



Desert Research Institute

# DRI News

F A L L

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## Arctic climate study reveals impact of industrial pollution

Ice-core research shows increases during the last century



Joe McConnell



Ross Edwards

**N**ew Desert Research Institute research results have hit the world stage and given the Institute's scientists more evidence on the impact of climate change—specifically, into the influence of human-produced black carbon, or soot, on the Arctic's changing climate.

The research, published in a recent online edition of *Science* magazine, was led by DRI's ice core scientists, Joe McConnell and Ross Edwards, who used a new method for measuring soot in snow and ice to evaluate historical changes in soot concentrations. At its maximum, from 1906 to 1910, estimated soot in Arctic snow was eight times that of the pre-industrial era.



“When we compare changes in the black carbon to changes in these other indicators, it is clear that most of the increases in black carbon in the late 19th and early 20th centuries, particularly in winter and spring, resulted from industrial emissions, probably from coal burning.”

— Joe McConnell

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Soot reduces the reflectivity of snow and ice, allowing the surface to absorb more energy from the sun. Changes in highly reflective seasonal snow may have resulted in earlier snow melt and exposure of much darker underlying soil, rock and sea ice throughout the Arctic—in turn leading to warming across much of this region in the late 19th and early 20th centuries.

For the Greenland ice sheet in particular, these findings are significant because it is the largest ice mass in the northern hemisphere. Darkening of the ice sheet's surface by soot from combustion of biomass and fossil fuels accelerates melting and increases the sensitivity to warming.

McConnell and Edwards are part of a team of National Science Foundation- and NASA-funded researchers from DRI, the University of California, the University of Wisconsin and Droplet Measurement Technologies. Their report

CLIMATE CHANGE  
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**From the desk of Steve Wells**

Reflecting on Lake Tahoe and our growing Institute

AS I WALK THROUGH THE CONSTRUCTION that is all around us on the Reno campus and listen to President Clinton stress the importance of preserving Lake Tahoe, I marvel at the pace we maintain and our ever evolving role.

During one three-day period in August, we had a Board of Regents meeting, the 10th Anniversary of the Clinton-Gore Tahoe Summit and the inaugural Clean Energy Summit spurred by Senator Harry Reid. Both the Lake Tahoe and energy events were attended by Reid, who continues to provide support and influence in the Tahoe Basin and in sustainable energy and clean technologies.

The Tahoe Summit, which was highlighted by President Clinton's return trip to the lake a decade after the first Tahoe Summit, was held near the new Tahoe Center for Environmental Sciences, which we share with Sierra Nevada College, UC-Davis and UNR. Jim Thomas, our director of the Center for Watersheds and Environmental Sustainability, put it best when he said: "For many years, there was some really fine research done at Lake Tahoe, but it was done in a bit of a vacuum. Now we're looking at things from a much more collective perspective, and it's made a difference."

At the Clean Energy Summit, I joined President Milt Glick from UNR and President David Ashley from UNLV in representing the Nevada System of Higher Education. We each gave an overview of our campuses and, more specifically, I spoke about DRI's activities in renewable energy.

For those of you who have not visited us lately, I am now working out of our new \$55 million, 8,000 square-foot Maxey addition on the Reno campus that features four state-of-the-art labs,

nine faculty and staff offices and a much needed conference room. Not only will this building give us more research space, it will provide a more appropriate space for fund-raising as public dollars become tougher to come by.

As I settle into the addition to the Maxey building, we can see below the emerging construction



Maxey addition

of the first phase of the Computational Research and Visualization building. This will be a major addition to the Reno campus with 42,000 square feet that will include space for the six-sided CAVE, faculty offices and laboratories.

This new building is a significant undertaking. Phase one cost \$17.87 million – \$14.4 million from state sources, \$2 million from federal funds and \$1.5 million in private money. We just received an additional \$791 million for phase two of the project from the 2007 session of the legislature.

One of the highlights of the Computational Research and Visualization building is that the State Public Works Board selected this project as a LEED certified silver building and recommended an additional \$1.45 million for the certification.

