

The promise of the National Ground Water Research and Educational Foundation (NGWREF) truly blossomed in 2008 with a diversity of programs rewarded by grant support made possible by the generosity of the Foundation's supporters.

## Water Exhibit Featuring Ground Water Draws Crowds at American Museum of Natural History

Thanks to a grant from NGWREF, wells and ground water are an integral part of a traveling exhibit on water touring the world's leading science museums.

The 7,000-square-foot exhibit, *Water: H<sub>2</sub>O=Life*, appeared at the American Museum of Natural History (AMNH) in New York City through May 27. After New York, the exhibit traveled to the San Diego Natural History Museum (July 19–November 30).

In 2009, the Science Museum of Minnesota (SMM) (January 17–April 26), Chicago's Field Museum (June 12–September 20), and the Great Lakes Science Center in Cleveland (November 14–April 11, 2010) all host the event.

In 2011, the Royal Ontario Museum in Toronto (March 12–September 5) is its home.

Destinations outside of North America will follow, including the Singapore Science Center; Instituto Sangari of Sao Paulo, Brazil; and the National Museum of Australia in Canberra.



"The exhibit invites people of all ages to discover the beauty and wonder of water and to explore the challenges to protecting Earth's most precious life-giving resource," says Patrick Hamilton, SMM's director for this project. Three million people are expected to experience the exhibit during its global tour.

The ground water portion of the exhibit features "Porous Stones," an exhibit component intended to help dispel the com-

mon misperception that ground water occurs largely as underground lakes, rivers, and "veins" of water.

Also featured is a component that shows what may happen when two wells access the same aquifer.

A third ground water component is featured in the three-dimensional GeoWall animation.

## Foundation Board Awards Three Developing Nations Grants

A total of \$16,000 in grants were awarded by NGWREF to three different organizations doing water well construction projects in differing regions of the developing world. This was the second time in the Foundation's history to award developing world grants.

Receiving \$6,000 was the Tarahumara Children's Hospital Fund for constructing water wells in the villages served by the hospital located near Creel in the Sierra Madre Mountains of Mexico's Copper Canyon region. According to Steve Schneider, MGWC, a water well contractor from Oregon who has volunteered for the hospital, "On one site where I was assisting with a new well, a man with a burro carrying a couple of five-gallon containers took over three hours making the round trip from our drill site and back, and he had still further to go to finish transporting the water to his family."



Receiving \$5,000 was second-time grant winner, the Ann Campana Judge Foundation. The funds will be used for potable water projects in either Guatemala, Panama, Honduras, Nicaragua, or El Salvador.

"Thank you so much for your notification of a \$5,000 match to be provided to the Ann Campana Judge Foundation," writes Mike Campana, Judge Foundation president.

A school in the Malawi village of Geisha benefited from a \$5,000 grant made to the Richland, Washington, Westside Presbyterian Church.

"Thank you so much," says Rochelle Holm, the organizer of the church's initiative. "This grant will improve the lives of hundreds of poor villagers. Clean water really is an invaluable resource."



Schoolchildren in Geisha, Malawi, who will benefit from the Foundation's grant.

"Thank you for your help and interest in helping the Tarahumara people to solve their fundamental needs of water," writes Father Pedro J. de Velasco, R.S.J. of the Tarahumara Indian Children's Hospital.

"As soon as we received your donation, we started drilling and we have already invested that money in drilling two wells in the communities of Wachonchi and El Ranchito, near Norogachi," Father de Velasco says. "Both of them have yielded enough water for those communities' needs."

### Three Receive Research Grants from NGWREF

The NGWREF Board made three awards totaling \$12,500 from the Foundation's Research Fund, the second such grants made by the Foundation. The selections were made following recommendations made by way of a blind review by a panel selected from among the membership of the National Ground Water Association.

#### Database-Independent Microbial Source Tracking to Determine the Source of Fecal Pollution in Ground Water

The lead investigator will be Lawrence Goodridge, assistant professor of food microbiology at the Department of Animal Sciences, Colorado State University. The research will include an investigation of the space between the bottom of a well pump intake and the bottom of the borehole in domestic well systems, and potential to promote bacterial growth and to harbor other microorganisms.

