

# POST-FIRE USGS and ALERT SYSTEMS



Chris Smith, USGS

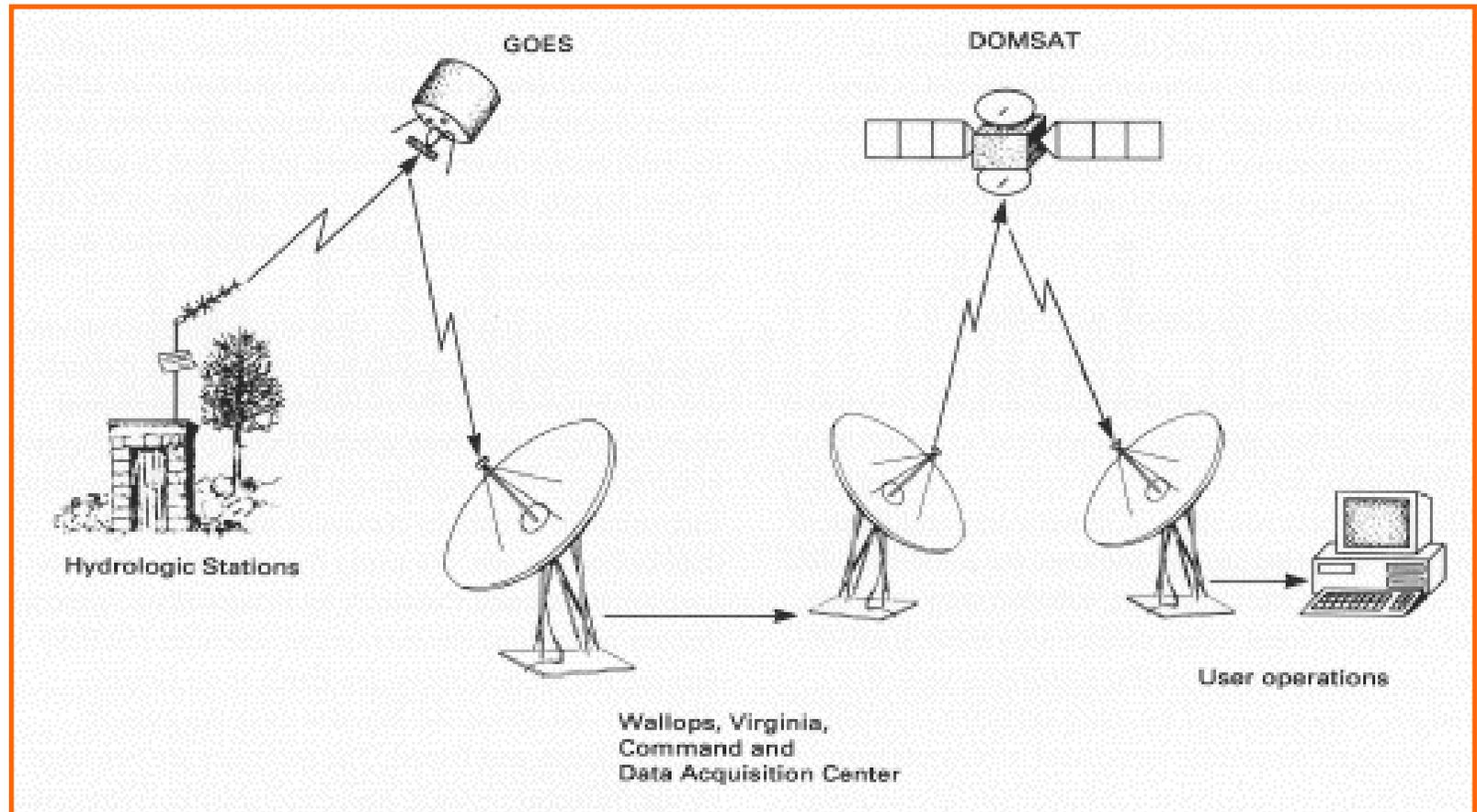
Brian Cosson, ADWR

Michael Schaffner, NWS

2012 Southwest Wildfire Hydrology and Hazards Workshop  
Biosphere 2  
April 2-5, 2012

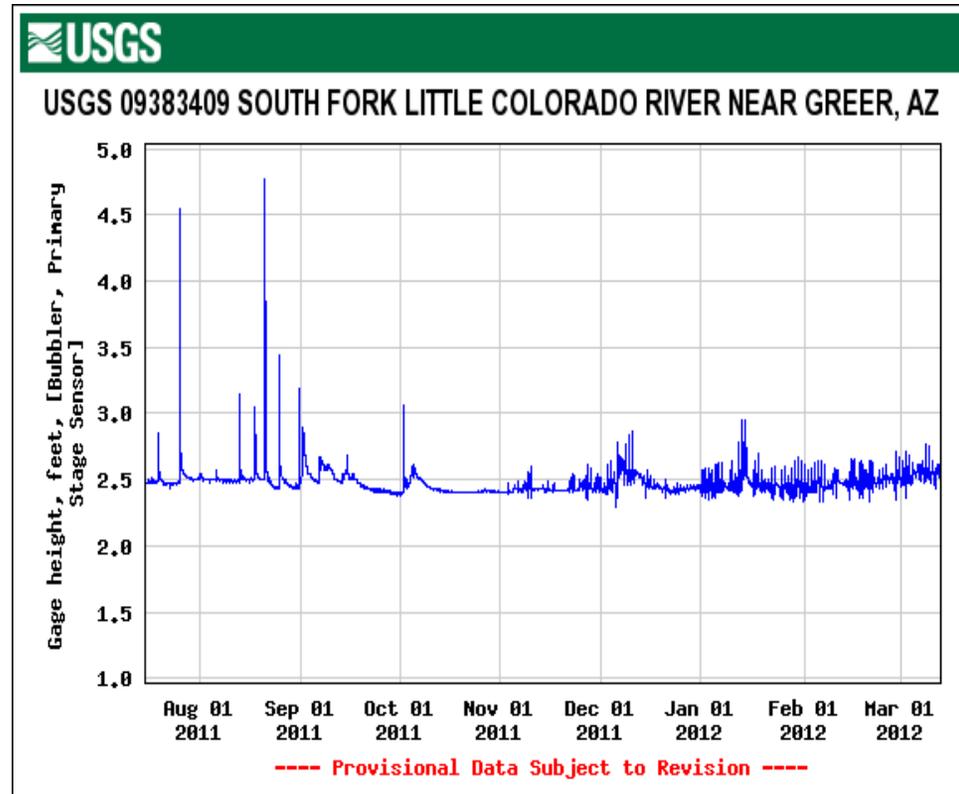
