

THE ARIZONA HYDROLOGICAL SOCIETY NEWSLETTER



Welcome to the first issue of the AHS "Online Newsletter". This newsletter will be published monthly just as the previous "printed" version was. You will be emailed the link to access the latest issue on a monthly basis. However, you may visit the web site at any time to pull up any issue to view and/or print out.

If you would like to contribute articles of interest to the members please feel free to email to azhydro@comcast.net. Please indicate "AHS Newsletter" in the subject line.

2007 MEMBERSHP DUES

Dues, payable to AHS (\$40.00, \$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

We regret the credit card system on our web site is not operational at this time. You will be notified via email when this is working. Sorry for any inconvenience.

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Gail Cordy Receives the 2006 AHS Lifetime Achievement Award

The Arizona Hydrological Society (AHS) established the Lifetime Achievement Award (LAA) in 1995, presenting the first award to Leonard Halpenny. Since then, it has been awarded eight times. The LAA honors an individual who has contributed to 1) AHS and the local water community, 2) the science of hydrology in Arizona, and 3) the national hydrology community. The process of electing a recipient begins with AHS members submitting nominations, which are then reviewed by a committee of past LAA recipients. This group makes a recommendation to the AHS corporate board, which then either accepts the nomination or declines to present the award for that year.

The recipient of the ninth Lifetime Achievement Award for 2006 is Gail Cordy. Ms. Cordy is the first woman recipient of the LAA. Gail retired in February 2005 from the U.S. Geological Survey in Tucson, but she worked several other places before coming to Tucson.

Ms. Cordy's career has been long and varied. She worked on her Master's thesis at ASU, where she mapped the environmental geology of Camelback Mountain, and coined the geologic name, "Camel's Head Formation." She and her mapping partner thought they were going to spend a fairly mundane summer mapping on Camelback, but then a record-breaking monsoon hit, washing down all the alluvium accumulated over decades in the washes below the mountain and filling local residents' garages and swimming pools.

While she was still working on her thesis, due to events going back to her junior year abroad in Scotland as an undergraduate and her interest in bagpipes, she got the job—as a staff geologist—at Dames & Moore (now URS Corporation). From Dames & Moore, Gail went on to several other positions:

She was an engineering geologist at the Bureau of Reclamation in Phoenix, working to determine the best route for the Central Arizona Project canal. She was also an engi-

neering geologist at the Nevada Bureau of Mines and Geology in Reno, doing field work as part of the Earthquake Hazards Reduction program. She taught briefly at Cal State Fullerton. Gail was a contract editor for Woodward-Clyde in Santa Ana;

And in 1984 she joined the U.S. Geological Survey as a hydrologic technician in Salt Lake City. Gail was soon promoted to Hydrologist, Project Chief, and then Supervisory Hydrologist as the Utah district's Reports Specialist. As Hydrologist, she worked on the Upper Colorado Basin Regional Aquifer System Analysis (RASA), mapping aquifers and confining units and preparing descriptions of the regional hydrologic units. As Project Chief, Gail implemented two coal hydrology studies, looking at the potential affects mining might have on the water resources of the area. During this time, in 1988, Gail was listed in Who's Who of American Women.

Upon moving to the Arizona District of the U.S. Geological Survey in 1993, Gail became the Project Chief for the Central Arizona Basins Study Unit within the National Aquifer Water Quality Assessment Program. She worked with federal, state, and local agencies to direct the sampling and analyses needed to understand central Arizona water quality issues within the context and goals of the national program.

More recently at U.S. Geological Survey, Gail collaborated with Dr. Herman Bouwer to investigate the potential effects and management of salt accumulation in south-central Arizona. She also worked with Dr. Bouwer and other scientists at the U.S. Water Conservation Laboratory in Phoenix, and with Tucson Water, to investigate which pharmaceuticals and other organic wastewater contaminants could be expected to persist during recharge of treated effluent. Gail's work in all of these areas has been published in a variety of U.S. Geological Survey reports, at local and national conferences, and in peer-reviewed journals.

Besides working hard in her

professional career, Gail has made considerable efforts to educate the general public about hydrologic issues. In 1999, Gail worked with the AHS Tucson chapter to prepare and participate in a series of public information sessions to educate the public on water issues in Tucson, in advance of an election that would determine the fate of CAP water in the city.

She helped prepare and present a workshop for teachers on the interconnected nature of droughts, fires, and floods at the 2004 AHS Symposium, in collaboration with the U of A Water Resources Research Center, the Tree Ring Lab, and the Arizona Department of Education.

