

Drought Impact Collection: Activities at the National Drought Mitigation Center



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Monitoring Program Area Leader**

**National Drought Mitigation Center
University of Nebraska-Lincoln**

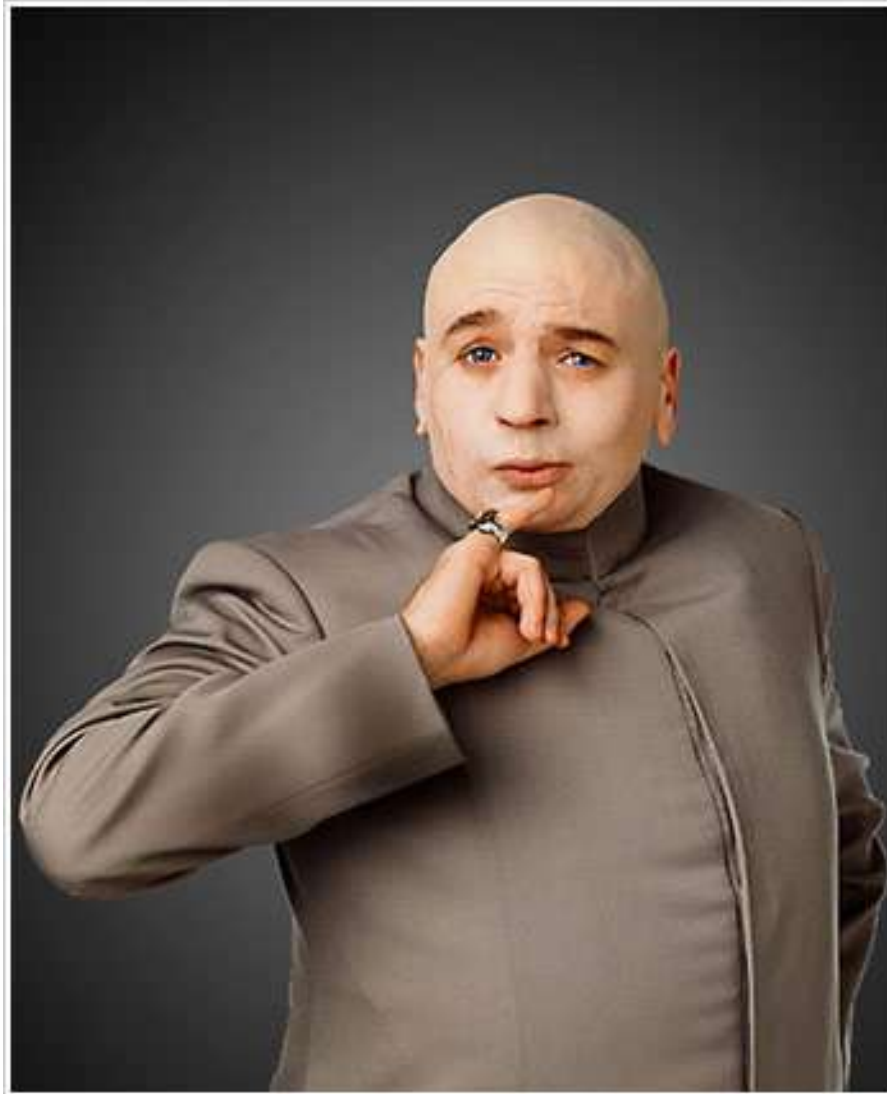
Canada Extremes Workshop, Winnipeg, Manitoba, February 7-8, 2011

Drought: “a force for truth”

- Analysis of drought risk management is the starting point for a comprehensive institutional analysis
- Stress from drought highlights:
 - Strengths and weaknesses that are usually hidden
 - Political priorities and underlying cultural values revealed by difficult choices
- Societies will manage climate change in the same way they will manage droughts (for better or for worse)

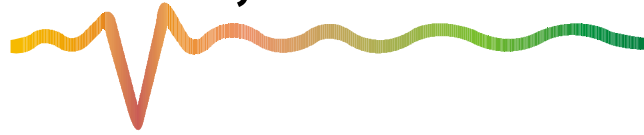
Daniel Connell, Australian National University, 2010

So just what is the cost of drought?