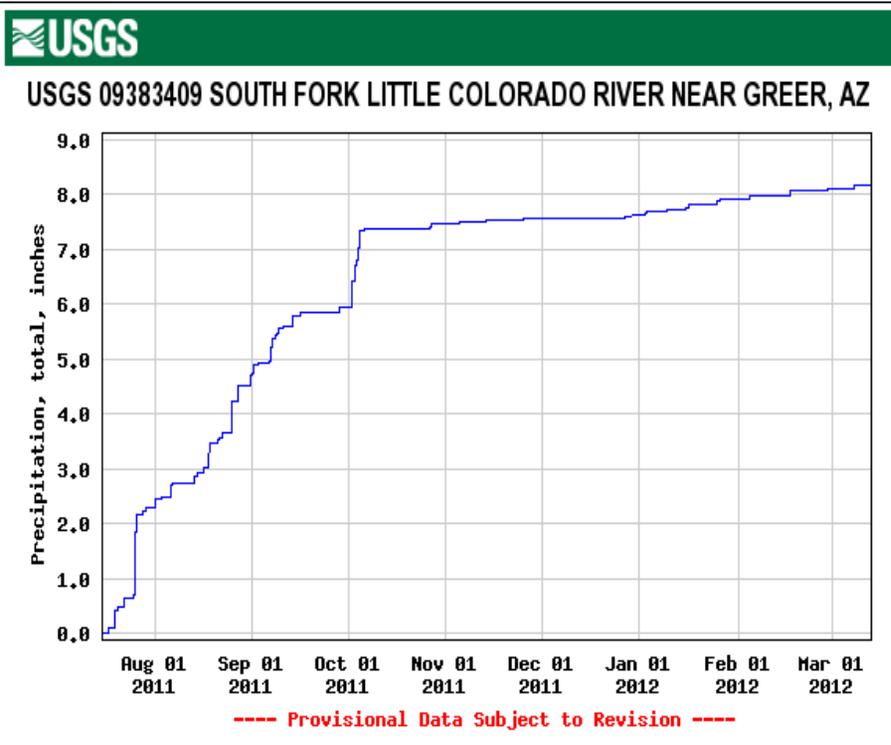
- The USGS has over 7,292 gauging stations throughout the Nation, 4,200 of which are equipped with satellite telemetry that provide real-time communications. The NWS uses data from 3,971 of these stations to forecast river depth and flow conditions.

