

ANNUAL REPORT 2014



RESEARCH SCIENCE EDUCATION





STEPHEN G. WELLS, PH.D.
DRI PRESIDENT

A MESSAGE FROM THE PRESIDENT

As President of DRI, it is my pleasure to have this opportunity to bring our partners, sponsors, donors, and friends up-to-date on the activities of the Institute.

This annual report affords us a chance to highlight the research and accomplishments of the past year and thank DRI's faculty, students and staff. As the core of DRI, they are what make the Institute a success and a wonderful place to work.

On the front and the back of this report we have chosen to highlight two water projects where DRI faculty, with the tremendous support of our DRI Foundation Trustees, are making an international impact. Dr. Kumud Acharya is leading efforts with Hohai University to address water quality in China's largest freshwater lake. DRI's new Sustainable Water Initiative, led by Dr. Braimah Apambire, launched in 2014 with a focus on providing women in developing countries with clean water.

In addition to the outstanding research and collaborations highlighted in this report, DRI's researchers also play a vital role in supporting the basic educational mission of the Nevada System of Higher Education. DRI provides non-state funding to graduate and undergraduate students from both UNR and UNLV to work on significant projects. In that way, our students gain direct exposure to cutting-edge research techniques and their application to solving real world problems.

DRI has built its reputation on being able to respond quickly, decisively, and without bias to opportunities and needs as they arise. DRI continues to serve as a model for demonstrating how entrepreneurialism in scientific research strengthens a university system, a state's economic portfolio, a nation's security, and society overall. Our faculty and students are meeting the challenge of pressing environmental problems ranging from local to global settings—as you'll see as you read on through this report.

STEPHEN G. WELLS

ON THE COVER . . .

FRONT: DRI is collaborating with Hohai University to help China address the toxic blue-green algae (cyanobacterium) blooms seen here in Lake Taihu—the country's largest freshwater lake in the Yangtze Delta Plain near Shanghai.

Photo credit: Dr. Hans W. Paerl

BACK: DRI's new Sustainable Water Initiative is installing hand pumps like this one and providing water, sanitation and hygiene training and education in more than 41 developing countries around the world.

Photo credit: Sarah Jenkins Newkirk

DRI'S KNOWLEDGE FUND PROJECTS

Since 2011, DRI has worked closely with the Governor's Office of Economic Development to support Innovation-Based Economic Development in Nevada. DRI has leveraged our Knowledge Fund support to create two exciting efforts that are expanding our private-sector R&D activity. Research faculty and new hires with private-sector experience are working side-by-side to find, attract, and secure new revenue opportunities from key sectors of industry, government, and foundations.



Science.
Innovation.
Solutions.



The Applied Innovation Center for Advanced Analytics (AIC) at DRI is positioned to provide research and development services supporting innovation in applied data, visualization, and computational analysis. Inspired by decades of data intensive pursuits of DRI scientists in atmospheric, hydrologic, biological, and geologic sciences, the AIC leverages broad interdisciplinary expertise in data acquisition, analysis, modeling, and visualization.

EARLY ACCOMPLISHMENTS:

- Recruited and hired key personnel in technical, computational, and business development capacities
- Engaged in four Master Services Agreements and submitted six proposals and letters of intent to provide contract services
- Established preliminary data sciences market assessment through dialogue with more than 40 private sector firms
- Crafted initial strategic business development plan to guide identification of opportunity in Phase II of AIC growth
- Procured computing cluster to expand software development capacity

The Nevada Center of Excellence in Water (NvCOE) aims to make Nevada a global water innovation hub and portal for investment by leveraging the state's leadership and expertise in water. Since receiving funding from the Knowledge Fund in June 2014, this public-private partnership has focused heavily on recruiting water technology companies to the state by coordinating commercialization services and offering opportunities for the demonstration and testing of new technologies.

