



Desert Research Institute

DRI News

S U M M E R

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AILEEN AND SULO MAKI

Remembering the Makis
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DRI receives major gift for Southern Nevada water research

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Solutions

Environment

Science



DRI receives gift worth more than \$20 million Sulo and Aileen Maki estate to be used for Las Vegas water research

The estate of Sulo and Aileen Maki has left in excess of \$20 million to establish an endowment at the Desert Research Institute, which will be designated for water-resource programs in southern Nevada.

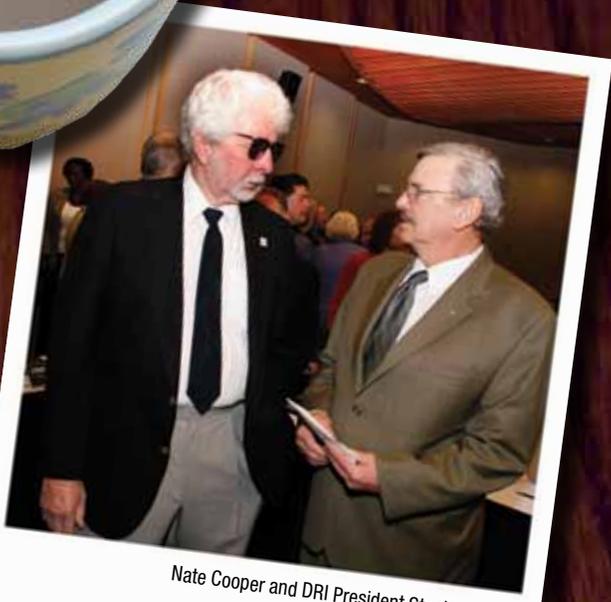
"This gift will propel one of the nation's largest academic research units, DRI's hydrologic sciences and water resources program, into a position of global leadership," says DRI's President Stephen Wells. "Through the years, Sulo and Aileen have been DRI's most generous benefactors, and I think it's fair to say they were the leading advocates for establishing and supporting a DRI campus in Las Vegas."

DRI's southern Nevada origins began in facilities owned by Sulo and Aileen Maki, who made substantial cash and property donations to the institute during the past four decades. In 2001, Aileen and her late husband were honored with the DRI President's Medal.

"Water is such a precious resource in Nevada, and this gift will allow DRI to greatly expand its programs and expertise," Wells says. "We are especially grateful to Sulo and Aileen for believing in DRI's mission and generously investing in its future."

Aileen Maki died in August 2007, and was preceded in death by her husband Sulo in 1985. After successfully building and managing apartment complexes in Seattle, Sulo and Aileen Maki moved to Las Vegas in 1951, where they became major residential developers near downtown. Sulo Maki, whose parents emigrated from Finland, served as the Finnish Consulate for Nevada.

"The Maki estate funds will be used to establish long-term programs that will create outstanding opportunities for DRI faculty to leverage into new external funding sources dealing with hydrologic sciences" says John Warwick, DRI's director of hydrologic sciences. "I envision this gift immediately benefiting our existing Underground Weighing Lysimeter Lab in Boulder City, expanding our efforts regarding monitoring and modeling of Lower Colorado River water quantity and quality, and creating a network of high-altitude precipitation and recharge monitoring stations to better understand climate-change impacts on Southern Nevada water resources." 



Nate Cooper and DRI President Stephen Wells

Nate Cooper: Remembering the Makis

Nate Cooper says he came to work in Las Vegas back on February 1, 1970 to begin a 25-year career as DRI's "Factotum."

The self-described jack-of-all-trades reveals his dry wit and self-effacing demeanor, but the relationship Cooper fostered with Sulo and Aileen Maki resulted in the Desert Research Institute receiving an estimated \$20 million gift from the couple in their will earlier this year.

"This gift is more about the Makis, though I was involved, but I didn't come up with the \$20 million," says Cooper, now living in retirement near Tucson, Arizona.

Cooper was drawn to DRI by former hydrologist George Maxey, who spent his sabbatical in 1969 working for the Montana Water Resources Board. Maxey's wife Jane just happened to be Cooper's seventh-grade teacher in Shawmut, Montana, and Cooper struck up a friendship with the Maxeys, often staying with them when he commuted into the capital in Helena.

At the conclusion of his sabbatical in Montana, Maxey asked Cooper to join him in Las Vegas to work on an Environmental Protection Agency groundwater study of the Las Vegas valley. Cooper then moved to Las Vegas and quickly became acquainted with the Makis, who had come to Las Vegas and bought 160 acres near the UNLV campus. The Makis, although

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—DRI President Stephen Wells

modest, were fixtures in 1950s Las Vegas, where they struck up a friendship with Liberace, who performed at the El Rancho Vegas, and their favorite buffet was the \$3.95 special at the Landmark.

"As Aileen once told it, she once got a phone call back in the 1950s from Howard Hughes, who wanted to buy a 10-acre parcel at Tropicana and Paradise," Cooper recalls. "She said 'Howard, let me talk to my husband and I'll call you back in a half hour.' When she returned the call, he agreed to pay them \$500,000 for the land."

When Cooper arrived in Las Vegas, DRI was located in half of a duplex owned by the Makis, directly across the street from the University of Nevada, Las Vegas on Maryland Parkway.

"When I got there I was told to clean out the boxes in the smaller of the two bedrooms in that duplex because that would be my office," Cooper says. "Eventually, that duplex was one of many gifts over the years that the Makis gave to DRI. I painted the first DRI sign on a piece of plywood with black letters outlined in red that I was quite proud of. I look back on it and remember that if the air conditioner or the plumbing in the duplex we rented didn't work, I'd call Sulo and he'd come over and fix it himself."

Cooper grew close to the Makis, who lived in and managed the nearby 239-unit Longacres Apartments. He admired their work ethic, saying that when a unit became available, Aileen would clean it and Sulo would paint it.

"They were hard workers, second-generation Finns," Cooper says. "Sulo bought his first four-plex in Seattle after saving money from his milk and egg route in high school. Before long, they had a 10-story, 90-unit apartment building in Seattle that they owned and ran."

In 1985, Sulo had a heart attack and died while driving on Sahara Avenue in Las Vegas. His car veered off the road with Aileen in the passenger seat. Two years later, Cooper helped her move out of a condominium on the Dunes Golf Course that she eventually gave to DRI and into a high-rise condominium in La Jolla, California, overlooking the ocean. Aileen passed away in August, 2007.

"They were something, she kept track of all of their investments on a legal pad and entered everything with a No. 3 pencil," Cooper says. "That legal pad had more than 100 pages filled out."

Sulo and Aileen Maki clearly had a special relationship with DRI. The result of that friendship was one of the largest single gifts a Nevada System of Higher Education institution has ever received. 

Going green at public schools

GreenPower supported by Sierra Pacific Power and Nevada Power Companies

Renewable energy, sometimes referred to as “green power,” is power generated from resources such as solar, wind, geothermal and biomass. The mission of the DRI Research Foundation’s GreenPower program is to support and promote the use and development of green sources of energy in Nevada, specifically by educating Nevada’s K-12 population.

Since its inception in 2000, GreenPower has been a partnership among the Desert Research Institute, volunteer GreenPower Committee members, Sierra Pacific Power Company and Nevada Power Company and their customers. Funded by the generosity of customers voluntarily adding a few dollars to their monthly electrical bill, 100 percent of the tax-deductible donations go toward renewable-energy education in Nevada.

“This is something the average person can do if they want to help a little bit and can’t spend \$20,000 or more for a solar system on their house,” says Roger Jacobson, vice president of academic affairs at DRI.

Fayth Ross, DRI’s recently hired GreenPower outreach administrator, agrees.