2



- ❑ Data are delivered automatically to National Weather Service (NWS), it is routed to NWS river forecast centers, and their local offices at 5 minute time intervals during extreme events.
- ❑ Data is also delivered to the USGS system where it is made available to the general public on the USGS web site NWISWEB, and transferred to the Arizona Flood Warning System (AFWS).

3

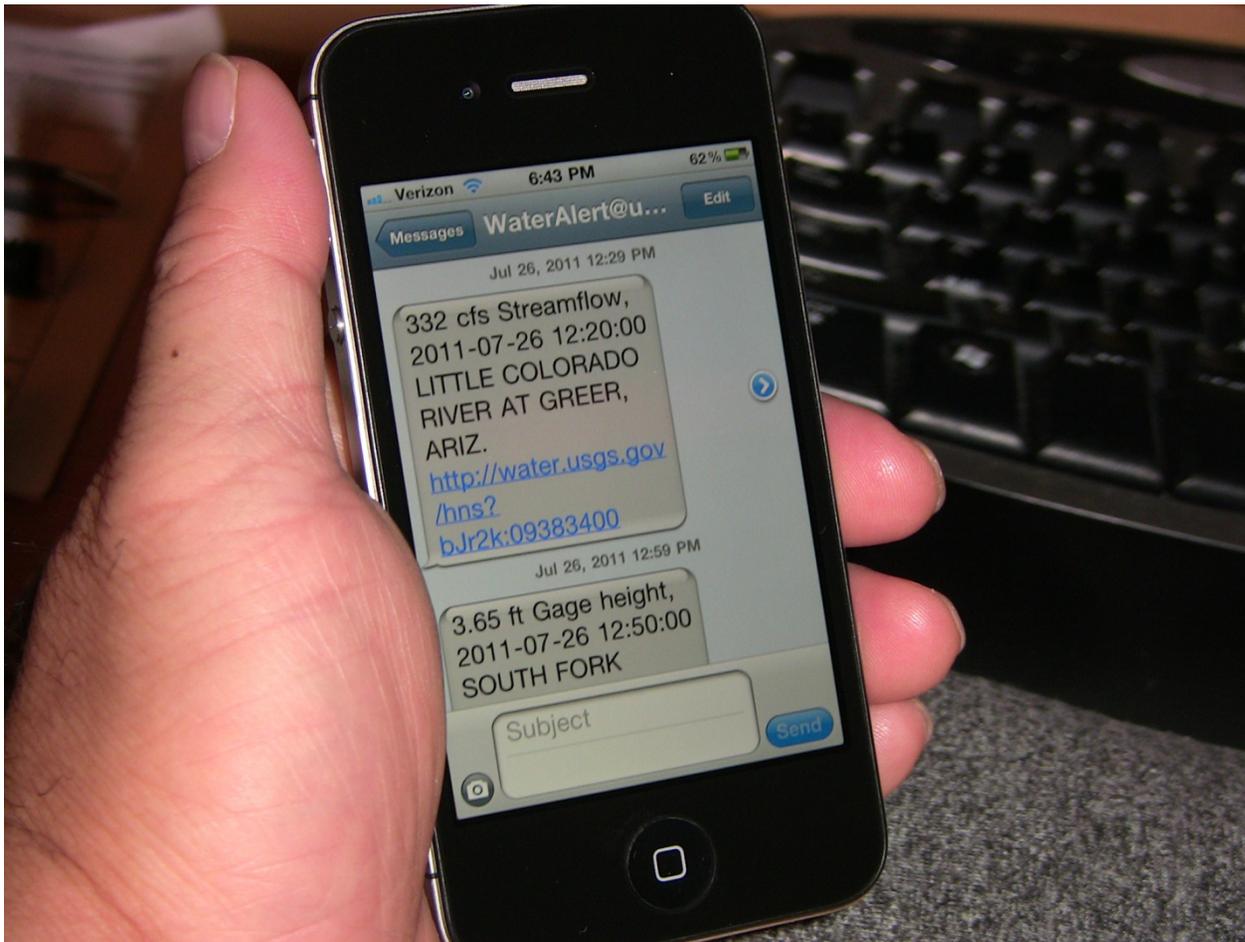


# WaterAlert

- An important feature of the gages is that they can be monitored by the general public through the USGS website, <http://waterdata.usgs.gov>. Through this site, historic and real-time information on stream flow and precipitation can be viewed. Residents can also subscribe free of charge to the WaterAlert notification system. This system allows individuals to be notified via e-mail or cel phone text message when an alert occurs.
