

The National Drought Mitigation Center



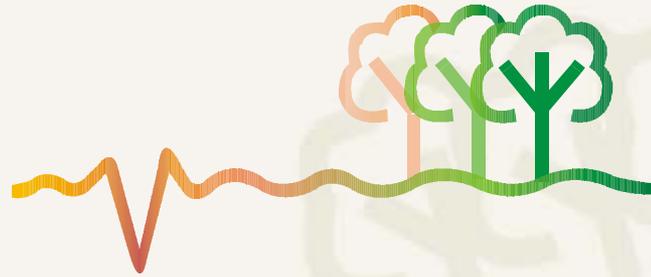
Brian Fuchs

National Drought Mitigation Center
University of Nebraska-Lincoln

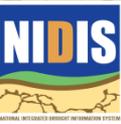
North Central Regional Soil Survey Conference
June 5, 2012



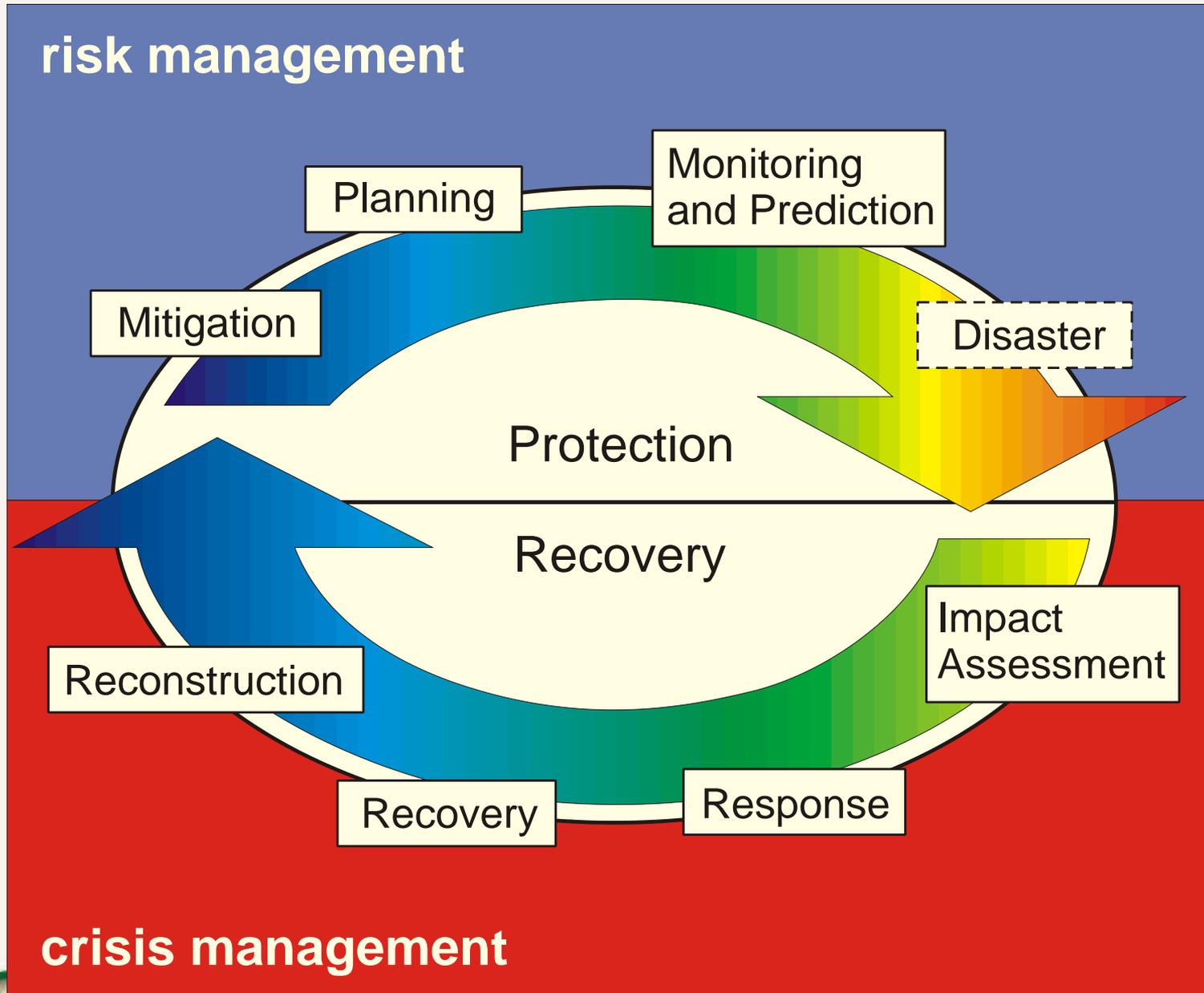
National Drought Mitigation Center

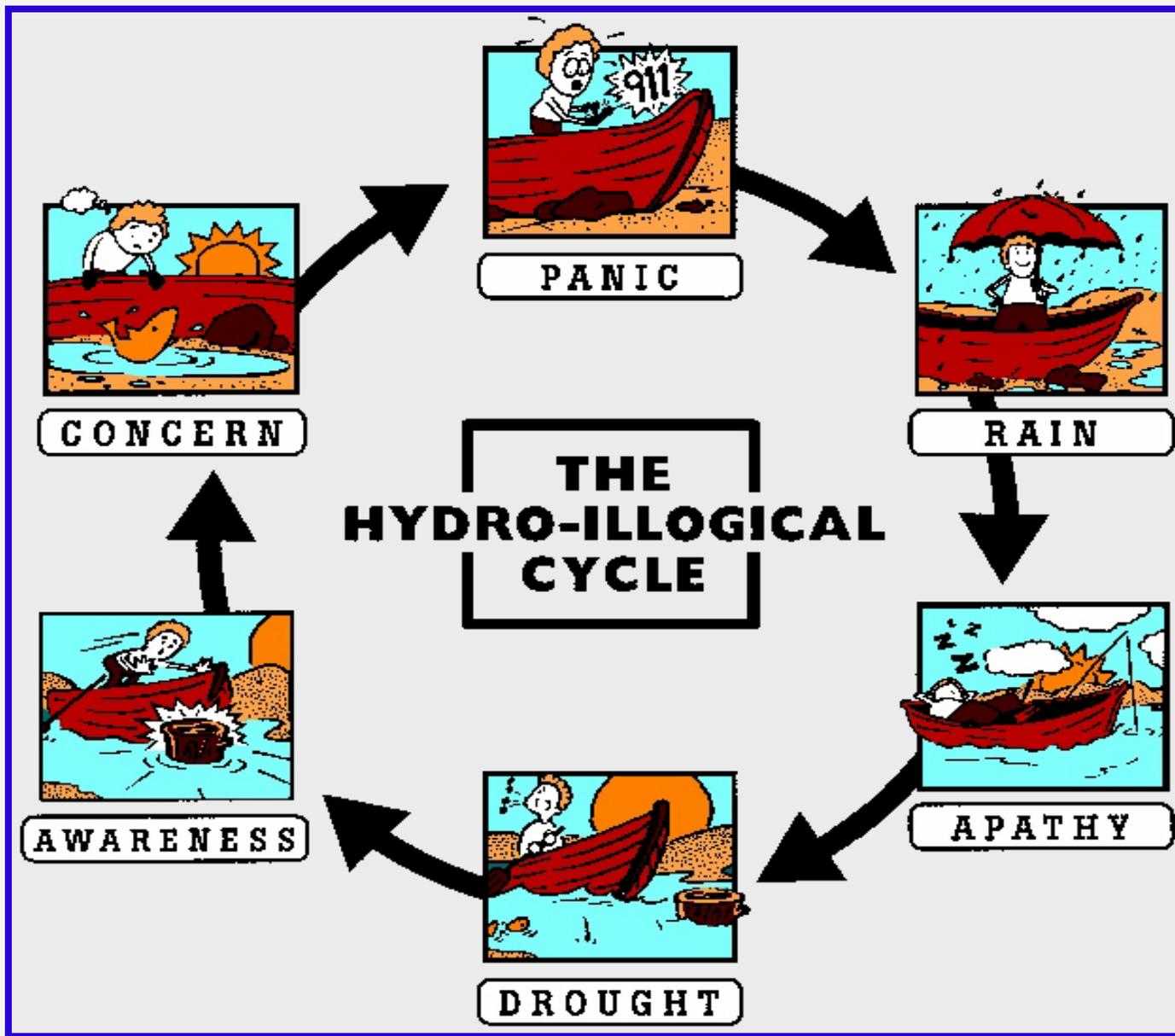


Mission: To lessen societal vulnerability to drought by promoting *planning* and the adoption of appropriate *risk management* techniques.



The Cycle of Disaster Management





NDMC in 1995



- ▶ Director: Don Wilhite
- ▶ Staff: Deb Wood, Kelly Smith, Mark Svoboda, Vicki Wilcox, and Mike Hayes
- ▶ International Drought Information Center (IDIC)
- ▶ Website launched in November 1995
- ▶ 29 states with Drought Response Plans
- ▶ Initial funding from USDA and NOAA



NDMC in 2012



- ▶ Director: Mike Hayes
- ▶ Staff: 17 people. Tremendous diversity.
