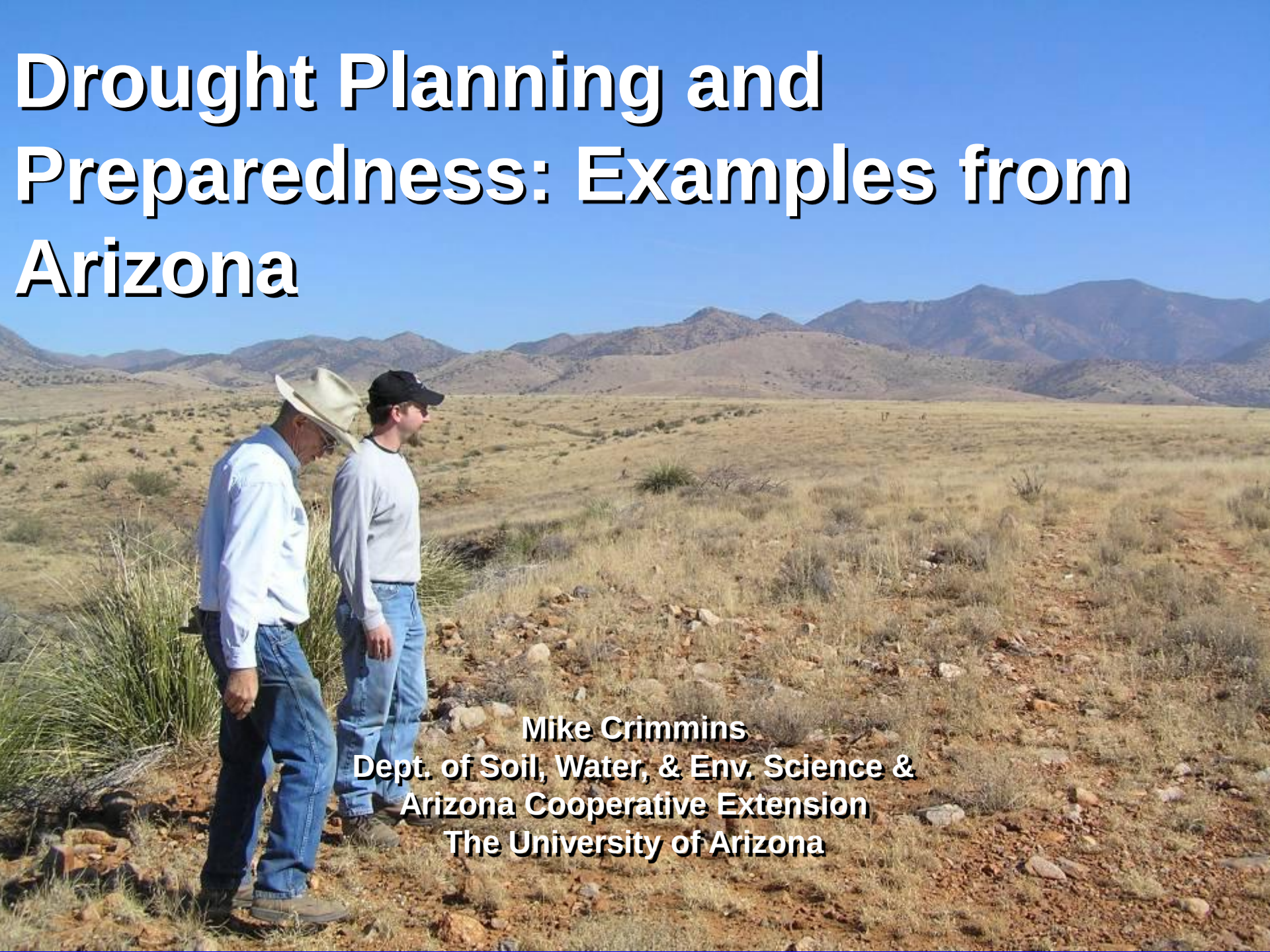
Drought Planning and Preparedness: Examples from Arizona

