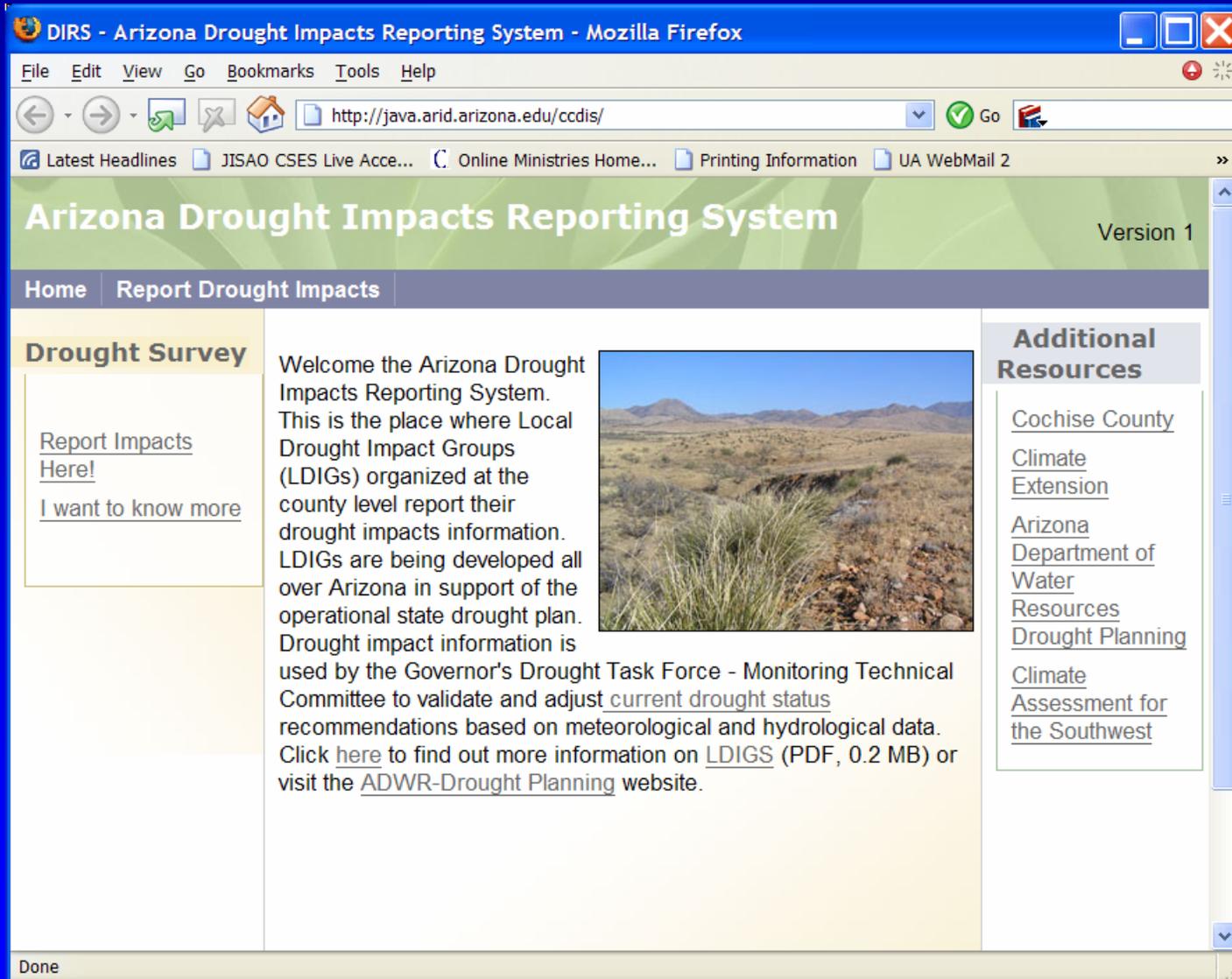




Monitoring Drought in Arizona

**Mike Crimmins
Climate Science Extension Specialist
Dept. of Soil, Water, & Env. Science &
Arizona Cooperative Extension
The University of Arizona**

Drought Impacts form is online!



The screenshot shows a web browser window titled "DIRS - Arizona Drought Impacts Reporting System - Mozilla Firefox". The address bar displays "http://java.arid.arizona.edu/ccdis/". The page content includes a navigation menu with "Home" and "Report Drought Impacts". A "Drought Survey" section contains links for "Report Impacts Here!" and "I want to know more". The main text area welcomes users and explains the system's purpose, accompanied by a photograph of a dry, hilly landscape. A sidebar titled "Additional Resources" lists links for "Cochise County", "Climate Extension", "Arizona Department of Water Resources", "Drought Planning", and "Climate Assessment for the Southwest".

DIRS - Arizona Drought Impacts Reporting System - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://java.arid.arizona.edu/ccdis/

Latest Headlines JISAO CSES Live Acce... Online Ministries Home... Printing Information UA WebMail 2

Arizona Drought Impacts Reporting System

Version 1

Home Report Drought Impacts

Drought Survey

[Report Impacts Here!](#)

[I want to know more](#)

Welcome the Arizona Drought Impacts Reporting System. This is the place where Local Drought Impact Groups (LDIGs) organized at the county level report their drought impacts information. LDIGs are being developed all over Arizona in support of the operational state drought plan. Drought impact information is used by the Governor's Drought Task Force - Monitoring Technical Committee to validate and adjust current drought status recommendations based on meteorological and hydrological data. Click [here](#) to find out more information on [LDIGS](#) (PDF, 0.2 MB) or visit the [ADWR-Drought Planning](#) website.



