

Water Management & Drought Preparedness in Arizona

DROUGHT SUMMIT

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Einav Henenson

Drought Program Coordinator

Arizona Department of Water Resources



Credit: Dave Dilli Photography

Overview:

ARIZONA WATER MANAGEMENT

1. 1980 Groundwater Management Act
2. Arizona Water Banking Authority
3. Water Management Success
4. Looking Forward: Governor's Arizona Water Initiative

ARIZONA DROUGHT PREPAREDNESS

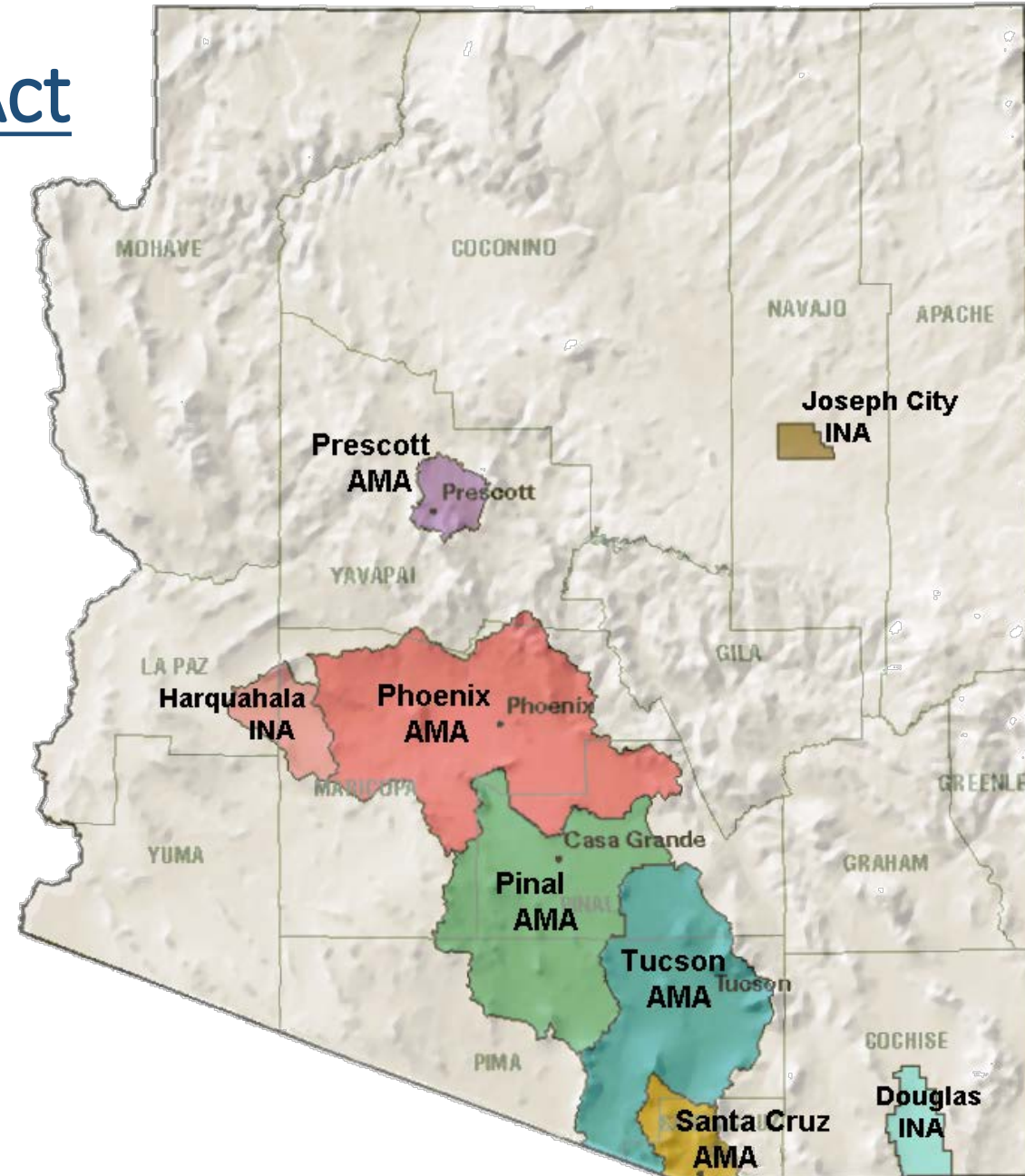
1. Drought History
2. 2004 Drought Preparedness Plan
3. Community Water Systems
4. Drought Working Groups
5. Drought Preparedness Annual Report