- “This is an exciting advancement in technology,” said County Manager Delwin Wengert. “It provides our residents access to the same information as our emergency responders. Residents can also personalize the system so that the drainage areas they are most concerned about are reported, and the trigger values such as amount of rainfall and river height can be customized.”
- “We think this is an important means of empowering our residents to plan for the inevitable flooding that will occur in the aftermath of Wallow. It’s not just the current monsoon season where vigilance is called for, but the spring runoff and the whole cycle that will repeat itself over the next few years as the forest heals. With scientists telling us that a typical 1 to 2 year rainfall could result in 50- to 100-year runoff, it’s important that residents have and use this technology as another tool to protect themselves.”

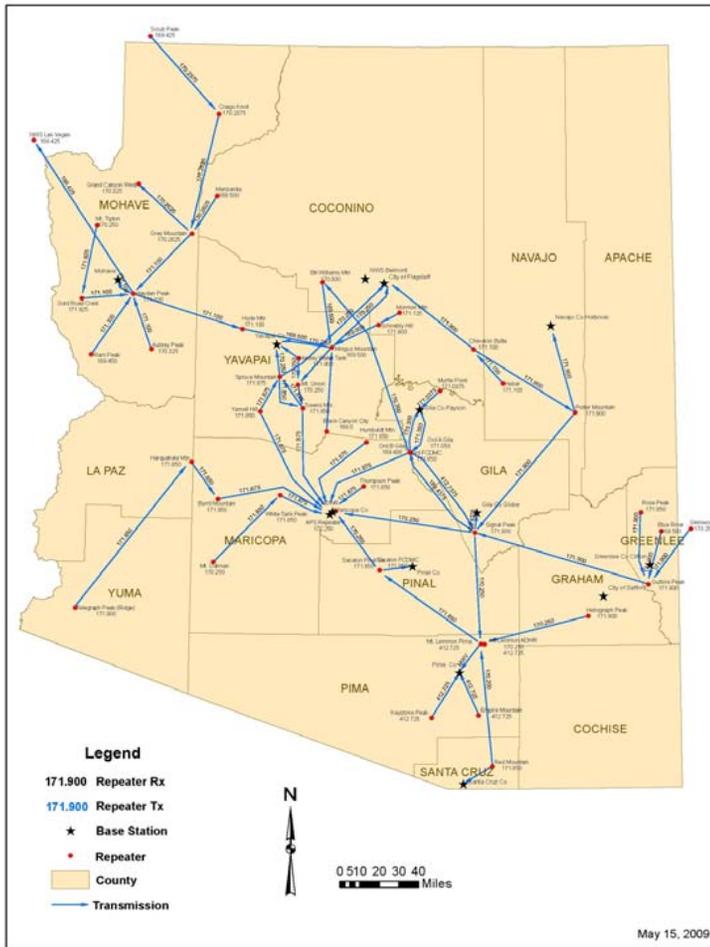
# WaterAlert

5



- AFWS is a collection of 50 repeaters, 16 base stations and over 2000 sensors.