“Students are our future,” she says. “They will grow up to be consumers and will someday be exploring options for their own homes and businesses. By teaching students early on how to incorporate green energy into their daily lives, we’re helping them as

well as our society’s future.”

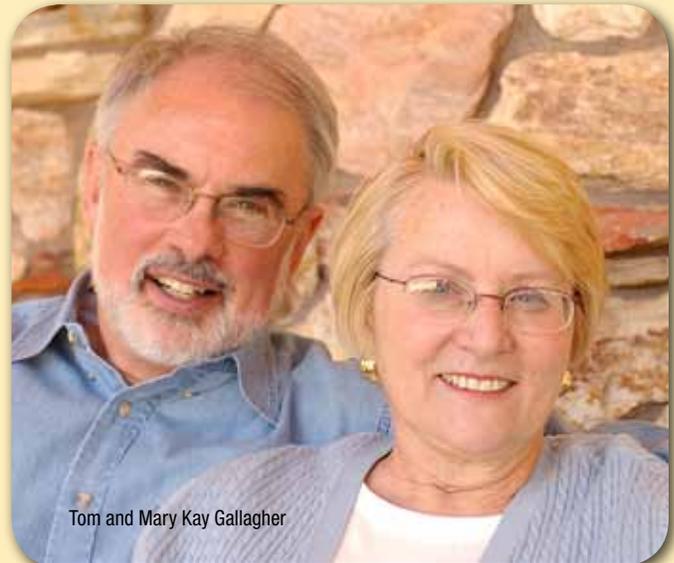
The GreenPower program works with Nevada’s K-12 educators to implement energy-conservation concepts and practices into the classroom and also provides curricula, books and hands-on teaching tools to help students learn about and use green power.

The GreenPower program also has installed permanent solar panels and wind turbines at the school sites, which are then hooked up to monitoring systems, helping students learn how renewable energy is generated.

There are currently 17 GreenPower schools operating throughout the state. The GreenPower program is working towards adding a new school in 2008, which will be in Clark County.



Fayth Ross



Tom and Mary Kay Gallagher

Tom and Mary Kay Gallagher make \$100,000 gift to DRI archaeology lab

Tom E. and Mary Kay Gallagher have pledged \$25,000 annually over the next four years to purchase important equipment for the Desert Research Institute’s archaeology lab.

“We are very grateful to Tom and Mary Kay for supporting a function of the institute where they have a personal interest,” says Stephen Wells, DRI’s president. “The identified equipment will tremendously expand the capability of researchers to identify biological and archaeological materials of value such as hair, charcoal and bone.”

The gift is critical to DRI’s ability to expand the range of federal grant opportunities that institute archaeologists can pursue. In recognition of the equipment purchase, DRI’s Division of Earth and Ecosystem Sciences will name the archaeology and paleoecology laboratory for Tom and Mary Kay Gallagher.

“My wife, Mary Kay, and I chose DRI because of its extraordinary potential to improve life, not just in Nevada, but also on a national and international scale,” says Tom Gallagher. “This area appealed to us because in our case, Mary Kay and our daughter Erin are the scientists in the family. When a request came for some important equipment for the archaeology lab at DRI, Mary Kay’s 40-year interest in the field made it a natural for a gift from us.”

Tom E. Gallagher, a former gaming executive, is a Trustee on DRI’s Research Foundation, where he serves as the Finance Committee Chair.

Clark J. Guild, Jr. endowment established for DRI Watershed Sciences

Guild's children, Joe and Jann, commit \$100,000 in father's memory

Joe Guild and Jann Guild Cademartori have committed \$100,000 to the Desert Research Institute to establish the Clark J. Guild, Jr. endowment for Watershed Sciences in memory of their father.

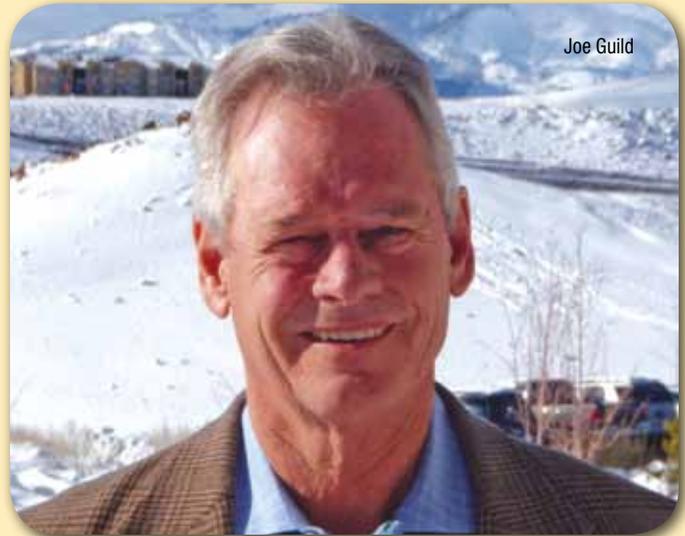
"My dad, Clark J. Guild, Jr., had a great interest in natural resources and was also a DRI Research Foundation trustee for a number of years," Joe says. "He was the reason my sister, Jann, and I decided to create an endowment for watershed science."

Jann adds that "my brother, Joe, and I established the Clark J. Guild, Jr. endowment for Watershed Sciences because it represented all the things our father believed in: Nevada, education and research."

The money will be used at the discretion of Jim Thomas, the senior director of DRI's Center for Watersheds and Environmental Sustainability for watershed science research, business development and/or management/policy programs in watershed sciences. Activities may include, but are not limited to:

- Facilitating the development of interdisciplinary and inter-divisional research teams that address issues of environmental restoration, sustainability and policy at the watershed scale;
- Acting as a catalyst to develop a program for emerging areas of watershed research;
- Aiding in the development of a regional environmental research agenda;
- Acting as a resource to environmental restoration and planning agencies to aid in the development and coordination of their science activities;
- Disseminating and interpreting findings of environmental research activities to the scientific community, legislative delegations and the public at large; and
- Providing direction as to the most effective methods to develop and implement environmentally sustainable watershed policies within the western United States.

"The Guild family's endowment in support of our research in watershed sciences comes at a critical time for DRI, Nevada, the nation and the world," says Stephen Wells, DRI's president. "Increasing our knowledge and enhancing our stewardship of water resources in the western United States and dry lands of the world is paramount for sustaining our environment and way of life. We deeply appreciate the generosity of Joe and Jann's contribution to achieve our mission." 



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—DRI President Stephen Wells

Help strengthen world-class environmental research

On any given day, 300 scientific experiments are conducted throughout the world by Desert Research Institute researchers. From its home in Nevada, DRI has provided high-integrity, non-biased science on every continent for nearly 50 years.

DRI answers some of today's most critical environmental questions. Will there be enough water in the West and other arid places? Can we harness the power of wind and water as reliable energy sources? What can we learn about global climate change to best prepare for, or alter, impending dramatic changes? DRI's research discoveries can help make the difference between global health and possible environmental crisis for Earth.

You can make a difference. Through a donation to the DRI Research Foundation, you have the ability to make a direct impact for the betterment of our planet by building a strong funding base for environmental research.

Visit www.dri.edu to make a gift or for more information.



Desert Research Institute News is published by the Desert Research Institute, a nonprofit, statewide division of the Nevada System of Higher Education. DRI is internationally recognized for excellence in environmental research. DRI operates two campuses: one in Las Vegas and one in Reno at the Dandini Research Park. Articles appearing in DRI News may be reprinted with appropriate attribution given to the Desert Research Institute.

