

The United States Drought Monitor

How to be part of the Process

Brian Fuchs, Climatologist
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University of Nebraska-Lincoln



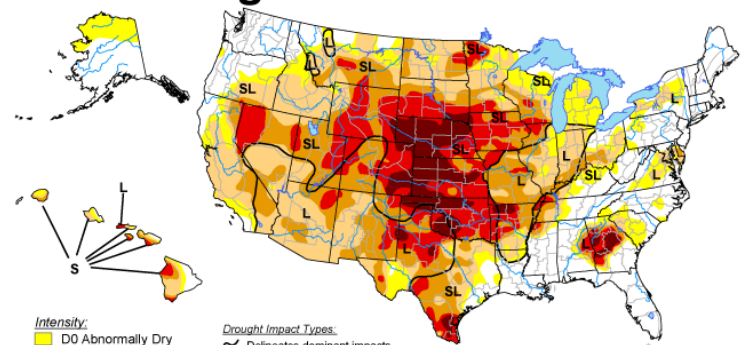
Ranching and California's Drought

November 7, 2014
Davis, California



U.S. Drought Monitor

September 25, 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.



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

Released Thursday, September 27, 2012
Author: Anthony Artusa, NOAA/NWS/NCCEP/CPC

What Types of information are the U.S. Drought Monitor Authors looking for?

- ▶ **Regional/State/local data which the authors may not be aware of**
 - Lake/reservoir levels compared to long-term averages
 - Agricultural information
 - ▶ Production estimates/data compared to normal
 - ▶ Fallowing of land and how much. Is it normal?
 - ▶ Irrigation availability: Decreased deliveries, how much?
 - ▶ Natural grazing lands/public grazing lands: Reduction of leases, forage availability etc.
 - Water availability/restrictions
 - ▶ For both municipal and agricultural uses
 - Groundwater/Well information
 - ▶ Wells going dry, new wells being drilled, groundwater levels compared to normal
 - Natural Landscapes conditions



What Types of information are the U.S. Drought Monitor Authors looking for?

▶ **Seasonal data**

- Snow course data
- State/Regional mesonet data which may not be getting into the national data streams
- State calculated streamflow forecasts

▶ **Drought Impact Data**

▶ **Current data compared to long-term rankings/historical averages.**

- **This allows data to be put into percentiles which relates directly to Dx categories on the U.S. Drought Monitor**



Ideas for what to monitor the condition of fall into several categories, sometimes more than one:

Plants & Wildlife

- Height or density of natural vegetation, one particular plant or a patch
- Presence or absence of a certain kind of plant, including invasive species
- Landscape or garden plants, height, progression through growth cycles
 - Ex: Frequency of lawn mowing
- Whether landscape or garden plants need watering
 - Brown spots on lawns
- How close wildlife are coming to human populations in search of food and water
 - Ex: Frequency of deer in yards
 - Ex: Number of bears looking for food or water
- Number of animals or species at a drinking water source
 - Ex: Number of birds or species at birdbath or feeder
- Presence or absence of aquatic species at a favorite fishing hole; number or size of a certain species; number of species counted
- Presence or absence of mosquitoes, grasshoppers, other insects with life-cycles related to dry and wet weather



Ideas for what to monitor the condition of fall into several categories, sometimes more than one:

▣ Agriculture

- Irrigated crop progress, appearance
- Unirrigated crop progress, appearance
- Availability or quality of forage or hay for livestock on both irrigated and natural grazing lands
- Pasture/Grazing Land conditions
- Availability of water for livestock
- Availability of water for irrigation

▣ Water Supply & Quality

- Water supply quality and quantity for human consumption: Need to haul or boil water
- Water quality and characteristics: Changes in taste, odor, color, chemical content (if a well is tested regularly)
- Municipal supply: Voluntary or mandatory watering restrictions
- Availability of water for livestock
- Availability of water for irrigation



Ideas for what to monitor the condition of fall into several categories, sometimes more than one:

▣ Recreation & Tourism

- Water-based recreation: Number of people boating, canoeing, swimming, fishing at a certain spot
- Outdoor recreation: Number of people hiking, camping, etc.