Managing Arizona's Water Resources

1980 Groundwater Management Act

- Established the Arizona Department of Water Resources (ADWR)
- Developed goals to control severe groundwater depletion
- Established Active Management Areas (AMAs) & Irrigation Non-Expansion Areas (INAs)
- Established regulations for water users within AMAs and INAs
 - No expansion of agriculture
 - Limits on groundwater pumpage
 - Annual water use reporting requirements
 - Conservation requirements



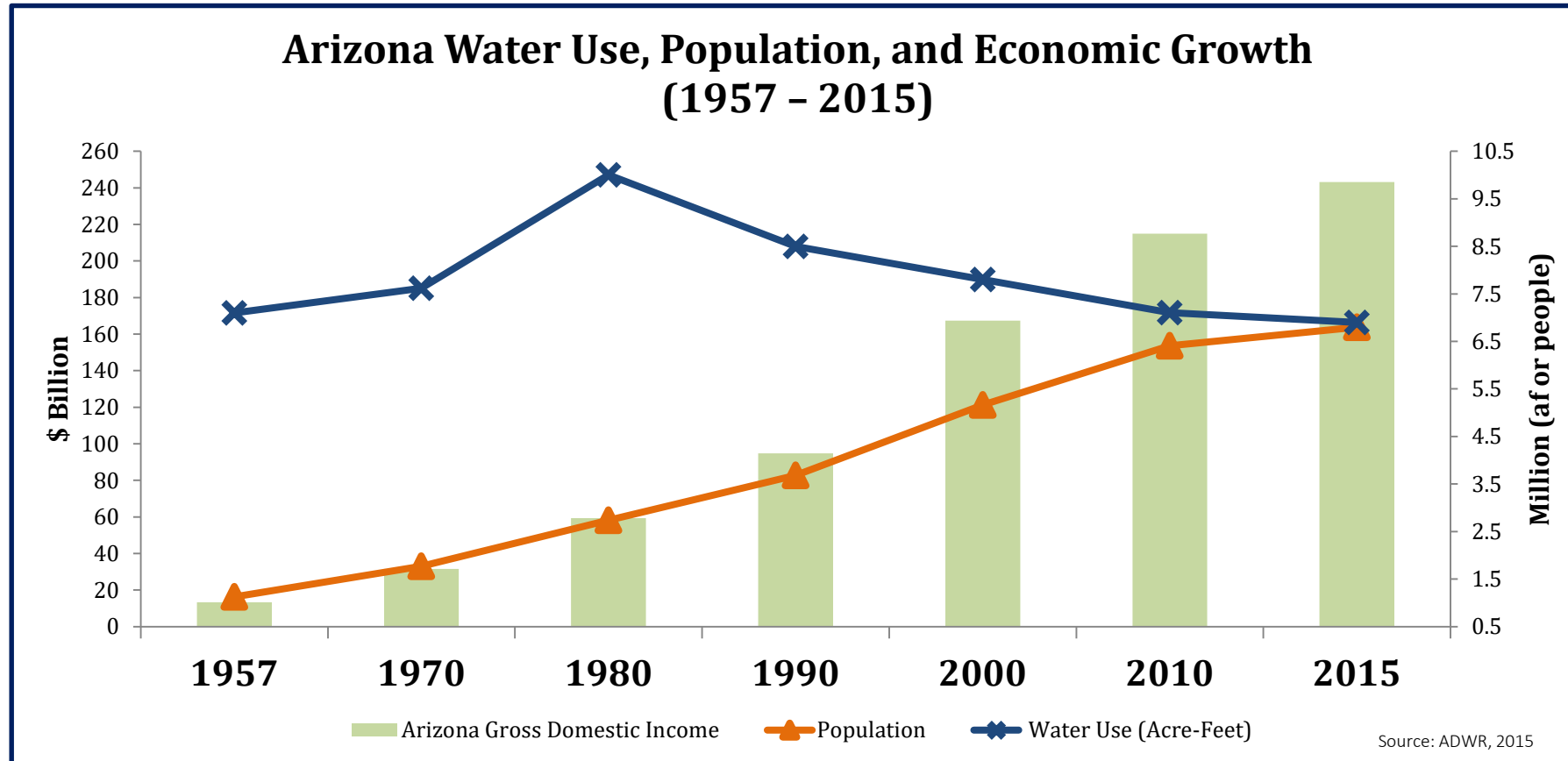


Arizona Water Banking Authority

- Established **1996**
- Stores unused Colorado River water, to be used in times of shortage
- Bank stored **3.4 Million acre-feet 1,100 Billion gallons**
 - Total stored statewide: **9 Million acre-feet** or 3,000 Billion gallons



