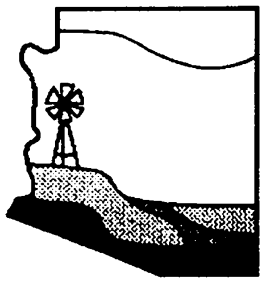
THE ARIZONA HYDROLOGICAL SOCIETY ~ December, 2007

NEWSLETTER



Viewpoint: Well, Well, Well

Thanks to Lori Cason and the hard-working NOI staff over at ADWR, we now have new information on well permitting activity for 2006 on our Website—click on "ADWR 2006 NOI Report" in the Members Only section. Lori prepared a detailed picture of NOI activity at ADWR for 2006, then broke it down by county, month, and well use. Wells and well behavior are critical to what groundwater hydrologists do, and critical to the water supply of Arizona. So it is interesting to see what the well numbers were for a year in which people still felt economically prosperous but were increasingly aware of drought and limitations on water supply, and what stories those numbers can tell.

Some 5,551 Notices of Intent to Drill (NOIDs) a well were filed with ADWR in 2006. This is neither high nor low, but pretty much in line with activity over the last several years. Another 1,245 Notices of Intent to Abandon (NOIAs) a well were filed, mostly by consultants closing down a remediated site. Wells have a usable lifespan, and at the end most people just quit using an old supply well. Unlike conscientious hydrological consultants, they never think about properly abandoning it. Or worse, they just throw plywood and dirt over it and walk away, leaving the hazard for the future. In an ideal world, every landowner with a disused well would hire a driller to grout it up, preventing trash and contaminants from going down the hole. Or animals, or children.

The second largest category by use was monitor/piezometer, some 1,046 wells. This is similar to the last four years, but way off from the glory years of environmental drilling in the 1990's. In 1995 over 2,800 NOIDs for monitor/piezometer wells were filed with ADWR, although not all of those wells were actually constructed. The 1990's saw the height of the LUST program at ADEQ, and Superfund sites were finally being investigated with vigor—when site characterization consumed almost every consultant and driller available,. Many consultants filed multiple NOIDs just to have an extra drilling authority in their back pocket in case they had to chase the contaminant plume a bit further, so the driller didn't have to demobilize (and hence disappear) while awaiting another well card. That approach evaporated in 2002 with the bump in NOI fees from $10 to $150—a long overdue increase that resulted in a fully funded and more efficient NOI unit at ADWR. Still, 1,046 NOIDs means that sites are still being investigated and groundwater contaminant plumes defined, that environmental consultants and drillers are still busy, and that ADEQ still fulfills the need to hold the responsible party's feet to the fire.

By far the majority of NOIDs were filed for domestic use wells, nearly 3,700 of them. This is lower than the 2005 number, but in line with the years before that. There is no indication here that people are drilling new or deepening old domestic wells because water levels are dropping. People are having domestic wells drilled to serve their usually rural properties.

Broken down by county, nearly one quarter (891)

CONTENTS

Viewpoint cont...

(Continued from page 1)

of the domestic wells were located in Yavapai County. This isn't a new trend. Yavapai County looks like Swiss cheese with all the holes in it. There are lots of possible explanations as to why every resident in Yavapai County wants a well, or two or three, on their parcel, despite the widespread occurrence of crystalline bedrock which limits where a well will be a successful producer. Twice as many stock wells are drilled in Yavapai County as in any other county. Even the goats want their own well.

Maricopa County had 632 NOIDs for domestic wells, which was expected. But Cochise (424) and Mohave (378) Counties both had far more domestic well applications than populous Pima County, with only 206 NOIDs. This could reflect the astounding growth rate in Cochise and Mohave Counties, where new housing went up in spectacular fashion in 2006. Navajo and Apache Counties came in with numbers in the same ball park as Pima County with nowhere near the population or growth. Something is happening in Pima County to hold down the number of new domestic wells—but I don't know what it is.

Broken down by county and use, the numbers tell a more predictable story for the Phoenix and Tucson areas. These two cities had most of Arizona's industrial facilities, and it is not surprising that the majority of environmentally-related wells are drilled in Maricopa and Pima Counties. Municipal wells were also more numerous, although just as many NOIDs were filed in Mohave County as in Pima County for municipal supply wells. Industrial/commercial wells were concentrated in Maricopa and Mohave Counties. Some 48 NOIDs for irrigation wells (out of 198 total) were filed from Maricopa County, but Cochise County accounted for 36, an unexpected uptick. Pima (18) and Pinal (17) Counties had half that number, but are usually considered more agricultural. I wonder what caused that uptick, what story lurks in those numbers.

There are a lot of stories buried in these numbers on our AHS Website—click on "ADWR 2006 NOI Report" in the Members Only section. I invite you to take a look for yourself, to spot your own trends, and to draw your own inferences. Thanks, ADWR, for all the numbers.

Alan Dulaney
President, AHS Corporate Board

How to visit the AHS Members Only area:

- Go to: www.azhydrosoc.org
- Located on the far right side of your screen click on Members Only
- Type in your username and password: Your username is the first initial of your first name and then your last name
(ie Flo Waters would be FWaters).
Your password is your zip code (that we have on file for you).

Once there you have access to documents that are not available on the public site.

REMEMBER you must be a currently paid member of AHS to have access.

TUCSON CHAPTER NEWS

Tucson Chapter Members, Please remember we had 2 Chapter meetings in November. There will not be a meeting in December. Happy Holiday's.

On November 6, 2007, author Laila Halaby spoke to the Tucson Chapter about her newest book "Once in a Promised Land". The book is the story of Jassim and Salwa, a Jordanian/Palestinian couple who moved to Arizona to pursue Jassim's career in hydrology, which becomes threatened by the paranoid sentiments of the nation right after the September 11th attacks on the World Trade Center and Pentagon.

Ms. Halaby described the thought process and research involved in creating Jassim's character, and her personal discovery regarding the science of hydrology. She described the eye-opening experience she had while attending a meeting regarding Muslim issues, and a speaker who stood up and educated the audience about his feeling that the most crucial world issue in the future was going to revolve around water supply. She then began to research the subject and incorporated many of the startling facts and figures she came across about global water supply into her book.

Ms. Halaby delighted the audience with readings from her book and answered questions about the writing process and her own continuing personal education in environmental issues. The AHS Tucson Chapter sold copies of "Once in a Promised Land", which Ms. Halaby signed and personalized.