Additional Resources

[Cochise County](#)

[Climate Extension](#)

[Arizona Department of Water Resources](#)

[Drought Planning](#)

[Climate Assessment for the Southwest](#)

Done

- <http://java.arid.arizona.edu/ccdis>

Why collect local drought impact information?

- Help refine drought status calculations for your watershed with corroborating information (e.g. impacts may be worse than climate observations are showing)
- Documentation of impacts are important in securing disaster assistance
- Informs state and federal agencies of local-scale changes
- Tool to assess local vulnerabilities



County Drought Impacts Reporting

- Very basic electronic version of original hardcopy form
- Requires entry of observers identification information each time
- Geographic reporting area can be identified by any descriptor (e.g. nearest town, HUC, Lat/Lon)
- Reporting frequency: monthly to quarterly?
- Next steps → map for reporting, more funding to improve interface (save login/account information, customized entry and reporting options)

DIRS Survey - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://java.arid.arizona.edu/ccdis/jsp/survey/

DIRS - Survey Version 1

Home Report Drought Impacts

Arizona Drought Impacts Reporting System - Current Drought Impacts

Name Email

Address Phone

Geographic Reporting Area (E.G. Nearest Town, Township/Range, Lat/Long, Hydrologic Unit Code)

Economic

Costs and losses to agricultural producers		
Impact	Observed?	Trend
A1 Damage to crop quality	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input type="radio"/> Worse <input type="radio"/> Same <input type="radio"/> Better
A2 Income loss to farmers due to reduced crop yield	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input type="radio"/> Worse <input type="radio"/> Same <input type="radio"/> Better
A3 Reduced productivity of cropland (wind erosion, long-term loss of organic matter, etc.)	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input type="radio"/> Worse <input type="radio"/> Same <input type="radio"/> Better
A4 Insect infestation	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input type="radio"/> Worse <input type="radio"/> Same <input type="radio"/> Better
A5 Plant disease	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input type="radio"/> Worse <input type="radio"/> Same <input type="radio"/> Better
A6 Wildlife damage to crops	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input type="radio"/> Worse <input type="radio"/> Same <input type="radio"/> Better
A7 Increased irrigation costs	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input type="radio"/> Worse <input type="radio"/> Same <input type="radio"/> Better
A8 Cost of new or supplemental water resources development (wells, dams, pipelines)	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input type="radio"/> Worse <input type="radio"/> Same <input type="radio"/> Better
Comments/specific causes		
<input type="text"/>		

Done

<http://java.arid.arizona.edu/ccdis/>

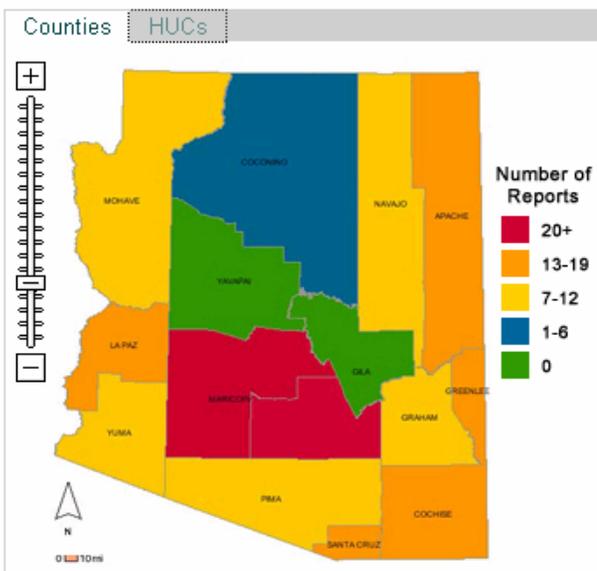
AZ-Drought Impact Reporting System v2.0

Arizona DIRS: Drought Impacts Reporting System

Interface Mock-up

Home My DIRS Subscribe to a Survey Log in

State of the State: June, 2007



County Synopsis

Click on a county on the map to view county synopsis, or select from the following list:

Yuma

(Mock-up users: no matter which county you select, clicking the "Go" button will return Yavapai county. Please use your imagination to visualize your desired county when viewing.)

<http://dirs.arid.arizona.edu/index.html>

Please provide feedback to Mike Crimmins
crimmins@u.arizona.edu

Partners

Arizona Cooperative Extension
Arizona Department of Water Resources
Arizona Remote Sensing Center
National Drought Mitigation Center

CSAP

Climate Science Applications Program - Arizona Cooperative Extension

CLIMAS
Climate Assessment for the Southwest

AZ-DIRS v2.0

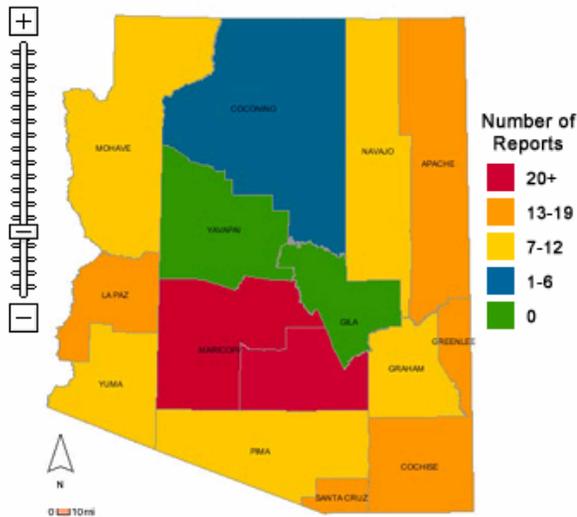
Arizona DIRS: Drought Impacts Reporting System