Arizona's Water Management Success



Timeframe	Total Water Use (in million acre-feet)	Population (in millions)	Gross Domestic Income (in billions)
1957	7.1maf	1.1	\$13.4
2015	6.9 maf	6.8	\$243.1
Change from 1957-2015	-3%	504%	1,716%



Looking Forward: Governor's Arizona Water Initiative

Governor's Water Augmentation Council

Comprised of water resources and other industry experts, the Council's goals are:

- Investigate water augmentation strategies
- Explore additional water conservation opportunities
- Identify infrastructure needs
- Provide policy direction to the Governor

Planning Area Process

Work with local stakeholders in Arizona's 22 planning areas to:

- Refine challenges causing supply-demand imbalances
- Identify strategies to address challenges
- Stakeholder-driven solutions





Arizona's Drought Preparedness

Drought History

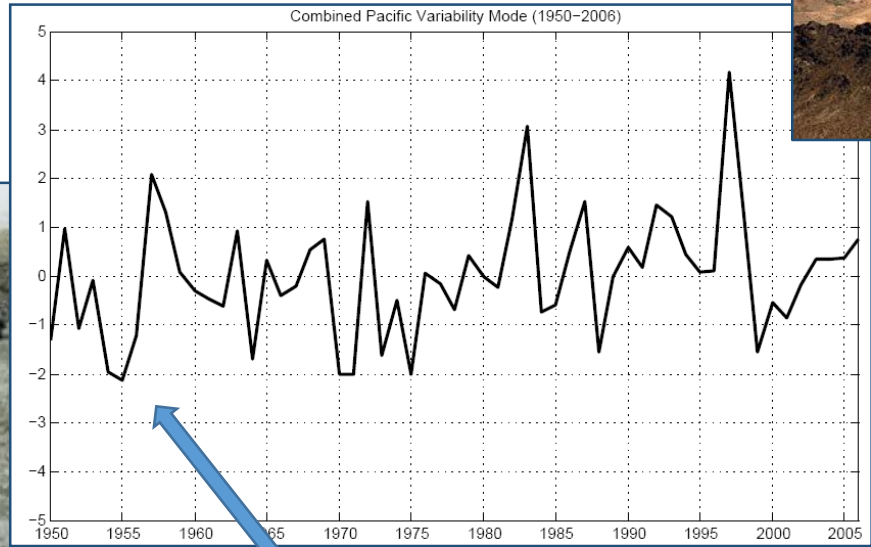
3 Severe Droughts in the 20th Century!



Current Drought
(from mid-late 1990s)



Several miles east of Phoenix, formerly cultivated land has returned to desert. A lateral, visible in the foreground, lies useless because of a lack of water. Droughts, floods, and erratic river flows would plague Salt River Valley farmers until a dam was built to tame the river and some formal organization formed to promote equitable water management, 1902. (Reclamation photograph)