- ▶ Students: 2 on assistantships
- ▶ Website
- ▶ DroughtScape
- ▶ USDM, NADM, VegDRI, DIR
- ▶ 47 states with drought plans, 12 states with drought *mitigation* plans
- ▶ NIDIS
- ▶ Funding from competitive grants

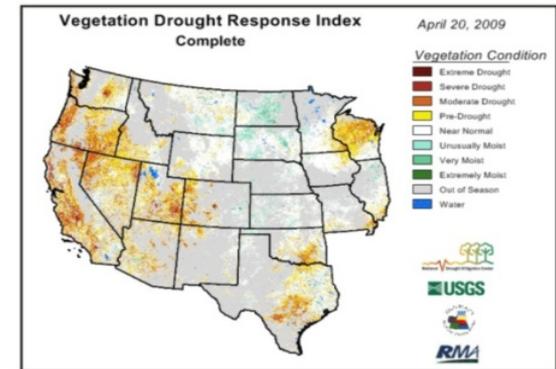
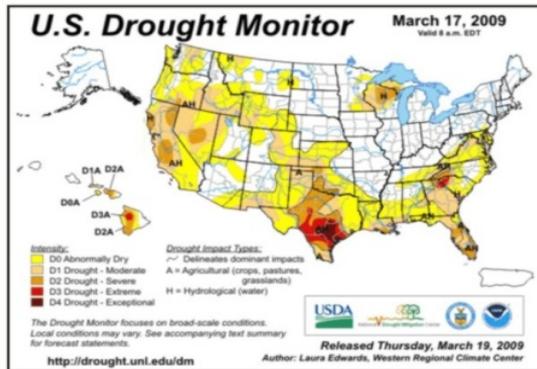


NDMC

Monitoring
Program Area
(Mark Svoboda)

Planning and Social
Science Program Area
(Cody Knutson)

GIScience
Program Area
(Brian Wardlow)



- RESEARCH, OUTREACH, AND TRAINING
- Tool Development: Research-Operations-Applications-Education Continuum



Types of Drought

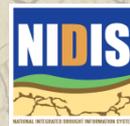
- ▶ **Meteorological**
 - ▶ **Agricultural**
 - ▶ **Hydrological**
 - ▶ **Socioeconomic**
-
- ▶ There are *indices for all* of these types of drought
 - ▶ There is *no one definition* of drought
 - ▶ Thus, there is *no one-size-fits-all* drought index or indicator



What is a Drought Indicator versus a Drought Index?

