



## More Trust Aquifer Management Programs Scheduled for 2008

There is a strong ongoing need to educate the public, convince regulatory authorities and capture the imagination of water managers about the economic and environmental benefits of making more use of sub-surface water resources.

The American Ground Water Trust has a long history of promoting awareness of aquifer management techniques for ground water. No other organization has so consistently advocated aquifer storage recovery (storing water in aquifers at times of surplus for later use in times of water shortage) as a basis for optimizing water resource potential. Since 1999, the Trust has convened seventeen conference programs that have featured aquifer storage technology and policy. The Trust's mission-focus on resource sustainability and effective water management is the rationale for information exchange programs on ground water and the showcasing of aquifer storage technologies.

There are upwards of 80 ASR projects in 20 US states using at least 400 wells. Three of the largest ASR users are the Las Vegas Valley Water District, Nevada; Calleguas Municipal Water District (Thousand Oaks, CA) and San Antonio Water System in Texas. Florida, New Jersey, California and the Northwest are areas of active ASR development and expansion.

Ongoing drought conditions in many parts of the US and predictions of climatic change influences, more than justify increased attention to the benefits of carefully managing aquifers and using them as "Banks" for additional water storage. The Trust's 5th Annual California Aquifer Management program in partnership with the Association of Ground Water Agencies took place in Ontario, CA in February. On May 7 & 8 the focus will be on Northwest aquifers with a two-day program in Kennewick, WA. The Trust's eighth annual Florida Aquifer Recharge Conference is scheduled for Orlando on September 22-23, and planning for the fourth Colorado program on Aquifer Management Issues is underway.

These aquifer management programs bring together engineers, scientists, planners, water-resource managers, attorneys, concerned citizens, etc., to share up-to-date information regarding challenges, feasibility, potential, regulatory concerns and economic & environmental benefits. Presenters are experts from scientific, engineering, management and regulatory organizations and companies. Aquifer storage is becoming increasingly important in the portfolio of water management tools. The Trust is proud to be leading the way.

 **ONLINE CALENDAR OF PROGRAMS & CONFERENCES:** [www.agwt.org/workshops.htm](http://www.agwt.org/workshops.htm)

## AGWT Publishes an Illustrated Children's Storybook About Well Drilling

Ground Water and Water Well Awareness: K thru Congress

Softcover \$7.95, 40 pages - ISBN: 9780964118638

*The book is nicely illustrated and is an informative story on private well construction and ground water for children and young adults.*

Robert Varney, US EPA, Region 1 Administrator

*A great job of communication directed at the elementary school level. We have needed this document very much, and I am proud of AGWT for getting it out.*

Phil LaMoreaux, Editor-in-Chief, Environmental Geology

**New Hampshire Water Well Association has provided funding to purchase and distribute the Trust's Well Book to all 350 elementary schools in the state!**



 **View online book sample at:**  
[www.agwt.org](http://www.agwt.org)

Additional bulk purchases of the book from organizations such as; Nebraska Department of Health, NE; Auburn University, Department of Geology, AL; New Brunswick Ground Water Association, Canada; Palmdale Water District, (FL); Ogallala Commission, TX, and Shiawassee City Health Dept., MI are helping the Trust in its endeavor to place a book in every school and every library in America.


## Colorado Conference on Aquifer Recharge and Storage Policy

The Trust's Ground Water Conference on Aquifer Recharge and Storage Policy Issues attracted 250 participants. The focus was on the politics of aquifer management. Nine of the state's elected representatives attended as did thirty attorneys with specialist interests in water issues. Keynote speakers were, Greg Hobbs, Supreme Court Justice; Harris Sherman, director of the Department of Natural Resources and Dick Wolfe, Assistant State Engineer (now appointed as State Engineer). The September conference was organized in partnership with the Arkansas Basin Roundtable, one of nine Roundtables established by the CO Department of Natural Resources, and charged by the legislature to convene a wide array of stakeholders to make decisions about how best to meet water challenges.

Perspectives on aquifer management issues in California, New Mexico, Arizona and Idaho were provided by Craig Miller, Assistant General Manager, Orange County Water District, CA; Denise Fort, Professor, University of New Mexico School of Law, NM; Gregg Houtz, Deputy Counsel, Arizona Department of Water Resources, AZ and Karl Dreher, VP, Brown & Caldwell, Golden, CO (former Director of Idaho Department of Water

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## AGWT WEBSITE

 **VISIT** [www.agwt.org](http://www.agwt.org) for details, registration and sponsorship opportunities of our upcoming conferences, workshops, teacher training programs across the United States and our online bookstore.

 **VISIT** [www.privatewell.com](http://www.privatewell.com) for ground water and well information.

### Support Ground Water Education Support the Trust

*[In 2007, for every \$1 in membership, the Trust leveraged an additional \$3 in program support]*

Charitable giving by individuals and businesses is an important source of funding for nonprofit organizations. If you care about science-based ground water education for those in K through Congress please consider adding us to your list of annual philanthropic donations. We do not share (or sell) membership names with anyone.

