New Assessment Tools in Monitoring Drought

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Prepared for:
USDA’s 84th Agricultural Outlook Forum
Session 38: Food Risk & Security,
U.S. Drought Monitor & Disaster Declarations
February 22, 2008, 1:45 p.m. – 3:15 p.m.
As Brad Rippey has just discussed, the weekly U.S. Drought Monitor has undergone numerous changes (improvements) from it’s inception in 1999.

Over time, the main focus has been to **Simplify** the map for the end user *(although with increased information available to the author, the author’s tasks have gotten a tad more **Complex**)*.

**Major changes to the USDM since 1999**...
Areas depicted on chart are derived by consolidating information from a number of sources based on surface observation networks and satellite. "Drought" is used to mean abnormal moisture shortages resulting in imminent or actual damage to crops, or pastures; high wildfire risk; or water shortages. Only relatively large areas are shown; local conditions may differ markedly from those shown on the map.

Legend:
- D0: Abnormal dryness but not currently classified as a drought.
- D1 to D4: Droughts ranging in severity from standard to exceptional.
- a: Impact on plant life (agric. or forests)
- h: Impact on water supplies (reservoirs, streams, wells)
- + of - refer to forecast 2-wk trend, where "+" means intensifying and "-" means weakening. No sign means no significant change.
Areas depicted on map are derived by consolidating information from a number of sources based on surface observations and satellite products. “Drought” is used to mean abnormal moisture shortages resulting in imminent or actual damage to crops or pastures; high wildfire risk; or water shortages. Only relatively large areas are shown; local conditions may differ markedly from those shown on the map.
“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.

Yellow (D0) = 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)

Crosshatching (■) = Overlapping drought type areas

Drought type: Used when impacts differ
Ag = agricultural (crops, grasslands)
Fire = forestry (wildfire potential)
Hydro = hydrological (rivers, wells, reservoirs)

Plus (+) = Forecast to intensify
Minus (-) = Forecast to diminish
August 24, 1999

U.S. Drought Monitor

Map focuses on widespread drought. Local conditions may vary.

- D0 Watch
- D1 Drought
- D2 Drought–Severe
- D3 Drought–Extreme
- D4 Drought–Exceptional

Drought type: used only when impacts differ
A = Agriculture
W = Water
F = Forest fire danger

Plus (+) = Forecast to intensify next two weeks
Minus (-) = Forecast to diminish next two weeks
No sign = No change in drought classification forecast

Updated every Thursday morning
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

Released Thursday, August 21, 2003
Author: Candace Tankersley/Richard Heim, NOAA/NCDC
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

http://drought.unl.edu/dm

Authors: Jay Lawrimore/Liz Love-Brotak, NOAA/NESDIS/NCDC
BACKGROUND

While trying to keep the USDM ‘simple’ for the consumer, the author(s) require as much current and past information as possible (e.g. multiple indices, products, local expertise, etc.) in order to determine this week’s drought analyses .... since no single definition of drought or index works for all circumstances.

So, as technology continues to improve, we have tried to utilize these upgrades to assist us in creating the weekly USDM.

(Each of the following slides could be made into its own presentation)
OVERVIEW

Modified or New Tools used in the Assessment of Drought in the Production of the USDM:

1) Improving Input Data Quality & Quantity;
2) Creating New Products, Indices, or Blends for a more Objective Analyses, inc. Soil Moisture Models;
3) Differentiating between Temporal (Short vs. Long) & Regional (East vs. West) Drought Distinctions;
4) Migrating USDM Analyses & Production to State-of-the-Art Software (ArcGIS);
5) Consolidating all drought-related information to a “one-stop drought shop” (NIDIS & Drought Portal);
6) Expanding Drought Monitoring Beyond the U.S.;
7) Forecasting Drought (U.S. Seasonal Drought Outlooks);
In the past, the **Palmer Drought Index** had been the standard for measuring drought in the U.S. (the **CMI** was developed 3 years later for short-term [ag] dryness)...

...but we’ve come a long way recently; increasing data quality & quantity, dissemination speed, user flexibility, and creating new products ....
1) Improving Input Data Quality & Quantity;

...although we still need to transition from a rather low-resolution (climate divisions) to higher resolution (e.g. county level) or to individual stations (e.g. ACIS) ...where there is enough past quality data for statistics.
1) Improving Input Data Quality & Quantity;

ACIS data

Percent of Normal Precipitation (%)
11/1/2007 - 1/31/2008

3-Month (Nov’07-Jan’08) PNP
Applied Climate Information System

- Applied Climate Information System (ACIS)
  - NOAA Regional Climate Centers (RCCs)

- A framework for management of metadata and climate data:
  - Ingest, Quality Control, and Archive
  - Multiple Datasets
  - Networked/Robust System
  - Distributed Data Management
  - Manages climate data (so you don’t have to!)