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DRI News

Editors	Bob Conrad Sara Marcus Greg Bortolin
Design	Rollermonkey Design
Printing	Bear Industries

www.dri.edu

Reno Campus Desert Research Institute 2215 Raggio Parkway Reno, NV 89512-1095 (775) 673-7300	Las Vegas Campus Desert Research Institute 755 East Flamingo Road Las Vegas, NV 89119-7363 (702) 862-5400
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The Desert Research Institute is committed to Equal Employment Opportunity/Affirmative Action in recruitment of its students and employees and does not discriminate on the basis of race, color, religion, sex, age, creed, national origin, veteran status, physical or mental disability or sexual orientation. DRI employs only United States citizens and aliens lawfully authorized to work in the United States. Women and under-represented groups are encouraged to apply.



From the desk of Steve Wells

With the tremendous gifts the Desert Research Institute has received during the past few months, it is only fitting that I introduce Russel A. Kost III, our new Vice President for Development.

In a time when our economy is soft, and the state is less able to offer support for DRI, Russel's charge to raise more private dollars has never been more critical to both our current mission and the future growth of the institute. I'm confident Russel is up to the task after he has personally raised more than \$100 million during his 23 years at the University of Nevada, Las Vegas, where he most recently served as the Associate Vice President of Alumni Relations and Development as well as Executive Director of the UNLV Alumni Association.

I believe in these past few months, starting with an incredible gift of about \$20 million from the estate of Sulo and Aileen Maki, that DRI has incredible momentum in the area of fund raising. DRI is indebted to the efforts of Nate Cooper, whose relationship with the Makis is featured in this edition.

Two other gifts that need to be singled out are those from DRI trustee Tom Gallagher, and Joe Guild.

Tom, of Caesars Palace fame, along with his wife, Mary Kay, have given DRI \$100,000 for equipment in our archaeology lab. Joe, along with his sister Jann Guild Cademartori, have given \$100,000 in their father's name, Clark J. Guild, Jr., to establish an endowment for Watershed Sciences. I might point out that Tom is from Las Vegas and has a home at Lake Tahoe, while Joe is a Reno attorney and runs a ranch in Lyon County.

While he got a mention in the last issue, I would be remiss if I didn't recognize Mike Benjamin, who has stepped up to be our chairman of our Research Foundation Board of Trustees. I have also been honored by the continued involvement of our immediate past Chairman, Ken Ladd.

I'm also pleased to report that we had our most successful Nevada Medal dinners to date in the new Peppermill Hotel in Reno and the

venerable Caesars Palace in Las Vegas. We raised more money at our two live auctions than ever before, thanks to auctioneer Christian Kolberg, who did a magnificent job selling mainly unique experiences highlighting our research. And of course, we got an incredible amount of national media attention – most of it good – from this year's Nevada Medalist, James Hansen, director of the NASA Goddard Institute for Space Studies.



Russel A. Kost III

In the rest of the issue is really what this all supports: Joe McConnell getting the inaugural Ansari Medal and a fine young scientist from MIT receiving the Peter B. Wagner Memorial Award for Women in Atmospheric Sciences. I'm proud of the outreach that we do at DRI, from the work that Fayth Ross does with our GreenPower renewable energy program to the work that Laura Edwards always seems to be in the middle of, reaching out to children about science in our schools.

Another indication of how DRI manages to support itself through indirect cost recovery of its research is the number of people we manage to hire, especially when you consider the state of the economy. And finally, I'm continually inspired by the work we do both here in Nevada and at the far reaches of the earth. 

Nevada Medal and DRI President's Medal

April 15 and 17, 2008



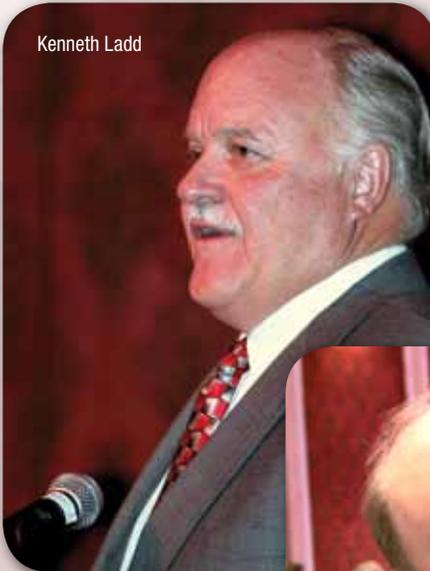
Stephen Wells, president of the Desert Research Institute, presented President's Medals at the annual Nevada Medal dinners in Reno at the Peppermill on April 15, and in Las Vegas at Caesars Palace on April 17. Nate Cooper, Nazir and Mary Ansari, and Kenneth G. Ladd were the 2008 recipients of the award. NASA's James Hansen accepted the 2008 Nevada Medal award (see *"James Hansen named 2008 DRI Nevada Medalist"*).

"This is an opportunity to acknowledge and thank these very special people for their leadership, dedication and generosity to DRI," Wells says. "The support we receive from the private sector has been critical to both our growth and success."

Nate Cooper, who is retired and lives in Arizona, received his award at a Nevada System of Higher Education Board of Regents meeting in February. A former DRI administrator in Las Vegas, Cooper was recognized for his stewardship of a gift to DRI from the estate of Sulo and Aileen Maki of approximately \$20 million (see *"Remembering the Makis"*).

Nazir Ansari, a DRI Trustee, and his wife Mary, both of Reno, have funded the Nazir and Mary Ansari Chair in Entrepreneurialism and Science in addition to the Nazir and Mary Ansari Medal for Excellence in Science at DRI. These awards recognize outstanding DRI faculty members in addition to funding their research and lectures (see *"McConnell named inaugural Ansari Medal winner"*).

Kenneth G. Ladd, of Las Vegas, is the Regional President of US Bank. He is the immediate past president of the DRI Research Foundation, where he led efforts to provide critical funding for the recently completed Maxey addition on the Reno campus. These President's Medal winners exemplify dedication to DRI's mission and have helped to advance the institute to where it is today. 



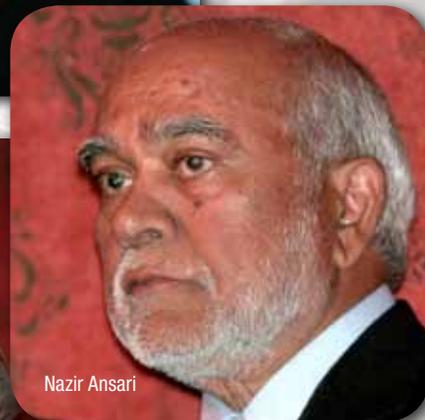
Kenneth Ladd



James Hansen



Regent Stavros Anthony



Nazir Ansari



Mary Ansari



Ed Ricks and DRI President Stephen Wells



Nevada Medal

April 15 and 17, 2008

James Hansen, 2008 Nevada Medalist

NASA scientist one of leading voices on climate change

James Hansen, director of the NASA Goddard Institute for Space Studies, was named the 2008 recipient of the Desert Research Institute's Nevada Medal, which was presented at the Nevada Medal dinners in Reno and Las Vegas.

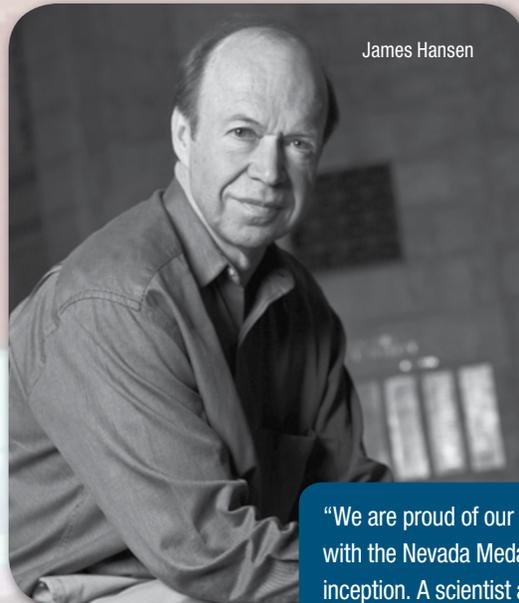
"Dr. Hansen has studied the effects of greenhouse gases (GHGs) on Earth's climate throughout most of his illustrious career," says Stephen Wells, DRI's president. "Through his development and application of global models to explore the potential climate effects of unchecked increases in GHG concentrations, Dr. Hansen has become one of the most prominent and recognizable scientific spokespersons on the topic of climate change."

