Kansas Drought Update

Kansas Water Office
December 7, 2020
Kansas Annual Rainfall

\[ y = 0.026x + 26.11 \]
Statewide Average Temperature Rank (of 126 years)

Contiguous U.S.
Temp: 57.0°F
Rank: 6th Warmest
Anomaly: 2.1°F
Mean: 55.0°F

Kansas
Temp: 58.3°F
Rank: 39th Warmest
Anomaly: 0.7°F
Mean: 57.6°F

Climate.gov
Statewide Precipitation Rank (of 126 years)

Contiguous U.S.
Precip: 26.30”
Rank: 40th Wettest
Anomaly: 0.94”
Mean: 25.36”

Kansas
Precip: 23.58”
Rank: 50th Driest
Anomaly: -1.28”
Mean: 24.86”

Climate.gov
Statewide Average Temperature Rank (of 126 years)

August - October 2020

**Contiguous U.S.**
- Temp: 65.0°F
- Rank: 16th Warmest
- Anomaly: 1.3°F
- Mean: 63.7°F

**Kansas**
- Temp: 65.1°F
- Rank: 8th Coldest
- Anomaly: -2.4°F
- Mean: 67.5°F

[Climate.gov](http://Climate.gov)
Rank – Fall 2020

Statewide Precipitation Rank (of 126 years)

Contiguous U.S.
Precip: 6.97"  Rank: 44th Driest  Anomaly: -0.30"  Mean: 7.27"

Kansas
Precip: 4.41"  Rank: 5th Driest  Anomaly: -3.50"  Mean: 7.91"

Climate.gov
**What Is The U.S. Drought Monitor?**

Maybe you've seen it in the media: that map of the U.S. painted with blobs of yellow, orange and red. It shows drought – but how do we know which colors go where? Who decides? What does it mean for you? Read below to find out.

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Possible Impacts</th>
<th>Ranges</th>
</tr>
</thead>
<tbody>
<tr>
<td>D0</td>
<td>Abnormally Dry</td>
<td>Going into drought</td>
<td>-1.0 to -1.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• shortened growing seasons, planting, growth of crops or pastures</td>
<td>21 to 30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Coming out of drought</td>
<td>21 to 30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• irrigating crops, increasing water deficit</td>
<td>-0.5 to -0.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• pastures or crops not fully recovered</td>
<td>21 to 30</td>
</tr>
<tr>
<td>D1</td>
<td>Moderate Drought</td>
<td>Some damage to crops, pastures</td>
<td>-2.0 to -2.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• streams, reservoirs, or wells low, some water shortages developing or imminent</td>
<td>11 to 20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• voluntary water use restrictions requested</td>
<td>-0.8 to -1.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• increased water use restrictions</td>
<td>11 to 20</td>
</tr>
<tr>
<td>D2</td>
<td>Severe Drought</td>
<td>Crop or pasture losses likely</td>
<td>-3.0 to -3.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• water shortages common</td>
<td>6 to 10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• water restrictions imposed</td>
<td>6 to 10</td>
</tr>
<tr>
<td>D3</td>
<td>Extreme Drought</td>
<td>Major crop/pasture losses</td>
<td>-4.0 to -4.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• widespread water shortages or restrictions</td>
<td>3 to 5</td>
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<tr>
<td>D4</td>
<td>Exceptional Drought</td>
<td>Exceptional and widespread crop/pasture losses</td>
<td>-5.0 or less</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• shortages of water in reservoirs, streams, and wells</td>
<td>0 to 2</td>
</tr>
</tbody>
</table>

[https://droughtmonitor.unl.edu/](https://droughtmonitor.unl.edu/)
<table>
<thead>
<tr>
<th>Category</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>D0</td>
<td>Stock pond levels decrease, planting is delayed (particularly for winter wheat), irrigation/watering demands increase</td>
</tr>
</tbody>
</table>
| D1       | Wheat and grasses are drought stressed; hay demand increases  
          | Fire danger increases  
          | Pond levels are low; habitat is poor in migratory flyways |
| D2       | Wheat, corn, soybean, and hay yields are low; crops are severely damaged  
          | Burn bans are implemented; firework sales are banned; more grass fires occur  
          | Blue-green algae impacts water supply; ponds and streams are dry |
| D3       | Cattle sales are high; emergency grazing is opened; corn and wheat crops fail; pasture conditions are poor  
          | Major infestation of locusts occurs; quail and pheasant populations are reduced; trees are stressed  
          | Emergency water supplies are needed; river levels are low; municipal water restrictions are implemented |
| D4       | All crops are severely impacted/not harvested; ground is cracking  
          | Wildfires and large dust storms occur  
          | All aquatic species and food chains are affected; fish kills occur  
          | Negative impact on economy is noted  
          | Irrigation is turned off; river has dried up |