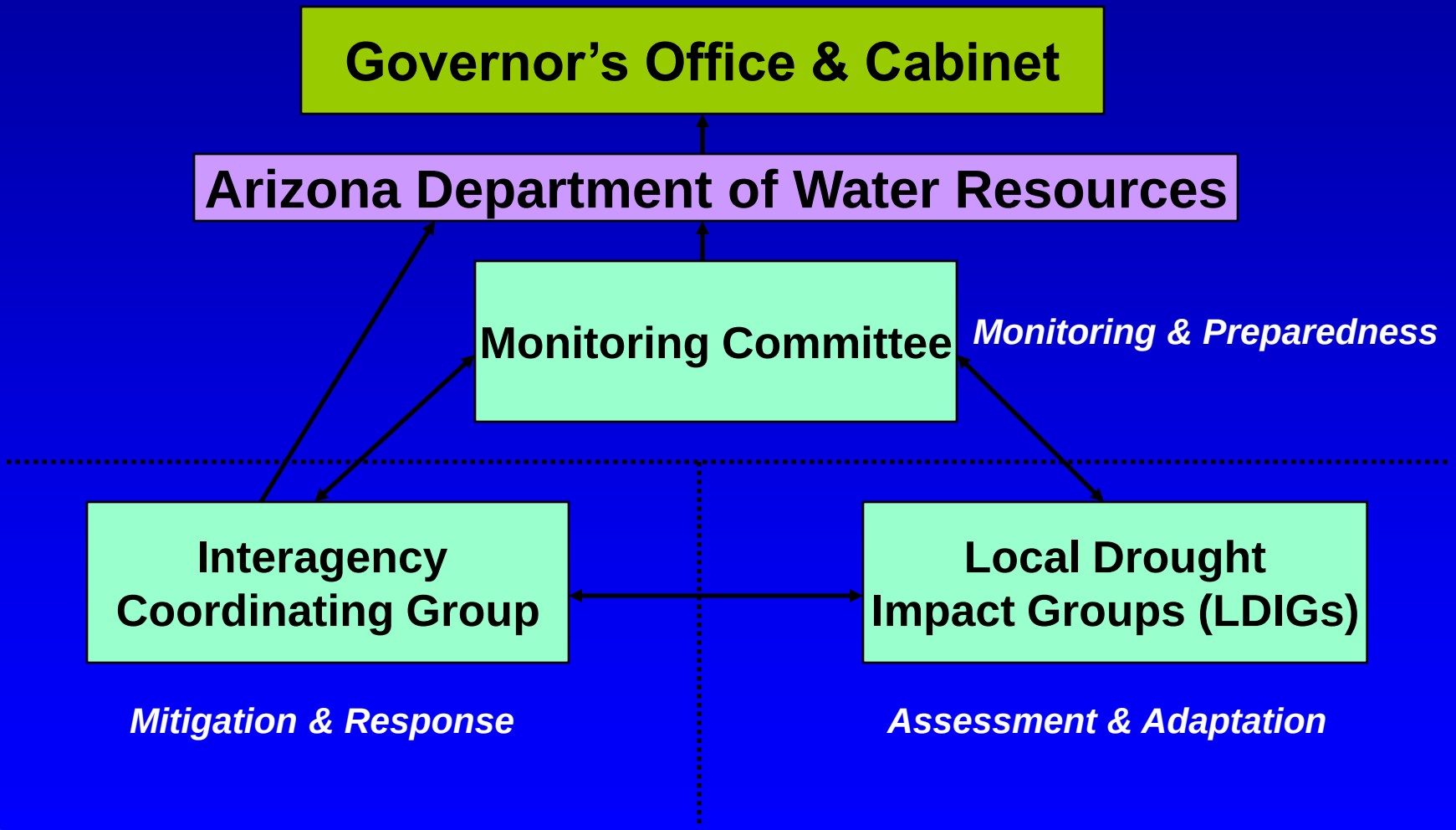


Mike Crimmins
Dept. of Soil, Water, & Env. Science &
Arizona Cooperative Extension
The University of Arizona

Arizona Drought Preparedness Plan

- Coordinated effort led by ADWR to monitor drought, recommend actions to Governor and provide planning support to citizens of Arizona
- Plan works to empower local communities to develop drought plans and mitigation strategies
- Sustained focus on issue through wet and dry cycles

Arizona Drought Preparedness Plan: Organizational Structure



From ADWR 2006

Arizona Drought Monitoring Technical Committee

NRCS Natural Resources Conservation Service

ARIZONA DEPARTMENT OF WATER RESOURCES
SECURING ARIZONA'S WATER FUTURE

CLIMAS

NOAA NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION U.S. DEPARTMENT OF COMMERCE

NATIONAL WEATHER SERVICE

SRP
Delivering More Than Power

ARIZONA DIVISION OF EMERGENCY MANAGEMENT

THE UNIVERSITY OF ARIZONA. ARIZONA COOPERATIVE EXTENSION
COLLEGE OF AGRICULTURE AND LIFE SCIENCES
| HOME | ABOUT US | SEARCH | DIRECTORY | SITE MAP |