In lieu of a December meeting, the Tucson Chapter of AHS sponsored a lecture by Bridget Scanlon at the University of Arizona. Her talk was titled "Impacts of Changing Land Use and Land Cover on Subsurface Water Resources", and is described as follows:

Most widespread changes in land use and land cover have occurred because of agricultural expansion. In the last 300 years, cultivated cropland has increased almost 70 fold in the U.S. and about 5 fold globally.

Total irrigated agriculture has doubled globally in the past 4 decades, and agricultural lands are projected to increase ~20% globally in the next 50 years. Irrigated agriculture accounts for about 70% of global water withdrawals and 90% of global water consumption.

This talk described how measurements of energy status, chemical composition of pore water above the water table (the vadose zone), groundwater levels, and groundwater quality provide an archive of system response to past land use/land cover changes. The presentation focused on the Texas Southern High Plains, which is one of the largest agricultural areas in the U.S. This region consists of 44% natural rangeland, 44% nonirrigated (rainfed) agriculture, 11% irrigated agriculture, and 1% other. Although irrigated land use represents only 11% of the area, it accounts for 94% of total water

Tucson Chapter Officers

President:
MARLA E ODOM
ERROL L MONTGOMERY & ASSOC INC
E-Mail: modom@elmontgomery.com

Vice President:
ROBERT MCGILL
HYDROGEOPHYSICS
E-Mail: rob@hydrogeophysics.com

Treasurer:
MIKE MAHAN
AZ GEOLOGICAL SURVEY
E-Mail: mike-mahan22@yahoo.com

Secretary:
DAN GUIDO
ERROL L MONTGOMERY & ASSOC INC.
E-Mail: dguido@elmontgomery.com

Student Representative:
AIDA ARIK
University of AZ
E-Mail aarik@hwr.arizona.edu

Corporate Board:

A MICHAEL GEDDIS
WATER MANAGEMENT CONSULTANTS INC
E-Mail: mgeddis@watermc.com

NICK B MELCHER
E-Mail: nickpaulame@msn.com

Tucson cont...

Could you put in a brief sentence re-iterating that we had a late November meeting in lieu of December?

On November 6, 2007, author Laila Halaby spoke to the Tucson Chapter about her newest book "Once in a Promised Land". The book is the story of Jassim and Salwa, a Jordanian/Palestinian couple who moved to Arizona to pursue Jassim's career in hydrology, which becomes threatened by the paranoid sentiments of the nation right after the September 11th attacks on the World Trade Center and Pentagon.

Ms. Halaby described the thought process and research involved in creating Jassim's character, and her personal discovery regarding the science of hydrology. She described the eye-opening experience she had while attending a meeting regarding Muslim issues, and a speaker who stood up and educated the audience about his feeling that the most crucial world issue in the future was going to revolve around water supply. She then began to research the subject and incorporated many of the startling facts and figures she came across about global water supply into her book.

Ms. Halaby delighted the audience with readings from her book and answered questions about the writing process and her own continuing personal education in environmental issues. The AHS Tucson Chapter sold copies of "Once in a Promised Land", which Ms. Halaby signed and personalized.

In lieu of a December meeting, the Tucson Chapter of AHS sponsored a lecture by Bridget Scanlon at the University of Arizona. Her talk was titled "Impacts of Changing Land Use and Land Cover on Subsurface Water Resources", and is described as follows:

Most widespread changes in land use and land cover have occurred because of agricultural expansion. In the last 300 years, cultivated cropland has increased almost 70 fold in the U.S. and about 5 fold globally.

Total irrigated agriculture has doubled globally in the past 4 decades, and agricultural lands are projected to increase ~20% globally in the next 50 years. Irrigated agriculture accounts for about 70% of global water withdrawals and 90% of global water consumption.

This talk described how measurements of energy status, chemical composition of pore water above the water table (the vadose zone), groundwater levels, and groundwater quality provide an archive of system response to past land use/land cover changes. The presentation focused on the Texas Southern High Plains, which is one of the largest agricultural areas in the U.S. This region consists of 44% natural rangeland, 44% nonirrigated (rain-fed) agriculture, 11% irrigated agriculture, and 1% other. Although irrigated land use represents only 11% of the area, it accounts for 94% of total water consumption.

Cultivation of rangelands has changed the system from discharging through evapotranspiration to recharging. Evidence of discharge (no recharge, upward water movement) under natural rangeland ecosystems includes upward hydraulic-head gradients, high chloride concentrations, and no change in groundwater levels over time. These natural rangelands have been discharging since Pleistocene times (~10,000 to 15,000 yr).

Recharge under rain-fed agricultural lands is shown by downward hydraulic-head gradients, high matric potentials, low chloride concentrations, and rising groundwater levels. Groundwater-level rises have ranged from 2 to 23 m and averaged 7 m over a 3,400-km2 area of predominantly rain-fed agriculture during the last few decades, indicating recharge rates from 5 to 50 mm/yr (median 21 mm/yr, 5% of precipitation). Change from discharge to recharge conditions reflects long fallow periods (~7 months/yr) associated with cultivation. Recharge under irrigated agricultural lands is shown by downward hydraulic-head gradients and high matric potentials. Low irrigation rates (0.3 to 0.6 m/yr) in this region result in accumulation of chloride and nitrate in shallow soils that may ultimately cause soil salinization. Large groundwater-level declines (as much as 75 m) under irrigated areas indicate that irrigated agriculture is not sustainable. Thick unsaturated zones under natural rangelands contain a reservoir of salts that are mobilized by recharge caused by cultivation, resulting in degradation of groundwater quality (for example, increased salinity, nitrate, and perchlorate). Results from land use/land cover changes in this region will be com-

(Continued on page 5)

Tucson cont...

(Continued from page 4)

pared with those from other regions globally.

Although past land-use changes had unintended impacts on the water cycle, a comprehensive understanding of these impacts could be used to alter land use/land cover for better management of water resources.
Further increases in water resources may be achieved through expansion of rain-fed agriculture with potentially minimal negative environmental impacts.

References

* Scanlon, B. R., R. C. Reedy, and J. A. Tachovsky. in press. Semiarid unsaturated zone chloride profiles: archives of past land-use change impacts on water resources. Water Resources Research.