▣ Society & Public Health

- Water supply quality and quantity for human consumption: Need to haul or boil water
- Air quality related to dust, aerosols, smoke: Whether outdoor activities are accessible or need to be curtailed due to air quality
- Mood: How do you or the people around you -- farmers, ranchers, neighbors, family, etc. -- sound when talking about the weather? You could describe the mood in words such as normal, glad, amazed, depressed, scared, or relieved. Or you could use a scale such as 1 to 10, with 1 being "very unpleasant" and 10 being "very pleasant."

▣ Business & Industry

- Pounds of bait sold >
- Number or quality of fish catch, or the need to diversify species or business activities
- Number of watercraft rented (canoes, kayaks, pontoon boats)
- Effects on landscaping business, such as number of plants replaced or planted, people employed
- Prices or availability of agricultural products
- High or low irrigation costs

▣ Relief, Response & Restrictions

- Presence or absence of burn bans or fireworks bans
- Presence or absence of watering restrictions



There are several methods to get information into the United States Drought Monitor process already in existence

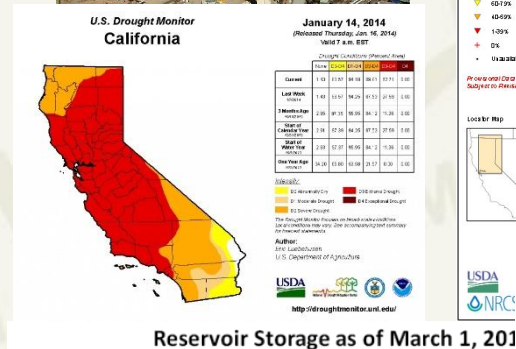
- ▶ US Drought Monitor Listserv
- ▶ The Drought Impact Reporter
- ▶ CoCoRaHS
- ▶ California State Climate Office
- ▶ California/Nevada Drought Monitoring Group
- ▶ CalDry Group
- ▶ Direct Email to the authors
- ▶ Generic Email to the U.S. Drought Monitor



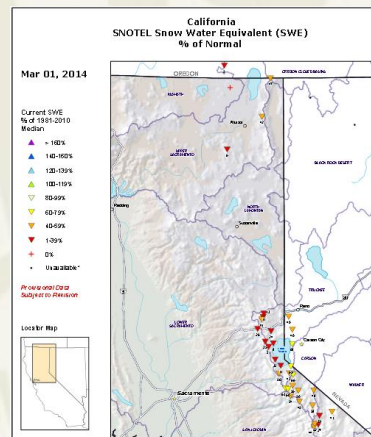
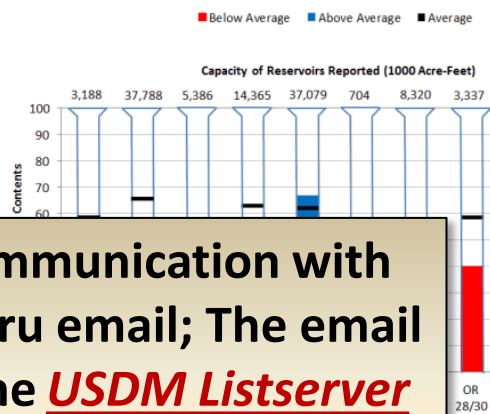
The Importance of Local Expert Input

- ▶ The U.S. Drought Monitor Team Relies on Field Observation Feedback from the Local Experts for Impacts Information & "Ground Truth"
 - **Listserver (350+ Participants: 2/3 Federal, 1/3 State/Univ.)**

- Local NWS & USDA/NRCS Offices
- State Climate Offices
- State Drought Task Forces
- Regional Climate Centers
- NIDIS Basin



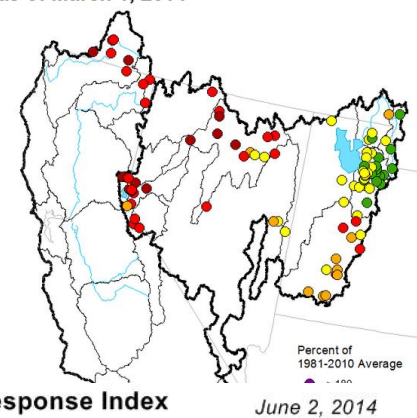
Reservoir Storage as of March 1, 2011



Vegetation Drought Response Index Complete: California



Great Basin and California Spring and Summer Streamflow Forecasts as of March 1, 2014