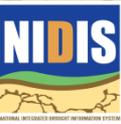
- ▶ **Indicator**: a measure of a meteorological, hydrological, agricultural, or socio-economic variable that provides an indication of potential drought related stress or deficiency.
- ▶ **Index**: a method of deriving “value added” information related to drought by comparing current conditions to historical information based upon statistical calculations.

(Note: Indices are indicators as well)



Examples of Indicators

- ▶ Precipitation amounts
- ▶ River and Streamflow levels
- ▶ Soil Moisture information
- ▶ Evapotranspiration information
- ▶ Reservoir storage
- ▶ Impact information
- ▶ Crop status/yield estimation reports
- ▶ Temperature
- ▶ Vegetation Health/Stress
- ▶ Short and long-term/seasonal forecasts
- ▶ Ground water
- ▶ Snow pack



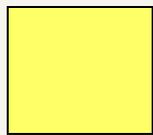
The U.S Drought Monitor

- ▶ An example of several groups (govt and non-govt) working together to produce a single **“hybrid”** approach to drought monitoring
- ▶ Uses both *indicators* and *indices* in a **“Consolidation of Evidence”** approach based upon percentile rankings
- ▶ Continually **evolving** as inputs continue to develop and the use of technology is incorporated



The U.S Drought Monitor

Drought Intensity Categories based upon a “Percentile Ranking” methodology



D0 **Abnormally Dry (30%tile)**



D1 Drought – **Moderate (20%tile)**



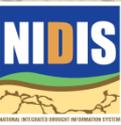
D2 Drought – **Severe (10%tile)**



D3 Drought – **Extreme (5%tile)**

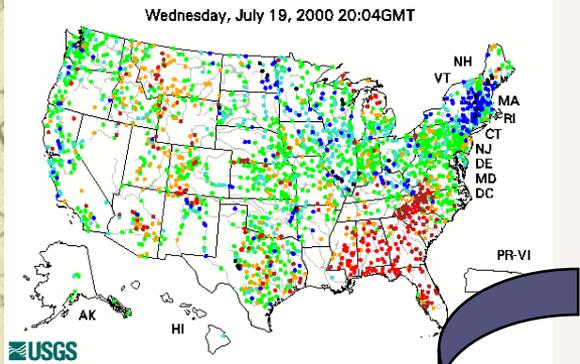


D4 Drought – **Exceptional (2%tile)**

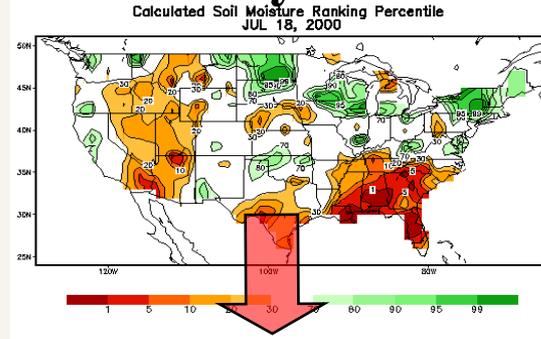


Principal Drought Monitor Inputs

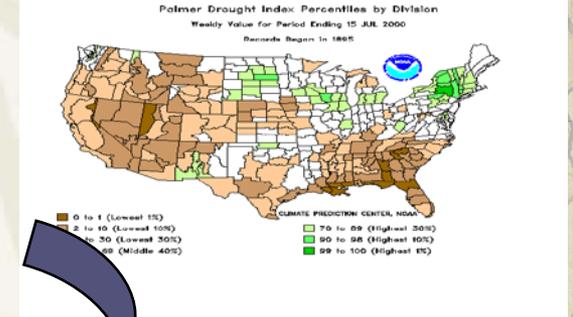
USGS Streamflow



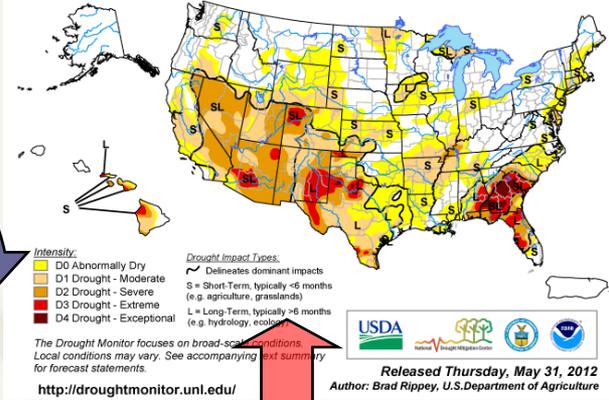
CPC Daily Soil Model



Palmer Drought Index

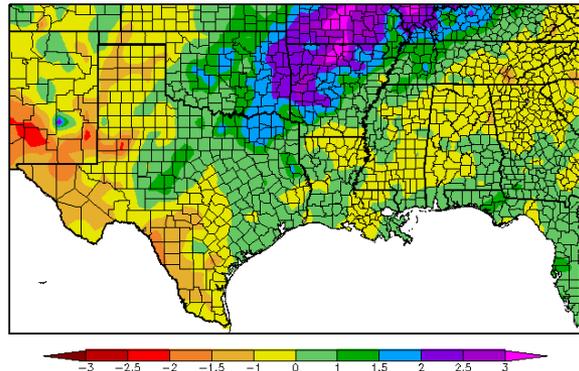


U.S. Drought Monitor

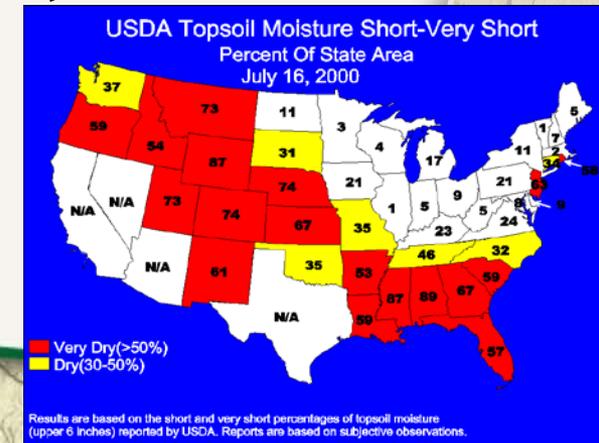


SPI Drought Index

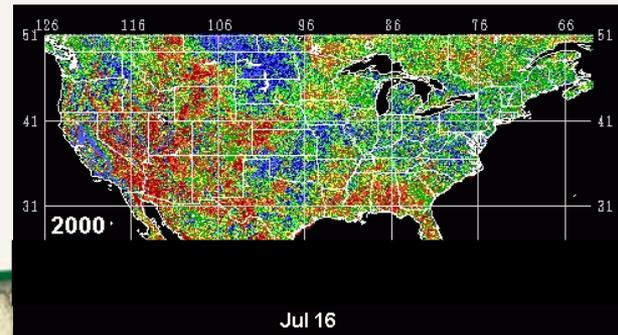
90 Day SPI
1/16/2008 - 4/14/2008



USDA Soil Ratings



Satellite Veg Health



U.S. Drought Monitor

Integrates Key
Drought Indicators:

- Palmer Drought Index

Several “newer” indicators also being considered:

- Mesonet data
- VegDri
- NWS Precipitation Analysis Tool
- NLDAS Soil Moisture
- VIC Soil Moisture
- Texas SPI Hybrid
- CRN Soil Moisture

- Plus many others !

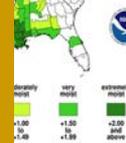
Water Year SPI
10/1/2006 - 4/19/2007



Palmer Drought Index
Long-Term (Meteorological) Conditions
October 21, 2001 - October 27, 2001

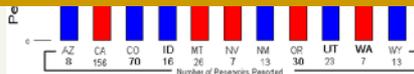
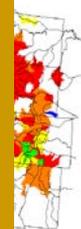


Standardized Precipitation Index
Six Months
June-November 2002



PR-VI

Legend:
100% of Average
75% of Average
50% of Average
25% of Average
0% of Average
-25% of Average
-50% of Average
-75% of Average
-100% of Average