OFFICE OF THE STATE CLIMATOLOGIST

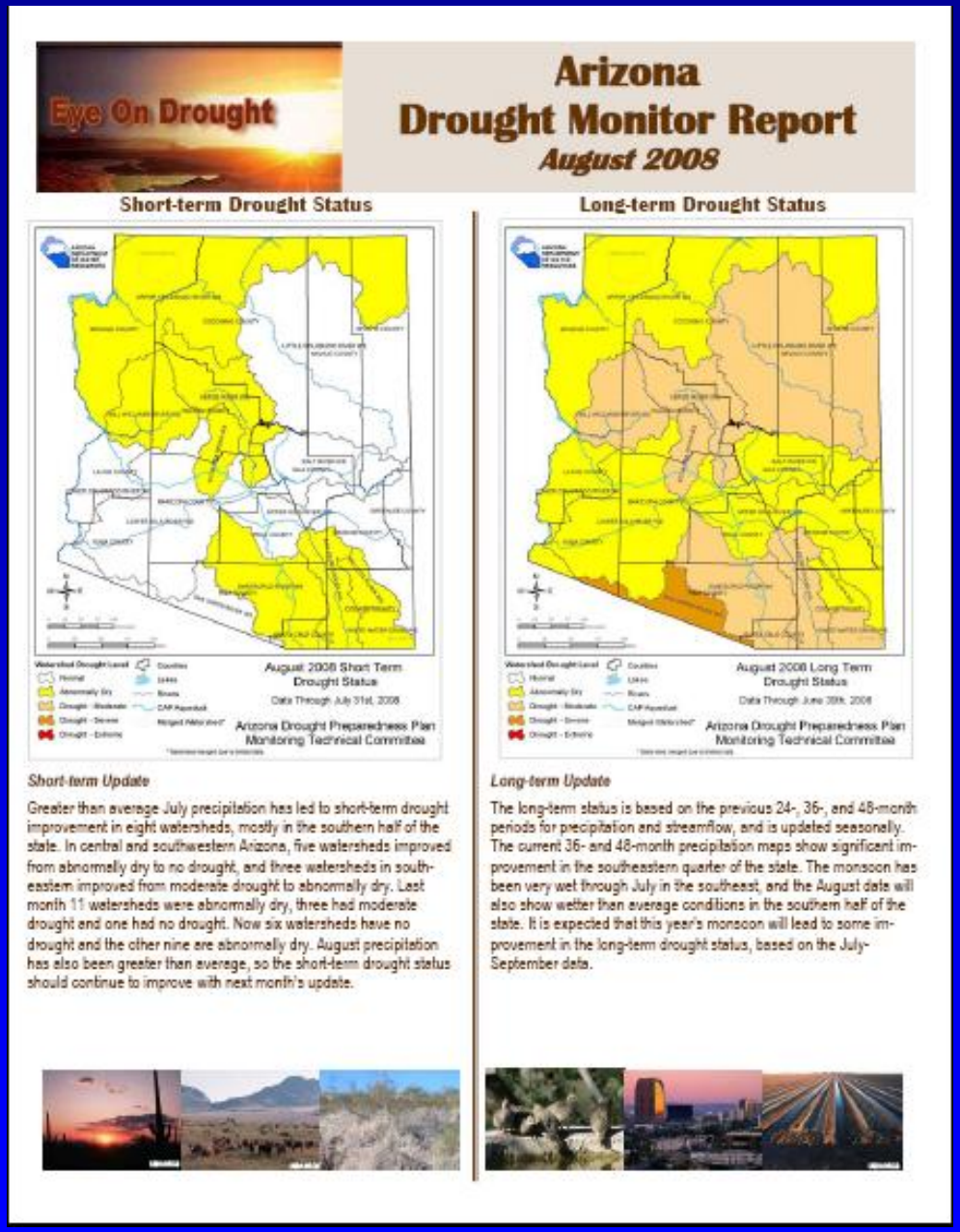
USGS science for a changing world
Water Resources of ARIZONA

From T. Haffer

CSAP
Climate Science Applications Program - Arizona Cooperative Extension

CLIMAS
Climate Assessment for the Southwest

Monthly Drought Status Report



Interagency Coordinating Group

- Membership: Over 20 different state and federal agencies; chaired by AZ Dept. of Water Resources & Div. of Emergency Mgmt.
- Meets biannually
- Directs state-level mitigation and response actions
- Advises Governor on drought declarations

Arizona Department of Water Resources

FACT SHEET

Interagency Coordinating Group

MEMBERSHIP

- Governor's Office
- AZ Dept of Administration
- AZ Corporation Commission
- AZ Commission on Indian Affairs
- AZ Dept of Agriculture
- AZ Dept of Commerce
- AZ Dept of Environmental Quality
- AZ Game & Fish Dept
- AZ Dept of Health Services
- AZ Dept of Real Estate
- AZ State Land Dept
- AZ State Parks
- AZ Dept of Transportation
- AZ Cooperative Extension
- Central AZ Water Conservation District
- USDA - Natural Resources Conservation Service
- USDA - Farm Services
- USDA - Forest Service
- U.S. Bureau of Reclamation
- U.S. Bureau of Indian Affairs
- U.S. Fish & Wildlife Service
- U.S. Bureau of Land Management
- U.S. National Park Service
- U.S. Geological Survey
- Salt River Project
- Non-Governmental Organizations

CO-CHAIRS

- AZ Department of Water Resources
- AZ Division of Emergency Management

Primary Role - Mitigation and Response

Comprised of state, federal, tribal and non-governmental organizations, this group provides an integral mechanism to coordinate and integrate drought planning and management on all lands within Arizona.