Interface Mock-up

Home My DIRS Subscribe to a Survey Log in

print report

State of the State



Yavapai County Synopsis

← May 2007 →

Average of all Impacts

11 REPORTS



Economic Impacts

Environmental Impacts

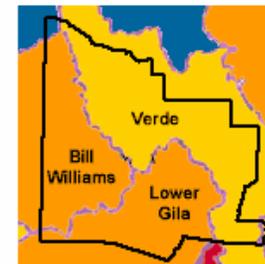
Agricultural

15 REPORTS



Wildlife

2 REPORTS



AZ-DIRS v2.0

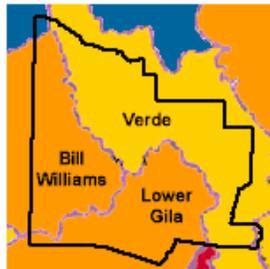
Arizona DIRS: Drought Impacts Reporting System

Interface Mock-up

[Home](#) | [My DIRS](#) | [Subscribe to a Survey](#) | [Log in](#)

My DIRS: Yavapai County

(AJAX Map zoomed in to reported areas)



Survey: Monthly Issues, 2007

[+ Add new survey](#)

print report

ID	HUC	Watershed	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Delete
1	XXXXXXXXXX	Bill Williams	✓	✓		✓									
2	XXXXXXXXXX	Lower Gila	✓	✓	✓	✓									
3	XXXXXXXXXX	Verde	✓	✓		✓									
4	XXXXXXXXXX XXXXXXXXXX	Lower Colorado Little Colorado	✓	✓	✓	✓									
5	XXXXXXXXXX XXXXXXXXXX XXXXXXXXXX	Bill Williams Lower Gila Verde		✓	✓	✓									
6	XXXXXXXXXX	Salt		✓		✓									
7	XXXXXXXXXX	Lower Gila			✓	✓									

© 2007 Arizona Board of Regents | send mock-up feedback to [dirs.feedback\(at\)gmail.com](mailto:dirs.feedback(at)gmail.com)

AZ-DIRS v2.0

ECONOMIC IMPACTS

Impact observed? Yes/No

COSTS AND LOSSES TO AGRICULTURAL PRODUCERS

	Impact	Trend				Comments	Images
A1	Damage to crop quality	<input type="radio"/> yes	<input type="radio"/> no	<input type="radio"/> No data	<input type="radio"/> No data		
A2	Income loss to farmers due to reduced crop yield	<input type="radio"/> Worse	<input type="radio"/> Same	<input type="radio"/> Better	<input type="radio"/> No data		
A3	Reduced productivity of cropland (wind erosion, long-term loss of organic matter, etc.)	<input type="radio"/> Worse	<input type="radio"/> Same	<input type="radio"/> Better	<input type="radio"/> No data		
A4	Insect infestation	<input type="radio"/> Worse	<input type="radio"/> Same	<input type="radio"/> Better	<input type="radio"/> No data		
A5	Plant disease	<input type="radio"/> Worse	<input type="radio"/> Same	<input type="radio"/> Better	<input type="radio"/> No data		
A6	Wildlife damage to crops	<input type="radio"/> Worse	<input type="radio"/> Same	<input type="radio"/> Better	<input type="radio"/> No data		
A7	Increased irrigation costs	<input type="radio"/> Worse	<input type="radio"/> Same	<input type="radio"/> Better	<input type="radio"/> No data		
A8	Cost of new or supplemental water resources development (wells, dams, pipelines)	<input type="radio"/> Worse	<input type="radio"/> Same	<input type="radio"/> Better	<input type="radio"/> No data		