* Scanlon, B. R., I. M. Jolly, M. Sophocleous, and L. Zhang. 2007. Global impacts of conversions from natural to agricultural ecosystems on water resources: Quantity versus quality. Water Resour. Res., 43, W03437, doi:10.1029/2006WR005486.

* Scanlon, B. R., R. C. Reedy, D. A. Stonestrom, D. E. Prudic, and K. F. Dennehy. 2005. Impact of land use and land cover change on groundwater recharge and quality in the southwestern USA. Global Change Biology 11:1577-1593.

2008 AHS Tucson Chapter Slate

President - Jeff Gawad
Vice President - Rob McGill
Secretary - Marla Odom
Treasurer - Mike Mahan
Chapter Director - Dan Guido
Corporate Board - Nick Melcher

Stanley Nelson Davis

Dr. Stanley Nelson Davis, 83, professor emeritus at the University of Arizona and internationally recognized expert in the study of ground water, died November 18, 2007, at his home in Tucson. He was the husband of Augusta Felty Davis. A memorial service will be held at Adair Funeral Home, Avalon Chapel, 8090 N. Northern, on Saturday, November 24, 2007 at 3:00 p.m. Dr. Davis was born August 6, 1924, in Rio de Janeiro, Brazil, where his father was researching a cure for yellow fever. He was a son of the late Dr. and Mrs. Nelson Davis. Dr. Davis received a bachelor's degree in geology with a minor in mathematics from the University of Nevada in 1949, a master of science degree in geology from the University of Kansas in 1951, and his doctorate in geology from Yale University in 1955. Dr. Davis served on the faculty of the University of Arizona from 1975 to the present. Dr. Davis also served on the faculty of Stanford University, the University of Chile, the University of Missouri--Columbia, and Indiana University--Bloomington. Additionally, over his career, he was a consultant for the United States Bureau of Reclamation, the Kansas and Missouri geological surveys, the Arctic Institute of North America, Princeton University, and the University Oriente and the University de los Andes, both of Venezuela. He also held numerous appointments during his career. The recipient of multiple honors throughout his career, in 1989 he was presented with the O.E. Meinzer Award by the Geological Society of America, and in 1996 he was made a Fellow of the American Geophysical Union. Over the course of his career, Dr. Davis was author or coauthor of more than 100 scholarly publications, and coauthor of the seminal textbook "Hydrogeology" with Dr. Roger DeWiest. From 1943-1946, Dr. Davis served in the U.S. Army during World War II in the Pacific Theater. Dr. Davis is also survived by two sons, Gerald N. Davis of York, PA, and Randall W. Davis of Phoenix, four daughters, Ruth Queathem of Pine Bluff, AR, Darlene Binder of Arvada, CO, Betty Jean Davis Voelkel of Tucson, and Nancy F. Davis of Phoenix, and two stepdaughters, Tara de Souza of Phoenix, and Locana de Souza of Tucson. Additionally, Dr. Davis is survived by three brothers, Dr. Donald Davis of Logan, UT, Dr. Irvine Davis of Albuquerque, NM, and Dr. Franklin Davis of Sacramento, CA. He is also survived by 12 grandchildren, five great-grandchildren, and many loving nieces, nephews, cousins, and members of his wife's family. Memorial contributions may be made to World Vision (800-777-5777), a humanitarian organization dedicated to fighting poverty and injustice around the world for the benefit of children, families, and communities.

PHOENIX CHAPTER NEWS

November Meeting Summary

On November 13, 2007 Laurie LaPat-Polasko, Ph.D., QEP, of Geomatrix Consultants, presented results from a recent study evaluating bioremediation of perchlorate contaminated soil. First off, she explained that perchlorate is a soluble anion that can be found in "anything that blows up" such as rocket fuel, airbags, and matches and has a direct impact on humans when ingested. In the last decade, detection at lower levels has been possible and thus follows the demand to cleanup areas of high perchlorate.

Laurie shared that one way to clean up soils with perchlorate is to use bioremediation. Some bacteria occurring naturally use perchlorate for respiration. So if the conditions are right, these bacteria can degrade perchlorate into oxygen and chloride, which is a similar process as nitrate reduction. So what are these conditions that are necessary? That is what Laurie and her colleagues set out to find in their study.

They experimented, both in the lab and at a field site, different combinations of food sources and moisture levels. Food sources included hexene, ethanol, corn syrup, sodium acetate and yeast. They also looked at ways to enhance the microbial populations by adding commercial septic product ZEP and waste activated sludge form a local wastewater treatment plant. It turned out that the combination of plenty of moisture (at least > 20% moisture content) and the WWTP microbes reduced the levels of perchlorate the best. Using these results, they tested them out in a pilot-scale study and found that perchlorate in contaminated soil was reduced by more than 86% after 4 weeks and by more than 95% after 8 weeks. For more details on this study, see Laurie's article in the AHS November 2007 issue, "What are the Challenges of In-Situ and Ex-Situ Bioremediation of Perchlorate-Contaminated Soil?"

Perchlorate also contaminates groundwater. Thus the next step of studying bioremediation of perchlorate for Laurie will be determining ideal conditions and designing systems to reduce perchlorate in groundwater. We wish her continued success in her future research and thank her for sharing her recent study with us.

If you are looking for more information on perchlorate, http://perchlorateinfo.com, is a good starting point.

(Continued on page 7)

Speaker, Laurie LaPat-Polasko, with esteemed guests Jessie and Herman Bouwer at November's meeting.

Phoenix Chapter continued

(Continued from page 6)

December Meeting Announcement

Our speaker will be Tim Fitzpatrick from Laboratory Data Consultants. He will be discussing the implementation of a web enabled automated data management system designed especially for environmental database management.

This presentation is an overview of the evolution and implementation of a data management system used to manage field and chemistry data and related documents for environmental consulting applications. The discussion will demonstrate tools used in field sample collection such as electronic chain of custody, automated data review utilizing the LDC ADR software, semi-automated generation of quarterly and annual reports, mobile computing devices, and web based data entry and retrieval.

