

# ANNUAL REPORT 2015



## OUR MISSION

We excel in basic and applied research and the application of technologies to improve people's lives throughout Nevada and the world. We implement this mission by fostering scientific and engineering talent. We apply scientific understanding to the effective management of natural resources while meeting Nevada's needs for economic diversification and science-based educational opportunities.





STEPHEN G. WELLS, PH.D.

DRI President

*"The opportunity to work at a world-renowned institute with some of the brightest minds in their fields. I knew I wanted to work with Dr. Christian Fritsen when I heard about the exciting work that he was conducting and his strong affiliation with the space community."*

— KATHRYN BYWATERS, PH.D.  
SYSTEMS ENVIRONMENTAL SCIENCES

*"DRI's collaboration with the University of Nevada made the program very attractive. DRI gave me the chance to work for amazing researchers at an actual research institute while pursuing an advanced degree; that is a great opportunity that many graduate students don't get."*

—SAMANTHA TABOR, MASTER'S IN  
ATMOSPHERIC SCIENCES

Dear Friends,

As President of DRI, it is my pleasure to highlight to our partners, sponsors, donors, and friends the state-wide, national and international research activities of the Institute.

This annual report affords us a chance to feature the scientific, technical and educational accomplishments of the past year and thank DRI's exceptional faculty, students and staff. Collectively they form the core engine of DRI, making the Institute both successful and an inspiring place to innovate, study and work.

Throughout these pages you will read about DRI scientists, engineers, students and staff from all walks of life making profound impacts through their scholarly endeavors and persistent dedication to our communities here in Nevada, throughout the nation and around the globe.

For more than five years, DRI has worked closely with the Nevada Governor's Office of Economic Development (GOED) to provide scientific and technical support, build innovative applied research programs, and create an advanced STEM workforce within higher-education as part of Governor Brian Sandoval's vision for a New Nevada. Thus, we have included summaries of four significant projects underway at DRI with support derived from GOED's Knowledge Fund. These projects will have lasting impacts on Nevada's economy, as well as people's lives.

In addition to the outstanding research and collaborations highlighted in this report, DRI's researchers also play a vital role in supporting and providing added value to the basic educational mission of the Nevada System of Higher Education. DRI provides non-state funding to support graduate and undergraduate students from both UNR and UNLV; as well as expose them to cutting-edge research techniques; as well as real world experiences and problem solving in science and engineering. The attraction of students to DRI and thus the value added to higher education can be easily summarized by the quotes on the left from former and current graduate students.

DRI is a unique institution within the higher education system of Nevada, and as such it 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.

DRI is Nevada's research institution that is recognized nationally and internationally for the quality of its scientific and engineering accomplishments. Since 2005, DRI has ranked nationally in the top 4–6 percent out of 400 plus institutions of higher education ranked by the National Science Foundation in total research and development (R&D) expenditures in the environmental sciences.

It has been a privilege and honor to have served as DRI's President for over 16 years, and it has been with great pride that I have lived in and participated in supporting the communities of Las Vegas and Reno. DRI's best days are ahead. The number of research proposals as well as awards to date are up significantly when compared to last fiscal year. We are growing our engagement with private industry and well as undertaking new marketing approaches to public-private partnerships. The trend is changing positively on the federal R&D front with new opportunities and support from agencies such as the Department of Defense. In addition, DRI is taking significant steps to leverage our 56 years of science management experience for bold new opportunities.

In conclusion, please know that I have thoroughly appreciated and valued the opportunity to serve as an institutional leader in Nevada's System of Higher Education.

