



Staff Report

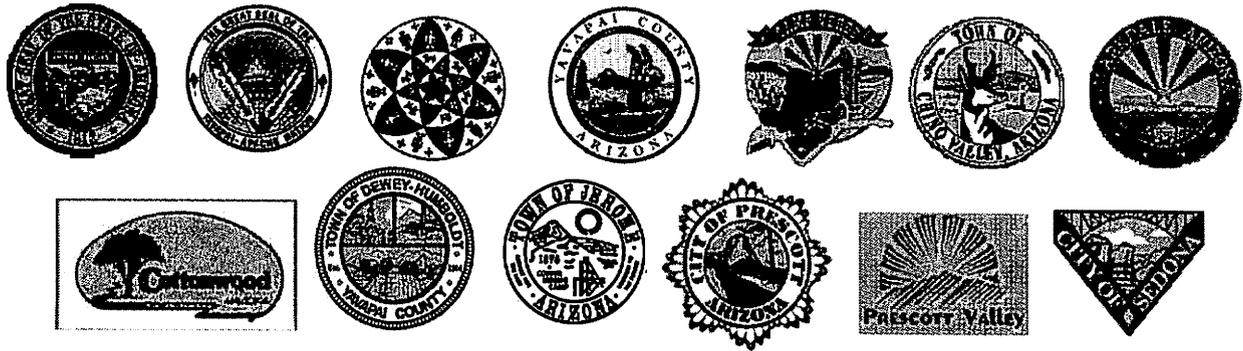
- Agenda Item: PRESENTATION BY YAVAPAI COUNTY WATER ADVISORY COMMITTEE - Report by John Rasmussen, Yavapai County Water Advisory Committee (WAC) Director on the current and future WAC projects and the WAC in general.
- Sponsored By: Mayor Doug Von Gausig
- Staff Contact: Deputy Town Clerk Walt Good
- Meeting Date: March 11, 2008
- Background: Presentation by John Rasmussen, Yavapai County Water Advisory Committee Director. 2007 Annual Report will be discussed in addition to future WAC projects.
- Recommendation: This is a presentation and no action is required.



Water Advisory Committee

Yavapai County Water Advisory Committee
2007 Annual Report

February 2008



Water Advisory Committee Members
Arizona Department of Water Resources
Yavapai-Apache Nation
Yavapai- Prescott Tribe
Yavapai County Districts 1, 2, and 3
The Incorporated Cities and Towns of Yavapai County:
Camp Verde
Chino Valley
Clarkdale
Cottonwood
Dewey-Humboldt
Jerome
Prescott
Prescott Valley
Sedona

Charter: The Yavapai County Water Advisory Committee is a committed coalition of communities and selected stakeholders that are dedicated to developing a management plan for the sustainable use of our regional water supply.

Mission Statement: The Yavapai County Water Advisory Committee is committed to preserving sustainable water resources for future generations while enhancing the economic viability of our County. We are dedicated to meeting the long-term water resource needs of our customers - the citizens of the Yavapai County region. We will accomplish our goals by developing and enacting a total water management strategy through a consensus of our coalition members.

Contact: John Rasmussen, Coordinator, 1015 Fair Street, Prescott, AZ 86305
Telephone: 928-442-5199, email: john.rasmussen@co.yavapai.az.us

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Executive Summary

The Yavapai County Water Advisory Committee's tradition of supporting management-relevant scientific discovery and objective analysis of factual information was reflected in the activities of 2007 and will continue through 2008.

In 2007, the Yavapai County Water Advisory Committee (WAC or Committee) progressed towards its goals and fulfillment of its mission. Member contributions funded projects including a Regional Groundwater Flow Model; a Long-Term Growth Scenario Development Project; a base flow evaluation of the Verde Valley; Well, stream, and isotope monitoring; Verde data compilation, and Water Education in Yavapai County.

The WAC was also involved in outreach through education programs, speakers, issue papers; and communication amongst the members, other water organizations, and the community.

The WAC received \$244,004.86 in member contributions and investment returns. For administration and projects, the WAC expended almost \$ 350,000 in calendar year 2007 utilizing some carried-over funds from the previous year. The WAC also benefited from, and "stretched" the budget through matching funds and in-kind services. The Committee's fund balance as of January 1, 2008 is \$321,465.92.

For 2008, the WAC is focused on continuing with existing projects and embarking on some new projects. For instance, the first model results of the Northern Arizona Regional Groundwater Flow Model will be produced early in the year (by U.S. Geological Survey and Arizona Department of Water Resources (ADWR) with WAC input regarding scenarios); and the WAC will begin an Appraisal Level Water Resource Management Study (with U.S. Bureau of Reclamation and ADWR). The WAC will also commit some of its resources to promoting water education in Yavapai County. Communication between the Committee and the member communities, and interpreting science is a high priority for 2008.

2008 will be the first year with the Yavapai County Board of Supervisors seated as members of the Committee. The WAC intends to continue its role in regional management planning and its service as a communication forum for the governmental jurisdictions in Yavapai County.

Introduction

The purpose of this annual report is to summarize the calendar-year 2007 activities of the Yavapai County Water Advisory Committee (WAC or Committee). It is intended for the members of the WAC, their councils, and the general public which the Committee serves.

This document contains a background section with basic information, membership and structure; a financial section; a 2007-activities section; and a section listing on-going projects and priorities for 2008.

Background

History

The Water Advisory Committee was established in 1999 by the Yavapai County Board of Supervisors Resolution 1163. An Intergovernmental Agreement (IGA) between member communities was recorded by Yavapai County on September 20, 2000. The Resolution has been amended by the Board of Supervisors most recently on December 3, 2007. The current Resolution is number 1661 (Appendix A).

Recognizing that water is a regional resource, the Board of Supervisors created the WAC as a vehicle to establish strong communication links among stakeholders and bring regional water management decisions to a local level through consensus. Goals include developing a regional water management strategy and protecting the base flows of county streams.

The WAC recognizes several components are needed to achieve the goals. These components include making a scientific determination of the facts; identifying management strategies and developing the tools necessary to implement the strategies; developing regional/state cooperation for the plan; implementing necessary legislative changes; and creating a focused body to implement plans.

Charter and Mission

Charter: The Yavapai County Water Advisory Committee is a committed coalition of communities and selected stakeholders that are dedicated to developing a management plan for the sustainable use of our regional water supply.

Mission Statement: The Yavapai County Water Advisory Committee is committed to preserving sustainable water resources for future generations while enhancing the economic viability of our County. We are dedicated to meeting the long-term water resource needs of our customers - the citizens of the Yavapai County region. We will accomplish our goals by developing and enacting a total water management strategy through a consensus of our coalition members.

Membership and Organization

The Water Advisory Committee is composed of members representing the nine incorporated cities and towns in Yavapai County, the three Supervisor Districts, ADWR, and the two Native American tribes. Each member has one designated representative and may appoint an alternate.

The WAC has a Technical and Administrative Subcommittee (TAC). The TAC consists of seven members with expertise in local and regional water resources.

The WAC has one coordinator and a recording secretary. These staff are employed by Yavapai County and maintain offices in County buildings.

The County is the fiduciary agent for the WAC. The WAC receives support services from other County departments such as Management Information Systems (e.g. computers and website), Board of Supervisors, and Finance.

While the membership has not changed in 2007 the representatives of the member communities have changed. As of December, 2007, the County Board of Supervisors will represent their districts. Table 1 shows the members who served for the majority of 2007 and Table 2 shows the current members who are serving as of December 19, 2007. Table 3 is a list of the TAC members.

