

Arizona DroughtWatch



User Guide

Arizona's Drought Impact Reporting System

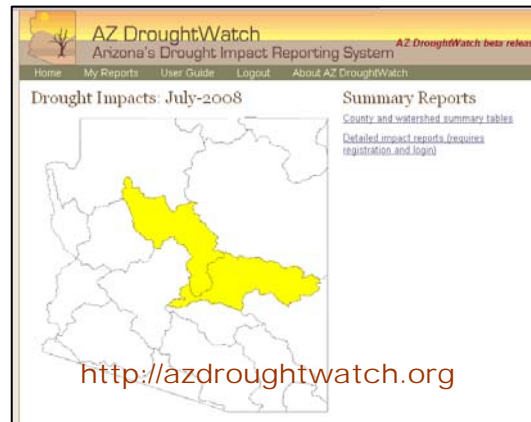
<http://azdroughtwatch.org>

August 2008



What is Arizona DroughtWatch?

AZ DroughtWatch is a monitoring program designed to collect, summarize and display timely observations of drought impacts across Arizona. The tool is designed to support drought monitoring efforts spearheaded by county-level Local Drought Impact Groups (LDIGs) to help meet the goals of the Arizona State Drought Preparedness Plan. Observations of local drought impacts are invaluable in properly monitoring and characterizing drought across Arizona's complex landscape. Information collected through AZ DW will be used by:



- Arizona Drought Monitoring Technical Committee in the production of monthly drought status maps
- National Drought Mitigation Center in the development of the National Drought Monitor
- Local communities to monitor conditions in support of drought response plans and also to guide longer-term risk assessments and mitigation plans

How does it work?

The system collects and compiles data based on monthly drought impact "surveys" developed for Arizona with guidance from the LDIGs and agency partners. The data gathered in these surveys is reliant on observations made in the field and in communities across Arizona. Registered users, including LDIG members, agency field experts, and local volunteer monitors, contribute observations through this on-line reporting system on a monthly basis. Questions within the survey include a list of potential drought impacts relevant to Arizona's diverse sectors and ecosystems. Additional comments and photographs are also collected with qualitative observations through the monthly impact surveys. Local level monitoring of this sort is vital to developing a comprehensive knowledge of the range of drought impacts in Arizona through space and time. The success of AZ DW is reliant on members making observations in each county or basin.

Getting Started

Registration

Click on the **Register** link at the top of the page to access the registration page. The registration page creates an account for you that is required to submit data or access detailed reports. The registration process is easy and quick to complete. Registration includes creating a username and password and identifying yourself with a contact

information, and affiliation (e.g. agency, institution, volunteer group...). Contact information will only be used by DroughtWatch administrators and will not be shared with

third parties. Registration information is also used to interpret drought impact reports and for following-up on observations of interest.

Register for an AZ DroughtWatch Account

I am registering only to access data (no data entry)

Enter your desired username:

Enter your new password:

Re-enter your password:

Email address:

First name:

Last name:

Address:

Address (continued):

City:

State:

Zip code:

Phone:

County:

Choose the type of observer that best describes you (choose N/A if you are registering only to access data):

Affiliation:

On average, how often do you observe drought-related field conditions in your reporting area each month (choose N/A if you are registering only to access data)?

Once you fill out the registration form, you will be sent an email to confirm your account creation. Save your username and password information to log into DroughtWatch in future sessions.

Submit data

Once you have created an account under *Register*, click on the 'MyReports' button. If you have just created an account, you will already be logged into the site. If you are returning, you will need to use your username and password information to log in. If you forgot your username and password, click on the 'Retrieve forgotten password' to receive your information by email.

AZ DroughtWatch Login

Username:

Password:

Once you have logged in, you will be taken to the 'MyReports' page where new observations and past reports are managed. This page allows you to submit new 'reports' (observations of impacts) or access past reports. A 'report' is a series of monthly impact 'surveys' for a particular location. Reports are created and stored in 'subscriptions' --meaning that you can follow drought impacts at a location through time. When you submit an observation of an impact or impacts at a location for a particular month you will receive a follow-up email the next month asking you if the impact(s) is still occurring. If so, you can simply confirm the previous month's report or change the report to reflect new conditions that you have observed. Either way, reports become part of a subscription to impact observations at a specific geographic location. Old reports tied to subscriptions are always available through the MyReports page.