The data management system is residing on an Earthsoft EQuIS 5 Sequel Server platform and has been integrated with a Microsoft SharePoint portal. The system accepts a variety of data types including chemistry, geology, process data (including flow, pressure, etc.), site events, and shipments and all manner of documents can be stored. Data can be uploaded using Electronic Data Deliverables (EDDs), EQuIS Professional v5.0, and records can be directly entered via web interfaces using java script. Once in the database, the data can be pushed out directly to various third party applications including ArcGIS, RockWorks, LogPlot, Gint, SURFER, GMS and EVS. This eliminates the need to keep multiple copies of the data in different proprietary formats.

Some key elements of the system include the Electronic Data Processing (EDP) tool integrated with the ADR format file script which verifies the completeness and compliance with the EDD format prior to loading to the EDMSi Enterprise Web database. The EDD checker references a project-specific library built upon the QAPP in verifying compliance and completeness. EDD deficiencies are detailed in an outlier report.

The ADR software reviews analytical data based upon project-specific criteria. Upon execution of the program, data is qualified using EPA data flags and exported into the database through EDP. Command buttons generate reports such as a rejected data table, method blank contamination, surrogate outliers, etc. Forms and view screens also provided on-line review of data qualifiers.

The EDMSi Enterprise Web database system has successfully centralized field and chemistry data, including project documents, for the entire project team to access. The data is loaded through a web interface and has been reviewed using automated data review software tools. Data is available to stakeholders and interested parties through a secure login system and allows for data retrieval in multiple output forms including Excel, PDF, and others.

The meeting will again be held at El Penasco at Mill & Broadway in Tempe. Hope to see you there!

Date: December 11, 2007
Location: El Penasco Mexican Kitchen
19 E. Broadway Road
Tempe, AZ 85282

Speaker: Tim Fitzpatrick, Laboratory Data Consultants

Chapter Board Meeting: 4:30 PM – 5:40 PM
Happy Hour & Dinner: 5:45 PM – 7:00 PM
Dinner Speaker: 7:00 PM – 8:00 PM

Cost: $15 member, $20 non-member, $5 student

Phoenix Chapter Officers

President:
TED LEHMAN
JE FULLER HYDROLOGY & GEOMORPHOLOGY
E-Mail: ted@jefuller.com

Vice-President:
MIKE HULST
EEC INC
E-Mail: mhulst@eecphx.com

Treasurer:
BETH PROFFITT
TRANSWEST GEOCHEM INC
E-Mail: eproffitt@transgeo.com

Secretary:
MATTHEW BEVERSDORF
ADWR
E-Mail: mabeversdorf@azwater.gov

Phoenix Chapter cont.

(Continued from page 7)

All chapter members (and non-members) are welcome to attend the board meeting too!

Planning for 2009 Symposium in Phoenix, August 23 – 26, 2009

The Phoenix Chapter has kicked off its planning for the 2009 AHS Symposium and is beginning to meet regularly. We are currently working on a joint symposium with the 2009 national conference of the American Institute of Hydrology (AIH). The dates have been set – August 23 – 26, 2009. We have selected a theme too – "Managing Hydrologic Extremes". Our next meeting is scheduled for after work some day in the week of Dec. 3rd (TBD). If you are interested in helping with the planning process or just listening in, please contact Ted Lehman at ted@jefuller.com or 480-222-5709, Lee-Anna Walker at LeeAnna.Walker@arcadis-us.com or Christie O'Day at coday@acstempe.com or 480-894-5477.

2007 Event Calendar

December – Tim Fitzpatrick, Laboratory Data Consultants
January – Kick-off meeting
February – Paul Westerhoff – ASU, Endocrine disruptor talk

2008 MEMBERSHP DUES

If you did not attend the AHS Annual Symposium you were recently emailed an invitation to renew your AHS Membership dues for 2008.
Your membership is very important to us and we hope you will consider renewing promptly.

Dues, payable to AHS ($45.00, $15.00 for students) should be sent to:
Arizona Hydrological Society
Jeanie Merideth, Association Manager
PMB 139; 3305 N. Swan Road #109
Tucson, AZ 85712
Phone: (520) 299-6787

Dues may also be paid using our "Online Payment" system.
Go to
www.azhydrosoc.org
And click on "Join or Renew Online" and have your credit card ready. AHS accepts Visa, MasterCard and American Express.

GROUNDWATER RESOURCES ASSOCIATION
of California

Introduction to Groundwater and Watershed Hydrology:
Monitoring, Assessment and Protection

January 22-23, 2008 – Davis, CA
Buehler Alumni Center, University of California, Davis

Co-Sponsored by:
University of California Cooperative Extension
Groundwater Hydrology Program

Approved MCLE Credits - 13.25 hours

Register For This Course
- http://www.grac.org/hydroreg.htm

Flagstaff Chapter News cont.

Joint AHS/AIPG 2008 Conference Organizing Steering Committee: A Working Document

The 2008 AHS/AIPG Joint Conference in Flagstaff, Arizona will have a Joint organizing Steering Committee. The steering committee will have many sub-committees each assigned to do specific organizational work related to the Conference. Each subcommittee will report the progress of its activities and timely performance on its assignment to the Joint Conference Organizing Steering Committee (JCOSC) at its scheduled meeting or at any time to the co-chairs of the Joint Conference Organizing Committee.

The following individuals have expressed interest to serve in one or more subcommittees and most if not all will be members of the JCOSC.

Volunteers names and e-mail addresses:
Lee Allison, Arizona State Geologist and AIPG (Lee.Allison@azgs.az.gov)
David Best, Co-Chairman, AIPG (david.best@nau.edu)
Don Bills, AHS, USGS, djbills@usgs.gov
Bruce Broster, CCPG (broster@unb.ca)
Kel Buchanan, AIPG (summitcrk@aol.com)
Mike Conway, Arizona Geological Survey (michael.conway@azgs.az.gov)
Alan Dulaney, AHS (ardulaney@azwater.gov)
Dana Downs, AHS, Dana.Downs-Heimes@CH2M.com
Larry Fellows, AIPG (rockpix@comcast.net)
Robert G. Font, AIPG 3rd IPGC General Chairman) (rgfont@cs.com)
Mike Geddis, AHS Treasurer (mgeddis@watermc.com)
Bill Greenslade, AIPG (need email address)
David Kirchner, AIPG (kirchner@basin-and-range.com)
Barbara Murphy, General Chairperson, AIPG, AHS (bmurphy@clearcreekassociates.com)
Dale Nations, AIPG (daleaudrey@comcast.net)
David Palmer, AIPG (david_palmer@urscorp.com)
Boris Poff, AHS (bpoff@fs.fed.us)
Manuel Regueiro, EFG (m.regueiro@igme.es)
Charlie Schlinger, AHS, Charles.Schlinger@nau.edu
Aregai Tecle, Co-Chairman, AHS, Aregai.Tecle@nau.edu
Margot Truini, AHS (mtruini@usgs.gov)
Paul Whitefield, AHS, Paul_Whitefield@nps.gov
John Williams, ASBOG (williams@geosun.sjsu.edu)
Erin Young, AHS (eyoung@flusol.com)

AIPG Staff will handle both before and at the conference (on-site) registration activities. The core AIPG staff consists of:
Bill Siok (wsiok@aipg.org
Wendy Davidson (wjd@aipg.org)
Cristie Valero (cjv@aipg.org)
Cathy Duran, AIPG (aipg@aipg.org)

We will also have student volunteers and members of both AHS and AIPG to provide help as needed during the conference period.

