness concerns for SW Wyoming, Colorado, SW Kansas, and SW Nebraska

Spring flood concerns for Missouri & Mississippi River Basins and potential delay in spring fieldwork preparation and planting.

Projected spring water levels in all Great Lakes are expected to be well above average (if not record levels).
Additional Resources from our Partners

- **Today’s and Past Recorded Presentations and:**
  - [http://mrcc.illinois.edu/multimedia/webinars.jsp](http://mrcc.illinois.edu/multimedia/webinars.jsp)
  - [http://hprcc.unl.edu/webinars.php](http://hprcc.unl.edu/webinars.php)

- 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)


- 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
  - [http://mrcc.isws.illinois.edu](http://mrcc.isws.illinois.edu)
  - [http://www.hprcc.unl.edu](http://www.hprcc.unl.edu)
Thank You and Questions?

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