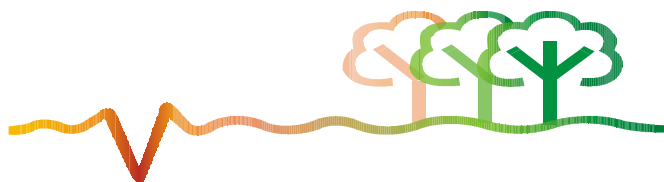


# **Perspectives from the National Drought Mitigation Center: Addressing Communication Issues in the Context of Drought**

**Mark Svoboda, Climatologist  
Monitoring Program Area Leader  
National Drought Mitigation Center  
School of Natural Resources  
University of Nebraska-Lincoln**

**NOAA Attribution Workshop: Broomfield, CO, August 17- 18, 2010**

# National Drought Mitigation Center



***Founded:*** 1995 at the University of Nebraska-Lincoln by Dr. Don Wilhite

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

# NDMC National Collaborations

## Federal

- **National Integrated Drought Information System (NIDIS)**
    - NIDIS Program Implementation Team, NIDIS Pilots Teams, NIDIS Portal Team, NIDIS Working Groups
  - **NOAA:** RISAs, RCCs, NCCDC, NWS Offices (D.C., Regional, RFCs, WFOs), CPC, ESRL/PSD etc...
  - **NASA:** NASA Goddard Space Flight Center (GSFC) and Jet Propulsion Laboratory (JPL)
  - **USDA:** NRCS National Water and Climate Center, RMA, ARS, Joint Agricultural Weather Facility, World Agricultural Outlook Board
  - **USGS** Center for Earth Resources Observation Science (EROS)
  - **U.S. Army Corps of Engineers:** Institute for Water Research
  - **Bureau of Reclamation:** Lower Colorado Region
- 

## National

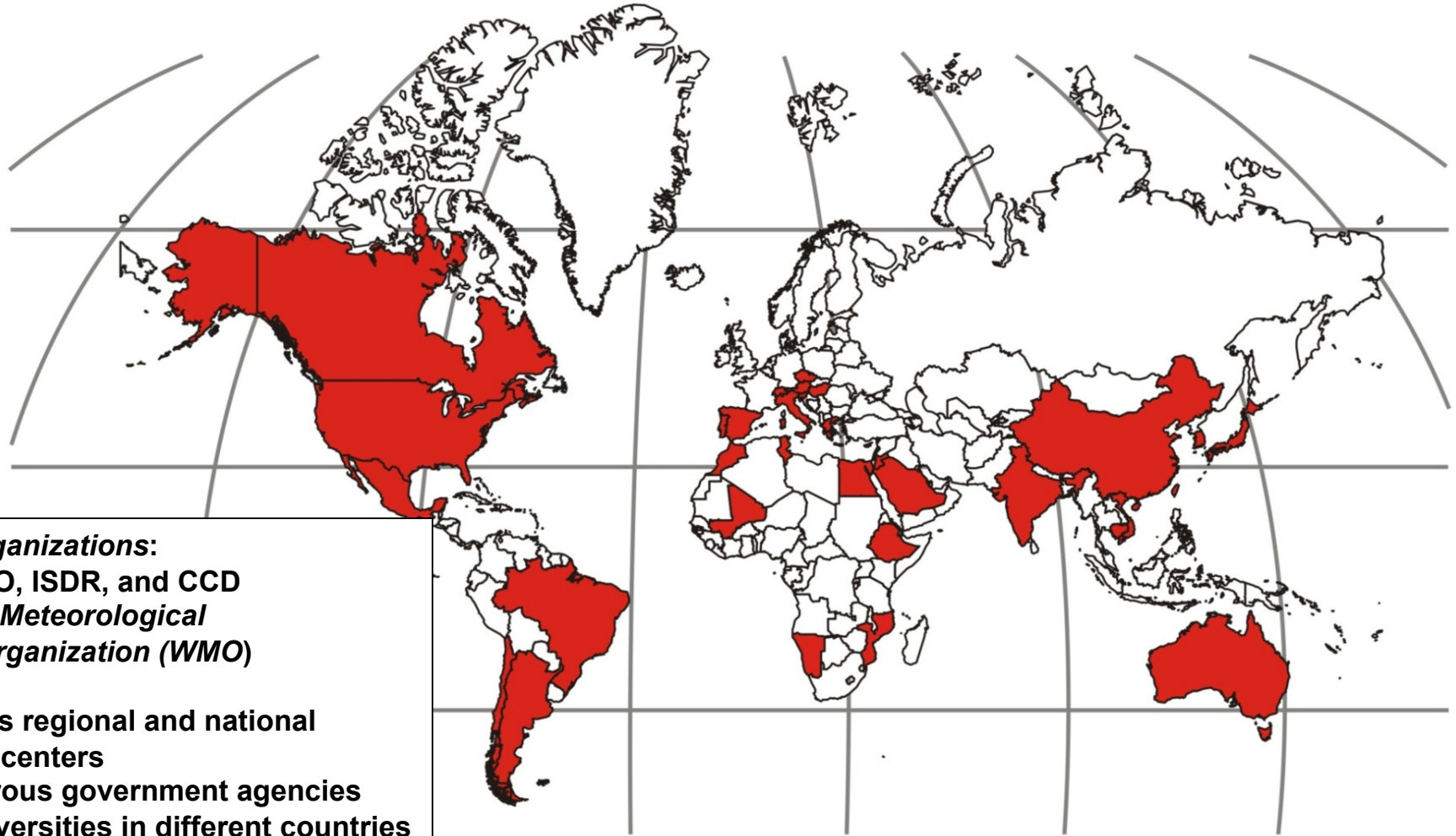
- U.S. Drought Monitor Author Group and Listserv
  - North American Drought Monitor Author Group and Listserv
  - National Phenology Network
  - National Conference of State Legislatures
- 

