



## December 2009 Newsletter

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### **Viewpoint: The Electrical Nature of Water**

For a molecule that is only slightly dipolar, water can sure suck up a lot of electrical power.

Water and electricity have been inextricably intertwined in Arizona since before statehood. The creation of the Salt River Project was the first formal linkage on a large scale, as electricity was sold—almost as an afterthought—to help defray the costs of the irrigation water. The power generation side of SRP long ago became huge, but the concept of electrical generation supporting water deliveries continues.

After World War II the prevalence of cheap electricity enabled the pumping of groundwater, and farmers had hundreds of deep wells drilled as Arizona agriculture expanded. The resulting drop in water levels led eventually to the Groundwater Management Act of 1980. The costs didn't matter then. Now municipal providers and others find that the biggest portion of their budget to operate their wells goes into electricity.

When the Central Arizona Project canal was built, the Navajo Generating Station at Page was constructed to provide power to move the CAP water, and also to help defray the costs of the project by selling excess electricity on the western grid. It takes a lot of power to move water. At the time the Navajo plant was an environmental compromise to avoid an additional dam on the Colorado River. Now the plant is seen as an environmental liability, and its closure is sought. If it closes, the lack of power from this plant will mean that CAP will have to compete for power on the grid, which will raise the cost of CAP water sharply, and the extra money to pay for the canal will disappear.

You cannot pump water without power, and you cannot produce electricity (except with wind) without water. Increasingly water is in short supply. In the current ADD Water process underway at CAP, distant water sources may be purchased to be moved through the canal, but the cost of this water likely will be many times the cost of the current allocated supply. Likewise, the additional power needed to move the water is increasingly in short supply, and the cost of future electricity will be huge. In an ever ascending spiral, the cost of the water to generate the electricity is boosted by the cost of the electricity to move the water, leaving less of both for the ultimate end user. The list of those who can afford either may be very short. As cheap water and cheap electricity were the factors that helped fuel the Arizona boom in the last century, expensive water and expensive power are beginning to look like the factors that limit any economic expansion in this century.

As water resources professionals, we should all stay alert for the policy issues which are certain to arise as decision-makers begin to grasp the implications of the spiraling costs of water and electricity, and just how closely the two are intertwined.

Alan Dulaney,

## Membership Renewal Notice

We remind our current and past members, that it is that time again to renew your membership.

If you attended the 2009 Symposium, or renewed your membership after the Symposium, your membership extends through the end of 2010. Otherwise, your membership expires at the end of December 2009.

To renew your membership you can either:

1) Renew Online: Regular Membership (\$45)  
Student Membership (\$15)

2) Download our Renewal Form, and either:

a) Fax to (866) 931-3134

b) Mail to :  
Arizona Hydrological Society  
3317 S. Higley Road  
Suite 114-120  
Gilbert, Arizona 85297

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## Phoenix Chapter

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### December Dinner Meeting

Our next dinner meeting will be held Tuesday, December 15th at the SunUp Brewhouse (formerly Sonora Brewhouse) near 3rd Street east of Central Avenue on Camelback Road in Phoenix. Our speakers will be Lucius Kyyitan and Brian Bennon of GRIC Office of Water Rights.

Please join us Tuesday, Dec. 15th at the Sun Up Brewhouse in Phoenix to have a beverage, share business cards, and talk water. It's just a short walk from the light rail station too.

- Location:** Sun Up Brewing Co. and Brewhouse  
(Formerly Sonora Brewhouse)  
322 E Camelback Rd  
Phoenix, AZ 85012
- Event:** "The Culture and Hydrology of the Gila River Indian Community"  
by Lucius Kyyitan, Director, and Brian Bennon, Hydrologist,  
of GRIC Office of Water Rights
- Chapter Board Meeting:** 4:30 PM – 5:30 PM
- Happy Hour & Dinner:** 5:30 PM – 7:00 PM

**Presentation:** 7:00 PM – 8:00 PM  
**Cost:** \$15 member, \$20 non-member, \$5 student

RSVP with Kirk Creswick at [kcreswick@eecphx.com](mailto:kcreswick@eecphx.com) or 602-248-7702.