Table 1: WAC Membership for majority of 2007

Member	Representative	Title	Alternate
Yavapai Apache Nation	Billie Garner	Land and Water Manager	Yolanda Trujillo
Yavapai Prescott Tribe	Chris Moss	Staff	
AZ Dept Water Resources	Thomas Whitmer	Regional Planning Manager	Leslie Graser
Yavapai County District 1	Art Coates	Retired Citizen	
Yavapai County District 2	Jim Williams	Well Driller	Mary Hoadley
Yavapai County District 3	Steven Estes	Director Mingus Center	Dorothy O'Brien
Town of Camp Verde	Brenda Hauser	Council	Tony Gioia, Mayor
Town of Chino Valley	Virginia Reid	Council	
City of Cottonwood	Diane Joens	Mayor	Bob Rothrock
Town of Clarkdale	Doug Von Gausig	Mayor	Jerry Wiley
Town of Dewey-Humboldt	Len Marinaccio	Council	Preceded by Roger Swenson, town manager
Town of Jerome	Jane Moore	Council	Doree Christensen
City of Prescott	Robert Roecker	Council	
Town of Prescott Valley	Michael Flannery	Council	Harold Wise
City of Sedona	Pud Colquitt	Mayor	

Table 2: Current WAC Membership (as of December 2007)

Member	Representative	Title	Alternate
Yavapai Apache Nation	Billie Garner	Council	Yolanda Trujillo
Yavapai Prescott Tribe	Chris Moss	Staff	
AZ Dept Water Resources	Thomas Whitmer	Regional Planning Manager	Leslie Graser, Hydrologist
Yavapai County District 1	Carol Springer	Supervisor	
Yavapai County District 2	Thomas Thurman	Supervisor	Mary Hoadley, Upper Agua Fria Partnership
Yavapai County District 3	Chip Davis	Supervisor	
Town of Camp Verde	Brenda Hauser	Council	Tony Gioia, Mayor
Town of Chino Valley	Virginia Reid	Council	Jim Bunker, Council
City of Cottonwood	Diane Joens	Mayor	Tim Elinski, Council
Town of Clarkdale	Doug Von Gausig	Mayor	Jerry Wiley, Council
Town of Dewey-Humboldt	Len Marinaccio	Council	Don Tebbe, Council
Town of Jerome	Jane Moore	Council	Doree Christensen, Council
City of Prescott	Robert Roecker	Council	Bob Luzius, Council
Town of Prescott Valley	Michael Flannery	Council	Harold Wise, Council
City of Sedona	Pud Colquitt	Mayor	Jerry Frey, Council

Table 3: 2007 and Current Technical Administrative Committee (TAC)

TAC Member	Title
Loyd Barnett	Watershed Consultant
Leslie Graser	ADWR Hydrologist
Robert Hardy	Cottonwood Water Resources Manager
Mark Holmes	Chino Valley Water Resources Manager
James Holt	Prescott Water Resources Manager
John Munderloh	Prescott Valley Water Resources Manager
Dr. Abe Springer	Professor, NAU Geology Department

The organization of the Water Advisory Committee is shown in Figure 1. The WAC is empowered to carry out its mission by the member governing boards and communities. The Committee has a Coordinator, a recording secretary, and a Technical Administrative Committee (TAC). The WAC may establish subcommittees as needed.

Unless a special meeting is called, the Committee meets once a month, typically the third Wednesday. The TAC meets once a month, typically the first Thursday. The WAC and TAC adhere to the requirements of the Arizona Open Meeting Law.

The WAC has two co-chairpersons selected by the members from amongst the membership. Co-chair terms are one-year.

The members of the Technical Advisory Committee (TAC) fulfill a set of minimum qualifications and are appointed by the WAC according to established policy. The WAC directs the work of the TAC. The work of the Coordinator is directed by both the WAC and the TAC based on established priorities and objectives.

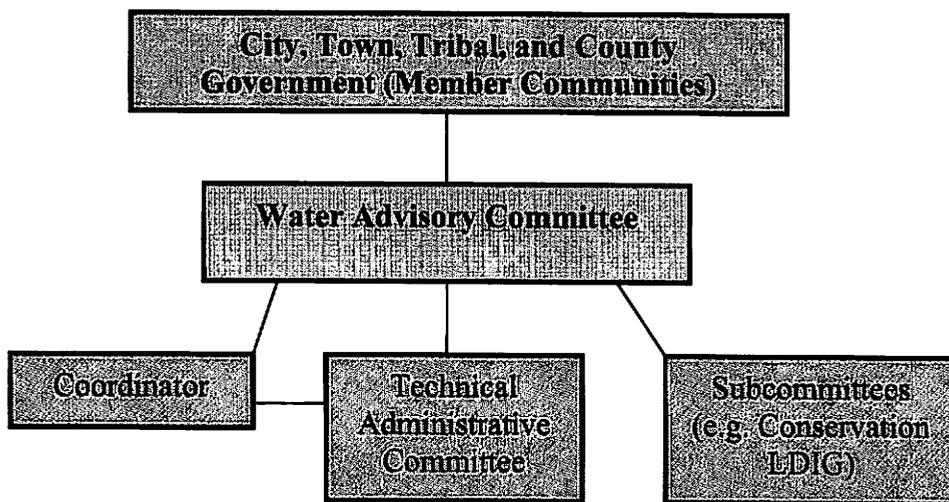


Figure 1: Water Advisory Committee Structure

Financial Statement - 2007 Budget

Budget:

The WAC operates with an annual budget of \$226,000 funded through member contributions. The contributions are based on population. Yavapai County serves as the fiduciary agent for the WAC. Table 4, below lists the communities and their direct contribution to the WAC.

Table 4: WAC Member Funding Contribution to WAC

Member	Share
Camp Verde	\$ 10,000
Chino Valley	\$ 10,000
Clarkdale	\$ 2,500
Cottonwood	\$ 10,000
Jerome	\$ 500
Prescott	\$ 45,000
Prescott Valley	\$ 30,000
Sedona Yavapai	\$ 10,000
Dewey-Humboldt	\$ 2,500
Unincorporated	\$104,500
Yavapai Prescott	\$ 500
Yavapai Apache	\$ 500
Totals	\$ 226,000

Staff members of the affiliate communities and organizations contribute time to the Committee meetings and projects, both technical and administrative. The monetary value of these in-kind services has not been determined.

2007 Income:

Income is generated from member contributions, interest on investments, and miscellaneous additions. The table below lists the additions as reported by the County finance department (Table 5).

The total calendar year additions were slightly over \$244,000. Member contributions amounted to \$226,000. Calendar year 2007 interest-on-investments was \$ 15,271.09. Miscellaneous additions totaled \$2,733.77.

Table 5: Total of WAC Calendar Year Additions

Member Contributions	\$ 226,000.00
Interest on Investments	\$ 15,271.09
Miscellaneous Additions	\$ 2,733.77
Total 2007 Additions	\$ 244,004.86

2007 Expenditures:

The total calendar year 2007 expenditures amounted to \$349,979.88 (As reported by Yavapai County Finance Department). Expenditures of the WAC are toward administration and projects. The year began with a carry over amount of \$421,245. The following tables (Table 6, 7, and 8) list the expenditures

Table 6: Total of WAC Calendar Year 2007 Expenditures

Administration	\$ 91,091.98
Projects (Outside Services)	\$ 258,887.90
Total 2007 Expenditures	\$ 349,979.88

Table 7: 2007 Administration Expenditures

Coordinator Salary	\$ 69,635.31
Employees Related Expenses	\$ 17,841.52
Supplies/Equipment/Postage	\$ 511.91
Travel and Meetings	\$ 1,078.16
Mileage	\$ 2,000.25
Phone	\$ 24.83
Total Calendar Year 2007	\$ 91,091.98

Table 8: 2007 Projects (Outside Services) Expenditures

USGS (Model and Monitoring)	\$ 130,000.00
USGS (Verde Subflow)	\$ 42,000.00
H3J Consulting (Scenarios)	\$ 55,000.00
NAU Geospatial Database	\$ 17,171.00
AZ Project WET	\$ 13,200.00
Conservation Survey Printing	\$ 1,560.90
Total Calendar Year 2007	\$ 258,887.90

January 1, 2008 Account Balance: \$321,465.92 (from preliminary December, 2007 County Fund Balance Report)

2007 Matching Funds, Cost Share and In-Kind Service Contributions:

In most cases, WAC expenditures were combined with matching funds and/or in-kind services. Over \$75,000 was matched to WAC funds by USGS, NAU, and ADWR. ADWR also contributed through funding from the Rural Watershed Initiative program.

In addition, the WAC benefits from member organization staff (such as the WAC's Recording Secretary Chris Moran, other Yavapai County professional staff, TAC members, and others). The WAC members and their alternates also devote significant amounts of time to the Committee. Thus, hundreds of hours have been utilized for the benefit of the communities through WAC. While undoubtedly vital, the monetary value of these in-kind contributions has not been calculated.

Highlights of 2007 – Primary Water Advisory Committee activities of the year

In 2007, the Committee continued established projects and began new projects. Although the projects overlap, for the purpose of this document the listed projects are assigned to one of three categories: Science, Management, or Education/Outreach. Each project in which the WAC invests is identified and prioritized based on an analysis of the WAC's mission and objectives (Appendix B contains a list of WAC priorities from February of 2007). The Coordinator and the TAC were involved in setting schedules, priorities and serving as liaisons with the project teams. Other highlights including a structural change on the Committee and a legislative update are also below.

Science Activities

Northern Arizona Regional Groundwater Flow Model (USGS and ADWR)

Description and objectives:

- Develop a regional hydrogeologic database for Upper and Middle Verde watershed and Coconino Plateau incorporating existing and new data.
- Develop a hydrogeologic framework that will define the distribution and hydraulic properties of the aquifers and confining units in the system.
- Develop a conceptual model that will provide an understanding of the surface- and groundwater flow systems.
- Develop a regional numerical flow model (see Figure 2 for model area).