https://droughtmonitor.unl.edu/
# Latest Drought

**December 1, 2020**  
(Released Thursday, Dec. 3, 2020)  
Valid 7 a.m. EST

## Drought Conditions (Percent Area)

<table>
<thead>
<tr>
<th></th>
<th>None</th>
<th>D0</th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current</strong></td>
<td>14.76</td>
<td>24.69</td>
<td>40.08</td>
<td>10.46</td>
<td>10.01</td>
<td>0.00</td>
</tr>
<tr>
<td><strong>Last Week</strong></td>
<td>12.80</td>
<td>18.18</td>
<td>43.17</td>
<td>16.36</td>
<td>9.50</td>
<td>0.00</td>
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<tr>
<td><strong>3 Months Ago</strong></td>
<td>63.39</td>
<td>21.65</td>
<td>10.83</td>
<td>3.49</td>
<td>0.65</td>
<td>0.00</td>
</tr>
<tr>
<td><strong>Start of Calendar Year</strong></td>
<td>67.13</td>
<td>22.98</td>
<td>5.67</td>
<td>4.22</td>
<td>0.00</td>
<td>0.00</td>
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<tr>
<td><strong>Start of Water Year</strong></td>
<td>22.82</td>
<td>60.25</td>
<td>12.50</td>
<td>3.74</td>
<td>0.68</td>
<td>0.00</td>
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<tr>
<td><strong>One Year Ago</strong></td>
<td>51.64</td>
<td>30.14</td>
<td>12.70</td>
<td>3.93</td>
<td>1.60</td>
<td>0.00</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*
Change in Kansas Conditions

U.S. Drought Monitor Class Change - Kansas
1 Week

December 1, 2020
compared to
November 24, 2020

droughtmonitor.unl.edu
Departure from Normal Precipitation Summary

January 1, 2020 - May 18, 2020

Produced by Weather Data Library
Department of Agronomy
Kansas State University

Spring 2020
Departure from Normal Monthly Precipitation
September 1 - September 30, 2020

Produced by Weather Data Library
Department of Agronomy
Kansas State University
Departure from Normal Monthly Precipitation
October 1 - October 31, 2020

Produced by Weather Data Library
Department of Agronomy
Kansas State University
Soil Moisture Levels

Percent of Soil Saturation
as of November 18, 2020

2 Inch

4 inch
Soil Moisture Levels

Percent of Soil Saturation
as of December 1, 2020

2 Inch

4 inch
## Past La Niña Winters

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<th>Year</th>
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<th>JFM</th>
<th>FMA</th>
<th>MAM</th>
<th>AMJ</th>
<th>MJJ</th>
<th>JJA</th>
<th>JAS</th>
<th>ASO</th>
<th>SON</th>
<th>OND</th>
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<td>-0.6</td>
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<td>0.8</td>
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<td>2010</td>
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</tbody>
</table>
Winter Precipitation

Seasonal Precipitation during La Niña vs 1981-2010 Normals

Total Precipitation (inches)

-3.00
-2.00
-1.00
0.00
1.00
2.00
3.00
4.00
5.00


NDJ Pcp Qotr
**U.S. Seasonal Drought Outlook**

Valid for November 19, 2020 - February 28, 2021

**Drought Tendency During the Valid Period**

Released November 19, 2020

This map depicts the seasonal drought outlook for the United States. The outlook is based on large-scale trends and statistical and dynamical forecasts. The key is as follows:

- **Drought persists**
- **Drought remains but improves**
- **Drought removal likely**
- **Drought development likely**

NOTE: The fan 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).