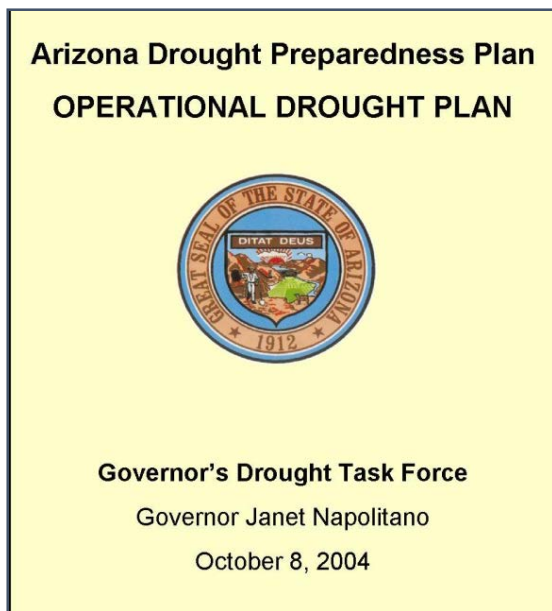


1950s Drought



1900s Drought

2004 Arizona Drought Preparedness Plan



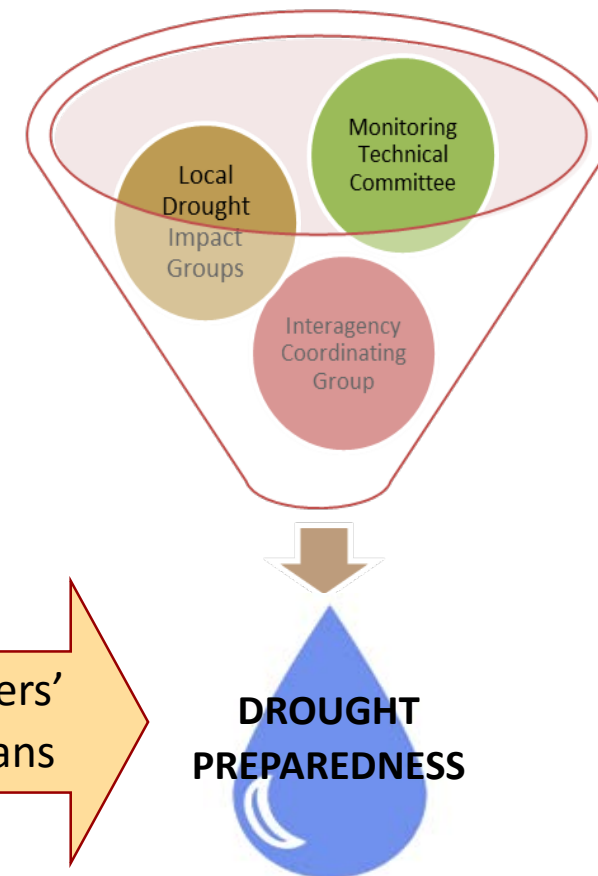
In March 2003 former Governor Napolitano issued an Executive Order to create the **Governor's Drought Task Force** to address drought impacts to Arizonans.

Drought Taskforce goals:

- Establish a flexible framework to refine AZ's drought monitoring process
- Improve understanding of drought impacts
- Identify mechanisms for limiting future vulnerability

Drought Preparedness Plan results:

- Water Use Reports & Drought Plan Requirements for all State's water providers
- Working committees
 - Monitoring Technical Committee
 - Interagency Coordinating Group
 - Local Drought Impact Groups



Drought Planning for Community Water Systems

Community Water System (CWS) = Any drinking water provider that serves water to at least 15 connections or 25 year-round residents (from RV Parks to large cities).

Requirements:

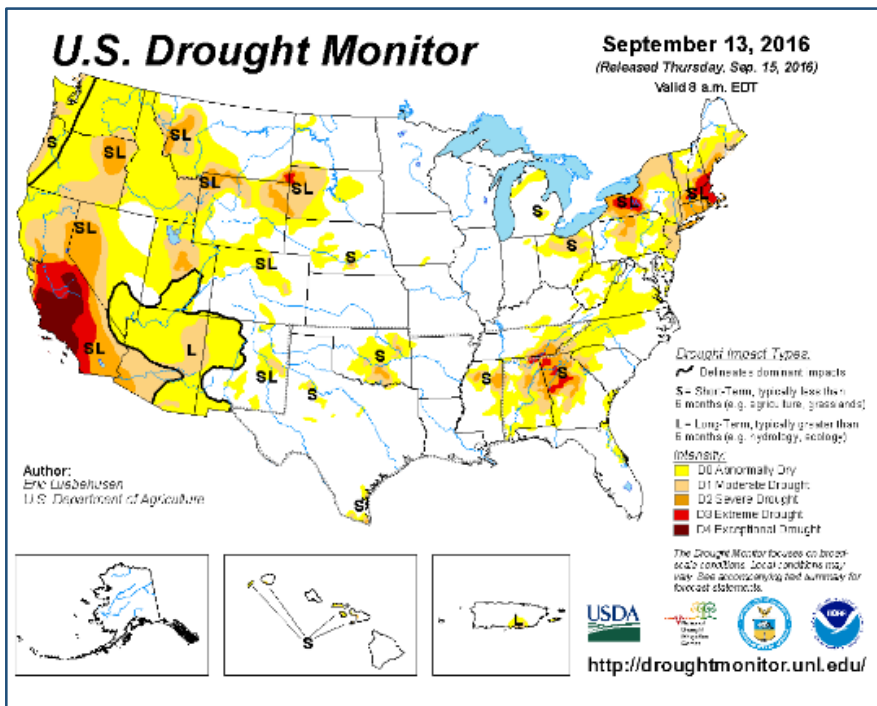
- Annual Water Use Report
- 5-year System Water Plan
 - Water Supply Plan
 - Drought Preparedness Plan
 - Conservation Plan