Value to WAC:

- Regional planning tool
- Refine and assess water budget
- Model to run various water-use scenarios
- Assess conceptual model and data needs (data gaps, model resolution issues, need for refined/nested models)

Deliverable(s):

- Model and Reports
- Data Sets
- Water Budget
- Groundwater Flow Model
- Conceptual Model and water budget presented in published report (April 2006 "Hydrogeology of the Upper and Middle Verde River Watersheds, Central Arizona": SIR 2005-5198, K.W. Blasch, J.P. Hoffman, L.F. Graser, J.R. Bryson and A.L. Flint <http://pubs.usgs.gov/sir/2005/5198/>)

Who:

- Project Chief and Staff: Don Pool (USGS), Kyle Blasch (USGS), John Hoffman (USGS), Don Bills (USGS), James Callegary (USGS), Doug Rautenkranz (USGS), Leslie Graser (ADWR)

Other Comments:

- Joint Funding Agreement with USGS for model development and data collection.

- ADWR contributes through Rural Watershed Initiative and staff time.
- Continued from previous year and will continue into 2008.
- WAC is currently developing water-use scenarios for the model.

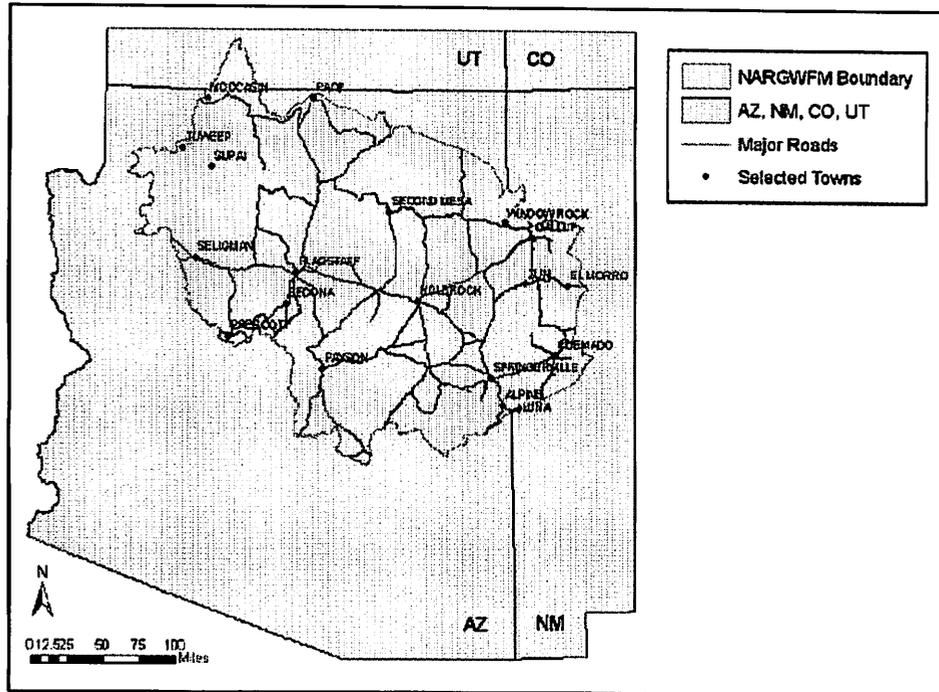


Figure 2: Area of Northern Arizona Regional Groundwater Flow Model
<http://az.water.usgs.gov/projects/9671-AD9/>

Data Collection / Monitoring - (USGS and ADWR)

Description and objectives:

- The WAC funded continued operation of Williamson Valley flow gage (see data example in Figure 3), continuous well monitoring (water levels) in the Verde watershed, and water sampling and analysis of stable isotopes.
- Collect and analyze data of importance to water budgets and modeling
- Develop defensible, accurate records

Value to WAC:

- Data used in water budgets and refining/calibrating models.
- Develop basic data and records on key hydrogeologic parameters.
- Provide insight on answers to questions of water sources, water level variation, and flood flow in Williamson Valley.

Deliverable(s):

- Data sets
- Summary reports

Who:

- USGS and ADWR Staff

Other Comments:

- The Data will be incorporated into groundwater model for development and refinement.
- To be most effective, coordination with other monitoring plans and programs will be necessary.

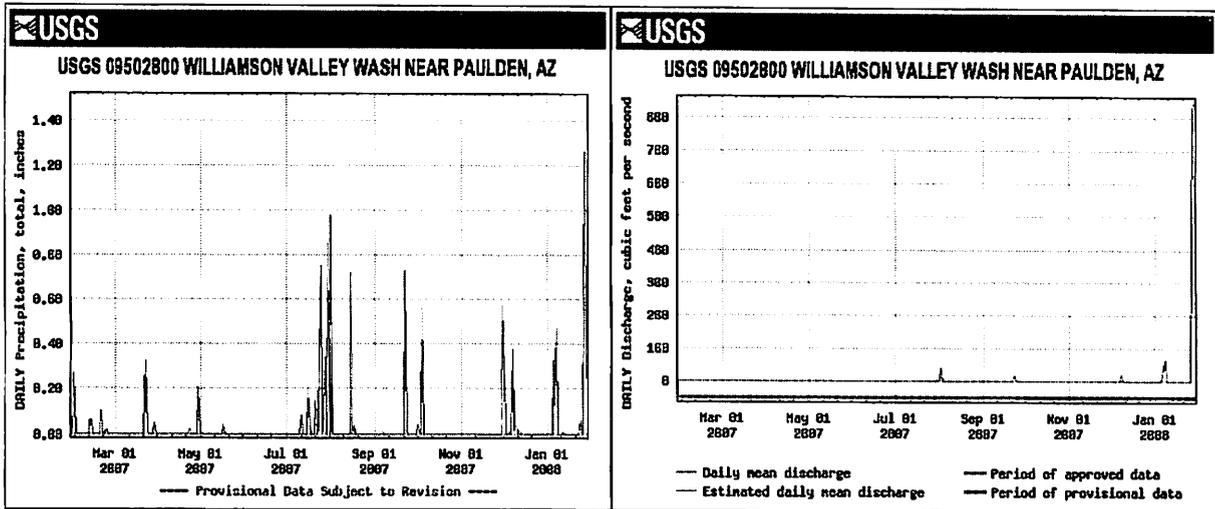


Figure 3: Precipitation and Discharge at Williamson Valley Gage
<http://waterdata.usgs.gov/az/nwis>

Long-Term Growth and Water-Use Scenario Development (H3J Consulting)

Description and objectives:

- Provide water-use scenario for USGS regional groundwater model.
- Use information provided by WAC communities to estimate future population growth in the model area as it might occur on the landscape (e.g. Figures 4-6); and project water use values, and source locations.
- Assemble into GIS database and transfer to USGS for use in Northern Arizona Regional Groundwater Flow Model.
- Use as a basis for additional growth scenarios.
- Make available to County and others for other uses (e.g. other types of planning)

Value to WAC:

- Develop water-use scenario for application in USGS regional flow model.
- Gain an understanding of potential growth areas, and associated future water use values.
- Provide baseline for development of other scenarios.

- Use in Phase I of Central Yavapai Highlands Water Resource Management Study.

Deliverable(s):

- Data set (also delivered to USGS for input into USGS model)
- Population growth scenario and growth model;
- Water-use scenario and Summary Report
- Presentations to WAC and TAC

Who:

- Project Chief: Hoyt Johnson III (H3J Consulting) and TAC of WAC members as liaisons with communities.

Other Comments:

- The work serves as basis for other scenarios.
- There are other potential uses of the data and model.

WAC Populations per Jurisdiction

	Increase	Unincrease	Total
2008	132,778	74,234	207,012
Increase	22,079	7,276	29,355
2010	154,857	82,010	236,867
Increase	22,079	8,576	30,655
2015	187,481	90,979	278,460
Increase	32,624	9,136	41,760
2020	224,911	99,116	324,028
Increase	37,430	9,136	46,566
2025	269,097	106,323	375,420
Increase	44,180	7,207	51,387
2030	318,888	112,580	431,468
Increase	49,791	6,257	56,048
2035	362,022	117,800	479,821
Increase	43,834	5,239	49,073
2040	385,244	122,114	507,359
Increase	22,223	4,315	26,538
2045	390,852	125,908	516,760
Increase	5,608	3,794	9,402
2050	396,248	129,580	525,829
Increase	5,396	3,672	9,068

30 Year Trend Population

	Increase	Unincrease	Total
2006	129,536	83,614	213,150
Increase	55,955	29,700	85,655
2010	185,491	107,336	292,827
Increase	55,955	26,636	82,591
2015	230,684	127,770	358,454
Increase	45,193	26,434	71,627
2020	275,677	148,204	424,081
Increase	45,000	28,214	73,214
2025	346,883	176,417	523,300
Increase	71,205	28,214	99,419
2030	417,888	204,831	622,519
Increase	71,000	28,214	99,214
2035	531,363	243,587	774,950
Increase	113,475	38,000	151,475
2040	644,837	282,543	927,381
Increase	113,475	38,000	151,475
2045	828,897	336,331	1,165,229
Increase	184,060	53,788	237,848
2050	1,012,958	390,120	1,403,077
Increase	184,060	53,788	237,848

Figure 4: Draft growth projections for one scenario and 30-year-trend population to year 2050 (from: “Scenario Develop Update_Report2 H3J 9-19-07.ppt”) <http://www.co.yavapai.az.us/WorkArea/showcontent.aspx?id=30450> The “WAC Populations per jurisdiction” are as reported by the entities for this scenario; and the “30 year Trend Population” represents a linear extrapolation of the historical data trend (past 30 years) into the future.