Objectives

Mitigation & Response

- Direct state agency action to assess, implement and develop response options
- Identify pre-drought mitigation and adaptation options
- Make recommendations to the Governor for resources necessary to provide assistance and continued implementation of the *Arizona Drought Preparedness Plan*

Advisor to the Governor

- Provide Governor with updates on an annual basis
- Advise the Governor of changes in drought conditions
- Request a drought declaration if conditions warrant
  - By May 1, based on water supply status
  - By November 1, based on ancillary drought impacts

Drought Plan Review

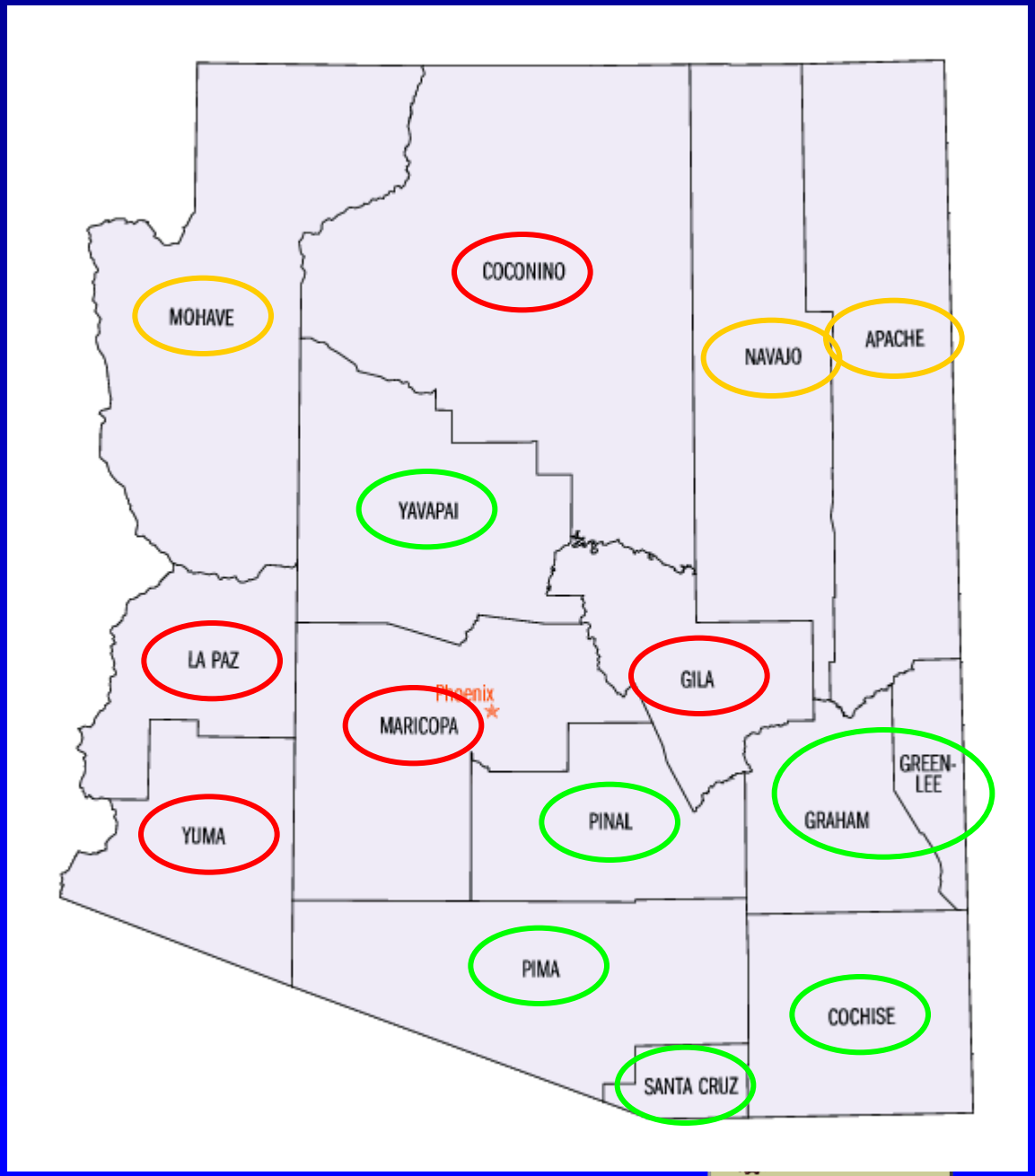
- Review effectiveness of mitigation and response actions with the Monitoring Technical Committee and the Local Area Impact Assessment Groups each year by November 15th
- Make recommendations for improving monitoring, implementation and response