EARLY ACCOMPLISHMENTS:

- Conducted two international recruiting trips and built a pipeline of 115 water technology companies
- Initiated five R&D projects with companies committed to moving to Nevada
- Created an estimated 12 new high-tech jobs through working with companies like Echologics and Acqua
- In September 2014, appointed Nathan Allen, Executive Director
- Submitted over \$500,000 of new grant proposals

DRI'S GLOBAL WATER KNOWLEDGE CAMPAIGN

DRI LAUNCHES GLOBAL INITIATIVE TO PROVIDE WOMEN IN DEVELOPING COUNTRIES WITH CLEAN WATER

Imagine a day in which your access to clean, drinkable water ceased and you could not shower or bathe properly and you had no one to help you. For more than 783 million people around the world, that day was today. In 2015, more than 2.5 billion people lack access to basic sanitation in the developing world.

In 2014, DRI launched a new initiative that is aiming to dramatically reduce those numbers, focusing specifically on women—who often bear the brunt of the impact from lack of access to safe water. The DRI Sustainable Water Initiative is a unique, international collaboration with WaterAid, Water for People, and World Vision. Collaboratively, these three world-renowned organizations currently have water, sanitation, and hygiene (WASH) programs in more than 41 countries.

Donate today at www.dri-water.charity.org



Leading this new initiative is Braimah Apambire, Ph.D., a native of Ghana, West Africa, who serves as director of DRI's Center for International Water and Sustainability.



Kumud Acharya, Ph.D., has worked in the Lake Taihu region since 2007 and published more than a dozen scientific reports on the water quality issues affecting the region.

DRI EXPANDS INTERNATIONAL PARTNERSHIP TO ADDRESS WATER POLLUTION, MANAGEMENT ISSUES

For more than two decades, Lake Taihu (the largest freshwater lake in the Yangtze Delta Plain near Shanghai, China) has been stricken with toxic blue-green algae (cyanobacterium) blooms that jeopardize the drinking water supply of more than 10 million people. The once stable watershed is now home to over 51 million people and serves as the literal “canary in the coal mine” related to the environmental impacts of China’s dramatic economic and population growth.

In 2014, DRI launched a unique partnership with Hohai University—China’s foremost water research university—to address global water pollution and supply issues. Building upon a long-standing academic relationship between DRI faculty and Hohai University, the new joint-international laboratory will facilitate faculty and student exchanges; water resources management and training, and water pollution monitoring and mitigation. Initial work is expanding focus on innovative scientific research to rehabilitate and sustain some of China’s most polluted watersheds such as Lake Taihu.

Learn more at www.dri.edu/eco-engineer

IMPACT

DRl's research calls on the expertise and methods of scientists from more than 40 scientific disciplines. More than 500 highly-skilled scientists, engineers, students, technicians, and staff are collaboratively focused on understanding and answering critical environmental science questions about global climate change, water quality and availability, air quality, sustainability of desert lands, life in extreme environments, and more. The stories highlighted below demonstrate DRI's breadth of research expertise and impact around the world.



SCIENTIFIC PROOF THAT INDUSTRIAL LEAD POLLUTION BEAT EXPLORERS TO THE SOUTH POLE

Norwegian explorer Ronald Amundsen became the first man to reach the South Pole in December of 1911. More than 100 years later, an international team of scientists led by Joe McConnell, Ph.D., a renowned hydrogeologist at DRI, proved in 2014 that air pollution from industrial activities arrived long before the first human explorers.

Analyzing data extracted from 16 ice cores (including the one shown above) collected from locations around Antarctica, including the South Pole, McConnell's team created the most accurate and precise reconstruction to date of lead pollution over the Earth's southernmost continent. The new record, described in an article published in the online edition of *Nature Scientific Reports*, spans a 410-year period from 1600 to 2010 A.D.

The new record showed the dramatic impact of industrial activities such as smelting, mining, and fossil fuel burning on even the most remote parts of the world.

Data from the new ice core array illustrated that Antarctic lead concentrations reached a peak in 1900 and remained high until the late 1920's, with brief declines during the Great Depression and the end of World War II. Concentrations then increased rapidly until 1975 and remained elevated until the 1990's.

Concentrations across the Antarctic continent have since declined, but still are about four-fold higher than before industrialization, despite the phase out of leaded gasoline and other mitigation efforts in many countries in the Southern Hemisphere.

A CITIZEN SCIENCE APPROACH TO FILLING THE OCEAN DATA GAP

Despite new technologies, satellite imagery, and modern research methods, the work of collecting routine fundamental data about the Earth's oceans' physical, biological, and chemical characteristics remains an unforgiving and impossible task that has challenged scientists for centuries.