ACIS provides a platform for suites of climate products:
* CLIMOD (RCCs)
* xmACIS (NWS)
* NOWData (NWS)
* AgACIS (NRCS)

Precipitation Stations After Gap Analysis With At Least 30 Years of Data
2533 stations
1) Improving Input Data Quality & Quantity;

RFC Network (n-days)

USGS Stream flow Network (Instant, 1-, 7-, 14-, and 28-days)
1) Improving Input Data Quality & Quantity;

SNOTEL Site and Snow Course Locations

Legend
- SNOTEL
- Snow Course

SNOTEL Network

SCAN Network

Drought Impact Reporter
National Drought Mitigation Center
May - October 2007

Drought statements issued by NWS Forecast Offices:

NWSFO

- Charleston, SC (7/12/07)
- Charleston, SC (7/16/07)
- Charleston, SC (7/25/07)
- Charleston, SC (7/26/07)
- Charleston, SC (7/27/07)

NDMC

- Charleston, SC (7/1/07)
- Charleston, SC (7/2/07)
- Charleston, SC (7/3/07)
- Charleston, SC (7/4/07)
- Charleston, SC (7/5/07)
- Charleston, SC (7/6/07)
- Charleston, SC (7/7/07)
- Charleston, SC (7/8/07)
- Charleston, SC (7/9/07)
- Charleston, SC (7/10/07)
- Charleston, SC (7/11/07)
- Charleston, SC (7/12/07)
- Charleston, SC (7/13/07)
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- Charleston, SC (7/15/07)
- Charleston, SC (7/16/07)
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- Charleston, SC (7/28/07)
- Charleston, SC (7/29/07)
- Charleston, SC (7/30/07)
- Charleston, SC (7/31/07)

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- Charleston, SC (8/4/07)
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- Charleston, SC (10/30/07)
- Charleston, SC (10/31/07)
1) Improving Input Data Quality & Quantity;

Real-Time Ground-Water Level Network

Friday, February 15, 2008

Reservoirs
Legend. Map data updated 02/18/19:30 UTC, 02/18:12:00 MST. Click map to zoom.
Data Type: River | Snow
Click to: Select | Zoom
Zoom to: 1x | 4x | 8x
Zoom Mode: Topography | Satellite

Reservoir Storage as Percent of Capacity for January 1st, Water Year 2008

<table>
<thead>
<tr>
<th>Capacity of Reservoirs Reported in 1000's of Acre-Feet</th>
<th>3180</th>
<th>6000</th>
<th>14305</th>
<th>36694</th>
<th>1448</th>
<th>8319</th>
<th>3876</th>
<th>3906</th>
<th>7237</th>
<th>1290</th>
</tr>
</thead>
<tbody>
<tr>
<td>40%</td>
<td>50%</td>
<td>50%</td>
<td>50%</td>
<td>45%</td>
<td>35%</td>
<td>63%</td>
<td>58%</td>
<td>72%</td>
<td>28%</td>
<td>45%</td>
</tr>
<tr>
<td>A2</td>
<td>CO</td>
<td>ID</td>
<td>MT</td>
<td>NV</td>
<td>NM</td>
<td>OR</td>
<td>UT</td>
<td>WA</td>
<td>WY</td>
<td></td>
</tr>
<tr>
<td>3 of 4</td>
<td>76 of 74</td>
<td>24 of 24</td>
<td>29 of 45</td>
<td>7 of 7</td>
<td>13 of 13</td>
<td>30 of 21</td>
<td>26 of 28</td>
<td>12 of 13</td>
<td>13 of 13</td>
<td></td>
</tr>
</tbody>
</table>

Legend of Storage (% Avg)
- No data
- <25
- 25-50
- 50-75
- 75-90
- 90-110
- 110-125
- 125-150
- 150-175
- >175

Display Options
- Topography
- States
- RFC
- Rivers
- HSBAs
- Basins
- Data Points
- Station Labels
- Apply
1) Improving Input Data Quality & Quantity;

http://water.weather.gov
2) New Products, Indices, Blends for a more Objective Analyses, including Soil Moisture Models;

![Drought Indicator Blend Percentiles](image)