STEPHEN G. WELLS

# 400+

RESEARCH PROJECTS HAPPENING ON ALL SEVEN CONTINENTS

# 150

PH.D. FACULTY WHO WORK IN MORE THAN 40 DISCIPLINES

# 60

SPECIALIZED LABS AND UNIQUE RESEARCH FACILITIES

# \$30 MILLION

IN GRANTS AND CONTRACT RESEARCH IN 2015



## DRI'S RESEARCH COMPETITIVENESS

416 Institutions Ranked by  
Federally Financed Research &  
Development Expenditures in the  
Environmental Sciences

*National Science Foundation,  
Higher Education Research and  
Development Survey – FY14*

- 1 – Woods Hole Oceanographic Institute (WHOI)
- 2 – U. of Washington, Seattle
- 3 – U. of Colorado, Boulder
- 4 – Colorado State University, Ft. Collins
- 14 – Massachusetts Institute of Technology (MIT)
- 23 – U. Oklahoma, Norman and Health Science Center
- 26 – Desert Research Institute**
- 33 – U. of Maryland, Center for Environmental Sciences
- 38 – Stanford University
- 57 – U. of California, Davis
- 59 – U. of Nevada, Reno
- 72 – U. of Nevada, Las Vegas





RESEARCH  
STORIES FROM ACROSS  
THE INSTITUTE



## Identifying the diverse sources of methane in shallow Arctic lakes

Research on the changing ecology of thousands of shallow lakes on the North Slope of Alaska suggests that in scenarios of increasing global temperatures, methane-generating microbes (found in thawing lake sediments) may ramp up production of the potent greenhouse gas—which has a global warming potential 25 times greater than carbon dioxide.

Five years of collaborative research, led by DRI's Alison Murray, Ph.D., and Paula Matheus Carnevali, a doctoral student at DRI, found that the methane detected in lake sediments in this region can arise from both ancient thermogenic sources deep in the earth, or from shallow contemporary biological sources. The study marked an important step in recognizing that there are different methane sources in close proximity that may respond differently in the changing Alaskan Arctic ecosystems.

## Volcanic eruptions that changed human history

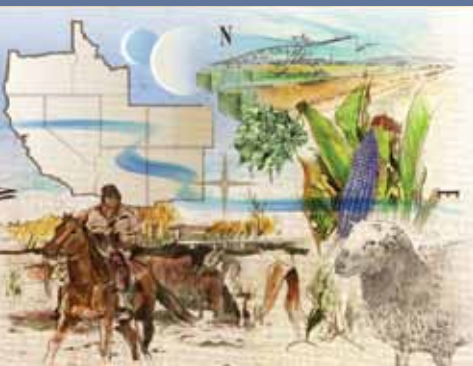
It is well known that large volcanic eruptions contribute to climate variability. However, quantifying these contributions has proven challenging due to inconsistencies in both historic atmospheric data observed in ice cores and corresponding temperature variations seen in climate proxies such as tree rings.

A study published in the journal *Nature* in July 2015, led (or first authored) by Michael Sigl, Ph.D., an assistant research professor at DRI and doctoral fellow with the Paul Scherrer Institute in Switzerland, resolved these inconsistencies with a new reconstruction of the timing and associated radiative forcing of nearly 300 individual volcanic eruptions extending as far back as the early Roman period.

The study showed that 15 of the 16 coldest summers recorded between 500 B.C. and 1,000 A.D. followed large volcanic eruptions—with four of the coldest occurring shortly after the largest volcanic events found on record.

The reconciliation of ice-core records and other records of past environmental change is helping climate scientists and modelers around the world define the role that large climatic perturbations may have had in the rise and fall of civilizations throughout human history.





## USDA awards \$4.5 million to explore agriculture and water management on tribal lands



In early 2015, DRI scientists were part of a unique team of researchers awarded a competitive \$4.5 million grant by the U.S. Department of Agriculture's Agriculture and Food Research Initiative.

The "Native Waters on Arid Lands" project integrates research and extension to help Great Basin and Southwestern tribal communities develop plans, policies and practices for sustainable agriculture and water management.

The five-year project brings together faculty and students from three of the West's 1862 land-grant institutions—University of Nevada, Reno, University of Arizona and Utah State University; First Americans (1994) Land-Grant Consortium (FALCON); Federally Recognized Tribal Extension Program instructors in Nevada and Arizona; Desert Research Institute; U.S. Geological Survey; and Ohio University. The program team also includes tribal members from Nevada, Utah, Arizona and New Mexico.