A pioneering approach published in the open access, peer reviewed scientific journal *PLOS Biology*, and co-authored by DRI's Joseph Grzyski, Ph.D., an associate research professor of computational biology and microbiology, challenged conventional research methods and proposed a global effort to engage and empower citizen scientists to gather basic ocean data aboard small vessels on the most common sailing routes.



Such data would significantly improve the accuracy of climate models, weather forecasts, and even assist search and rescue efforts struggling to learn the likely trajectory of floating debris left by a plane crash or other incidents.

Grzyski, who was lead expedition scientist of the Indigo V Indian Ocean Expedition—a pilot study in 2013 to test the aptly named “citizen oceanographer approach” across 6,500 nautical miles from Cape Town, South Africa to Phuket, Thailand—explained that daily observations, combined with a newly developed, simple and reliable technique for bacterioplankton sampling could be deployed and recorded by sailors—who have an inherent concern for the oceans and make ideal candidates for citizen scientists.

The research demonstrated that with simple instruments and basic training, sailors could sample a wide-range of waters and collect meaningful data—thus creating the largest global oceanographic monitoring network to date.



DRI AND UNR HELPING NORTHERN NEVADA BUILD RESILIENCY TO FUTURE DROUGHTS

In August 2014, a NSF/USDA competitive grant totaling \$3.8 million was awarded to the University of Nevada, Reno and DRI, in partnership with the U.S. Geological Survey, to integrate science and water policy research with extensive community outreach to identify the expected impacts of climate change and solutions for protecting valuable water resources throughout northern Nevada. The “Water for the Seasons” project will focus on the Truckee-Carson River System as a model for snow-fed, arid-land river systems across the American West.

RESEARCHING THE GLOBAL THREAT OF SMOLDERING PEAT FIRES

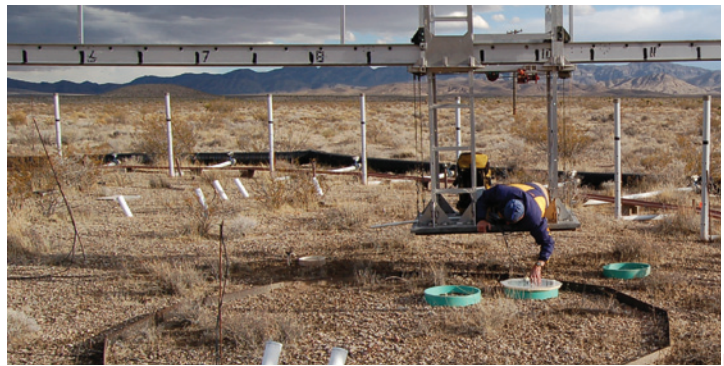
The natural disaster plays out like a movie script—ash falling from the sky, thick smoke shutting down airports across the globe, and uncontrollable fires burning for days and weeks. But this is not from a script; rather, it is a vivid description of a future climate change scenario in which the Earth’s peat-rich regions become more susceptible to drying and burning.

New research published in the journal *Nature Geoscience*, co-authored by Adam Watts, Ph.D., a fire ecologist and deputy director of DRI’s Climate, Ecosystems, Fire, and Applications Program, outlined the threat of drying peatlands (also known as mires) across the globe and their increased vulnerability to fire and carbon loss. Peatlands—which make up around 3% of the Earth’s land surface and store approximately 25% of the world’s soil carbon—are deposits of plant material and organic matter mixed with soil that is too wet to support high levels of decomposition. Peatlands are found on all seven continents.

Already the largest fires on Earth in terms of their carbon footprint, these smoldering fires burn through thick layers of peat, built up over thousands of years, which blanket the ground in ecosystems ranging from the tropics to the arctic.

Peat fires can burn for days and weeks, even under relatively wet conditions, and produce a lot of smoke. That smoke contains large amounts of carbon and makes peat fires dangerous to human health. It can worsen air quality and even trigger asthma and other respiratory problems.

