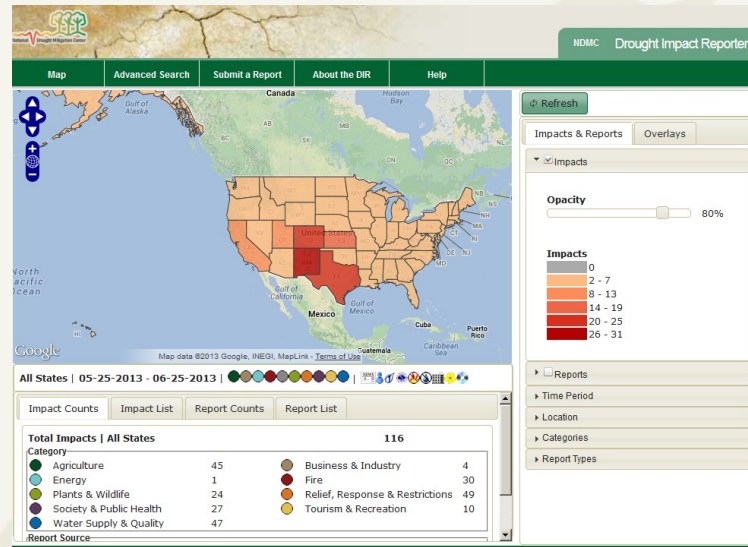


# Drought Impact Reporter Lessons Learned Since 2005



<http://droughtreporter.unl.edu>

**Kelly Helm Smith**

Communications and Planning Specialist  
National Drought Mitigation Center  
University of Nebraska-Lincoln

**Western States Water Council**

**August 7, 2013**

**San Diego, CA**



# Why Track Drought Impacts?

- ▶ To understand ***all*** drought's impacts on people, the environment and the economy
- ▶ To know where to direct ***relief***
- ▶ To help identify and reduce ***vulnerability*** in advance of the next drought
- ▶ ***"Ground truth"*** indicators and models



# DIR 1.0, 2005

- ▶ comprehensive,
- ▶ nationwide,
- ▶ web-based impacts archive,
- ▶ able to incorporate information from diverse sources



# Drought impact definition for the DIR:

*An observable loss or change that occurred at a specific place and time because of drought.*

NOT strictly physical: i.e., reduced streamflows, reservoir levels, soil moisture

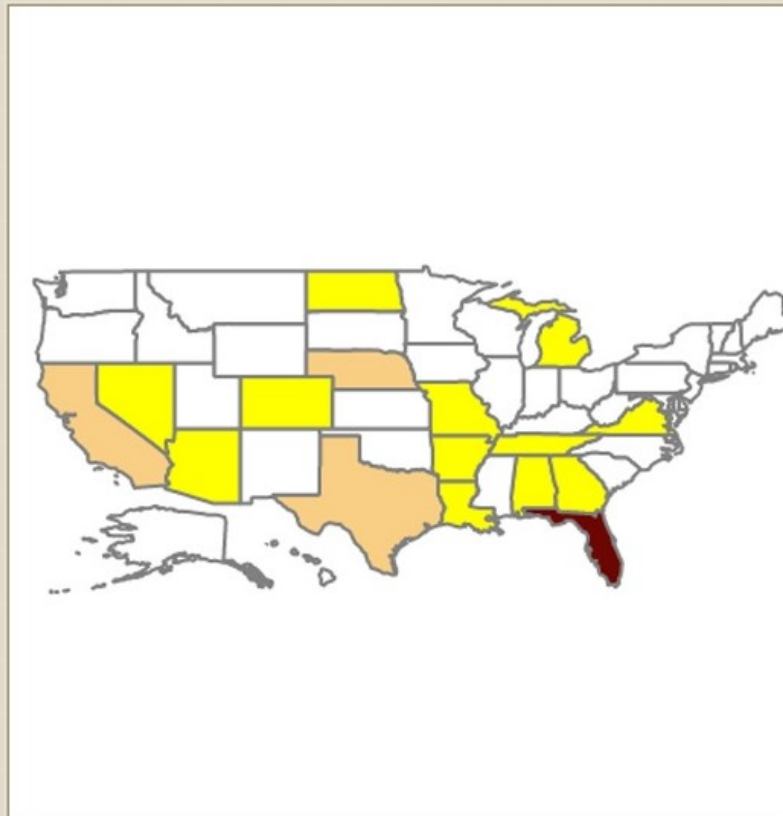


# Drought Impact Reporter

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:

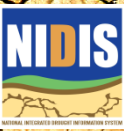
[Show Drought Monitor Layers](#)

## Legend

- |                               |                         |
|-------------------------------|-------------------------|
| <input type="text" value=""/> | No reported impacts     |
| <input type="text" value=""/> | 1 - 2 reported impacts  |
| <input type="text" value=""/> | 3 - 4 reported impacts  |
| <input type="text" value=""/> | 5 - 6 reported impacts  |
| <input type="text" value=""/> | 7 - 8 reported impacts  |
| <input type="text" value=""/> | 9 - 10 reported impacts |

# DIR 1.0, Lessons Learned

- ▶ People want to count something
- ▶ Quantified economic loss data – dollar amounts -- is very hard to come by (only 242 out of 7,178 impacts since Nov. 2008-June 2013)
- ▶ No agreed-on methodology exists to attribute \$ losses (or other impacts) to drought
- ▶ Individuals and businesses may not want to report losses



# DIR 1.0, More Lessons Learned

- Needed better archiving
- Needed a less subjective, more robust process
- Understanding of “drought impact” varies widely
  - Moderators ID’d impacts in media stories that met definition
  - But all user reports became impacts



# DIR Database 2.0, 2008

- ▣ Handle reports separately from impacts
- ▣ Archive original reports
- ▣ Moderators can make impacts from one or more report(s) (synthesis and aggregation)
- ▣ Lets condition reports stay separate from impacts



# The DIR is ...

- ▶ An actively curated, ***near real-time archive*** of geographically and sectorally representative drought impacts.
- ▶ Narrative-based. Content analysis, both automated and human, helps researchers and decision-makers identify the full range of reported drought concerns, including distinctive local impacts.
- ▶ A framework that can archive and display other drought impact collection efforts.