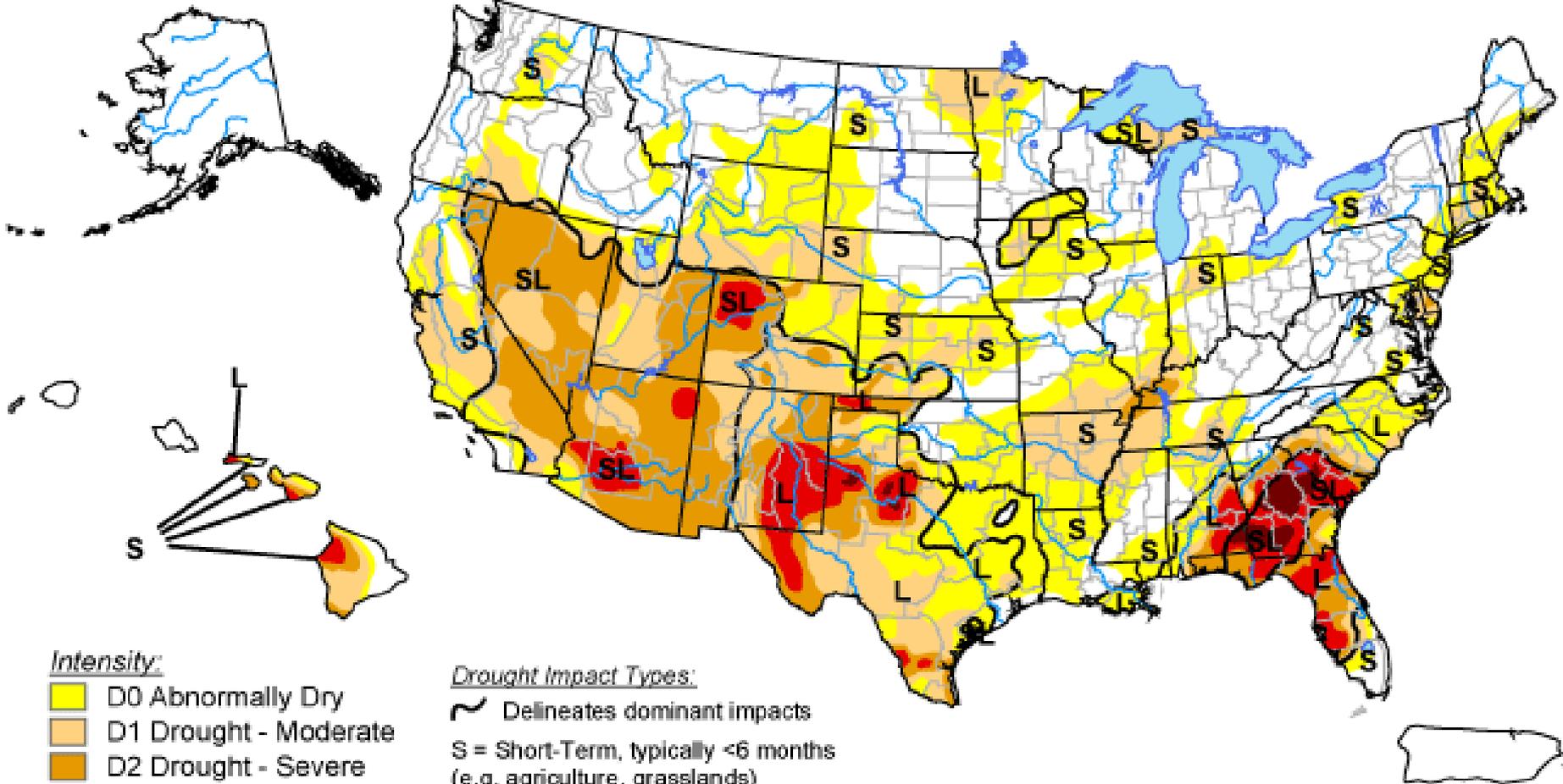


Prepared by: USDA, Natural Resources Conservation Service, National Water and Climate Center, Portland, OR
<http://www.wcc.nrcs.usda.gov>



U.S. Drought Monitor

May 29, 2012
Valid 7 a.m. EDT



Intensity:

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

Drought Impact Types:

-  Delineates dominant impacts
- S = Short-Term, typically <6 months
(e.g. agriculture, grasslands)
- L = Long-Term, typically >6 months
(e.g. hydrology, ecology)

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

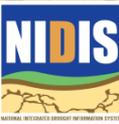


Released Thursday, May 31, 2012
Author: Brad Rippey, U.S. Department of Agriculture