Comments/specific causes

Trends, specific impact details, and additional geographic info provided here

COSTS AND LOSSES TO LIVESTOCK PRODUCERS

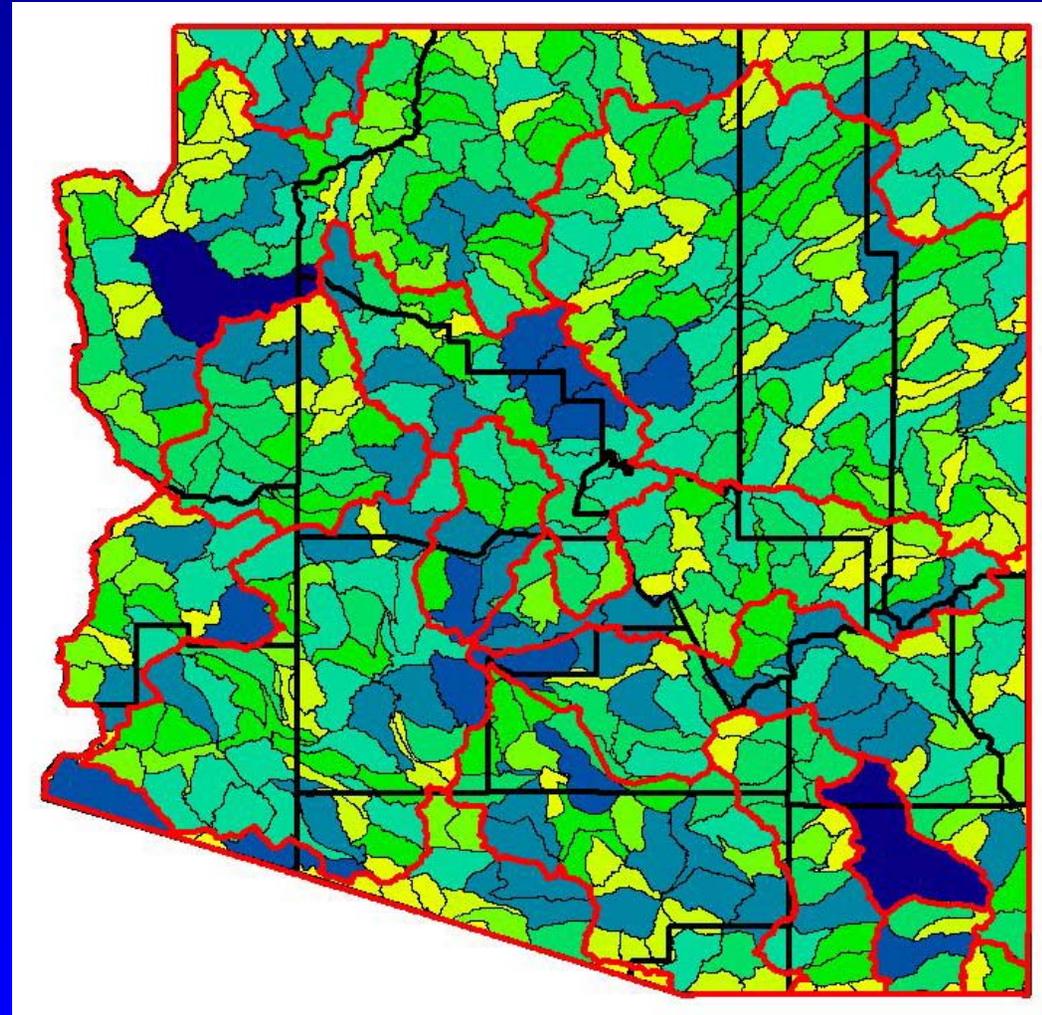
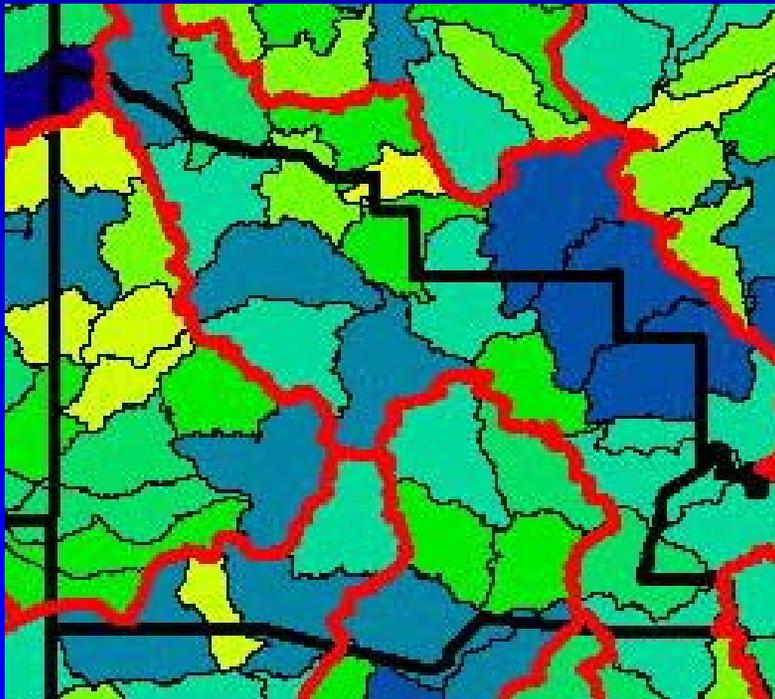
	Impact	Trend				Comments	Images
B1	Reduced productivity of rangelands	<input type="radio"/> Worse	<input type="radio"/> Same	<input type="radio"/> Better	<input type="radio"/> No data		
B2	Forced reduction of foundation stock	<input type="radio"/> Worse	<input type="radio"/> Same	<input type="radio"/> Better	<input type="radio"/> No data		
B3	High cost/unavailability of water for livestock	<input type="radio"/> Worse	<input type="radio"/> Same	<input type="radio"/> Better	<input type="radio"/> No data		

AZ-DIRS: Impact reporting themes

- **Agricultural Impacts**
- **Impacts on Livestock Production and Rangelands**
- **Impacts on Society**
- **Impacts on Aquatic Species**
- **Impacts on Terrestrial Wildlife**
- **Impacts on Plant Communities**
- **Impacts on Hydrology**



Impact Reporting Units = Watersheds?