The Joint Conference Organizing Steering Committee (JOSC), the general chairman, the subcommittees, the Conference Organizing Committee co-chairs and AIPG staff will perform many tasks in the process of organizing the joint conference. The subcommittees, their composition to date and their specific tasks are described here in. Figure 1 represents a draft organization chart of the JCOSC and its subcommittees.

1) Co-chairs responsibilities

Co-chairs Aregai Tecle and David Best are responsible for convening the JCOSC and for ensuring that subcommittees' tasks are performed in a timely manner.

The co-chairs are responsible for putting together detailed agreements with High Country Conference Center (HCCC) for using it as the venue for the Joint AHS/AIPG 2008 Conference. The agreements include: cost of using the Conference Center for the meeting, clearly articulating the materials and other provisions included in the agreement (these include statements on guarantying the delivery of quality services as agreed upon), a total of 400- room reservation for four nights and developing any other working relationships.

The specific agreements that will be made with the HCCC will be summarized in this document once the agreements are formally concluded and signed. For now all conference sessions' meetings are expected to be held in the Conference Center, while the AESE Annual Meeting and AIPG board meetings will be held at the Radisson Hotel. AIPG has already a commitment for 650 rooms over 4 nights at the Radisson. We will arrange other hotels such as the Embassy Suites and La Quinta Hotel for some spill over from the two hotels.

(Continued on page 14)

Flagstaff Chapter Officers

President
Aregai Tecle
Northern Arizona University
aregai.tecle@nau.edu

Vice President
Corporate Board Member
Margo Truini
USGS
mtruini@usgs.gov

Secretary
Erin Young
Fluid Solutions
eyoung@flusol.com

Treasurer
Dana Downs-Heimes
ddownshe@ch2m.com

ISMAR6 WRAP-UP

ISMAR6 an AHS Success!!

After four years of planning and effort, the Arizona Hydrological Society hosted a successful, five-day international symposium. The 6th International Symposium on Managed Aquifer Recharge (ISMAR6) was held from October 28 to November 1, 2007 at the Pointe South Mountain Resort (now the Arizona Grand Resort) in Phoenix and was attended by 285 individuals from 26 countries and 27 U.S. states. This symposium brought many of the world's experts on Managed Aquifer Recharge (MAR) to our state. Arizona received high marks for the water management efforts that have been developed here and we, in turn, had a chance to learn the worldwide "state-of-the-science" on MAR.

The conference began on Sunday, October 28 with four workshops on various aspects of MAR including everything from practical aspects of constructing MAR facilities to field techniques for testing MAR potential to using geochemical tracers to understand the hydraulics induced by MAR. After the workshops, a reception was held at the resort. On Monday, our keynote speaker, Dr. Ed Bouwer provided an overview of a just-released report by the National Research Council prepared by the Committee on Sustainable Underground Storage of Recoverable Water, chaired by Dr. Bouwer. The purpose of the report was to present the biogeochemical, engineering, and institutional factors that may affect the performance of MAR technology. He reviewed possible water quality impacts of MAR and the committee's recommendations on long-term impacts of MAR and the opportunities and challenges of incorporating MAR projects into water management strategies. The report provided recommendations on the appropriate regulatory framework that should be developed for MAR to succeed.

During the rest of Monday, and then on both Tuesday and Thursday, participants to ISMAR6 heard talks from around the world on all aspects of MAR. Talks were given from countries in Europe (Germany, The Netherlands, England, and Sweden), the Middle East (Egypt), Africa (South Africa), Asia (India), and Australia covering a diverse range of MAR topics including hydraulics and storage, the role of integrated water management, regulations, economics, geochemistry, the fate of pathogens and organic compounds, regional issues, Arizona MAR, basin recharge, subsurface water quality changes, and operations and management issues. On Wednesday, about 130 of the symposium participants attended a field trip to several key MAR sites in the Phoenix metropolitan area. The first stop was the City of Scottsdale's Water Campus to view the treatment process for both CAP and wastewater and to observe a vadose zone recharge well. This portion of the field trip was led by Marshall Brown and Maurice Tatlow of the Scottsdale. The next stop was to the recently completed New River / Agua Fria River Underground Storage Project (NAUSRP). Dr. Mario Lluria

(Continued on page 12)

AHS Newsletter Articles

Anyone wishing to submit articles of interest to AHS members may do so by emailing your article to jgmerideth@aol.com. Deadline is the 15th of the month prior to publication.

The AHS Editorial team reserves the right to publish or not publish your article.

Announcements

Donations to AHS Foundation are considered charitable 501(c)(3) for tax purposes.

Donations of any amount may be sent to the AHSF Treasurer or the AHSF President.
AHS Foundation
A. Michael Geddis, Treasurer
3845 N Business Center Dr #115
Tucson, AZ 85705

The AHS web site has a new document posted for your information. "A Strategy for Federal Science and Technology to Support Water Availability and Quality in the United States". The document was prepared by the Executive Office of the President of the United States.

Did you know that AHS has a

JOBS

page on our web site? Visit:

Www.azhydrosoc.org and then click on JOBS to view the most recent postings. If you would like to post an opening just email it to jgmerideth@aol.com and Jeanie will post it for you.

Call for Papers - CAP Award for Water Research

First Place Award: $1,000
Second Place Award: $500

Papers are now being accepted for the CAP Award for Water Research. Papers should focus on water issues that affect central and southern Arizona and the Colorado River, including legal, economic, political, environmental, or water management issues, as well as any other issue that might be of interest to CAP or Arizona water users. Winners will present their research at the Arizona Hydrological Society's annual symposium.