## Other

- **Researchers at Universities:** Colorado, Arizona, Iowa State, Missouri, Kansas, Indiana, Purdue, Texas A&M, South Dakota State, Illinois, Oklahoma, New Mexico, UNK, Augustana, Colorado State, UMKC, South Carolina, Washington, Wisconsin, Dartmouth, California-Riverside, Scripps Research Institute, Center for Research on the Changing Earth System
- **States/Tribes:** Hualapai, Hawaii, Colorado, Missouri, Nebraska, Arizona, Illinois, Oklahoma
- **Communities:** Lincoln, NE; Kansas City, MO; Johnson County, KS; Nebraska City, NE; Decatur, IL; Ada, Cordell, Norman, OK
- **Nebraska Natural Resources Districts**



# NDMC International Activities

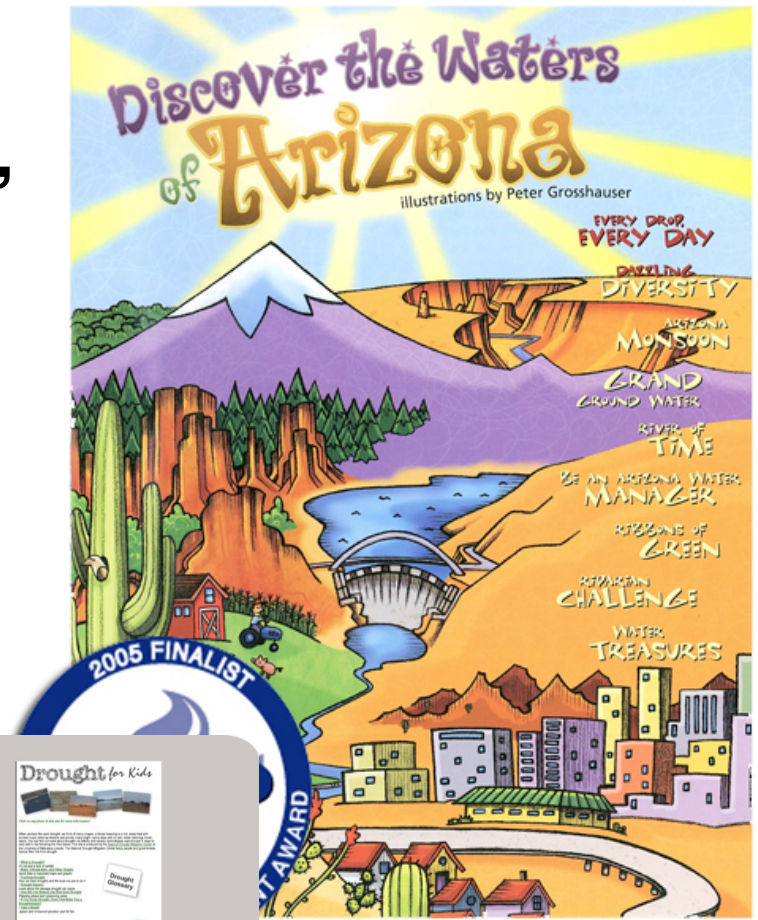


- **UN organizations:**  
FAO, ISDR, and CCD
- **World Meteorological Organization (WMO)**
- **USAID**
- **Various regional and national drought centers**
- **Numerous government agencies and universities in different countries**

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

# Drought-related Educational Materials

- **Guides:** Discover the Waters of Nebraska
- **Games:** “Meteoropoly”, “Water Banking” and “Wheel of Misfortune”