**WELLS**

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SPEAKING FOR TAHOE: Local and national leaders sound off about the lake. From left to right: President Bill Clinton, Senator Harry Reid, Governor Jim Gibbons and Senator John Ensing.

**CLIMATE CHANGE**  
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shows that the source of most of the black carbon landing on the ice changed from natural causes, such as forest fires, to industrial sources. The amount of black carbon deposited during this period increased dramatically, reaching a peak about 1910.

“Concentrations of black carbon varied significantly from 1788 to 2002 and were highly seasonal, particularly during the period before the industrial revolution in North America in the mid-1800s,” says McConnell, the lead author of the study. “Starting in about 1850, soot concentrations began to rise, particularly in winter when forest fire emissions are at a minimum.”

Co-author Edwards adds that “in order to understand why the Arctic climate is changing so rapidly at present, we need to understand how and why it has changed both before and after human activities had an influence on

DRI scientists drill for ice-cores

climate. To do this properly, we need to know the seasonal history of soot deposition and its impact on Arctic snow during the past few centuries. Our results allow this component of climate change to be incorporated into predictive climate models in a more realistic way.”

Using sophisticated equipment, and an extremely cold ice-core laboratory at DRI’s Reno campus, McConnell and Edwards have been able to track the possible trajectories of major snowfalls that would have transported and deposited the black carbon to Greenland.

Their conclusion: Industrial areas of the United States and Canada were the most likely sources of the increased deposition during the past century. Similarly, forest fires in northern and eastern Canada and the United States were



the likely sources of natural black carbon found in the ice core.

McConnell says the study’s results have created a better understanding of the sources of black carbon in the Arctic. “When we compare changes in the black carbon to changes in these other indicators,” he says, “it is clear that most of the increases in black carbon in the late 19th and early 20th centuries, particularly in winter and spring, resulted from industrial emissions, probably from coal burning.”

**WELLS**  
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Computational Research and Visualization building

While the bulk of DRI’s construction is at the Reno campus, we are also excited about the new underground lysimeter lab in Boulder City, which was built at a cost of \$1.2 million – the result of an NSF EPSCoR grant. The project relies on the use of weighing lysimeters – soil containers that rest on large-capacity balances. Once filled with soil and monitoring instruments, the lysimeters will become part of the statewide infrastructure for research into arid soil development, water cycling, biogeochemical processes, and fate and transport of compounds in unsaturated soil.

I hope this snapshot in time gives you a glimpse of the role DRI is playing in the world while growing our research here in Nevada.

–President Steve Wells

## Global Hits

### Pollution study makes world news

- 20th Century black carbon emissions . . . . . *Science Magazine*
- Humans leave sooty footprint in Arctic ice . . . . . *USA Today, FOX News*
- Soot added to Arctic warming, report says . . . . . *Los Angeles Times*
- Arctic climate study reveals impact of industrial soot . . . . . *Hindu, India*
- Soot ‘influences Arctic climate’ . . . . . *BBC*
- DRI study finds indicators of early pollution . . . . . *Reno Gazette-Journal*
- U.S. Coal-Burning Boom
- Drastically Warmed Arctic . . . . . *National Geographic News*
- Global warming will step up after 2009 . . . . . *Washington Post*
- New Science Challenges Climate Alarmists . . . . . *Canadian Free Press*
- Global warming will step up after 2009 . . . . . *Scientific American*

## Moser and team strike gold by discovering microbial life in a South African mine

Assistant Research Professor and Environmental Microbiologist, Duane Moser and his colleagues have discovered an isolated, self-sustaining, microbial community living under extreme conditions almost two miles beneath the Earth’s surface in a South African gold mine.

The community of microorganisms may be the first demonstrated to subsist purely on geologically produced substrates (sulfate and hydrogen), and is one of the few ecosystems on Earth that operates independently of the sun.

The discovery, which appeared in *Science*, raises the possibility that similar life could exist beneath the surface of other worlds, such as Mars or Jupiter’s moon Europa.

# Reid on Walker

By John Trent



With congressional support, University of Nevada, Reno and Desert Research Institute scientists are exploring the best means to get water to Walker Lake while maintaining a strong economy for upstream communities.