This past spring, Gail participated in a day-long training and field trip for Tucson middle school teachers focusing on climate change, weather, and drought with Paul Sheppard (U of A Tree Ring Lab) and Joaquin Delgado.

Gail was also active in the Arizona Envirothon as a U.S. Geological Survey resource professional. And she wrote a USGS Fact Sheet, "primer on water quality" for a public audience. More informally, Gail has often made herself available to the media to answer questions about water quality issues in Arizona, and she frequently visits classrooms to teach third and fourth graders hydrology lessons.

In her retirement, Gail is developing a community education course on guidelines to natural hazards targeted to homeowners and realtors, which she will teach at Pima Community College beginning next month.

Released by:
Michael Block, AHS Corporate Board
Betsy Woodhouse, Southwest Hydrology

National Water Research Institute

December 14, 2006, E-Announcement

NWRI Establishes the Ronald B. Linsky Fellowship to Support Outstanding Graduate Research in Water Sciences

NWRI is pleased to announce that the first Ronald B. Linsky Fellowship for Outstanding Water Research will be awarded to a graduate student in a U.S. university for the 2007/2008 academic school year. The Fellowship comes with a 2-year, \$20,000-a-year award. This special fellowship was named in honor of NWRI's late Executive Director, Ronald B. Linsky, who worked as a biology teacher, oceanographer, Sea Grant director, and private consultant for the United Nations and others before becoming NWRI's founding director in 1991. Funding for this fellowship is provided by Patricia Linsky and Family, as well as by the Joan Irvine Smith/Athalie R. Clarke Foundation. In addition to the Ronald B. Linsky Fellowship, NWRI is also offering the following fellowship awards for 2007/2008 to graduate students (Masters or Ph.D.) at U.S. universities conducting research the areas of water resources and treatment:

- **NWRI Fellowships** (three to four fellowships of up to \$10,000 a year for up to 3 years) Research for this fellowship must pertain to NWRI's mission, which is to create new sources of water through research and technology and to protect the freshwater and

marine environments.

- **NWRI-AMTA Fellowships for Membrane Technology** (two fellowships of \$10,000 a year for 2 years) Research for this fellowship must pertain to the advancement of membrane technologies in the water, wastewater, or water reuse industries. Funding is provided by the American Membrane Technology Association (AMTA).

- **NWRI-MWH Fellowship for Advanced Water/Wastewater Treatment Technologies** (one fellowship of \$10,000 a year for 2 years) Research must pertain to the development of novel and innovative advanced water and wastewater treatment, disinfection, or oxidation technologies. Funding is provided by MWH.

- **NWRI-Southern California Salinity Coalition Fellowship** (one fellowship of \$10,000 a year for 1 year) Research must address the critical need to remove or reduce salts from water supplies and to preserve water resources in Southern California. This fellowship, which is funded by the Southern California Salinity Coalition, is limited to students at Southern California universities/colleges.

The deadline for applications is **March 1, 2007**. Additional information about Fellowships, including application procedures and current fellowship recipients, may be found on NWRI's website at www.nwri-usa.org/Fellowship.

NWRI's Fellowship Program is underwritten by:

- The Joan Irvine Smith & Athalie R. Clarke Foundation
- NWRI Member Agencies, which include Inland Empire Utilities Agency, Irvine Ranch Water

District, Los Angeles Department of Water and Power, Orange County Sanitation District, Orange County Sanitation District, and West Basin Municipal Water District

- NWRI Circle of Friends, including the C.W. & Modene Neely Foundation and Patricia Linsky and Family
 - NWRI Corporate Associates, including Boyle Engineering, Cargill, Inc., Carollo, CDM, Kennedy/Jenks Consultants, Malcolm Pirnie, Inc., and MWH
 - NWRI Partners, including the American Membrane Technology Association and Southern California Salinity Coalition
- NWRI is very grateful for the support provided by these partners.

This article was received via email from NWRI, a non-profit public-private partnership founded in 1991 to promote the protection, maintenance, and restoration of water supplies through the development of cooperative research work.

NWRI provides occasional information via email list serve on upcoming events and activities. If you would like to be added to NWRI's email list serve, please contact Christina Fuller at NWRI at cfuller@nwri-usa.org. Thank you.

National Water Research Institute
10500 Ellis Ave.

Fountain Valley, CA 92708

714-378-3278

Fax 714-378-3375

www.nwri-usa.org

PHOENIX CHAPTER NEWS

1. Annual Kick-off Party Announcement

To kick-off another exciting year with AHS, everybody is invited to join us at Pizzeria Uno in Tempe on January 9, 2007 at 6 pm time. All food and non-alcoholic beverages will be provided by the Phoenix Chapter. Please bring your ideas for ways to address the needs and wishes of the society and any ideas for interesting speakers.