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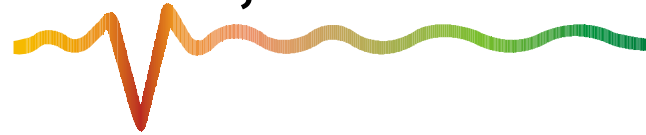
Photo: Lake Travis in Texas

Jay Janner, *Austin American-Statesman*, April 24, 2009



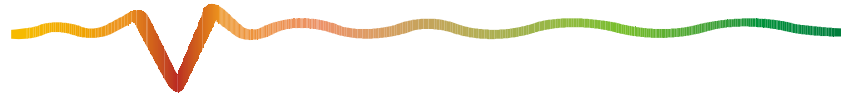
# Billion Dollar Disasters

NCDC, 1980-2008



<u>Disaster</u>	<u>Events</u>	<u>Damage\$</u>
Hurricanes	27	367
Tornadoes	16	34
<b>Droughts</b>	<b>14</b>	<b>180</b>
Floods	13	70
Fires	9	21
Winter-related	11	39
<b>Total</b>	<b>90</b>	<b>711</b>

# Getting into the Drought Biz

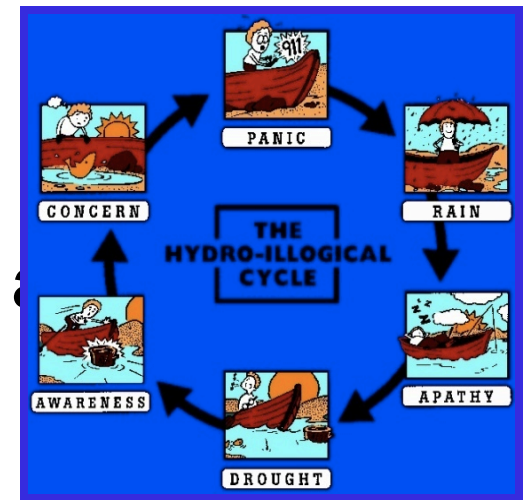


- **Heighten awareness** of drought as a hazard
- Answer these **three questions** (Kelly Redmond) **PLUS** one or two more:
  - How bad is it?
  - How does this drought compare to past droughts?
  - When will it end?
  - What does climate change mean for future droughts and/or is this drought due to climate change?!
- The NDMC, on average, fields between **300-500+** interviews per year



# What are the communication challenges in dealing with drought?

- Heightened awareness as a result of IPCC AR4: Drought is a normal part of the climate cycle and will continue to be
- Slow onset hazard: apathy
- Definitions: no universal definition....one size does not fit all nor should it.
- Differences in spatial, temporal, magnitude (duration) and impact characteristics
  - Short- vs. Long-term drought
  - Lags
  - Going into and coming out (triggers)