The paper concludes that almost all peat-rich regions will become more susceptible to drying and burning with a changing climate. The authors also note that the ecology of peat fires and the role of peat fires in long-term Earth system processes need to be explored more thoroughly in future research.



CULMINATING 10 YEARS OF RESEARCH INTO THE EARTH’S ARID CARBON BUDGET

In the Mojave Desert, just north of Las Vegas, researchers from DRI, UNLV, UNR and Washington State University recently completed a study of the impact of elevated carbon-dioxide (CO₂) levels on desert ecosystems, CO₂ levels similar to those expected on Earth by 2050.

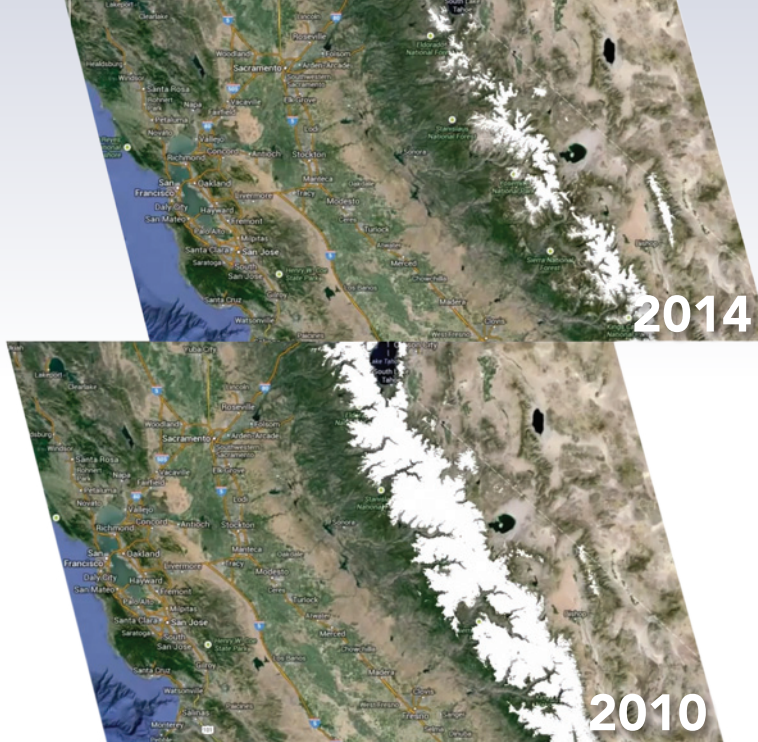
The research findings are providing scientists with a better understanding of the global carbon budget—which looks at the balance of CO₂ storage and emissions across all of Earth’s ecosystems, including the ocean.

A recent publication in the journal *Nature Climate Change*, details key results from Mojave Desert plots exposed to elevated CO₂ over a 10-year span at the Nevada Desert F.A.C.E. (Free-Air CO₂ Enrichment) Facility (NDFF).

Researchers investigated the effects of increased atmospheric CO₂ concentrations on a number of plant processes including photosynthesis, plant growth and plant water dynamics to determine impacts on plant nutrient uptake and other processes. The results revealed that elevated atmospheric CO₂ has a significant positive impact on ecosystem carbon storage, which is almost entirely due to enhanced carbon storage within the soil.

Lynn Fenstermaker, Ph.D., an associate research professor at DRI, pioneered the use of a radio control helicopter and multispectral camera during this project to help quantify vegetation cover, harvest area, and the impact of increased CO₂ emissions. This was one of the first applications of unmanned aircraft systems (UAS) in Nevada.

RESEARCH



Google™ earth engine
a google.org project

WHITE HOUSE CLIMATE DATA INITIATIVE HIGHLIGHTS DRI-GOOGLE PARTNERSHIP

As part of the President Obama's Climate Action Plan announced in 2014, researchers at DRI, along with colleagues from University of Idaho and University of Nebraska, are working with Google to create new web-based drought mapping and monitoring tools for the entire continental United States in near real-time; and model water consumption by agriculture and natural vegetation across the globe.

Leading DRI's effort is assistant research professor Justin Huntington, Ph.D., and staff research scientist Charles Morton, who specialize in evaluating consumptive water use from agriculture and rangelands through the use of satellite remote sensing.