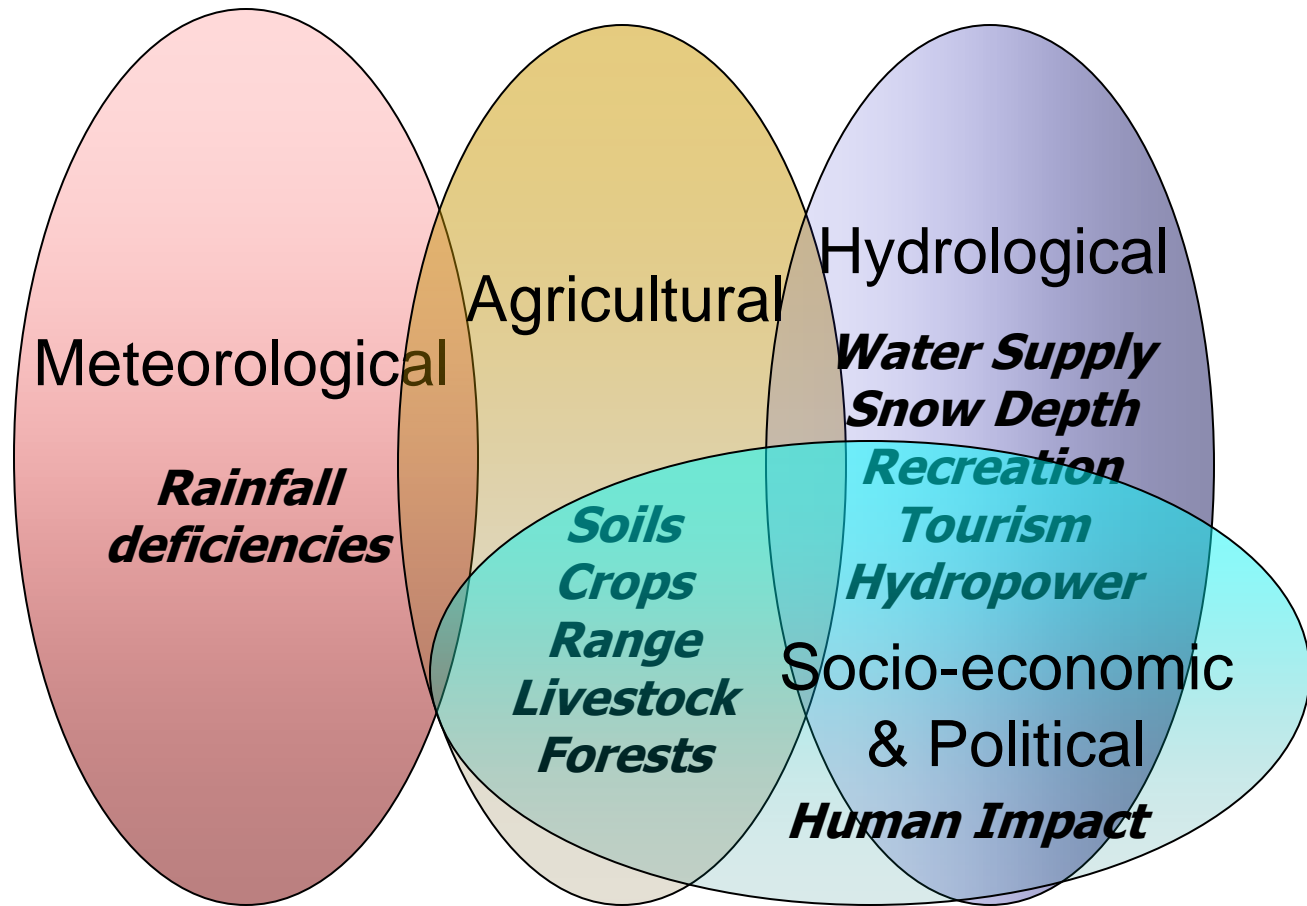
Billion Dollar Disasters

NCDC, 1980-2008



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

What we've learned: Defining Impacts



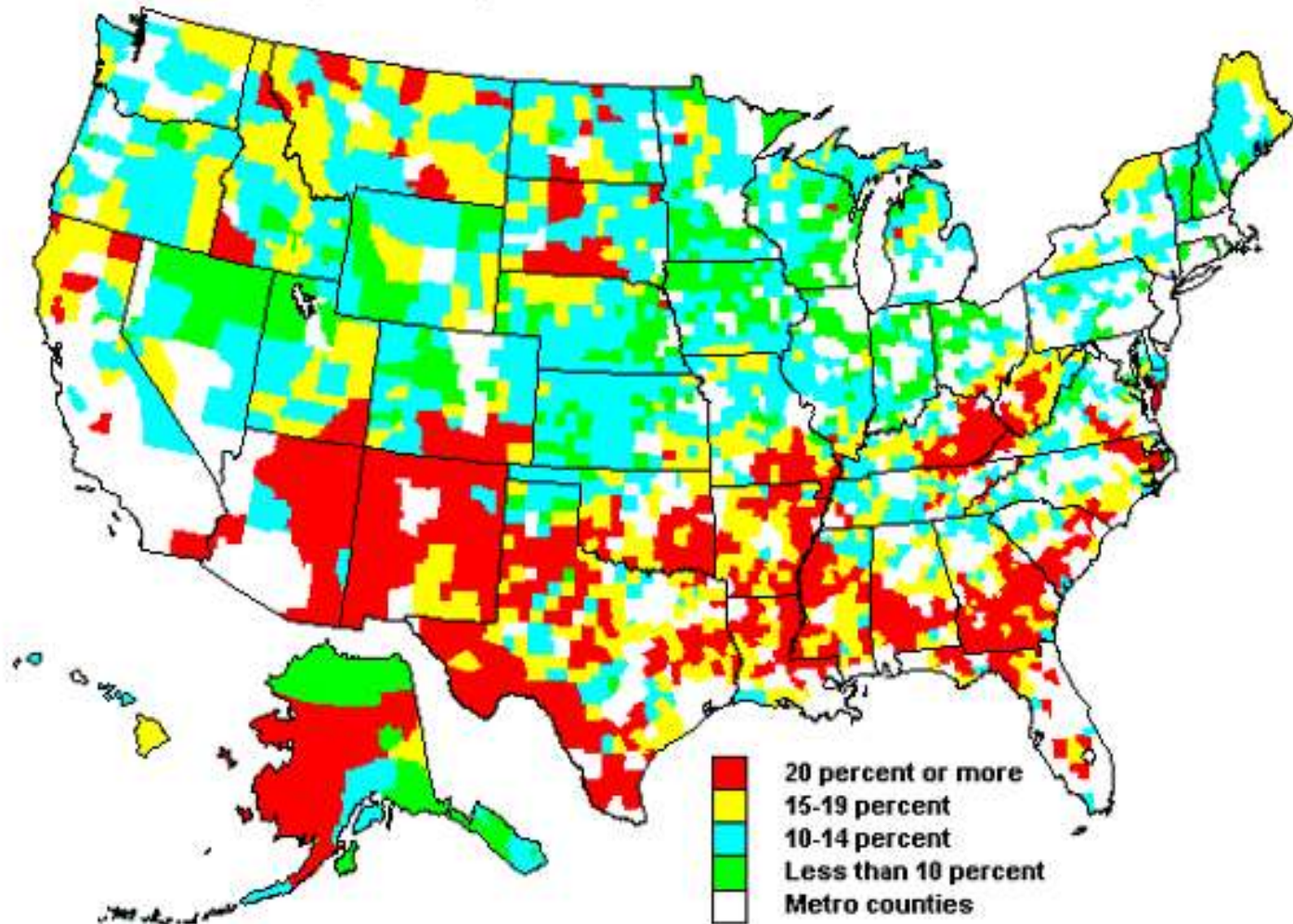
Why Track Drought Impacts?

- Establish an impacts **baseline** for monitoring
 - Climate change
- To know where to direct **relief**
- To reduce **vulnerability** in advance of the next drought
- **“Ground truth”** indices
- No single method exists for collecting and/or **quantifying** drought losses
- Very little in the way of **environmental** or **qualitative** collection

Vulnerability: Not all impacts are created equal

Rural Poverty Rates, 1997

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

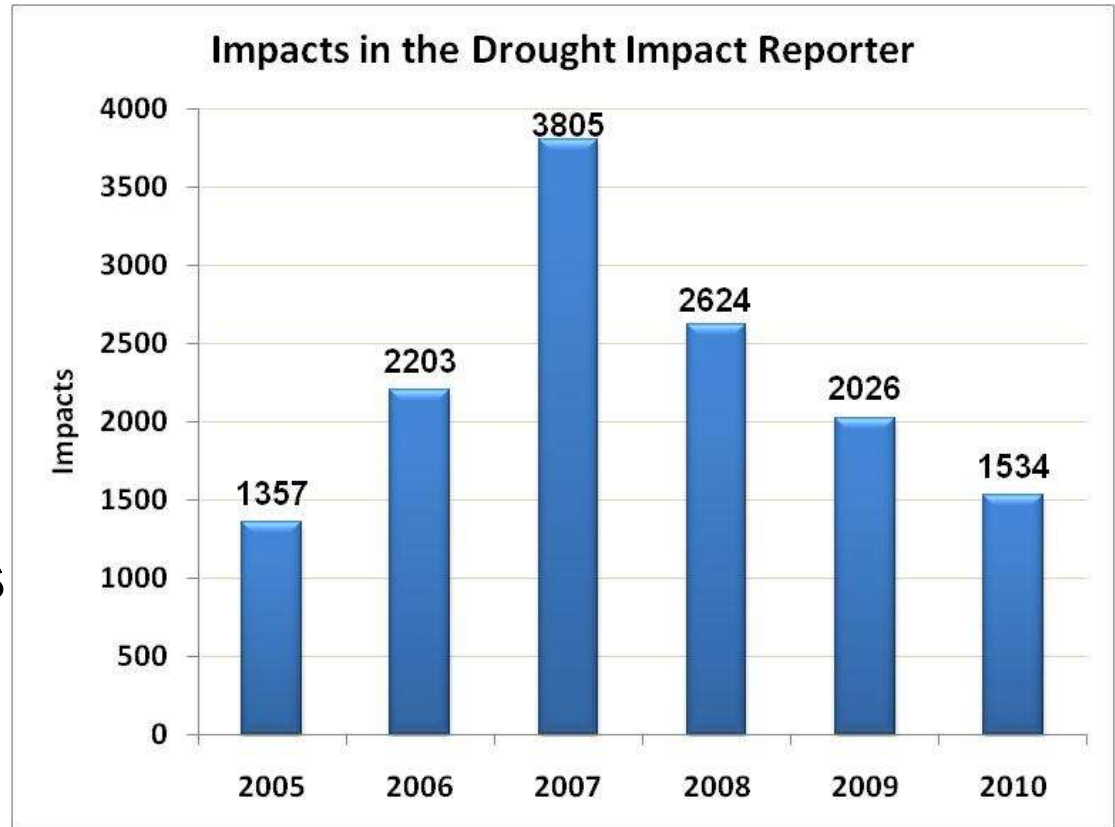


Source: U.S. Census Bureau, Small Area Income and Poverty Estimates, 1997.