Author:
Adam Allgood  
NOAA/NWS/NCEP/Climate Prediction Center

[Map Legend and Key](http://go.usa.gov/3eZ73)
• Increased wind erosion potential
• Stress on Winter Wheat
• Falling surface water supplies – particularly stock ponds
• Increased fire danger
Heavy rainfall and severe weather threat diminishes over the Southeast overnight, winter storm to impact the West Tuesday

The heavy rainfall and severe weather threat over the Southeast U.S. will diminish. A strong cold front will impact the Western U.S. overnight through Tuesday. Winter Storm Warnings, Watches, and Advisories are in effect. Portions of the Sierra’s and Rockies could see one foot of snow and travel impacts.

Read More
Resources

Data Snapshots: Reusable Climate Maps

Browse the Dataset Gallery
This visual catalog with convenient filtering options can help you find the climate data you need. How-to instructions can help you navigate data access tools.

Enter the Dataset Gallery

GIS Data Locator (Advanced Users)
Launch Map Application

Climate Data Primer
Ready to learn some of the basics about climate data? Find out about measuring, modeling, and predicting climate and ways to find and use climate data.

The Primer includes information on instruments used to measure weather and climate; how weather observations relate to climate products; how climate scientists check...
• National Weather Service
  – http://weather.gov
• Climate
  – http://climate.gov
• Climate Predication Center
  – http://www.cpc.ncep.noaa.gov/
• Community Collaborative Rain Hail Snow (CoCoRaHS)
  – http://cocorahs.org/
Contact Information

• Weather Data Library
• Department of Agronomy
• Kansas State University
• Manhattan, KS 66506
• PH: office (785) 532-7019
  • Cell (785) 313-1562
• E-mail: kansas-wdl@k-state.edu
• URL: mesonet.k-state.edu
• URL: climate.k-state.edu
Kansas 2020-2021 Winter-Spring Climate Outlook

Doug Kluck
Regional Climate Services Director
NOAA's National Centers for Environmental Information
Kansas City, MO

December 7th, 2020
For the Kansas Water Office
La Niña

Typical wintertime La Niña pattern

variable Polar Jet Stream

blocking high pressure

colder

wetter

warmer

drier

NOAA Climate.gov
Since 1950
- Multitude of outcomes
- Variability will rule
- Falls tend to be dry and relatively warm
- 2010-2011
- 2011-2012
- 2017-2018
Winter Precipitation Patterns for Strongest La Niñas

Since 1950
Multitude of outcomes
Variability will rule
Falls tend to be dry and relatively warm
2010-2011
2011-2012
2017-2018
Temperature and Precipitation

Weeks 3 & 4 (12/19/20 – 1/1/21)
December 2020
Temperature & Precipitation Outlook

http://www.cpc.noaa.gov/
December 2020 – February 2021
Temperature & Precipitation Outlook

Temperature

Precipitation

http://www.cpc.noaa.gov/
March - May 2021
Temperature & Precipitation Outlook

Temperature

Precipitation

http://www.cpc.noaa.gov/
Drought Conditions

U.S. Drought Monitor
Kansas

December 1, 2020
(Released Thursday, Dec. 3, 2020)
Valid 7 a.m. EST

<table>
<thead>
<tr>
<th>Drought Conditions (Percent Area)</th>
<th>None</th>
<th>D0-D4</th>
<th>D1-D4</th>
<th>D2-D4</th>
<th>D3-D4</th>
<th>D4</th>
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</thead>
<tbody>
<tr>
<td>Current</td>
<td>14.76</td>
<td>85.24</td>
<td>0.00</td>
<td>0.00</td>
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<tr>
<td>Last Week</td>
<td>12.90</td>
<td>87.20</td>
<td>0.00</td>
<td>0.00</td>
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<td>0.00</td>
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</tbody>
</table>

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

Valid for November 19, 2020 - February 28, 2021
Released November 19, 2020

Author: Audra Allgood
NOAA/NWS/NCEP/Climate Prediction Center

https://droughtmonitor.unl.edu/Maps/MapArchive.aspx
https://www.cpc.ncep.noaa.gov/
Current Conditions

* Dry
* Strong “La Niña” ongoing, probably through spring 2021

Outlook

* Temperatures: leans warm (short and long term)
* Precipitation: leans dry (short and long term)
  * Tendency for more southern-central plains dryness in late winter into spring
* La Niñas tend to be quite variable with big swings
  * Stay tuned ... changes are inevitable over the next few months
Next NOAA State & Regional Partners Climate Webinar on December 17th, 1:00 pm CT

Sign up here: https://attendee.gotowebinar.com/register/7528179497868100876

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O: 816-994-3008
C: 816-564-2417