The CAP Award is available to students at any college or university in the State of Arizona. To apply, submit your complete paper online at www.cap-az.com.

Deadline: June 1
Get more information on the web at www.cap-az.com

Central Arizona Project Disclaimer - 11/16/2007
This e-mail message and any files transmitted with it may contain confidential or privileged information intended solely for . Any review, use, distribution, or disclosure of this information by others is strictly prohibited. If you are not the intended recipient, or authorized to receive this transmission for the intended recipient, please contact the sender by reply e-mail and delete all copies of this message and any files transmitted with it from your system.

ISMAR6 Wrap-Up cont.

(Continued from page 10)

of SRP lead the participants on a dusty walk around the large recharge basins near the Agua Fria River channel explaining the operations and monitoring equipment used at the site. We ended the day at the Gilbert Riparian Area where we were treated to a beautiful scenic walk around basins that Gilbert uses to recharge treated effluent.

Tuesday night, a dinner was hosted for the participants at the hotel with after dinner entertainment by Arizona's State Historian, Marshall Trimble. Delegates from The Netherlands were initially upset with Marshall's comment that you can never trust a Dutchman from his story about the Lost Dutchman, but they regained their good cheer after he revealed that the "Dutchman" in the story was actually a German immigrant!

All participants received an electronic copy of the proceedings volume containing over 50 peer-reviewed papers on MAR. Hard bound copies of the proceedings were made available at the conference and are now available to anyone at www.acaciapublishing.com.

AHS would like to thank the ISMAR6 Organizing Committee for their incredible efforts at putting this important conference on. The Society should feel very proud of this effort – it was a unique and interesting conference that enriched all that attended.

Doug Bartlett

AHS Volunteers man the registration desk. From left to right: Lori Bartlett, LeeAnna Walker, Karen Schwab, Peter Kroopnick, Alan Dulaney, Barbara Murphy.

Emily Black, Lori Bartlett, Herman Bouwer at the Sunday evening Reception.

ISMAR6 Wrap-Up cont.

Field trip participants visit New River-Agua Fria Underground Storage Project.

Lunch and breaks were held outdoors at the hotel.

Doug Bartlett presents Dr. Herman Bouwer with the Lifetime Achievement Award from the Groundwater Resources Association of California.

Arizona's State Historian, Marshall Trimble, entertained our international guests with humorous stories and songs of Arizona.

Marvin Glotfelty holds forth on Arizona hydrogeology with delegates from several countries.

FLAGSTAFF Cont.

(Continued from page 9)

2) Selected Tentative Joint Activities.

Both AIPG and AHS agrees to hold conference technical sessions, poster presentations and exhibits as well as a joint welcome reception at the HCCC. Other joint activities will include ice breaker, social events, guest trips, and field trips with one of them focusing on hydrogeology. The two organizations will also consider developing joint short courses that may include technical writing, ethics on water issues, and on other topics relevant to the conference theme.

3) Field Trips Subcommittee

The subcommittee Chairman is David Palmer of AIPG and subcommittee members will include: David Best, Don Bills, Dana Downs, Paul Whitefield, Erin Young, Boris Poff and Charles Schlinger. The subcommittee has openings for more volunteers. The subcommittee is responsible for organizing field trips and preparing all provisions to make the field trips successful. Suggested field trips include to: (1) the Grand Canyon, (2) the Verde Valley, (3) Walnut Canyon, (4) Oak Creek and Sedona, (5) visits to Fossil Creek to see the decommissioned dam, etc.

4) Sponsorship/Fund Raising/Exhibitor Subcommittee

Subcommittee Chairman is Kel Buchanan, and David Kirchner is AIPG vice chair. Other AIPG subcommittee members are Dave Palmer, Bill Greenslade, Barbara Murphy and Dan St. Germain. The AHS subcommittee chair is Alan Dulaney and other AHS subcommittee members are Dawn Garcia, Mike Hulst and to be named later. Membership to this subcommittee is still open.

The subcommittee in agreement with JCOSC, the general chairman and the co-chairs will develop different tiers (or grades) of sponsorship. They may also develop varying tiers for exhibitors.

The Fundraising Goal is $100,000.00. The sponsorship subcommittee will be responsible for purchasing SWAG. Exhibitor Chairs are Alan Dulaney, AHS and David Palmer, AIPG.

5) Advertising and SWAG

There will be SWAG – Registration give-away-items. This subcommittee will work with sponsorship subcommittee to develop desirable items such as: Arizona Book, flash drives, backpack or bags with Route 66, or Grand Canyon, or tribal logos on them, and baseball hats with the joint conference logos on them, etc. This sub committee consists of Wendy Davidson as Chair and Bill Siok, Barbara Murphy, and Alan Dulaney as members.

6) Technical Sessions Subcommittee

Robert Font and Margot Truini co-chairs this subcommittee. Other members of this subcommittee are Aregai Tecle, Boris Poff, Bruce Broster (CCPG), manuel Requeiro (EFG), John Williams (ABOG) and Ginger McLemore (AIPG). Poster session will be chaired by Margot Truini. Altogether, AHS will run two to four technical sessions concurrently.

The technical session committee will be responsible for creating program, call for papers, and create schedule. AIPG typically will not hold concurrent sessions whereas AHS has concurrent sessions and workshops.

7) Student Participation Subcommittee

The Student Outreach Subcommittee consists of Erin Young (AHS), chair, Abe Springer (AHS), Ginger McLemore (AIPG), Joey Fiore (AIPG) and David Best (AIPG). Note that the AHS registration fee for students has been less than full registration and student volunteers usually receive compensation in the form of free registration. The subcommittee will also be in charge of judging best student presentations and coordinating other student related activities.

8) Publications and Proceedings Subcommittee

Ginger Mclemore will chair this subcommittee. AIPG will take the lead on this. This will include sending e-mail broadcasts and providing abstracts to all registrants. AHS has in the past provided abstracts to registrants on a flash drive with its logo on it. The subcommittee chair will be Wendy Davidson with Mike Conway, and Dana Downs as members. Mike Conway has offered to publish abstracts through the AGS.