Objective **Short-Term** Drought Indicator Blend Percentiles
January 26, 2008

Objective **"Unified"** Drought Indicator Blend Percentiles
January 26, 2008

Objective **Long-Term** Drought Indicator Blend Percentiles
January 26, 2008

**Worst** Drought Indicator Blend Percentiles
January 26, 2008

- **Inputs (as percentages):**
  - Palmer Z-index
  - 3-month Precipitation
  - 1-month Precipitation
  - CPC Soil Moisture Model
  - Palmer Drought Index

- **Western Formulation Inputs (as percentages):**
  - Palmer Hydrologic Index
  - 6-month Precipitation
  - 6-month Average Z-index
  - CPC Soil Moisture Model
  - CPC Soil Moisture Model
2) New Products, Indices, Blends for a more Objective Analyses, including Soil Moisture Models;

For D0-D4; 11 parameters & change from last week

Four regional draft maps with counties

For 1-, 4-, 16-weeks & Water Year comparisons

These maps depict approximate changes in drought intensity from selected initial times to the current week, with no consideration given to intervening weeks. The difference calculations are based on interpolated 4 km grids of Drought Monitor classifications, and as a result, will be smoother than would similar products based directly on the published versions of the Drought Monitor.
2) New Products, Indices, Blends for a more Objective Analyses, including Soil Moisture Models;
2) New Products, Indices, Blends for a more Objective Analyses, including Soil Moisture Models;
2) New Products, Indices, Blends for a more Objective Analyses, including Soil Moisture Models;
3) Temporal & Regional Drought Distinctions;

30-Days

Objective Short-Term Drought Indicator Blend Percentiles
January 26, 2008

Objective Long-Term Drought Indicator Blend Percentiles
January 26, 2008

Percent of Normal Precipitation (%)
1/30/2007 – 1/29/2008

12-Months

1/30/2008 at HPRCC using provisional data.
NOAA Regional Climate Center
3) Temporal & Regional Drought Distinctions;

Objective Long-Term Drought Indicator Blend Percentiles -- January 26, 2008

Objective Short-Term Drought Indicator Blend Percentiles -- January 26, 2008

Inputs (as percentiles):
- 25% Palmer Hydrologic Index
- 20% 24-Month Precipitation
- 20% 12-Month Precipitation
- 15% 6-Month Precipitation
- 10% 60-Month Precipitation
- 10% CPC Soil Moisture Model

Western Formulation Inputs (as percentiles):
- 30% Palmer Hydrologic Index
- 30% 60-Month Average Z-Index
- 10% 60-Month Precipitation
- 10% 24-Month Precipitation
- 10% 12-Month Precipitation
- 10% CPC Soil Moisture Model

Inputs (as percentiles):
- 35% Palmer Z-Index
- 25% 3-Month Precipitation
- 20% 1-Month Precipitation
- 13% CPC Soil Moisture Model
- 7% Palmer Drought Index
3) Temporal & Regional Drought Distinctions; Seasons ... Winter vs. Summer
3) Temporal & Regional Drought Distinctions;

**West**
- Mountain Snowpack as of February 1, 2008
- Legend:  
  - Percent
  - >100
  - 150-160
  - 130-140
  - 110-120
  - 90-100
  - 70-89
  - 50-69
  - 25-49
  - <25

**Plains**
- Percent of Normal Annual Precipitation (Apr-Sep)
- Spring & Summer (Growing Season)

**East & South**
- 7-Day Streamflows
- Year-Round (Even Precip Distribution)
3) Temporal & Regional Drought Distinctions; West

Reservoir Storage as of February 1, 2009

Spring and Summer Streamflow Forecasts as of February 1, 2008

Legend
percent

- 180
- 150 - 180
- 120 - 150
- 110 - 120
- 90 - 110
- 70 - 90
- 50 - 70
- 25 - 50
- < 25
No Forecast

OREGON SURFACE WATER SUPPLY INDEX (SWSI)
As of January 1, 2008

North Coast -0.2
Willamette 0.6
Lower Deschutes -0.2
Upper Deschutes 0.2
Upper John Day 0.3
Klamath -0.5
Rogue & Umpqua 0.6
Harney -0.4
Owyhee -1.0
Grande Ronde, Powder & Burnt -1.7
Malheur -1.4

High Surface Water Supply (+4.0 thru +1.6)
Average Surface Water Supply (+1.5 thru -1.5)
Low Surface Water Supply (-1.6 thru -4.0)