Vegetation Condition

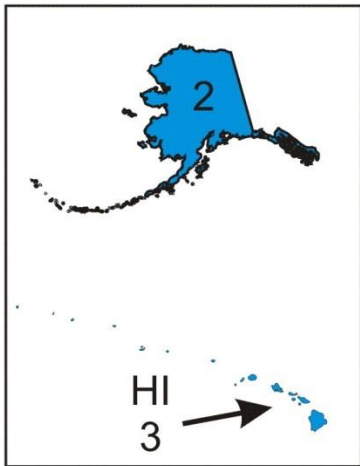
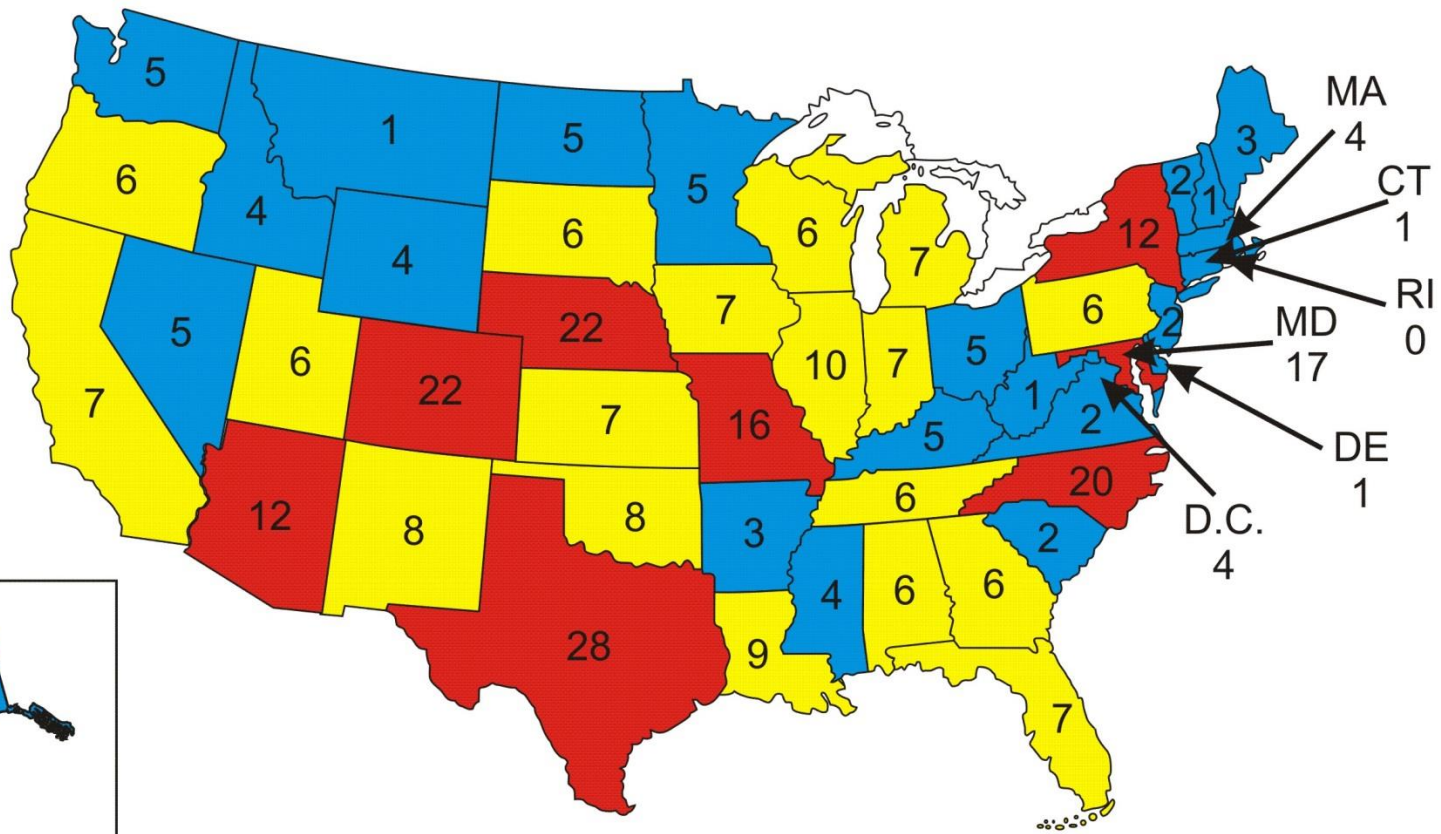
- Extreme Drought
- Severe Drought
- Moderate Drought
- Pre-Drought
- Near Normal
- Unusually Moist
- Very Moist
- Extremely Moist
- Out of Season
- Water