Some DIR Factoids



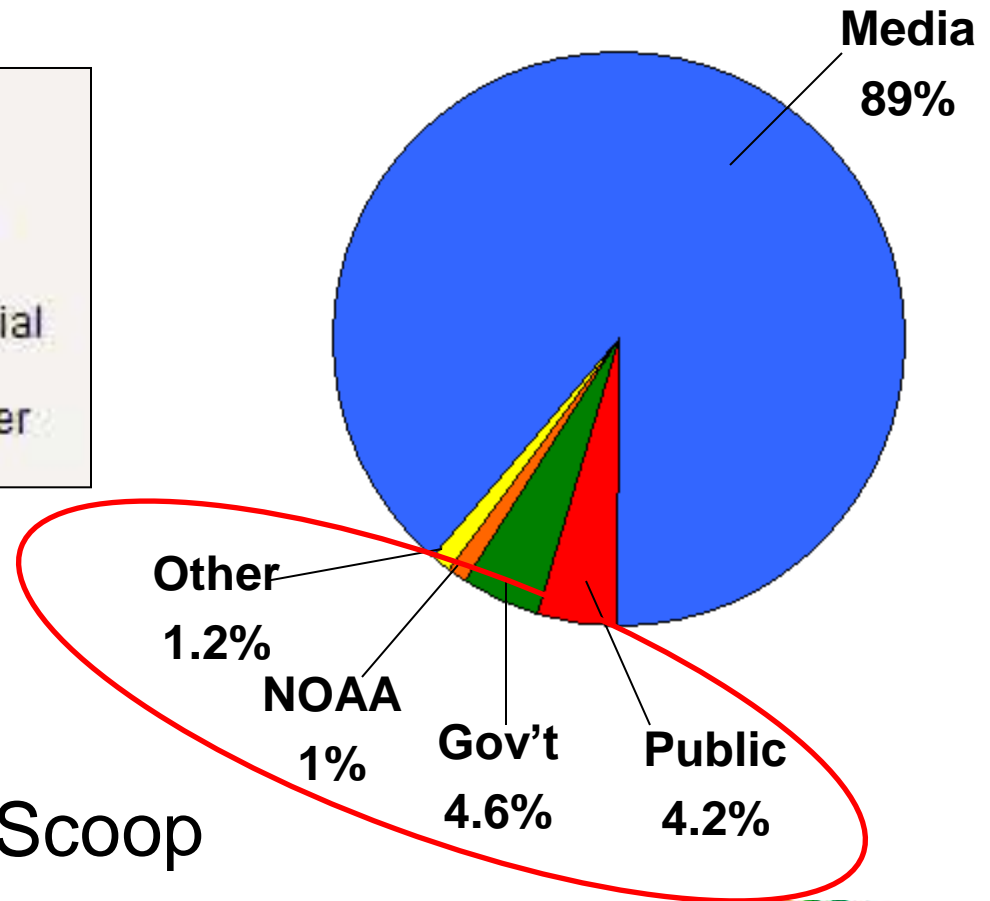
- **Established in 2005**
- **DIR DB now contains >13,500 impacts**
- **1,534 impacts added in 2010**



What's in the Current DIR?

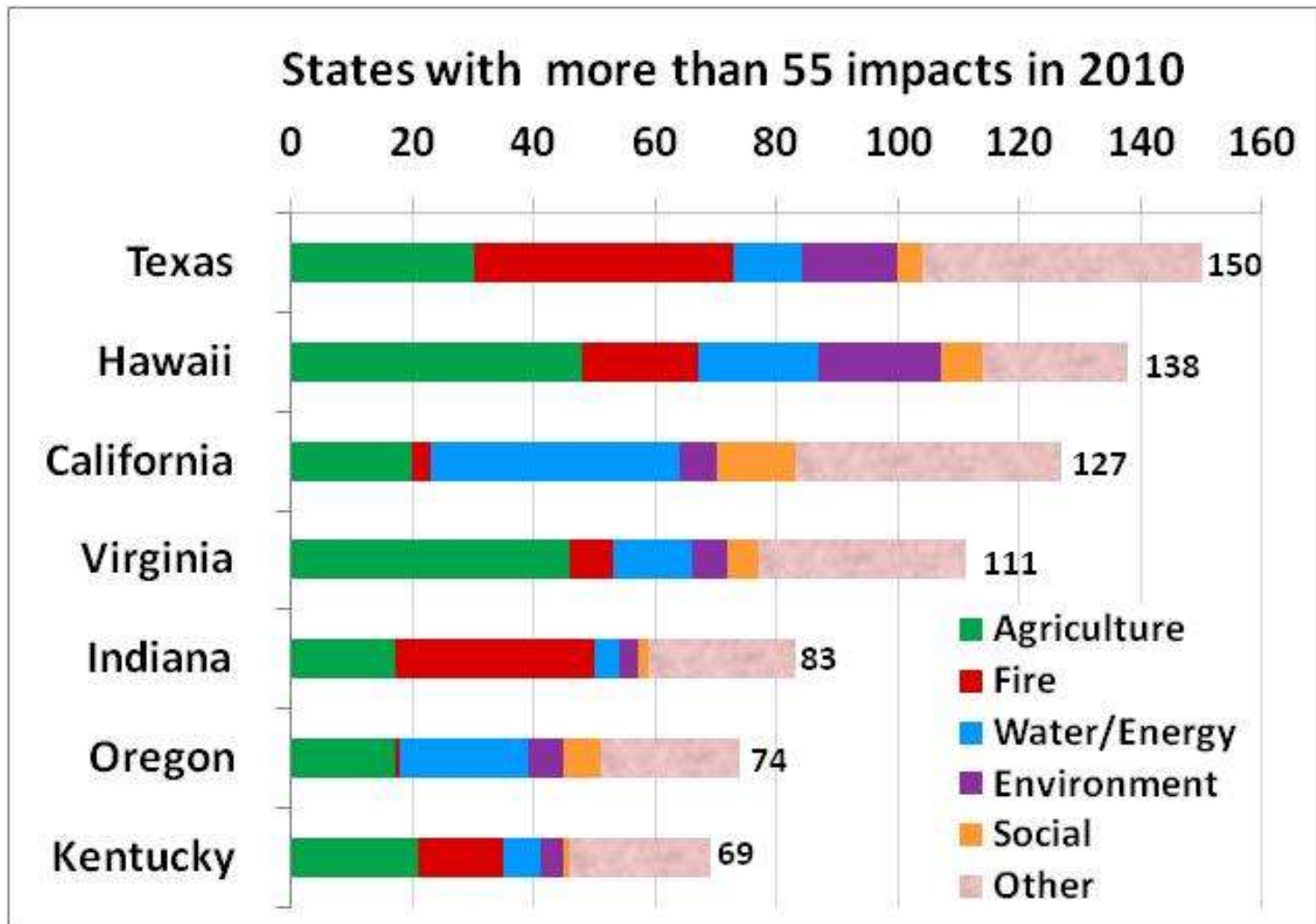
Impact Categories:

<input checked="" type="checkbox"/>  Agriculture	<input checked="" type="checkbox"/>  Fire
<input checked="" type="checkbox"/>  Water/Energy	<input checked="" type="checkbox"/>  Social
<input checked="" type="checkbox"/>  Environment	<input checked="" type="checkbox"/>  Other