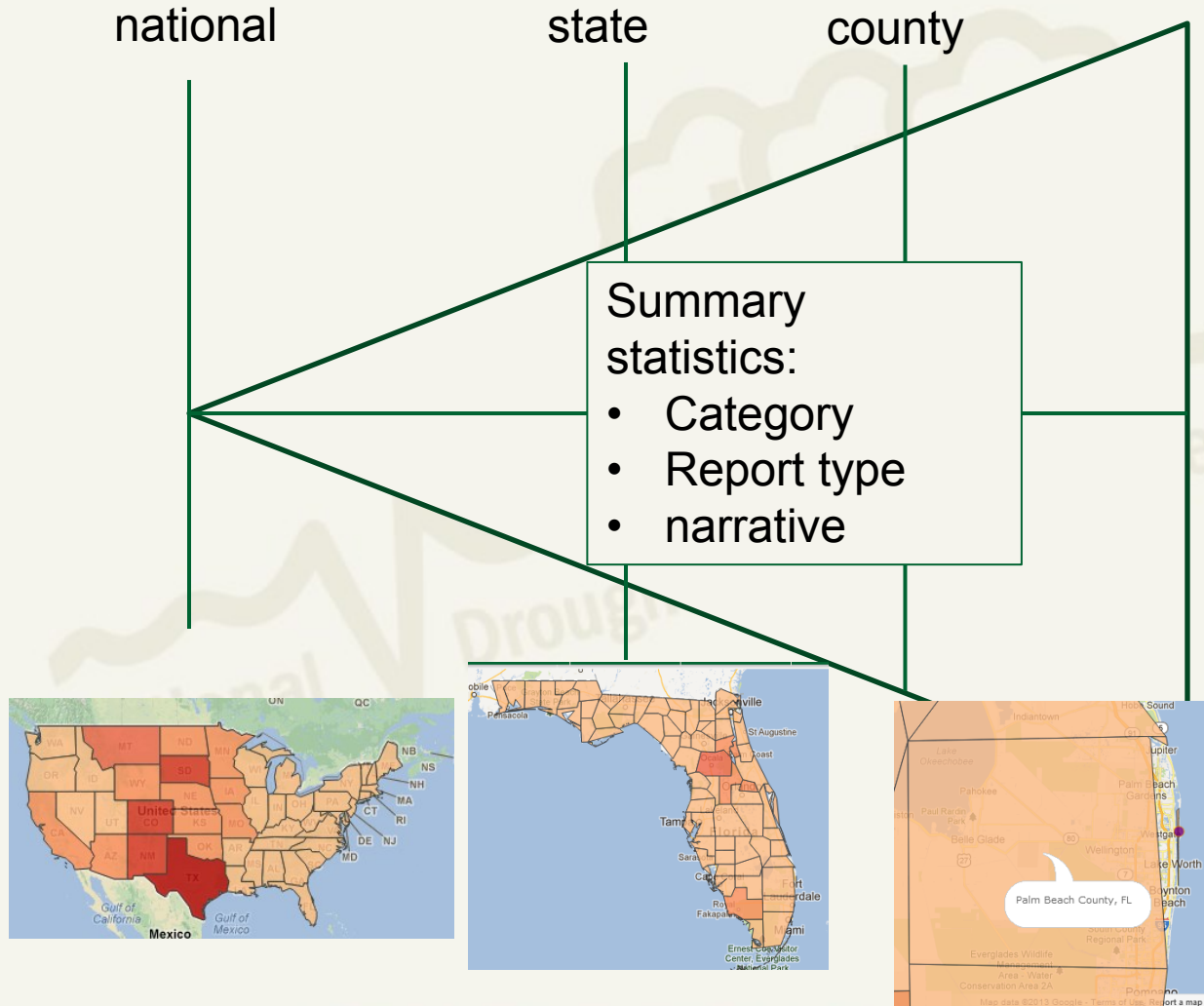


# Disciplinary Methodologies

- History
- Journalism (“rough draft of history”)
- GIS + social media =
- Crowd-sourced mapping
- Planning



# DIR Web Interface 2.0, 2011



✕

9

4

## Agriculture 5

5

3

3

3

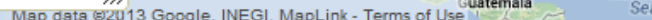
4

---

## Media 9

9

County View



## Report List

## 142

● Agriculture 49 ● Business & Industry

49

1

28

29

52

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phone: (402) 472-6707 | fax: (402) 472-2946 | [Contact Us](#)

## Page 1 of 1



Duration: 06-10-2013 - unknown

Duration: 06-09-2013 - unknown



Duration: 06-06-2013 - unknown



Duration: 06-03-2013 - unknown

## STATE | ● ●

Duration: 05-30-2013 - unknown

## STATE | ● ●

Duration: 05-30-2013 - unknown



Duration: 05-27-2013 - 05-28-2013

## STATE | ●●

Duration: 05-28-2013 - unknown

Map

Advanced Search

Submit a Report

About the DIR

Help



Refresh

Impacts & Reports

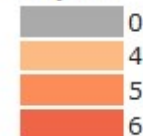
Overlays

Impacts

Opacity

80%

Impacts



Reports

Time Period

Location

State: California

County: All Counties

Categories

Report Types

California | 05-27-2013 - 06-27-2013 | [Color Swatches] [Icons]

Impact Counts

Impact List

Report Counts

Report List

Total Impacts | California

9

Statewide Impacts

4

Category

|                                 |   |                         |   |
|---------------------------------|---|-------------------------|---|
| Agriculture                     | 5 | Fire                    | 3 |
| Relief, Response & Restrictions | 3 | Society & Public Health | 3 |
| Water Supply & Quality          | 4 |                         |   |

Report Source

|       |   |
|-------|---|
| Media | 9 |
|-------|---|

## Impacts | California

06-01-2003 - 06-27-2013



|                                 |             |
|---------------------------------|-------------|
| <b>Total Impacts</b>            | <b>1011</b> |
| <b>Statewide Impacts</b>        | <b>144</b>  |
| <b>Category</b>                 |             |
| Agriculture                     | 268         |
| Business & Industry             | 46          |
| Energy                          | 7           |
| Fire                            | 104         |
| Plants & Wildlife               | 92          |
| Relief, Response & Restrictions | 316         |
| Society & Public Health         | 179         |
| Tourism & Recreation            | 22          |
| Water Supply & Quality          | 449         |
| <b>Report Source</b>            |             |
| Media                           | 512         |
| User                            | 3           |
| CoCoRaHS                        | 19          |
| National Weather Service        | 1           |
| Other Agency                    | 9           |
| Legacy                          | 471         |

Impacts List

County View

## Reports | California

06-01-2003 - 06-27-2013



|                                 |             |
|---------------------------------|-------------|
| <b>Total Reports</b>            | <b>2633</b> |
| <b>Category</b>                 |             |
| Agriculture                     | 553         |
| Business & Industry             | 150         |
| Energy                          | 24          |
| Fire                            | 244         |
| General Awareness               | 920         |
| Plants & Wildlife               | 178         |
| Relief, Response & Restrictions | 1095        |
| Society & Public Health         | 365         |
| Tourism & Recreation            | 53          |
| Water Supply & Quality          | 1235        |
| <b>Report Source</b>            |             |
| Media                           | 2519        |
| User                            | 51          |
| CoCoRaHS                        | 46          |
| National Weather Service        | 1           |
| Other Agency                    | 16          |

Reports List

County View



# Reports

Media

User

CoCoRaHS

Agency

NWS DIS

Burn bans

Water restrictions

Hawaii

## Impacts

## Aggregation

- Map w/ stats
  - By affected area
  - By source location
- Advanced search w/ stats
- CSV export
- RSS, state or national

Input

aggregation

output



# Additional Products, Weekly: Drought Impact News via email



Drought Monitor Discussion Group <DROUGHT@listserv.unl.edu> on behalf of Denise Gutzmer <dgutzmer2@UNL.EDU>

Fri 8/2/2012 2:52 PM

To: DROUGHT@LISTSERV.UNL.EDU

I'll be out of the office a bit, so expect the next Drought News email on Aug. 16, 2012.

This is a collection of drought-related news stories from the past seven days or so. Impact information from these articles is entered into the [Drought Impact Reporter](#). A number of these articles will also be posted on the [Drought Headlines](#) page at the NDMC website.

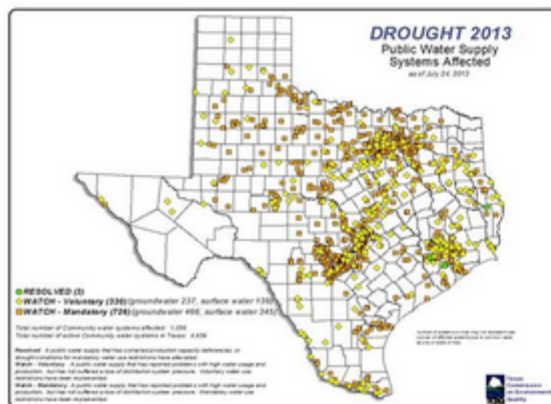
Noteworthy topics in the news this week:

## Agriculture

- U.S. feedlot placements in June dropped 5 percent as drought forced producers to keep culling livestock. June feedlot placements in Iowa were down 23 percent, compared to June 2012, and were 9 percent lower in Kansas.
- High crop prices, stemming from drought in 2012, and historic crop insurance payouts led farmers to farm on fragile lands, such as animal habitats and erodible lands. The largest conversion from fragile land to cropland occurred in northern Plains counties, according to Environmental Working Group, an environmental advocacy group, which opposes the changes. Thirty-nine percent of the wetland conversion happened in North Dakota, South Dakota and Minnesota, while more than 50 percent of the plowing of fragile lands occurred in ten states in the Great Plains and the western Corn Belt.
- Dry conditions have hindered crop growth and production in Utah, leading the executive director of Utah's Farm Service Agency to estimate that the tart cherry crop yield will be 20 to 30 percent less than usual, along with the peach and apple crops. He also noted that water supplies were everyone's worry, with drought affecting so much of the state.

