United States Drought Monitor homepage

droughtmonitor.unl.edu
Menu Options and available data on the U.S. Drought Monitor homepage
Contact information for the USDM Authors is available at:

http://droughtmonitor.unl.edu/AboutUSDM/ContactUs.aspx
The U.S. Drought Monitor

Since 1999, NOAA (CPC, NCEI, WRCC), USDA, and the NDMC in an EQUAL Partnership have produced a weekly composite drought map -- the U.S. Drought Monitor -- with input from numerous federal and non-federal agencies

- 11 current authors, 2 legacy authors
- Western Region Climate Center on board 2008
- Incorporate relevant information and products from all entities (and levels of government) dealing with drought (RCC’s, SC’s, federal/state agencies, etc.) (450+ experts)
**U.S. Drought Monitor**

USDA Northern Plains Climate Hub

**June 13, 2017**
(Released Thursday, Jun. 15, 2017)
Valid 8 a.m. EDT

**Drought Conditions (Percent Area)**

<table>
<thead>
<tr>
<th></th>
<th>00-04</th>
<th>01-04</th>
<th>02-04</th>
<th>03-04</th>
<th>04-04</th>
<th>05-04</th>
<th>06-04</th>
<th>07-04</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current</strong></td>
<td>65.98</td>
<td>34.02</td>
<td>21.59</td>
<td>7.66</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td><strong>Last Week</strong></td>
<td>65.25</td>
<td>34.75</td>
<td>21.80</td>
<td>3.19</td>
<td>0.00</td>
<td>0.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>3 Months Ago</strong></td>
<td>75.05</td>
<td>24.95</td>
<td>12.90</td>
<td>0.80</td>
<td>0.04</td>
<td>0.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Start of Calendaryear</strong></td>
<td>61.47</td>
<td>38.53</td>
<td>15.05</td>
<td>1.47</td>
<td>0.00</td>
<td>0.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Start of Water Year</strong></td>
<td>62.66</td>
<td>37.34</td>
<td>14.21</td>
<td>3.08</td>
<td>0.23</td>
<td>0.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>One Year Ago</strong></td>
<td>76.43</td>
<td>21.57</td>
<td>5.05</td>
<td>0.22</td>
<td>0.00</td>
<td>0.00</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Intensity:**
- 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. See accompanying text summary for forecast statements.

**Author:**
David Miskus
NOAA/NWS/NCEP/CPC

http://droughtmonitor.unl.edu/
Seasonal Drought Outlook

Released on the 3rd Thursday of every month by NOAA’s Climate Prediction Center (CPC).

Monthly Drought Outlooks are released at the end of each month for the next month by CPC.
How is all of this done?
Requirement: Authors must work at a regional or national “center”, government or academia/research
There are currently 11* authors, and all are volunteers
U.S. Drought Monitor Objectives

Assessment of **current** conditions and **current** impacts

The U.S. Drought Monitor is **NOT** a model
- The map is made manually each week based off the previous map

The U.S. Drought Monitor is **NOT** interpreting just precipitation

The U.S. Drought Monitor is **NOT** a forecast or drought declaration
- Can be used by decision makers in this way though

Identifying **impacts**
- "S" short-term impacts, "L" long-term impacts or "SL" for a combination of both
- "S"-6 month time scales or less, "L"-greater than 6 month time scales

Incorporate **local expert** input
- Accomplished via email and impact reports

Authors try to be as **objective** as possible (using the percentiles methodology)
- The physical data and indicators **must** support the depiction on the map
- Impact data validates physical data

"**Convergence of evidence**" approach
U.S. Drought Monitor Approach

“Convergence of Evidence”

- Many types of drought “information” can be collectively analyzed
  - *Determining if the majority of information is ‘converging’ (telling the same story)* about the accuracy, or inaccuracy, of the drought as depicted by the U.S. Drought Monitor

- Authors need to **look at 100% of the data, BUT don’t believe in any one piece of data input 100%** in making a decision...

- **Multiple indicators and many types of information are part of the analysis**
  - These data will identify different climatic and hydrologic parameters which are needed to understand the complete picture of a drought indicator’s performance and how they interact

- **Impacts are the “ground truth”**, yet aren’t monitored to the extent which other data are....you can’t measure what you don’t monitor!
Percentiles and the U.S. Drought Monitor

Advantages of percentiles:
- Can be applied to any parameter
- Can be used for any length of data record
- Puts drought in historical perspective
  - How many occurrences in a given period of time

- D4: Exceptional Drought (1st-2nd percentile)
- D3: Extreme Drought (3rd-5th percentile)
- D2: Severe Drought (6th-10th percentile)
- D1: Moderate Drought (11th-20th percentile)
- D0: Abnormally Dry (21st-30th percentile)
The drought categories are associated with historical occurrence/likelihood (percentile ranking) It is not anecdotal or subjective, like “It’s really, really dry!!” ….or, “I don’t remember it ever being this dry, we have to be D4!!”
What are percentiles?