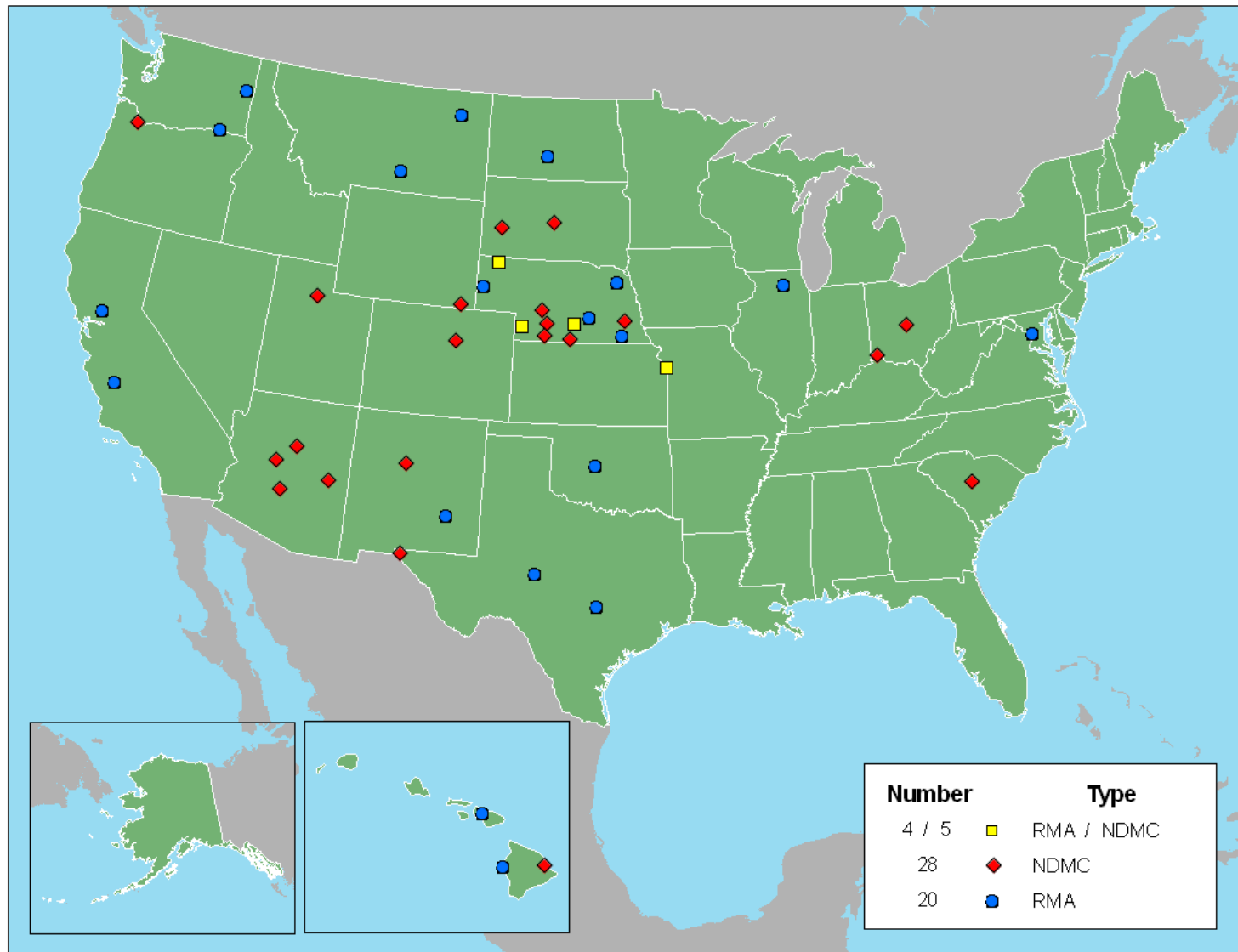
# What are the communication challenges in dealing with drought?

- **Drought vs. Aridity**
  - If there is a drought in the desert, does anyone see it?
  - Drought vs. Desertification
  - Drought vs. Water/Food Scarcity
- **Definitions: Mitigation**
  - C.C. = GGH reduction
  - Drought = climate change adaptation
- **Early warning is more than just a forecast**
- **FEMA doesn't deal w/ drought (hazard credibility) (NIDIS)**
- **Urban vs. Rural**
- **Mitigation incentives**





# NDMC Stakeholder Workshops 1996-2009



# Engaging Users on Drought Management Tools



- Building partnerships and trust
- Provide producers and advisors with easy-to-use tools, data and resources to better understand/utilize the linkages between local climate and their operations/decisions
- Obtain feedback on what information or tools are needed to better understand these linkages
  - Multiple **feedback** approaches (needs)
  - Continuous **dialogue/learning**



***Goal: Make our tools so easy to use  
use a Caveman can do it!***



Courtesy of GEICO



# The Drought Impact Reporter v2

<http://droughtreporter.unl.edu>

**Map Options**  
Impact Categories:

- Agriculture
- Water/Energy
- Environment
- Fire
- Social
- Other

Source: All Sources  
Time Period: Last Month  
Submit

Show Drought Monitor Layers

**Legend**

- No reported impacts
- 1 - 14 reported impacts
- 15 - 28 reported impacts
- 29 - 42 reported impacts
- 43 - 56 reported impacts
- 57 - 70 reported impacts

Instructions: Click on a state to see the reported drought impacts that affect that state.

**Sponsor: USDA-Risk Management Agency and National Oceanic and Atmospheric Administration's Transition of Research Applications to Climate Services Program (TRACS)**

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Lincoln





# Promoting the “drought impact reporting” idea to their volunteers...

The composite image features several elements:

- Top Left:** A close-up photograph of severely cracked, dry earth.
- Top Center:** The CoCoRaHS logo, which is a stylized leaf shape with the text "CoCoRaHS" and "Common, Consistent, Rain, Hail, & Snow Reporting" around it.
- Top Right:** A photograph of a man in a plaid shirt and dark pants standing in a field of young corn plants, appearing to inspect them.
- Bottom Left:** A map of the United States with colored dots indicating precipitation levels. A legend to the right of the map provides the following scale:

Daily Precipitation (inches x.xx)
Trace
0.00 - 0.22
0.23 - 0.44
0.45 - 1.10
1.11 - 2.65
2.66 - 3.98
3.99 - 4.43
- Bottom Center:** A dark banner with the text "COCORAHS & DROUGHT" in large white letters. Below this, it says "DO YOU? LET US KNOW" and "NEEDER MILK? YOUR FAVORITE FISHING HOLE GONE? AFFECTED YOU ... YOUR COMMENTS ARE VERY IMPORTANT!".