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### **November Meeting Summary**

The Phoenix Chapter would like to thank [Tim Bray](#) from the Central Arizona Water Conservation District for joining us at our November dinner meeting.

Tim is a member of the Central Arizona Water Conservation District board of 15 directors who serve for a six-year term to give policy and direction to the Central Arizona Project (CAP). He also presently serves as Chairman of the Central Arizona Groundwater Replenishment District (CAGRDR) sub-committee of the Central Arizona Project.

In 1922 the seven basin states decided how to divide up Colorado River water. This agreement was signed when the flow in the Colorado River was extremely high. In 1964 a court case got the CAP started. Lyndon B. Johnson signed off on the CAP in 1968. In 1980 the Secretary of the Interior required that Arizona adopt a Groundwater code before the federal government would complete construction of the CAP. In 1980 Arizona adopted the groundwater management act and formed the Active Management Areas (AMAs). The CAGRDR was formed in 1993. Its mission is to replenish the groundwater where there has been overdraft and prevent earth fissures.

Areas distant from the CAP canal can also become members of the CAGRDR. Membership in the CAGRDR provides an assured water supply. It is allowable to recharge in a different section of the Phoenix AMA. It has not yet been answered whether some areas suffer due to lack of money.

There are 342,000 residential members of the CAGRDR up through September 2009. The CAGRDR has initiated acquisition of new water supplies to meet its replenishment obligations for these residential units.

The Navajo Generating Station provides 95% of the power to the CAP. SRP is also a partial owner. EPA will soon require scrubbers that would cost \$600M - \$1B to implement. This would cause our water costs to triple. The CAGRDR is very concerned about that. They are trying to convince the EPA to use a less expensive solution. The CAP delivers 1.5 MAF/year. CAP is seeking new water supplies to meet future obligations of the CAGRDR and other municipal water providers.

There is a group of interested parties found at <http://www.projectaddwater.com>. AHS members, Brian Bennon (of the Gila River Indian Community) and Alan Dulaney (of the City of Peoria) are involved with this group as well.

No doubt, our water will be more expensive in the coming years, but new technology such as desalinization will provide additional water supplies to Arizona. We will continue to manage on an AMA-wide basis. We need to acquire water now and spread the cost over new members. This is not a perfect solution. There will be a lag time on fees. The overall objective is to provide water to all customers in the three county area serviced by the CAP.

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### **2010 Chapter Election Results**

Thanks to all who participated in our election. Our new board members are eager to get started. The new Phoenix Chapter board is:

#### **2010 Phoenix Chapter Board**

President	Mike Hulst, EEC
Vice President	Keith Ross, HydroGeo Chem

Treasurer	Kirk Creswick, EEC
Secretary	Jolene Tallsalt Robertson, Navajo Nation
Chapter Board	Tom Walker, Fleet-Fisher Engineering
Chapter Board	Angela Bond, Salt River Project
Corporate Board	Alan Dulaney, City of Peoria
Corporate Board	Beth Proffitt, Columbia Analytical Services

(Also continuing for 2<sup>nd</sup> year of 2-year term Corporate member – Lee-Anna Walker, Arcadis)

Our new board will be meeting with the old board on December 8th at EEC to orient new board members and those new to their offices with the duties of each office and begin planning for Chapter activities for 2010. Out-going Chapter President, Ted Lehman, would like to thank all the new board members and especially Mike Hulst of EEC for taking over as Chapter President and hosting this first-in-some-time new officer orientation meeting at the offices of EEC.

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### **2012 Symposium Planning Begins**

In the wake of the conclusion of the 2009 Symposium, the Phoenix Chapter has already begun thinking about and planning for 2012. Christie O'Day, Ted Lehman, and Mike Hulst have already begun exploring possible venues. If you are interested in helping them with the early stages of the planning for 2012, please contact Ted Lehman at [ted@jefuller.com](mailto:ted@jefuller.com) or 480-222-5709.