- To submit a new observation, click on 'Create a new report' (see inset). This will take you to a mapping interface to define the location of your impact survey for the current month.
- Choose the location of your drought impact observation by



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using the navigation tools (see inset). Be as precise as you can so that your location will be registered into the correct watershed and county. Arrows are used to pan the map back and forth, plus/minus buttons will change the zoom level. Once you find the location for your impact observation, double click on the map to select that point. This will enter the latitude and longitude of the point in the fields below the map. *If you know the latitude and longitude of your site, you can manually enter them in the latitude/longitude fields below the map (use decimal degree format).*

- After selecting the location on the map, fill out the form to provide some reference information for your report. Choose a name for your report and write a brief description of your observations (you can edit the text automatically entered). Also, select the geographic extent of your report (point/small area observation vs. county-wide impact) . When finished, click on the 'Subscribe to this survey' button. This will take you

Fill out the following information in order to start filling out monthly Arizona Drought Impact Reports.

| | |
|---|---|
| Name: | My report |
| Description: | My report created on 07-13-2008 |
| Geographic extent of impacts in this report: | <input checked="" type="radio"/> Specific location/area <input type="radio"/> County-wide |
| Latitude: | 36.03133177633187 |
| Longitude: | -110.28076171875 |
| <input type="button" value="Subscribe to this survey"/> | |

back to the **MyReports** page. Repeat this process to create reports for additional locations.

- Your new report will be listed in the **MyReports** table. Icons in the table list the status of your report for eleven months prior to the current month. A '+' means you can add a new impact survey for that month while a 'check' indicates that you have a survey submitted for that month. You can review previously submitted surveys by clicking on the 'check' icons in each report.

- Click on the '+' icon to add an observation to a report for that month. This action will bring you to the drought impact survey page. Potential drought impacts are sorted into six main categories. There are 96 specific impacts nested in the main impact categories (see the full list of impacts at the end of this document). Use the '+' buttons to expand the main categories into subcategories and impact lists. Find the impact that most closely matches your observation and select similar impacts in other categories as well. By ticking the box under "observed?" you select that impact for your survey. Use the 'other' text box to list impacts not identified in the survey.

This survey reflects observations of drought impacts from July, 2008

- WATER RESOURCES AND HYDROLOGY
- AGRICULTURAL IMPACTS (FOOD CROPS, CASH CROPS, AND AQUACULTURE)
- LIVESTOCK PRODUCTION AND GRAZING LAND IMPACTS
- SOCIETAL AND COMMUNITY IMPACTS
- TOURISM AND RECREATION
- ECOLOGICAL IMPACTS

- Provide additional comments and observations in the 'comments' field and attach (upload)

| Impact | Observed? | Comments | Images |
|---|-------------------------------------|----------------------|----------------------|
| Conflicts over water resources | <input type="checkbox"/> | <input type="text"/> | <input type="text"/> |
| Impact on property value/declining property sales due to drought (e.g. lack of water resources, ordinances, changes in landscape) | <input type="checkbox"/> | <input type="text"/> | <input type="text"/> |
| Unemployment related to drought impacts (e.g. businesses closing due to lack of water) | <input type="checkbox"/> | <input type="text"/> | <input type="text"/> |
| Property damage/injuries related to drought moderated natural hazards (e.g. erosion related to drought causing damage to roadways, bridges, and residences during precipitation events) | <input type="checkbox"/> | <input type="text"/> | <input type="text"/> |
| Strain on local communities due to drought impacts (e.g. business closures, property foreclosures, declining population, economic strain) | <input checked="" type="checkbox"/> | <input type="text"/> | <input type="text"/> |



photographs that help describe the impact (see inset). Once finished, submit your report by clicking the 'Submit Survey' button at the bottom of the page.

- A confirmation page will follow your submissions with a list of the impacts you are submitting for the current month. If everything looks good, click on the 'Confirm Drought Impacts' button to commit (or save) the report to the database.

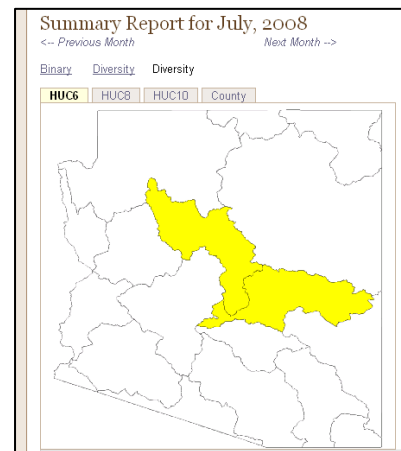


- **No impacts observed:** If you have created a report for a location and there are no drought impacts observed for a particular month, click on '+' for that month in the **MyReports** page. Once at the survey page, deselect any previously observed impacts or leave the survey blank and submit. Confirm that no impacts were observed to commit this survey to the system. This report will show up as observation of no drought impacts for your report location.

How do I access impact summary reports and maps?