#### Determination of 4-Helium Release Rates for Dating Old Ground Water in a Carbonate Aquifer

Victor M. Heilweil of the USGS and Kip Solomon, Ph.D., University of Utah and a former Darcy Lecturer, will team for this investigation that supports the Foundation's call for proposals that would lead to greater understanding of the issues that influence or constrain ground water recharge programs, as well as the integrated management of surface water and ground water.

#### Interactions Between Fire, Vegetation, Climate, and Ground Water in a Burned Ponderosa Pine/Gambel's Oak Watershed

Deborah Finch, Ph.D., of the U.S. Department of Agriculture's Forest Service will be the principal investigator. The semiarid

southwestern United States is currently suffering from a long-term drought. In addition, scientists are predicting a continued rise in global temperatures. This type of climate change is thought to have potential impacts upon water supplies. Continued climate change and fire suppression may further limit the water supply.

### Five Selected for NGWREF Scholarships

More than 120 individuals filed applications for scholarship consideration by NGWREF this year.

The independent review panel selected five students for awards this year, including Past Presidents Award recipient Jennifer Teeple, Toledo, Ohio, University of Toledo, environmental science and geology; and Ora Lyons Award honoree Jeanne Eckhart, Bandera, Texas, Texas A&M University, environmental geosciences. Each has been granted \$2,000.

Receiving \$1,000 scholarships each were Guleed Ahmed Hussein Ali, Tucson, Arizona, University of Arizona, geology; Jonathan Love, Petersburg, Illinois, Western Illinois University, geology (focus on hydrogeology) with a minor in natural resources and conservation; and Elliot Matthews, Easton, Kansas, Colorado School of Mines, geological engineering with an emphasis on hydrogeology.

The awards are made from NGWREF's Len Assante Scholarship Fund.

### Farvolden Award Winners Named at Ground Water Summit Conference

As a part of a larger effort to encourage students to pursue professional careers in ground water science and technology to address an increasing shortage of qualified professionals, NGWREF provided scholarship awards at the 2008 Ground Water Summit.

The awards were given for the best student poster and best student paper presentations based on three criteria: the quality of the presentation, content (including contribution to ground water science, engineering, management, or policy), and demonstrated insight on the topic.

NGWREF awarded four scholarships in the amount of \$500 each through the Len Assante Scholarship Fund. These awards are in honor of the late Dr. Robert Farvolden, a well respected educator, as well as a former senior scientist for NGWA.

The winners were Katelyn FitzGerald, Michigan Technological University, "Engaging Urban Students in Geoenvironmental Education Using Storm Water Management Techniques;" Laura Brunson, University of Oklahoma, "Sustainable Technologies and an Implementation Strategy for Arsenic and Fluoride Removal in Developing Areas;" Jennifer Oblinger, Clemson University, "Assessing the Impact of Water Harvesting on Water Resources in Rural India;" and Megan Smith, Colorado School of Mines, "Using Polymer Floods to Overcome Heterogeneity Effects During Bioremediation and Chemical Oxidation Ground Water Treatments."

### Laton 2009 McElhiney Lecturer

W. Richard Laton, Ph.D., PG, CPG, has been named NGWREF's 2009 McElhiney Distinguished Lecturer.

Laton, a director for NGWA's AGWSE division, and an active NGWA volunteer, is currently an associate professor of hydrogeology in the Department of Geological Sciences at California State University, Fullerton.



His main research focus for the past five years has been on the arid region of San Bernardino County in southern California, where he has worked closely with a large water agency in the area to evaluate the hydrogeology of its sphere of influence. Laton's research has shown itself in many public reports and atlases regarding the region's geology, hydrology, and hydrogeology. One other result of this research is that Laton has pinpointed an issue important for ground water contractors across the nation to address—the need to keep detailed well logs using standardized classifications.

"Boring Logs—What's Important and What's Not: A Scientific Viewpoint" will be the subject of Laton's 2009 NGWREF McElhiney Lecture. Fundamental to any drilling contractor's business, there are many uses for boring/well logs including specifying location, ground water levels, chemistry, and production capabilities—information used routinely by government and regulatory agencies, consultants, and academics. Beyond these usual uses, however, boring/well log information may be used for hydrostratigraphic interpretation, ground water modeling, subsurface investigations, and general background information. In fact, through careful logging and data collection, both contractors and scientists can work together to develop better subsurface models that will help everyone in the industry.