The primary means of communication with our "eyes in the field" is thru email; The email "Expert Group" is called the **USDM Listserver**

USDM Listserve Subscribers

(as of September 4, 2014)

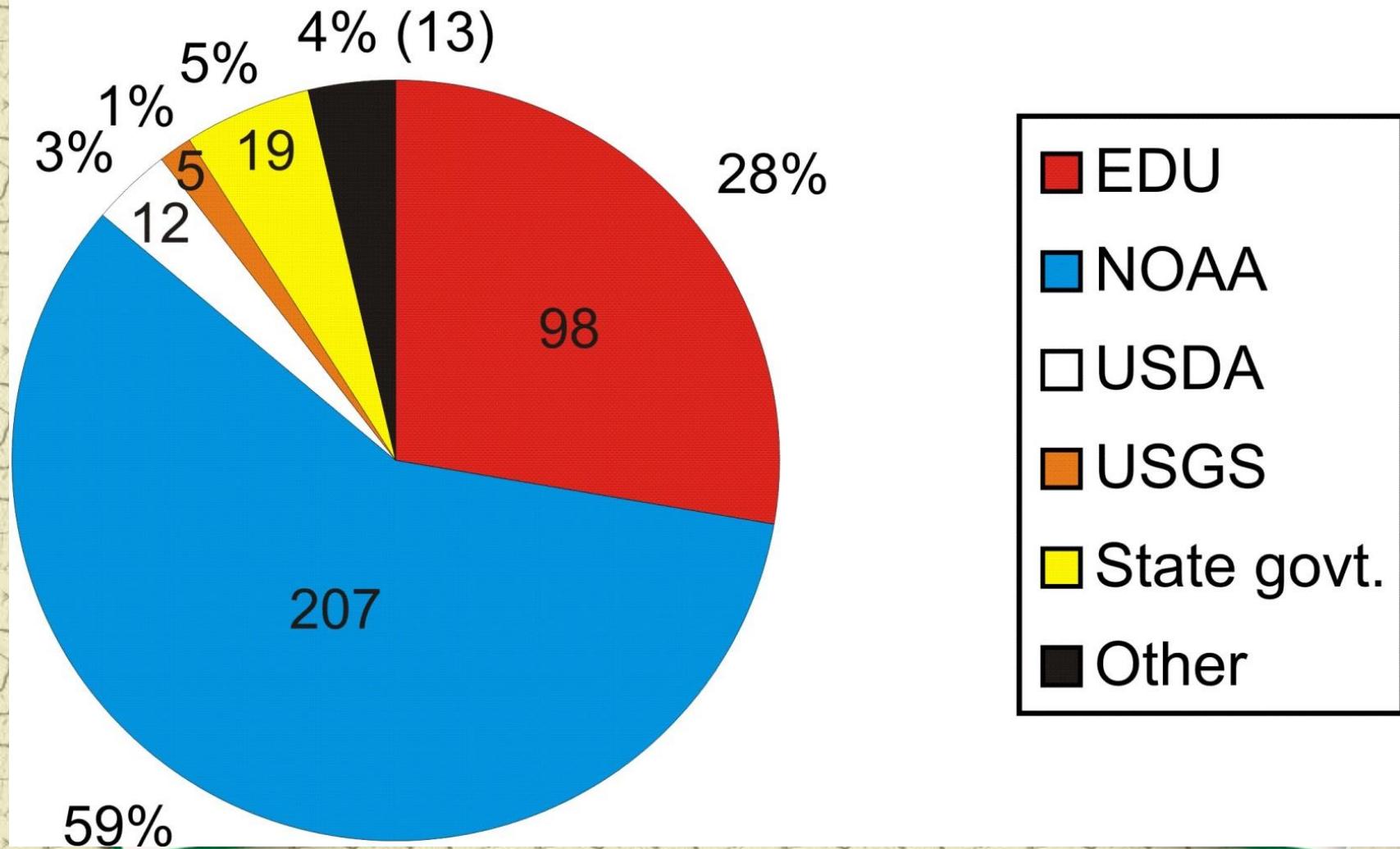


- 1-5 participants
- 6-10 participants
- 11+ participants

Total: 351 (does not include 1 participant from Canada and 2 participants from Brazil)

USDM Listserve Subscribers

(as of September 4, 2014)



To Subscribe:

- ▶ Email **Brian Fuchs** at the National Drought Mitigation Center to join the US Drought Monitor Listserv
 - bfuchs2@unl.edu



Drought Impact Information

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

NDMC Drought Impact Reporter

Map | Advanced Search | **Submit a Report** | About the DIR | Help

Refresh

Impacts & Reports | Overlays

Impacts

Opacity: 80%

Impacts Legend:

- 0
- 1 - 10
- 11 - 20
- 21 - 30
- 31 - 40
- 41 - 49

Reports

Time Period

Location

Categories

Report Types

All States | 05-04-2014 - 06-04-2014

Impact Counts | Impact List | Report Counts | Report List

Total Impacts | All States: 131

Category		Count	
● Agriculture	40	● Business & Industry	5
● Energy	1	● Fire	30
● Plants & Wildlife	35	● Relief, Response & Restrictions	76
● Society & Public Health	21	● Tourism & Recreation	6
● Water Supply & Quality	75		

Report Source

Anyone can provide drought impact information

- ▶ Archive of drought related impacts since 2005 with some historical impacts also available
- ▶ Over 18,850 impacts logged to date from all sources
- ▶ Partnerships with **CoCoRaHS** (5,000 since 2010) and the *Carolinas Integrated Sciences Assessments: CISA* (600 since 2013) have enhanced submissions directly into the DIR.



Submit a Report

Learn how your report becomes an impact.

* indicates required field

Description

Please provide a **Description** of how drought is affecting you, your livelihood, your activities, etc.

If there is a report online that helps illustrate your observation, please use the **Related Link** box to provide the link.