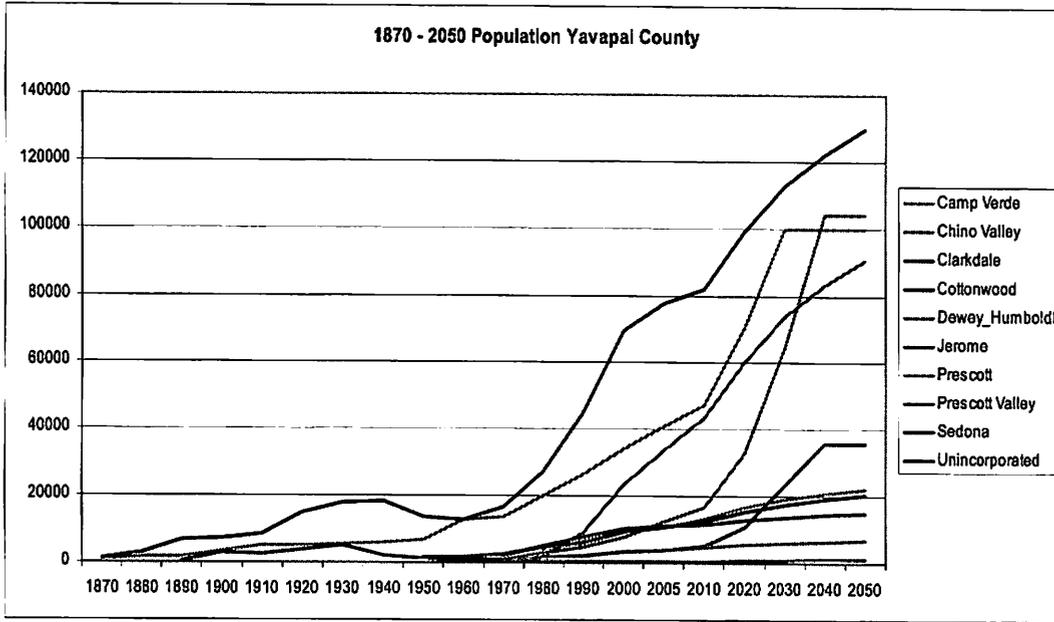


Figure 5: Draft of one population scenario in part of Yavapai County - Projected to 2050 (from: "WAC_Update Report 1.doc")

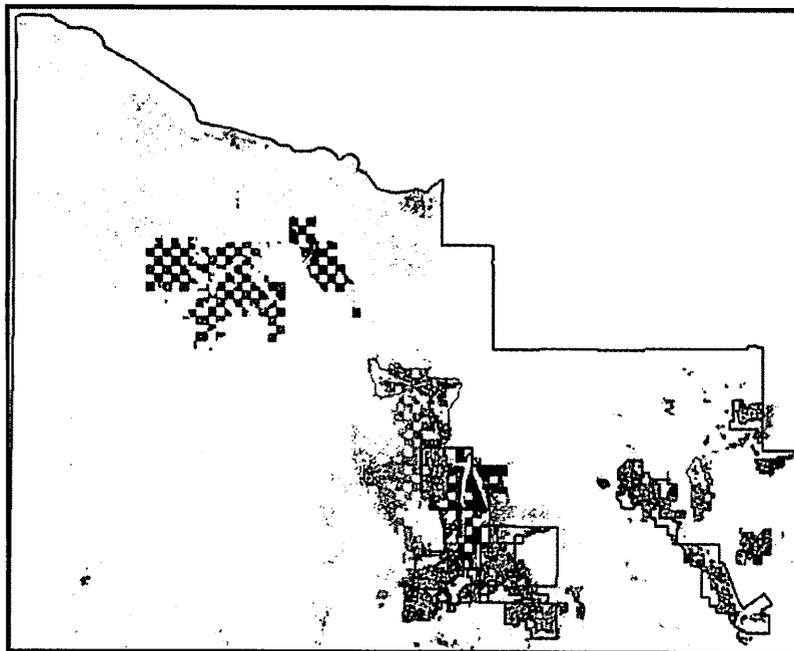


Figure 6: Draft map of developed parcels in one development scenario of central Yavapai County – year 2050 ("Scenario Develop Update_Report2 H3J 9-19-07.ppt") <http://www.co.yavapai.az.us/WorkArea/showcontent.aspx?id=30450>

Verde River Base Flow Evaluation (Seepage Run)(USGS)

Description and objectives:

- Collect stream discharge, specific conductance, temperature, pH, and dissolved oxygen data along Verde River and tributaries. From between gages near Clarkdale (09504000) and below Camp Verde (09506000); Oak Creek from near Sedona gage (09504420) to mouth; Wet Beaver Creek from gage near Rimrock (09505200) and Dry Beaver Creek from the gage near Rimrock (09505350) to their confluence and down to the mouth; and West Clear Creek from the gage near Camp Verde (09505800) to its mouth.
- Use to inform models and future monitoring.
- Assemble some basic data

Value to WAC:

- This work is being utilized by the USGS for the Northern Arizona Regional Groundwater Flow Model.
- Data will be used to determine potential monitoring or gage sites.
- Incorporate into surface water model (e.g.NAU work described below)
- Chemistry data

Deliverable(s):

- Data Files and report findings to WAC.
- Data for USGS NARGFM

Who: Project Chief: Don Bills (USGS); other staff as needed

Other Comments:

- Chemistry data was collected, analyzed and used by U of Arizona (Caitlan Zlatos, James Hogan, and Thomas Meixner). A poster has been presented and an abstract prepared for the 2007 Fall meeting of the American Geophysical Union titled "Ground-Water Sources, Flow Paths, and Residence Times in the Middle Verde River Watershed, Northern Arizona" (Zlatos, Hogan, Blasch, Bills, and Meixner).

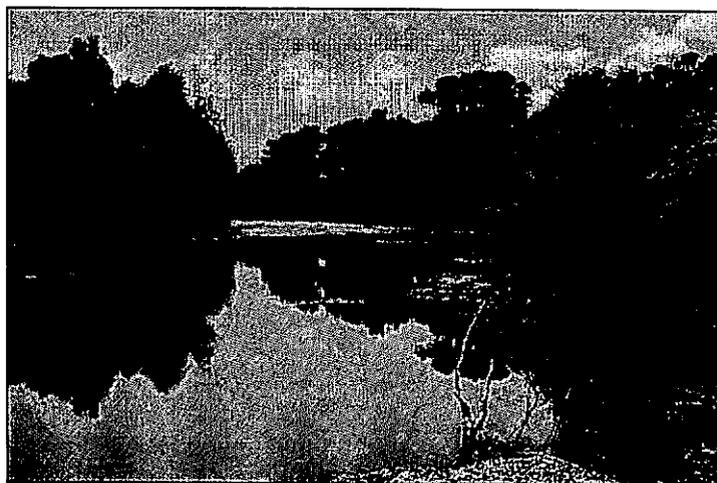


Figure 7: A surveyed section of the Verde River in the Verde Valley (The reach below Cottonwood Ditch; photo by Jeanmarie Haney)

Verde Valley Surface Flow Model – Phase I: Geospatial Database (Northern Arizona University)

Description and objectives:

- Collect data relevant to building a surface-water model to better understand how surface-water flows in the middle Verde River Valley respond to hydrological conditions.
- Assemble data into a central, geo-referenced database. Collect existing information about human created surface-water inputs and outputs in the middle Verde River valley from the Clarkdale gage to the Verde Falls gage (To complement existing USGS measurements of stream discharge and seepage runs to ascertain groundwater discharge),
- Prepare a geo-referenced conceptual surface-water model, and Research and review existing available hydrologic and hydraulic modeling software and make recommendations for the TAC's consideration.