Washington SNOTEL Month to Date (MTD) Precipitation % of Normal
Sep 30, 2007

Current MTD Precip. % of Normal
- > 200%
- 150-200%
- 125-150%
- 100-125%
- 75-99%
- 50-74%
- 25-49%
- 1-34%
- 0%
- Unavailable

Provisional Data Subject to Revision

Prepared by USDA, NRCS, National Water and Climate Center
510 West 8th Street, Pullman, WA 99163

USDA NRCS
National Water and Climate Center
Pullman, WA

Data unavailable at time of printing or unavailable long-term normal.
3) Temporal & Regional Drought Distinctions;

West

Snow

### SNOTEL Snow Water Equivalent

- **West-wide maps**
  - 95% of Normal
  - Percentile
  - Record
  - 95% of Normal Peak

- **State maps** [NEW]
  - 95% of Normal

### SNOTEL & Snow Course

- **West-wide maps**
  - 95% of Normal
  - 95% of Normal for Alaska

- **State/basin maps**
  - 95% of Normal by River Basin:
    - Arkansas, Colorado and Rio Grande
    - Columbia
    - Great Basin and California
    - Missouri

### SNOTEL Snow Depth

- **West-wide maps**
  - Snow Depth

- **State maps** [NEW]
  - Snow Depth

### SNOTEL Snow Density

- **West-wide maps**
  - Snow Density

- **State maps** [NEW]
  - Snow Density

*Analysis includes sites with more than 50 years of historical SNOTEL data.*

Prepared by the USDA/ARS National Water and Climate Center, Portland, Oregon (http://www.nwcc.nrcs.usda.gov) based on data from the National Water and Climate Center Science contact: Tom.Paganino@usda.gov 503-231-4301
3) Temporal & Regional Drought Distinctions;

ACIS + SNOTEL data

GIS Products
Precipitation

Note: Please manually reload .PDF files in internet browser to ensure you have the latest data.

<table>
<thead>
<tr>
<th>SNOTEL Precipitation</th>
<th>Month to Date</th>
<th>Water Year to Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>West-wide Maps</td>
<td>% of Normal</td>
<td>% of Normal</td>
</tr>
<tr>
<td></td>
<td>% of Monthly Total Normal</td>
<td>% of Annual Total Normal</td>
</tr>
<tr>
<td>State Maps</td>
<td>% of Normal</td>
<td>% of Normal</td>
</tr>
<tr>
<td></td>
<td>Select a State</td>
<td>Select a State</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SNOTEL &amp; ACIS Precipitation</th>
<th>Month to Date</th>
<th>Water Year to Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>West-wide Maps</td>
<td>% of Normal</td>
<td>% of Normal</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PRISM Precipitation</th>
<th>Month to Date</th>
<th>Water Year to Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. Maps</td>
<td>Total Monthly</td>
<td>Monthly % of Average</td>
</tr>
</tbody>
</table>
3) Temporal & Regional Drought Distinctions;

Plains

Midwest

East & South

Current Soil Moisture Deviation (inches), Depth = 0–12
2–21–2006

KBDI

Last 60 Days
Nov 16, 2007 through Feb 13, 2008

30-Day Precip for Texas
Jan 15, 2008 through Feb 13, 2008

Maryland and Delaware
Water Table Wells
Click on a county for more information on water table wells

- New record high for month
- ≥ 90th percentile
- 75th - 89th percentile
- 25th - 74th percentile
- 10th - 24th percentile
- ≤ 10th percentile
- New record low for month
- Not ranked

© 2008 USGS

4) Utilizing State-of-the-Art Software (ArcGIS);

Can overlay a multitude of information.
4) Utilizing State-of-the-Art Software (ArcGIS):

Some of our routine weekly GIS overlay products includes the past week’s D0-D4 contours on the 7-day precipitation dot plot & on the 7-Day USGS stream flow percentiles.

The same could be done to many of these other new USDM tools.
4) Utilizing the USDM with ArcGIS Applications;

Shapefiles of the weekly USDM where drought ≥D1 are overlaid on U.S. Beef Cow area shapefiles, and weekly statistics are made.
What is NIDIS?

A National Integrated Drought Information System (NIDIS)

NIDIS: An integrated, interagency national drought monitoring and forecasting system that provides:

- An early warning & forecast system for drought.
- Drought impact and causation education.
- Information for drought mitigation.
- An interactive, web-based drought portal.
- Improved observational capabilities.