<table>
<thead>
<tr>
<th>Percentile</th>
<th>Category</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>D0</td>
<td>Abnormally Dry</td>
<td>21-30</td>
</tr>
<tr>
<td>D1</td>
<td>Moderate Drought</td>
<td>11-20</td>
</tr>
<tr>
<td>D2</td>
<td>Severe Drought</td>
<td>6-10</td>
</tr>
<tr>
<td>D3</td>
<td>Extreme Drought</td>
<td>3-5</td>
</tr>
<tr>
<td>D4</td>
<td>Exceptional Drought</td>
<td>1-2</td>
</tr>
</tbody>
</table>

Most Precipitation 2007: 39.08”

Least Precipitation 2012: 11.58”

Near Normal 31-100 Percentile

1 – 2 percentile
Most of the information analyzed each week falls into one of these categories. Authors now use roughly **40-50 unique indicators** while creating the U.S. Drought Monitor map, but not all areas are represented equally by all pieces of data.
Integrates Key Drought Indicators:

- Palmer Drought Index
- SPI
- SPEI
- KBDI
- Modeled Soil Moisture
  - NLDAS
- 7-14 Day Avg. Streamflow
- Precipitation Anomalies
- AHPS Precipitation
- Other data which are available

Growing Season:

- Crop Moisture Index
- Sat. Veg. Health Index
- VegDRI/ESI/etc.
- Soil Moisture
- Mesonets
- State/Regional data

In The West:

- SWSI
- Reservoir levels
- Snowpack (SNOTEL)
- SWE
- Streamflow

Created in ArcGIS
Regional and Local Feedback/Input Process

Annual User **Feedback Forums** (USDM/NADM) since 2000

Various webinars/telecons/reports/data/products

**Regional Climate Centers** and NOAA **Regional Climate Service Directors and Coordinators along w/ Weather Forecast Offices (WFOs)**

**State Climatologists**

**USDA FSA/NRCS**

**Native American Tribal input**

**CoCoRaHS (impacts)**

National Integrated Drought Information System (**NIDIS** **Pilot RDEWS**) basin webinars:

- UCRB (Upper Colorado River Basin)
- ACF (Apalachicola-Chattahoochee-Flint)
- Southern Plains
- MORB (Missouri River Basin)
- California/Nevada
- Pacific Northwest/Midwest (both coming online)

**Drought Task Forces:** North Carolina, Hawaii, Oklahoma, Texas, New Mexico, Alabama, Florida, South Dakota, Kentucky, Arizona, Montana, and California

And MANY OTHERS!
USDM Listserve Subscribers
(as of August 24, 2016)

Total: 394 (does not include 2 participants from Canada and 2 participants from Brazil)

432 Subscribers as of 6/13/2017!
Where is drought this week?

As of June 7-13, 2017, drought (SI: D4) is impacting:

7.1% of the US and 7.3% of the lower 48 states.

19.5 million people in the U.S. and 16.4 in the lower 48 states.

The central Plains and Midwest have become dry and warm during the past several weeks, raising concerns of rapid topsoil moisture loss and declining crop conditions. In contrast, unsettled weather across the Northwest and into the northern Plains brought measurable snow to higher elevations of the Sierras while also producing scattered thunderstorms to parts of the drought-stricken Dakotas. In the Southeast, a stalled front dumped moderate to heavy rainfall (2-4 inches, locally over a foot) along the coastal areas of the eastern Gulf and southern Atlantic coasts, especially in Florida. In Hawaii, recent drier weather on windward sides of Maui and the Big Island led to expansion of abnormal drought, while wetter weather in Alaska erased wildfire conditions.
Missouri River Basin Drought Early Warning System (DEWS)

https://www.drought.gov/drought/dews/missouri-river-basin

Missouri River Basin Drought Early Warning System

Conditions for the week of June 7-13

After a dry and hot early June, a storm system tracked across the northern Plains, sending adequate temperatures and finally bringing rain (1.3 inches) to parts of the Dakotas. For the most part, the rains were not great enough to make notable improvements to the drought, but where 1.0 or more is recorded, especially in eastern sections of the Dakotas, drought was reduced. Moderate drought (D3) was also slightly reduced in south central South Dakota and southeastern North Dakota where bands of 2.0-2.5 inches of rain fell. Above normal dryness (B0) was reduced in the southeastern Montana and northeastern Wyoming where near normal long term (extended time) station index data (19%) were closer to normal or even wet. In contrast, drier than normal extended time data remained in eastern Nebraska where April-June are normally the wettest months of the year. D0 and D1 were expanded nationwide, and severe drought (D2) was added to encompass locations such as Elkhart, Crook, Fort Pierre, Jordan, Brookings, and Sioux that reported no rainfall or less than April 1 June 12 rainfall. Total rainfall from 1.25% of normal. In the central Dakotas, a strong I-90 corridor dried out and northern NE and southwestern IA D0 also pushed into extreme northern North Dakota and southwestern South Dakota. Even with I-90 dried, the rain fell across ND, SD, NE, WY, and MT, helping to reduce the dryness. In NE/SD, cattle producers were watching the drier conditions closely as the ND High Plains begin to dry up. Spring wheat conditions in the June USDA/NASS report remained poor or very poor in NE (23%), ND (17%), and SD (27%). Similarly, MD (50%), DB (48%), and ND (10) percent of the crop were in moderate and extreme dryness, respectively. A 30-day period fractional precipitation (percentage below 30%) of normal occurred in eastern Kansas, central AR, and MO was added, based upon the criteria for extreme drought dryness.

Read more about the Missouri River Basin DEWS

U.S. Drought Monitor - Missouri River Basin DEWS

As of June 13, 2017

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NOAA/NWS/NCEP/CPC

NATIONAL DROUGHT MITIGATION CENTER
OUR PARTNERS
Any Questions?
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