Hansen's scientific publications, testimony before congressional committees, media interactions and other means, have established him as a consistent voice warning about the potential effects of climate change and calling for directed approaches to reduce GHG emissions.

The Nevada Medal was established by DRI in 1988 to acknowledge outstanding achievement in science and engineering. It includes a \$20,000 honorarium and minted silver medal provided by the shareholders of communication company AT&T.

Nominations for the Nevada Medal are accepted continuously from universities, private firms, research organizations, professional societies and individuals.

"We are proud of our association with the Nevada Medal since its inception," says Hal Lenox, president of AT&T Nevada. "A scientist as renowned as Dr. Hansen accepting this award speaks to the wonderful reputation the Desert Research Institute has around the world." 



James Hansen

"We are proud of our association with the Nevada Medal since its inception. A scientist as renowned as Dr. Hansen accepting this award speaks to the wonderful reputation the Desert Research Institute has around the world."



—Hal Lenox, President, AT&T Nevada



Event volunteers, left to right, Marjory Jones, Cindy O'Kelly and Pat Hughes

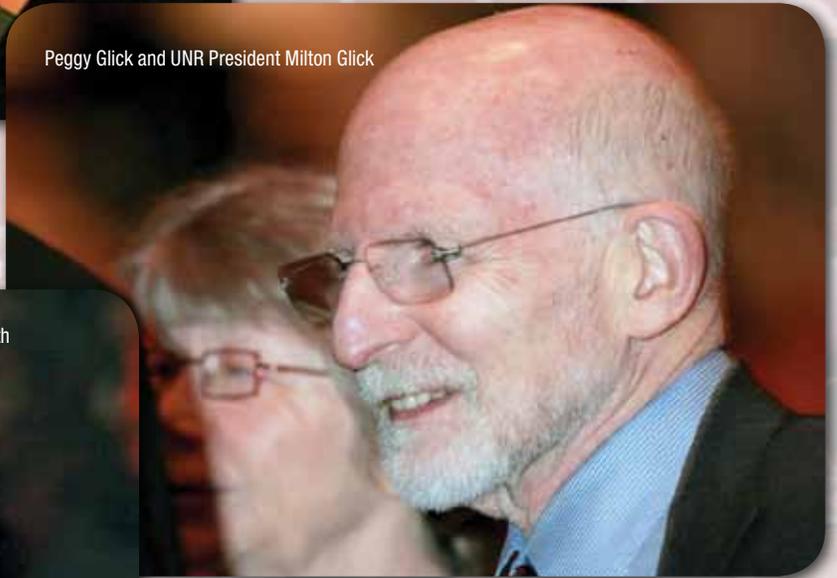
Walt Higgins



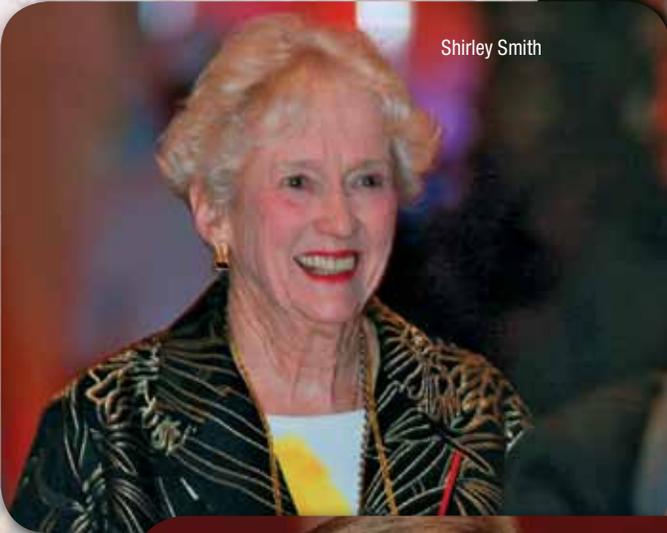
DRI President Stephen Wells and Auctioneer Christian Kolberg