Huntington and his colleagues are leveraging the Federal Government's extensive, freely-available, climate-relevant data resources and access to one petabyte (1,000 terabytes) of cloud storage and 50-million donated hours of computing time on Google's Earth Engine, Maps Engine, and App Engine cloud computing platforms.

These unparalleled resources are allowing researchers to mine, process, and analyze an ongoing 30-year archive of high resolution optical and thermal images taken of Earth by the Landsat satellites—"in a matter of seconds," compared to hours and even days with traditional computing systems.

The state-of-the-art, drought monitoring web applications and real-time visualizations of consumptive water use at multiple time scales across the U.S. and the globe will be accessible to the public and provide local communities with data insights and information to better understand changes in water use associated with changes in land use and climate.

NEW PROJECT AIMS TO UNDERSTAND EXTREME WILDFIRE BEHAVIOR

Yosemite's notorious Rim Fire grew to more than 10,000 acres in the first 36 hours of burning in August, 2013. It exhibited some of the most extreme fire behavior ever witnessed and is the single largest fire ever recorded in the Sierra Nevada.

Launched in 2014, a research collaborative between DRI and the U.S. Forest Service Wildland Fire Management Research, Development, and Application (RD&A) program is attempting to understand extreme and unexpected wildfire behavior, as seen in the Rim Fire, through human experience.

This unique collaborative project is led by Tamara Wall, Ph.D., and Tim Brown, Ph.D. (who serves as the director of DRI's Climate, Ecosystem, and Fire Applications Program).



COURTESY OF INCIWEB

The "Fire Stories" project initiated from phrases such as—"I've never seen a fire act like that" or "I am seeing a lot more of that kind of extreme fire behavior nowadays"—that are becoming more and more common amongst wildland firefighters tackling these extreme blazes.

Researchers at DRI and the Wildland Fire Management RD&A are integrating social science research techniques with the production of climate knowledge and application of data analysis to understand how wildfire behavior has changed in recent years and what those changes mean for wildland firefighters, agency managers, and on-the-ground decision makers.

Firefighters can share their stories online at www.dri.edu/firestories or through the SenseMaker Android or iPhone app available on most smartphones.



RISING TEMPERATURES THREATEN ENDANGERED NEVADA PUPFISH

Using advanced fiber-optics, Mark Hausner, Ph.D., a DRI hydrologist, and his colleagues at UNR, the National Park Service, and USGS, are tracking the rising temperature of the geothermal water found in an isolated cavern in the Nevada desert—home to one of the world's rarest fish species.

The hotter water in the limestone cavern, which now reaches more than 93 degrees Fahrenheit, has shortened by one week the amount of time the rare Devil's Hole pupfish larvae have to hatch and then find sufficient food to survive. This decrease is contributing to the decline of the adult pupfish population, according to research published in *Water Resources Research*, a journal of the American Geophysical Union.



COURTESY OF OLIN FEUERBACHER

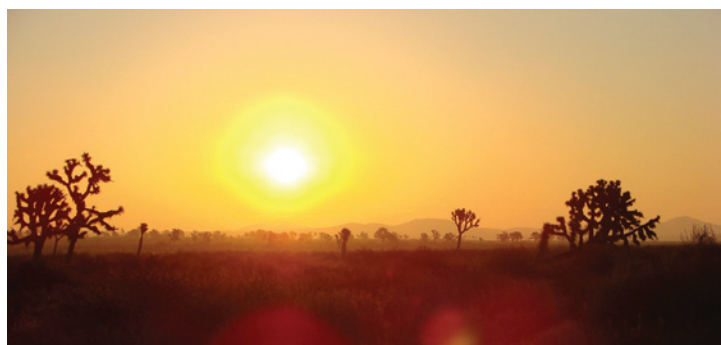
The iridescent blue, one-inch-long pupfish have lived in the top 80 feet of the water-filled cavern in Death Valley National Park for more than 10,000 years. In 2014, there were 92 Devil's Hole pupfish observed living in the geothermal pool. The population, which fluctuates throughout the year, is down from 171 fish a decade ago (according to seasonal counts). Historically, the annual peak population has been between 400 and 600 individuals,

according to the National Park Service.