NIDIS Builds Upon Collaborative Successes!
NIDIS Interagency Partners

Federal Level


U.S. Department of Commerce (DoC): International Trade Administration, National Oceanic and Atmospheric Administration


U.S. Department of Transportation (DoT): Federal Aviation Administration, Federal Highway Administration, Surface Transportation Board

Environmental Protection Agency (EPA)

Farm Credit Administration (FCA)

Federal Energy Regulatory Commission (FERC)

Internal Revenue Services

International Trade Commission (USITC)

National Aeronautics and Space Administration (NASA)

National Science Foundation (NSF)

Small Business Administration (SBA)
**NIDIS Interagency Partners**

**Regional, State, Tribal, and Local Levels**

- **Western Governors’ Association** – a key sponsor of early NIDIS development efforts and ongoing concerns representing drought in the Western States;
- **Western States Water Council** – represents water managers in the Western United States;
- **National Conference of State Legislatures** – drought monitoring and mitigation activities will require state support, much of which require state legislative involvement;
- **National League of Cities** – water availability and quality issues;
- **American Association of State Climatologists** – an organization state-appointed individuals, many of whom are active participants in the Drought Monitor or serve on drought monitoring committees within their respective states. Most are housed at universities and also conduct applied climate research;
- **National Drought Mitigation Center** – A national clearinghouse for drought-related information, research, mitigation measures, and operational home of the Drought Monitor and operational home of the Drought Monitor and Drought Impact Reporter;
- **Native American tribal governments** – mostly located in arid regions in which water is a vital concern;

www.eere.energy.gov
5) One-Stop Drought Shopping = Drought Portal; 
NIDIS – U.S. Drought Portal 
drought.gov: A Window on Drought Information

Why a Portal?
A Web site and services that improve the access, processing, and sharing of structured and unstructured information within and across a given “enterprise” through:

- **Portlets** - Components of a portal web site that provide aggregated, reusable access to specific information sources or applications (e.g., remote web services, search engines). Access is standardized and reusable (using APIs [application programming interfaces]).

- **Web Services** - Applications and utilities that allow data exchange in a highly interoperable, standardized language/vendor/platform-neutral manner. Crawlers and other content aggregation are supported.

- **Communities** - A virtual workspace of a portal for collaboration, communication, and information dissemination/collection. Communities contain portlets and projects.

- **Projects** - Workspaces within a community that involves subsets of Portal membership. Projects contain portlets and can be part of one or more communities, facilitating collaboration via overviews, discussions, and document/project management.
Showcase Portlets:
1.) U.S. Drought Monitor (NOAA, USDA, NDMC)
2.) Drought Impacts Reporter (NDMC)
3.) Climate Prediction Center Seasonal Drought Outlook (NOAA)
U.S. Drought Portal Home Page

Showcase Portlets and Key Themes

1) Current Drought
2) Forecasts
3) Impacts
4) Planning
5) Education
6) Research

Key Themes

1) Current Drought
2) Forecasts
3) Impacts
4) Planning
5) Education
6) Research

What’s New

The U.S. Drought Portal was officially launched on November 1, 2007. It was created to provide comprehensive information on emerging and ongoing droughts, and to enhance the nation’s drought preparedness. The Drought Portal is part of the National Integrated Drought Information System (NIDIS), which was recommended by the Western Governors Association in 2004 and enacted into law in 2006.

More about NIDIS...

The NIDIS Implementation Plan, published in June 2007, provides a detailed overview of the NIDIS initiative (pdf version).
Current Drought

The U.S. Drought Monitor blends numeric measurements of drought and experts' contributions into a single map every week. The Monitor is produced by a group of authors from the Department of Agriculture, National Oceanic and Atmospheric Administration, and the Drought Mitigation Center. It incorporates data from 220 climatologists, meteorologists, and other experts across the U.S. The author revises the previous map based on rainfall, snow, and other events, and reports how drought is affecting crops, wildlife, and other indicators. Authors balance data and reports to come up with a new map every Wednesday afternoon. It is released following Thursday morning.

Visit the US Drought Monitor for the current drought conditions...

The North American Drought Monitor is a monthly monitoring map for the entire continent that has been produced in cooperation with Canada and Mexico since 2000.

Plenty of related info to view
6) Expanding Drought Monitoring Beyond the U.S.

North American Drought Monitor
CANADA
June 30, 2007

Palmer Hydrological Drought Index
January 2008

Current Precipitation Compared to Historical Distribution
April 1, 2004 to August 25, 2004 (A.M.)