9) Guest Activities Subcommittee

These activities are for attendee spouses and other guests. So far we have Pam Palmer (David Palmer's spouse), Gail Siok (Bill Siok's spouse) and Erin Young of AHS volunteering. We may need one or two more volunteers to serve on this subcommittee.

10) Hotel Logistics/Food/Entertainment Subcommittee

Co-chairs Aregai Tecle and David Best, Bill Siok, Boris Poff, Paul Whitefield, Margot Truini and Don Bills will take charge on this. It is suggested that a joint social event with entertainment will be held. It is suggested that effort should be made to invite Native entertainers and/or story tellers such as a Navajo code talker and a hoop dancer for the dinner on Monday night. It was originally suggested that the evening banquet with entertainment would be held at Northern Arizona Museum. But, because of space inadequacy, the event will be held at the HCCC. AIPG is the lead contact for the Radisson.

11) Transportation Subcommittee

This subcommittee will be in charge of arranging local transportation between HCCC and hotels, field trips and Phoenix-Flagstaff transportation of attendees. Members to this subcommittee include Erin Young, David Palmer, Wendy Davidson with Dave Best as chair and new ones who would like to join this subcommittee. This subcommittee arranges transportation for field trips, shuttle between HCCC and hotels and other transportation as needed.

12) Registration Table Subcommittee

This will be manned by AIPG staff and probably one AHS members and student volunteers. However, it is agreed upon that AIPG office will take responsibility for handling both pre- and on-site registration activities.

13) Workshops and Short Courses Subcommittee

AHS desires to have a number of workshops/short courses as parts of the conference on Saturday, September 20th. We need a chair or co-chairs (one from AIPG and one from AHS) for this subcommittee. Desired courses include technical writing, water issues, legal issues, and ethics. The person(s) who will be in charge for this subcommittee may want to find out the requirements and qualifications for conducting a continuing education on water law by contacting the Arizona State Bar for more information on their requirements. For certifications, AIPG will need to create certificates and determine credits. A writing workshop led by Nancy Riccio, a teachers' workshop and a wokshop on water law are already set. We may need one or two more such as a uranium contamination problem workshop. As a part of its previous Symposiums, AHS had usually held a one day teacher workshop with a half day field trip. We may do the same in the 2008 Joint Conference. The usually number of workshop participants are 20-25 people per workshop. However,

FLAGSTAFF Cont.

(Continued from page 14)

the maximum number of attendance may be as many as 30 people. Other suggested workshop topics include: remote sensing, water resources, well design or construction, land subsidence, GIS Membership in this committee include: Erin Young (AHS), Charlie Schlinger, Christi Oday and Ginger McLemore. Others may also join this subcommittee.

14) Speakers Subcommittee

Aregai Tecle and David Best will co-chair this subcommittee with assistance from Margot Truini and Don Bills. The agreed upon conference theme is Changing Water Scapes and Water Ethics for the 21st Century. It is expected that key note speakers will speak on issues relevant to this theme.

AIPG suggests that Arizona State Geologist Lee Allison may be a good candidate to give the dinner presentation. AHS will take the lead on identifying and inviting speakers on water issues. However, it is decided that speakers will not be paid since both AIPG and AHS do not pay speakers , but may be compensated for hotel or travel expenses. Some suggested speakers include Gov. Napolitano, Colorado Springs Ct. of Justice, and James Howard Kuntzler. We need more suggestions on this.

15) AV Equipment Subcommittee

The HCCC will provide a podium and a microphone, other equipments such as computers and accessories are the responsibilities of AHS and AIPG. AHS has received AV from the USGS in the past. Members of this subcommittee include Margot Truini, chair and Paul Whitefield and others. We may need 8 to 10 computers for the meeting.

16) Budget/Finance Subcommittee

The budget subcommittee consists of co-chairs Bill Siok (AIPG) and Mike Geddis (AHS) and members Kel Buchanan (AIPG), Dan St. Germain (AIPG) and Dana Downs (AHS). The meeting registration will include AHS annual membership dues ($45.00) in which all registrants become AHS members for one year and receive the AHS newsletter. Non-AIPG registrants do not automatically become AIPG members because of some procedural problems. But, they will receive a complimentary one-year electronic subscription to the AIPG news journal *The Professional Geologist*.

The Budget/Finance committee is responsible for creating the budget. Setting the registration fee and determining all costs which include venue cost, hotel cost, field trip cost, and transportation cost. In accordance with the MOU between AIPG and AHS, the profit will be split 50/50 between the two organizations. As a basis for setting up the registration fee, the registration fee for the 2007 Tucson meeting was $340 early/$415 for late registration. The package included technical sessions, lunch every day, evening dinner, and two tickets for beer.

In the joint meeting, the registration may include ice-breaker (2 drink tickets), business breakfast meetings, breaks, sessions, social evening banquet, and either a field trip/workshop/short course.

It is agreed that AIPG will handle the meeting registration including paying and all bills doing all event accounting with AHS oversight. However, David Best and Aregai Tecle will have the final authority on all expenditures. Both organizations will be allowed to give out 6 free registrations each. Previously, AHS has given as many as six nights of free hotel rooms for scholarship and intern awardees and invited keynote speakers. We will have to work on this.

AHS and AIPG will have separate but concurrent business meetings. A breakfast meeting was favored by those in attendance.

17) General Chair

Barbara Murphy will be the general chair of the joint meeting and will work closely with the two co-chairs and JCOSC. The general chair will bring ideas and help coordinate communication and team work between both organizations.

18) On-line registration

The joint conference budget and on-line registration will be in place by December 2007. The Finance Subcommittee will assign sponsorship responsibilities to the sponsorship/fund raising/exhibitor subcommittee.

An indemnification clause will be included for anyone that registers on line.

19) Meeting Schedule

The JCOSC will set the place and dates for its meetings. This will be agreed upon during the first meeting of the JCOSC in November. Due to distance and large number of committee members, most JCOSC meetings will be electronic through teleconferences and e-mails.

20. Other action items

The following are important action items that need to be done in the course of the next few months.