## Water Supply & Quality

- The 2013 dead zone in the Gulf of Mexico is larger than usual and twice as big as last year. The dead zone is caused primarily by nitrogen-based fertilizers from the Midwest flowing into the Gulf and creating algal blooms. Drought in 2012 meant that plants weren't able to take up the fertilizer, which was flushed down river with spring 2013 rains, leading to a larger than expected dead zone. Dead fish, stingrays, crabs and shrimp by the thousands have washed ashore in Mississippi.
- At least a dozen water districts in Texas are within 45 days of running out of water, while another dozen have about 90 days' worth of water left. The graphic below shows the locations of water districts requesting water conservation.



from the Texas Commission on Environmental Quality website at <http://www.tceq.texas.gov/drinkingwater/2013/location.html>

Subscribe: [dgutzmer2@unl.edu](mailto:dgutzmer2@unl.edu)

# Additional Products, Monthly: Drought and Impact Summary

## Impacts: Wildfires raging, water supplies waning in June

by Denise Gutzmer, NDMC Drought Impact Specialist

### Wildfire

June was a month of wildfires and declining water supplies in the western United States. Wildfires charred many acres and numerous homes and forced evacuations as drought, dry vegetation and strong winds encouraged explosive wildfire growth and behavior. In central Arizona, 19 firefighters lost their lives in the Yarnell Hill Fire on June 30. The wind-driven fire began from a lightning strike on June 28 and consumed roughly 13 square miles and dozens of homes, and forced the evacuation of the town of Yarnell. The blaze grew explosively from 200 to 2,000 acres in a matter of hours on June 30. Of the 19 firefighters, 18 were from an elite group from Prescott, Arizona. [1] In New Mexico, more than 192 square miles burned from late May through late June. [2] As of July 9, the Silver Fire, burning in the Gila National Forest in southwestern New Mexico, had consumed 138,546 acres, or 216 square miles, since it began from a lightning strike on June 7. [3] In Colorado, many wildfires charred the parched state, with the Black Forest Fire scorching 14,280 acres, or 22.3 square miles, destroying 502 homes and taking two lives. [4] On June 28, at least 16 large wildfires were burning in Alaska. [5] California fire officials warned that the wildfire season there could be one of the most volatile in a century. By June 16, 50 percent more fires had burned four times the area as at the same time last year. [6]

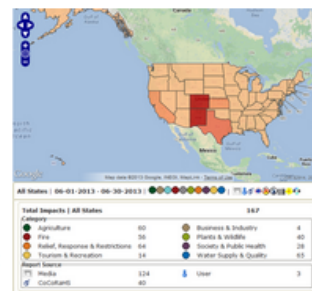
### New Mexico

New Mexico, where more than 44 percent of the state was in exceptional drought throughout June, had 39 impacts in the Drought Impact Reporter for the month, with most of the impacts related to wildfires and restrictions on outdoor burning and the use of fireworks. The past three years of drought have thoroughly dried out vegetation, increased the fire danger, limited grazing for livestock and stressed wildlife. Wildfires raging in New Mexico have charred acres of remaining grazing land, forcing ranchers to move cattle out of state. As the governor recommended, many communities banned some or all fireworks because the fire danger was too great. Fortunately for the Southwest, the monsoon has begun, bringing some relief to the region.

### New Mexico Water for Drinking, Irrigation, Wildlife

Water supplies remain low in many parts of New Mexico, with Santa Fe's reservoirs at about one-third of capacity. [7] Meanwhile, water deliveries for irrigation were miniscule or ended early. Stretches of the Rio Grande River are dry, prompting officials to plan water releases from federal reservoirs to protect the endangered silvery minnow, but water must be used judiciously because supplies are limited. [8]

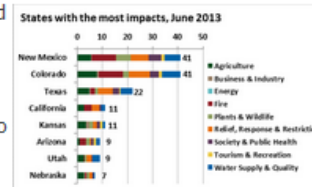
### Water Supply and Quality



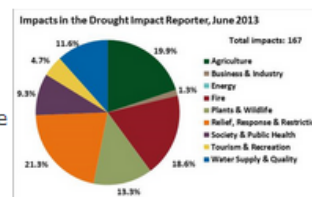
This map shows the distribution of impacts in the Drought Impact Reporter for June, 2013.



This is a June 28 screenshot from the Active Fire Mapping Program, an operational, satellite-based fire detection and monitoring program managed by the USDA Forest Service Remote Sensing Applications Center (RSAC) in Salt Lake City.



This chart color codes impacts by category for the eight states with the most impacts recorded in the Drought Impact Reporter for June 2013.



This chart shows the proportion of impacts by category entered for June 2013 in the Drought Impact Reporter.

# Additional Products, Quarterly: Impacts Summary in DroughtScape

## Spring drought impacts: wildfire, water supply, winter wheat

by Denise Gutzmer, NDMC Drought Impact Specialist

The Drought Impact Reporter logged 461 impacts for the nation in the second quarter of 2013. Impacts come from a variety of report types, including media reports from an automatic search that are entered by an NDMC moderator, user reports entered by observers across the country, and citizen science observers participating in the Community Collaborative Rain, Hail and Snow Network. Identifying and counting impacts is still an inexact science, but it serves as a rough indicator of where people are most concerned about drought's many direct and indirect effects.

emergencies as their supplies ran very low. The Middle Rio Grande Conservancy District, the Elephant Butte Irrigation District and the Carlsbad Irrigation District were forced to cut deliveries to just a fraction of the water they normally deliver because the thin snowpack this winter did not contribute much to reservoirs. Farmers turned instead to wells, risking more saline water, which can harm crops.

"Navajo Nation declares drought emergency," Associated Press, in the *Arizona (Tucson) Globe-News*, July 2, 2013.  
"Cloudcroft Declares Water Emergency," *KRWG News* (New Mexico and Texas public radio), July 3.

Wildfires in New Mexico also devoured more than 192 square miles from late May through late

Springs destroying more than 500 homes and taking two lives. The fire caused \$85.4 million in damage, according to El Paso County Assessor Mark Lowderman in an Associated Press report. A Denver ABC TV affiliate said the cost of fighting the wildfire was more than \$8.5 million, citing Incident Commander Rich Harvey. Hay supplies and production were down in Colorado, dealing a harsh blow to horse owners who cannot afford hay. Water supplies for irrigation were low, particularly in the southern part of the state.

"Dreaded fire, second worst: Colorado wildfires 2013," by Amanda Margolis, *Washington (D.C.) Post*, July 2, 2013.  
"Coffee shop regulars escape wildfire," by Josh Aron, *The (Nashville) Tennessean*, July 18, 2013.

Texas also felt the burn of ongoing drought, with 83 impacts, as water supplies continued to dwindle and low soil moisture hurt crop production. Soil moisture levels have not recovered from years of drought, leaving pastures and crops struggling. Cattle sales continued. Barnhart in western Texas ran out of water, and numerous lakes were near or at historical lows.

California  
Drought in California dried up pastures, led to livestock sales, reduced water supplies and shortened irrigation allotments. For example, drought cost Tehama County \$6.9 million in agricultural losses so far in 2013. Much of the damage is to rangeland, for a loss of about \$6.1 million, barley production, at a value of roughly \$275,000, and hay, valued at \$523,300. Dry conditions and the uptick in fire activity statewide have fire officials warning that this fire season could be the worst in a century. Through mid-June, roughly 50 percent more fires had scorched nearly four times as



Taken on May 3, 2013, this photo shows the effects of drought on Medina Lake, near San Antonio, Texas. Medina Lake is down to 5 percent of capacity. Photo by Mark Florence.

many acres than at the same point in 2012, according to Cal Fire. California had 44 impacts recorded in the second quarter.