Value to WAC:

- This work begins multi-phased approach to a basic understanding of, and gaining predictive capabilities regarding the Verde Valley surface water system.
- Assembles and organizes data into a central location for reference
- This is one step towards a model of the system that can be used to predict outcomes of various management alternatives.

Deliverable(s):

Data set, report, presentations to TAC and WAC.

Who:

Rob Ross (NAU Student), Dr. Abe Springer (NAU Geology Professor), and Mark Manone (NAU GIS specialist)

Other Comments:

First update and progress report to TAC in January, 2008.

White Paper (TAC)

Description and objectives:

The TAC produced a summary of the report titled “Geologic Framework of Aquifer Units and Ground-Water Flowpaths, Verde River Headwaters, North-Central Arizona” (U.S. Geological Survey Open File Report 2004-1411 by Laurie Wirt, Ed Dewitt, and V.E. Langenheim (<http://pubs.usgs.gov/of/2004/1411/>))

Value to WAC:

The paper serves as an interpretive aid to the WAC regarding key findings of the subject report. It concisely reports the technical findings and hydrogeologic methods of the report. For instance, the report shows basic information such as the locations of springs and their relative contributions to flow in the river (Figure 8).

Deliverable:

White paper document and verbal summary for WAC (Item 4a of February WAC meeting)

<http://www.co.yavapai.az.us/WorkArea/showcontent.aspx?id=25850>

Who:

Coordinator and TAC

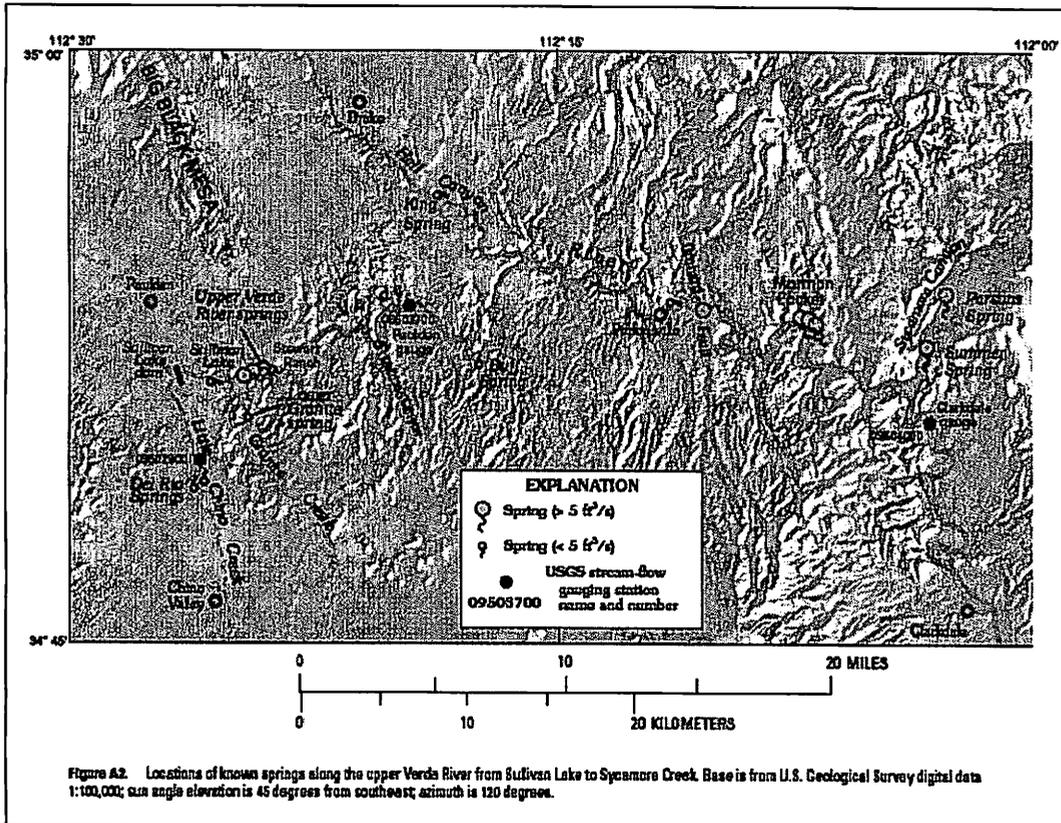


Figure 8: Location of springs in Upper Verde River (Figure A2 in report).

Management Activities

Appraisal Level Water Resource Study (with Reclamation and ADWR) (Central Yavapai Highlands Water resource Management Study)

Description and objectives:

- Developed and approve Plan of Study and draft Cost Share Agreement between the Bureau of Reclamation, ADWR, and the County. A plan for budget requirements was established.
- Appraisal Studies are preliminary investigations to determine the desirability of proceeding to a feasibility study. Appraisal reports generally use existing data and information to identify plans for meeting current and projected water needs and problems of the

planning area (Figure 9). Three primary questions should be answered by the study: 1. Is there a problem? (i.e. unmet water demand); 2. Is there at least one potential solution to the problem? and 3. Is there a Federal interest? Reclamation requires a 50/50 cost share with a local partner(s) to fund the study.

Value to WAC:

This will produce an organized, logical and objective assessment of future water demands and alternatives for meeting the demands.

Deliverable(s):

Regular summary reports and final report

Who:

Project Manager is Leslie Meyers (Engineer, Bureau of Reclamation), WAC and ADWR will serve on Project Management Team. WAC and TAC members and other scientists/managers as appropriate will be involved.

Other Comments:

- Study will begin in February 2008 upon signing of Cost Share Agreement.
- Study was discussed during the October WAC meeting:
<http://www.co.yavapai.az.us/WorkArea/showcontent.aspx?id=30556>

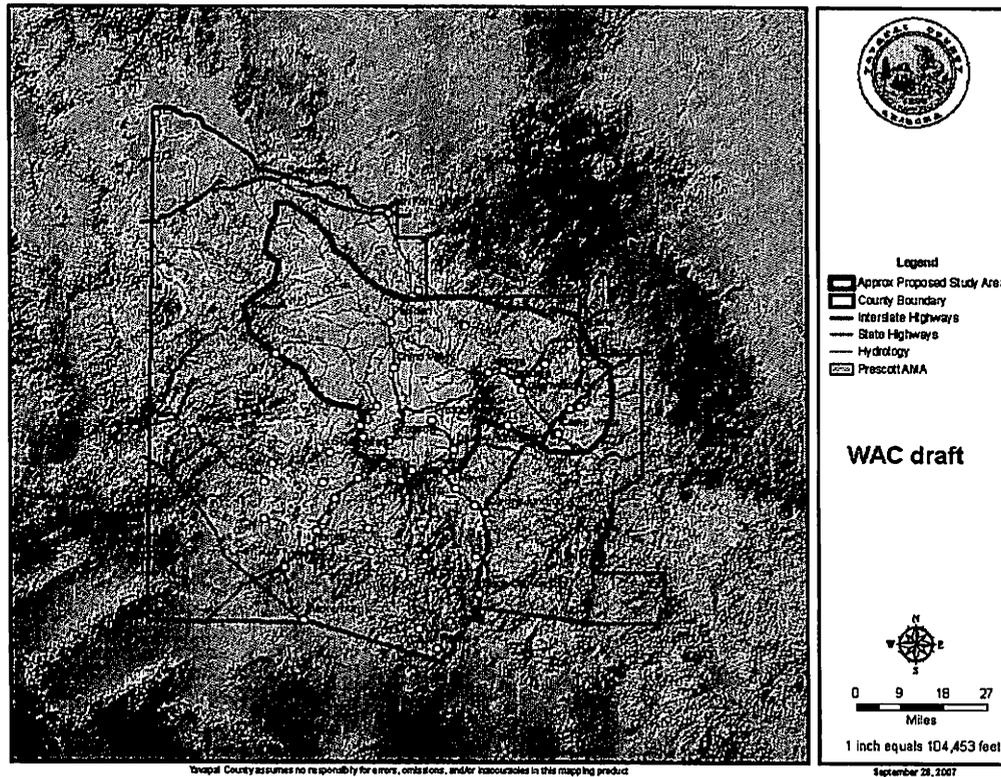


Figure 9: Approximate location of Planning Area for CYHWRMS appraisal level study

Yavapai County Local Drought Impact Group (LDIG)

Description and objectives:

- WAC serves as oversight committee to the LDIG.
- LDIGs are voluntary groups, coordinated by local representatives, created to raise public awareness, provide impact information to local and state leaders, and initiate local mitigation and response options. The work is proceeding through efforts of the state (ADWR), County Emergency Management, County BOS, Cooperative Extension and NRCS. (<http://www.azwater.gov/dwr/drought/LDIG.html>)
- The Yavapai County LDIG has three participant groups: Monitoring (Assess and report local drought conditions and impacts - collects climate and drought-related data), Outreach and Education (educate the public and improve awareness regarding drought), and Preparedness (prepares a mitigation and response plan for a local response to drought).