Local Drought Impact Groups

- **Geographic Scale:** County-level
- **Leadership:** Organized and coordinated by local Cooperative Extension and Emergency Management; oversight by ADWR
- **Membership:** Local municipal officials, natural resource managers, agricultural producers, water mangers/providers, concerned citizens/watershed groups
- **Function:** Organize local-level drought impact monitoring, assess local vulnerabilities, develop response, mitigation, and outreach plans

LDIG Development

- Six established groups
- Three in initial meetings stage
- Five to be developed in near future



LDIG Activities

- Development of subcommittees: monitoring, mitigation/response, education/outreach
- Periodic full group meetings and subcommittee meetings
- Developing monitoring plans/recruiting volunteers (impact reporting, precipitation)
- Providing local reports for state drought status maps

Successes and Challenges

- LDIG meetings have been well attended – broad interest in drought monitoring and preparedness
- *Are all of the necessary stakeholders at the table in each county?*
- Volunteer participation has continued beyond initial planning stages – enthusiasm and interest continues, but…
- *No financial support for coordination or activities at county level – how long can initiatives be maintained?*
- Exciting, innovative approach to drought monitoring and planning
- *Exciting, innovative approach to drought monitoring and planning*

Arizona Drought Impact Reporting System

- Impact monitoring = key LDIG task
- Why?: better characterizations of drought, assess local vulnerability
- Requested development of tool to facilitate collection and synthesis of impact reports
- Initial effort was a hardcopy impact checklist adapted from Colorado Drought Plan; iteratively adjusted with feedback from all LDIGs
- Request for transition to web-based tool

Development Steps

- Temporary, form-based system (v1.0) deployed for testing in early 2007
- Feedback from LDIGs and MTC = focus group meetings, teleconference meetings, and email communications (refining impact survey and developing system design)
- 'Mock up' system used to gain feedback on system design, features, and general structure → continued interaction with LDIGs and agency partners to guide development process
- Iterative development based on feedback
- Recruitment and Training

AZ DroughtWatch

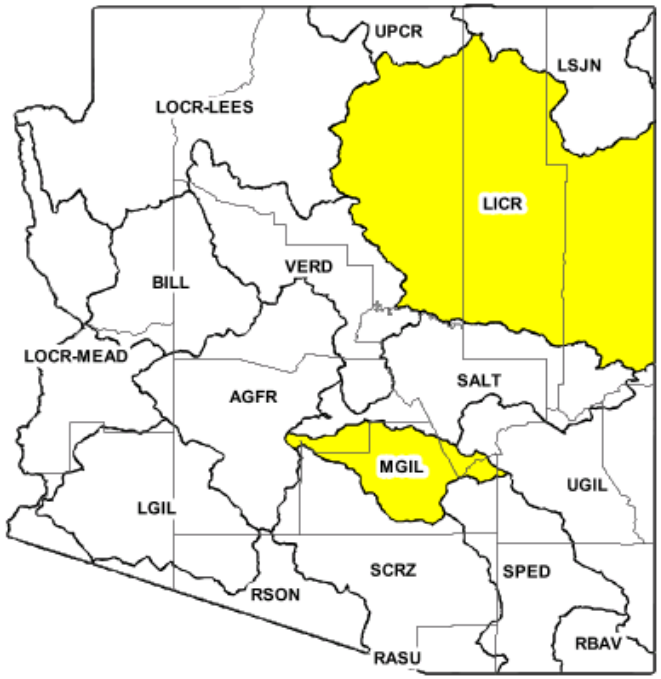
Address http://azdroughtwatch.org/ Go

AZ DroughtWatch
Arizona's Drought Impact Reporting System

AZ DroughtWatch beta release

Home | My DroughtWatch | User Guide | Register | About AZ DroughtWatch

Drought Impacts: August-2008



Summary Reports

County and watershed summary tables

Detailed impact reports (requires registration and login)

Impacts Reported
- in 0 of 6 categories
- in 1 of 6 categories
- in 2 of 6 categories
- in 3 of 6 categories
- in 4 of 6 categories
- in 5 of 6 categories
- in 6 of 6 categories

Categories
- Water
- Agriculture
- Livestock
- Society
- Tourism
- Ecology

Watershed Abbreviations

AGFR	Agua Fria River-Lower Gila River
BILL	Bill Williams River
LGIL	Lower Gila River below Painted Rock Dam
LICR	Little Colorado River
LOCR-LEES	Lower Colorado River, Lees Ferry to Lake Mead
LOCR-MEAD	Lower Colorado River below Lake Mead
LSJN	Lower San Juan River

About AZ DroughtWatch

AZ DroughtWatch is a tool designed to collect qualitative reports of drought impacts across Arizona. This impact information is used in conjunction with meterological and hydrological data to characterize drought conditions.