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### **Brown Bag Water Speaker Series**

**Date:** January 20, 2009  
Noon - 1:30 PM

**Speaker :** Jim Field, "Nanoparticle Interaction with Biological Wastewater Treatment Processes"

**Presentation:** "Water in the Sustainable Landscape"

**Location:** The University of Arizona Cooperative Extension,  
Maricopa County, Palo Verde Room at  
4341 E. Broadway, Phoenix.

Free and open to the public. Bring your lunch. There will be time for questions and answers. Please RSVP to Nancy Crocker at 602-827-8200 ext. 335 or [NCrocker@cals.arizona.edu](mailto:NCrocker@cals.arizona.edu).

Future Brown Bag WSS Events can be found on this [Calendar](#).

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### **Event Calendar (you may also see AHS calendar events at <http://www.azhydrosoc.org>)**

- December 15th – Lucius Kyyitan and Brian Bennon of GRIC Office of Water Rights
- December 19th –Arizona Modeling Community Group Meeting
- January – 2010 chapter kickoff meeting, TBD
- April 6th - AHS/AEG Student Night - ASU Memorial Union

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### **December Meeting Announcement**

The December chapter meeting was held on Tuesday December 8, 2009.

**Location:** Offices of Montgomery and Associates, Inc  
1550 E Prince Rd  
Tucson, AZ 85719

**Event:** Erik Pytlak, National Oceanic and Atmospheric Administration

**Social half-hour :** 6:00 PM

**Presentation:** 6:30 PM

**Abstract:** **Seasonal Weather Forecasting – El Niño and Monsoons, 2009.**

This seminar will focus on seasonal weather forecasting, with emphasis on the ongoing El Niño and potential impacts for southern Arizona. A new effort by NOAA to improve seasonal monsoon forecasts, The North American Monsoon Experiment, will also be discussed in relation to the 2009 monsoon season.

**Biography:** Erik Pytlak is the Science and Operations Officer for the National Weather Service (NWS) in Tucson, AZ. Since coming to Tucson in 1998, he has been heavily involved in improving monsoon weather forecasting science, and sharing those advances with weather forecasters and key decision makers outside the NWS. Erik earned his meteorology degree from Penn State University, and also holds a Masters Degree in Public Administration from the University of Arizona.

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### **January Meeting Announcement**

The first chapter meeting in 2010 will be held on Tuesday January 12th.

Speaker and Topic: To Be Announced

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### **November Meeting Summary**

- Marla Odom, Tucson Chapter Secretary, Montgomery & Associates

On November 10th, the Tucson Chapter hosted a meeting at the offices of Montgomery and Associates with 24 members in attendance. The meeting presenter was Warren Tenney, Assistant General Manager of Metropolitan Water District and member of the Central Arizona Water Replenishment District (CAWCD) Board of Directors. He presented a talk titled "Water – Is it wet enough?"

Mr. Tenney focused on 3 major functions of the CAWCD: Power, Water Supply, and the Central Arizona Groundwater Replenishment District (CAGRCD).

One of the current problems facing CAWCD is confronting issues related to climate change, such as how climate change will affect the Colorado River Watershed, and the need to “reset” what we consider normal climactic conditions for the Colorado River Watershed. As such, estimates of the volume of water available for long term use should be revised based on this re-evaluation of the climate of the Colorado River Watershed.

CAWCD is also facing issues regarding the Navajo Generating Station. It takes approximately 2.8 million megawatt hours of electrical energy each year to move 1.6 million acre-feet of water uphill through the Central Arizona Project (CAP) canal. About 95% of this energy comes from the Navajo Generating Station near Page, and 5% comes from Hoover Dam. The Colorado River Basin Project Act authorized the US to participate in a coal-fired power plant to provide the power for CAP pumping as an alternative to additional dams on the River (the Udall Compromise). Nearby Hopi lands have plenty of coal, and the US government owns 24.3% of the plant. CAP uses 2.8 of its allocated 4.3 million megawatt hours, and some power is also sold to help pay for CAP.

