DROUGHT★MART:
Your One-Tool Drought Monitoring Super Store

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

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National Drought Mitigation Center
University of Nebraska-Lincoln

USDA-RMA Workshop Bastrop, TX
February 12, 2009
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 Monitor Notes:
- "Drought" means moisture shortages leading to damaged crops or pastures, high wildfire risk, or water shortages. The map is based on information from many sources, including both satellite and surface data, and it focuses on widespread drought. Local conditions may vary.
- Values: (D9) = Drought Watch Area (abnormally dry but not full drought status).
- Red (D1-D4) = Current drought ranging in severity from standard (D1) to severe (D2-D3) to extreme (D4).
- Green shading = Overlapping drought type areas.
- Drought type: Used when impacts differ.
- Ag = agricultural crops, grasslands
- Fire = fire activity (wildfire potential)
- Hyd = hydrological (river, wet, reservoirs)
- Plus (+) = Forecast to increase
- Minus (-) = Forecast to diminish

U.S. Drought Monitor Website: http://drought.unl.edu/udm

Released Thursday, April 18, 2002
Author: David Markus, NWS/PCC/NOAA
Do you currently use the United States Drought Monitor?

YES

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

USDA Soil Ratings

SPI Drought Index

90 Day SPI
1/16/2008 - 4/14/2008

U.S. Drought Monitor
April 15, 2008
Valid 9 am EDT

Satellite Veg Health

Principal Drought Monitor Inputs

USGS Streamflow

CPC Daily Soil Model

Palmer Drought Index

USDA Soil Ratings

SPI Drought Index

90 Day SPI
1/16/2008 - 4/14/2008

U.S. Drought Monitor
April 15, 2008
Valid 9 am EDT

Satellite Veg Health
U.S. Drought Monitor

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 Listserve 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)

- **EDU**: 30% (79 subscribers)
- **NOAA**: 52% (136 subscribers)
- **USDA**: 2% (6 subscribers)
- **USGS**: 7% (6 subscribers)
- **State govt.**: 2% (16 subscribers)
- **Other**: 3% (7 subscribers)
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.
## U.S. Drought Monitor

### South

#### 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>32.2</td>
<td>67.8</td>
<td>41.6</td>
<td>24.4</td>
<td>9.9</td>
<td>3.4</td>
</tr>
<tr>
<td>Last Week (01/27/2009 map)</td>
<td>32.6</td>
<td>67.4</td>
<td>38.1</td>
<td>20.6</td>
<td>8.3</td>
<td>2.1</td>
</tr>
<tr>
<td>3 Months Ago (11/11/2008 map)</td>
<td>67.1</td>
<td>32.9</td>
<td>16.5</td>
<td>11.1</td>
<td>5.2</td>
<td>0.0</td>
</tr>
<tr>
<td>Start of Calendar Year (01/06/2009 map)</td>
<td>54.4</td>
<td>45.6</td>
<td>18.0</td>
<td>8.0</td>
<td>4.6</td>
<td>2.1</td>
</tr>
<tr>
<td>Start of Water Year (10/07/2008 map)</td>
<td>73.3</td>
<td>26.7</td>
<td>17.3</td>
<td>10.7</td>
<td>2.9</td>
<td>0.0</td>
</tr>
<tr>
<td>One Year Ago (02/05/2008 map)</td>
<td>31.9</td>
<td>68.1</td>
<td>21.9</td>
<td>7.4</td>
<td>2.9</td>
<td>1.5</td>
</tr>
</tbody>
</table>

### Intensity:

- Yellow: D0 Abnormally Dry
- Red: D3 Drought - Extreme
- Orange: D1 Drought - Moderate
- Brown: D4 Drought - Exceptional
- Dark Red: D2 Drought - Severe

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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, February 5, 2009

Author: Eric Luebehusen, U.S. Department of Agriculture
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.
Climate Links for Texas

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

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

State Drought Preparedness Response Plan: 

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...
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?

- National
- Regional
- County
- Sub-County
Thank you!

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

Please contact me at:
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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?