A **Condition Monitoring Report** allows a regular observer to describe normal conditions that are likely to change during drought, to create a basis for comparison. Please check Condition Monitoring Report if that's what you are submitting. If you aren't sure, please leave it unchecked.

Impact Description*

Related Link

Condition Monitoring Report

Categories

To help get a handle on drought's complex impacts, we divide them into **Categories**. Not all impacts fit neatly within a category, but many do.

Please click on the checkbox or category name to select it.

When you select a category, you have the option to enter a **Value** in dollars for losses or gains. Any information about dollar losses or gains will appear along with the other information you submit in your report.

Categories

- Agriculture
- Business & Industry
- Energy
- Fire
- General Awareness
- Plants & Wildlife
- Relief, Response & Restrictions
- Society & Public Health
- Tourism & Recreation
- Water Supply & Quality

Value (not required)

\$	<input type="text"/>
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Duration

The **Start Date** and **End Date** can be approximate. A **Start Date** is required. It is OK to leave the **End Date** blank if the impact is ongoing or if you don't know when it ended.

Click on the calendar icon and then on a specific date to select a **Start Date** or **End Date**, or manually enter a date using MM/DD/YYYY format.

* Start Date

End Date

Affected Places

To select an entire state, click on the arrow to the right of the name of the state. The name of the state should appear in the **Affected Places** box above.

To report on an impact in a specific location, first click on the name of the state where it is. The state should be highlighted, but should not appear in the **Affected Places** box. A list of counties in the state will appear. To select one or more counties, click on the arrow to the right of the name of one or more counties. The counties you selected will appear in the **Affected Places** box.