\* **14,000+** volunteers covering all 50 states!!

\* CoCoRaHS “Message of the Day”

\* Monthly e-mail reminders

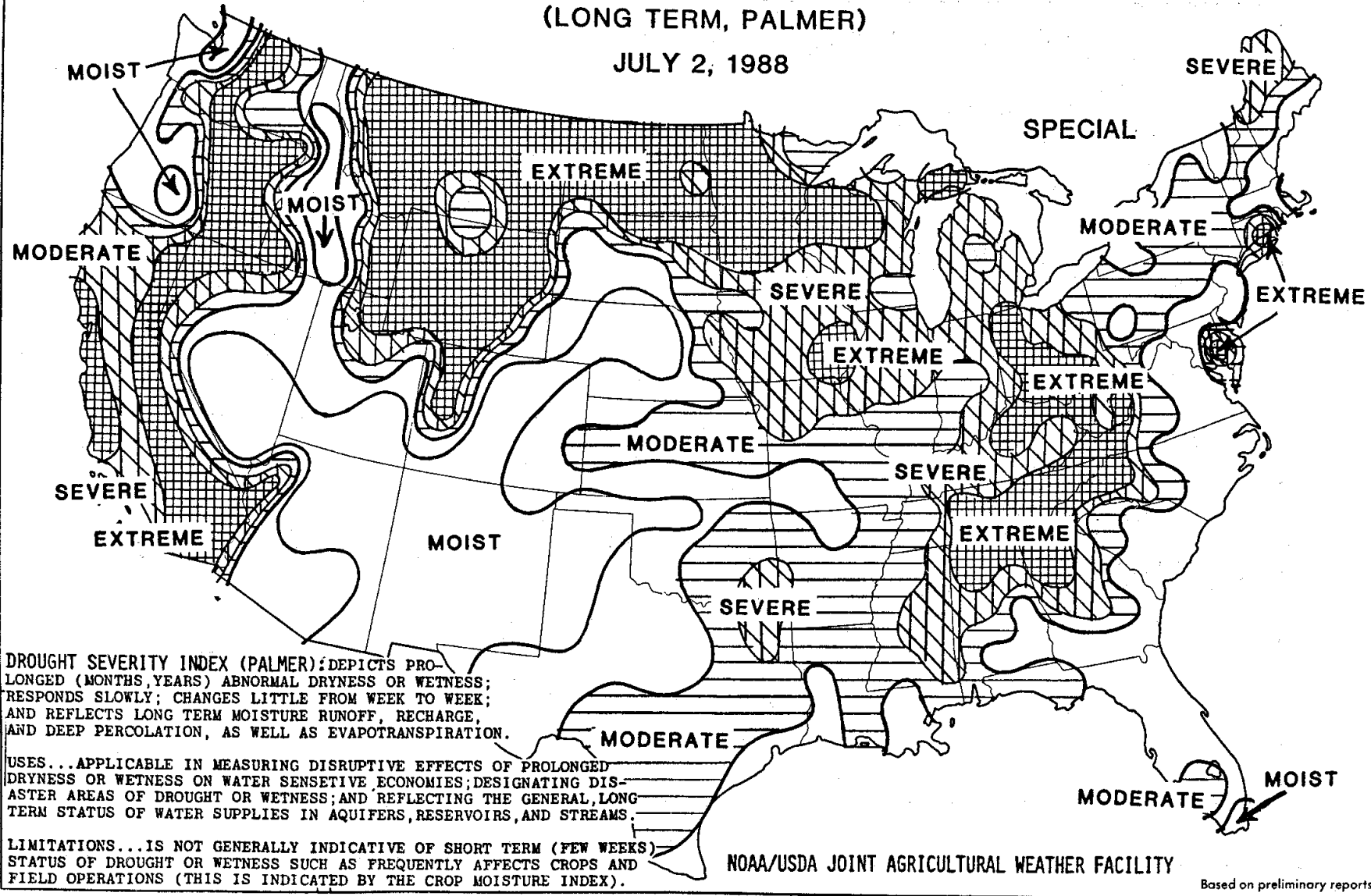
\* Guide to reporting drought impacts

\* Banners on the Web

Courtesy: Henry Reges, Colorado State University

# DROUGHT SEVERITY (LONG TERM, PALMER)

JULY 2, 1988



DROUGHT SEVERITY INDEX (PALMER): DEPICTS PROLONGED (MONTHS, YEARS) ABNORMAL DRYNESS OR WETNESS; RESPONDS SLOWLY; CHANGES LITTLE FROM WEEK TO WEEK; AND REFLECTS LONG TERM MOISTURE RUNOFF, RECHARGE, AND DEEP PERCOLATION, AS WELL AS EVAPOTRANSPIRATION.