Combining climate forecasts and historical data, models of water circulation in the cavern, and food web ecology dynamics, scientists are working to understand how climate change affects the ecosystem within the pool. Their techniques can be applied in other aquatic ecosystems around the world to model how other species might respond to the changing climate.

PATRICIA MULROY JOINS DRI AS MAKI DISTINGUISHED FACULTY ASSOCIATE

Patricia Mulroy, who oversaw the Southern Nevada Water Authority's development during the region's greatest period of growth, joined DRI's Division of Hydrologic Sciences in 2014 as a Maki Distinguished Faculty Associate. She is helping to develop DRI research programs in water resources and related areas at the state, national and international level. She also serves as a Brookings Senior Fellow for Climate Adaptation and Environmental Policy and a Practitioner in Residence for the Saltman Center for Conflict Resolution at the UNLV William S. Boyd School of Law.



TRAMMELED GROUND: WILDERNESS EXPERIENCES ON MILITARY LANDS

Within the nearly 450 military installations in the continental United States are some of the most pristine landscapes in the country, often less impacted than many federally designated wilderness areas, according to one of Nevada's top ecologists.

MILITARY GEOSCIENCES
in the Twenty-First Century



Published as part of the GSA's (Geological Society of America) 2014 Reviews in Engineering Geology series, Mary Cablk, Ph.D., authored a chapter in *Military Geosciences in the Twenty-First Century* that challenges the traditional perspectives about wilderness drawing on examples from the United States and abroad to pose the question—"Does wilderness exist on military installations?"

Walking readers through the legal definition of the Wilderness Act of 1964, Cablk contrasts the social and environmental costs of allowing open access to the 109.4 million acres of designated wilderness in the United States, with the unique and unexpected landscapes that exist within the 30.2 million acres of federally managed military lands.

Cablk, who has spent a lifetime on military bases in the U.S., illustrates the various impacts of human activity on public lands in the Mojave Desert and the management agencies' vastly different approaches to access, preservation, and stewardship.

Given the impacts of climate change, the time to reconsider conservation and preservation of natural landscapes is now. "Consider this to be a starting point," writes Cablk, "for future exploration and the opportunity to challenge personal beliefs."

AMERICAN GEOPHYSICAL UNION HONORS DRI'S TOP CLIMATOLOGIST FOR A LIFETIME OF PUBLIC OUTREACH AND CLIMATE ADVOCACY



As deputy director and regional climatologist for the Western Regional Climate Center at DRI, Kelly Redmond, Ph.D., has dedicated more than three decades of his career to understanding the Earth's climate and communicating that knowledge to the general public.

At its 47th Annual Fall Meeting in San Francisco, the American Geophysical Union (AGU) honored Redmond as its 2014 Tyndall History of Global Environmental Change Lecturer. The AGU Fall meeting is the largest worldwide conference in geophysical sciences, attended by nearly 20,000 Earth and space scientists, educators, students, and policy makers.

The award is named in honor of John Tyndall, a physicist and devoted advocate for explaining science to a broad audience whose measurements in the late 1850's and early 1860's verified the importance of the greenhouse effect. A scientist is selected to present the annual lecture based on their outstanding contributions to the understanding of global environmental change.

An expert on human-caused climate change and its effects on the Western U.S., Redmond's recent work has focused on projects to support the National Integrated Drought Information System (NIDIS)—used to generate the U.S. Drought Monitor and Seasonal Drought Outlook on www.drought.gov—and the Department of Interior Climate Science Center Program. He is also one of the founders and key coordinators of the Consortium for Integrated Climate Research in Western Mountains (CIRMOUNT), a collaborative, interdisciplinary consortium dedicated to understanding climates and ecosystems of western North American mountains.



Western Regional
Climate Center
Providing climate services since 1986



"If you want to communicate climate knowledge to decision-makers in the Southwest or Western U.S. (or probably anywhere else), there is no better source of know-how or the energy to get it done than Dr. Kelly Redmond."

—AGU AWARD NOMINATION COMMITTEE

WORKING ON THE FRONTLINES OF SCIENCE EDUCATION EFFORTS ACROSS NEVADA

DRI's GreenPower K-12 outreach program supports Nevada's preK-12 educators in science-based, environmental education by providing the tools, resources, and knowledge they need, so all students acquire the knowledge and skills needed to work, live, and contribute to our community.