Contributions are tax deductible to the extent permitted by law.

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Resources).

Kathleen Curry, Colorado State Representative and Chair, of the Agriculture, Livestock & Natural Resources Committee was one of panelists that considered how aquifer recharge could become a more significant part of Colorado's water management toolbox. Curry said that "legislators need to be given authority to be more collaborative." She promised to do even more as Chair of the House Agricultural Committee to create an environment




where legislators come to the table ready to work instead of coming with their positions already formed. Representative Marsha Looper (also on the panel) praised Curry for her leadership in that direction. When asked if they could support funding for a statewide aquifer recharge project, most of the legislators answered yes.

Fred Anderson, Former President of Colorado Senate, talked about major groundwater bills that were passed in 1965 and 1969. He said that back then there was more cross-pollination among the three branches of government which gave more flexibility to solve problems. He said when the justices asked the legislature to re-codify water law to allow conjunctive use of groundwater with surface water, they were clear in saying "...but don't kill the well users—the state can't afford the economy we would lose." Anderson stated that we currently should be making more use of the ground water in the South Platte basin.



At the interactive lunch session, in which participants at each table were asked to discuss a series of questions, one group came up with a simple but useful idea. They suggested that a water court category be created for a "statement of interest" in new applications that would allow interested parties to receive all information in the case without having to file as an "objector." Why automatically set up an adversarial atmosphere when many "objectors" are simply registering in order to be kept informed of the proceedings?

Eric Hecox, Manager of the Interbasin Compact Process for the Department of Natural Resources cited the conference as a very successful example of what the Roundtables process is trying to accomplish. He said the conference in its design and implementation was effective in that it allowed for active dialogue, not just a series of presentations by experts.

*This article is based on the text of a post conference report prepared by MaryLou Smith, Vice President, Aqua Engineering, Inc. Colorado. The report and many of the presentations are available on a post-conference CD:  [www.agwt.org](http://www.agwt.org) [bookstore]*

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# GROUND WATER TRAINING FOR TEACHERS

## Ground Water Institute for Teachers™ in partnership with the USGS



By the end of 2007 the Trust's Ground Water Institutes for Teachers™ program had reached close to 1,400 teachers in 17 states. The objective of the programs is to encourage and empower teachers to include ground water topics in their teaching. In recent years federal and state education policy has led to more and more student testing in schools and resulted in many teachers having to stick strictly to the set curriculum. The Institutes show teachers how to creatively integrate ground water subjects into existing curriculum so that students may have a better understanding of the economic and environmental importance of water resources and water professionals' skills, products and services.

In 2008 the Trust will continue the Institute program in partnership with the US Geological Survey. The Southwest Florida Water Management District is sponsoring four 2008 Institutes in their service area. Additional Institutes are already scheduled for Massachusetts, Pennsylvania, Texas, Colorado and California. The Trust will be pleased to hear from potential sponsors for these scheduled Institutes and from companies or organizations who would like to be an Institute sponsor for any specific city, region or state.



The Massachusetts teachers seen here are getting the low-down on how ground water moves through aquifers. The use of ground water flow models in the classroom (often called sand-tank aquifers) is increasingly popular in schools. However, in order to maximize the learning opportunity for students, teachers and instructors need to be confident about how to operate the aquifer model. The Trust's Institute programs explain how to relate what the model shows to real situations involving ground water use and aquifer protection.

One of the lessons from the 2007 Sarasota (FL) Institute was to show the connection of hydrologic pathways. Ground water is simply that part of the hydrologic system that occurs in a geologic environment. In this picture a model is demonstrated showing that surface water and ground water are connected and that protection of water quality is not only important for drinking supplies but also for the aquatic environment of rivers and estuaries.



One way to engage students in water issues is to present a local land use policy dilemma. Russ Donnelly, Education Programs Manager, Metropolitan Water District of Southern California sets the scene for teachers at the Riverside/ Diamond Valley Lake Institute in California for a role playing exercise about the potential risks of expanding a landfill in an area close to a water supply aquifer. The collective wisdom of teachers at the Institute was then put to use in working out how this topic and other similar ideas could be integrated with existing curriculum.

San Antonio (TX) teachers know that their water supply comes from the Edwards Aquifer. The 2007 Institute gave them additional insight about how the San Antonio Water System operates and maintains the infrastructure of wells, pumps, and pipelines. In addition to visiting a major pump station (picture) the teachers visited San Antonio's new aquifer recharge facility that uses a deep sandstone aquifer to store excess water from the Edwards (limestone) aquifer to augment supply when the Edwards water levels are low.



**ONLINE CALENDAR OF TEACHER PROGRAMS:** [www.agwt.org/teachers/institutehome.htm](http://www.agwt.org/teachers/institutehome.htm)

## Wells as Assets—An important way to think about the value of using ground water

In 1998 the Trust organized its first water well workshop program that focused on techniques to maximize the life and performance of water wells. At that time there were many high yield well users who assumed (incorrectly) that declining yields were the result of over-use of aquifers. However, in most cases the most likely cause was clogging of the well screen and adjacent aquifer because of poor maintenance and/or incorrect on-off cycling of the pump. The early workshops showed how to assess whether the well, the pump or the aquifer was the cause of lower yields and outlined the options available for restoring a declining well performance resulting from mineral and biological encrustation in the well. (This photo is of a brand-new wire-wrapped stainless steel well screen.)



