



The Arizona Rainfall Roundup: Integrating Environmental Monitoring and Citizen Science

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What is the Rainfall Roundup?

The Arizona Rainfall Roundup is an ongoing effort to organize a cooperative volunteer rainfall monitoring network across Arizona. Data collected through this network is presently being used in drought monitoring programs at the county, state, and national level to help supplement existing precipitation observation networks. The monitoring network also provides an opportunity to integrate citizen scientists into a Cooperative Extension based climate science program.

Why does Arizona need more rainfall data?

Precipitation amounts are highly variable through space and time across Arizona due to topography and seasonal weather patterns. This is especially true during the summer monsoon season when thunderstorms can produce heavy rainfall events that are very localized.

Summer Rainfall in Arizona



Photograph (left) of intense, but very localized, summer thunderstorm near Benson, Arizona. The localized nature of summer thunderstorms can also be seen on a radar image (right). Small areas of red and yellow indicate very heavy rainfall similar to picture on the left. Dense rain gauge networks are needed to adequately monitor these types of precipitation events which can produce rainfall amounts in excess of 1 to 2 inches per hour.

The image to the right shows a typical distribution of observations used to track monthly, seasonal, and annual rainfall amounts. Gaps exist over large parts of the state. Rainfall Roundup observations help close these gaps providing additional information that is used in drought monitoring and resource management decision-making.

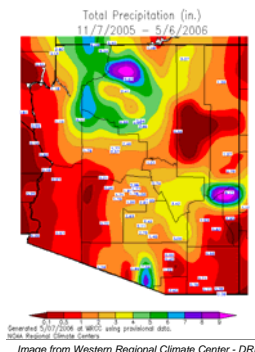


Image from Western Regional Climate Center - DRI

How does the Roundup work?

This volunteer monitoring program has been designed to be low cost and allows for various levels of commitment. All volunteers need to participate is a rain gauge and access to the internet. Additional communication methods to report rainfall data for volunteers without internet access are presently being explored. These methods include a postage paid postcard that can be mailed in each month with rainfall data logged on it and a telephone data entry system. Volunteers are asked to provide monthly total rainfall measurements at a minimum, but are encouraged to provide weekly and daily totals if possible.

Steps to Participate

- 1.) Register to become a volunteer on the Roundup webpage. This includes a link to aid in identifying the latitude and longitude of your home address.
- 2.) Purchase a rain gauge. Resources on the website help describe the different types of rain gauges available and potential costs.
- 3.) Install the rain gauge. Instructions provided on the Roundup website describe an ideal rain gauge installation and potential pitfalls to avoid when installing a gauge.
- 4.) Track and report data. An online data submission form accepts both monthly and weekly totals. These totals are then tabulated into maps and reports available on the Roundup website.

What has the Roundup done so far?

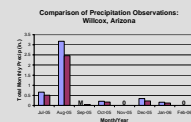
Volunteer observations have been reported every month since July 2005 by close to 20 volunteers. Several new volunteers are signing up each month helping the network to grow. New volunteers are being solicited through existing University of Arizona Cooperative Extension programs like the Master Watershed Steward program



Map of current Rainfall Roundup volunteer monitoring locations (left) and sample monthly observations to rainfall totals including unusual weather conditions, vegetation conditions, phenological observations, and local climatological information. This additional information is especially useful to managers and scientists for activities like drought planning and monitoring.

Data Quality and Volunteer Observations

Volunteers provide high-quality observations that complement existing official precipitation monitoring networks like the National Weather Service Cooperative Observer Network.



The chart above compares NWS Coop Observer data in Willcox, Arizona to a nearby Rainfall Roundup volunteer. Note that in September 2005 the NWS observation was missing and the Roundup observation helped close a potential data gap.

Next Steps

A next generation data reporting and visualization website is under development and new efforts to recruit volunteers are underway.



More information at
<http://cals.arizona.edu/climate/proj/rr/>