The main AZ DroughtWatch page (home) displays a summary map of the most recent month of observations submitted to the system. You can access two additional reporting options by clicking on the links to the right of the map:

County and Watershed Summary Tables (clicking on the home page summary map will also load this page): This page provides a quick look at tabulated monthly impact reports by county and watersheds across Arizona. Several map options are available including different geographic areas (county, watershed units: HUC 6-large basins, HUC 8-medium basins, HUC 10-small basins) and map type (Binary: simple map of impact presence/absence, Diversity: number of different main categories with observed impacts). You can page forward and backward in time to look at summaries from other months by clicking on 'Previous Month' or 'Next Month'. Beneath many of these maps you will find tables portraying the same information in tabular rather than geographic form. The output is formatted in tables organized by county and large watershed (HUC6).



Detailed Impact Reports: This page provides a detailed report of



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all impacts observed along with comments and photos added to each survey. You can page forward and backward in time to access other months by using the 'Previous Month' and 'Next Month' links at the top of the page. Accessing detailed reports requires the creation of an AZ DroughtWatch account.

How to interpret these maps and tables?

A map with a colored polygon (HUC basin or county) indicates that there have been drought impacts reported in those geographic areas. To understand what type of impact or precisely where within that basin or county it occurred, refer to the summary tables below the map (see inset). Drought impacts are reported and organized into the six main categories listed in the table (Water, Agriculture, Livestock, Society, Tourism, and Ecology). Numbers in these columns represent the total number of impacts reported on surveys by all observers for a particular month.

| Watershed Name | water | agriculture | livestock | society | tourism | ecology | Total number of impacts | Total number of surveys | Number of unique observers |
|---|-------|-------------|-----------|---------|---------|---------|-------------------------|-------------------------|----------------------------|
| Upper Colorado River of Lake Powell Area | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Upper San Juan River | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lower San Juan River | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lower Colorado River, Lees Ferry to Lake Mead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Little Colorado River | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lower Colorado River below Lake Mead (Local Drainage) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bill Williams River | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Upper Gila River | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Middle Gila River (Local Drainage) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| San Pedro River | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| Santa Cruz River | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Salt River | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 |
| Verde River | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 |

The table also provides information on the number of surveys posted that month and number of unique observers (those that have completed and submitted the reports).

Summary Table Tips

- Many impacts across multiple categories may indicate more widespread drought conditions versus many impacts in one category alone.
- A large number of surveys indicates that impacts are distributed across many geographic locations.
- A large number of unique observers indicates that surveys are being made by different people rather than many surveys submitted by one observer.
- Months with completed surveys and no impacts reported, indicate an observation of no impacts for that watershed or county.



- Impact Survey Reference Sheet –

A. Water Resources and Hydrology

- Surface Water Impacts
 - Unusually low water levels in reservoirs, lakes and ponds
 - Unusually low flows in streams, rivers, and springs
 - Poor water quality due to low levels/low flows
 - Impacts on hydro-electric power generation
 - Need for supplemental water due to drought impacts on local surface water resources (e.g. hauling water)
- Groundwater Impacts
 - Unusually low groundwater levels due to long-term precipitation deficits/lack of recharge
 - Need for deepening of existing wells to reach groundwater supplies
 - Need for developing new wells to meet water demands (existing wells are going dry due to drought impacts)
 - Land subsidence and desiccation cracks observed due to depletion of groundwater supplies
 - Need for supplemental water due to drought impacts on local ground water resources (e.g. hauling water)

B. Agricultural Impacts (food crops, cash crops and aquaculture)

- Soil Impacts
 - Soil erosion due to loss of vegetation/organic matter
 - Reduction in soil quality/fertility (e.g. increasing salinity due increased irrigation and lack of precipitation)
- Crop Impacts
 - Unusual levels of plant stress due to lack of sufficient soil moisture
 - Unusual levels of plant mortality due to lack of sufficient soil moisture
 - Reduction in overall crop quality
 - Reduction in productivity
 - Unusual levels of plant disease or insect infestations related to drought
 - Unusual levels of herbivory from drought stressed wildlife
 - Encroachment of drought-tolerant invasive species
- Agricultural Water Resource Impacts
 - Unusual need for irrigation from surface or groundwater sources
 - Need for supplemental water sources to meet irrigation demands (e.g. wells, dams, diversions, hauling)
 - Supplemental water needs for aquaculture operations (e.g. additional groundwater pumping or surface water diversions)



C. Livestock Production and Grazing Land Impacts

- Soil Impacts
 - Soil erosion due to loss of vegetation/organic matter
 - Soil degradation/reduction in fertility due to drought

- Forage/Vegetation Impacts
 - Unusually low range productivity (e.g. forage amounts per acre)
 - Unusually low plant diversity
 - Poor forage nutritional quality/increased toxicity of forage
 - Unusual levels of forage herbivory by drought-stressed wildlife (e.g. Competition with deer and elk on grazing lands)
 - Unusual levels of insect forage herbivory related to drought (e.g. grasshopper infestations)
 - Loss of rangeland forage to drought-related wildfires