Peggy Glick and UNR President Milton Glick



Shirley Smith



DRI President Stephen Wells and Matt James



State Senator Bill Raggio





Nevada Medal

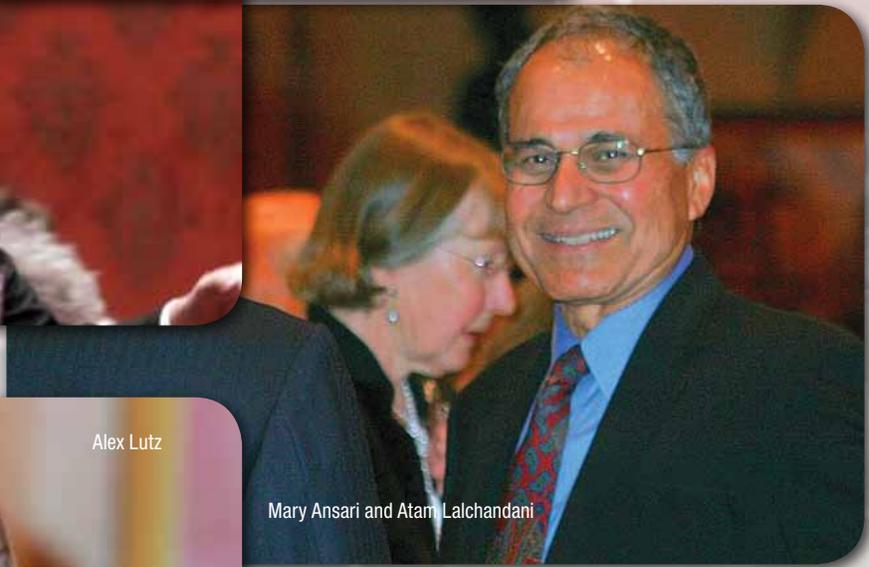
April 15 and 17, 2008



State Senator Randolph J. Townsend



Auctioneer Christian Kolberg



Mary Ansari and Atam Lalchandani

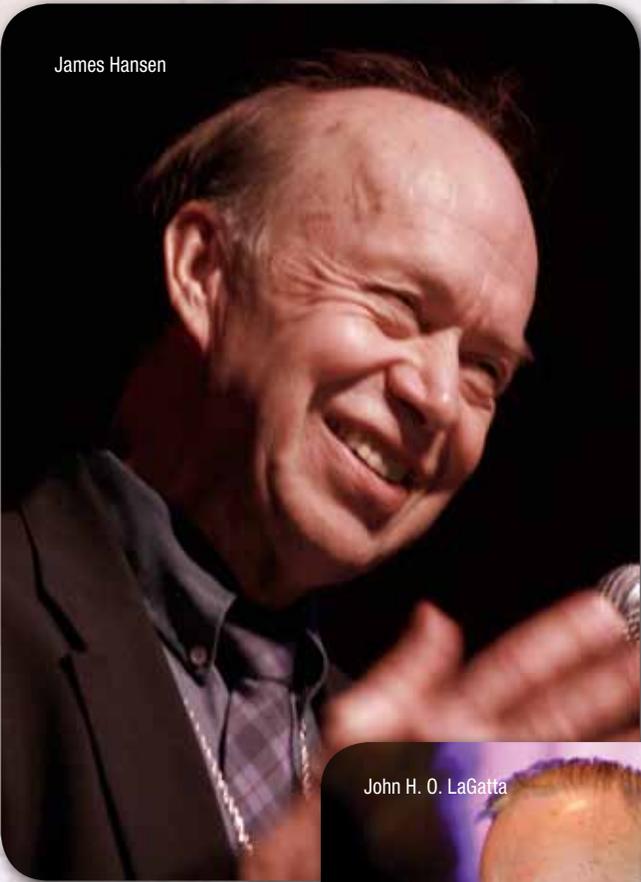


Alex Lutz

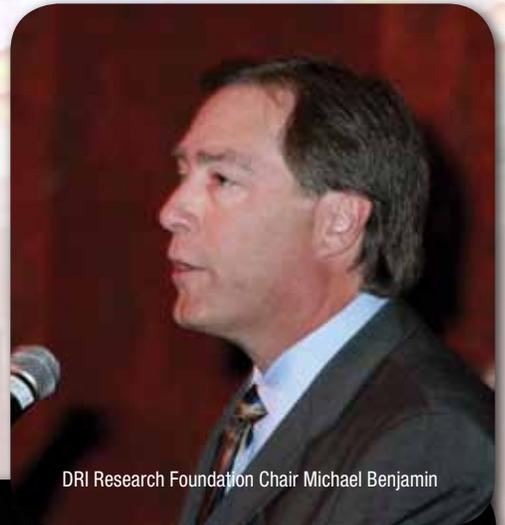


Ryan Coots and Ali Pyne

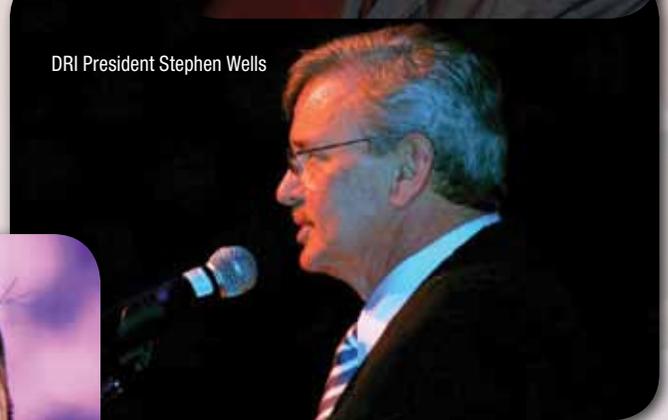
James Hansen



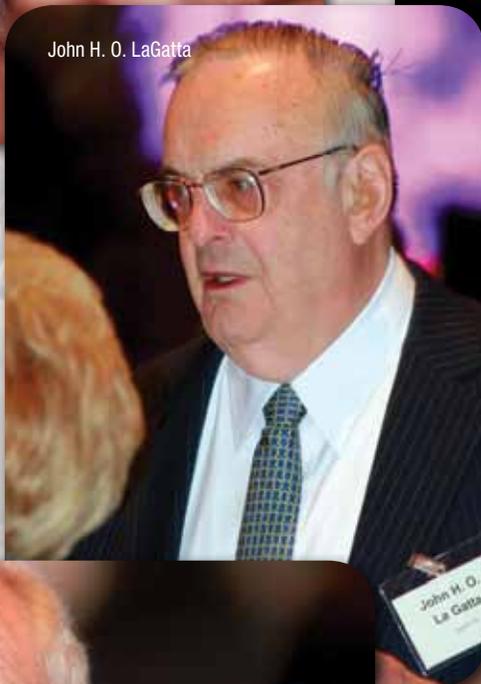
DRI Research Foundation Chair Michael Benjamin



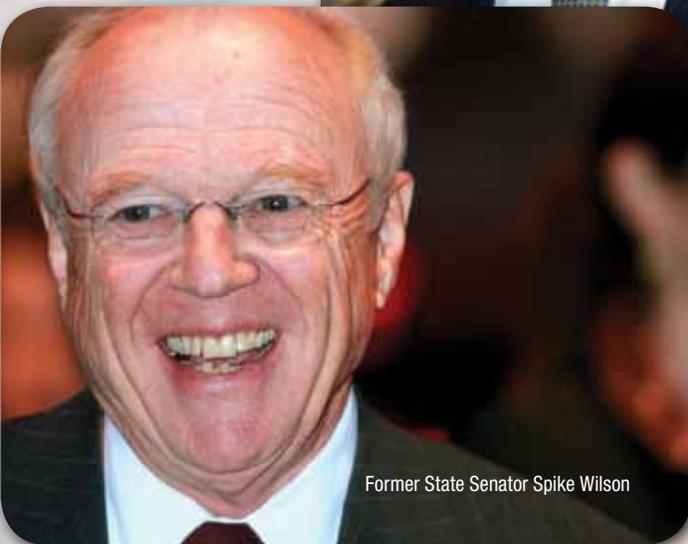
DRI President Stephen Wells



John H. O. LaGatta



Former State Senator Spike Wilson



Sean Smith



McConnell named inaugural Ansari Medal winner

DRI faculty member recognized for outstanding scientific achievements

Joe McConnell, a research professor in the Division of Hydrologic Sciences, was recently awarded the inaugural Nazir and Mary Ansari Medal for Excellence in Science.

“The Ansari Medal reflects Dr. McConnell’s superb scholarship, which has received international recognition,” says DRI President Stephen Wells. “I’m also grateful for the continued generosity and leadership of Nazir and Mary Ansari, who are both such wonderful supporters of DRI.”

McConnell was named the Regents Researcher of the Year in 2006, and is being awarded the Ansari Medal for his accomplishments from 2004 through 2006, including the development of one of the world’s premier ice-core analytical programs. During this three-year period, McConnell has been the co-author of a paper in *Science* in 2005, published 12 additional peer-reviewed publications and 50 conference presentations and abstracts.

He expanded his original ultra-trace chemistry lab through a National Science Foundation Major Research Instrumentation Award to acquire a second high-resolution mass spectrometer.

“I want to congratulate Joe for his tremendous work on such an important subject,” Nazir Ansari says. “Mary and I are proud to do our part in recognizing the excellent research and science being conducted at DRI. At the same time, we hope this award brings about a greater recognition of the excellent high level of research and science taking place through DRI both statewide and worldwide.”

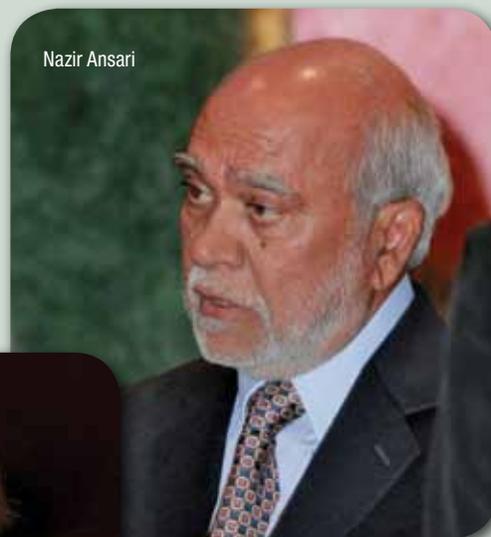
McConnell’s recent research was ranked 19th out of *Discover Magazine’s* 100 top science stories of 2007. Through a new method developed by McConnell, he determined that eight times as much black carbon was deposited in Greenland’s ice from 1906 to 1910 than during the previous 100 years. The study showed the dramatic effect of the industrial revolution on the environment.

The Nazir and Mary Ansari Medal for Excellence in Science was established in 2007 by the Ansaris through the DRI Research Foundation to recognize institute faculty for their outstanding contributions to science and entrepreneurialism. The recipient receives a \$2,000 prize and gives lectures in Las Vegas and Reno. 



“Mary and I are proud to do our part in recognizing the excellent research and science being conducted at DRI. At the same time, we hope this award brings about a greater recognition of the excellent high level of research and science taking place through DRI both statewide and worldwide.”