Value to WAC:

Drought Planning; Ability to secure “buy-in” to recommendations presented in Preparedness Plan; Gain understanding of drought status and conditions and prepare response for communities (e.g. Figure 10).

Deliverable(s):

Data and Report (Plan)

Who:

State (ADWR), County Emergency Management, County BOS, Cooperative Extension and NRCS, Coordinator and Committee members

Other Comments: - Ongoing into 2008.

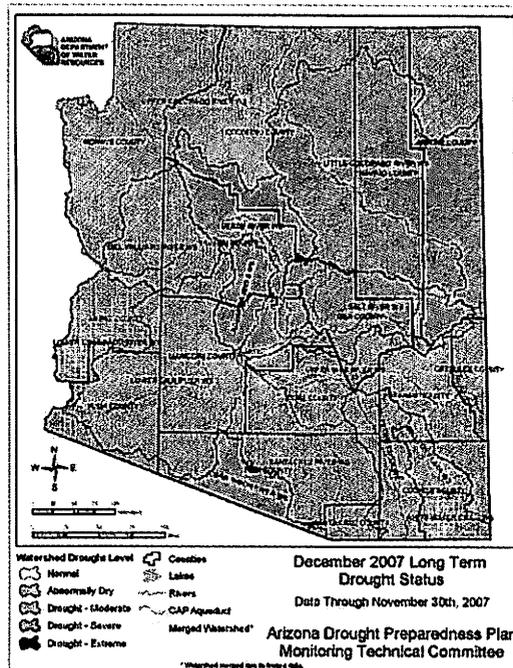


Figure 10: Long Term Drought Status from December 2007 ADWR Drought Monitoring Report (<http://www.azwater.gov/dwr/drought/>)

Water Conservation and Efficiency

Description and objectives:

- Update WAC Conservation Report to provide a summary document of recommendations to the County Board of Supervisors. Make table that lists conservation efforts of the member communities.
- Identify and help implement conservation programs in County and communities.
- Reduce overlap and contradictions between jurisdictions and programs
- Coordinate with and utilize aspects of existing programs such as ADWR (Figure 11), municipalities, and organizations.
- Participate in water conservation opinion survey (print and distribute) (City of Prescott USBR conservation grant)

Value to WAC:

- Promoting water conservation and water efficiency awareness and action is a WAC priority.
- Coordinated and appropriate conservation and efficiency programs are one aspect of wise regional management.

Deliverable(s)

Summary report with recommendations

Who:

WAC Subcommittee, Coordinator

Other Comments:

- Liaison with and assist other entities also working on conservation (Cities/Towns, ADWR, County Planning and Zoning, Central Yavapai Water Conservation Partnership, Upper Verde River Watershed Protection Coalition)
- Continue conservation priority in 2008 (Get Survey Results, liaison with others, update table of community conservation programs)



Figure 11: Examples of conservation and efficiency programs/materials. Drought tolerant plant list; smart irrigation system controller, “Save H2O” front license plate, Project Rinse Smart logo, hot water recirculation pump, and rainwater harvesting booklet. (Photos from: <http://www.azwater.gov/dwr/Conservation/ConservationHome.html>)

Questions Document – Compile and Understand the Questions of the WAC Members

Description:

- WAC members compiled a list of water resource related questions they and their councils.
- The list was divided into broad categories of resource/science related and management related questions.
- Intent is to understand what the Committee and communities want to know and determine if the WAC efforts are relevant to the questions.

Value to WAC:

- Understand and communicate that which the Committee would like to know about the resource and its management.
- Reflect upon and confirm that focus of WAC activities is appropriate.
- Help establish priorities, and understand purpose and capabilities of the WAC.
- Substantiate that work is moving in appropriate direction.

Deliverable(s):

Summary List and Discussion

Who:

Coordinator, TAC

Other Comments:

This exercise influenced choice of projects and funding priorities of 2008.

Education and Outreach Activities

Arizona Project WET (Water Education for Teachers)

Description and objectives:

- Water education is a priority of the WAC.
- *“Arizona Project WET is a program of the University of Arizona’s Water Resource Center. Project WET Water Education for Teachers is all about WATER! The curriculum covers the properties of water, the water cycle, watersheds, groundwater, water quality, water rights, as well as an understanding of the importance of water to all users”* (from website <http://cals.arizona.edu/arizonawet/>)
- Support Make-a-Splash Water festivals and other forms of water education in the schools of Yavapai County.
- The curriculum is correlated to the Arizona State standards at all grade levels, K-12, and in all curricular areas including Science, Language Arts, Social Studies and Math.

Value to WAC:

Promote water awareness throughout the community through efforts in schools. Correlated to Arizona State education standards.

Deliverable(s)

- Education programs in Yavapai County schools
- Training of teachers and facilitators
- Education materials

Who:

- University of Arizona - Arizona Project WET staff
- ADWR staff
- Participating educators
- Coordinator, TAC

Other Comments:

This program will continue in Yavapai County in 2008.

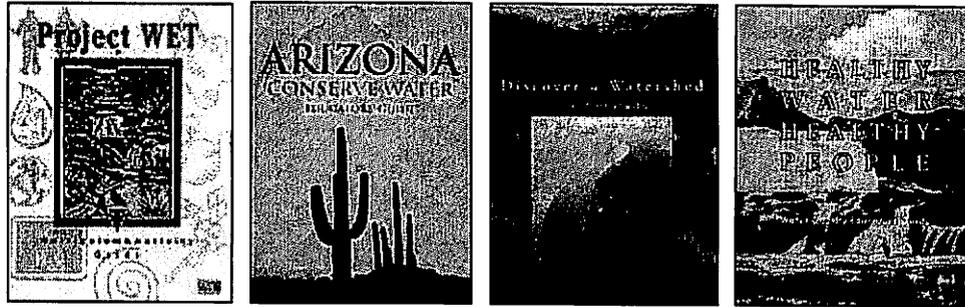


Figure 12: Examples of Project WET curriculum guides. From left to right: *The Project WET Curriculum and Activity Guide*, *Arizona Conserve Water Educators Guide*, *Discover a Watershed: The Colorado Educators' Guide*, and *Health Water Healthy People Water Quality Educators Guide* (<http://cals.arizona.edu/arizonawet/>)

Water Conservation and Efficiency

Although education and outreach are critical components of the water conservation priority, this activity is described above in the “management” section.

Website

Yavapai County has and continues to host a website for the Water Advisory Committee (<http://www.co.yavapai.az.us/Content.aspx?id=20562>). The site has a summary of the Committee, major reports, meeting agendas, attachments, and copies of visual presentations.

Coordinator Appearances and meeting attendance

Over the year, the WAC coordinator made several appearances on behalf of the WAC. The primary purpose was to describe the Committee, its mission and the work with which it is involved. The coordinator attended numerous meetings and conferences in 2007.

Speakers at WAC meetings

An element of the WAC agenda is presentations and discussions on topics relevant to water science and management in Yavapai County. These

presentations help the Committee and public understand the status and relevance of projects, explore potential programs and measures, and understand management alternative, and recent science results. Over the course of the year, the WAC heard from scientists and managers including:

- Project WET (Kerry Schwartz, Project WET Director)
- Digital Hydrogeologic Framework Model of the Upper Verde River Headwaters (Northern Arizona University, Matt Fry and Abe Springer)
- Habitat Conservation Plans (US Fish and Wildlife Service, John Nystedt and Brenda Smith)
- Appraisal Level Water Resource Investigations (Leslie Meyers, US Bureau of Reclamation)
- Chino Valley Water Resource Plans (Mark Holmes, Town of Chino Valley)
- Scenario Development and Growth Modeling (Hoyt Johnson III, H3J Consulting)
- Conservation Easements and Purchase of Development Rights (Dan Campbell, The Nature Conservancy)
- Regular Project Updates (e.g. Coordinator reports)

Organizational Structure Change: Seat County Board of Supervisors on Committee:

In December of 2007, the WAC structure was modified to allow the Board of Supervisors to be seated on the Committee. This was accomplished through an amendment to the County Resolution establishing the WAC. The amended County Resolution, #1661, is attached as Appendix A. The intent of the change was to bring the Board of Supervisors closer to the discussions of the WAC and facilitate their involvement in the WAC's consensus process. The amendment was intended to keep as much of the operational details of the WAC the same as before the amendment.

Legislative Updates:

Water Advisory Committee members, such as the ADWR, provided the WAC with regular updates of Legislative activities throughout the session.