There are visibility concerns for the Grand Canyon and other parks as a result of the proximity of the coal-fired. NGS is the only plant to have controls installed exclusively for visibility concerns. NGS is voluntarily installing low nitrogen oxide controls. Mr. Tenney described the two processes under consideration and the pros and cons of each. The worst case scenario is that depending on the method, costs might make NGS economically unviable, which could lead to increased fees for CAP water users to pay for power generation. Preliminary calculations from ongoing studies indicate that replacing power and revenues from NGS would require that CAP double or triple rates to customers. This could translate to \$15.6 million dollars per year to get water to Tucson via the CAP canal. The current contract for NGS expires in 2011, and additionally, re-negotiations with the Navajo Nation for use of the site are scheduled for 2019.

Mr. Tenney then talked about water supply in general. The Colorado River system is currently over-allocated. Of the total river volume, 2.8 million acre-feet go to Arizona for the primary purposes of residential and agricultural use. Mr. Tenney described alternate methods being investigated for augmenting river water supply as well as compliance with the Endangered Species Act and how it ties in to CAP allocations.

Mr. Tenney talked briefly about the Drop 2 Storage Reservoir Site Plan. In the event of rain or other conditions that cancel CAP water orders, this reservoir sets up sites to store CAP water. He also talked about considerations for the Yuma desalination plant. Plans are to get the plant up and running at 10% capacity for a full year. They would like to potentially recapture up to 100,000 acre-feet per year back to the system. Additional water supply augmentation plans include looking at the potential use of desalinated ocean water from Puerto Peñasco transported via canal through Yuma.

Mr. Tenney reviewed the status of the **ADD Water (Acquisition, Development, and Distribution)** program set up to identify new sources of water. The ADD water program is a cooperative approach to avoid bidding wars over water, and to keep disputes over allocations out of court.

Mr. Tenney wrapped up his presentation by talking about the “Elephant in the Room” – that is, with the creation of the CAGR in 1983, participants pay an enrollment fee, an activation fee, and a fee on water usage each year. In return, CAGR must replenish somewhere in the AMA within 3 years. Assured water supply regulations require demonstration that you have a renewable supply of water. However, CAGR does not have to replenish at the site of use, causing concern for areas not close to the CAP canal or without a CAP allocation. There is also a large disconnect between replenishment locations and pumping centers.

The AHS Tucson Chapter extends a very warm thanks to Mr. Tenney for his informative presentation and dialogue afterward.

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## **2010 Chapter Election Results**

Congratulations to next year's Tucson Chapter officers!

President	Damien Gosch – Masters Student, Department of Hydrology

Vice President	Greg Hess – Clear Creek Associates
Treasurer	Dan Guido – M&A
Secretary	Shane Clark – Student, Watershed Hydrology and Management
Chapter Director	To be determined, but will be filled
Corporate Board	Marla Odom – M&A
Corporate Board	To be determined, but will be filled

Thanks so much to everybody who took the time to vote. We now have a strong slate of officers for next year!

### **2010 Symposium Planning Committee**

The second meeting of the planning committee for the Tucson AHS 2010 Symposium was held on Tuesday, November 17th, at the offices of Hadley and Aldrich. The meeting was a great success. We had good turnout, and are in the process of forming sub-committees. Highlights include:

- Theme: “Dryland Hydrology: Global Perspectives/Local Solutions”
- Partnership: The International Association of Hydrologists (IAH) has agreed to co-sponsor the symposium. (<http://www.iah.org/>)
- Symposium will be held from September 1st through 3rd, 2010
- Venue is the Westin La Paloma, near Sunrise and Swan

If you're interested in getting involved, it's not too late to get in on the ground floor! Come and join us for the **next meeting on Thursday, December 17th**, at 5:30 pm at the offices of Montgomery and Associates, 1550 E Prince Rd. DINNER AND REFRESHMENTS WILL BE SERVED.

### **WRRC Brown Bag Seminars**

#### **Biomimicry - Learning from Nature's Consummate Engineers**

**Speaker:** Mary Hansel, Sustainability Manager, Carollo Engineers, P.C., Portland, Oregon

**Date:** Friday, December 11th, 2009

**Time:** Noon to 1:30

Biomimicry is an old practice and an emerging discipline that studies and emulates nature's remarkably effective strategies to solve human challenges. This presentation will describe what biomimicry is and how it is being used to help solve water and other sustainability challenges. Biomimicry tools, practices and resources will also be described.