### Arizona ALERT Repeaters & Base Stations



# AFWS Website

7

## MARTA – Yosemite Cloud©

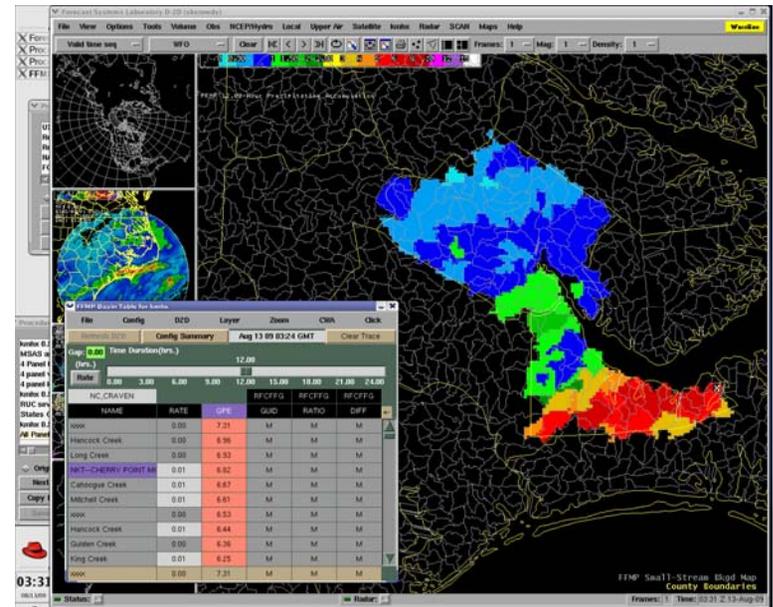
- ❑ GIS
  - National Data Sets
  - Local Data Sets
- ❑ Meteorological Data
  - RADAR
  - Satellite Imagery
- ❑ Agency Data
  - ALERT (local and state)
  - USGS
- ❑ General Flood Warning Information
- ❑ Project Management and Communication Forum



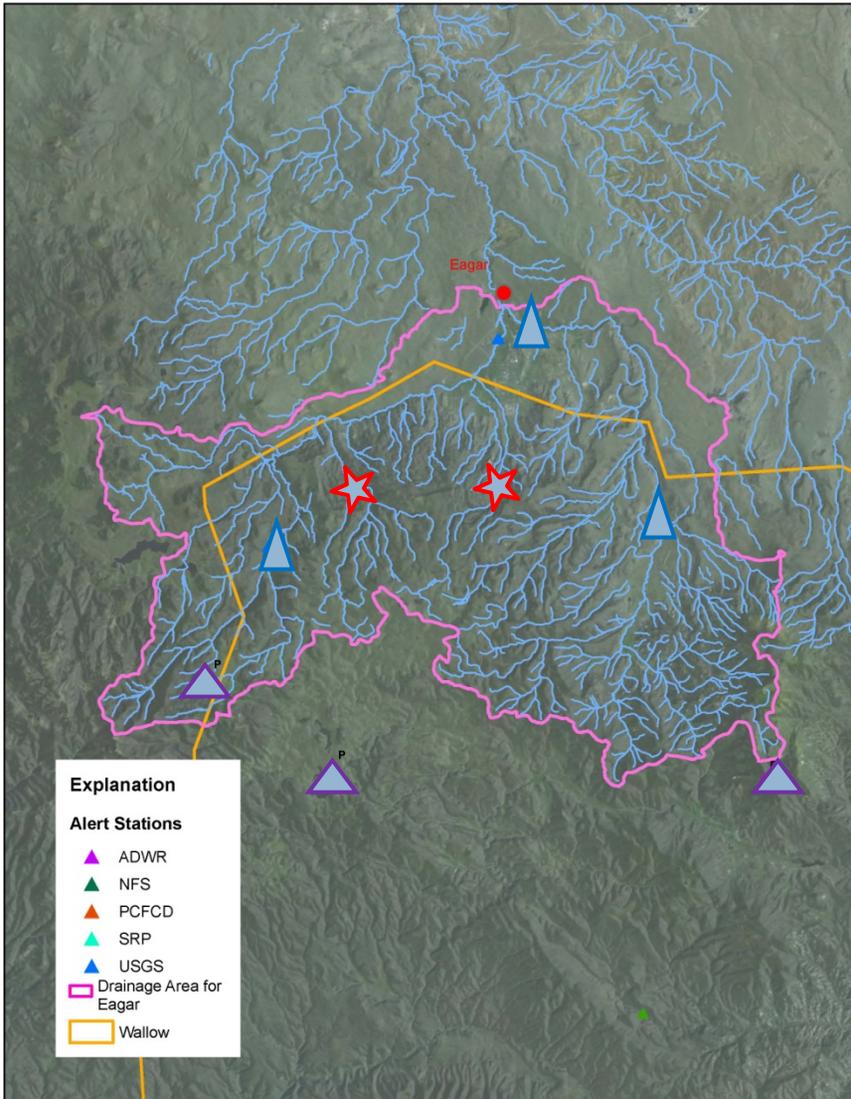
# Role of the National Weather Service

8

- ❑ Local weather forecast offices are open 24/7/365.
- ❑ Forecasters and hydrologists at those offices are evaluating conditions likely to produce excessive rainfall.
- ❑ NWS radar, USGS stream gages, and county/state ALERT gages are interrogated.
- ❑ Flash Flood Warnings (FFWs) are issued when rainfall exceeds thresholds over burn areas.
- ❑ FFWs alarm the Emergency Alert System.