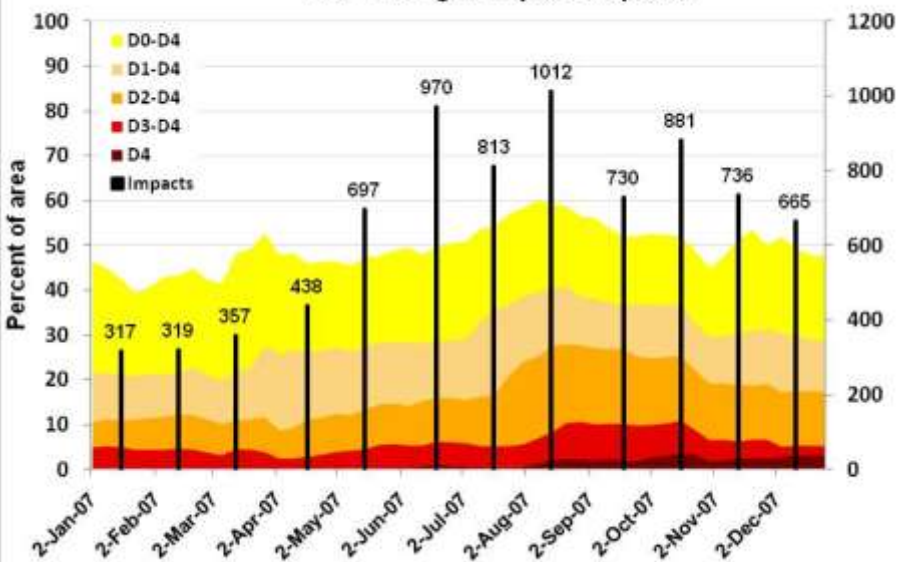
Utilizing CustomScoop

DIR Categorical Breakdown

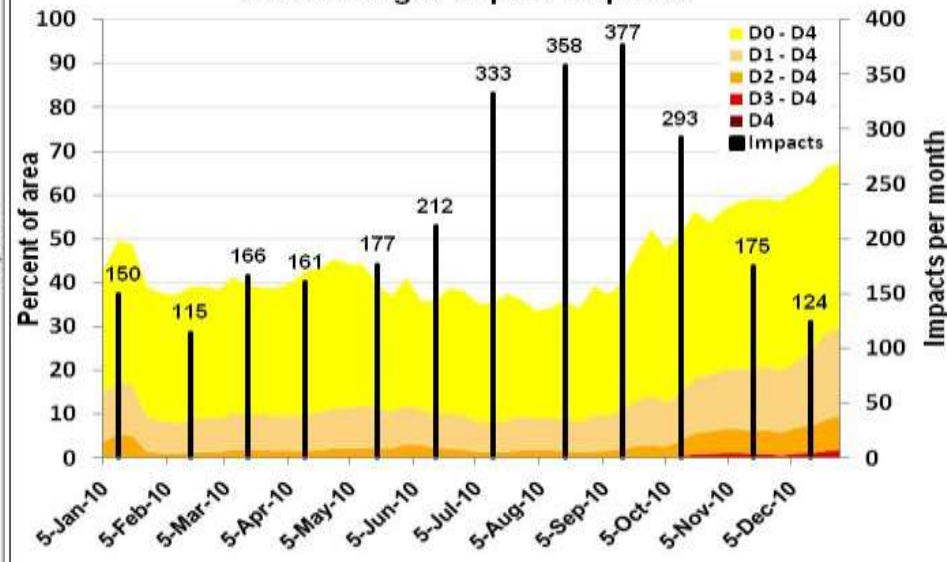


Tracking impacts vs. the U.S. Drought Monitor

Drought Monitor in 2007 with monthly impacts from Drought Impact Reporter



Drought Monitor in 2010 with monthly impacts from Drought Impact Reporter

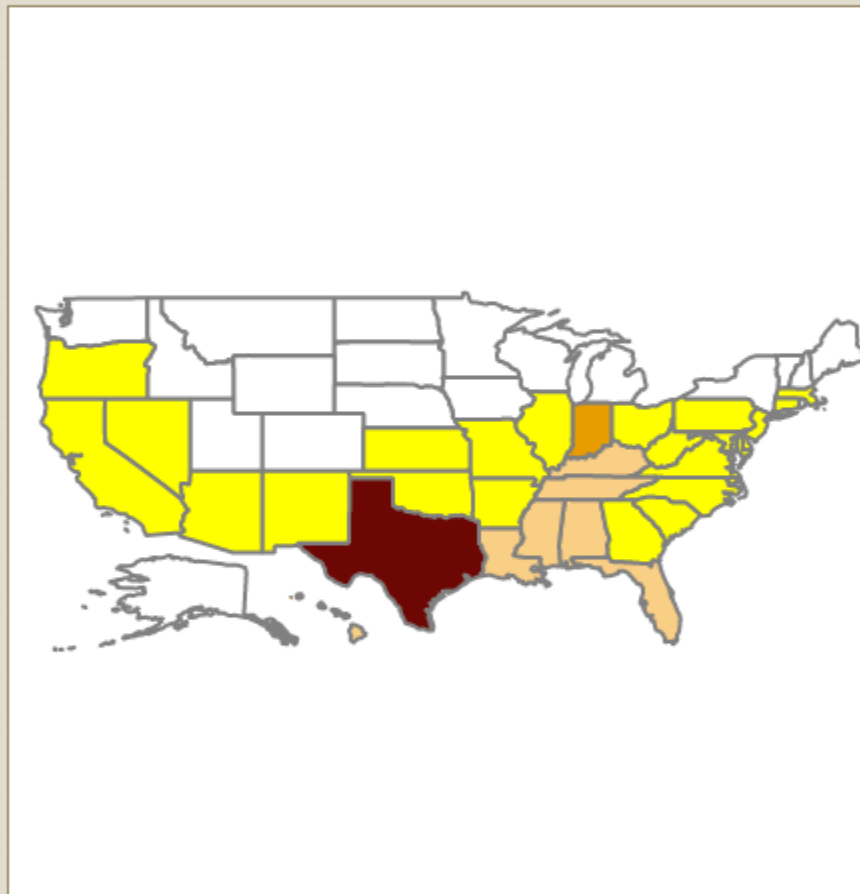


Drought Impact Reporter

National Drought Mitigation Center



[View Drought Impacts](#) | [Add A Drought Impact](#) | [Time-Lapse Animation](#) | [About](#) | [Help](#) | [User Login](#)



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

Map Options

Impact Categories:

- | | |
|--|--|
| <input checked="" type="checkbox"/> Agriculture | <input checked="" type="checkbox"/> Fire |
| <input checked="" type="checkbox"/> Water/Energy | <input checked="" type="checkbox"/> Social |
| <input checked="" type="checkbox"/> Environment | <input checked="" type="checkbox"/> Other |

Source:

Time Period:

Start:

End:

[Show Drought Monitor Layers](#)

Legend

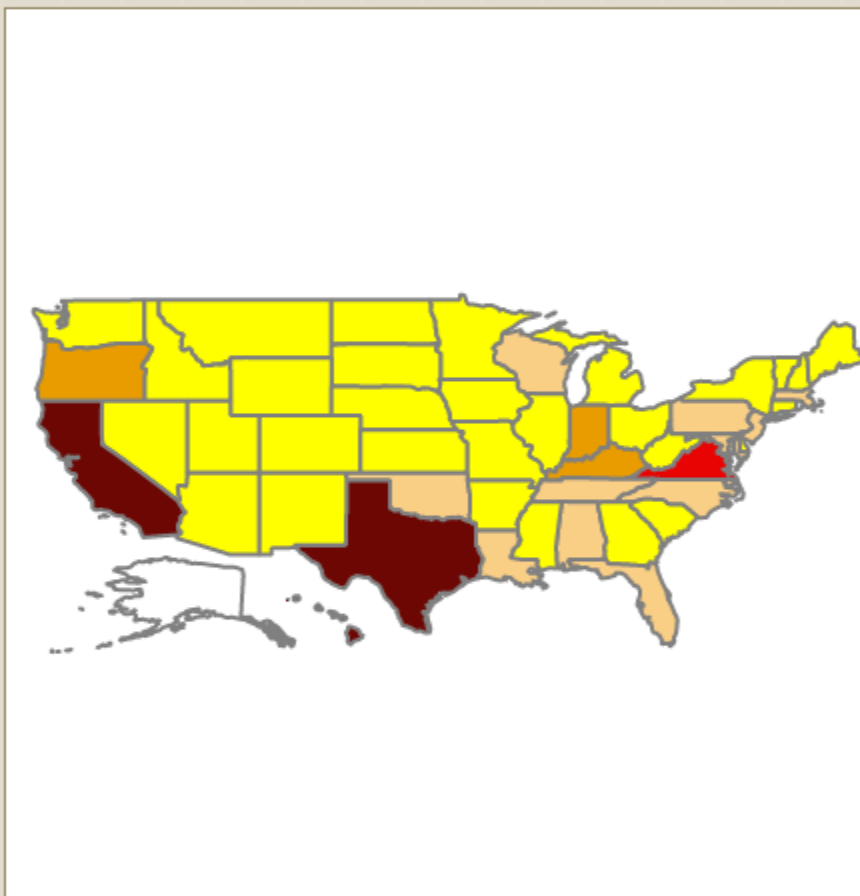
- | | |
|--------------------------|--------------------------|
| <input type="checkbox"/> | No reported impacts |
| <input type="checkbox"/> | 2 - 16 reported impacts |
| <input type="checkbox"/> | 17 - 31 reported impacts |
| <input type="checkbox"/> | 32 - 45 reported impacts |
| <input type="checkbox"/> | 46 - 60 reported impacts |
| <input type="checkbox"/> | 61 - 75 reported impacts |

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Source:

Time Period:

Start:

End:

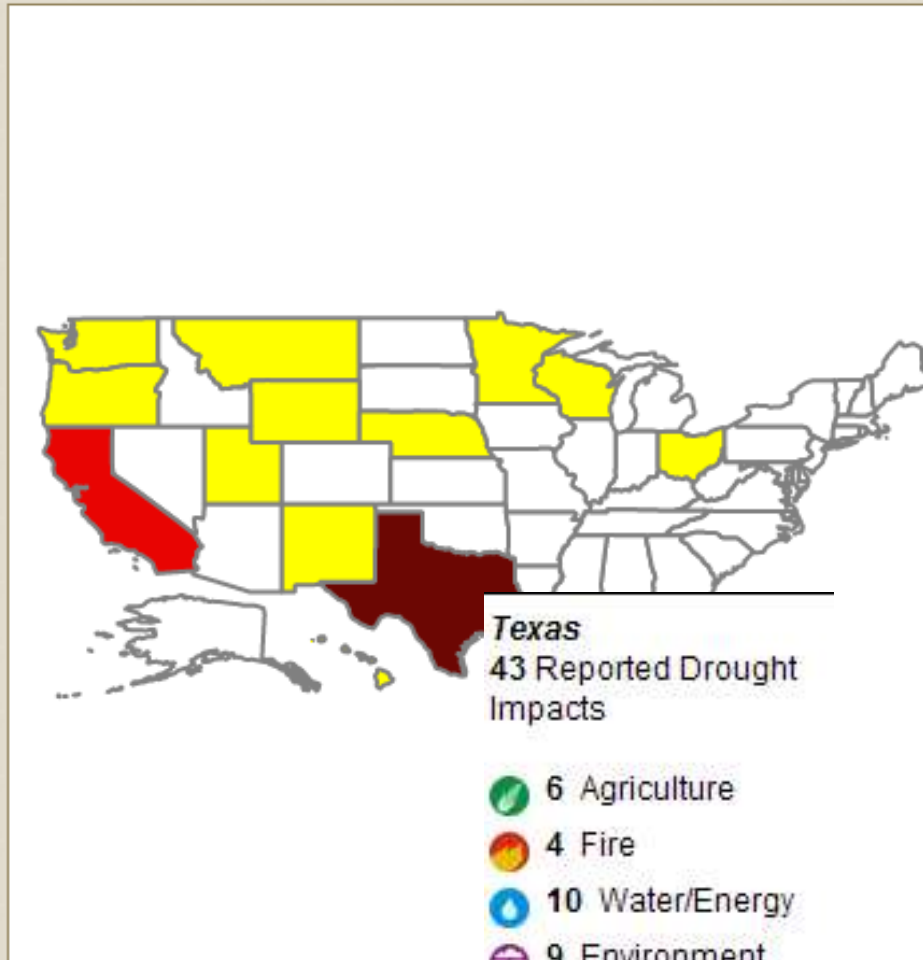
[Show Drought Monitor Layers](#)

Legend

- | | |
|--------------------------|----------------------------|
| <input type="checkbox"/> | No reported impacts |
| <input type="checkbox"/> | 1 - 29 reported impacts |
| <input type="checkbox"/> | 30 - 58 reported impacts |
| <input type="checkbox"/> | 59 - 87 reported impacts |
| <input type="checkbox"/> | 88 - 116 reported impacts |
| <input type="checkbox"/> | 117 - 145 reported impacts |

Drought Impact Reporter, October 5, 2009







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Instructions: Click or reported drought impact

Map Options

Impact Categories:







- | | |
|--|--|
| <input checked="" type="checkbox"/>  Agriculture | <input checked="" type="checkbox"/>  Fire |
| <input checked="" type="checkbox"/>  Water/Energy | <input checked="" type="checkbox"/>  Social |
| <input checked="" type="checkbox"/>  Environment | <input checked="" type="checkbox"/>  Other |

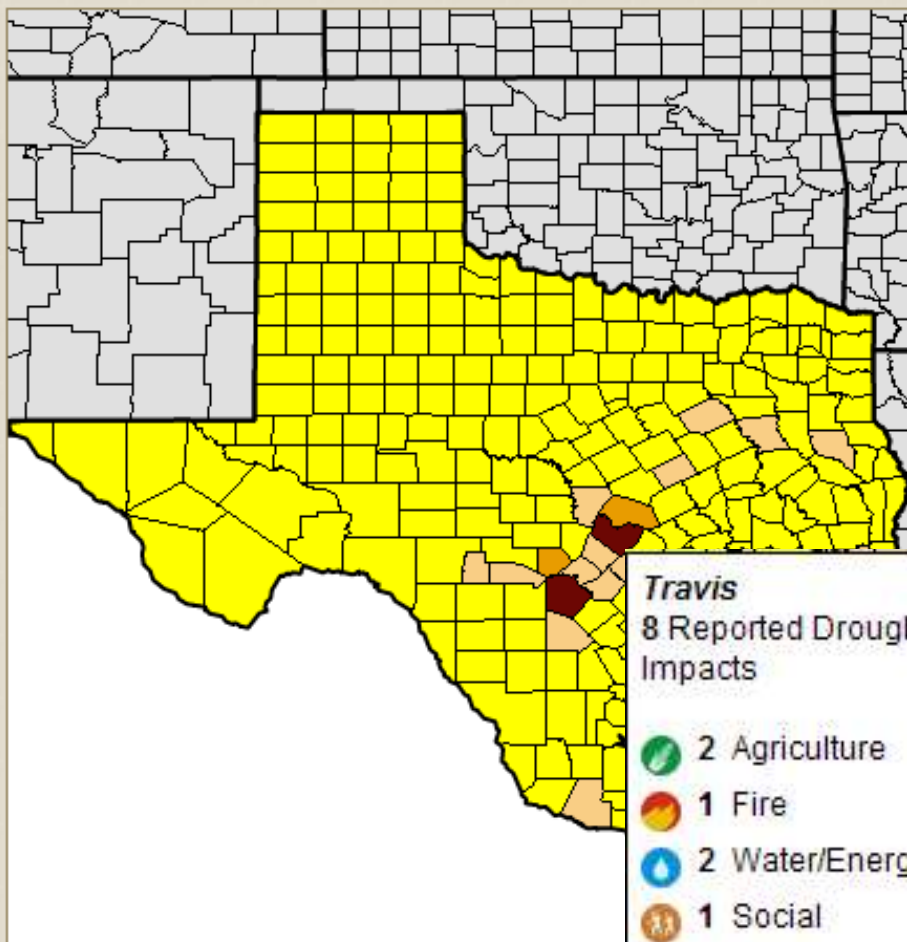
Source:

Time Period:

[Show Drought Monitor Layers](#)

Legend

- | | |
|---|--------------------------|
|  | No reported impacts |
|  | 1 - 9 reported impacts |
|  | 10 - 17 reported impacts |
|  | 18 - 26 reported impacts |
|  | 27 - 34 reported impacts |
|  | 35 - 43 reported impacts |



Map Options

Impact Categories:

<input checked="" type="checkbox"/> Agriculture	<input checked="" type="checkbox"/> Fire
<input checked="" type="checkbox"/> Water/Energy	<input checked="" type="checkbox"/> Social
<input checked="" type="checkbox"/> Environment	<input checked="" type="checkbox"/> Other

Source: ▾

Time Period: ▾

Travis
8 Reported Drought Impacts

	2 Agriculture
	1 Fire
	2 Water/Energy
	1 Social
	2 Other

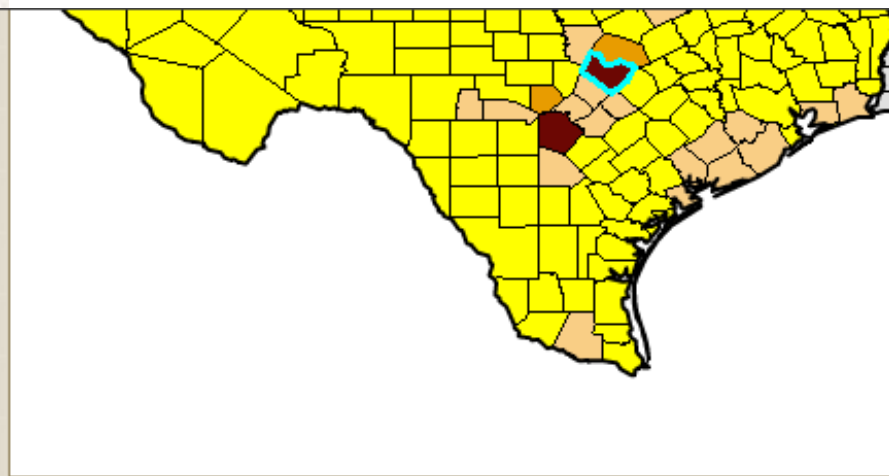
[Show Drought Monitor Layers](#)

Legend

	No reported impacts
	1 - 2 reported impacts
	3 - 4 reported impacts
	5 reported impacts
	6 - 7 reported impacts
	8 - 9 reported impacts

[Zoom To Entire U.S.](#)

Instructions: Click on a county to list the reported drought impacts that affect it.