<http://droughtmonitor.unl.edu/>

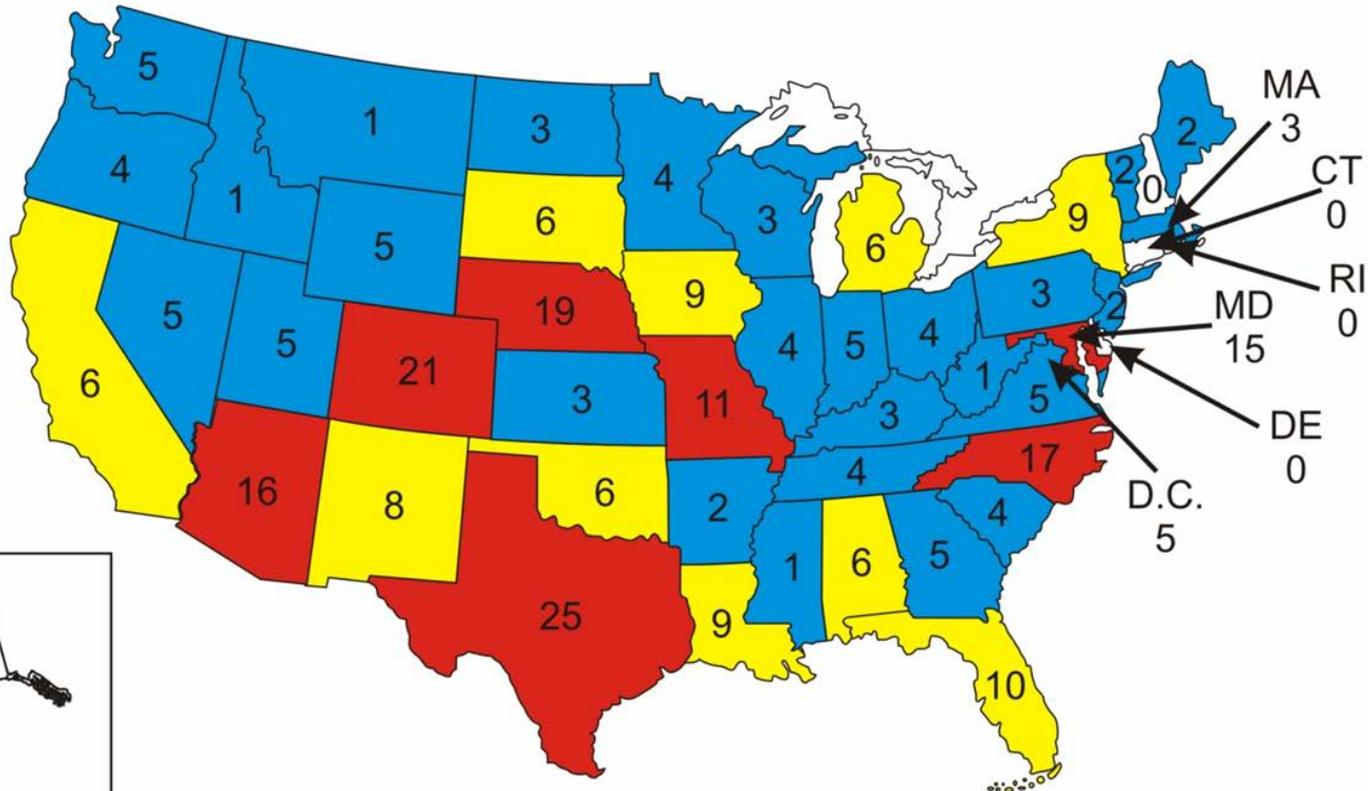
The Drought Monitor is Widely Used

- ▶ **Policy:** Farm Bill/IRS/USDA/NWS DGT/State drought plan triggers
- ▶ **~3.5M+** page views and **~2M+** visitors/year
- ▶ **Media:** The Weather Channel/USA Today and all major newspapers/Internet /radio/ Nightly Network News/CNN/NPR/etc.
- ▶ Presidential/Congressional/Governor **briefings**
- ▶ **NIDIS** portal/portlet
- ▶ A **model** of interagency collaboration



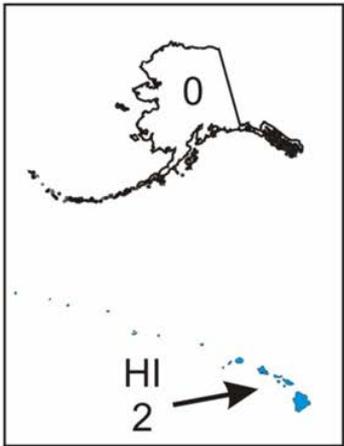
USDM Listserve Subscribers