To select a city, first click on the name of the state where it is. The state should be highlighted, but should not appear in the **Affected Places** box. Then begin typing the name of the city in the box at the top of the **City** column, and select the city you want when it appears by clicking on the arrow to the right of its name.

To unselect a state, county or city, click on the x to the left of its name in the **Affected Places** field.

Clicking on **Add All States** will do just that. It may be faster to add all and then unselect a few than to select a large number of states. Please use this option with caution.

If all but a few counties in a state are affected, you can **select all**, which will highlight all of them, and then hold down the control key and click on the county names to unselect them, and then click **add selected** to make the ones still highlighted appear in the **Affected Places** box.

State

[add all states](#)

County

[select all](#) [add selected](#)

City

Alabama			
Alaska			
Arizona			
Arkansas			
California			



Images

Browse to the **Photo** you would like to submit. Attach up to five gif/jpg/jpeg/png image files smaller than 10 MB.

Please enter the photographer's name and organization, if applicable, as it should appear in the **Credit**.

Enter the **Date** the photo was taken.

Enter the **Location** where the photo was taken.

Please provide **Caption** information that helps people understand what effect of drought the photo shows. It may be helpful to submit before and after photos, if possible, so that people can contrast drought conditions with normal conditions.

By submitting images, you agree that the National Drought Mitigation Center may publish them in the Drought Impact Reporter, on NDMC websites, or via social media. You also agree that you are the photographer or that you have the photographer's permission to submit the photo.

Photo	<input type="button" value="Browse..."/>	No file selected.
Credit	<input type="text"/>	
Date	<input type="text"/>	
Location	<input type="text"/>	
Caption	<input type="text"/>	

[add another image](#)

Contact Information

Please provide your **First Name** and **Last Name**. We can keep it confidential based on your answer below, but we still need it for our records.

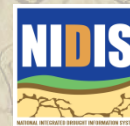
Please select the **Observer Type** that best describes you.

If you are submitting a report on behalf of an organization, agency, or business, please let us know.

Please provide your **State** and the nearest **City**.

Please provide an **Email** address and a **Phone** number in case our moderators need to contact you to verify information.

* First Name	<input type="text"/>
* Last Name	<input type="text"/>
* Observer Type	<input type="text" value="Please Select"/>
Organization	<input type="text"/>
Address 1	<input type="text"/>
Address 2	<input type="text"/>
* State	<input type="text" value="Please Select"/>
* City	Begin typing in the window and select your city when it appears below. <input type="text"/>
Zip	<input type="text"/>
* Phone 1	<input type="text"/>
Phone 2	<input type="text"/>
* Email	<input type="text"/>



Citizens Providing Impact Information

Map Advanced Search Submit a Report About the DIR Help

Map Data

All States | 06-04-2013 - 06-04-2014 | ●

Total Impacts All States	
Category	
● Agriculture	144
● Energy	5
● Plants & Wildlife	151
● Society & Public Health	29
● Water Supply & Quality	83

Report Source	
Media	4
CoCoRaHS	216

Impacts | California
06-04-2013 - 06-04-2014
Page 1 of 5

Duration: 12-03-2013 - 05-07-2014

Tuolumne County, California, water restrictions, can't water lawns, trees dying ▾
● ● ●

Duration: 04-01-2014 - 05-07-2014

Affected Areas
Tuolumne County

Description
County wide utility district announced major cut backs of 40%. Residents can't water lawns this summer. Increased tree mortality in Stanislaus National Forest. CoCoRaHS Report from Station #Tuolumne City 2.0 N on 5/7/2014

Associated Reports
[CoCoRaHS Report from Station #Tuolumne City 2.0 N on 5/7/2014](#) ▶

Midpines, California, trees dying, rancher forced to sell cattle due to reduced grass growth ▾
● ●



Citizens Providing Data and Impacts



COMMUNITY COLLABORATIVE RAIN, HAIL & SNOW NETWORK

"Because every drop counts"



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Drought Impact Reports

<http://www.cocorahs.org/>

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DROUGHT IMPACTS REPORTING RESOURCE PAGE

Has your community been

IMPACTED BY DROUGHT?