*All seminars and events are held at the Sol Resnick Conference Room, Water Resources Research Center, 350 N. Campbell Ave.*

**Information for additional seminars can be found on the WRRC web site:**

[www.cals.arizona.edu/azwater](http://www.cals.arizona.edu/azwater)

***All seminars and events are held at the Sol Resnick Conference Room, Water Resources Research Center, 350 N. Campbell Ave., Tucson, AZ***

## **Tucson HydroNews**

**Program will offer home water audits**

By Diane Saunders, *Eastern Arizona Courier*

Published on Wednesday, December 2, 2009 8:17 AM MST

Anyone who has wondered how to reduce water consumption may want to participate in a free water audit by the University of Arizona Cooperative Extension after Jan. 1.

The audits are part of the Cooperative Extension's Water Counts program, said Bill Brandau, director. Recommendations will be made at the conclusion of each audit. Following the recommendations, while not mandatory, will probably result in lower water usage — and lower water bills.

The audits, which will be performed by Lori Knight, involve reviewing water-use and other records on participating homes. The water meter and indoor and outdoor water pressures will be checked, and water lines and toilets will be examined for leaks.

<http://www.eacourier.com/articles/2009/12/06/news/doc4b1589bf0e3b1897836043.txt>

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## **Millions in U.S. Drink Dirty Water, Records Show**

By Charles Duhigg, *NY Times*  
Published: December 7, 2009

More than 20 percent of the nation's water treatment systems have violated key provisions of the Safe Drinking Water Act over the last five years, according to a New York Times analysis of federal data.

That law requires communities to deliver safe tap water to local residents. But since 2004, the water provided to more than 49 million people has contained illegal concentrations of chemicals like arsenic or radioactive substances like uranium, as well as dangerous bacteria often found in sewage.

[http://www.nytimes.com/2009/12/08/business/energy-environment/08water.html?\\_r=3&ref=us](http://www.nytimes.com/2009/12/08/business/energy-environment/08water.html?_r=3&ref=us)

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## **Paying for water with power**

Ryan Randazzo, *The Arizona Republic*  
Published: Nov. 28, 2009 06:40 PM

Salt River Project is the largest water supplier in the region, delivering the state's most precious resource from the Salt and Verde rivers to people in the Valley.

Delivering water, however, is not a lucrative business.

SRP lost more than \$33 million in its last fiscal year that ended in April providing water in the desert to farmers and the 10 cities across SRP territory.

That's the smallest loss in several years.

SRP has a financial crutch - electricity - that allows it to provide water for about one-fifth to one-third the actual cost, which benefits farmers and cities such as Phoenix that use the water.

Farmers and cities paid SRP \$14 million in water assessments in fiscal 2009, but it cost SRP \$47 million to deliver all the water. Electricity customers picked up the \$33 million difference.

<http://www.azcentral.com/business/articles/2009/11/28/20091128biz-srpwater1129.html>

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## **Tech firms work to reduce water, energy use**

by Andrew Johnson, *The Arizona Republic*  
Published: Nov. 25, 2009 12:00 AM

Sustainability, already a buzzword in the real-estate and construction industries, is getting more attention



from high-tech manufacturers.

Producers of computer components, radio equipment, solar panels and other high-tech equipment are among the world's largest resource users.

They eat up billions of gallons of water and kilowatt-hours of electricity to make semiconductors, display panels and other parts that make their way into millions of consumer electronics, appliances, industrial tools and automobiles.

<http://www.azcentral.com/business/articles/2009/11/25/20091125biz-manufacturing1125.html>

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### **Mesa weighs Tucson model to save water**

by Gary Nelson, *The Arizona Republic*  
Published: Nov. 13, 2009 12:00 AM

Assuming it ever rains again, Rodney Glassman thinks he has a partial answer for one of Arizona's most vexing long-term issues - water.