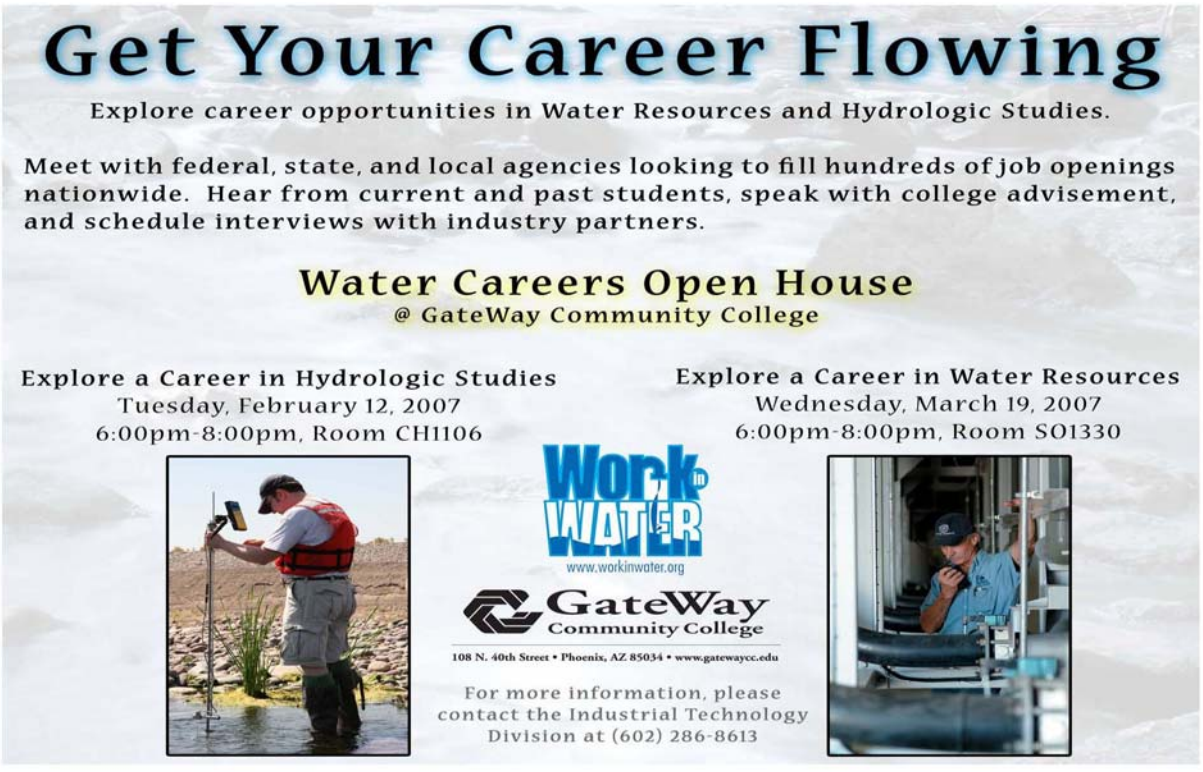
- Finalize chair selection and membership lists for all subcommittees
- Co-chairs have the final MOU document in their hand to use as a guide
- Determine the next and future meeting schedules for JCOSC
- Preparing the registration package
- Launching web-based registration by December 1, 2007.
- Arranging event Insurance (Bill Siok)
- Work on Phoenix to Flagstaff Shuttle and local transportation logistics
- Look into discount rental cars and airfares for conference attendees.
- Advertise conference dates and places in widely distributed newsletters and other outlets
- Program development
- Sending call for abstracts for technical and poster sessions
- Identifying field trips and workshops (finish the process by December)
- Identify keynote and other invited plenary speakers.

Announcements

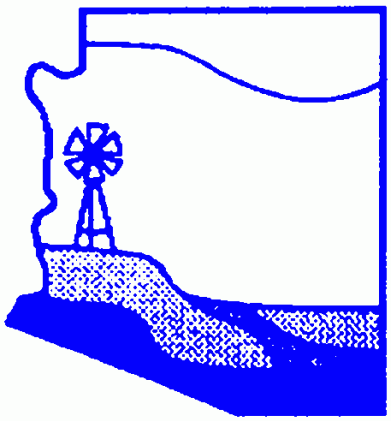
On behalf of Apache Nitrogen Products, Inc. (ANPI) in Benson, I would like to give you advance notice of a forthcoming event commemorating the 10th Anniversary of the dedication of the Apache Wetlands. The event will be held on April 24-26, 2008, with a conference on Thursday the 24th, probably held at Cochise Community College. This will comprise a series of invited papers about the Apache Wetland as well as other wetland treatment projects. Dr. Robert Gearheart (Humboldt State University) and I will be coordinating this event, at which we hope to get acti ve participation from investigators in Arizona among other places.

Then on Friday, the 25th, there will be a "Dignitary Ceremony" at the Wetland (near St. David) followed on Saturday by a tour of the ANPI plant and wetland.

ASU Water Quality seminar
FEBRUARY 7, 2008.
cost is only $225 and includes lunch. The class starts at 8:00 a.m. and will be held at the ASU Polytechnic Campus. keep up to date on new developments.
For more information contact the Office of Environmental Technology, Arizona State University Polytechnic by calling Denise Kolisar at (480) 727-1825, or faxing (480) 727-1684 or simply GOOGLE ASU OFFICE OF ENVIRONMENTAL TECHNOLOGY and it will be the first item in your search. Last year over 100 professionals with an interest in Water Quality Issues in Arizona attended this one day seminar for updates on key developments.



MEMBERSHIP APPLICATION



Arizona Hydrological Society

Jeanie Merideth
Association Manager
PMB #139; 3305 N. Swan Rd. #109
Tucson, AZ 85712
(520)299-6787
Fax: (520)299-6431
azhydro@comcast.net

www.azhydrosoc.org

ARIZONA HYDROLOGICAL SOCIETY, c/o Jeanie Merideth Association Manager
PMB #139; 3305 N. Swan Rd #109, Tucson, AZ 85712
Membership Application (Dues: 1 year $45, $15 for students)

Name:_____ Position:_____

Company:_____ Email:_____

Mailing Address:_____

Work Phone:_____ Home Phone:_____ Fax:_____

Chapter Affiliation:
_____Tucson
_____Phoenix
_____Flagstaff

In addition to my dues, I am enclosing
$_____ Herman Bouwer Intern Scholarship fund (Phoenix),
$_____ Leonard C. Halpenny Intern Scholarship fund (Tucson),
$_____ for the SARSEF Scholarship fund,
and/or $_____ for the state-wide AHS General Scholarship fund.

Total amount enclosed: $_____