(as of April 1, 2011)



- 1-5 participants
- 6-10 participants
- 11+ participants

Total: 298 (does not include 1 participant from Canada and 1 participant from Mexico)



North American Drought Monitor

April 30, 2012

Released: Thursday, May 10, 2012

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

Analysts:

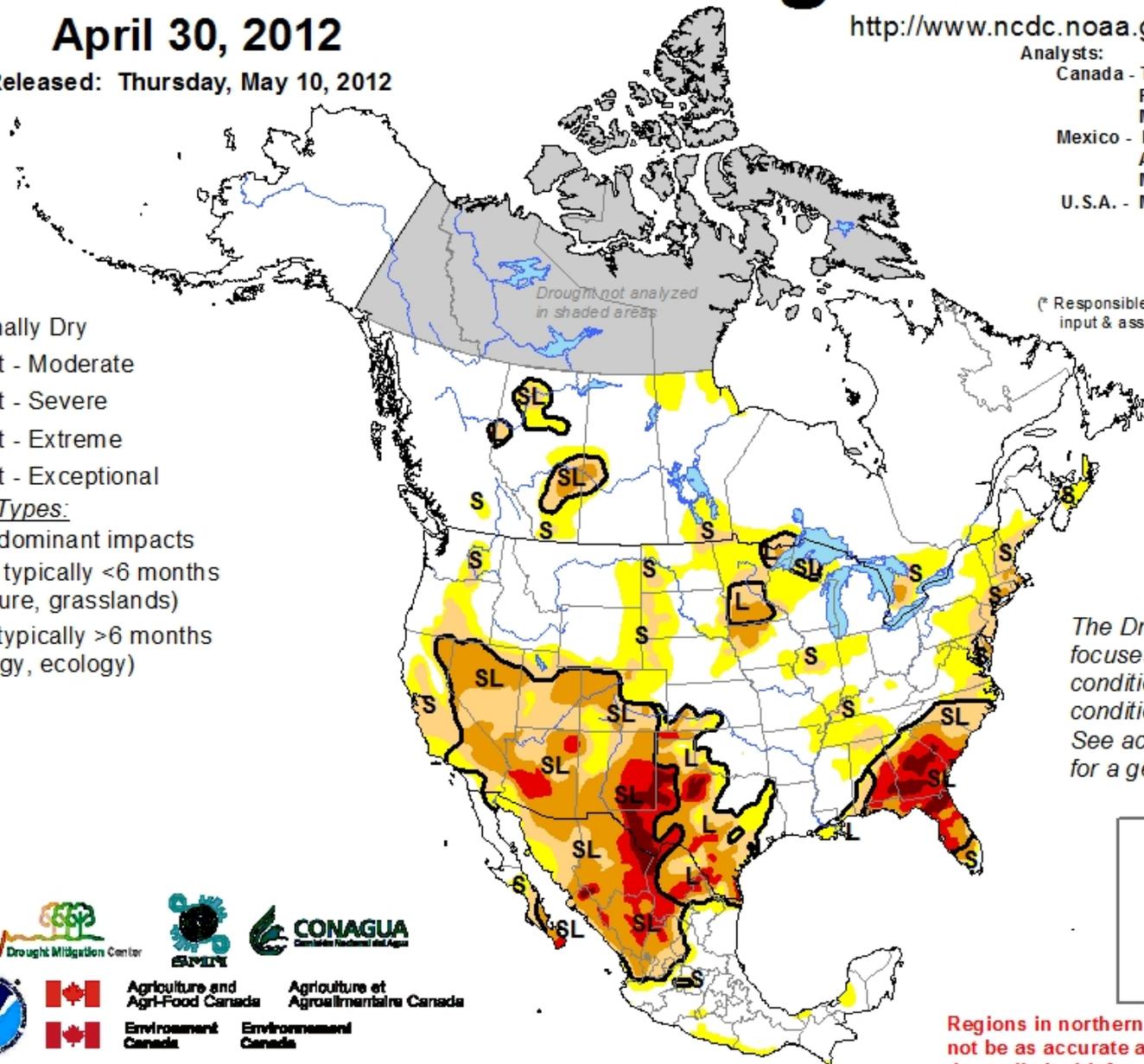
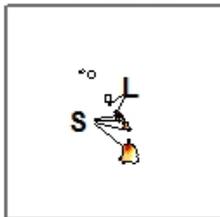
Canada - Trevor Hadwen
Richard Rieger
Mallory MacDonald
Mexico - Reynaldo Pascual*
Adelina Albanil*
Minerva López*
U.S.A. - Matthew Rosencrans