Actually, he has a couple of such answers, and he's eager to share them with anyone who will listen. On Monday, it will be Mesa's turn as Glassman makes a guest appearance during a City Council study session.

The Tucson councilman was the driving force behind his city's requirement that commercial buildings harvest rainwater and that homes use "gray water" plumbing.

While numerous governments, businesses and non-profits promote such measures, Tucson kicked it up a notch in September 2008 by making gray-water plumbing mandatory for new construction beginning next June.

"Tucson is the first city in the country to pass a mandatory rainwater-harvesting ordinance for new construction that actually quantifies the amount of savings that has to occur," said Glassman, 31, a Democrat who is exploring a run for U.S. Senate next year.

<http://www.azcentral.com/community/mesa/articles/2009/11/13/20091113rainwater1113.html>

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## **Flagstaff Chapter**

### **Next Regular Chapter Meeting**

The Flagstaff Chapter held its annual Holiday Dinner, on Wednesday, December 9, 6pm, at Picazzo's Restaurant on Milton in Flagstaff .

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### **Future Speaker Events**

Mark your calendars for the following presentations at NAU!

**Speaker:** Tim Scheibe, Darcy Lecturer of the National Ground Water Association,  
**Date:** Friday January 29, 12:30, either in Geology or Physical Sciences Room 103.

Stay tuned for location and title of talk, or contact Dr. Abe Springer at [Abe.Springer@nau.edu](mailto:Abe.Springer@nau.edu).

**Speaker:** Paul Marinos, 2010 Jahns Distinguished Lecturer of the Association of Environmental & Engineering Geologists and the Engineering Geology Division of the Geological Society of America

**Date:** March 5 at 12:30, location TBD

**Topic:** Geology of Athens, Greece: A case of urban geology for land use, construction of major engineering

structures, hazard assessment and sustainable development.

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### **2010 Flagstaff Chapter Election Results**

Congratulations to next year's Flagstaff Chapter officers!

President	Brad Hill
Vice President	Paul Whitefield
Treasurer	Dana Downs-Heimes
Secretary	Erin Young
Chapter Board Member At Large	Erin Young
Corporate Board Member	Brad Hill

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### **AHS Sponsors Arizona Modeling Community Group Meeting**

The meeting will be held on Thursday, December 17th, at 1:00 o'clock at the Arizona Department of Water Resources' Main office in the (the Verde Conference rooms). [Map](#)

This meeting will be an informal workshop talking about the implementation of the most recent SRV model and issues that arise from importing the model into a pre/post processor such as Groundwater Vistas or Visual MODFLOW.

Please contact Wesley Hipke (602-771-8560 or [wehipke@azwater.gov](mailto:wehipke@azwater.gov)) if you would like to attend.

AHS is sponsoring the next Arizona Modeling Community Group Meeting, by providing refreshments. Please RSVP with Wesley Hipke so we can provide sufficient refreshments.

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### **Recent jobs posted on AHS website**

Despite the recent high unemployment figures, we have been receiving and posting Hydrology related jobs on our website

- 1) Geologist, Hydro Geo Chem, Scottsdale, AZ.
- 2) Hydrogeologist, Montgomery & Associates, Santiago, Chile.
- 3) Water Resources, Advisor, City of Mesa, AZ.
- 4) Staff Geologist/Engineer, Terranext LLC

Details can be found on our website: <http://azhydrosoc.org/jobs.html>

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**For more information about the Arizona Hydrological Society, or to view current job listings and announcements, please visit our web site at:**

<http://www.azhydrosoc.org/>

Your membership may be renewed for 2010 by credit card through the AHS website or by mailing a check to the Arizona Hydrological Society, c/o Christie O'day, 3317 S. Higley Road, Suite #114, Box 120, Gilbert, Arizona 85297. Dues remain at \$45.00 year for regular membership and \$15.00 for students. Thank you all for a great 2009 and for your continuing support in 2010. For those who attended the 2009 Water Symposium, be reminded that membership dues for 2010 were included in the registration fee.