Access recent drought status reports compiled by the Governor's Drought Task Force Monitoring Technical Commmittee

Find out more about AZ DroughtWatch

Arizona Drought Links

AZ Dept. of Water Resources - Drought Program

Rainlog Precipitation Monitoring Network

U of A Climate Science Applications Program

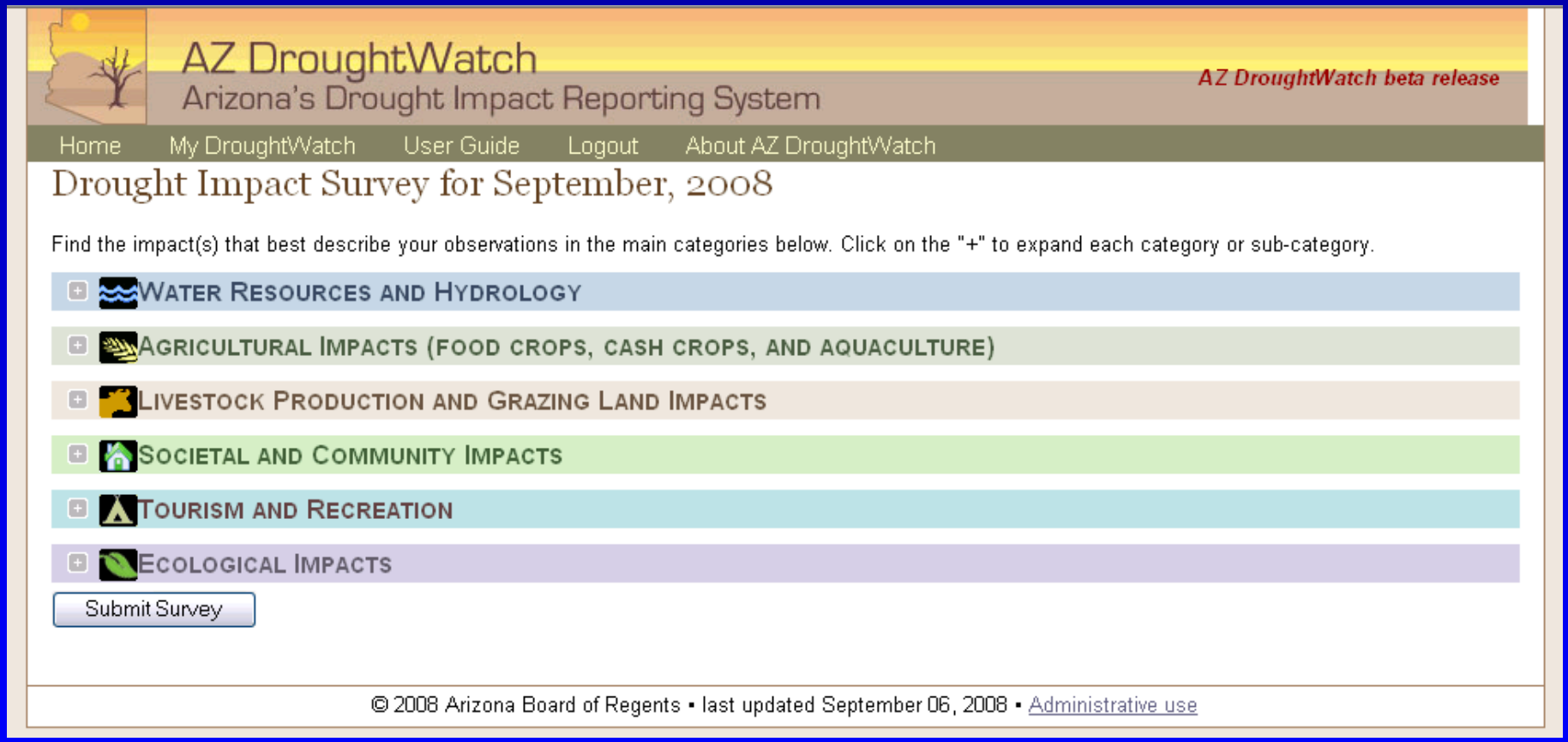
Climate Assessment for the Southwest

http://azdroughtwatch.org

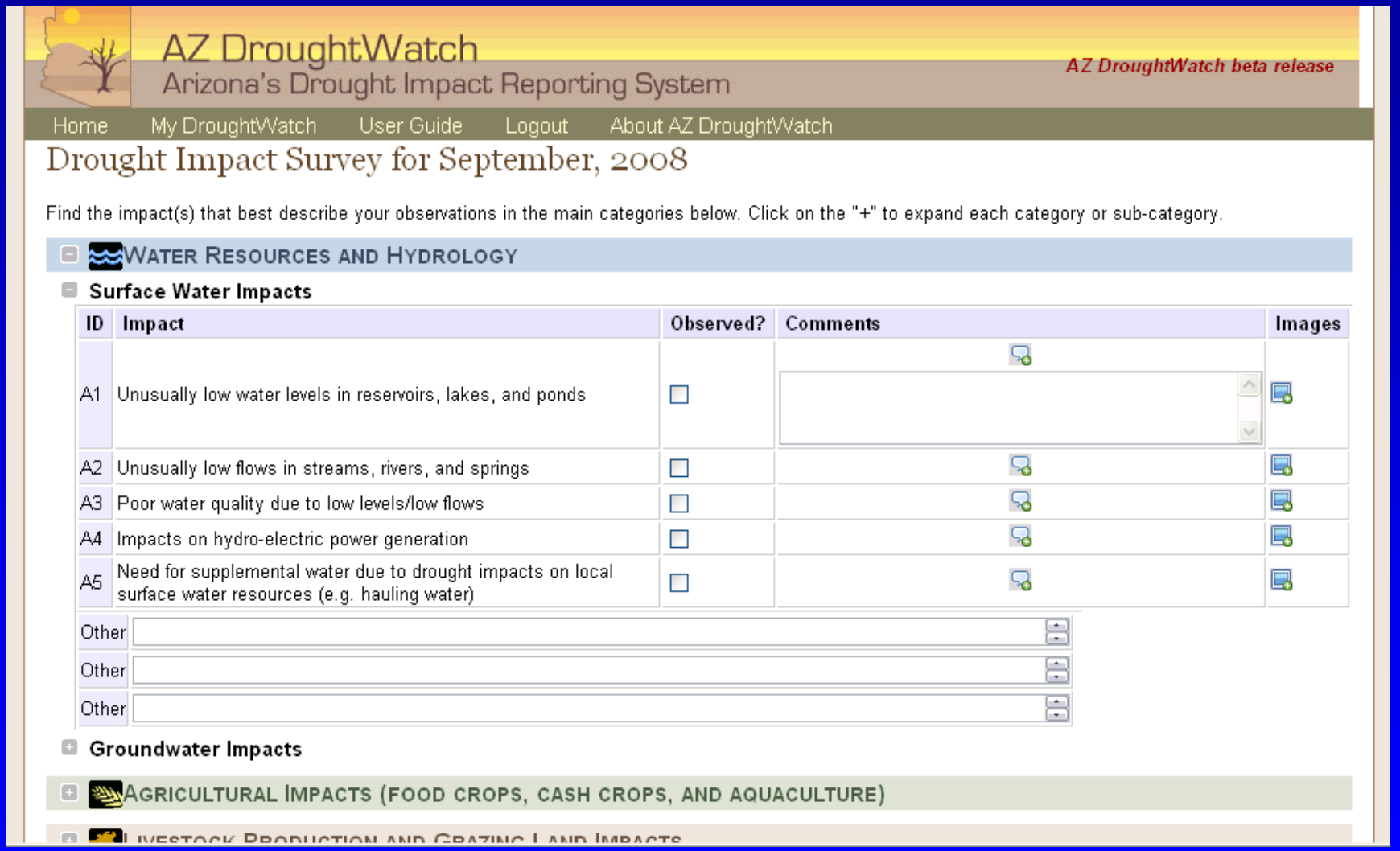
CSAP Climate Science Applications Program - Arizona Cooperative Extension