Intensity:

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

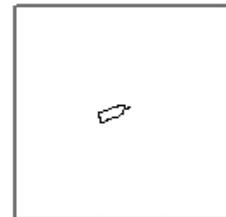
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(* Responsible for collecting analysts' input & assembling the NA-DM map)

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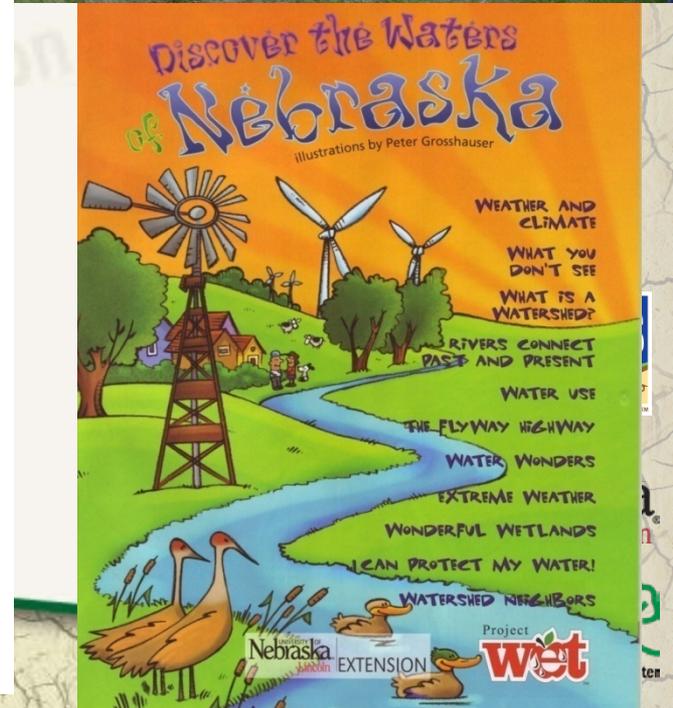
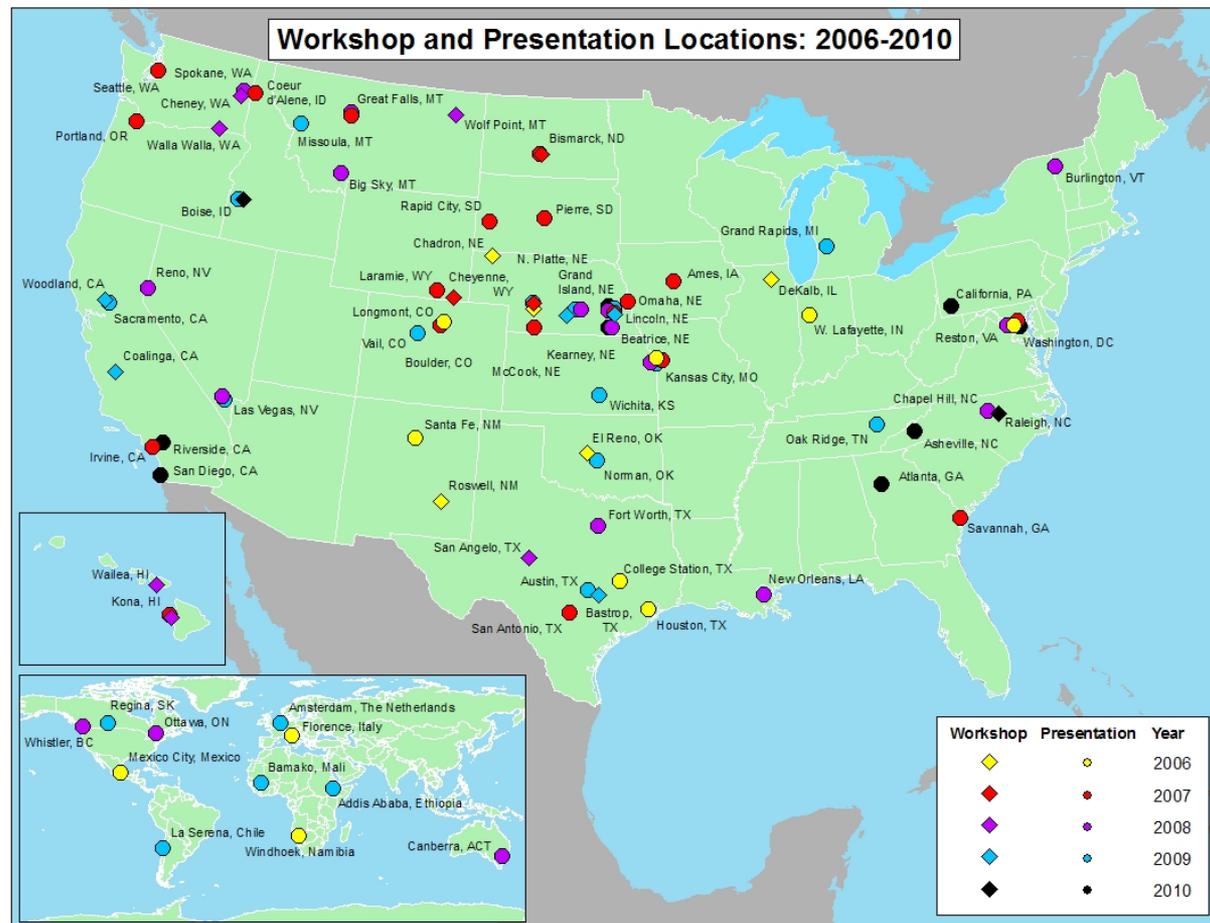