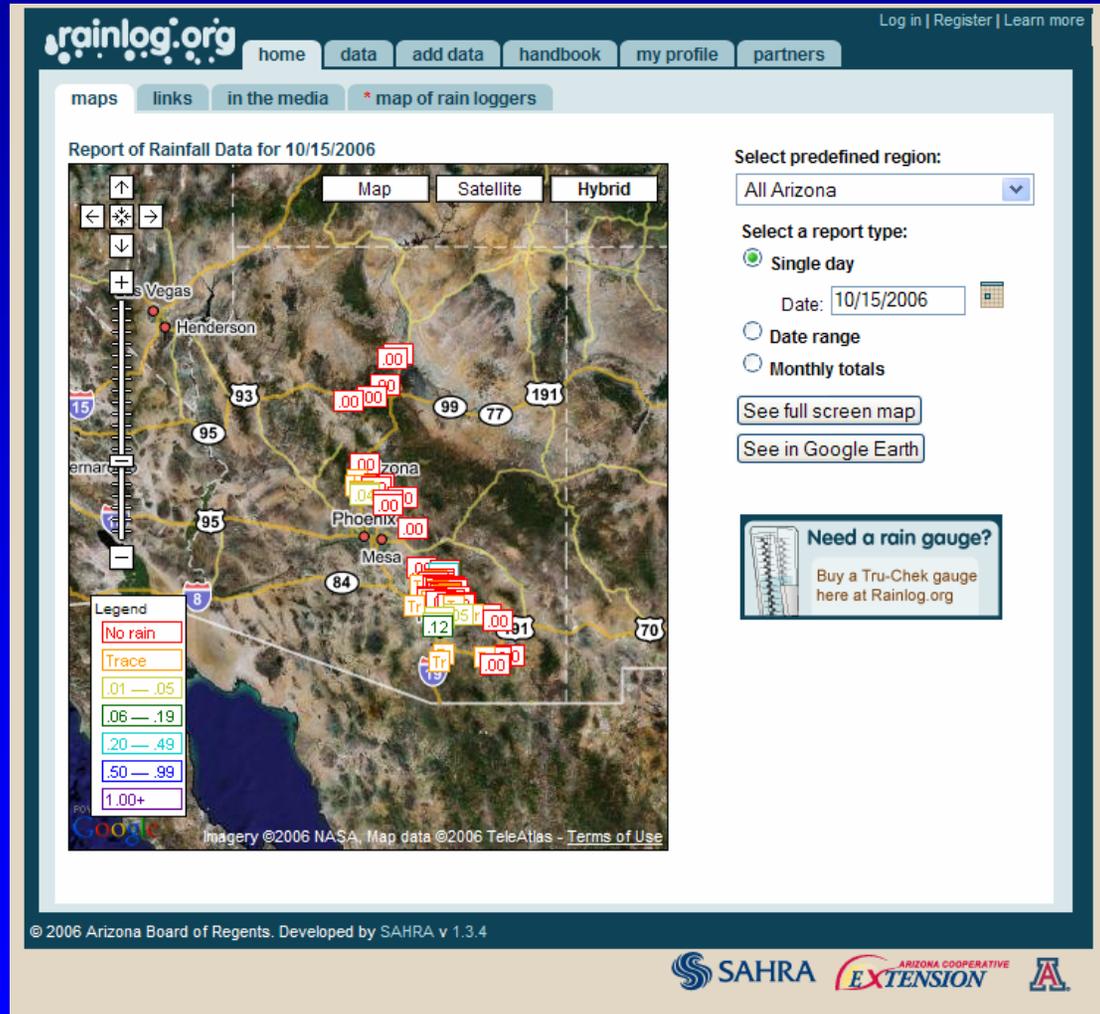
AZ-DIRS: Custom Features

- Observed impacts will be switched on/off each month
- Automated email notifications will remind observers to revisit previously reported impacts (e.g. 'turn off' impact that is no longer occurring)
- Any site visitor can register to be notified when impacts are reported in geographic areas of interest
- Customized reporting of impact summaries at user specified scales (e.g. county or group of watersheds)
- Google Map platform will allow impact maps to be exported into Google Earth
- Integration with other tools on Arizona Hydrologic Information System (Rainlog, Arizona Flood Warning System, Arizona Wells Database...)