—Nazir Ansari



MIT scientist awarded annual Peter B. Wagner Award

Ariane Verdy, a postdoctoral fellow at MIT, was awarded the Desert Research Institute's Peter B. Wagner Memorial Award for Women in Atmospheric Sciences for her study entitled, "Carbon dioxide and oxygen fluxes in the Southern Ocean: Mechanisms of interannual variability."

"We are pleased to give this award to one of the truly outstanding young scientists in the nation," says Stephen Wells, DRI president. "Her work is both innovative and important. Addressing global climate change cannot be overstated."



In her paper, Verdy studied the year-to-year variations in the uptake of carbon dioxide and oxygen by the Southern Ocean. The exchange of soluble gases between the atmosphere and the ocean is controlled

by physical and biogeochemical processes, which in turn are influenced by changes in the local climate. The goal of the study was to quantify the variability of air-sea gas exchange and to identify the processes that are most important in generating that variability.

"The complex interactions between the atmospheric, oceanic and biogeochemical components of the Earth system are a fascinating topic to study," Verdy says. "The Southern Ocean region is particularly interesting because it plays a critical role in the global carbon cycle."

Understanding the dynamical processes controlling air-sea fluxes is an important step toward predicting how the global carbon cycle will respond to future climate change.

Verdy studied physics engineering at Ecole Polytechnique de Montreal, Canada, and physical oceanography at MIT and at the Woods Hole Oceanographic Institution. She received her doctorate from the MIT-WHOI Joint Program in November 2007. She is currently a postdoctoral fellow of the Earth System Initiative at MIT.

The winner of the Peter B. Wagner Memorial Award for Women in Atmospheric Sciences competition receives \$1,500 and must be a woman pursuing a masters or doctorate in atmospheric sciences or a related program in the United States.

Danyal Petersen receives DRI's Colin Warden Award

UNR student studying atmospheric sciences and physics

Danyal Petersen, a University of Nevada, Reno graduate student, has been awarded the 2008 Colin Warden Award from the Desert Research Institute.

"Dan has been working on lightning simulation at the Nevada Terawatt Facility since 2003 with Matt Bailey, a faculty member for both UNR and DRI," Stephen Wells, DRI president, says. "Dan's research to learn how light-

ning works and how to divert it is fascinating, important and challenging."

The Colin Warden Memorial Endowment makes an annual award of approximately \$1,500 to a graduate student at UNR or the University of Nevada, Las Vegas. Applicants must be involved with a DRI research project or have a DRI faculty member direct their graduate research. They must also be students in good standing and Nevada residents for at least one semester.



The endowment was established by the family and friends of Colin Warden after his death in 1991. Maureen Warden presented a check and the award to Petersen in April following Petersen's lecture titled, "Brief Review of the Problem of Lightning Initiation and a Hypothesis of Initial Lightning Leader Formation."

Warden says the endowment was started to honor her husband's longstanding commitment to the environment. He was an electrician at Washoe Medical Center at the time of his death.

University of New Hampshire student is DRI's 2008 national Jonathan O. Davis Scholarship Award winner

Krista Reichert, a master's degree student at the University of New Hampshire, recently won DRI's Jonathan O. Davis Scholarship Award. Reichert's winning research proposal is titled, "Late Pleistocene Temperature Variability in the Lake Chewaucan Basin, Oregon, Using Amino Acid Racemization of Ostracode Fossils."

She plans to use the \$4,000 award to pay for analysis of levels of remnant amino acids found in the carapaces, or shells, of ostracodes—tiny animals that lived in Lake Chewaucan during the late Pleistocene, Earth's last glacial period.

Using these measurements, she will determine what lake temperatures were when these animals were alive, and these results ultimately will help build a picture of temperature and lake-level history in this part of Oregon during the late Pleistocene.

This scholarship has been endowed in memory of Jonathan O. Davis, a DRI geologist and geoarchaeologist who died in 1990, with the winning research proposal chosen by a committee from DRI's Division of Earth and Ecosystem Sciences. 🌐



Laura Edwards

Science education gets a boost from the weather and climate scientists

DRI researchers visit elementary schools in northern Nevada

Weather and climate are among the favorite subjects in elementary science classrooms. Weather changes all the time, and it has some real-life impact on the young students at Moss Elementary in Sparks. Some Desert Research Institute scientists are working with local elementary school teachers to help bring their weather and climate research to these science classrooms.

Laura Edwards, an assistant research climatologist in the Division of Atmospheric Sciences, has been visiting second- and fourth-grade classes to talk about how those in the weather and climate fields measure temperature, rain, wind and other elements.

“The students are amazed to see real weather instruments,” Edwards says. “The favorite among them is a heavy-duty solid metal anemometer, which is used on mountain tops and can withstand up to 200 mph wind speeds.”

Edwards enjoys having the class make guesses on how many students it takes to blow on it to get it going with a constant speed and recruiting volunteers to blow as hard as they can to make it move.

Michelle Breckner and Greg McCurdy, who work with Edwards in the Western Regional Climate Center (WRCC), have accompanied her to some classrooms. Together, they present a different view of who a meteorologist or climatologist is as compared to those seen on television. They go in after communicating with at least one teacher at the school to acquire background on what the students have been learning. Some teachers focus on the water cycle, others on severe weather, or weather instrumentation and observation.

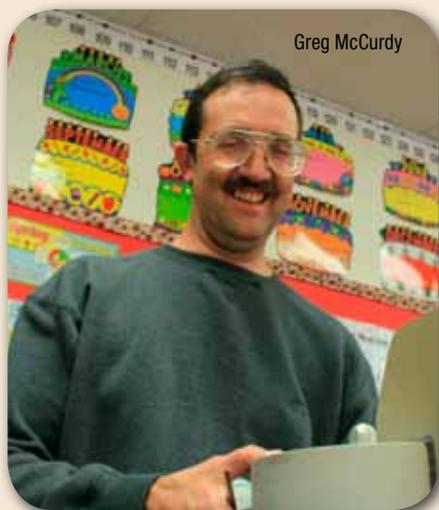
The WRCC has installed and/or maintains about 100 weather and climate stations in the western U.S., with many in the Reno and Las Vegas areas. For this reason, there always seems to be a selection of slightly broken or uncalibrated instruments that can be used for demonstration purposes. In one recent case, Edwards and McCurdy were able to assemble a mock automated weather station for a day at Moss Elementary. This had never been done before. It was a result of the teacher sending a copy of the student textbook, where the pictures included a weather station.

“It was great fun for the students and teachers alike to see the real thing,” Edwards says, “complete with a tripod stand, spinning anemometer, satellite transmitter and rain gauge.”

Edwards also has an ongoing collection of 2-liter beverage bottles and uses them to make rain gauges with the elementary students.

“This is a great hands-on activity that they can bring home with them, and it offers some teaching moments,” she says. “For example, as they are attaching their ruler to the side of the gauge, does the zero line go on the top or bottom? Where in your yard would be an ideal place to set your gauge? They have an opportunity to further explain the difference between weather and climate, in addition to some free time for the students to handle the demonstration instruments.”

So far this spring, Edwards and her colleagues have helped make nearly 200 pop-bottle rain gauges, speaking to eight classes at three different schools. As far as Edwards is concerned, it’s all about having fun with the students and sharing her hobby and work with others. 🌍



Greg McCurdy



Students at Moss Elementary



Students at Moss Elementary School having fun making weather instruments.



Brown named director of Western Regional Climate Center

Scientist created Climate, Ecosystem and Fire program

Tim Brown has been named director of the Western Regional Climate Center (WRCC), which is supported by the National Oceanic and Atmospheric Administration (NOAA), and resides on the Desert Research Institute campus.