"Tehama County drought finding sought," by Rich Greene, *Red Bluff (California) Daily News*, July 3, 2013.  
"WALDFIRE: Conditions ripe for volatile season, officials predict," by John Asbury, *Press-Enterprise*, Riverside, California, June 18, 2013.

Kansas  
Kansas' winter wheat crop and pastures suffered from ongoing drought and late spring freezes. The state had 39 impacts reported from April through June. The Risk Management Agency office in Topeka had received indemnity claims for \$33.5 million for 2013 as of June 8. Of the 9.4 million acres affected, more than \$31 million of the claims were for the damaged wheat crop. Poor pastures and unusually low hay stocks kept

livestock producers culling cattle. Lake levels were low statewide, but particularly in western Kansas. Many streams were at historically low levels, and many stock ponds were dry, forcing farmers to haul water or relocate cattle.

"In Kansas, drought, freeze paralyze wheat crop," Associated Press, Kansas City (Missouri) Star, June 8, 2013.

"Drought puts hay supply at new low," by Amy Glick, *The Hutchinson (Kansas) News*, May 26, 2013.  
"Kansas late levels low for Memorial Day," Associated Press, Selma (Kansas) Journal, May 26, 2013.

Nebraska  
Hay supplies were scarce and pastures were in poor shape in Nebraska, accounting for some of the 31 impacts for the state. The National Agricultural Statistics Service expects Nebraska's wheat harvest to be 42.9 million bushels or 20 percent smaller than

the 2012 wheat crop as drought continues to hamper plant growth. This is Nebraska's smallest crop of wheat since 1944.

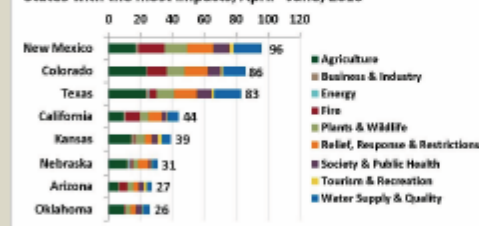
"Report anticipates smallest Nebraska wheat crop since 1944," Associated Press, Omaha (Nebraska) World-Herald, May 13, 2013.

Arizona  
Wildfires flared across Arizona, including the Yarnell Hill Fire, which took the lives of 19 firefighters on June 30. Fire restrictions prohibited open burning in some national forests. Native trees and plants were stressed and dying in parts of Arizona and surface water was scarce, leading to rescue efforts to supply wildlife with water. Wildfires and fire restrictions accounted for many of the 27 impacts for the state.

"Water is a wonderful thing and the Arizona Elk Society is making it happen," by Scott Kelly, CEO - Black Dog Productions, AZCentral.com, June 26, 2013.

Oklahoma  
Southwestern Oklahoma saw water restrictions as continued drought dried up lakes and reservoirs. Cotton planting was delayed for lack of rain. The low water level of Lake Albus-Lugert in Quartz Mountain State Park drew fewer visitors, causing a drop in revenue for the park. The water level in the lake dropped by 20 feet, leading to fish kills. Most of the state's 26 impacts described

### States with the most impacts, April - June, 2013

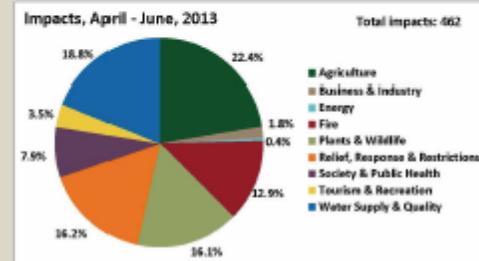


New Mexico  
Wildfires, meager water supplies and ongoing agricultural challenges have been hitting New Mexico hard as the state endures its third year of drought. The NDMC recorded 96 impacts for the state in the second quarter of 2013. Water supplies are down in much of New Mexico, with the Rio Grande facing its worst irrigation water shortage in nearly a century. Magdalena ran out of water, and the Navajo Nation and the town of Cloudcroft declared water

June, with the Silver Fire in the Gila National Forest charring at least 127 square miles. Wildfires on grazing land have forced ranchers to move cattle out of state.

"Silver Fire jumps to 127 square miles," by Susan Montoya Bryan, Associated Press, Las Cruces Sun-News, June 25, 2013.

Colorado  
Ongoing drought led to a total of 86 impacts for Colorado, where wildfires scorched roughly 180 square miles in the first half of 2013, with flames from the Black Forest Fire north of Colorado



continued on page 8



# Comprehensive List of Impacts

## Appendix B – Categories

### Business and Industry

This category tracks drought's effects on non-agriculture and non-tourism businesses, such as lawn care, recreational vehicles or gear dealers, and plant nurseries. Typical impacts include reduction or loss of demand for goods or services, reduction in employment, variation in number of calls for service, late opening or early closure for the season, bankruptcy, permanent store closure, and other economic impacts.

### Energy

This category concerns drought's effects on power production, rates and revenue, such as:

- production changes for both hydropower and non-hydropower providers
- changes in electricity rates
- revenue shortfalls and/or windfall profits
- purchase of electricity when hydropower generation is down.

### Fire

Drought often contributes to forest, range, rural, or urban fires; fire danger; and burning restrictions. Specific impacts include:

- enacting or easing burning restrictions
- fireworks bans, increased fire risk
- occurrence of fire (number of acres burned, number of wildfires compared to average, people displaced, etc.)
- state of emergency during periods of high fire danger
- closure of roads or land due to fire occurrence or risk
- expenses to state and county governments of paying firefighters overtime and paying equipment (helicopter) costs.

### Plants and Wildlife

Drought effects associated with unmanaged plants and

wildlife, both aquatic and terrestrial, include:

- loss of biodiversity of plants or wildlife
- loss of trees from rural or urban landscapes, shelterbelts, or wooded conservation areas
- reduction and degradation of fish and wildlife habitat
- lack of feed and drinking water
- greater mortality due to increased contact with agricultural producers, as animals seek food from farms and producers are less tolerant of the intrusion
- disease
- increased vulnerability to predation (from species concentrated near water)
- migration and concentration (loss of wildlife in some areas and too much wildlife in others)
- increased stress on endangered species
- salinity levels affecting wildlife; wildlife encroaching into urban areas
- loss of wetlands.

### Relief, Response and Restrictions

This category refers to drought effects associated with disaster declarations, aid programs, requests for disaster declaration or aid, water restrictions, or fire restrictions, such as:

- disaster declarations
- aid programs
- USDA Secretarial disaster declarations
- Small Business Association disaster declarations
- government relief and response programs
- state-level water shortage or water emergency declarations
- county-level declarations
- a declared "state of emergency"
- requests for declarations or aid
- non-profit organization-based relief
- water restrictions
- fire restrictions
- National Weather Service Red Flag warnings
- declaration of drought watches or warnings.

(continued on next page)

## Appendix B – Categories, continued

### Society & Public Health

Drought effects associated with human, public and social health include health-related problems related to reduced water quantity and/or quality, such as:

- increased concentration of contaminants
- loss of human life (e.g., from heat stress, suicide)
- increased respiratory ailments
- increased disease caused by wildlife concentrations
- increased human disease caused by changes in insect carrier populations
- population migration (rural to urban areas, migrants into the United States)
- loss of aesthetic values
- change in daily activities (non-recreational, like putting a bucket in the shower to catch water)
- elevated stress levels
- meetings to discuss drought
- communities creating drought plans
- lawmakers altering penalties for violation of water restrictions
- demand for higher water rates
- cultural/historical discoveries from low water levels
- prayer meetings
- cancellation of fundraising events
- cancellation/alteration of festivals or holiday traditions
- stockpiling water
- public service announcements and drought information websites
- protests
- conflicts within the community due to competition for water.