Submit

Show Drought Monitor Layers

Legend

- No reported impacts
- 1 - 2 reported impacts
- 3 - 4 reported impacts
- 5 reported impacts
- 6 - 7 reported impacts
- 8 - 9 reported impacts

[Zoom To Entire U.S.](#)

Sources: All Sources, Categories: All Categories
 Date Range: September 5, 2009 to October 5, 2009

5 reported drought impacts for Travis County, Texas:

1. [Farmers and ranchers in](#) Texas who have lost livestock grazing... (click to read more)

Categories: Agriculture Other

Source: Media

Dates of Impact: 2009-01-01 to 2009-09-15

External URL: <http://www.beaumontenterprise.com/news/local/texa...>

2. [A ban on outdoor](#) burning is in effect for 30... (click to read more)

Categories: Fire Other

Source: Media

Dates of Impact: 2009-01-13 to 2009-09-15

External URL: <http://www.oakhillgazette.com/link.asp?twindow=De...>

3. [The low water level](#) of Lake Travis is exposing more... (click to read more)

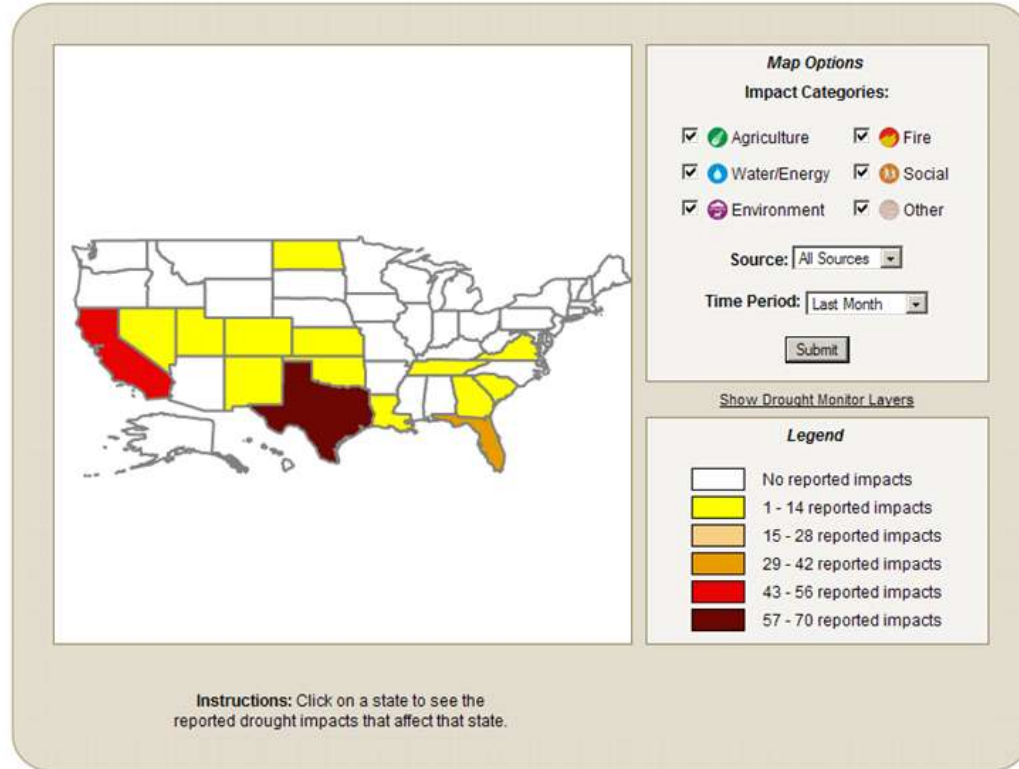
Categories: Social Water/Energy

Source: Media

Dates of Impact: 2009-09-10 to 2009-09-10

The Drought Impact Reporter v2

<http://droughtreporter.unl.edu>









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

What We've Learned: Refine Categories

Current

Map Options











Impact Categories:

<input checked="" type="checkbox"/>  Agriculture	<input checked="" type="checkbox"/>  Fire
<input checked="" type="checkbox"/>  Water/Energy	<input checked="" type="checkbox"/>  Social
<input checked="" type="checkbox"/>  Environment	<input checked="" type="checkbox"/>  Other

Source:

Time Period:

Planned

- [+] Media Reports
-  Society & Public Health
 -  Agriculture
 -  Disaster Declarations & Aid
 -  Energy
 -  Water Supply & Quality
 -  Wildfire
 -  Plants & Wildlife
 -  Other Business & Industry
 -  Tourism & Recreation
 -  General Awareness

Lessons learned: Need “government layers”

Disaster Declarations and Relief

USDA Secretarial Disaster Declaration S2424

The U.S. Department of Agriculture designated 17 Wyoming counties primary natural disaster areas, making all farm operators in the designated areas eligible for low-interest emergency (EM) loans from the USDA's Farm Service Agency (FSA). 26 secondary counties are eligible because they are contiguous.

Start Date: Dec. 31, 2005
End Date:
Termination Date: June 24, 2007
Approval Date: Oct. 11, 2006
Description: Drought, excessive heat, high winds, wildfires

[View county list](#)
[View full press release](#)
[Contact Information](#)

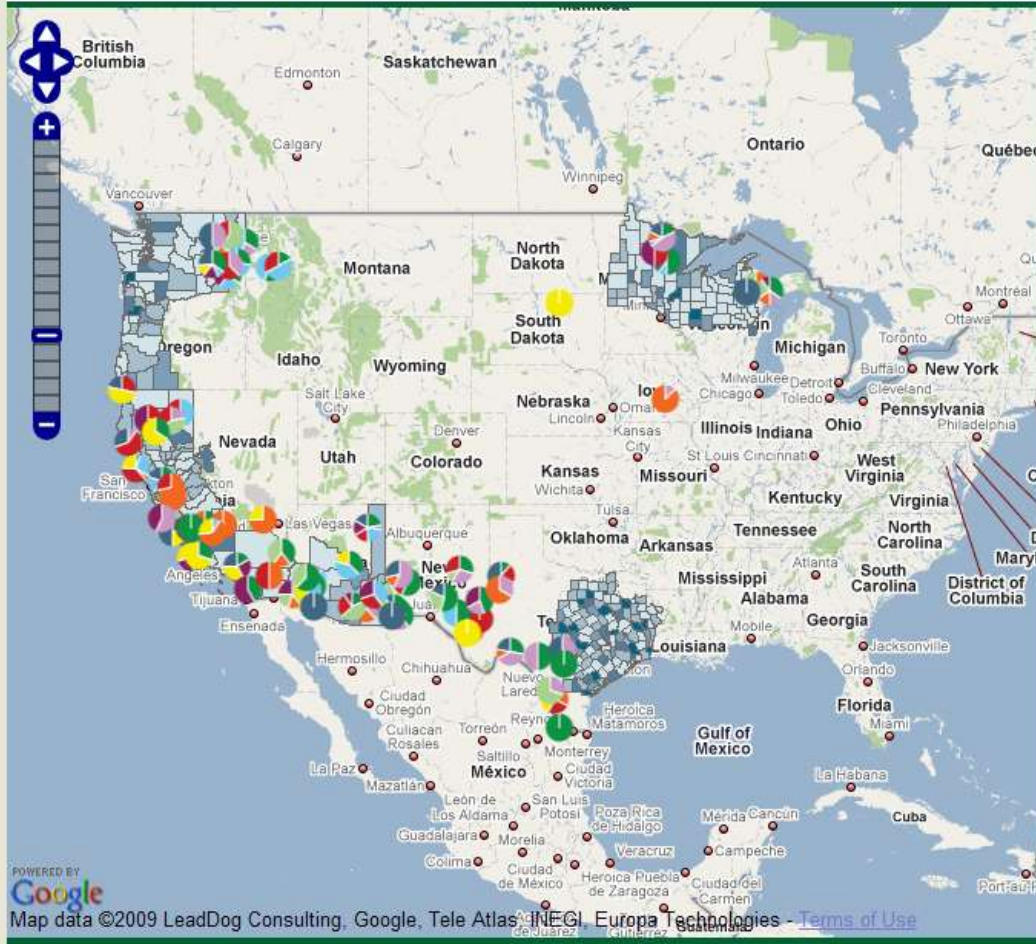
Legend

- [-] Secretarial Disaster Declarations
 - [-] SSD S2424
 - Primary County
 - Secondary County
 - [+] SSD S2435
- [-] Relief Programs
 - [+] Low Interest Emergency (EM) Loans
 - [+] Livestock Assistance Program (LAP)
 - [+] Emergency Haying and Grazing of CRP Acreage

Boundaries

Continental United States Alaska Hawaii

Welcome, Drought Fan!