Since the first Baltimore event, the Trust has convened 19 "well" programs in 16 states. From the early focus on chemical & mechanical well rehabilitation methods the program has evolved to include more sophisticated diagnostic content and in the last two years has presented the program in the context of "asset management" where utility managers, contractors or any large ground water user can adopt a structured economic approach to decisions related to well operation, maintenance, rehabilitation and replacement.

There are several reasons to maximize the performance of high capacity wells. For a start, a new high yield well can cost in excess of \$1 million and obtaining a permit for new wells can be a protracted process. A very powerful reason for keeping a well at peak performance is high energy costs. When a well is not efficient it causes a deeper drawdown of the water level in the well. The deeper drawdown means that the pump has to work harder to lift the water to the surface. The extra "lift" can amount to many thousands of dollars a month for each well in unnecessary operation costs. Maintaining wells in a systematic way using asset management principles to make rehabilitation/ replacement decisions can significantly lower the costs of using ground water.

In 2007 the Trust's well performance programs took place in Florida, Washington and Oregon and the first 2008 well program was in Phoenix, Arizona. Upcoming programs currently scheduled are in Lakewood, CA (May 28) and Langley, BC, Canada (September 15).

Companies that have provided presentation experts for the Trust's 19 well programs include, Subsurface Technologies, Baroid IDP, Brown & Caldwell, Goulds Pumps, Flowserve, Kleinfelder, Golder Associates, MWH, ASR Systems, Layne Christensen, Roscoe Moss Company, pigadi GmbH, Johnson Screens, Design Water Technologies, and Water Systems Engineering. The programs have been attended by over 1,400 engineers, utility managers, water industry professionals, regulatory staff, well owners, water users and ground water specialists.

## Ground Source Heating & Cooling (Geothermal)

*This important technology and the related environmental and energy issues is a major program initiative for the Trust in 2008*

Congressman Richard Neal (D. MA) was one of the speakers at the Trust's Ground Source Heating and Cooling (GSHC) workshop in Massachusetts. Neal emphasized the importance of using renewable energy wherever feasible. With oil at close to \$100 a barrel, energy costs and dependence on imported oil are national issues. Building owners & home owners can help reduce the amount of pollution produced by fossil fuel systems and reduce demand for imported oil. High energy prices mean that there is now a quick pay-back for investing in GSHC.



There is a well established technology that uses the nearly constant temperature of the sub-surface as the basis for heat exchange for heating & cooling buildings and for generating hot-water. The technology has typically been called "geothermal" or "ground-source heat-pump." GSHC is a name that emphasizes that the same system can cool in summer and heat in winter. Installing closed loop GSHC systems (usually in a vertical bore-hole) requires the skill of well contractor professionals. The in-building work is typically undertaken by heating & ventilation (HVAC) professionals.

The American Ground Water Trust has scheduled a series of programs in 2008 on the subject of ground source heating and cooling to raise awareness of the technology and to highlight the importance of correct design and installation of closed loop systems so that there is no risk to ground water. The Trust's 2008 programs include: Tallahassee (FL) January 17th; Columbia (MD) February 20th; Chicago (IL) April 2nd; Seattle (WA) May 12th and Bridgewater (NJ) June 24th. The programs will provide a great opportunity for information exchange among policy makers and specialists involved in design, construction and permitting. The technology cuts across traditional professional boundaries and the program participants include energy company engineers, architects, well contractors, HVAC engineers, plumbers, planners, builders & developers, city planners and individuals interested in "green technology."

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### 2007 AGWT SCHOLARSHIP AWARDS



Ben Everson \$2,500 Scholarship (Funded by Claude Laval Corp., Fresno, CA): Fraser Evans, Brown University, Providence, RI  
Baroid \$2,000 Scholarship (Funded by Baroid Industrial Drilling Products, Houston, TX): Desiree Diana Amadeo, Massachusetts Institute of Technology, Cambridge, MA  
Amtrol \$1,000 Scholarship (Funded by Amtrol, Inc., West Warwick, RI): Dillion Harker, Brigham Young University, Provo, UT  
Stetson \$1,000 Scholarship (Funded by Stetson Engineers, Inc., San Rafael, CA): Catherine Wilcox, Seattle University, Seattle, WA

**To date, the Trust has awarded scholarships in the amount of \$125,000 to 75 college-bound students.**

This newsletter is from the American Ground Water Trust. The AGWT is a not-for-profit 501(c)(3) educational organization. The Trust's programs are focused on:

- ◆ Promoting efficient and effective ground water management
- ◆ Communicating the environmental and economic value of ground water
- ◆ Showcasing ground water science and technology solutions
- ◆ Increasing citizen, community and decision-maker awareness
- ◆ Facilitating stakeholder participation in water resource decisions



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