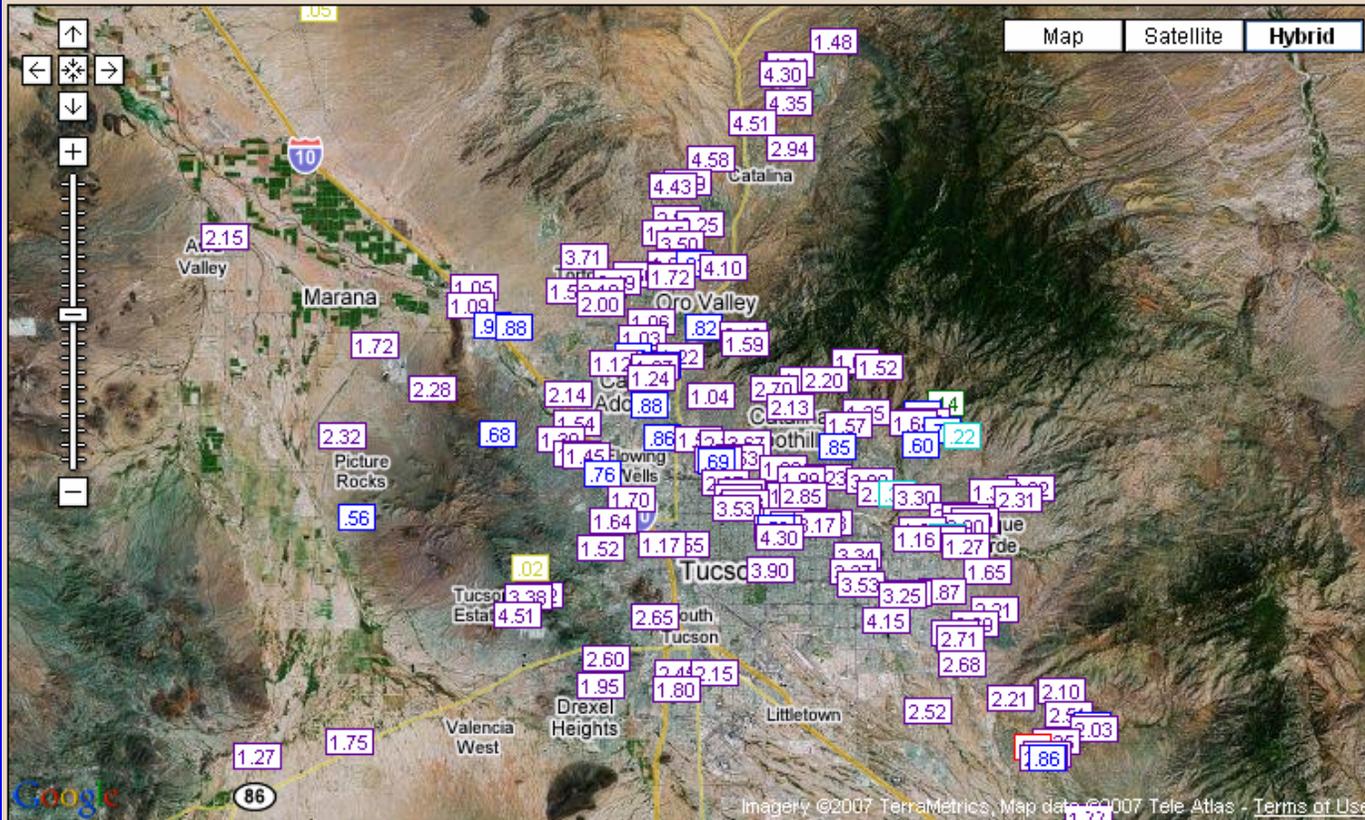
RainLog: Volunteer Precipitation Monitoring Network for Arizona

- Network developed by SAHRA and Arizona Cooperative Extension in support of state drought monitoring needs
- Has over 1000 volunteers and is continuing to grow
- Provides additional observations necessary to characterize complex precip patterns across AZ



Tucson Area Volunteers Observed Rainfall from July 8th – July 25th, 2007

Report of Rainfall Data from 07/08/2007 to 07/25/2007



Select predefined region:

Tucson

Select a report type:

- Single day
- Date range
- Monthly totals

From: 07/08/2007

To: 07/25/2007

Get report

See in Google Earth

Need a rain gauge?

Buy a Tru-Chek gauge here at Rainlog.org

Thanks to the following sponsor(s):



My RainLog

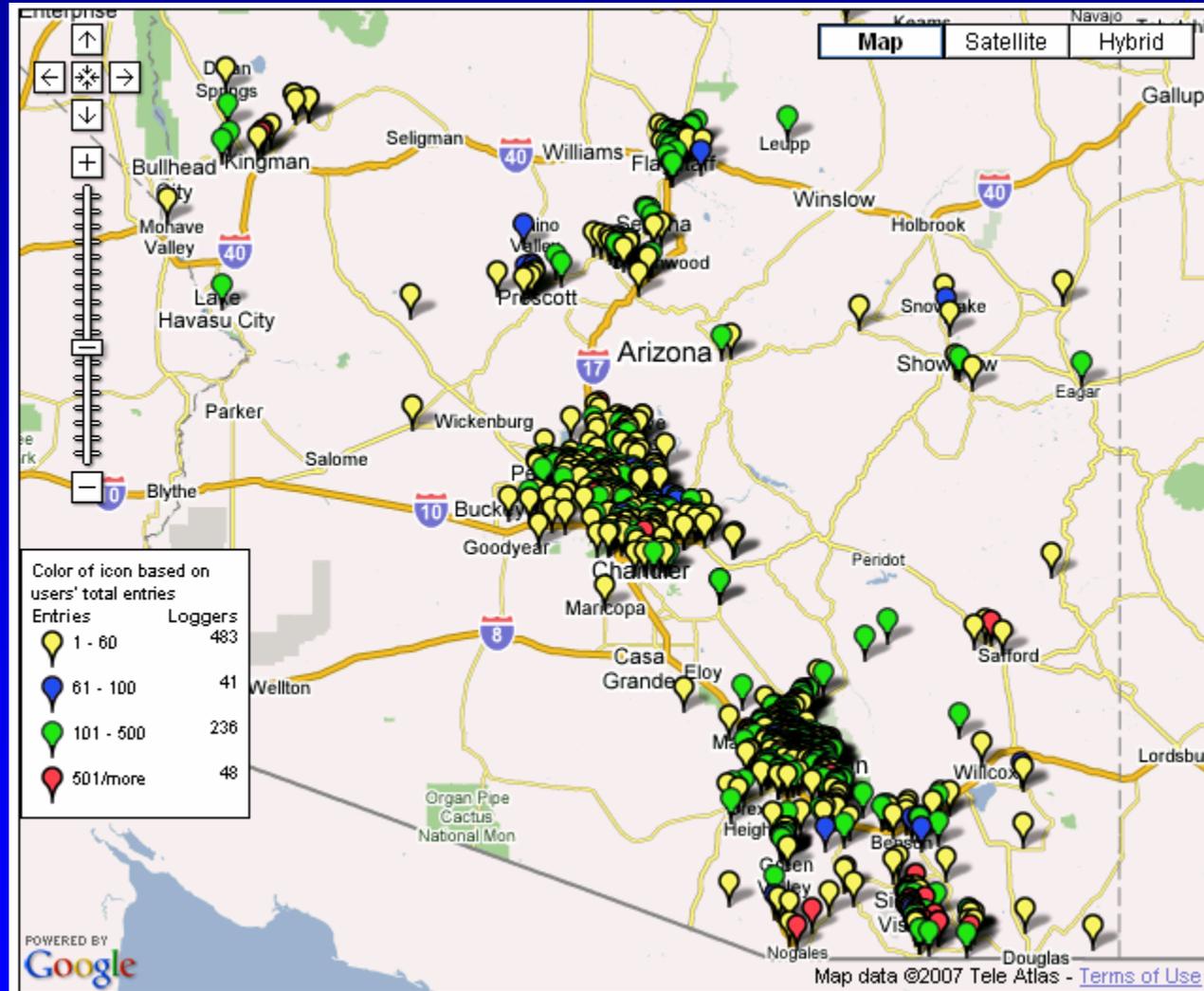
- Encouraging volunteers to submit, store, and manage their own historical data
- Special functions and tools to create reports and graphics
- Historical data allows for calculations of 'normals' and percentiles useful in drought monitoring
- Further engages volunteers as *Citizen Scientists*