- Apply to all CWSs
 - ~200 large & ~600 small systems
- Help CWSs reduce vulnerability to drought and be prepared to respond to drought & water shortage
- Regulations established by the state legislature in 2005

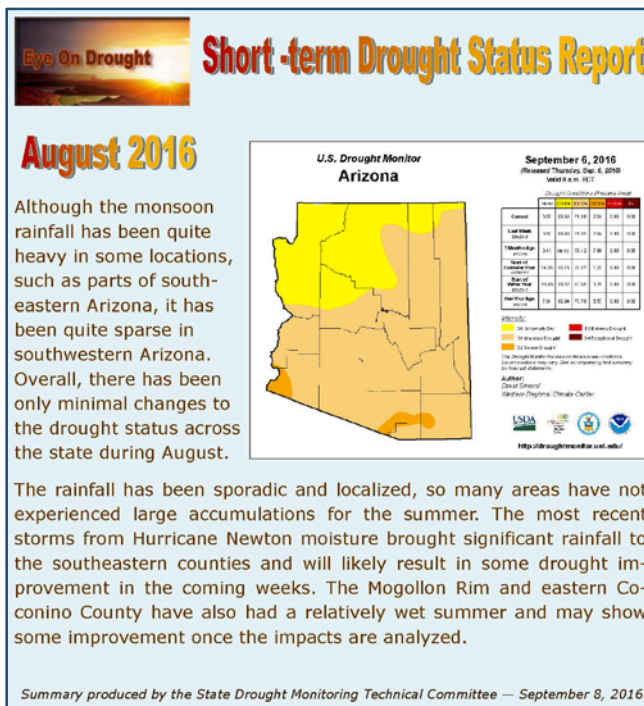


Monitoring Technical Committee (MTC)

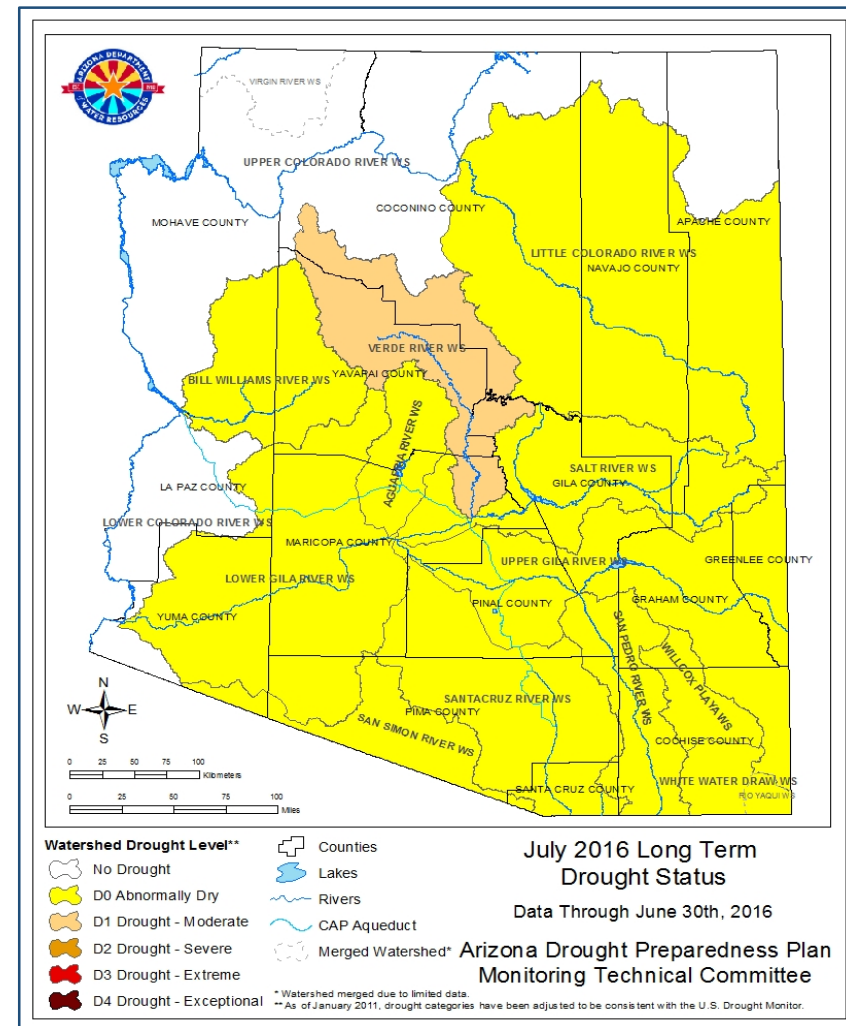
- Gathers and evaluates drought, climate & weather data
- Distributes information to land managers, policy-makers & public
- Comprised of climate experts (State Climatologist, NWS, NOAA, NRCS, SRP, ADEM, USGS, ADWR, County Officials, State Universities, and others)