RSVP with Ted Lehman at ted@jefuller.com 480-222-5709 by Jan. 8th if you plan to attend. We look forward to seeing you in the new year!

2. December 2006 Meeting Summary

Gavin Fielding, Compliance Cleanup Manager, with the State of Arizona's Department of Emergency And Military Affairs presented his Master's degree research on the Arid Region Mapping of Evapo-Transpiration Technique (ARMETT). His research was conducted at the University of Arizona with assistance from the US Geological Survey (USGS). ARMETT is a 2-part technique that identifies and differentiates active vegetation from all other cover types in color infrared photos. Gavin discussed how human perceptiveness of colors is limited for red and pink shades. By re-projecting the reds of color infrared photos to yellows and greens, and then grayscaling all other cover types by using a specially designed Red Edge

Response Differentiation (RERD) in Photoshop Elements, the human vision system becomes dramatically more effective at perceiving and interpreting the visual information present in the photos.

Gavin's research question was aimed at determining obligate phreatophytes (plants that reach, and use groundwater) from opportunistic phreatophytes (plants that flourish during storm events, but become dormant during arid time periods) using aerial photography. By applying several different tool packages available through Photoshop in a specific sequence (i.e. altering the hues, color casting and sharpening the image) our perception of obligate versus opportunistic phreatophytes can be determined. In some instances, when combined with an interpretive three dimensional terrain analysis, landform stability can also be inferred from the altered imagery.

This technique can be used to assess whether vegetation is accessing regional or local aquifers, areas of shallow groundwater, fault systems that may be impacting groundwater flow paths, and how water supplies may react to drought. In some instances, the technique can also be used to plan the installation of groundwater monitoring wells among many other multi-disciplinary applications. However, ARMETT is limited to arid regions but may be developed further as the technique becomes more widely utilized.

Web Page

With the recent departure of Leilani Bew after 13 years of wonderful service as editor of our newsletter, AHS has now converted from the paper to an electronic format. The chapter and society information can now be viewed on-line at: www.azhydrosoc.org

The web page will soon also offer a member's only page and information regarding accessing this portion of the site will be e-mailed to you when it is finalized. Stay posted while we work diligently to update the site as it is currently under construction.

4. Future Speakers

January 9th – Annual Kick-off Meeting, no speaker
February 13th – Jeff Trembly, Mogollon Environmental March – Maybe you? Please contact Mike Hulst at mhulst@eecphx.com if you are interested in presenting at a dinner meeting in 2007!



TUCSON CHAPTER NEWS

TUCSON MONTHLY MEETING

Tuesday, January 9, 2007

Time: 7:00 Social Half Hour, 7:30 Presentation

**Location: Errol Montgomery & Associates, Inc.,
1550 East Prince Road**

**Floods and Debris Flows in the Catalina Front
Range, July 31, 2006**

Authors:

Bob Webb, Peter Griffiths, Chris Magirl, and Diane Boyer (USGS)

Erik Pytlak, Craig Shoemaker, Michael Schaffner, and Tom Evans (NWS)

Phil Pearthree and Ann Youberg (Arizona Geological Survey)

Presented by Ann Youberg (AZGS)

Abstract:

In the early morning hours of July 31, 2006, following 4 days of rain, pulses of rainfall from mesoscale convective thunderstorms fell on the southern Santa Catalina and western Rincon Mountains. Record floods occurred in Rincon Creek, Pantano Wash, Tanque Verde Creek, Sabino Creek, and Rillito Creek. A spectacular number of slope failures occurred in Sabino Canyon and other nearby watersheds in the front range of the Santa Catalina Mountains. To date, 252 slope

failures have been recorded. Prior to this event, approximately 10 recent debris flows were known in the Santa Catalina Mountains. Evidence also exists of much older debris flows emanating from many front-range canyons. During the July 31 event, debris flows exited, or nearly exited, five canyons into developed areas. In light of these events, the USGS, NWS, and AZGS are working in cooperation with Pima County to evaluate geologic hazards from the Santa Catalina Mountains.

Bio:

Ann Youberg is a geologist at the Arizona Geological Survey, Environmental Geology Section. Her work focuses on Quaternary geology, flood hazards, and post-wildfire floods and debris flows. She is also currently working on her PhD in Hydrology at the University of Arizona.