The screenshot shows the 'rainlog.org' website interface. At the top, there are navigation tabs: 'home', 'data', 'add data', 'handbook', 'my profile', and 'partners'. Below these, there are sub-tabs: 'daily', 'month grid', and 'monthly entries'. The main content area is titled 'Monthly Rain Data for August, 2006'. It includes navigation links for '< Previous month' and 'Next month >', and a 'jump to:' dropdown menu. A message states: 'Enter your rain gauge data below. Red columns are required. Dates in the future are not presented.' Below this is a table with the following columns: 'Gauge Read On', 'Will Report On', 'Check to Save', 'Total Precipitation', 'Reading Time 00-23:00-59', 'Quality', and 'Comments'. The table contains 17 rows of data for August 1st through 17th, 2006. Each row has a 'Gauge Read On' date, a 'Will Report On' date, a 'Check to Save' checkbox, and a 'Total Precipitation' field. The 'Total Precipitation' field is highlighted in red and contains '0.0'. The 'Reading Time' field is also highlighted in red and contains '07:00'. The 'Quality' field is a dropdown menu with 'Good' selected. The 'Comments' field is a text input box. There is also a 'Check all' checkbox at the top of the table.

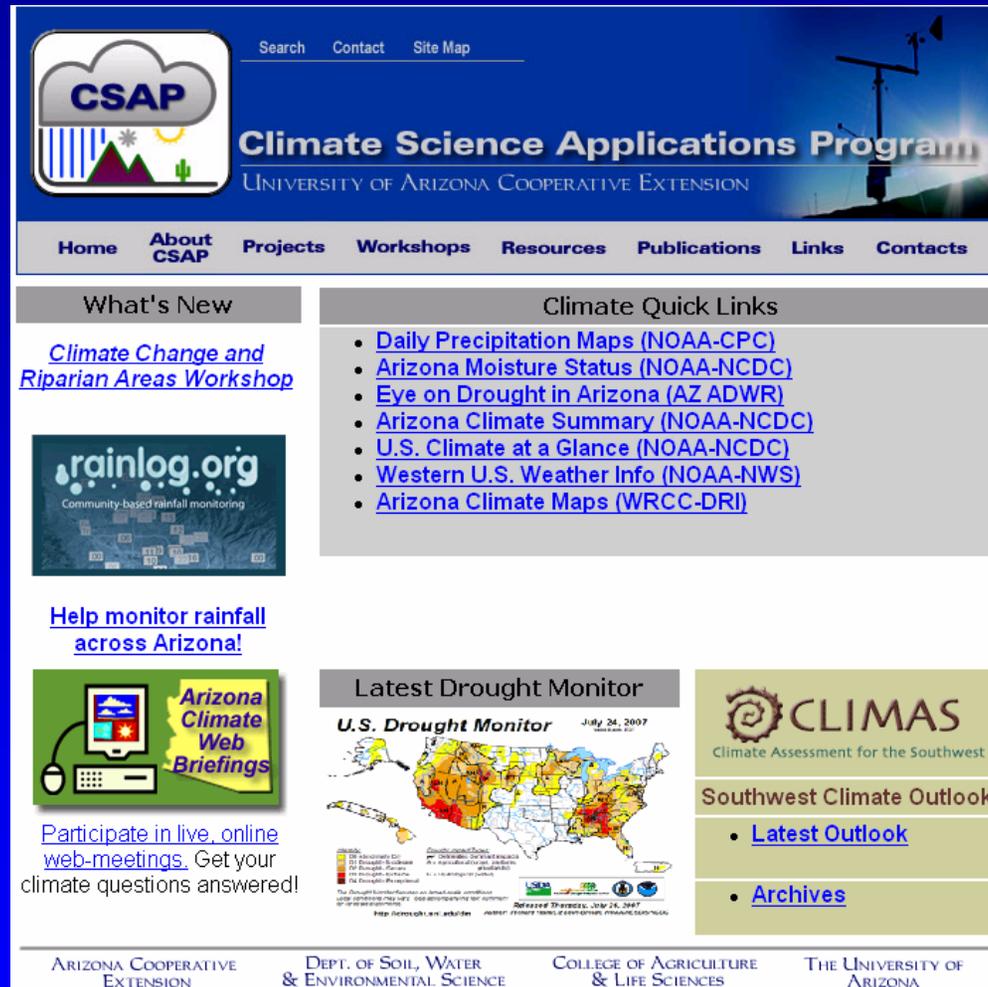
Gauge Read On	Will Report On	Check to Save	Total Precipitation	Reading Time 00-23:00-59	Quality	Comments
08/01	07/31	<input type="checkbox"/>	0.0	07:00	Good	
08/02	08/01	<input type="checkbox"/>	0.0	07:00	Good	
08/03	08/02	<input type="checkbox"/>	0.0	07:00	Good	
08/04	08/03	<input type="checkbox"/>	0.0	07:00	Good	
08/05	08/04	<input type="checkbox"/>	0.0	07:00	Good	
08/06	08/05	<input type="checkbox"/>	0.0	07:00	Good	
08/07	08/06	<input type="checkbox"/>	0.0	07:00	Good	
08/08	08/07	<input type="checkbox"/>	0.0	07:00	Good	
08/09	08/08	<input type="checkbox"/>	0.0	07:00	Good	
08/10	08/09	<input type="checkbox"/>	0.0	07:00	Good	
08/11	08/10	<input type="checkbox"/>	0.0	07:00	Good	
08/12	08/11	<input type="checkbox"/>	0.0	07:00	Good	
08/13	08/12	<input type="checkbox"/>	0.0	07:00	Good	
08/14	08/13	<input type="checkbox"/>	0.0	07:00	Good	
08/15	08/14	<input type="checkbox"/>	0.0	07:00	Good	
08/16	08/15	<input type="checkbox"/>	0.0	07:00	Good	
08/17	08/16	<input type="checkbox"/>	0.0	07:00	Good	