**T**he drive from Las Vegas to Reno in January 1969 was interminable for the young Nevada State Assemblyman. There was much on Harry Reid's mind as he left southern Nevada that morning, headed out on a long, solitary drive for Carson City and the beginning of that year's session of the Nevada State Legislature.

Reid, still in his 20s, had left hesitantly that morning. He was leaving his wife, Landra, and their two young children behind at home. "I remember I had a lot on my mind during that drive," says Reid, now majority leader of the United States Senate.

Reid recalled the endless stretches of sagebrush, the vast sameness of the land that made the loneliness well in him even more strongly. And then, just after cruising through the small northern Nevada town of Hawthorne, Reid's thoughts were broken. A massive lake rose like a mirage from the desert floor.

He couldn't believe his eyes. Years earlier, during the late 1950s, he had traveled on a school bus from his hometown in Henderson, for the state baseball championships, and had passed the same spot. The lake hadn't registered then. Now, though, the sight of Walker Lake pulled something deep from within Reid.

"I thought, 'My land, I can't believe this,'" Reid remembers. "This lake . . . it's just like it shouldn't belong. But it did belong. Nature had

put it there, and it was quite a sight to see."

As Reid noted, the 18-mile-long, 6-mile-wide Walker Lake has always been a bit of an anomaly. It is one of only six terminal desert lakes in the United States with a fresh water fishery, and one of only three – Pyramid Lake and Summit Lake are the others – in Nevada. It is the terminus for the Walker River watershed, whose ebbing and rising flows upstream from the lake have helped support the agricultural communities in the Smith and Mason valleys for more than 100 years.

as Smith Valley and Yerington? How can this happen so that the economic viability of the neighboring Walker River Paiute Tribe, as well as the residents of Hawthorne, can also be enhanced?

It is one of the most difficult natural resource challenges Nevada has, one that is emblematic of a larger debate throughout the country regarding water and how use of this most precious of western resources can be maximized in a time of uncertain precipitation and global climate change.



"This isn't just about getting more water to the lake now. It's a big-picture approach that hopefully will leave everyone and everything much stronger."

—Jim Thomas, research professor

And therein lies the problem, at least as far as the health of Walker Lake is concerned. The lake is rapidly disappearing. Its level has declined 145 feet since 1882, with increased salinity that has major implications for wildlife supported by the lake, including a once thriving fishery, as well as thousands of breeding and migrating water birds.

The solution seems easy enough: Get more water into Walker Lake.

Yet how can this be accomplished without irreparably damaging the agricultural economies of Walker's upstream communities, such

"From the get-go, throughout the West, the problem has been over-allocation," says Jim Thomas, research professor at the Desert Research Institute. "That was how the agricultural economy of the West was able to develop."

Thomas has studied the Walker Basin watershed for nearly 20 years. "Unfortunately, irrigation seems like it always ends up in the crosshairs of this debate. It will always be a complicated issue for the West, because it's mixed with the needs of different users and producers, as well as the roots and values of all these people."



“We have some of the finest scientists in the world at UNR and DRI, and their comprehensive research is going to provide critical information that will not only help improve the health of Walker Lake, it will help sustain the local economy.”

—US Senator Harry Reid



Thomas’ research at Walker started with sampling water quality at Walker Lake in the late 1980s and the early 1990s. “We started out working from a series of major gauging stations, looking at the flows in and out of the basin, to gain a better understanding of the surface water and the associated chemistry and how that would have an effect on salt loading into Walker Lake. We were out there then because we knew it was a closed basin lake and it was declining rapidly.”

Thomas clearly recalls the importance of the work at the time. “I still feel it’s important now,” he says, “because there are only a handful of desert terminal lakes that also are freshwater fisheries. They are very unique and are a very beautiful thing in the world. If we don’t save the lake, then we’re going to have another dry lake bed, just like many of others in the Great Basin.”