# Eagar Area



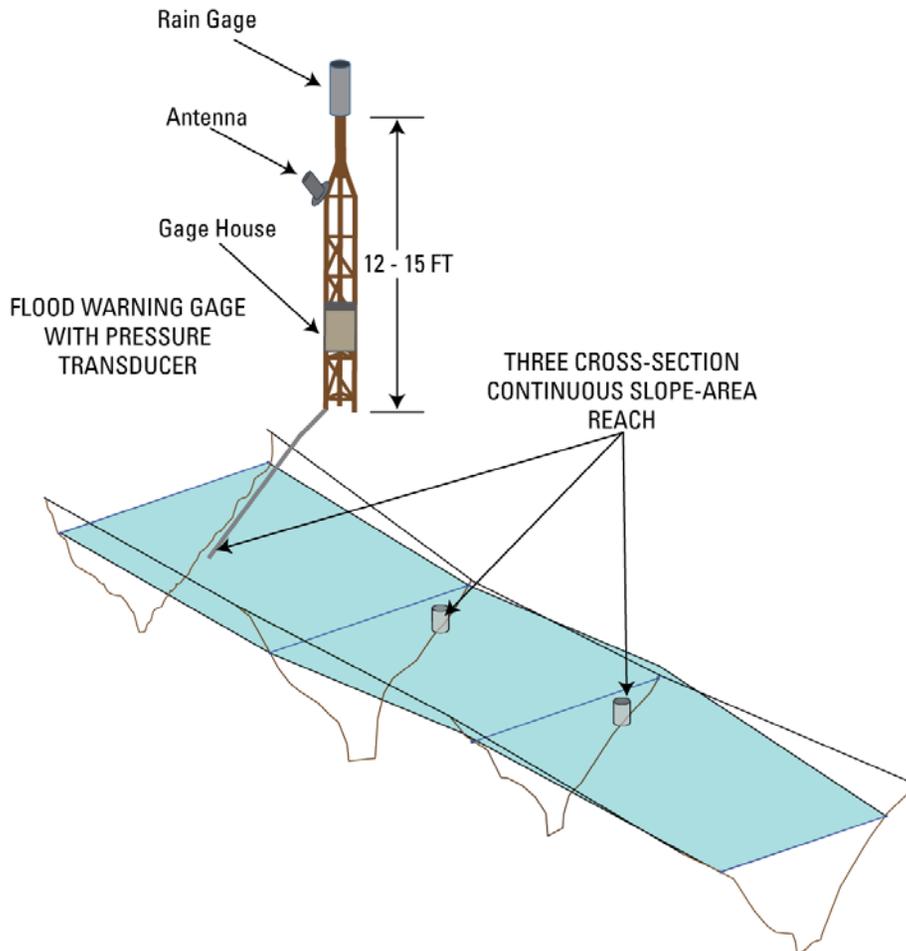
★ New flood warning gage (satellite telemetered)

▲ New rain gage at existing gage (satellite telemetered)

▲ New rain gage (radio telemetered)