Agriculture and Agri-Food Canada

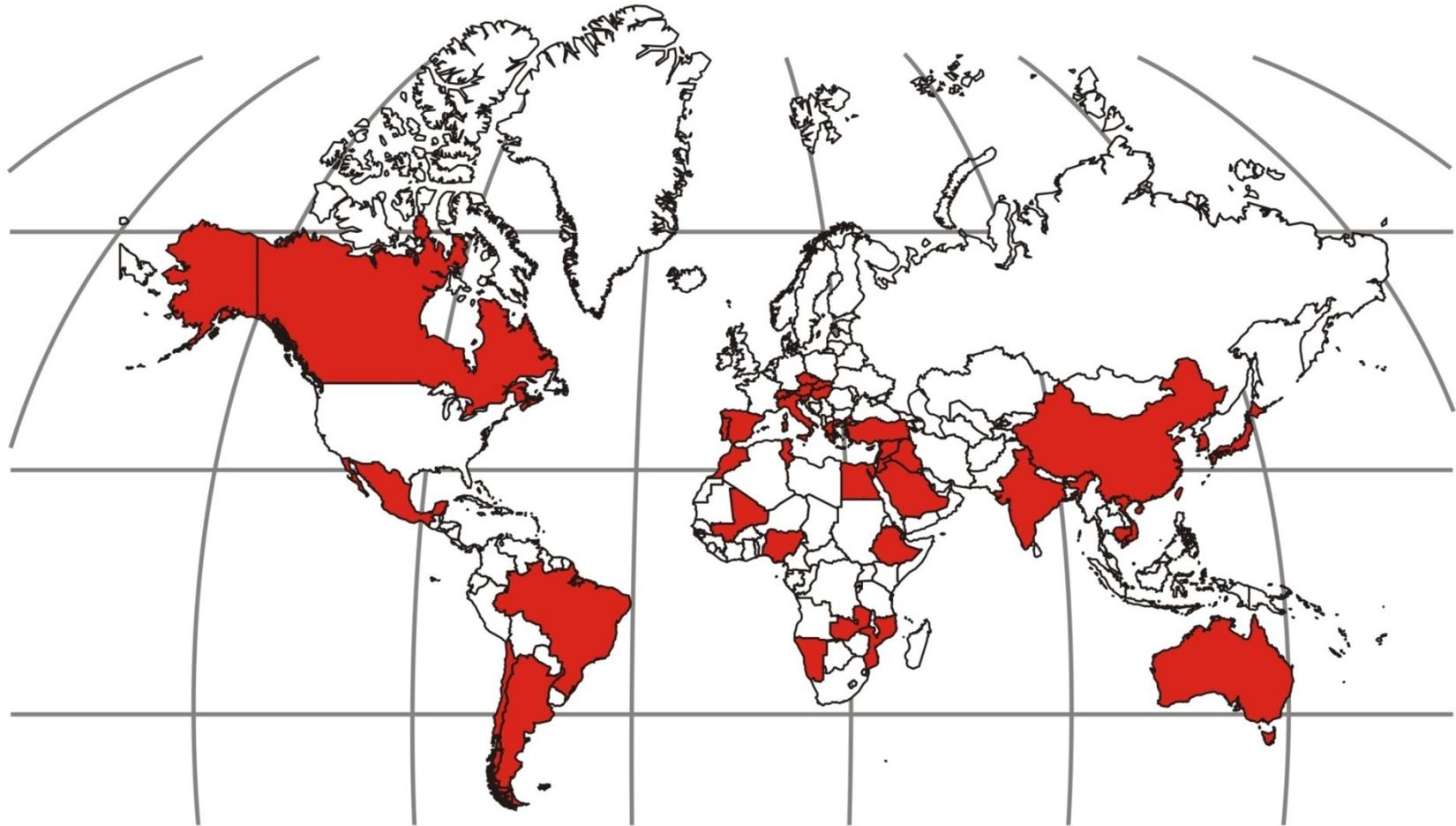
Agriculture et Agroalimentaire Canada

Regions in northern Canada may not be as accurate as other regions due to limited information.

Outreach



NDMC International Activities



Activities 2005–2010

Czech Republic • Italy • Switzerland • Spain • Slovenia • European Union • Southern Europe/Northern Africa • Morocco • Tunisia • Mali • Ethiopia • Mozambique • Namibia • Egypt • Saudi Arabia • Syria • Iraq • Jordan • India • Japan • China • South Korea • Vietnam and Cambodia • Australia • Brazil • Chile • Mexico • Canada

Activities planned in 2011

Turkey • Czech Republic • Slovakia • Austria • Australia • Canada • Mexico • India • Korea • China • Ethiopia • Nigeria • Zambia •

Status of State Drought Planning

1982



-  States with plans
-  States without drought plans



Any Questions ?



Contact Information:

Brian Fuchs

bfuchs2@unl.edu

402-472-6775

**National Drought Mitigation Center
School of Natural Resources
University of Nebraska-Lincoln**