In an effort to solve the Walker dilemma, the Nevada System of Higher Education has embarked on an 18-month, \$70 million study of the Walker Basin. The project, sponsored by Reid (D-Nev.) and co-sponsor Nevada Sen. John Ensign (R-Nev.), has been authorized and funded through a congressional appropriation. Research by the University and Desert Research Institute is limited to \$14 million of this figure, with the rest set aside for the acquisition of water rights from willing sellers.

“The DRI-UNR research partnership is a good one,” Thomas says. “There are places where we really fit together well. DRI is taking the lead on watershed modeling and is also working with (Scott Tyler at UNR) on groundwater modeling. UNR is strong in alternative crops. DRI has strong Geographic Information System researchers, but certainly, there is also strong expertise at UNR. It’s a perfect fit between two

institutions that have collaborated together very well in the past.”

Ultimately, research done by University and DRI scientists will explore the best means to get water to Walker Lake while maintaining a strong economy and improving the ecosystem of the Walker Lake watershed. It will involve developing a watershed and decision support model and will evaluate economic impacts of water purchases, low-water use drought-resistant crops, water conservation, in-stream health of the Walker River and sediment and salt delivery to the lake.



PARTNERS: Desert Research Institute and University of Nevada, Reno scientists partner on research in the Walker Basin.

“Decades of litigation involving Walker hasn’t solved many of its problems,” Reid says. “In Congress, we’ve worked to save Nevada’s two great terminal lakes, and we’ve managed to save Pyramid. We’re taking the same approach with Walker. Walker is very, very important, and it’s important to keep it healthy, keep it alive. A healthy Walker Lake speaks well of Nevada . . . an unhealthy Walker Lake doesn’t speak well of our state. We have some of the finest scientists in the world at UNR and DRI, and their comprehensive research is going to provide critical information that will not only help improve the health of Walker Lake, it will help sustain the local economy.”

“The Walker research projects are on a very fast-track,” adds Thomas, who is serving, along with Mike Collopy, director of the University’s Academy for the Environment, as coordina-

tor of the research end of the effort. Thomas received his PhD from Nevada in 1996. “We’re very pleased with how it’s moving along and we anticipate having some research results in a year. What distinguishes this project from previous work at Walker is how this project isn’t just looking at potential scenarios if water rights could be leased or purchased.

“Now we’re looking at providing the best information to help efficiently move water into the lake – and this is just as important – while also providing information to have a strong economy in the basin. This isn’t just about getting more water to the lake now. It’s a big-picture approach that hopefully will leave everyone and everything much stronger.”

For more information, please visit: [www.nevada.edu/walker](http://www.nevada.edu/walker).

## Partners in Research UNR and DRI Projects

- Development of a Decision Support Tool (DST) in Support of Water Rights Acquisitions in the Walker River Basin
- A Socio-economic, Political and Environmental Analysis of Land and Water Rights Acquisitions in the Walker River Ecosystem
- Alternative Agriculture & Vegetation Management
- Plant, Soil and Water Interactions
- Assessing the Importance of Water Acquisitions to Health of the In-stream Environment, Aquatic Ecology, and TDS loading to Walker Lake
- Development of Recommendations to Maximize Water Conveyance and Minimize Degradation of Water Quality in Walker Lake Due to Erosion, Sediment Transport, and Salt Delivery
- Economic Analysis of Water Conservation Practices for Agricultural Producers
- Formulation and Implementation of Economic Development Strategies to Mitigate Economic and Fiscal Dislocations
- Development of a Water Rights GIS Database and Associated Demographic, Economic and Property Databases of the Walker River Basin
- Wild Horse and Burro Marketing Study

# Landmine detection technologies get a boost from DRI

\$300,000 grant to study desert soils and improve discovery techniques

LANDMINES ARE LIFE-THREATENING hazards to civilians and military personnel worldwide, and the Desert Research Institute recently helped to step up efforts to better detect the hidden explosives. DRI Geologist Don Sabol was awarded a \$300,000 grant from the National Geospatial-Intelligence Agency (NGA) to study desert soils for better landmine detection.

“This is a tremendous breakthrough for DRI and a significant step towards enhancing the protection of our nation’s troops,” says Stephen Wells, DRI president.