- Livestock Health
 - Drought-related livestock mortality
 - Disruption of reproductive cycles (e.g. delayed breed, more miscarriages)
 - Reduced rate of livestock fattening
 - Livestock predation by drought-stressed wildlife
 - Need for supplemental feed due to drought impacts
 - Forced reduction of herd numbers due to drought impacts

- Rangeland Water Resources
 - Unusually low water levels in stock ponds/tanks
 - Need for supplemental water sources to meet livestock water demands (e.g. new wells, diversions, water hauling, pipelines)

D. Societal and Community Impacts

- Conflicts over water resources
- Impact on property value/declining property sales due to drought (e.g. lack of water resources, ordinances, changes in landscape)
- Unemployment related to drought impacts (e.g. businesses closing due to lack of water)
- Property damage/injuries related to drought moderated natural hazards (e.g. erosion related to drought causing damage to roadways, bridges, and residences during precipitation events)
- Strain on local communities due to drought impacts (e.g. business closures, property foreclosures, declining population, economic strain)
- Community water systems:
 - Low water supplies or lack of water for public consumption
 - Poor drinking water quality due to drought impacts
 - Need for supplemental water sources to meet public water demands (e.g. water hauling)
 - Need for new or upgraded water infrastructure to meet public water demands (e.g. new wells, pipelines)



E. Tourism and Recreation

- Public land/park closures to recreational users due to lack of water or increased wildfire danger
- Impact on key tourism/recreation areas due to drought (e.g. lack of streamflow at key fishing/camping area)
- Impact on hunting license sales due to drought-related land closures or declining wildlife population
- Impact on recreational boating due to low streamflow or lake/pond/reservoir levels
- Impact on tourist visitation numbers/revenues due to drought impacts (e.g. local park closures impacting tourist stops at local businesses)

F. Ecological Impacts

F.1 Plant Species and Plant Community Impacts

- Forest/woodlands
 - Plant stress due to unusually low soil moisture
 - Newly observed plant mortality
 - Drought induced leaf cast/needle drop
 - Unusual plant phenology (e.g. weak bud break on trees)
 - Unusual wildfire activity (e.g. extreme wildfire behavior or unusually early or late wildfires due to drought)
 - Unusually dry dead fuels or increased fuel loads due to drought
 - Drought related insect infestations and impacts
 - Unusual wildlife herbivory due to drought impacts
 - Soil erosion due to drought-related loss of vegetation/organic matter
 - Drought impacts on endangered/threatened species
 - Drought-related encroachment of invasive species
- Grasslands/chapparal
 - Plant stress due to unusually low soil moisture
 - Newly observed plant mortality
 - Drought induced leaf drop
 - Unusual plant phenology (e.g. weak bud break on shrubs)
 - Unusual wildfire activity (e.g. extreme wildfire behavior or unusually early or late wildfires due to drought)
 - Unusually dry dead fuels or increased fuel loads due to drought
 - Drought related insect infestations and impacts
 - Unusual wildlife herbivory due to drought impacts
 - Soil erosion due to drought-related loss of vegetation/organic matter
 - Drought impacts on endangered/threatened species
 - Drought-related encroachment of invasive species
- Desert
 - Plant stress due to unusually low soil moisture
 - Newly observed plant mortality
 - Drought induced leaf drop
 - Unusual plant phenology (e.g. weak bud break on shrubs)



- Unusual wildfire activity (e.g. extreme wildfire behavior or unusually early or late wildfires due to drought)
- Unusually dry dead fuels or increased fuel loads due to drought
- Drought related insect infestations and impacts
- Unusual wildlife herbivory due to drought impacts
- Soil erosion due to drought-related loss of vegetation/organic matter
- Drought impacts on endangered/threatened species
- Drought-related encroachment of invasive species

F.2 Aquatic Species Impacts (Aquatic plants and animals)

- Impacts to Habitat
 - Reduction in habitat area (e.g. due to unusually low water levels)
 - Poor water quality (e.g. unusual eutrophication due low water levels)
- Impacts on Species
 - Stress on native aquatic species (due directly to drought-related habitat changes or indirectly by competition with non-native species)
 - Stress on endangered/threatened aquatic species (due directly to drought-related habitat changes or indirectly by competition with non-native species)

F.3 Terrestrial Species Impacts

- Impacts on Habitat
 - Reduction in habitat area (e.g. due to drought-related plant mortality or wildfire)
 - Altered migration patterns/shifts in range due to poor habitat/lack of food and water sources (e.g. wildlife entering urban areas to find food)
- Impacts on Species
 - Stress on native species due to lack of food/water sources
 - Stress on endangered/threatened species due to lack of food/water sources
 - Unusual levels of disease in wildlife due to drought stress