Impacts

First 1 2 3 4 5 Last

Pecan Crop in Guadalupe County devastated by drought

12/14/2009 • 12/20/2009

Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Vestibulum tortor quam, feugiat vitae, ultricies eget, tempor sit amet, ante. Donec eu libero sit amet quam egestas semper.

Monte Vista Water District in stage two water restrictions

12/20/2009 • 12/30/2009

Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Vestibulum tortor quam, feugiat vitae, ultricies eget, tempor sit amet, ante. Donec eu libero sit amet quam egestas semper.

Geese drawn to Lubbock lakes as area lakes dwindle

12/15/2009 • 12/15/2009

Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Vestibulum tortor quam, feugiat vitae, ultricies eget, tempor sit amet, ante. Donec eu libero sit amet quam egestas semper.

Welcome, Drought Fan!

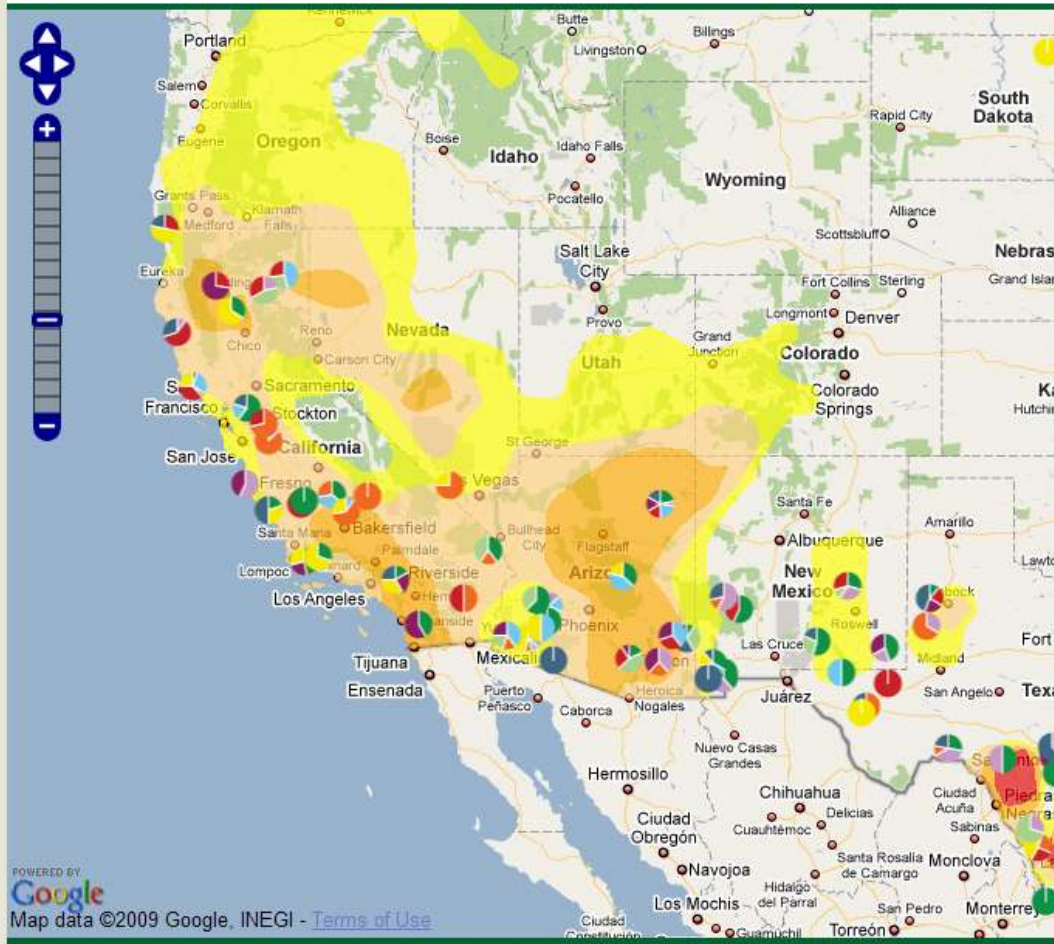


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 - Relief, Response & Restrictions
 - Energy
 - Fire
 - General Awareness
 - Plants & Wildlife
 - Society & Public Health
 - Tourism & Recreation
 - Water Supply & Quality
- Burn Bans
- Water Restrictions
- CoCoRaHS Reports
- NWS Drought Statements
- Drought Monitor
 - D0 - Abnormally Dry
 - D1 - Moderate Drought
 - D2 - Severe Drought
 - D3 - Extreme Drought

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Welcome, Drought Fan!

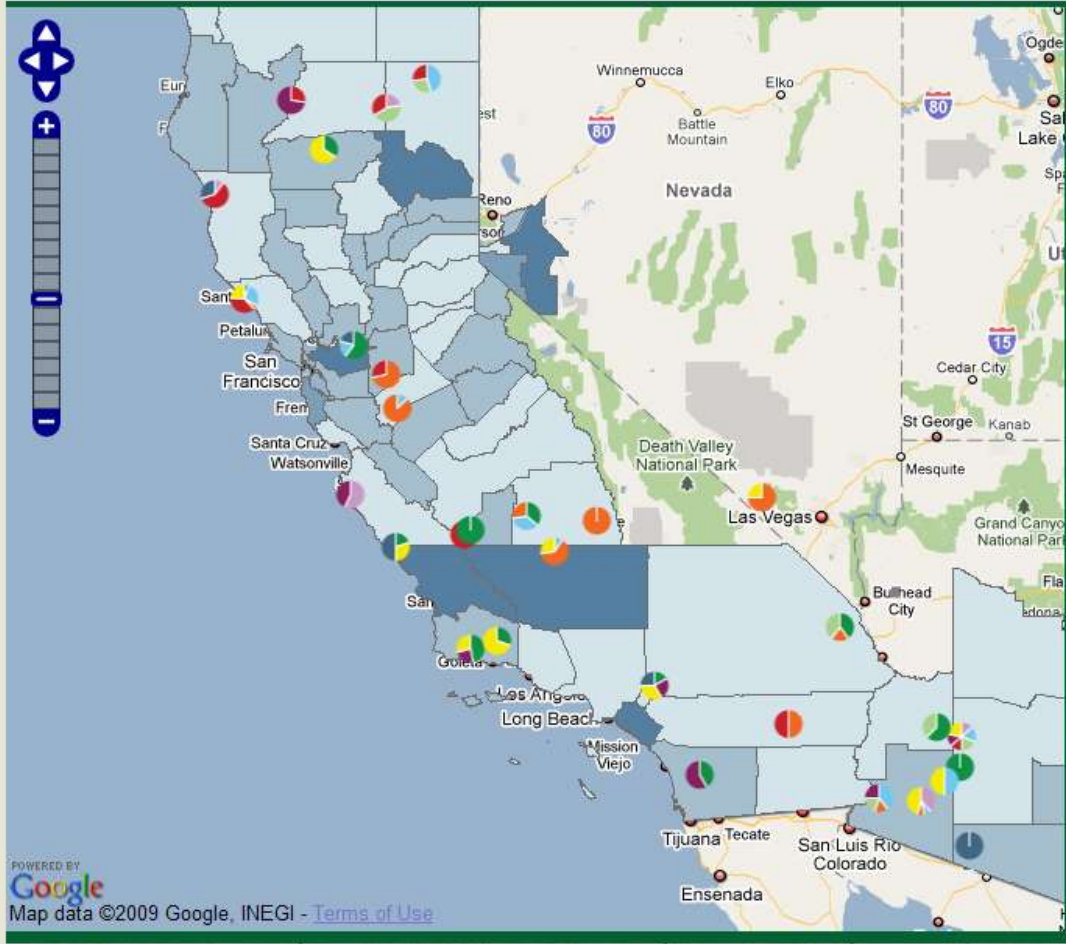


Table of Contents

- Impacts
 - No Impacts
 - 1-5 Impacts
 - 6-10 Impacts
 - 11-20 Impacts
 - 20-50 Impacts
 - 50+ Impacts
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 - NWS Drought Statements
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 - HUC 2
 - HUC 4
 - HUC 6
 - HUC 8
 - Climate Divisions
 - County Warning Areas

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Other Impacts Research and Efforts:

- CoCoRaHS
- States: AZ, HI, CA, TX, reporting impacts – how connected to policy process is it?
- Case studies: North Carolina landscapers
- Transferability to North America?
- GEO/GEOSS system of systems/tying together virtual networks of global drought impact reporting.....