Sabol, along with co-principle investigators from DRI, Eric McDonald and Todd Caldwell, will study four basic soil types at the U.S. Army’s Yuma Proving Ground to better characterize desert terrain for improving detection techniques of buried munitions, including landmines and improvised explosive devices (IEDs). The study will be conducted at existing IED and countermine research sites.

Results from the study will leverage extensive research conducted by DRI for the U.S. Army. DRI research is focused on forecasting

desert terrain conditions in support of military operations in Iraq and Afghanistan.

Technological advancements have resulted in a wide range of approaches available to address the worldwide problem of buried munitions. Effectiveness of these approaches depends upon soil composition and structure, as well as size, composition and depth of munitions’ burial. An understanding of how these soil properties affect the different mine-detection technologies is therefore critical.

“The goal is to thoroughly describe the significant processes that influence near surface soils in desert environments, so that monitoring, characterization and surveillance systems can more accurately detect disturbances that would indicate the presence of land mines or mine fields,” Sabol says of the project.



Don Sabol

The grant awards are part of this year’s NGA University Research Initiative program. The program’s objective is to enhance U.S. universities’ ability to perform research in geospatial science, mathematics and engineering topics integral to geospatial intelligence and provide education in related science and engineering areas critical to U.S. national security.

## Weather device makes flying safer

Hallet develops aircraft technology with NSF grant

SOMEDAY SOON, PILOTS WILL HAVE a new instrument necessary to gauge the weather an aircraft will be encountering. This innovative technology being developed by John Hallett, an atmospheric physicist at DRI, will give pilots one more tool to keep their passengers safe. It will also give scientists a more accurate portrayal of a changing moisture climate.

Hallett was awarded a National Science Foundation grant to develop a device for airplanes to detect flight conditions leading to wing and instrument icing.

“This aircraft instrument makes high resolution measurements of ice and super cool water concentration,” Hallett says. “We are being funded to try to quadruple the maximum

amount of measurement from one cubic gram to four grams.”

Hallett previously developed a stationary “hot plate” that measures rain and snow for the Federal Aviation Authority. He estimates that without his invention, it costs upwards of \$3,000 every time a plane needs to be de-iced. With his device, airline maintenance crews can more cost-effectively prepare aircraft for inclement weather conditions.

The former winner of the Nevada System of Higher Education Researcher of the Year award, Hallett has been at DRI for many years and developed the highly acclaimed atmospheric sciences graduate program in the physics department at the University of Nevada, Reno.



John Hallett

# Namib sand dune study shines new light on past climate change

LINEAR SAND DUNES, LIKE THOSE FOUND in the Namib Desert in southwestern Africa, are the most widespread type of desert sand dune around the world, and move over time as if alive—stretching farther in long lines as winds blow across the desert, piling more sand on them.

Until recently, insufficient data led to challenges with determining the age of these sand dunes, as well as how they were formed. DRI's Nick Lancaster, with colleagues Geoff Duller of the University of Aberystwyth and Charlie Bristow of the University of London, used ground penetrating radar and optically stimulated luminescence dating to dig deep inside the dunes to reconstruct the sedimentary layers and to solve the mystery of their age.

The results, which appear in an article in a recent issue of the journal *Geology*, are monumental: The dunes were younger than expected;

there was firm evidence of lateral migration—or shifting sideways—of linear dunes; and they were constructed by winds from different directions than previously thought.

The results have important implications for understanding how all these ancient sand dunes formed, whether they were formed during the Jurassic Period (206 to 144 million years ago), such as the Navajo Sandstone in the Southwestern U.S., or in the last 5,000 years like those in the Namib Desert.

The researchers use what is called ground penetrating radar (GPR). A GPR system sends electromagnetic signals down below the ground that are then reflected back through the sediment. How the signals respond depends on the size of the sand and its moisture content. The GPR sends back signals to a computer allowing researchers to create an image of the sedimentary

structure in the sand dune.

“Using GPR allowed us to pick out sedimentary units, or layers formed over time with different wind direction,” Lancaster says. “The resulting images showed us that the winds during the Jurassic Period were different than we thought. The unique combination of the GPR with a luminescence dating study provided a clear picture of how the dunes developed over thousands of years, and even revealed a break in the migration of the dune, leading us to ask what happened with the wind regime and whether there was some significant climate change, such as increased rainfall.”