“During his time here, Tim established and now directs the Climate, Ecosystem and Fire Applications (CEFA) program at DRI,” says Stephen Wells, DRI’s president. “He is well-respected in the scientific community, is familiar with WRCC staff and many projects and has the required contacts and managerial and scientific experience to lead and grow the WRCC program.”

The Western Regional Climate Center, inaugurated in 1986, is one of six regional climate centers in the United States. NOAA administers the regional climate-center program. Specific oversight is provided by the National Climatic Data Center (NCDC) of the National Environmental Satellite, Data and Information Service (NESDIS).

In addition to the CEFA program at DRI, Brown was also a key player in the development of the Advanced Visualization, Computation and Modeling (CAVE) program at DRI. He received his doctorate in climatology from the University of Colorado, Boulder in 1995 and joined DRI in 2000.

Since the retirement of Dick Reinhardt in June 2007, Dr. Kelly Redmond has served as interim director and will remain as regional climatologist and deputy director of WRCC.

Research Visualization Scientist Daniel Coming is Nevada’s first Millennium Scholarship graduate



Daniel Coming, who was Nevada’s first Millennium Scholar to graduate from college, has been hired as an assistant research visualization scientist to work in the Desert Research Institute’s Center for Advanced Visualization, Computation and Modeling.

“Daniel is a celebrated individual for his undergraduate accomplishments

at the University of Nevada, Reno, but we’re also very impressed with what he did in graduate school at the University of California, Davis,” says DRI President Stephen Wells.

Coming, who will be a faculty member in the Division of Hydrologic Sciences, has joined DRI’s CAVE program, which provides researchers

and industry with state-of-the-art visualization and virtual-reality tools and hardware. The program has a four-sided immersive display and will have a six-sided version completed later this year.

Coming received his doctorate in computer science in 2007 from UC Davis.

Research hydrologist studies Northern Nevada groundwater



Anna Knust has been hired as an assistant research hydrologist in the Desert Research Institute’s Division of Hydrologic Sciences.

“Anna is a recent product of the excellent graduate program of hydrologic sciences at the University of Nevada, Reno, and we’re proud that she has chosen to stay in the state,” says Stephen

Wells, DRI’s president. “She will be a valuable asset in DRI’s on-going surface water and groundwater studies in the arid and semi-arid regions of the southwestern United States.”

Knust earned a bachelor’s degree in environmental science from Indiana University in May 2004, and a master’s in hydrogeology from UNR in 2006.

Surface-water hydrologist Li Chen working in Walker River Basin

Li Chen has been hired as an assistant research professor specializing in surface-water hydrology.

“All of us who have lived in the desert for any amount of time understand how much water moves along the surfaces during a rainstorm, transporting sediment along the way,” says Stephen Wells, DRI’s president. “Li’s research is vital, and DRI is proud to have him working on such critical water issues.”

Chen is researching Nevada’s Walker River to develop a set of recommendations to minimize further sediment and salt loading to Walker Lake. His longtime research interests are in flow and transport modeling



in watersheds, open channels, lakes and estuaries. He has done extensive work in modeling of the polyacrylamide process in irrigation canals. By better understanding natural water interaction with irrigation systems, Chen believes this research could have environmental ramifications leading to benefits such as habitat restoration.

Chen received his doctorate in fluid mechanics from the Chinese Academy of Sciences, Institute of Mechanics in 2001.

DRI names Gerrard Technologist Employee of the Year

A committee of her peers at DRI has awarded Jo Gerrard, who works in the Division of Atmospheric Sciences, the Technologist Employee of the Year.

“We are very proud of Jo, who is in a very high-profile laboratory that includes handling support to researchers who are conducting research in China to help preserve one of its national treasures, the Terracotta Warriors and Horses,” says DRI President Stephen Wells. “Jo not only oversees international travel, she also stays on top of reports and makes sure deadlines are met.”



Jo Gerrard and Chris Maples

As this year’s winner, Gerrard received a reserved parking spot, a \$500 gift card and institutional recognition, with her photo displayed in the DRI lobby and her name engraved on a permanent plaque.

Gerrard is part of the environmental analysis facility team. Her duties include assembling and editing reports and publications, interacting with sponsors and other researchers on behalf of researchers, managing busy travel schedules, maintaining reports and meeting review deadlines. She is in the process of obtaining her master’s degree in English with an emphasis on writing at the University of Nevada, Reno.

Chris Garner hired as assistant research hydrologist

Chris Garner was hired in May as an assistant research hydrologist by the Desert Research Institute.

“Chris has experience in developing computer codes for the calibration of integrated numerical surface and groundwater models,” says Stephen Wells, president of DRI. “He is working on the development of an integrated model for a portion of the Walker River Basin, which will

serve as a decision support tool for the acquisition of water rights in the agricultural valleys upstream of Walker Lake.”

Garner received his master of science degree in hydrology from the graduate program of hydrologic sciences at the University of Nevada, Reno in May of 2007. He received a bachelor’s degree in geological sciences from the University of Memphis in 2005. He has worked as a staff hydrologist at DRI for the past year, working on various projects in the semi-arid/arid portions of the United States.

He is also working on a project—funded by the National Science Foundation Science and Technology Center—on the sustainability of semi-arid hydrology and riparian areas, and developing a medium-resolution hydrologic model to assess the feasibility of water leasing in the Middle Rio Grande Basin.



Statistical hydrologist Rina Schumer joins DRI

Water research relates to both Reno and Las Vegas

Rina Schumer has been hired at the Desert Research Institute as an assistant research professor specializing in statistical hydrology.

“We are very familiar with Rina as she has worked on projects at DRI over the past decade and is a product of the University of Nevada, Reno,” says DRI President Stephen Wells. “Much of her research has focused on stochastic theory for representing hydrologic processes with random components.”

Two examples of her research are based in Nevada. Schumer has studied the relationship of Truckee River inflows and outflows through the Truckee Meadows to help predict flows at Derby Dam.

She is also involved in an Army Corps of Engineers’ study to better predict the size of flash floods in Las Vegas, Phoenix and Albuquerque, and improve flood-control planning and construction.

Schumer earned a doctorate in hydrogeology from UNR in 2002, where she also previously received master’s degrees in applied mathematics and hydrogeology. She received her bachelor’s degree in earth and environmental sciences from Wesleyan University in 1992. 



New Antarctic ice core to provide clearest climate record yet

DRI's Kendrick Taylor chief scientist for the project

After enduring months on the coldest, driest and windiest continent on Earth, researchers recently closed out the inaugural season on an unprecedented, multi-year effort to retrieve the most detailed record of greenhouse gases in Earth's atmosphere over the last 100,000 years.

Working as part of the National Science Foundation's West Antarctic Ice Sheet Divide (WAIS Divide) Ice Core Project, a team of scientists, engineers, technicians and students from multiple U.S. institutions have recovered a 1,900-foot ice core—the first section of what is hoped to be a 11,360-foot column of ice detailing 100,000 years of Earth's climate history, including a precise year-by-year record of the last 40,000 years.

The dust, chemicals and air trapped in the two-mile-long ice core will provide important information for scientists working to predict the extent to which human activity will alter Earth's climate, according to the chief scientist for the project, Kendrick Taylor of the Desert Research Institute. DRI, along with the University of New Hampshire, operate the Science Coordination Office for the WAIS Divide Project.

WAIS Divide, named for the high-elevation region that is the boundary separating opposing flow directions on the ice sheet, is one of the best spots on the planet to recover ancient ice containing trapped air bubbles—samples of the Earth's atmosphere from the present to as far back as 100,000 years ago.

The record from WAIS Divide will allow the most detailed study yet of the interaction of previous increases in greenhouse gases and climate change. This information will improve computer models that are used to predict how the current, unprecedented high levels of greenhouse gases



DRI's Rebecca Anderson examines a section of the WAIS Divide ice core.

in the atmosphere caused by human activity will influence future climate.