Percentile Classes
- Record Dry
- Extremely Low (0-10)
- Very Low (10-20)
- Low (20-40)
- Mid-Range (40-60)
- High (60-80)
- Very High (80-90)
- Extremely High (90-100)
- Record Wet

Lakes and Rivers
- Extent of Agricultural Land

Prepared by Agriculture and Agri-Food Canada (AAFC) using data from the Time Use Climate Monitoring Network and the many federal and provincial agencies and volunteers that support it.
6) Expanding Drought Monitoring Beyond the U.S.;

1-Month Standardized Precipitation Index
September 2004

-2.00 or less  dry
-1.99 to -1.00
-1.59 to -1.30
-1.29 to -0.80
-0.59 to -0.51
-0.50 to +0.50 near normal
+0.51 to +0.79
+0.80 to +1.29
+1.30 to +1.59
+1.60 to +1.99 wet
+2.00 or greater

* Based on Preliminary Data
** Base Period for Averages 1951 - 2001

MEXICO

1-Month Standardized Precipitation Index
September 2004

* Based on Preliminary Data
** Base Period for Averages 1951 - 2001

Analysis by Mexico

Anomalia porcentual de la lluvia
enero de 2008

Jan’08 PNP

17% Debajo de la climatología
United States = (USDM: end of month or start of next month)
North American Drought Monitor

December 31, 2007
Released: Wednesday, January 16, 2008

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

Drought Impact Types:
- Delineates dominant impacts
- A = Agriculture
- H = Hydrological (Water)

Available in English

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

Regions in the northern extremes of Canada may not be as accurate as other regions due to limited information.
Monitor de Sequía de América del Norte

Diciembre 31, 2007
Liberado: Miércoles, 16 de Enero de 2008

http://www.ncdc.noaa.gov/nadm.html

Analysts:
Canada - Trevor Hadwen
Dwayne Chobanik
Mexico - Valentina Davydova
Adelina Albán
Elvira Delgado
Fernando Romero
U.S.A. - Richard Heim
Jay Lawrimore
Liz Love-Brotak

* Responsable de la integración del mapa

Intensidad de la Sequía:
- D0 Anormalmente Seco
- D1 Sequía - Moderada
- D2 Sequía - Severa
- D3 Sequía - Extrema
- D4 Sequía - Excepcional

Delimita impactos dominantes
- A = Agrícola
- H = Hidrológica

En el Monitor de Sequía se analizan condiciones de gran escala, por lo que las condiciones locales pueden variar. Para una mejor interpretación se recomienda ver el texto anexo.

Available in Spanish

Las regiones en el extremo norte de Canadá podrían no ser tan precisas como el resto, debido a limitaciones en la información.
Outil de surveillance des sécheresses à l'échelle nord-américaine

31 Décembre 2007
Parution : Mercredi, le 16 Janvier, 2008

Available in French

L'outil de surveillance des sécheresses s'attarde aux conditions à grande échelle. Les conditions locales peuvent varier. Voir le texte d'accompagnement pour un sommaire général.
7) Drought Forecasts;

Short and Long-Term Forecast Contributions

Start with latest U.S. Drought Monitor D1 areas

2-week Soil Moisture Forecasts

3-month Precipitation and Temperature Outlooks

(see Douglas LeComte for more information)
7) Drought Forecasts; Principal Drought Outlook Inputs

- CPC Long-Lead Precip. Outlook
- Palmer 4-mo Probabilities
- U.S. Drought Monitor
- U.S. Seasonal Drought Outlook
- 2-Wk Soil Moisture
- Constructed Analogue Soil Model
- Medium-Range Fcst

Drought Forecasts

Principal Drought Outlook Inputs
7) Drought Forecasts;

Latest Seasonal Drought Outlook

U.S. Seasonal Drought Outlook
Drought Tendency During the Valid Period
Valid February 7, 2008 - April, 2008
Released February 7, 2008

KEY:
- Drought to persist or intensify
- Drought ongoing, some improvement
- Drought likely to improve, impacts ease
- Drought development likely

Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Short-term events such as individual storms cannot be accurately forecast more than a few days in advance. Use caution for applications such as crops that can be affected by such events.

“Ongoing” drought areas are approximated from the Drought Monitor (D1 to D4 intensity). For weekly drought updates, see the latest U.S. Drought Monitor. NOTE: the green improvement areas imply at least a 1-category improvement in the Drought Monitor intensity levels, but do not necessarily imply drought elimination.

Thank You!

and to the many contributors of this presentation

Agricultural Outlook Forum

Feb. 21-22, 2008