### Tourism & Recreation

Drought effects associated with recreational activities and tourism include:

- closure of state hiking trails and hunting areas due to fire danger
- water access or navigation problems for recreation
- bans on recreational activities
- reduced license, permit, or ticket sales (e.g., hunting, fishing, ski lifts, etc.)
- losses related to curtailed activities (e.g., bird watching, hunting and fishing, boating, etc.)
- reduced park visitation
- cancellation or postponement of sporting events.

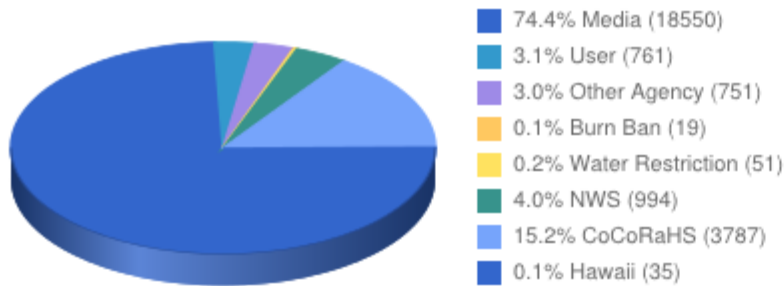
### Water Supply & Quality

Drought effects associated with water supply and water quality include:

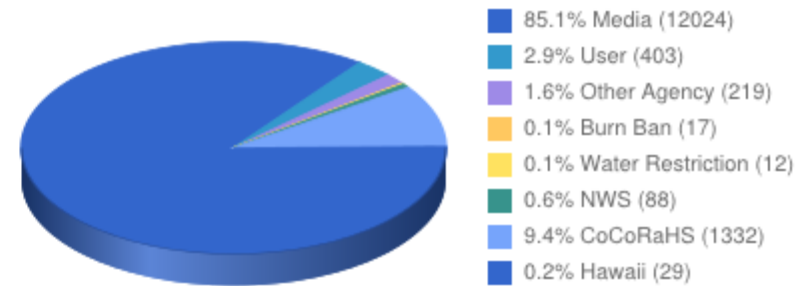
- dry wells
- voluntary and mandatory water restrictions
- changes in water rates
- easing of water restrictions
- increases in requests for new well permits
- changes in water use due to water restrictions
- greater water demand, decreases in water allocation or allotments
- installation or alteration of water pumps or water intakes
- changes to allowable water contaminants
- water line damage or repairs due to drought stress
- drinking water turbidity
- change in water color or odor
- declaration of drought watches or warnings
- mitigation activities.