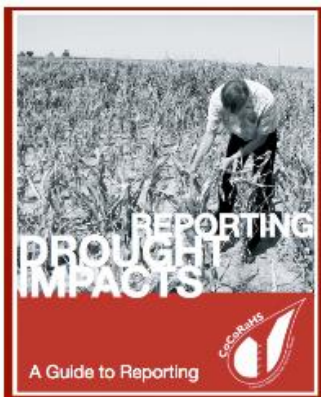
Tell us by submitting a "CoCoRaHS Drought Impact Report"

Please take a moment to view the "Drought Impacts Reporting Guide" below and then go ahead and submit an "Impact Report" on-line.

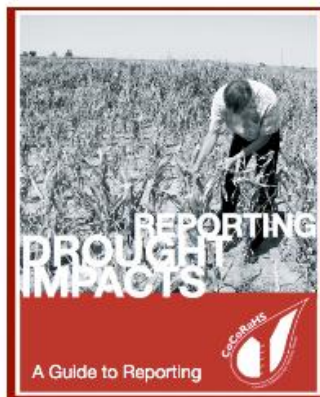
[View Drought Impact Reports](#)

DROUGHT IMPACT REPORTING GUIDE

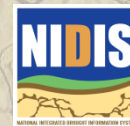
View our short guide on Reporting Drought Impacts by clicking on the icon below:



HTML Slideshow



Downloadable PDF



UNIVERSITY OF
Nebraska
Lincoln



Example of CoCoRaHS Drought Impact Reports



COMMUNITY COLLABORATIVE RAIN, HAIL & SNOW NETWORK
"Because every drop counts"

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View Data : List Drought Impact Reports

- View Data**
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 - [Multiple Day Reports](#)
 - [Drought Impact Reports](#)
- [Days with Hail](#)
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 - [Station Hail Reports](#)

Search Drought Impact Reports



Station Fields: Station Number Station Name

Location: USA Select State No State Selected

Date Range:

Start Date: 1/2/2014 End Date: 11/3/2014

Searched: Stations in USA. Report start or end date between 1/2/2014 and 11/3/2014.

6/4/2014	6/4/2014	CA-FR-2	CA	Fresno	False	 Agriculture : \$8,000.00	Well went dry yesterday, almond trees will die, and I'll have roughly two and a half acres of firewood.
6/11/2014		CA-FR-2	CA	Fresno	False	 Agriculture : \$6,000.00	Neighbor's well went dry yesterday, a week after mine. He is going to lose 4 acres of orange trees.

To become a CoCoRaHS Observer:



COMMUNITY COLLABORATIVE RAIN, HAIL & SNOW NETWORK
"Because every drop counts"

<http://www.cocorahs.org/>

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Welcome to CoCoRaHS! "Volunteers working together to measure precipitation across the nation."

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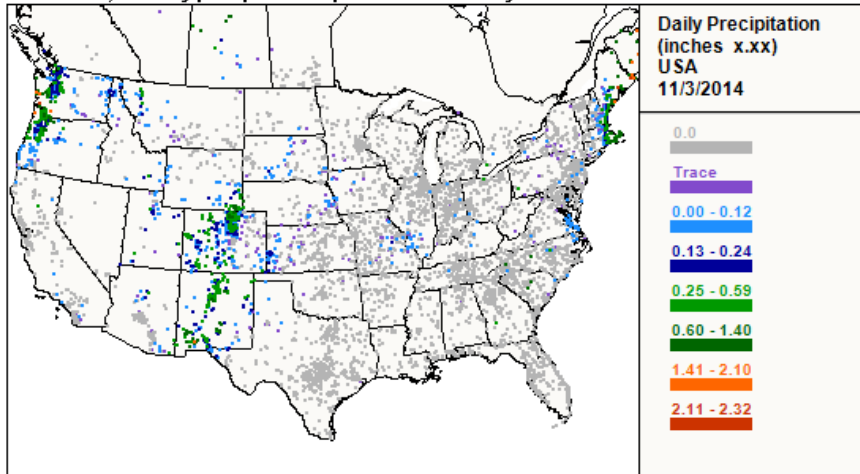
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CoCoRaHS 2015 RAIN GAUGE CALENDARS NOW ON SALE !!
Click here to order



7,034 daily precipitation reports received today as of 11/3/2014 12:17 PM EDT



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CoCoRaHS
TRAINING
SLIDE-SHOWS

Things to know about...