USES... APPLICABLE IN MEASURING DISRUPTIVE EFFECTS OF PROLONGED DRYNESS OR WETNESS ON WATER SENSITIVE ECONOMIES; DESIGNATING DISTASTER AREAS OF DROUGHT OR WETNESS; AND REFLECTING THE GENERAL, LONG TERM STATUS OF WATER SUPPLIES IN AQUIFERS, RESERVOIRS, AND STREAMS.

LIMITATIONS... IS NOT GENERALLY INDICATIVE OF SHORT TERM (FEW WEEKS) STATUS OF DROUGHT OR WETNESS SUCH AS FREQUENTLY AFFECTS CROPS AND FIELD OPERATIONS (THIS IS INDICATED BY THE CROP MOISTURE INDEX).

NOAA/USDA JOINT AGRICULTURAL WEATHER FACILITY

Based on preliminary reports



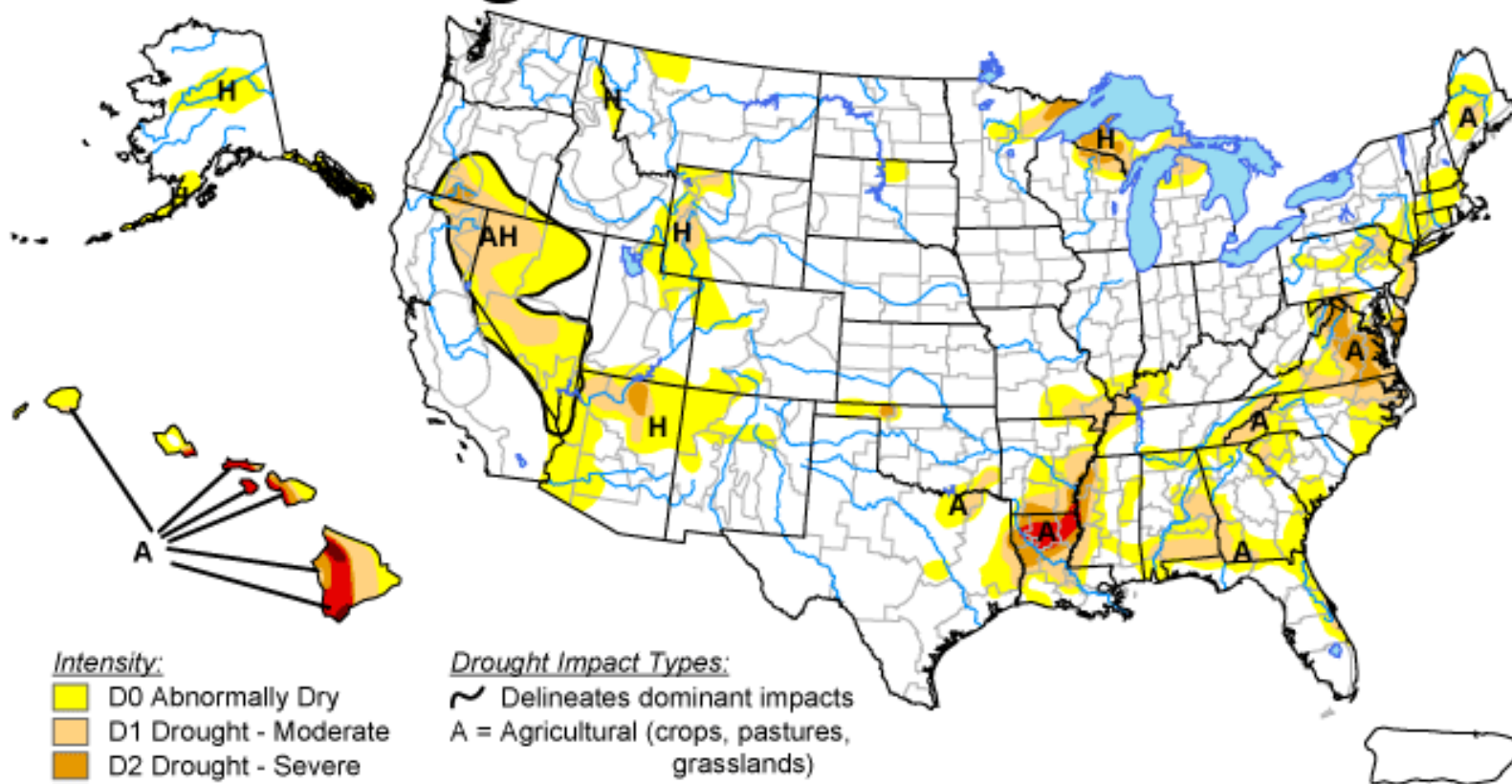
Courtesy: Weekly Weather and Crop Bulletin, JAWF