# What's in the DIR through June 25, 2013

**Report Composition**  
24,948 reports



**Impact Composition**  
16,878 impacts

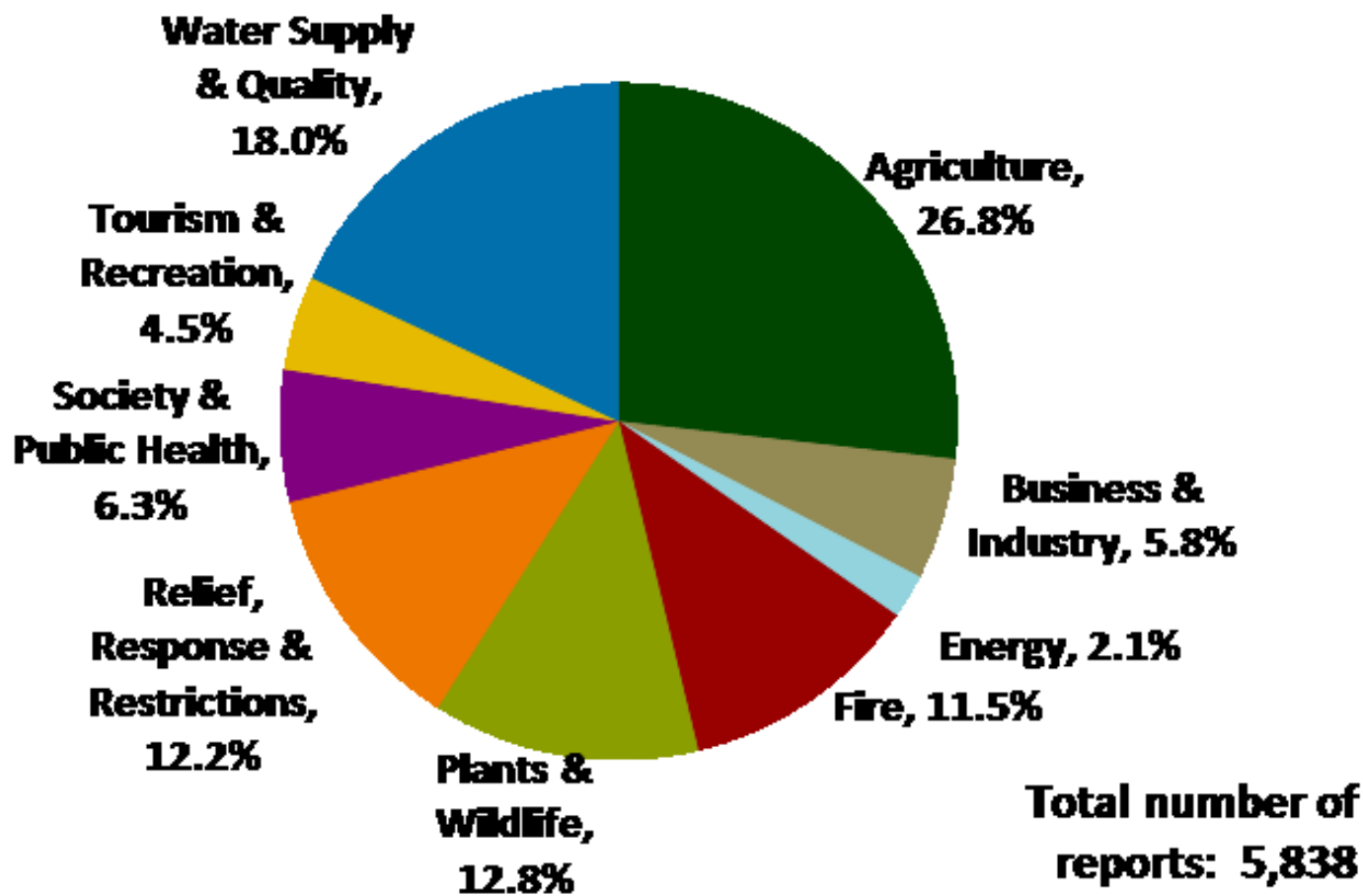


Since mid-November 2008

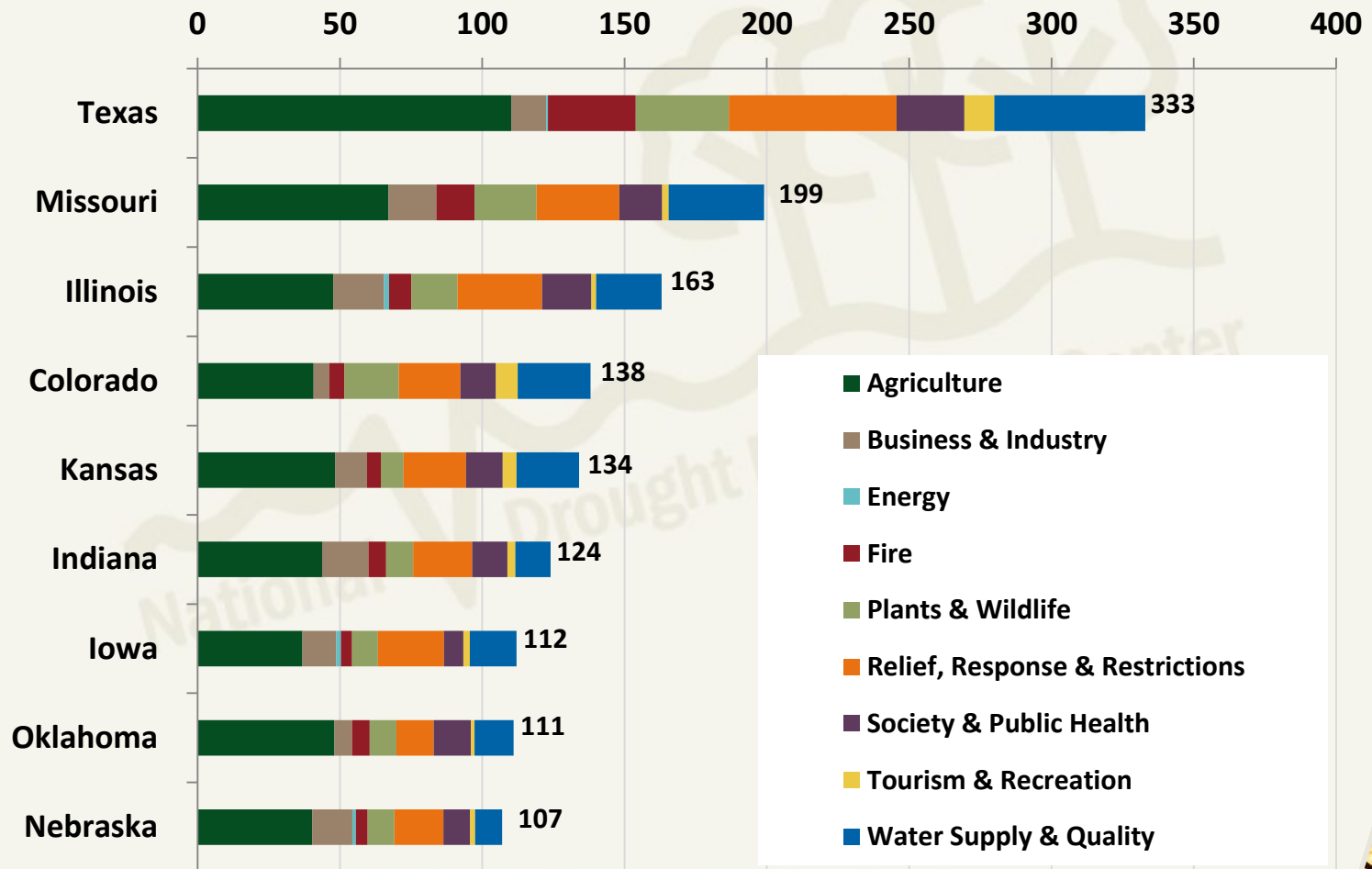
Since 2005: Impact composition includes about 10,000 “legacy impacts” from original database with no associated reports.

# 2012 U.S. Drought Reports by Sector

## Category analysis for 2012 reports



## Impacts in 2012

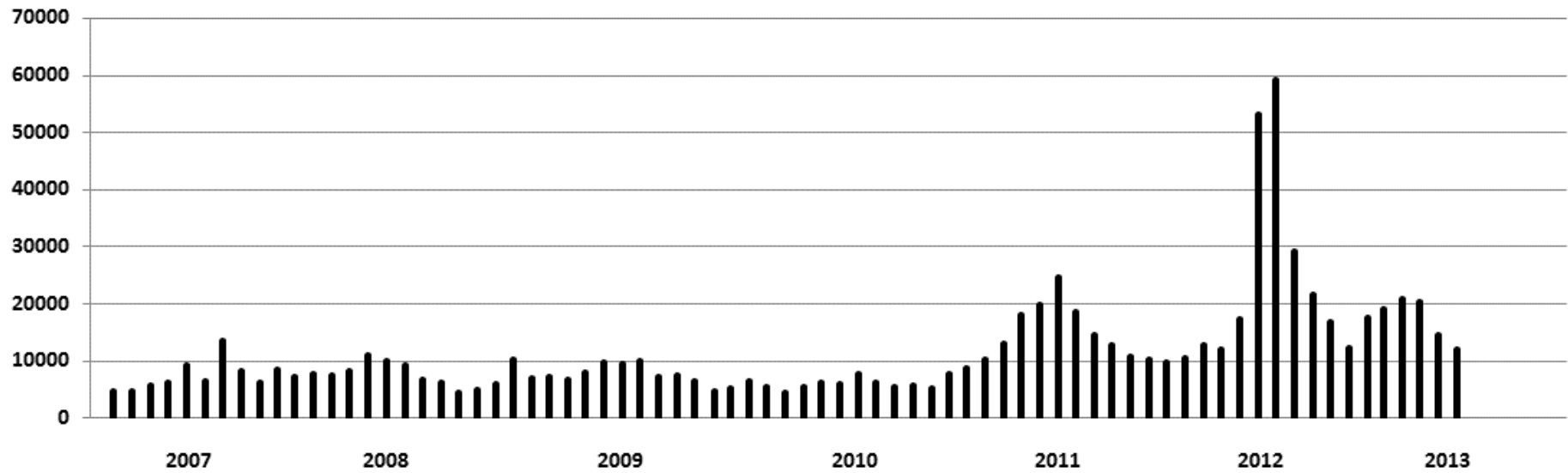


# Media reports



# All media reports by month (not all are entered in the DIR)

Drought-related articles found by CustomScoop per month, 2007 - 2013





drought



## Trends

Web Search interest: drought. United States, 2004 - present.



Hot Searches

Top Charts [New!](#)

Explore

Search terms

drought

+ Add term

Limit to

Web Search

United States

2004 - present

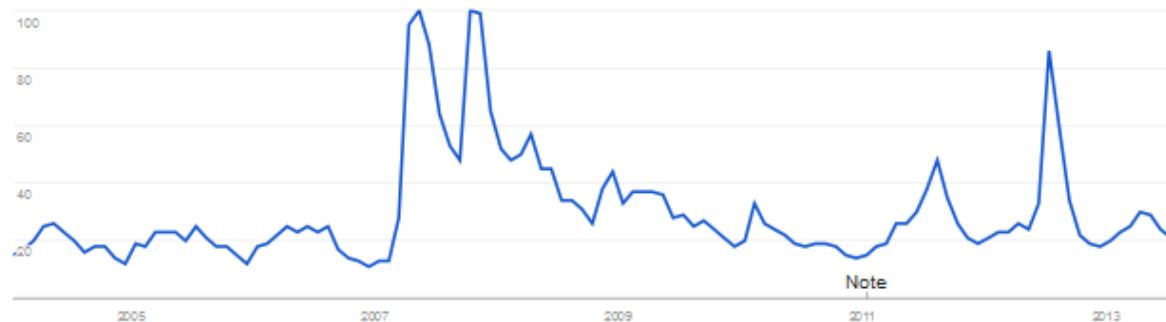
All categories

### Interest over time

The number 100 represents the peak search interest

☐ News headlines

☐ Forecast

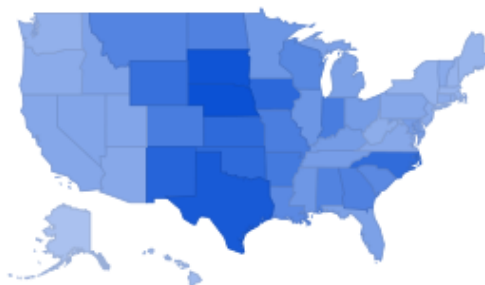


Note

Embed

### Regional interest

Worldwide > United States



0 100

Subregion | Metro | City

### Related terms

Top

Rising

|                   |     |             |
|-------------------|-----|-------------|
| the drought       | 100 | <div></div> |
| drought monitor   | 65  | <div></div> |
| drought 3         | 60  | <div></div> |
| lil wayne drought | 50  | <div></div> |
| da drought        | 45  | <div></div> |
| drought is over   | 35  | <div></div> |
| texas drought     | 35  | <div></div> |
| drought us        | 30  | <div></div> |
| da drought 3      | 30  | <div></div> |