2014 ACCOMPLISHMENTS

- 247 participating schools across Nevada
- Distribution of more than 50 Green Box science kits to classrooms across the state, reaching over 17,000 students by the end of the school year
- Hands-on training provided to 300 educators representing all Nevada school districts
- Collaboration with numerous DRI faculty to share their research and broaden their outreach to local students and teachers



"The GreenPower team has worked tirelessly to develop and improve classroom-ready resources and build capacity for teacher support and implementation. Through our many collaborations, like last summer's workshop series, I was able to really see their curriculum materials in action. It was great to see such a comprehensive program which still supports classroom best practices. I am excited to continue our partnership through many formal and informal education endeavors as we support Nevada learners."

—KRISTOPHER CARROLL,
K-12 REGIONAL SCIENCE TRAINER, SOUTHERN NEVADA
REGIONAL PROFESSIONAL DEVELOPMENT



OUTREACH

FOSTERING SCIENTIFIC TALENT AND PROVIDING RESEARCH-FOCUSED EDUCATIONAL OPPORTUNITIES

For higher education students, DRI provides a learning environment strongly focused on collaborative, interdisciplinary research. DRI faculty members participate in numerous academic programs throughout the Nevada System of Higher Education. Students conduct their research at DRI while earning degrees through the universities in programs such as Atmospheric Sciences, Hydrologic Sciences, Cellular and Molecular Biology, Environmental Science, Life Sciences, Geological Sciences, and Anthropology.

THE NUMBERS

DRI invested **\$1.6 MILLION** in non-state funds in 2014 for support of graduate students at UNLV, UNR, and Nevada State College



DRI



65 graduate students employed at DRI in 2014

EXAMPLES OF KEY COURSES TAUGHT BY DRI FACULTY

- Atmospheric Physics and Pollution
- Synoptic Meteorology
- Climate Modeling
- Mountain Meteorology
- Environmental Geochemistry
- Groundwater Modeling
- Writing in the Sciences
- Snow Hydrology Seminar
- Computer Programming in Environmental Sciences
- Quaternary Field Exercises
- Introduction to Symbolic Logic

45% of all DRI-supported graduate students are in Ph.D. programs



2014 GRADUATE ADVISOR OF THE YEAR—MIKE KAPLAN, PH.D.

Every spring, DRI's Graduate Student Association recognizes one Graduate Advisor for his or her outstanding commitment to the success of DRI graduate and doctoral students. Mike Kaplan, Ph.D., a research professor of atmospheric science, has over 40 years of experience in synoptic and dynamical meteorology and mesoscale numerical weather prediction.

"Mike stands out as someone who sincerely cares about student success. He is an effective and responsive communicator and is always there for his students. He pushes his students to grow and learn and gives them the tools to do so while keeping them accountable for their work. Mike is always willing to mentor new students because he believes that great mentorship is essential to bring up the next generation of great scientists."

—K.C. KING, 2014 GRADUATE STUDENT ASSOCIATION PRESIDENT

SHARING THEIR EXPERIENCE...



I worked on developing the Martis Valley integrated groundwater-surface water hydrologic model to assess groundwater recharge in space and time. The most enjoyable part of this work for me was working together with professionals at DRI to develop novel techniques applicable to hydrologic modeling that provided insights to water resources so highly important to the communities and ecosystems of the Truckee Meadows.

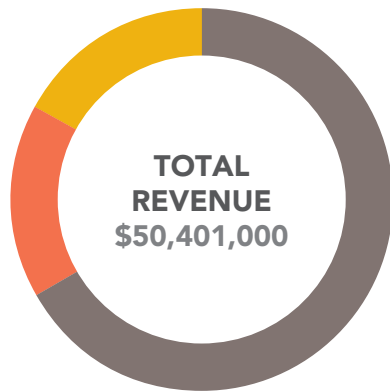
—MURPHY GARDNER
(DRI MENTOR: JUSTIN HUNTINGTON, PH.D.)