Of particular interest to the Committee is legislation that passed regarding assured and adequate water supply rules (SB 1575). This law allows counties, cities and towns to require new subdivisions that are located outside an Active Management Area (AMA) to have an adequate water supply in order for the proposed development to be approved. The Rulemaking proceedings at the ADWR have begun for this legislation, and will continue in 2008. Details water regulations can be found at the ADWR web site (<http://www.azwater.gov/dwr/>). Details of the rulemaking process, such as policy statements are also available at the ADWR website

The following is a summary of the water related legislation of 48th State Legislatures' 1st Legislative Session (2007) provided by the Arizona Department of Water Resources:

ADWR LEGISLATION

HB 2485 (well water; Colorado River water)

Primary Sponsor: Representative Mason

Summary: Makes technical changes that prevent the NOI fee provisions in statute from being repealed when the Secretary of Interior issues final regulations for administering entitlements to the Colorado River water in the lower Colorado River basin.

Final Disposition: Signed by Governor on 4/18/07 – Laws 2007, Chapter 91.

HB 2488 (drought emergency groundwater transfers)

Primary Sponsor: Representative Mason

Summary: An annual session law that allows limited transfers of groundwater across basins during drought emergencies, requires approval of the Director.

Final Disposition: Signed by Governor on 4/1/07 – Laws 2007, Chapter 149.

HJR 2001 (Lower Colorado basin; forbearance authority)

Primary Sponsor: House Speaker Jim Weiers

Summary: Resolution giving the Director approval to enter into forbearance agreements on behalf of the State for improving Arizona's position for receiving allocations from the Colorado River in times of shortage.

Final Disposition: Enacted without signature on 3/10/07.

SB 1182 (Summerhaven fire; assured water supply)

Primary Sponsor: Senate President Bee

Summary: Provides a limited waiver of ADWR's assured water supply requirements in order for the Summerhaven community to rebuild in the aftermath of the Aspen Fire.

Final Disposition: Signed by Governor on 4/16/07 – Laws 2007, Chapter 51.

SB 1557 (water; municipal conservation requirements)

Primary Sponsor: Senator Flake

Summary: Modifies ADWR's Non-Per Capita Per Day Program.

Final Disposition: Signed by Governor on 4/24/07 – Laws 2007, Chapter 139.

SWAG LEGISLATION

HB 2693 (water provisions; adequacy)

Primary Sponsor: Representative Mason

Summary: Allows counties, cities and towns to require new subdivisions that are located outside of an Active Management Area (AMA) to have an adequate water supply in order for the proposed development to be approved.

Final Disposition: SB 1575 was substituted for this measure on House 3rd Read on 5/30/07.

SB 1575 (water adequacy amendments)

Primary Sponsor: Senator Arzberger.

Summary: Identical to HB 2693.

Final Disposition: Signed by Governor on 6/4/07 – Laws 2007, Chapter 240.

HB 2692 (water supply development revolving fund)

Primary Sponsor: Representative Mason

Summary: Establishes the Water Supply Development Fund to provide financial assistance for water supply development projects.

Final Disposition: Signed by Governor on 5/24/07 – Laws 2007, Chapter 226.

HB 2484 (contamination; well impacts)

Primary Sponsor: Representative Mason

Summary: Authorizes the Director of ADWR to prohibit the drilling of a new well if it will likely result in the migration of contaminated groundwater to both exempt and nonexempt wells statewide.

Final Disposition: Signed by Governor on 5/14/07 – Laws 2007, Chapter 209.

HB 2300 (water district; Upper San Pedro)

Primary Sponsor: Representative Burns

Summary: Establishes an organizing committee to prepare organization, financial, comprehensive and election plans for a special water district for the Upper San Pedro Groundwater Basin. District formation, taxing authority, and Board of Directors positions shall be put to a vote of qualified electors in the District.

Final Disposition: Signed by Governor on 6/20/07 – Laws 2007, Chapter 252.

OTHER WATER RELATED LEGISLATION

HB 2321 (adequate water supply; city designation)

Primary Sponsor: Representative McClain

Summary: Allows Bullhead City to use its Colorado River allocation to directly serve municipal water users.

Final Disposition: Signed by Governor on 4/16/07 – Laws 2007, Chapter 75.

SB 1312 (water storage permits; notice requirements)

Primary Sponsor: Senator Flake

Summary: Requires ADWR to post notice on its website when an application is received for an underground storage facility permit.

Final Disposition: Signed by Governor on 5/1/07 – Laws 2007, Chapter 161.

SB 1570 (Arizona water settlement act)

Primary Sponsor: Senator Arzberger

Summary: Amends the conditional enactment criteria related to the Arizona Water Settlements Act adopted by the Arizona Legislature in 2005 (Laws 2005, Chapter 143). The effect of this legislation is separation of the GRIC Settlement from the Tohono O’Odham Settlement so that they may continue independent of each other. There is no substantive policy proposed in this legislation.

Final Disposition: Signed by Governor on 6/14/07 – Laws 2007, Chapter 249. *Also see SB 1218, which made a technical correction to this legislation.*

BUDGET LEGISLATION

HB 2781 (general appropriations; 2007-2008; 2008-2009)

Primary Sponsor: Representative Boone

Summary: This is the general appropriation legislation.

Final Disposition: Signed by Governor on 6/25/07 – Laws 2007, Chapter 255.

Projects and Agenda for 2008

The following is a list of 2008 priority projects of the Water Advisory Committee.

Central Yavapai Highlands Water Resource Management Study (CYHWRMS) (USBR, ADWR):

Conduct the first year activities of the Appraisal Level Study

Activity summary:

- Begin tasks outlined in Plan of Study. Bring data and provide input
- The Plan of Study contains background and a schedule (schedule below). The schedule and cost estimate represent a very high level of stakeholder input and involvement. In other words this will require active involvement from Coordinator, TAC and WAC and should be recognized as a major commitment. (The tasks, schedule, and cost allowance for this project are included in Appendix C)

Funding:

- Cost Share Agreement (50-50 cost share; combination of in-kind services and WAC funds not to exceed \$300,000 over three year life of project).
- Staff time

Benefit to WAC:

- Regional Planning and Management Study
- Document our knowledge on the resource, the demands, and alternatives for meeting long term needs.

Northern Arizona Regional Groundwater Model (USGS, ADWR): Model Runs/ Scenarios/Interpretation

Activity summary:

- Understand the model via presentations and summary reports
- Keep involved with refinements
- Produce additional scenarios
- Interpret results
- Understand model abilities and limitations, put in context w/other models
- Plan for future models/runs

Funding:

- Cost share by USGS \$40,000 for FY 2008.
- Staff time

Benefit to WAC:

- Water Budgets
- Existing and future conditions
- Predictive capabilities
- Identification of knowledge limitations
- Data gaps and science needs

Water budgets, data gaps, continued data collection (USGS, ADWR)

This includes recently funded gages, stable isotopes, and continuous well monitoring. (Also, includes potential for other monitoring work as could be identified and coordinated with other groups)

Activity summary:

- Apply data sets to groundwater model
- Develop statistically significant (Long-term) records for key parameters
- WAC Education (e.g. start with a map, describe value, etc)
- Coordinate with other monitoring assessments and projects
- Consider other watersheds (e.g. Agua Fria)

Funding:

- WAC \$50,000; matched with USGS funds (\$40,000) for groundwater model development work.
- Staff time

Benefit to WAC:

- Develop accurate data records;
- Water budgets;
- Use in model;
- Provide empirical basis to answer management questions.

Long-Term Growth and Water-Use Scenario Development (H3J Consulting)

Activities summary:

- Complete water-use scenario for USGS regional groundwater model.
- Use as a basis for additional growth scenarios. Identify next steps.
- Make available to County and others for other uses (e.g. other types of planning)

Funding:

- Contractor payment of \$5,000 remaining.
- Staff time

Benefit to WAC:

- Develop water-use scenario for application in USGS regional flow model.
- Gain an understanding of potential growth areas, and associated future water use values.
- Provide baseline for development of other scenarios.
- Use in Phase I of Central Yavapai Highlands Water Resource Management Study.

Verde Valley Surface Flow Model – Phase I: Geospatial Database (Northern Arizona University)

Activities summary:

- Complete Phase I. Finish assembling data into a central, geo-referenced database.

- Prepare a geo-referenced conceptual surface-water model
- Research and review existing available hydrologic and hydraulic modeling software and make recommendations for the TAC's consideration.
- Examine Phase II requirements

Funding:

- Outstanding balance of \$17,171 to be transferred to NAU
- Staff time

Benefit to WAC

- This work begins a multi-phased approach to a basic understanding of, and gaining predictive capabilities regarding the Verde Valley surface water system.
- Assembles and organizes data into a central location for reference
- This is one step towards a model of the system that can be used to predict outcomes of various management alternatives.

