DROUGHT★MART

Your One-Tool Drought Monitoring Super Store

Developing a New and Improved Drought Monitor for the U.S.

Brian Fuchs
National Drought Mitigation Center
University of Nebraska-Lincoln

USDA-RMA Workshop Raleigh, NC
April 1, 2010
Moving toward state-level trend analysis capabilities (left) and providing more county-level drought assessment information (right).
The U.S. Drought Monitor

Since 1999, NOAA (CPC and NCDC), USDA, and the NDMC have produced a weekly composite drought map -- the U.S. Drought Monitor -- with input from numerous federal and non-federal partners.

August 3, 1999
Experimental U.S. Drought Monitor

U.S. Drought Monitor
April 16, 2002

Drought Impact Types:
A = Agriculture
W = Water (Hydrological)
F = Fire danger
P = Physical

http://drought.unl.edu/dm
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

http://drought.unl.edu/dm

Released Thursday, March 25, 2010
Author: Brad Rippey, U.S. Department of Agriculture
Do you currently use the United States Drought Monitor

A. Yes

B. No
The Drought Monitor Concept

A **partnership** between the NDMC, USDA and NOAA’s CPC, NCDC, and RCC’s (WRCC) (authors)

Incorporate relevant information and products from all entities (and levels of government) dealing with drought (RCC’s, SC’s, federal/state agencies, etc.) (experts)

The **Drought Monitor** is *updated weekly* and provides a general up-to-date summary of current drought conditions across the 50 states, Puerto Rico and the Pacific possessions.
The Drought Monitor Concept

A consolidation of indices and indicators into one comprehensive national drought map

Trying to capture these characteristics:
- the drought’s magnitude (duration + intensity)
- spatial extent
- probability of occurrence
- Impacts

Rates drought intensity by **percentile ranks**
Original Objectives

- “Fujita-like” scale
- **NOT** a forecast!
- **NOT** a drought declaration!
- Identify **impacts** (A, H)
- Assessment of **current** conditions
- Incorporate **local expert** input
- Be as **objective** as possible
U.S. Drought Monitor Map

Drought Intensity Categories

- **D0** Abnormally Dry (30% tile)
- **D1** Drought – Moderate (20% tile)
- **D2** Drought – Severe (10% tile)
- **D3** Drought – Extreme (5% tile)
- **D4** Drought – Exceptional (2% tile)
Principal Drought Monitor Inputs

USGS Streamflow

CPC Daily Soil Model

Palmer Drought Index

SPI Drought Index

USDA Soil Ratings

Satellite Veg Health
Integrates Key Drought Indicators:
- Palmer Drought Index
- SPI
- KBDI
- Modeled Soil Moisture
- 7-Day Avg. Streamflow
- Precipitation Anomalies

Growing Season:
- Crop Moisture Index
- Sat. Veg. Health Index
- Soil Moisture
- Mesonet data

In The West:
- SWSI
- Reservoir levels
- Snowpack
- Streamflow

Created in ArcGIS
Monitor Development  
(Period starts 12Z last Tuesday)

Monday  
(5 Days available)
✓ Draft map sent to local experts

Tuesday  
(6 Days available)
✓ Local expert feedback
✓ Draft map sent to local experts
✓ Draft text sent to local experts

Wednesday  
(7 Days available; ending 12Z yesterday)
✓ Local expert feedback
✓ Draft map(s) sent to local experts
✓ Draft text(s) sent to local experts (Outlook)
✓ Final map and text sent to secured ftp server

Thursday
✓ Final map & text released on NDMC Website
USDM Listserv Subscribers (as of February 2, 2009)

Total: 260 (does not include 2 participants from unknown locations and 1 participant from Canada)
USDM Listserv Subscribers  
(as of February 2, 2009)
Visit the [NDMC Photo Gallery](http://drought.unl.edu/dm/monitor.html) to see photos of drought conditions in California, Georgia, South Carolina, and other states. If you have photos showing drought conditions, please consider submitting them to the Photo Gallery.

The data cutoff for Drought Monitor maps is Tuesday at 7 a.m. Eastern Standard Time. The maps, which are based on analysis of the data, are released each Thursday at 8:30 a.m. Eastern Time.

**NOTE:** To view regional drought conditions, click on map below. State maps can be accessed from regional maps.

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**U.S. Drought Monitor**  
February 3, 2009  
Valid 8 a.m. EST

![Map of U.S. Drought Monitor](http://drought.unl.edu/dm/monitor.html)

**Intensity:**  
- D0 Abnormally Dry  
- D1 Drought - Moderate  
- D2 Drought - Severe  
- D3 Drought - Extreme  
- D4 Drought - Exceptional

**Drought Impact Types:**  
- ~ Delineates dominant impacts  
- A = Agricultural (crops, pastures, grasslands)  
- H = Hydrological (water)