I learned about DRI serendipitously while researching options for graduate school and was impressed by the extensive research and global reputation that DRI carried. The unique experience that comes with being a part of both the DRI community and the UNLV community is constantly rewarding and gratifying.

—KATHERINE WILLEVER
(DRI MENTOR: DUANE MOSER, PH.D.)

FOR THE INSTITUTE



◆ Grants & Contracts	\$33,733,000
Federal	\$27,268,000
Private	\$3,865,000
State & Local	\$887,000
Other Revenue	\$1,713,000
◆ State Appropriations	\$8,144,000
State General Fund	\$7,507,000
Other Appropriations	\$637,000
◆ Other Resources	\$8,524,000



◆ Employee Compensation & Benefits	\$32,245,000
◆ Supplies & Services	\$9,219,000
◆ Depreciation	\$4,974,000
◆ Utilities	\$1,050,000

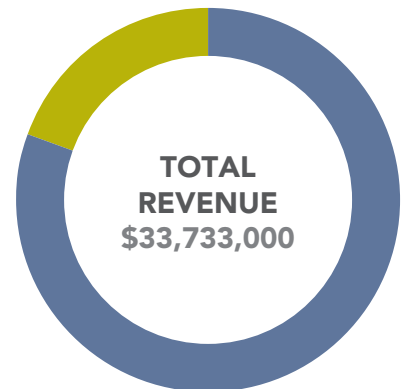
GRANTS AND CONTRACTS FUNDING SOURCES

FEDERAL \$27,268,000

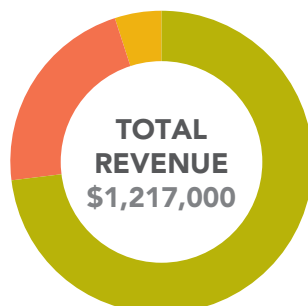
Dept. of Energy (DOE)	22.1%
Dept. of Defense (DOD)	15.4%
National Science Foundation	11.8%
Dept. of Interior	10.4%
Dept. of Commerce (DOC)	7.9%
Environmental Protection Agency	6.2%
NASA	4.0%
USDA	2.8%
Other	0.1%
Total	80.7%

NON-FEDERAL \$6,465,000

Private	9.4%
Other State Government	
Agencies	5.1%
Local Government	2.3%
Foreign	2.1%
State Government	0.4%
Total	19.3%



FOR THE FOUNDATION



◆ Gifts, Contributions & Events	\$891,000
◆ DRI Support	\$266,000
◆ Other Revenue	\$60,000



◆ Gifts to DRI	\$572,000
◆ Supplies & Services	\$254,000
◆ Contributed Salaries & Wages	\$261,000



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2015 DRI NEVADA MEDAL



PRESENTED BY:



LIFE IN THE EXTREME

Over the last 28 years, DRI has bestowed honors to individuals whose unique contributions to science and engineering have shaped and continued advancement of knowledge and discovery on Earth and in space. In 2015, Nevada's highest scientific honor will be awarded to NASA scientist Dr. Christopher P. McKay of the Ames Research Center in California's Silicon Valley.

Dr. Christopher P. McKay is a Planetary Scientist with the Space Science Division of NASA. From the evolution of the solar system to the origins of life, Dr. McKay's research in planning for future Mars missions has spanned the globe of extreme Earth environments including Siberia, Antarctica and some of the driest deserts on earth. His contributions to the Huygens probe to Saturn's moon Titan in 2005, the Phoenix Mars Lander mission in 2008, and the current Mars Science Laboratory mission have expanded our innate human curiosity in our world and beyond.

A pioneer in the origins of life and the evolution of the solar system, Dr. McKay's research has included collaboration with DRI scientists Dr. Chris Fritsen, Dr. Alison Murray, and Dr. Henry Sun on projects including the search for life in extreme environments deep within the Earth's surface and deep underwater in one of Antarctica's most isolated lakes.

FROM NEVADA TO THE WORLD



DRI

Desert Research Institute

CONTRACT CENTER FOR COOPERATION
FED. WILDS. FUNDING PROJECT
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NAME OF COMMUNITY: MAYAYO
WELL NO. XVII: 1972-05
DATE DRILLED: 10-2-05
WHITE JADE