Education (Arizona Project WET K-12 Education, and Adult Education through University of Arizona Yavapai County Cooperative Extension)

Activity summary:

- Hire person for Program Coordinator position to be housed at Yavapai County Extension office
- Implement existing programs County-wide
- Receive Program review and update

Funding:

- WAC has budgeted for partial funding of the position:
 - FY 2008 \$11,750 (Jan – June 2008)
 - FY 2009 \$23,500 (July '08 – June '09)
 - FY 2010 \$23,500 (July '09 – June '10)
- Cost Share with County Extension (U of A) and ADWR

Benefits to WAC:

- Jointly funded local contact for water education efforts in Yavapai County.
- Continuation of Project WET program and the Cooperative Extension water education program.

Conservation (Coordinate with other groups, follow up on recommendations)

Activities summary:

- TAC evaluation / Assess WAC's role in regional conservation
- WAC Recommendations to County – follow up
- Coordinate with others organizations
- Water Festival(s)

Funding:

- \$2,000 budgeted for a water festival committed.

- No other funding committed at this. Possibility of funding printing conservation booklet that results from survey
- Staff time

Benefits to the WAC:

- Objective of conservation has been priority
- Associated with Appraisal Level Study (CYHWRMS)
- Potential area of policy-setting

Other Watersheds in Yavapai County - Needs assessments of other County Watersheds (in addition to the Verde River watershed are identified as a priority item for 2008 (Agua Fria, Bill Williams, and Hassayampa).

Legislation – The WAC will continue to receive regular legislative updates in 2008. The WAC will discuss and possibly react as a group to particular legislation; however, most action regarding legislation will be taken by the individual members rather than the Committee as a whole. In addition to tracking by the ADWR (www.azwater.gov), legislative summaries can also be found at the Arizona Municipal Water Users Association website (<http://www.amwua.org/>).

Issue Papers – The WAC will benefit from summaries of issues and interpretation of science. The TAC will be tasked with preparing issue papers and recommendations on relevant subjects.

Outreach – The WAC and TAC members and the Coordinator recognize the importance of communication with the public, town and city councils, and etc in order to inform and gain approval of WAC plans and activities. The WAC website will be evaluated and improved where practical.

Liaison with other organizations and keep apprised of current events – It is a high priority to coordinate with other organizations in appropriate ways that serve the WAC goals and mission. Additionally, the WAC will stay apprised of other activities in the County through regular updates. The Members, Coordinator and TAC members will attend meetings and conferences and report to the Committee as appropriate.

Education – The WAC will educate itself (and public in attendance at meetings) through speakers at meetings, issue papers, and other means. The purpose of such education is to create the ability to understand science results and alternatives for managing the water resources of their jurisdictions and the County.

2008 Budget - The total projected expenses for 2008 *fiscal year* equal about \$314,000. In 2008, the Water Advisory Committee will continue to work within its budget in order to accomplish priority tasks and positively progress towards accomplishing the mission.

Appendix A

Yavapai County Resolution 1661

RESOLUTION NO. 1661

AMENDING RESOLUTION NO. 1425, WHICH AMENDED RESOLUTION NO. 1347, WHICH AMENDED RESOLUTION NO. 1163 ESTABLISHING THE YAVAPAI COUNTY WATER ADVISORY COMMITTEE AND RESOLUTION

WHEREAS, the Board of Supervisors ("Board") is authorized under the general powers found in A.R.S. 11-251 to establish advisory committees; and

WHEREAS, a need exists in Yavapai County for a coordinated effort to deal with water issues that are of a regional nature; and

WHEREAS, the cities and towns of Yavapai County, along with private water-related organizations have expressed interest in the County acting as the facilitator for coordinated efforts related to regional water issues; and

WHEREAS, the Board of Supervisors has agreed to act as the facilitator for this coordinated effort.

NOW, THEREFORE, BE IT RESOLVED THAT:

- (1) The Yavapai County Water Advisory Committee ("Committee") is established, with the mission of the committee to be the review of information on water issues of a regional nature and recommend water management strategies.
- (2) The Committee shall meet on a regular basis to review information on regional water issues. The Committee shall be responsible for determining the issues and the priority of the issues it will consider. Any conclusions reached by the Committee regarding such issues shall be accomplished by consensus rather than voting. Consensus will be reached when no members present at the meeting have an objection. The Committee shall be subject to the provisions of the Arizona Open Meeting Law, and all records received by or generated from the Committee shall be public except to - the extent that such records may be deemed confidential pursuant to applicable statutes
- (3) Membership on the Committee shall consist of the three Yavapai County Supervisors, one representative from each of the incorporated cities and towns in the County, one representative from each of the two Native American tribes in the County, and the Director of the Arizona Department of Water Resources or their designee. Members shall serve until replaced by the entity they represent. Appointments to the Committee shall be

accompanied by official written notification of such to the Committee from the member entity. Notwithstanding the above stated ability for each member entity to replace their representative at any time, terms of representatives shall be two years. Unless official written notice of replacement is provided to the Committee upon completion of a term, the representatives' term shall be deemed automatically renewed. Appointments will not be subject to term limitations. The Committee may maintain a list of alternates who from time to time may sit in place of the appointed representative.

- (4) The Committee may establish policies and procedures for positions of Committee Chair, Vice-Chair, and Secretary.
- (5) The Committee shall have the authority to establish subcommittees, as it deems appropriate, and may use such technical and legal resources as may be necessary subject to available funds. Subcommittees established by the Committee shall be subject to the provisions of the Arizona Open Meeting Law, and all records received by or generated from the Committee shall be public except to the extent that such records may be deemed confidential pursuant to applicable statutes.
- (6) Funding to support the activities of the Water Advisory Committee is provided by the member entities. With the exception of the Arizona Department of Water Resources, each entity contributes their own funds based on population in the amount set forth in the Contribution Schedule established by the applicable Intergovernmental Agreement between the member parties.
- (7) Staffing for the Committee with regard to the posting of agendas, taking of minutes, and keeping of official records shall be provided by the Board of Supervisors through Clerk of the Board or their designee.
- (8) The Board of Supervisors shall have the authority to suspend or dissolve the Committee if it deems such action to be appropriate.

APPROVED AND ADOPTED this 3rd day of December 2007.

Chairman, Board of Supervisors

ATTEST:

Clerk, Board of Supervisors

Appendix B

February 2007 WAC Priority List

WAC Priority Projects – 2007 (February, 2007 List)

Science:

U.S. Geological Survey Northern Arizona Regional Groundwater Flow Model

Hoyt Johnson, scenario development (for use in model)

Verde Valley Surface Water Study (scoping phase)

Persistent Chemicals (rework proposal)

Other data gaps (e.g. water budget related (gages, wells))

Other watersheds: identify needs and opportunities

Other: (e.g. “information-transfer as needed”)

Management

Conservation

Updated WAC Report [Coordinator/Conservation Subcommittee]
Coordination with other groups (ADWR, UVRWPC, Reclamation)

Management Comparison/Options Report

Pilot Management Project (work with Clarkdale)

Legislation

“Questions” Document (what we know; what we recommend)

Local Drought Impact Group (LDIG)

Education and Outreach

Project WET in Yavapai County (cost share with ADWR)

Water festivals

Outreach/Education subcommittee activities (newsletter, website, water quality, etc)

Reports to Councils and Supervisors

Database/Clearing House for water resource studies, data, “information”

Liaison with other groups and track of other projects (i.e. NAMWUA, Coconino WAC, Coalition, Partnership, Agua Fria Partnership)

Appendix C

List of Tasks and Schedule Central Yavapai Highlands Water Resource Management Study (CYHWRMS - Appraisal Level Study)

CYHWRMS Appraisal Level Study Tasks:

Phase I (5 months, allowance \$75,000)

1. Study Area
 - a. Define Area
 - b. Develop list of water providers
2. Water Demand (evaluated for each water provider)
 - a. Present Population
 - b. Future Population
 - c. Present Water Demands
 - d. Present Water Resources (source and amount)
 - e. Future Demands

Question: Are there demands that will be unmet in 2050? Where? How much?

Phase II (9 months, allowance \$200,000)

1. Water Supply Assessment (in addition to present water resources)
 - a. Surface Water
 - b. Ground Water
 - c. Reuse
 - d. Conservation
 - e. Other

Phase III (16 months, allowance \$250,000)

1. Alternative Formulation
2. Alternative Analysis
 - a. Environmental
 - b. Economic
 - c. Legal and Institutional
3. Alternative Evaluation
 - a. Completeness
 - b. Effectiveness
 - c. Efficiency
 - d. Acceptability

Question: Is there at least one alternative that can meet the unmet demands?

Question: Is there a Federal Interest in the identified alternatives?

Phase IV (6 months, allowance \$75,000)

1. Final Report Formulation
 - a. Draft Report Development
 - i. Draft Review and comment
 - b. Final Report Development
 - i. Review and comment
 - c. Publish Final Report