# U.S. Drought Monitor


August 10, 2010  
Valid 8 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
- 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>



Released Thursday, August 12, 2010

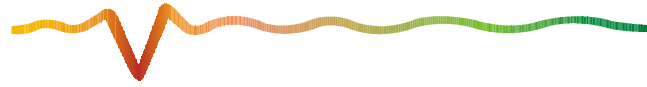
Author: Brian Fuchs, National Drought Mitigation Center



# ***The NDMC (and DM authors) have engaged stakeholder communities :***

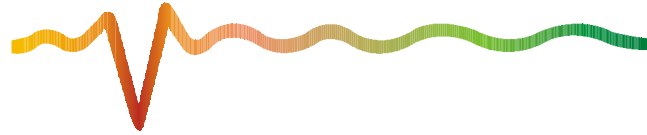
- USDM/NADM **Forums** and surveys
- USDM/NADM **Listservers** (participatory)
- USDA/RMA and other projects: **workshops, listening session, focus groups** w/ producers/etc. (60 since 2003)
- Meetings w/ Media (face-to-face, conferences)
- Meetings at annual conferences/trade shows/ etc.
- Meetings/briefings/workshops with/for various federal/state/tribal officials

# Challenges



- Find new ways to interact with our users
  - **Stakeholder “burnout”**
- Convince decision-makers that their mitigation/adaptation actions will reduce impacts
  - Quantify impacts and benefits
  - **Incorporate into drought planning/mitigation**
    - Proactive vs. Reactive
  - **Continual education and awareness**
  - It is also hard for mitigation measures to compete for funding with the many urgent and immediate emergency funding needs facing governments

# Lessons Learned?

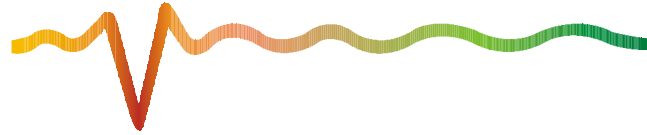


- 1. Drought needs to be placed into the broader context of the issues surrounding water, sustainability, and all natural hazards





# Lessons Learned?

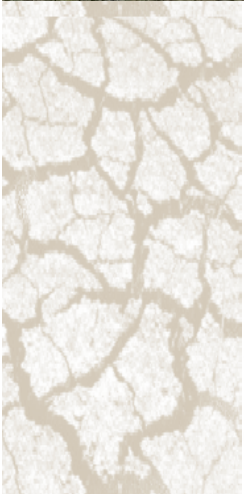
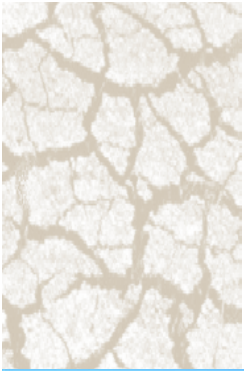


- 2. Drought is a normal part of climate across the United States
  - Recent droughts provide opportunities to learn lessons
  - Worst-case scenarios have been difficult to conceptualize
  - Independent of global warming....no need to wait for it to deal with it!

# Lessons Learned?

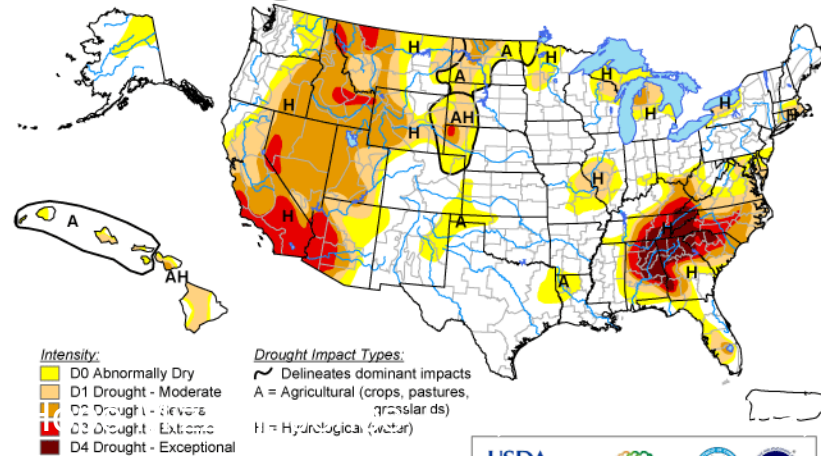


## 3. Drought is not a West-only phenomenon



### U.S. Drought Monitor

October 30, 2007  
Valid 8 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  
 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>