The study was sponsored by the American Chemical Society's Petroleum Research Fund. The *Geology* journal is published by the Geological Society of America and is the most popular and widely read earth science journal in print.

## Lancaster earns Regents' Researcher Award

DRI receives top system award for third year in a row

Nick Lancaster received the Nevada System of Higher Education's Regents' Researcher Award for 2007—marking the third year in a row that a DRI faculty member has received this honor.

Lancaster, research professor and senior director of DRI's Center for Arid Lands Environmental Management, received BA, MA and PhD degrees in geography from the University of Cambridge in the United Kingdom.

He has since established himself as one of the world's foremost experts on sand-dune systems and eolian, or wind-driven, processes. His research has included studies of the deserts of Namibia, Botswana and parts of South Africa as well as the Gran Desierto in northwestern Mexico and the Mojave Desert of California and Nevada.

Lancaster's scientific contributions have been essential to evaluating areas affected by wind erosion, estimation of past climate conditions and perhaps most importantly, forecasting potential effects of changes in climate and land use. He has published more than 100 scientific papers and given more than 110 presentations throughout the world during his career.

The Board of Regents established the Regents' Researcher Award in 1992. DRI's Jim McConnell won the award in 2006 and John Watson received it in 2005. The honoree receives a \$5,000 stipend and a medal.



Nick Lancaster (right) and Geoff Duller (University of Aberystwyth) conduct high-resolution ground penetrating radar imaging of the internal sedimentary structure of a Namib Desert sand dune.

# DRI Golf Extravaganza

July 20 and 21, 2007



THE 11TH ANNUAL GOLF TOURNAMENT ON JULY 20-21 at the Resort at Red Hawk was once again a great success raising more than \$47,000 for the Desert Research Institute. In addition to the many DRI Foundation Trustees who participated, Governor Jim Gibbons, State Senators Bill Raggio and Mark Amodei, along with NSHE Regents Stavros Anthony and Jason Geddes took part in the event. We thank all of our sponsors, teams, donors and volunteers for participating.

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Longest Drive Women . . . . .	Amber Pearson of IGT
Closest to the Pin without Going in – Men . . . . .	Jim Bauserman of Barrick I
Closest to the Pin without Going in – Women . . . . .	Mendy Elliott of Bear Industries II
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Second Place Mixed . . . . .	IGT
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First Place Men . . . . .	Golf Headquarters
Second Place Men . . . . .	North American Title Company
Third Place Men . . . . .	IGT Tigers



1ST PLACE MIXED – BARRICK I  
Steve Polikalai, Taylor Groth, Jim Bauserman & Sean Gamble

1ST PLACE MEN'S – GOLF HEADQUARTERS  
Eric Moreno, Rocky Lepori, Pat Hickey & Cody Kosman



2ND PLACE MEN'S – NORTH AMERICAN TITLE CO.  
Mark Gamba, Jack Gamba, Javier Vandesteeg & Dave Reeder

3RD PLACE MEN'S – IGT TIGERS  
Tom Howell, Bill Nelson, JJ Jarzynka & Barry Phillips



3RD PLACE MIXED – BEAR INDUSTRIES II  
Rory Hickok, Mandy Elliott, Governor Jim Gibbons & Senator Mark Amodei

2ND PLACE MIXED – IGT  
Jim Shaw, Amber Pearson, Kurt Davis & Jeff Henning

BEST DRESSED MEN'S – FASTFRAME  
Craig Park, Vic Camp, Steve Buszka & Wilton Herz



# DRI Golf Extravaganza

July 20 and 21, 2007

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# Nevada Medal Dinners

April 10 and 12, 2007

THE 20TH ANNUAL NEVADA MEDAL EVENTS gathered supporters and friends of the Desert Research Institute in Reno April 10, and in Las Vegas on April 12, to recognize the 2007 Nevada Medalist, Susan Lindquist. Lindquist, a biologist, received a medallion of pure Nevada silver and a \$20,000 honorarium sponsored by AT&T Nevada. She is a member and former director of the Whitehead Institute, a professor of biology at the Massachusetts Institute of Technology and a Howard Hughes Medical Institute investigator.