# Official Reports

- ▣ Archiving NWS DIS statements
  - Not yet analyzed
- ▣ “Other agency reports”
  - Agency staff as moderators
  - Archive of comprehensive reports



## Reports Advanced Search

You searched Reports published between 05/01/2004 and 06/27/2013  
by the location of the report's source  
in California  
for Agriculture, Business & Industry, Energy, Fire, General Awareness, Plants & Wildlife, Relief, Response & Restrictions, Society & Public Health, Tourism & Recreation, Water Supply & Quality, Ranching \*, Ornamentals \*, Fruits and Nuts (orchard) \*, Produce (fruits and vegetables) \*, Other Agriculture \*

The Drought Report Reporter found 16 Reports matching your query.  
category/ies

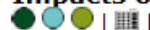
- 16 in  Agriculture
- 5 in  Business & Industry
- 3 in  Energy
- 2 in  Fire
- 0 in  General Awareness
- 3 in  Plants & Wildlife
- 8 in  Relief, Response & Restrictions
- 3 in  Society & Public Health
- 2 in  Tourism & Recreation
- 15 in  Water Supply & Quality
- 0 in  Ranching \*
- 0 in  Ornamentals \*
- 0 in  Fruits and Nuts (orchard) \*
- 0 in  Produce (fruits and vegetables) \*
- 0 in  Other Agriculture \*

sources

- 16 in  Other Agency

1. [See report detail](#)
2. [List of associated impacts](#)
3. [See detail on associated impacts](#)

## Impacts of the California Drought from 2007 to 2009



Source Name: Pacific Institute

Publication Date: 2011-06-16

## Impacts of the California Drought from 2007 to 2009



**Source Name:** Pacific Institute

**Publication Date:** 2011-06-16

**Url:** [http://www.pacinst.org/reports/california\\_drought\\_impacts/ca\\_drought\\_impacts\\_full\\_report.pdf](http://www.pacinst.org/reports/california_drought_impacts/ca_drought_impacts_full_report.pdf)

## California Drought Update Report, April 2009



**Source Name:** California Department of Water Resources

**Publication Date:** 2009-04-30

**Url:** [http://www.water.ca.gov/drought/docs/drought\\_update.pdf](http://www.water.ca.gov/drought/docs/drought_update.pdf)

## California Drought Update Report, May 2009



**Source Name:** California Department of Water Resources

**Publication Date:** 2009-05-29

**Url:** [http://www.water.ca.gov/drought/docs/052909drought\\_update.pdf](http://www.water.ca.gov/drought/docs/052909drought_update.pdf)

## California Drought Update Report, June 2009



**Source Name:** California Department of Water Resources

**Publication Date:** 2009-06-30

**Url:** [http://www.water.ca.gov/drought/docs/Drought\\_report\\_30june2009\\_web.pdf](http://www.water.ca.gov/drought/docs/Drought_report_30june2009_web.pdf)

## California Drought Update Report, July 2009



**Source Name:** California Department of Water Resources

**Publication Date:** 2009-07-31

**Url:** <http://www.water.ca.gov/drought/docs/DroughtUpdate-073109.pdf>

## California Drought Update Report, Aug 2009



**Source Name:** California Department of Water Resources

**Publication Date:** 2009-08-31

**Url:** <http://www.water.ca.gov/drought/docs/DroughtUpdate-083109.pdf>

## California Drought Update Report, Sept 2009



**Source Name:** California Department of Water Resources

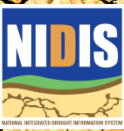
**Publication Date:** 2009-09-30

**Url:** [http://www.water.ca.gov/drought/docs/DroughtUpdate\\_sept30.pdf](http://www.water.ca.gov/drought/docs/DroughtUpdate_sept30.pdf)



# Volunteer-submitted report types

- ❑ User -- Typically professional observers
  - Farm Service Agency, Extension, National Weather Service.
  - Photos
  - Baseline reporting
- ❑ Hawaii – version of user reports with specialized agricultural categories
- ❑ CoCoRaHS – citizen science observation network
  - Reports appear immediately
  - Photos in the works

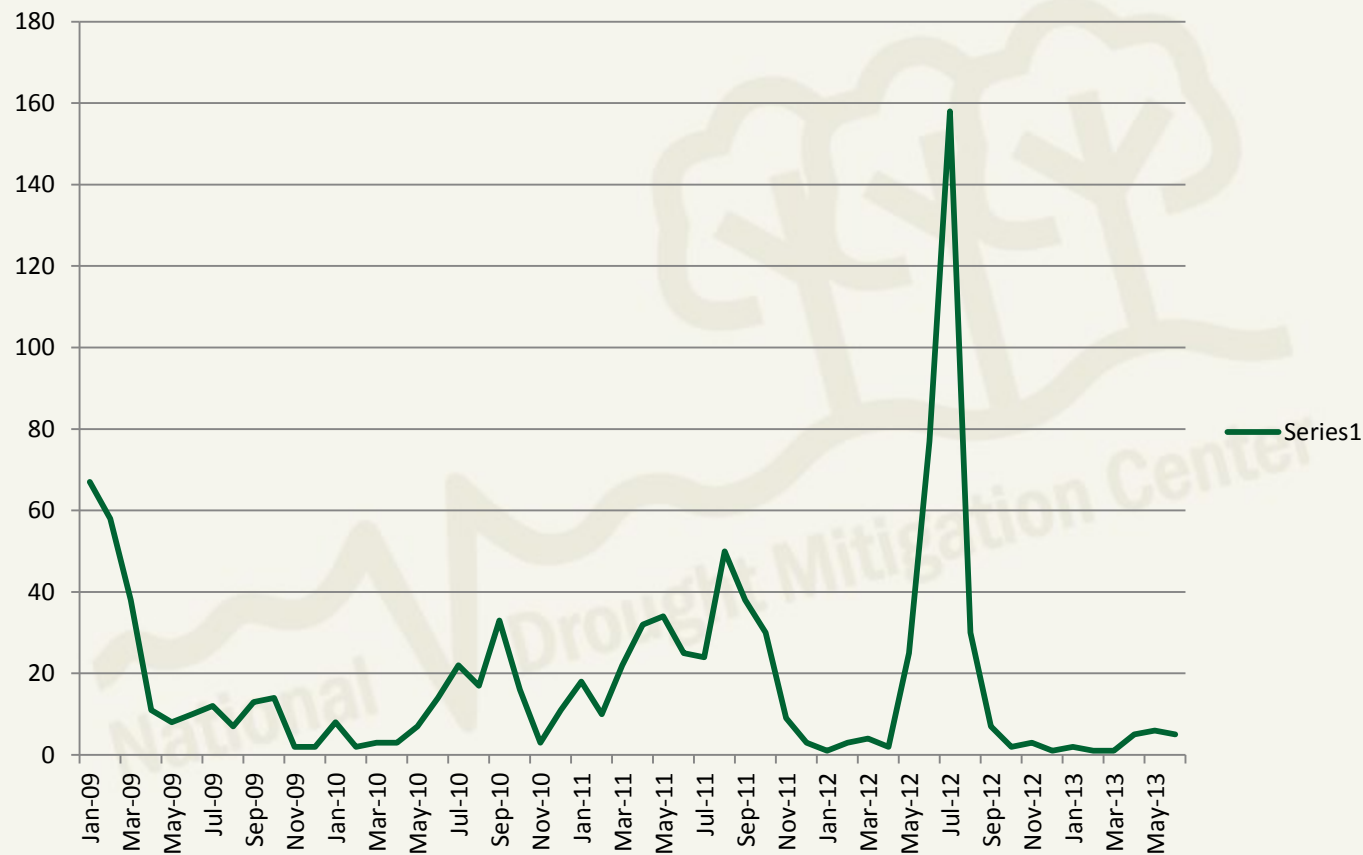


# Volunteer submissions:

- Help ensure diversity of voices
- May help counterbalance tendency for information to originate from urban areas
- May help bridge urban-rural divide
- Or, informally -- Gives everyone/everyplace their own dot on the map



# User Reports, Jan. 2009-June 2013



# CoCoRaHS: Promoting drought impact reporting to volunteers...



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

**CoCoRaHS**  
Community Collaborative Rain, Hail & Snow Network

National Drought Mitigation Center  
University of Nebraska-Lincoln

WRITE FISHING HOLE GONE?  
COMMENTS ARE VERY IMPORTANT!