CLIMAS Climate Assessment for the Southwest

Add Impact Reports



Add Impact Reports



Access Reports

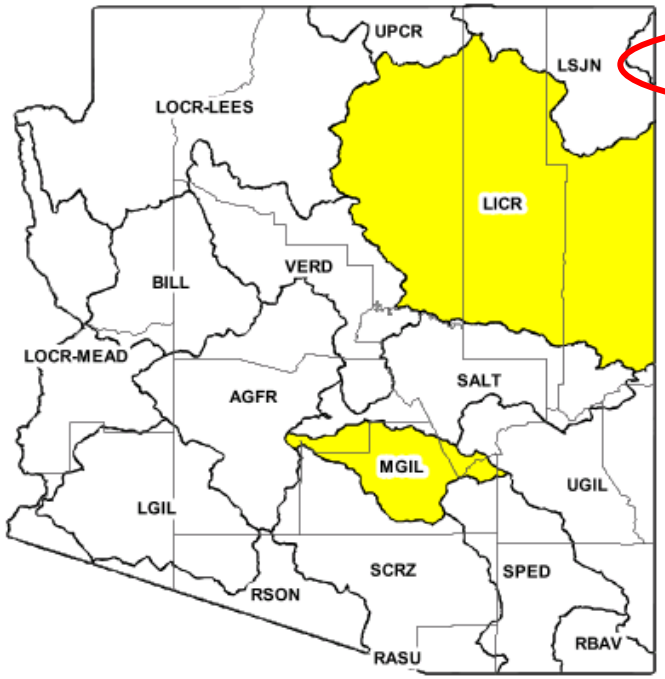
Address http://azdroughtwatch.org/ Go

AZ DroughtWatch
Arizona's Drought Impact Reporting System

AZ DroughtWatch beta release

Home | My DroughtWatch | User Guide | Register | About AZ DroughtWatch

Drought Impacts: August-2008



Summary Reports

County and watershed summary tables

Detailed impact reports (requires registration and login)

Impacts Reported

- in 0 of 6 categories
- in 1 of 6 categories
- in 2 of 6 categories
- in 3 of 6 categories
- in 4 of 6 categories
- in 5 of 6 categories
- in 6 of 6 categories

Categories

- Water
- Agriculture
- Livestock
- Society
- Tourism
- Ecology

Watershed Abbreviations

AGFR	Agua Fria River-Lower Gila River
BILL	Bill Williams River
LGIL	Lower Gila River below Painted Rock Dam
LICR	Little Colorado River
LOCR-LEES	Lower Colorado River, Lees Ferry to Lake Mead
LOCR-MEAD	Lower Colorado River below Lake Mead
LSJN	Lower San Juan River

About AZ DroughtWatch

AZ DroughtWatch is a tool designed to collect qualitative reports of drought impacts across Arizona. This impact information is used in conjunction with meterological and hydrological data to characterize drought conditions.

Access recent drought status reports compiled by the Governor's Drought Task Force Monitoring Technical Commmittee

Find out more about AZ DroughtWatch

Arizona Drought Links

AZ Dept. of Water Resources - Drought Program

Rainlog Precipitation Monitoring Network

U of A Climate Science Applications Program

Climate Assessment for the Southwest

Detailed Summary Report

AZ DroughtWatch
Arizona's Drought Impact Reporting System

AZ DroughtWatch beta release

Home | My DroughtWatch | User Guide | Logout | About AZ DroughtWatch

Listing all impacts observed during: September, 2008

<-- Previous Month *Next Month -->*

Individual Watershed Report

Huc 6: Santa Cruz River

Huc 8: Upper Santa Cruz River

Huc 10: Julian Wash-Upper Santa Cruz River

Observer Type: University Researcher
Observation Frequency: 2-5 days

Surface Water Impacts

Unusually low water levels in reservoirs, lakes, and ponds
test

Observer Type: University Researcher
Observation Frequency: 2-5 days

Surface Water Impacts

Unusually low water levels in reservoirs, lakes, and ponds
Test...pond was low

Individual Watershed Report

Huc 6: Santa Cruz River

Huc 8: Pantano Wash-Rillito River

Huc 10: Agua Verde Creek-Pantano Wash

Additional Project Outcomes

- Partnerships forged with National Drought Mitigation Center and National Integrated Drought Information System (National Drought Impacts Reporter and Drought.gov portal)
- Technology transfer of system to North/South Carolina and Southeast Regional Climate Center (discussion of national implementation in support of NIDIS)
- Interest in citizen science and high school education participation/educational opportunities

Thanks!

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

Michael A. Crimmins received his undergraduate degree in atmospheric science from the University of Michigan, his master's degree in geography/climatology from Western Michigan University and his doctorate in geography/climatology from the University of Arizona. Dr. Crimmins is trained as an applied climatologist and meteorologist and has ten years experience in the application of climatological methods, tools, and data for natural resource management. Watershed management was his focus for several years while working as a private sector environmental scientist. In that position, he provided expertise on hydroclimatology, urban and agricultural non-point source runoff modeling, remote sensing and GIS applications for watershed management.

Dr. Crimmins is currently on the faculty of the Department of Soil, Water, and Environmental Science at the University of Arizona and is a Climate Science Extension Specialist for Arizona Cooperative Extension. In this position he provides climate science support to resource managers across Arizona by assessing information needs, synthesizing and transferring relevant research results and conducting applied research projects. His extension and research work supports resource management across multiple sectors including rangelands, forests/wildfire, and water resources as well as policy and decision makers. This work aims to support managers by increasing climate science literacy as well as developing strategies to adapt to a changing climate. He also serves as a drought monitoring expert on the Arizona Governor's Drought Task Force and has worked with counties across Arizona to implement drought preparedness and impact monitoring plans.