Business leaders, government officials and other friends of DRI attended the events to congratulate Lindquist and celebrate DRI's accomplishments.

The two events netted \$85,000 to support DRI's environmental scientific research. Chancellor Jim and Beverly Rogers issued a "Chancellor's Challenge," which raised an additional \$100,000.



Former Lieutenant Governor and former University Regent Lonnie Hammagren, DRI Research Foundation Trustee Marlene Wheeler, Regent Thalia Dondero, Andy Wheeler



Regent Stavros Anthony, Regent Dorothy Gallagher, Dick Scott, DRI Research Foundation Trustee Vicki Hafen Scott, Regent Mark Alden



AT&T Nevada President Hal Lenox (left) and Governor Jim Gibbons (right) prepare to award the DRI Nevada Medalist, Dr. Susan Lindquist (center), her medal at the DRI Research Foundation annual award event.



DRI Research Foundation Trustee Walt Higgins III, Annie Strauss, Fred Gibson Jr., DRI Research Foundation Trustee Jim Kropid, Judy Kropid



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## System and Test Site contractor sign agreement

Chancellor Jim Rogers of the Nevada System of Higher Education recently signed the first-ever agreement between the System—including DRI—and National Security Technologies, LLC, the primary contractor at the Nevada Test Site.

The agreement is meant to help promote research, support the acceleration of new technology business formations and expand existing technology-based companies that will benefit Nevada research institutions, entrepreneurs, industry, investors and Nevada's citizens by creating upper level jobs.

## Georgia graduate student wins Wagner Memorial award

A Georgia Institute of Technology graduate student, Paula Agudelo, won this spring the Desert Research Institute's Peter B. Wagner Memorial Award for Women in Atmospheric Sciences. Agudelo is studying tropical climate dynamics and the role of ocean-atmosphere coupling in the development of deep convection and cyclones.

Agudelo received the \$1,500 prize following a presentation of her winning paper, entitled "Transition between suppressed and active phases of intraseasonal oscillations in the Indo-Pacific warm pool."

The Peter B. Wagner Award, given annually, was established in 1998 by Nevada Gaming Commission member and former Nevada Lt. Gov. Sue Wagner in memory of her late husband, Peter, a DRI scientist who died in the 1980 crash of a DRI research aircraft. The national award is intended to encourage women graduate students in the atmospheric sciences.

## DRI assists with radon detection from Utah fire

Since July 5, elevated radiation levels, presumably due to the Milford Flat Fire, have been detected for brief periods at the Milford, Utah, Community Environmental Monitoring

Program (CEMP) station. All other CEMP monitoring stations show normal readings associated with naturally occurring background levels of radiation.

The CEMP is a network of 29 monitoring stations located in Nevada, Utah and California communities and ranch locations surrounding and downwind of the Nevada Test Site. The sensitive equipment captures changes in the airborne environment that indicate radioactivity. Data from all of the monitoring stations are published in the Nevada Test Site Environmental Report available at [www.nv.doe.gov](http://www.nv.doe.gov).

DRI employs local citizens, many of them high school science teachers, to manage the stations.

## Institute to participate in \$900,000 mercury study

As the world has taken more notice of the effects of global climate change in recent years, much attention has been paid to plant and soil carbon and their effect on carbon dioxide in the atmosphere.

But what of the tremendous amounts of mercury that co-exist with carbon in soils and plants? Mercury tightly associates with carbon and has been a substance of concern by the U.S. Environmental Protection Agency. Forty five states have posted fish advisories for mercury in recent years, for example, but no one has linked how changes in plant biomass and soil carbon pools will affect the mercury sequestered, or stored, in these pools. Until now.

DRI's Daniel Obrist and his colleagues recently received \$900,000 from the EPA to conduct a four-year study to assess how global change during the next 100 years is likely to affect mercury cycling processes.