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

[http://drought.unl.edu/dm](http://drought.unl.edu/dm)  
**Released Thursday, February 5, 2009**  
**Author:** Eric Luebhusen, U.S. Department of Agriculture
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

http://drought.unl.edu/dm
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

http://drought.unl.edu/dm
### Drought Monitor Archives

#### Contiguous U.S.
- Alabama
- Alaska
- Arizona
- Arkansas
- California
- Colorado
- Connecticut
- Delaware
- District of Columbia
- Florida
- Georgia
- Hawaii
- Idaho

#### States
- Illinois
- Indiana
- Iowa
- Kansas
- Kentucky
- Louisiana
- Maine
- Maryland
- Massachusetts
- Michigan
- Minnesota
- Mississippi
- Missouri

#### Additional States
- Montana
- Nebraska
- Nevada
- New Hampshire
- New Jersey
- New Mexico
- New York
- North Carolina
- North Dakota
- Ohio
- Oklahoma
- Oregon
- Pennsylvania
- Puerto Rico
- Rhode Island
- South Carolina
- South Dakota
- Tennessee
- Texas
- Utah
- Vermont
- Virginia
- Washington
- West Virginia
- Wisconsin
- Wyoming

#### Drought Severity
- D0 - Abnormally Dry
- D1 - Drought - Moderate
- D2 - Drought - Severe
- D3 - Drought - Exceptional
- D4 - Drought - Extreme

### Table

<table>
<thead>
<tr>
<th>Week</th>
<th>Nothing</th>
<th>D0-D4</th>
<th>D1-D4</th>
<th>D2-D4</th>
<th>D3-D4</th>
<th>D4</th>
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<td>March 31, 2009</td>
<td>58.06</td>
<td>41.94</td>
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</table>
Drought Conditions: January 2008-January 2009

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<th>Week</th>
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<th>D0</th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
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<td>11.61</td>
<td>88.39</td>
<td>62.14</td>
<td>37.54</td>
<td>16.48</td>
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<td>January 20, 2008</td>
<td>26.85</td>
<td>73.14</td>
<td>46.84</td>
<td>22.72</td>
<td>16.04</td>
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<td>28.85</td>
<td>71.04</td>
<td>43.02</td>
<td>20.99</td>
<td>16.04</td>
<td>4.15</td>
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<td>January 6, 2008</td>
<td>41.67</td>
<td>58.33</td>
<td>24.52</td>
<td>14.96</td>
<td>9.07</td>
<td>4.15</td>
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<td>December 30, 2008</td>
<td>48.06</td>
<td>51.94</td>
<td>24.52</td>
<td>14.96</td>
<td>9.07</td>
<td>4.15</td>
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<td>47.65</td>
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<td>24.56</td>
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<td>December 16, 2008</td>
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<td>24.56</td>
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<td>4.15</td>
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<td>December 9, 2008</td>
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<td>47.10</td>
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<td>December 2, 2008</td>
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<td>November 26, 2008</td>
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<td>14.23</td>
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Climate Links for Texas

Southern Regional Climate Center:
http://www.srcc.lsu.edu

Bureau of Reclamation Reservoir Levels:
http://www.usbr.gov/gp/water/rfcflow.cfm

USGS Real-Time Streamflow Data:
http://waterdata.usgs.gov/tx/nwis/rt
Local Weather Forecast Office: http://www.srh.noaa.gov/ewx

State Climatologist: http://www.met.tamu.edu/osc


Precipitation: January 2008-January 2009

Drought Impacts for Austin, TX

Water Impact 12/11/2008

Austin, Texas—The Barton Springs/Edwards Aquifer Conservation District is in a critical stage drought. Those who pump groundwater in the district must reduce...
The goal of the atlas is to provide usable tools and products for users at all levels by giving them the ability to visualize and assess their drought risk through a variety of web-based options. The example above shows how producers and other decision makers can assess drought at a variety of time scales and at user-defined spatial levels.
Homogeneous clusters were developed using relationships between precipitation, elevation, latitude and longitude.
✓ 23 Discordant points for the Summer (1.1%)
✓ 7 clusters out of 135 failed Homogeneity tests (5.2%) for the Summer season
✓ For all Seasons, 80 clusters passed all Homogeneity tests
Some Examples of Decision Making Using the DM

- USDA Dried Milk Program 2002-03
- USDA CRP Release hot spot trigger
- Numerous states use as a drought trigger (Governor’s declarations)
- 2006-07 USDA Livestock Assistance
- 2006-07 IRS (tax deferral on livestock losses)
- 2008 Farm Bill
- NWS Drought Information Statements
What Resolution of the United States Drought Monitor is the most Useful to you?

- A. National
- B. Regional
- C. County
- D. Sub-County

[Default]
[MC Any]
[MC All]
Thank you!

Please visit us at: http://drought.unl.edu/

Please contact me at: bfuchs2@unl.edu
402-472-6775
DM/DSS Discussion Questions

❖ What features did you like most from what were presented to you about the DM/DSS?

❖ What features are lacking or what would you like to see in the DM/DSS that are not currently there or proposed to be there?

❖ How do you currently use the information provided on the United States Drought Monitor now?

❖ Would a historical perspective of drought indices be helpful to compare current drought in magnitude and intensity?