In addition, Laton will discuss the widespread use of handheld GPS devices and the value of Google Earth for basic mapping of locations, which can help even the smallest contractor's business, not to mention that obtaining accurate location information—and its mapping—allows for a better understanding of the local and regional geology.

NGWREF presents the William A. McElhiney Distinguished Lecture Series in Water Well Technology to foster professional excellence for the ultimate purpose of protecting the world's ground water resources for their productive use by mankind.

Initiated in 2001, this lecture series honors William A. McElhiney, the 1948 founding president of NGWA. He was a ground water contractor and civil engineer from Brookline, Illinois. McElhiney and the other founders of the Association saw several primary functions for the new national group, including serving as a clearinghouse for information.

The series is made possible by a grant from the Franklin Electric Co.



**Franklin Electric**

## McElhiney Lecture Series Scores Well with Audiences

The McElhiney Lecture Series in Water Well Technology aims to further increase the skills and competencies of ground water professionals. To help determine if that goal is being met, audiences are asked to complete a post-lecture evaluation form.

Recent evaluations conducted at lecture sites yielded the following data supporting the important roles of the McElhiney Lecture Series:

- 97 percent of the respondents say the lecture was useful to their work.
- 87 percent say the lecture inspired them to further their water well technology knowledge relating to the lecture topic.
- 93 percent say they would recommend the lecture to a colleague.
- 93 percent say they would attend another McElhiney Lecture on a different topic.

## Australian Named 2009 Darcy Lecturer in Ground Water Science

Peter Cook, Ph.D., senior principal research scientist at the Commonwealth Scientific and Industrial Research Organisation (CSIRO), Land and Water in Adelaide, Australia has been named the 2009 Darcy Lecturer in Ground Water Science by the NGWREF Board of Directors. He is the first non-North American to be named a Darcy Lecturer since the program's inception in 1987.



Environmental tracers can reduce uncertainty of hydrogeological predictions in all environments, but are particularly valuable in highly heterogeneous systems, where spatial variations in aquifer hydraulic conductivity may range over several orders of magnitude, and so hydraulic approaches are inherently uncertain. However, despite the rapid growth of these methods over the past few decades and their adoption by the research community, environmental tracers are not widely used in routine hydrogeological assessments. This lecture will illustrate the potential of environmental tracers through illustration using field sites in North America and Australia, and discuss methods for bridging the gap between research and practice.

Cook's research has focused on the use of isotopes for water resources management. Initially, his work involved the use of  $^3\text{H}$  and  $^{36}\text{Cl}$  as tracers of soil water movement leading to ground water research. Subsequently, he studied use of isotopes ( $^{14}\text{C}$ ,  $^2\text{H}$ ,  $^{18}\text{O}$ ,  $^3\text{H}/^3\text{He}$ ) for ground water dating and as tracers of ground water processes. Over the past five years, Cook has been actively developing the use of radon as a tracer of ground water/surface water interaction. He has published 43 papers in international journals in the last 18 years.

During post-doctoral study in Canada and the United States between 1992 and 1994, Cook was instrumental in the development of chlorofluorocarbon methods for ground water dating. In 2003, he was one of three international scientists commissioned by the International Atomic Energy Agency to develop a guidebook for the use of chlorofluorocarbons in hydrology.

In 2000, Cook was the lead editor of the textbook *Environmental Tracers in Subsurface Hydrology*, now considered to be the preeminent reference work in this field. Cook also co-authored the textbook *Ecohydrology*, published in 2006.

## Foundation Seeks Broader Support of Darcy Lecture Series

NGWREF sponsors the Henry Darcy Distinguished Lecture Series in Ground Water Science in response to invitations from universities and research institutes throughout the world at no cost to the audiences. At present, our annual operating costs for the Darcy Lecture Series are \$25,000. The Foundation's board has set an endowment target of \$500,000 and seeks support from all employers benefitting from, and in continuing need for, a skilled and competent work force. Corporate underwriting opportunities are available.

During the past 22 years, the program has reached an estimated 70,000 ground water students, faculty members, and other professionals around the world.

The Darcy Lecture Series captures the spirit of Henry Darcy, the French hydraulic engineer who described in 1856 his laboratory experiments on the flow of water through sands that led to the empirical law named for him. Darcy's investigations established

the physical basis upon which ground water hydrogeology has been studied ever since.

In articulating to students, researchers, and practitioners the societal relevant engineering and scientific challenges in ground water hydrogeology, the Darcy Lecture Series fosters interest and excellence in ground water science and technology.