"We are concerned about the fate of mercury sequestered in carbon pools when these pools may likely shrink in the future as a consequence of global change," Obrist says. "Does mercury emit back to the atmosphere and add to atmospheric pollution? Or could protecting and building up carbon pools mitigate future mercury pollution because they securely store



Ghana's former President Jerry Rawlings

## Former president of Ghana visits Las Vegas campus

**A VISIT FROM GHANA:** The former president of Ghana, His Excellency Jerry Rawlings, recently made a visit to DRI's Las Vegas campus. Rawlings received an overview presentation of the Institute from Chris Maples, executive vice president of research. Associate Research Hydrogeologist Alan McKay then presented the 15-year history of DRI's programs in West Africa. This was followed by a tour of the Institute by DRI's Assistant to the President, John Gardner, who coordinated the President's visit. Rawlings' interest in DRI was extremely high because of DRI's work in Ghana, such as bringing clean drinking water to Ghanaian villages.

mercury in the soil?"

Atmospheric mercury levels largely determine mercury deposition to terrestrial ecosystems, where it can transfer to streams, rivers and lakes and is the primary source of mercury to the freshwater ecosystems at risk.

# Chow receives new Nazir and Mary Ansari Chair award

Research to benefit cultural artifacts around the world

The Desert Research Institute's Judy Chow has been awarded the inaugural Nazir and Mary Ansari Chair in Entrepreneurialism and Science, a \$75,000 DRI professorship spread over three years funded by the Nazir and Mary Ansari Foundation.

Chow will use the award to enhance her research in "Atmospheric Degradation of Cultural Heritage," which is a challenge in some countries where different types of air pollution are affecting the preservation of precious cultural artifacts.



"Dr. Chow has a stellar scientific background, and it is our pleasure to recognize her value to our state and to our system of higher education."

— Nazir Ansari

The project expands on her collaborative work for the preservation of the Terra-cotta Warriors in Xi'an, China and will allow her to collaborate with colleagues elsewhere, such as Italy, Cyprus, Chile and India.

The award is the first of its kind at DRI, as it is from a private foundation and will be used to augment funds gained through scientists' grants and contracts.

"The Desert Research Institute is an important part of our community, and we all feel very enthusiastic at the prospect of providing leadership support to the institution and its faculty," Nazir Ansari says. "Dr. Chow has a stellar scientific background, and it is our pleasure to recognize her value to our state and to our system of higher education."

Nazir Ansari is a trustee on DRI's Research Foundation Board. The Ansaris are long-time supporters of higher education and social and community projects in Nevada. They are recipients of numerous community and university awards and honors, including the Distinguished Nevadan honor bestowed upon them this year by Nevada's Board of Regents. The charitable foundation seeks to improve people's lives through support of human services, education, the arts and culture in northern Nevada.



AWARD WINNER: Judith Chow researches atmospheric degradation on cultural artifacts.

## Personnel updates

- ▶ On August 1, **Kent Hoekman** stepped down as the DAS executive director to head up DRI's renewable energy effort.
- ▶ **Alan Gertler**, one of the longest serving and most respected researchers at the Institute, has stepped in as interim executive director until a national search is completed to fill the position.
- ▶ **Fred Harris**, who has worked as an assistant research professor of CaVCAM and is also a computer science professor in the College of Engineering at UNR, has been named interim senior director of CaVCAM.
- ▶ **Gayle Dana**, an associate research professor, has been named Nevada NSF EPSCOR Director.

## Visualization scientist joins Institute

Patrick O'Leary comes from the Idaho National Laboratory

Patrick O'Leary has joined the Desert Research Institute as an associate visualization scientist. He comes to DRI from the Idaho National Laboratory, where he was the scientific computing manager.

"With the development of our new computer visualization technology at DRI, we're very excited to have Patrick join the Institute," said Michael Auerbach, director of DRI's Division of Earth and Ecosystem Sciences. "He comes to us with more than 18 years of relevant work experience in scientific visualization."



Patrick O'Leary

O'Leary earned a PhD in applied mathematics from the University of Wyoming, and a BS in mathematics from the University of Arkansas.

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