Please view the **Arizona Water Institute (AWI) January** newsletter at the following link:

<http://www.azwaterinstitute.org/media/010307%20awi%20newsletter.pdf>

CHAPTER-Election Results

Phoenix Chapter Officers

(one year position)

President: Ted Lehman
Vice President: Mike Hulst
Treasurer: Beth Proffitt
Secretary: Matt Beversdorf

Phoenix Chapter Board Member

(one year positions)

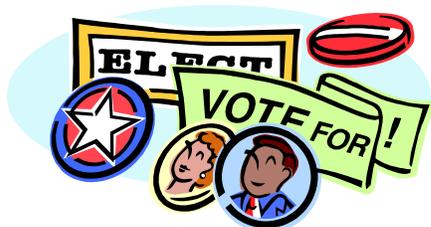
Jacob Miller
 Christie O'Day

Phoenix Chapter Corporate Board Member

(two year position 2006-2008)

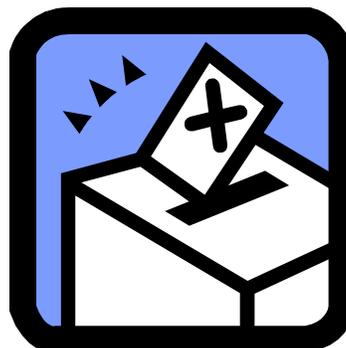
Paul Plato

(Lee-Anna Walker and Alan Dulaney are the other corporate board members for 2005-2007 term)



Tucson Chapter Officers

President: Marla Odom
Vice President: Rob McGill
Treasurer: Mike Mahan
Secretary: Dan Guido
Student Rep: Aida Arik
Corporate Board: Nick Melcher





GRA Presents its 3rd Event in
the *Tools and Technology*
Series

**A Two Program, Two Day
Event**
***Isotope Methods for
Groundwater Investiga-
tions Course***
***Applications of Isotope
Tools to Groundwater
Studies Symposium***
March 28 & 29, 2007
The Hilton Hotel, Concord,
CA

**Event Announcement and
Symposium Call For Abstracts**
Abstract Submittal Deadline is
January 26, 2007

The use of isotopic methods in groundwater investigations is gaining widespread acceptance among hydrogeology professionals. Well-established techniques such as using stable isotopes of hydrogen and oxygen as markers of water source have been applied in water resource investigations for several decades. Isotope methods are powerful tools when applied to the intractable problems of source attribution for the most common groundwater contaminants, including nitrate, VOCs, and perchlorate. Radioactive isotopes can be used to determine groundwater age, or the time since water entered the saturated zone, which has important implications for delineating

groundwater or contaminant flow pathways, identifying recharge areas, and providing a measure of aquifer vulnerability. GRA seeks to provide a forum for disseminating proven methods, practical applications, and problem-solving techniques involving isotopes and groundwater investigations.

Join us March 28 and 29, 2007 at the Hilton Hotel in Concord, California for the 3rd Event in GRA's *Tools and Technologies Series*.

**March 28 – Isotope Methods
for Groundwater Investigations
Course**

Instructors: Dr. Carol Kendall (U.S. Geological Survey) and Dr. Jean Moran (Lawrence Livermore National Laboratory)
Check for future updates about the short course on GRA's web site at <http://www.grac.org/isotope.asp>

**March 29 – Applications of Iso-
tope Tools to Ground-
water Studies Sympo-
sium**

Symposium sessions will cover a variety of topics, including but not limited to:

**Surface Water –
Groundwater Interaction**

- Tracing artificial recharge at surface spreading sites
- Use of isotopes to monitor aquifer storage and recovery (ASR)
- Tracking stream recharge along losing stream reaches
- Induced recharge via pumping
- Isotope tracers in areas of groundwater banking
- Use of isotopes to examine bio-

geochemical processes in the hyporheic zone

- Examining vadose zone transport using isotope methods

**Contaminant Transport and
Geochemical Evolution of
Groundwater**

- Multi-tracer or multi-isotope studies
- Nitrate source attribution using isotope tracers
- Characterization of nitrogen fate, transport and cycling in the saturated and vadose zones
- Perchlorate source attribution using isotopes of Cl and O
- Use of sulfur, carbon, boron or halogen isotopes in fate and transport studies
- 'Heavy' stable isotopes (e.g., Cr, Pb), or radiogenic isotopes (Sr, U, etc.) in environmental forensics applications
- Isotope methods for examining multi-component mixtures

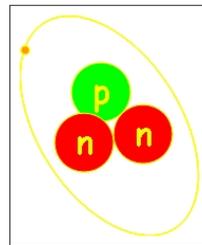
**Aquifer Vulnerability and Water
Residence Time**