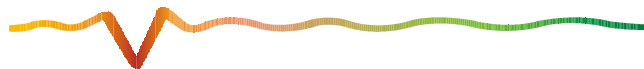


Released Thursday, November 1, 2007  
 Author: Douglas Le Comte, CPC/NOAA

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National Drought Mitigation Center

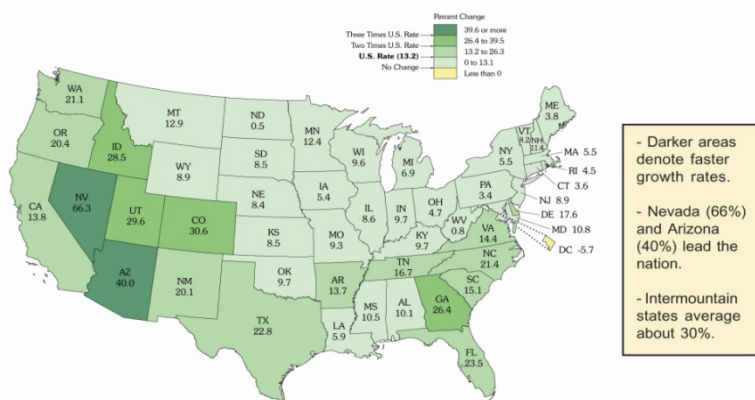
# Lessons Learned?



- 4. Vulnerability matters!
  - Drought is not just a physical event
    - Public health
    - Quantitative vs. qualitative impacts
  - Not all impacts are equal

Demographic Changes: Population Has Grown Fastest in the West, Particularly in the “Public Land States”

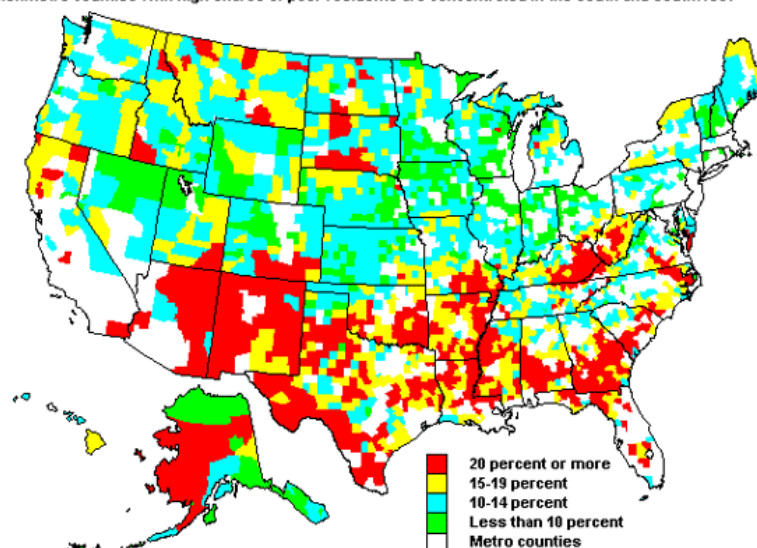
Percent Change in Resident Population for the 48 States and the District of Columbia: 1990 to 2000



- Darker areas denote faster growth rates.  
- Nevada (66%) and Arizona (40%) lead the nation.  
- Intermountain states average about 30%.

Rural Poverty Rates, 1997

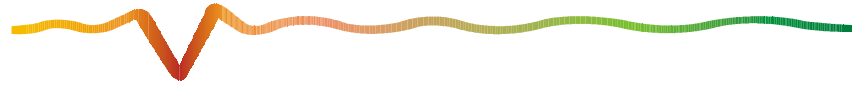
Nonmetro counties with high shares of poor residents are concentrated in the South and Southwest



Source: U.S. Census Bureau, Small Area Income and Poverty Estimates, 1997.



# Communication Challenges



- Response and decision support should focus on the needs of our users (**WGA (June 2010)**, *Climate Adaptation Priorities for the West*, as taken from the **National Research Council's**, *Informing Decisions in a Changing Climate*)
  - Develop information to allow for informed responses
  - Have to plan under uncertainty
- Give Priority to Processes over Products
  - Fosters interaction and learning....not just a final “one-off” product (USDM/DIR)
- Design for Learning w/ a continuous dialogue
- Establish Monitoring and Reporting Protocols:
  - Use feedback to adjust planning and implementation as appropriate

# Thank You

**Please contact me at:**

**Mark Svoboda  
National Drought Mitigation Center  
402-472-8238  
msvoboda2@unl.edu**

**Please visit the NDMC website for more  
information: <http://www.drought.unl.edu>**