Weekly
U.S. Drought Monitor



Monthly
Short-term Drought Status Report







Quarterly
Long-term Drought Status Report



Interagency Coordinating Group (ICG)

An advising body to the Governor on drought, Comprised of state & federal agencies & non-governmental organizations

- Provides biannual updates on water supply & availability
- Advises the Governor of:
 - Drought status
 - Drought impacts
 - Necessary preparedness and response actions
- Identifies pre-drought mitigation options
- Identifies needs for additional resources
- Reviews the Drought Preparedness Annual Report

Arizona Drought Assistance			
An Arizona drought emergency declaration has been in effect since 1997. In response to this, several state and federal agencies provide assistance for drought planning, mitigation and response as seen in the matrix below. The types of assistances include financial, technical and educational, as well as support of local level preparation and response.			
Agency and Website	Target Audiences	Assistance and Resources	Contact Person
 Arizona State University	Orchard growers and ranchers	Provides drought-related information and resources; reports on drought impacts.	Patrick Bray, Executive Vice President, bray@asu.edu or 602-337-4123
 Arizona State Parks	Residents, government agencies	Reports on the impacts of drought.	Bob Nelson, Water Program Manager, rbn@arizona.gov or 520-624-4174
 Arizona Corporation Commission	430 individual water systems operated by nearly 350 corporations	Regulates curtailment tariffs, which include descriptions of drought stages and corresponding requirements for measures and notification.	Steve Cole, Director of Public Utilities, sc@azcc.gov or 602-542-4025
 Arizona Department of Water Resources		Offers grants related to water development project (stock and trap conservation on grant funding at current time.)	Lisa Jans, Livestock and Crop Conservation Grant Program Manager, ljan@azdwr.gov or 520-942-3262

 ASU Arizona State Climate Office, Arizona State University	All residents of Arizona, government agencies	Provides and analyzes current weather conditions, watches, warnings and forecasts.	Marco Malone, State Climatologist and Research Professor, malone@asu.edu or 480-965-0569
 Arizona State Forestry Division	Residents, communities and wildland areas	Manages and reduces wildfire risks; provides forest resource stewardship in cooperation with Federal, Tribal, state and local agencies, and private industries; reports on the impact of drought on wildland fuels.	Jeff Whitney, Arizona State Forester, jwhitney@azdfo.gov or 602-775-1400
 Arizona State Land Department	Arizona State Trust Land leases	Provides information on drought-related impacts to water supply for lessees of State Trust Land.	Afin Schmeiser, Assistant Director, Natural Resources Division, 602-556-2677 or afschmeiser@azland.gov
 CAP South Central Arizona Project	Residents of central and southern Arizona, elected officials and government leaders, water stakeholders, teachers, students	Offers funding and programs in support of water education and the environment.	Clyde Thompson, Community Outreach, ct@capac.com or 602-868-2138
 CLIMAS Arizona Climate Assessment for the Southwest, University of Arizona	Scientists, decision makers, resource users, educators, and others seeking information	Provides participatory, iterative research on the nature, causes, and consequences of climate change and variability in the southwestern United States in order to improve the region's ability to respond sufficiently and appropriately.	Michael Crosson, Associate Professor, Soil, Water and Environmental Science, crossonm@arizona.edu or 520-624-4244