Our specific objectives with the Darcy Lecture Series in Ground Water Science are to:

- Attract students to ground water science.
- Create excitement in the growing community interested in ground water.
- Provide a forum for examining real problems related to ground water resources faced by society.
- Provide interesting and dynamic lectures for universities to complement hydrogeology and geotechnical departments and programs.

The evidence says we are achieving our ambitions.

"It is the goal of research to develop understanding that will provide the next generation of tools, methods, and interpretations that will be applied in the private sector," explains Allen M. Shapiro, Ph.D., the 2004 Darcy Lecturer. "In delivering the Darcy Lecture Series, NGWREF is promoting the fields of hydrogeology and water management at educational institutions and motivating students to become engaged in water resources. These are the students who will become the next generation of employees.

"It is critical that a lecture series in hydrogeology interact with the private sector engaged in applying innovative techniques in addressing issues of water management," Shapiro adds.

Recent evaluations conducted at lecture sites yielded the following data supporting the important roles of the Darcy Lecture Series:

- 54 percent are 35 years old or younger in age.
- 60 percent have five or fewer years of professional experience.
- 63 percent say the lecture was useful to their career goals.
- 74 percent say the lecture was useful to their personal specific ground water interests, research, or specialization.
- 71 percent say the lecture inspired them to further their ground water knowledge in general.
- 81 percent say they would recommend the lecture to a colleague.
- 88 percent say they would attend another Darcy Lecture.

NGWREF support opportunities include:

- Donations
- Sponsorships

- Bequests
- Insurance policies naming NGWREF as the beneficiary
- Fundraising events
- Fund campaigns.

To discuss your corporate or individual support for the Darcy Lecture Series, contact Kevin McCray at 800 551.7379 (614 898.7791) or [kmccray@ngwa.org](mailto:kmccray@ngwa.org).

## NGWREF Appreciates Its Donors

The various works made possible by NGWREF, such as the Darcy and McElhiney Lectures, scholarships, and grants for ground water projects in the developing world, are only possible through the generosity of the many donors to the Foundation.

Since 1995, these are the statistics for our various NGWREF donor recognition categories:

Category	Donation Range (cumulative)	Number of Donors
Leader	\$50,000 and above	Franklin Electric Co.
Benefactor	\$25,000 to \$49,999	Len and Joanne Assante
Partner	\$10,000 to \$24,999	Gregg Drilling and Testing William W. Reichart Inc. Downey Drilling
Patron	\$5,000 to \$9,999	19
Associate	\$2,500 to \$4,999	26
Friend	\$500 to \$2,499	112
Donor	\$1 to \$499	872

In all, 1,034 donors have given a collective \$516,746 to date. This is not inclusive of support provided by NGWA.

## Contributions Make a Difference

Your corporate or personal gift contribution helps the ground water professions in many ways, such as providing necessary support to accomplish the programs described in this annual report.

We invite your tax-deductible contribution. You may be able to increase the impact of your gift by stipulating a "matching fund contribution" offered by many employers. For your convenience, you may make your contribution through our Web site. Simply go to [www.ngwa.org/about/ngwref/contribute/index.aspx](http://www.ngwa.org/about/ngwref/contribute/index.aspx) to learn more about how to contribute to NGWREF.

Please contact Executive Director Kevin McCray if you have any questions, want to discuss opportunities for supporting a specific program, or wish to make a planned gift. He can be reached at 800 551.7379 (or 614 898.7791), extension 503, or by e-mail to [kmccray@ngwa.org](mailto:kmccray@ngwa.org).

### 2008 NGWREF Board of Directors

#### President

Scott Fowler, CWD/PI

#### Executive Director

Kevin McCray, CAE

#### Directors

Alan Eades, CWD/PI  
Brent Murray, PG  
Jack Henrich, MGWC  
Richard Clarke  
Mark Husnik, CSP  
John Pitz, CPI  
Art Becker, CWD  
Len Assante, CWD/PI  
Robert Reichart, CWD/PI



National Ground Water Research and Educational Foundation  
601 Dempsey Rd.  
Westerville, Ohio 43081  
Phone/ 800 551.7379  
Fax/ 614 898.7791  
[www.ngwa.org/about/ngwref](http://www.ngwa.org/about/ngwref)