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

COCORAHS & DROUGHT
HOW HAS THE LACK OF RAIN IMPACTED YOU? LET US KNOW

WRITE FISHING HOLE GONE?
COMMENTS ARE VERY IMPORTANT!

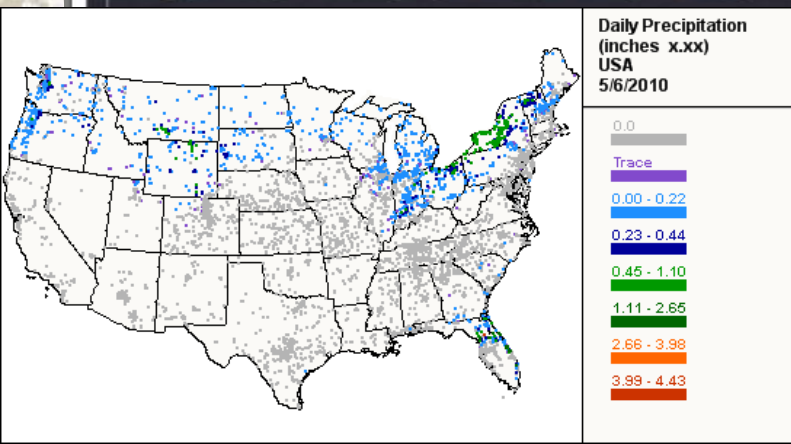
* **14,000+** volunteers covering all 50 states!!

* CoCoRaHS “Message of the Day”

* Monthly e-mail reminders

* Guide to reporting drought impacts

* Banners on the Web



Courtesy: Henry Reges, Colorado State University

IS 'BROWN' THE NEW GREEN?

CoCoRaHS Drought Impacts

Report how drought is impacting your community with a "Drought Impact Report"

BOATING ACTIVITY HIT BOTTOM?

CoCoRaHS Drought Impacts

Report how drought is impacting your community with a "Drought Impact Report"

COWS GIVING POWDERED MILK?

CoCoRaHS Drought Impacts

Report how drought is impacting your community with a "Drought Impact Report"

HOW DO YOU SPELL RELIEF?

CoCoRaHS Drought Impacts

Report how drought is impacting your community with a "Drought Impact Report"

READING BY CANDLELIGHT LATELY?

CoCoRaHS Drought Impacts

Report how drought is impacting your community with a "Drought Impact Report"

COUGHIN' MORE OFTEN?

CoCoRaHS Drought Impacts

Report how drought is impacting your community with a "Drought Impact Report"

"... SMOKE GETS IN YOUR EYES"

CoCoRaHS Drought Impacts

Report how drought is impacting your community with a "Drought Impact Report"

DRINKING WATER TASTE DUSTY?

CoCoRaHS Drought Impacts

Report how drought is impacting your community with a "Drought Impact Report"

BIRDS FLYING NORTH THIS WINTER?

CoCoRaHS Drought Impacts

Report how drought is impacting your community with a "Drought Impact Report"


Some Key Recommendations: Through a strengthening of NIDIS.....

- * **Full funding for basic data collection**
 - ***Socio-economic data*** to better understand and ***quantify the impacts of drought*** and to inform cost-effective preparedness and response strategies
 - ***Ecosystem data*** to better understand the ***impacts of drought*** to aquatic, riparian and groundwater dependent ecosystems and species and the ***loss of ecosystem services***

WGA/WSWC 2011



Improving Drought Preparedness
in the West
*Findings and Recommendations from the
Western Governors' Association and
Western States Water Council Workshops*
January 2011



WESTERN
GOVERNORS
ASSOCIATION

Summary

Drought affects communities, economies, and the natural environment throughout the West. For over a decade, the Western Governors have worked to improve drought forecasting and promote drought preparedness in the Western States. This year the Governors directed WGA to convene a series of meetings with end-users of drought information to identify key actions needed regionally and nationally to improve drought preparedness.

This report details findings from the meetings convened. The findings fall into three broad areas:

- Strengthening the National Integrated Drought Information System (NIDIS);
- Improving drought preparedness planning; and
- Identifying the role of states and other stakeholders in shaping climate services.

This report also provides recommendations for advancing these three key issues.

Background

In recent years, several severe and long-term droughts have occurred in the Western United States. Severe drought conditions have created life-threatening situations and financial burdens for government, the private sector, and individuals. Dry conditions have led to forest and rangeland fires, destroying homes, impairing habitat and grazing lands, and affecting water quality and streams. Drought has caused shortages of grain and other agricultural products, resulting in increased prices that are passed on to consumers. Municipal water supplies are threatened by drought, leading to water restrictions and heightened competition with other water users. In short, drought damages social, economic and environmental resources and negatively affects the quality of life of our citizens.

Drought is often called the 'creeping disaster'. Unlike other natural disasters such as floods, tornadoes, and hurricanes, the effects of drought creep up over a period of several years. We often do not know when a drought has started, nor do we know when droughts will end. We often fall into the 'hydro-logical cycle': we ignore drought until the situation is dire, and then we lament the impacts, call for help and seek emergency funding; but then it will rain, we forget there was ever a problem, and we go back to business as usual. The WGA is working to break this cycle.

Over the past decade, Western Governors consistently advocated for a comprehensive national drought policy. WGA Policy Resolution 08-14 states:

The Western Governors believe that a comprehensive, integrated response to drought emergencies, including mitigation planning, is critical to the social, environmental and economic well-being of the West. Because of the intractable nature of this crisis and its

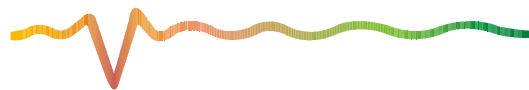
www.westgov.org/www

Challenges



- Systematic impact assessments are needed
- Convince decision-makers that their mitigation/adaptation actions will reduce future drought 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

Summary



- Drought is not just a physical event
- Vulnerability matters
- Impacts (establish a baseline)
- Promote and Encourage Citizen Science



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

National Drought Mitigation Center

University of Nebraska–Lincoln



The National Drought Mitigation Center (NDMC) helps people and institutions develop and implement measures to reduce societal vulnerability to drought. The NDMC, based at the University of Nebraska–Lincoln, stresses preparation and risk management rather than crisis management.

What is Drought?

An overview of drought • Discussion of drought indices • Drought and climate change • Drought and El Niño

Planning for Drought

Why plan for drought • 10-Step Planning Process • State, tribal, and local drought plans • Drought planning contacts

Monitoring Drought

Drought monitoring tools • SPI maps • Climographs • Dust Bowl • Historical drought

Drought Risk and Impacts

Reducing drought risk • Drought impacts • Drought vulnerability analysis

Mitigating Drought

Putting a drought plan together • Existing drought plans and studies • Drought mitigation tools/initiatives • Water conservation

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What's New at NDMC

- [Central California Workshops](#)
- [NDMC Welcomes New Members](#)
- [DroughtScope - Winter 2009](#)



[Drought for Kids](#)

[For Media](#)

[Other Drought-related Sites](#)

[U.S. Drought Monitor](#)

[NDMC's Drought Impact Reporter](#)

Thanks!

Contact me at:

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402-472-8238

msovoboda2@unl.edu