Arizona Drought Assistance Matrix

 ADEQ Arizona Department of Environmental Quality	All residents	Requires community water systems to consult an Emergency Response Plan based on their Emergency Operations Plan and Vulnerability Assessment.	Nash Adams, Emergency Preparedness and Response, nash@adeq.gov or 602-771-4033
 Arizona Department of Water Resources	Water providers and planners, all residents, water-related sectors	Coordinates drought mitigation, coordinating group and monitor and technical committees; disseminates drought reports; requires drought preparedness plans of community water systems; provides drought planning assistance and conservation resources.	Ruth Greenhouse, Conservation and Drought Planning, rgr@azdwr.gov or 602-775-4034
 Arizona Division of Emergency Management	Emergency management community and key government officials	Prepares and coordinates emergency services and the efforts of government agencies to reduce the impact or disruption on persons and property; website provides tips for communities, utilities and homes.	Deborah Cox, Assistant Director of Operations and Coordination, deborah.cox@azdems.gov or 602-464-6302
 Arizona Firewise Communities	Communities, families, youth, educators	Coordinates the Arizona Firewise Communities program; provides classes, presentations and information on Firewise principles. To download publications, visit: http://rains.arizona.edu/firewise/ .	Carris Donnell, State Firewise Coordinator, 602-399-6038 or CarrisDonnell@azdof.gov
 Arizona Game & Fish Department	Residents, government agencies	Provides water development/water catchments to wildlife; reports on the impacts of drought.	Ed Jahnke, Habitat Program Manager, edjahnke@azgfd.gov or 602-442-3933 x7802



Local Drought Impact Groups (LDIGs)

County based local drought groups, provide drought monitoring info to the MTC, provide drought response and mitigation options at the local level.

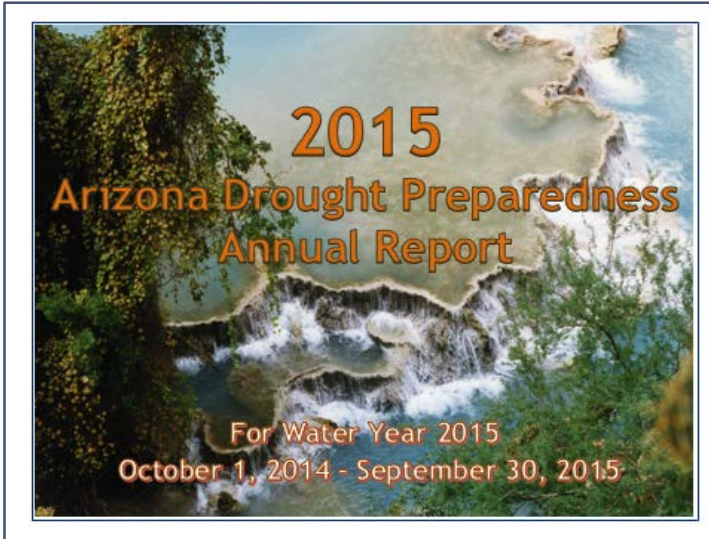
- Identify local drought-related impacts
- Define and assess drought:
 - Severity
 - Societal impacts
 - Loss and costs
- Identify response options & needs
- Identify and facilitate efforts to mitigate impacts



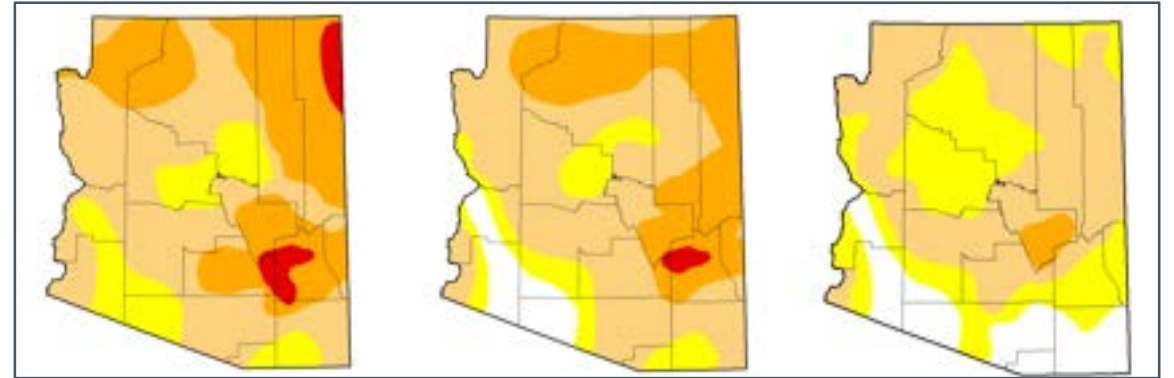
Local drought preparedness & reduced drought vulnerabilities