# Water Canyon Flood Warning Gage

10



# Water Canyon Flood Warning Gage Cont.

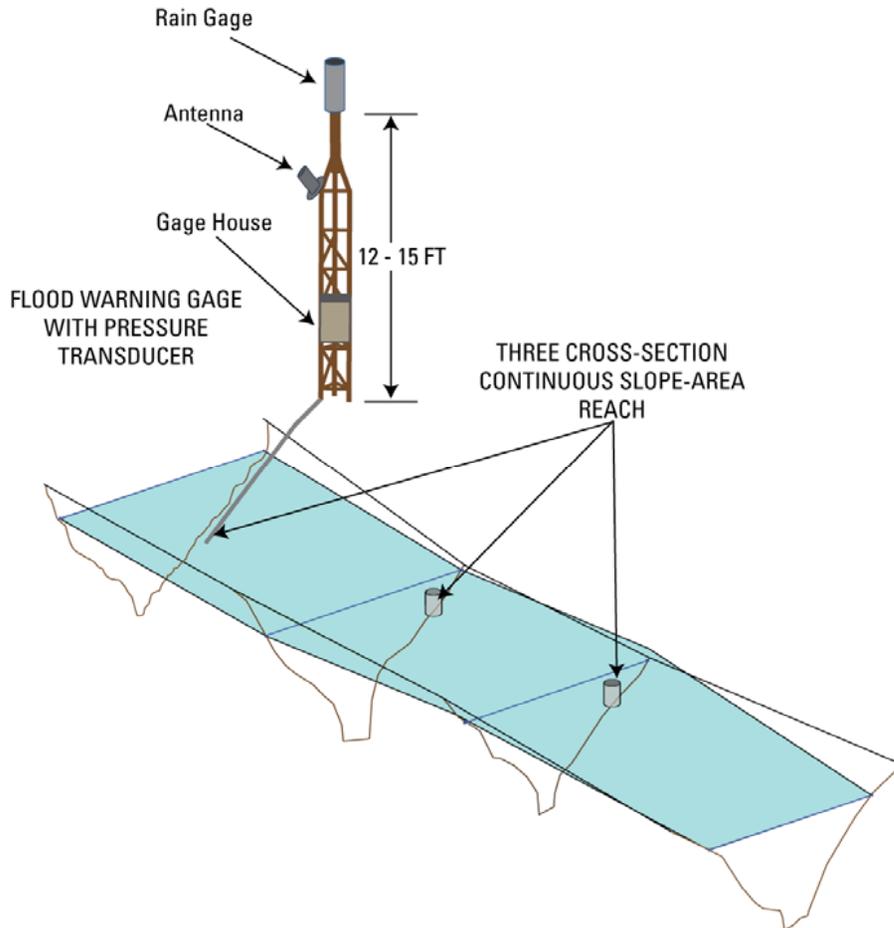
11



- ❑ Stream gages installed in burned areas need a variety of sensors to handle the extreme conditions of runoff from burned areas. Non-contact sensors, such as radar, can be used in concert with redundant sensors to ensure survivability of the gage.
- ❑ The monitoring sites can be used both for hazard warning and for scientific data collection.
- ❑ Rapid deployment of the gages is essential for the protection of threatened communities and also for the collection of data from the first storm event.

# MONTEZUMA CANYON WASH AT CORONADO NATL MEMORIAL

12



# MONTEZUMA CANYON WASH

13

- ❑ This site is a **Flood Warning Station** located in Montezuma Canyon and was installed 08/17/2011. It measures precipitation and storm runoff in the burned area of the Monument Fire. The station consist of two rain-gages, one water level sensor, and a Data Collection Platform (DCP). Data from these sensors are stored and transmitted via satellite telemetry and are displayed on the web. Two additional stage sensors record stage data in the continuous slope-area reach.
- ❑ One rain-gage is located near the visitors' center and the other is located at the Montezuma Pass Lookout.
- ❑ The station can be configured into a data-collection cluster that allows a satellite-telemetered master gage to collect data from up to 12 remote gages (sensors). The remote gages can be used to collect many types of data including precipitation, river stage, and soil moisture. The remote gages are limited to a range of 5 miles, and must have line of site with the master gage.

# MONTEZUMA CANYON WASH GAGE



# Precipitation Gages

15



# Coordination Challenges for Installing Systems

16

- ❑ Staff Availability for Multiple Meetings
- ❑ Limited Local Knowledge of Flood Warning Systems
- ❑ Access to Critical Locations
- ❑ Lack of Local Experience with Selecting Site Locations
- ❑ Identifying Type of Data Needed, and Who Needs it
- ❑ Identifying Resources Early in the Process

# – Funding Issues

17

- Limited Agency Resources
- Funding Comes too Late to Measure First Event
- Limited Funding Possibilities
- No Clear Funding Source
- Disaster Declarations

# Contact Information

18

**Chris Smith** (cfsmith@usgs.gov)

Assistant Director

Arizona Water Science Center

Phone: (520) 670-6671

520 North Park Ave., Suite 221

Tucson, AZ 85719

**Brian Cosson** (btcosson@azwater.gov)

Engineering and Permits Division

Flood Warning Unit

3550 N. Central Ave., 2nd Floor

Phoenix, AZ 85012

Office Phone: (602) 771-8657

Cell: (602) 679-0937

**Michael Schaffner** (mike.schaffner@noaa.gov)

NOAA/National Weather Service

Western Region Headquarters

125 South State Street

Salt Lake City, Utah 84103

Phone: (801) 524-5121



Miller Canyon, Cochise County July 2011