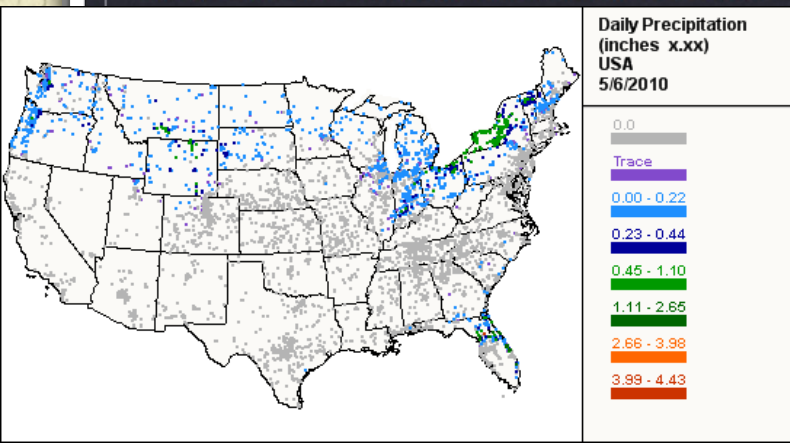
- \* **14,000+ volunteers covering all 50 states!!**

- \* **CoCoRaHS “Message of the Day”**

- \* **Monthly e-mail reminders**

- \* **Guide to reporting drought impacts**

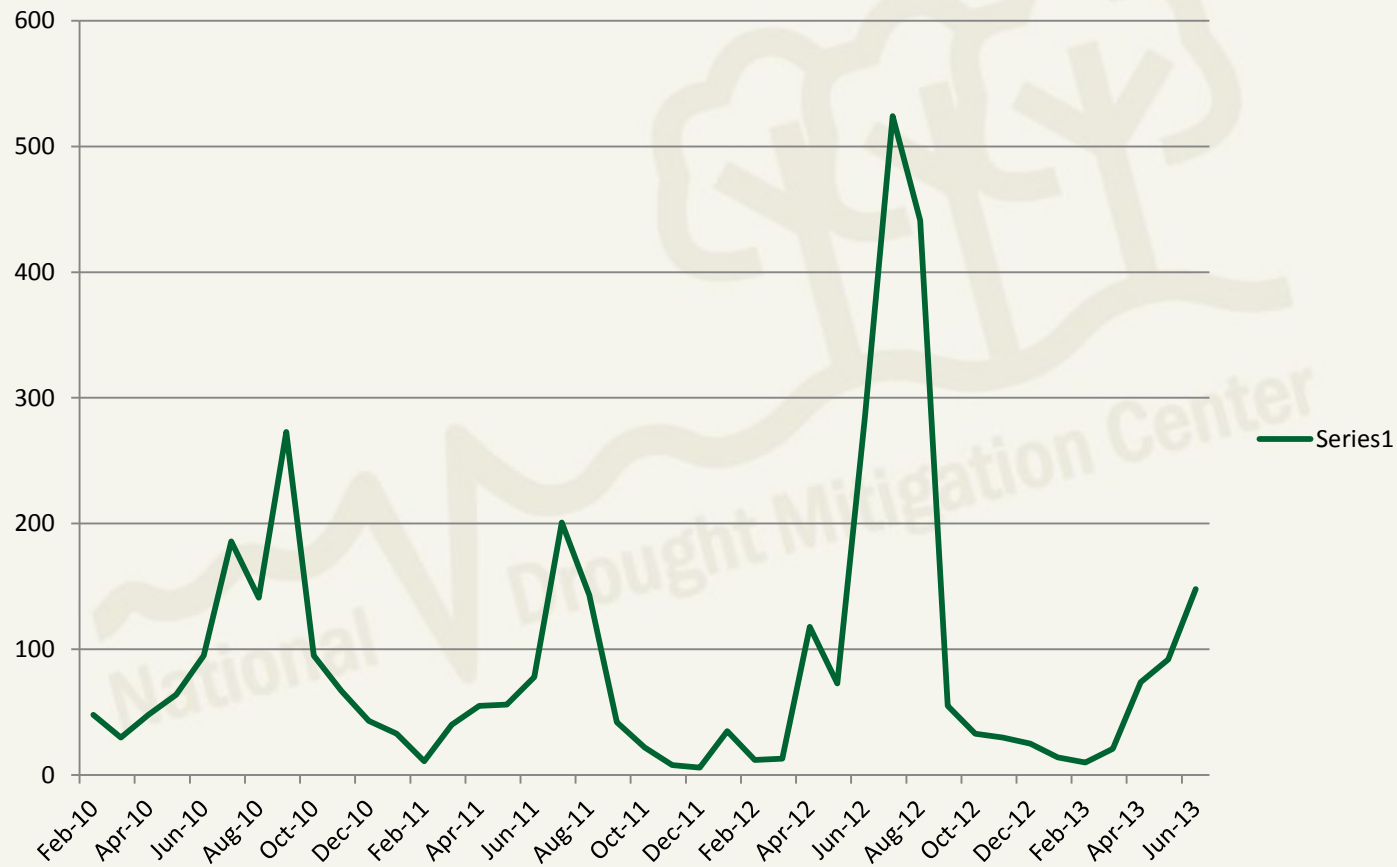
- \* **Banners on the Web**



Courtesy: Henry Reges, Colorado State University



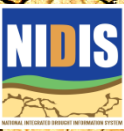
# CoCoRaHS Reports, Feb. 2010-June 2013



# DIR 2013: Exploring Partnerships

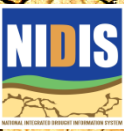
Connecting Data Collection and Decision-Making:

- ▣ What are the indicators (precursors)
- ▣ Who observes (records) indicators?
- ▣ Who/where is affected?
- ▣ Who aggregates?
- ▣ Who are the decision-makers?
- ▣ What do they need?



# Taking it to the next level: Condition Monitoring

- Observers can submit regular reports over time to show drought's effects on various aspects of the environment, people's livelihoods, and human health and well-being.
- Intervals could be seasonal, monthly, or even more frequent during times of rapid change.
- Condition monitoring reports should include information on the chosen variable but can also include more information.



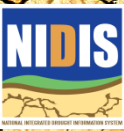
# Why monitor conditions?

- ▶ To understand how a particular feature or system changes as it goes into and comes out of drought.
- ▶ To develop quantifiable “baselines,” i.e., measurements of normal.



# Partnership Possibilities:

- ▣ Archive and display data as it is collected from local observers (CoCoRaHS, Gullah/Geechee)
  - ▣ Serve as collection system for local monitoring network
- ▣ Agency staff can enter reports and/or moderate impacts
- ▣ Systematically archive final reports and analysis
- ▣ Other?



# Summary



- ▶ Drought is **NOT** just a physical event
  - Droughts defined by their impacts
- ▶ Data on impacts (***baseline establishment***) critical, but lacking
- ▶ Much more work needed to ***tie impacts to drought indicators/indices***
- ▶ Can we engage and help address via ***Citizen Science and social media?***



**Questions, comments, ideas?**  
**Please contact:**  
**Kelly Helm Smith**  
**National Drought Mitigation Center**  
**402-472-3373**  
**[ksmith2@unl.edu](mailto:ksmith2@unl.edu)**