Current Rainlog Volunteers

- Over 400 observers in Pima County
- Use email list to distribute drought updates and outreach material?
- Recruit more observers in rural areas?



Thanks!



The screenshot shows the homepage of the Climate Science Applications Program (CSAP) at the University of Arizona Cooperative Extension. The header includes a search bar, navigation links (Home, About CSAP, Projects, Workshops, Resources, Publications, Links, Contacts), and the CSAP logo. The main content area is divided into two columns: 'What's New' and 'Climate Quick Links'. The 'What's New' section features a link to a 'Climate Change and Riparian Areas Workshop' and a 'rainlog.org' logo for community-based rainfall monitoring. Below this is a link to 'Help monitor rainfall across Arizona!' with an 'Arizona Climate Web Briefings' logo. The 'Climate Quick Links' section lists several resources: Daily Precipitation Maps (NOAA-CPC), Arizona Moisture Status (NOAA-NCDC), Eye on Drought in Arizona (AZ ADWR), Arizona Climate Summary (NOAA-NCDC), U.S. Climate at a Glance (NOAA-NCDC), Western U.S. Weather Info (NOAA-NWS), and Arizona Climate Maps (WRCC-DRI). A 'Latest Drought Monitor' section displays a map of the U.S. Drought Monitor from July 24, 2007, with a legend and a 'CLIMAS' logo. To the right of the drought monitor is a 'Southwest Climate Outlook' section with links to 'Latest Outlook' and 'Archives'. The footer contains the names of the parent organizations: Arizona Cooperative Extension, Dept. of Soil, Water & Environmental Science, College of Agriculture & Life Sciences, and The University of Arizona.

Search Contact Site Map

CSAP
Climate Science Applications Program
UNIVERSITY OF ARIZONA COOPERATIVE EXTENSION

Home About CSAP Projects Workshops Resources Publications Links Contacts

What's New

[Climate Change and Riparian Areas Workshop](#)


Community-based rainfall monitoring

[Help monitor rainfall across Arizona!](#)



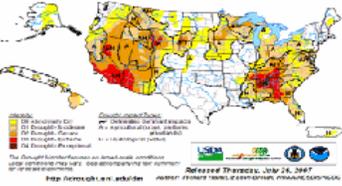
[Participate in live, online web-meetings.](#) Get your climate questions answered!

Climate Quick Links

- [Daily Precipitation Maps \(NOAA-CPC\)](#)
- [Arizona Moisture Status \(NOAA-NCDC\)](#)
- [Eye on Drought in Arizona \(AZ ADWR\)](#)
- [Arizona Climate Summary \(NOAA-NCDC\)](#)
- [U.S. Climate at a Glance \(NOAA-NCDC\)](#)
- [Western U.S. Weather Info \(NOAA-NWS\)](#)
- [Arizona Climate Maps \(WRCC-DRI\)](#)

Latest Drought Monitor

U.S. Drought Monitor July 24, 2007



CLIMAS
Climate Assessment for the Southwest

Southwest Climate Outlook

- [Latest Outlook](#)
- [Archives](#)

ARIZONA COOPERATIVE EXTENSION DEPT. OF SOIL, WATER & ENVIRONMENTAL SCIENCE COLLEGE OF AGRICULTURE & LIFE SCIENCES THE UNIVERSITY OF ARIZONA

crimmins@u.arizona.edu
<http://cals.arizona.edu/climate>