- Rain
- Hail
- Snow

CoCoRaHS
WxTalk
Webinar Series



Contacting your State Climatologist directly



<http://www.water.ca.gov/floodmgmt/hafoo/csc/>

- Home
- Newsroom
- Flood & Safety
- Planning
- State Water Project
- Funding
- Environment
- Supply & Use
- Data

FloodSAFE California | Levee Repair | Flood Management | CDEC | CVFMP | SFMP | FESSRO | All Flood & Safety Topics...

Flood Management

- Hydrology & Flood Operations
- Flood Projects
- Levee Repairs & Floodplain Management
- Flood Maintenance

Hydrology & Flood Operations

- California State Climatologist
- Flood Operations
- Flood Project Integrity & Inspection
- Hydrology

California State Climatologist

- Climate Change
- Climate Data & Information
- Documents

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CALIFORNIA STATE CLIMATOLOGIST

ANNOUNCEMENTS

What is CoCoRaHS?

CoCoRaHS (Community Collaborative Rain, Hail and Snow Network) is a grassroots volunteer network of backyard weather observers of all ages and backgrounds working together to measure and map precipitation (rain, hail, and snow) in their local communities. For more information on this program, please visit the [National CoCoRaHS website](#) or the [State of California CoCoRaHS website](#). To become a CoCoRaHS observer, use the [online application](#).



The California State Climatologist collects and interprets climate data for California, and disseminates climate data and information through various means including this portal. The California State Climatologist is a function of the California Department of Water Resources' Division of Flood Management and is a member of the American Association of State Climatologists.

[The Weather and Climate Newsletter](#), written periodically by the State's weather and climate staff, is available through the [California Data Exchange Center](#).

Climate vs. Weather (What to expect vs. What is happening)

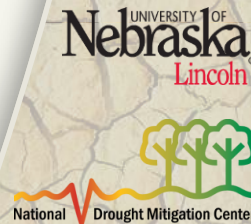
Climate is the expected state of weather variables such as precipitation or temperature. Climate values are defined as averages of weather variables over time periods such as 30 years. For example, the monthly mean temperature for December is a climate variable. This value is

October Climate Notables -
Happy New Water Year!



To find and contact all of the state climatologists, please go to the American Association of State Climatologists (AASC) webpage

<http://www.stateclimate.org/>



California/Nevada Drought Monitor Group

To Join:

▶ **Contact:** Mike Anderson
Michael.L.Anderson@water.ca.gov
(916) 574-2830
Cindy Matthews
cindy.matthews@noaa.gov
(916) 979-3041 Ext 240

▶ **Group Email:**
sto.ca.nv.droughtm@noaa.gov



CalDry Email List

To Join:

- ▶ **Contact:** Mike Anderson
Michael.L.Anderson@water.ca.gov
(916) 574-2830
Cindy Matthews
cindy.matthews@noaa.gov
(916) 979-3041 Ext 240
- ▶ **Group Email:**
caldm@water.ca.gov



Contact the USDM Authors Directly

▣ All the authors contacts can be found here:
<http://droughtmonitor.unl.edu/AboutUSDM/ContactUs.aspx>

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- [Matthew Rosencrans](mailto:matthew.rosencrans@noaa.gov), Climate Prediction Center, (301) 683-3413
matthew.rosencrans@noaa.gov
- [David Simeral](mailto:david.simeral@dri.edu), Western Regional Climate Center, (775) 674-7132 david.simeral@dri.edu
- [Mark Svoboda](mailto:msovoboda2@unl.edu), National Drought Mitigation Center, (402) 472-8238
msovoboda2@unl.edu
- [Richard Tinker](mailto:rich.tinker@noaa.gov), Climate Prediction Center, (301) 683-3411 rich.tinker@noaa.gov



Generic U.S. Drought Monitor email:

- ▶ If all else fails or if you have questions concerning the U.S. Drought Monitor map, data, process etc, the following email can be used to get an answer:
- ▶ DroughtMonitor@unl.edu



Any Questions ?



Contact Information:

Brian Fuchs

bfuchs2@unl.edu

402-472-6775

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