- Age dating groundwater using radioactive isotopes (e.g., tritium (3H), 3H-Helium, 14Carbon); application of other groundwater age tools (CFCs, SF6, 4Helium)
- Using groundwater age to validate or calibrate flow and transport models
- Identifying paleowater

using long-lived isotopes and other age/climate proxies

- Applications of 'young' groundwater tracers in active recharge areas
- Tracer techniques for examining groundwater mixing/dispersion
- Communication of results from isotope studies to clients, sponsors, purveyors, and the public

(Continued on page 8)



(Continued from page 7)

Experts from academia, consulting, regulatory agencies and industry will participate in moderated speaker sessions and posters sessions. The combination of invited speakers and experts from key areas, along with talks chosen from submitted abstracts, will make this an important event for all professionals considering application of isotopic techniques in groundwater investigations.

Abstracts for Papers and Poster Presentations at the Symposium

GRA welcomes submittals of abstracts for papers and poster presentations on any topic related to the use of isotopes in groundwater investigations. The **deadline** for submitting an abstract for a Paper or a Poster Presentation is **January 26, 2007**. Please feel free to contact Bill Motzer (510-595-2120 or bmotzer@toddengineers.com) or Tom Mohr (408-265-2607 extension 2051 or tmohr@valleywater.com) if you would like to discuss your topic for this Symposium before submitting your abstract, or if you have any questions.

Student Poster Competition

GRA welcomes poster submissions describing recent research in any of the topic areas from undergraduate and graduate students. Prizes for the best student posters will be awarded!

First prize - \$300

Second prize - \$200

Third prize - \$100

Poster presentations will take place during an evening reception on **March 28th**. Winners will

be announced during lunch on March 29th.

Students, submit your poster abstract according to the guidelines given below.

Guidelines for submitting an abstract for a Paper or Poster Presentation:

- > Word 9.0 documents are preferred.
- > Indicate the preferred presentation method (paper or poster) and the topic of the abstract
- > Abstracts must be one page in length or less, and should be titled and include all contributing authors' names and affiliations. Please identify the name of the person who will be presenting the paper or poster, and add biographical sketches of the authors as a second page. The sketches should be 50 words or less in paragraph form, and full mailing and e-mail addresses and phone and fax numbers must be included.
- > Margins should be 1-inch top, bottom, and right side and 1 ¼-inch left margin. The text should be single-spaced, 10-point size, Times-Roman font, with no pagination, footers and headers. Paragraphs should be justified.
- > Major headings should be 12-point bold; minor headings should be 10-point italicized not bolded. There should be one blank line above and below all headings, except above major headings, which should have two blank lines.
- > Graphics should not be used in Abstracts.

By virtue of submitting an abstract, the submitter(s) grants GRA the right to publish any accepted abstract or the right to decline any abstract. Please sub-

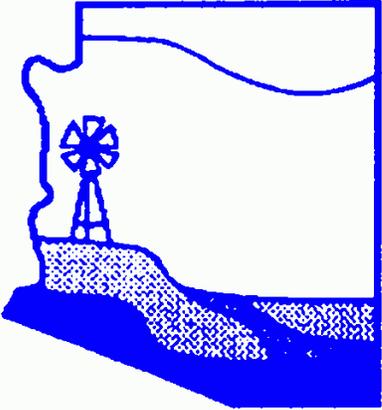
mit your abstract by email to: Mary Megarry, Groundwater Resources Association, mmegarry@nossaman.com no later than **January 26, 2007**. The Symposium Committee will review abstracts and make final selections.

Exhibitors and Sponsors

If you are interested in exhibiting your organization's services or products, or being an event sponsor, please contact Mary Megarry at mmegarry@nossaman.com or 916-446-3626. GRA welcomes co-sponsors, lunch, refreshment and reception sponsors.

GRA is dedicated to resource management that protects and improves groundwater through education and technical leadership.

915 L Street, Ste 1000 * Sacramento, CA 95814 * Ph: 916-446-3626 * Fx: 916-442-0382 *
www.grac.org



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ARIZONA HYDROLOGICAL SOCIETY, c/o Jeanie Merideth Association Manager
PMB #139; 3305 N. Swan Rd #109, Tucson, AZ 85712
Membership Application (Dues: 1 year \$40, \$15 for students)

Name: _____ Position: _____

Company: _____ Email: _____

Mailing Address: _____

Work Phone: _____ Home Phone: _____ Fax: _____

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

Total amount enclosed: \$ _____

Chapter Affiliation:
_____ Tucson
_____ Phoenix
_____ Flagstaff