“We are very excited to work with ancient ice that fell as snow as long as 100,000 years ago,” Taylor says. “We read the ice like other people might read a stack of old weather reports.”

—by David Sims, *Institute for the Study of Earth, Oceans, and Space*

New ice core shows evidence of Antarctic change

More evidence of changing weather patterns around the southwestern portion of the Antarctic Peninsula—a region where climate has changed rapidly over the last 50 years—was published in *Geophysical Research Letters* earlier this year.

DRI scientist Joe McConnell, working with Elizabeth Thomas and Gareth Marshall of the British Antarctic Survey, reported a doubling of snowfall in the western Antarctic Peninsula since the 1850s, with an increasing rate of accumulation of snow and ice each decade since the 1970s.

Although their findings are consistent with predictions of increased snowfall as the Antarctic Peninsula gets warmer, the magnitude of this change is surprising. Records of snowfall across the rest of Antarctica appear to change very little during this time. This finding contributes to an ongoing series of investigations on the West Antarctic Ice Sheet that aim to predict future climate change.

Scientist contributes to global climate model

Dave Mitchell, a researcher in the Division of Atmospheric Sciences, worked on the National Center for Atmospheric Research global climate model (GCM), known as the Community Climate Systems Model version 3 (CCSM3), which is used around the world to predict climate.

In CCSM3, Mitchell improved the representation of cirrus clouds, which have a strong “greenhouse” effect on climate. To incorporate new research, the CCSM is being revised to include more atmospheric physics.

Several methods developed at DRI are being used in the model, including ice-fall speeds and the way clouds interact with solar radiation and thermal radiation emitted by Earth. Ice-fall speed is the rate at which ice crystals fall out of cirrus clouds. A low fall speed results in greater cloud coverage and thickness, which can trap heat normally emitted into space, thus warming the planet.

Cloud interaction with solar and thermal radiation is known for liquid-water clouds, but not for ice clouds, because of the complexity of ice-

crystal shapes. A means of predicting these interactions for ice clouds has been developed at DRI, and also will be part of the new CCSM4.

With these improvements, which DRI has a big part in, the CCSM should predict Earth's climate in the future more accurately.

DRI's Storm Peak Lab hosts open house, garners support

On March 22, more than 800 people attended the annual DRI Storm Peak Laboratory open house. The Storm Peak Laboratory (SPL), located at 10,500 ft. within Colorado's Steamboat Springs ski-resort area, hosted local and out-of-town visitors, who skied to the lab.



The National Weather Service, the University Corporation for Atmospheric Research and the Colorado Avalanche Information Center also had demonstrations and information at the lab, and local Boy Scouts pitched in by directing people and setting up groups for the tour.

Once inside the facility, visitors toured the lab with DRI's Storm Peak Lab director, Gannet Hallar, and the Storm Peak Lab site manager, Ian McCubbin. Tours included explaining instrumentation in the lab, data that the lab collects and experiments that take advantage of the lab's high-altitude location.

Hallar says that "we had a number of people who visited at the open house last year, and they wanted to see what new instruments we have installed this year." Visitors were able to ask questions and were treated to refreshments provided by local businesses.



Finally, the National Weather Service had a display and explained its involvement at Storm Peak. McCubbin says SPL enjoys "a nice partnership" with the weather service, as well as the other groups who were represented at the open house.

Hallar and McCubbin say that local support for the open house was great. "We got lots of support from Steamboat Springs community and the ski resort for the open house," Hallar says.

Hallar and McCubbin both praised the local support and connections that Storm Peak Lab has made in the community. Their outreach program for local students has forged ties in the community, and local businesses, such as Smartwool, Ace Hardware and the Steamboat Springs Resort, have all contributed to the Lab facility. Other support has come from Rotary International, the Yampa Valley Community Foundation, the Mellam Family Foundation and the Brown Family Foundation.

By holding the open house in the winter when the ski resort is busy, out-of-town visitors who might not have been exposed to DRI or the research that is conducted at SPL were able to learn about some of the work DRI does at the laboratory.

Results published about radioactive waste transport

David Shafer and Julianne Miller from the Desert Research Institute recently presented their study, "Characterizing Potential Exposure to the Exposure to the Public from Low-Level Radioactive Waste Transportation by Truck," to the Citizens Advisory Board for Nevada Test Site Programs in Pahrump.

DRI's study, published in the December 2007 issue of *Health Physics*, *The Radiation Safety Journal*, addresses public concern about potential exposure to gamma radiation from legal-weight low-level radioactive waste truck shipments to the Nevada Test Site.

Radiation measurements from the trucks were made with an automated array of four pressurized ion chambers that were established for trucks to pass through before they entered the Nevada Test Site. Data was collected from 1,012 trucks used to ship the waste to the Nevada Test Site for disposal in 2003.

"For 483 trucks (nearly half of the survey), calculated net exposure values were equal to less than background radiation, indicating that there was no potential exposure to the public from the trucks," says David Shafer, director of the Frank H. Rogers Center for Environmental Remediation and Monitoring.

Cumulative exposure scenarios appropriate for rural transportation routes to the Nevada Test Site were developed, although these scenarios assumed the unlikely case that the same individual was exposed to all of the trucks on a particular route.

"For these scenarios, only a small percentage of the trucks measured dominated the potential cumulative exposure, but even these trucks were well below U.S. Department of Transportation limits for radioactive waste transport," says Julianne Miller, an assistant research hydrologist at DRI.

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Are we alone in the universe? Researcher's book searches for life on other planets

Giles Marion's recently published book, *Cold Aqueous Planetary Geochemistry with FREZCHEM*, explicitly investigates issues of astrobiological relevance in the context of cold aqueous planetary geochemistry.

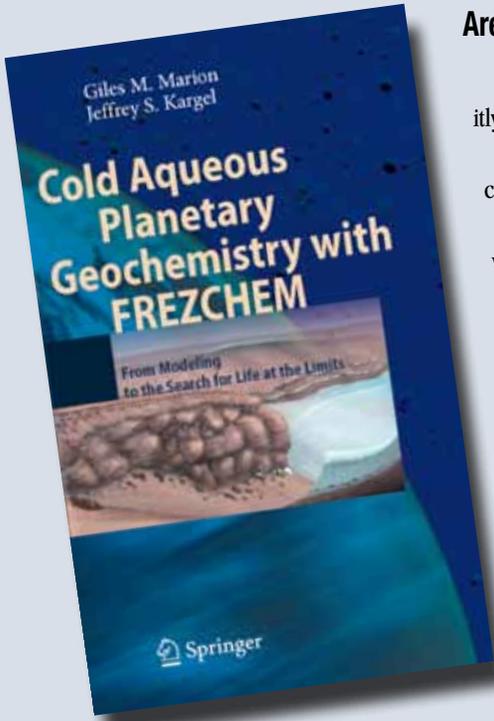
Marion is an associate research professor in the Division of Earth and Ecosystem Sciences. Marion's co-author, Jeffery S. Kargel, is a planetary geologist from the University of Arizona.

"I have worked on refining a computer model known as FREZCHEM (FREeZing CHEMistry) at DRI, which simulates and predicts the behavior of substances at extremely cold temperatures," Marion says. "My interest in thermodynamics led to the development of FREZCHEM, which allows researchers to look at and predict geochemical processes at subzero temperatures.

"The potential applications are numerous, including examining the possibility of life on other planets, mine reclamation in cold regions, road deicing, gas hydrate stability in oceans and commercial refrigeration processes."

FREZCHEM is of general relevance to biogeochemists, geochemical modelers and cold planetary scientists, with applications to solar-system bodies in general and for speculations about the limits for life in cold environments in particular.

"We raise several questions in our book," Marion says. "Are we alone in the universe? Should we reach for the stars? Either yes or no to these questions is both frightening and profound." 🌍



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