Arizona Drought Preparedness Annual Report



Drought status changes



Climate & Precipitation Data

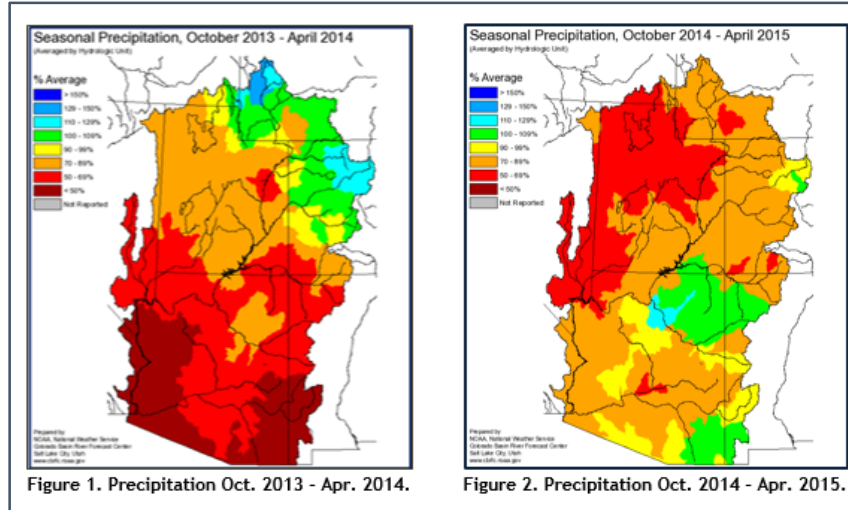
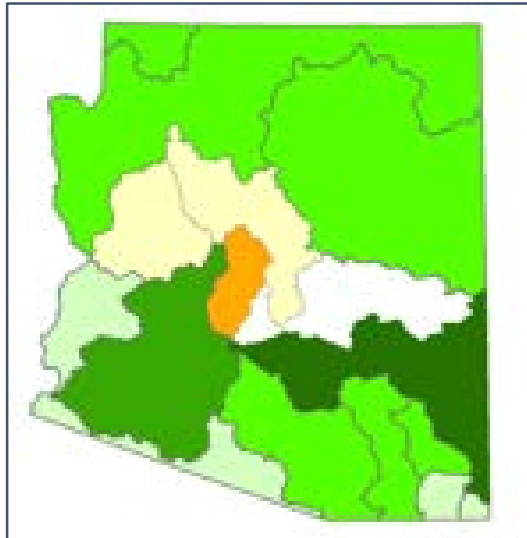
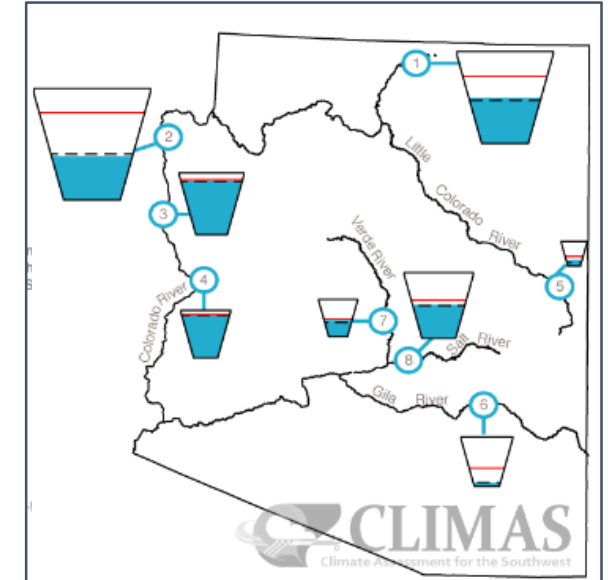


Figure 1. Precipitation Oct. 2013 - Apr. 2014.

Figure 2. Precipitation Oct. 2014 - Apr. 2015.

Drought Status Summary



Water Supply Status



Thank you!

Einav Henenson

ehenenson@azwater.gov

(602) 771-8607



PROTECTING
ARIZONA'S WATER SUPPLIES
for ITS NEXT CENTURY