## Exploring solar energy's potential and the cost of reducing greenhouse gas emissions

Published in *Solar Energy*, a report authored by Xiaowei "Vivian" Liu, Ph.D.,—recipient of the Nell J. Redfield Foundation Post-Doctoral Fellowship in Renewable Energy—used data collected from DRI's eight solar photovoltaic (PV) systems to create realistic estimates of cost and environmental performance.

Working within DRI's Clean Technology and Renewable Energy Center (CTREC), Liu and her colleagues examined several variables such as greenhouse-gas (GHG) reduction of solar electricity, cost per ton of CO<sub>2</sub> avoided, and the "energy payback time" of DRI's solar PV systems.

Their results showed that over 90 percent of the lifetime GHG emissions and 75 percent of the total energy used can be attributed to the manufacturing process. Based on their Life Cycle Analysis (LCA) calculations, the energy payback time of DRI's six large-scale solar PV systems ranges from 3.6 to 4.9 years. The economic payback time is approximately 15 years.

The report also showed that DRI's six large-scale solar PV systems are highly effective in reducing GHG emissions.

DRI's solar-generation projects were made possible thanks to the financial incentives provided through NV Energy's Solar Generations program, the Governor's Office of Energy revolving loans program, the State Public Works Board and the State Attorney General's Office.





## DRI awarded prime seaport-e contract

DRI was awarded a prime Seaport Enhanced (Seaport-e) Indefinite Delivery, Indefinite Quantity contract sponsored by the Naval Systems Command (NAVSEA) in August 2015. Under this new contract, DRI's Naval Earth Sciences and Engineering Program (NESEP) faculty and staff are providing expertise in several key areas of inquiry including science and engineering research and development; modeling, simulation and analysis; and ranges instrumentation support.

Founded in 2009 by Dave Decker, Ph.D., NESEP provides a leadership and organizational focal point for research and development activities being undertaken by DRI faculty for the U.S. Navy. In the six years since it was created, NESEP has attracted \$9 million in contract research and development sponsor investment into Nevada and to DRI.

SeaPort-e is the Navy's electronic platform for acquiring competing support services in 22 functional areas including Science and Engineering Research and Development, Financial Management and Program Management.

## Two-mile long ice core reveals ocean currents transmitted climate change

Published in *Nature* in April 2015, new research findings from an ice-core representing more than 68,000 years of climate history illustrated how sudden climate changes that began in the North Atlantic around Greenland circulated southward, appearing in the Antarctic approximately 200 years later.

A team of hydrogeologists based at the DRI and led by Joe McConnell, Ph.D., used their unique ice-core analytical system to measure impurities associated with sea salts and desert dust in more than two kilometers (1.6 miles) of the WAIS Divide ice core in support of this research.

Many of the methane measurements used in this study were performed in DRI's ice-core laboratory in Reno, Nevada by visiting scientists from Oregon State University. The past temperatures were determined by measuring the isotopes of the melted ice at the University of Washington.

*"Our findings show how ocean currents can transmit climate changes that start in the Arctic across the globe all the way to the Antarctic," explained professor Kendrick Taylor, Ph.D., a hydrologist at the Desert Research Institute (DRI) and Chief Scientist for the WAIS Divide project, who in addition to leading the project spent five seasons in Antarctica collecting the core and helped determine the age of the ice. "Knowing how ocean currents influenced past climates will help us predict how the current human-caused variations in climate could propagate across our planet."*







## RESEARCH STORIES FROM ACROSS THE INSTITUTE



## Foothill High School student names new microorganism

Brenna Hardtner, a student from Foothill High School in Henderson, Nevada was honored in 2015 as the winner of DRI's first Bacteria Naming Contest.

Hardtner's entry was selected from nearly 100 submissions from high school biology students across the Clark County School District.

The newly discovered bacterium, which Hardtner named "*Thermoanaerosceptum fracticalcis*", will be acknowledged in an internationally peer-reviewed scientific research paper.

DRI scientist Scott Hamilton-Brehm, Ph.D., discovered the bacterium in a sample of water that was collected from an aquifer at a depth of 923 meters (almost two miles) below the surface of the Southern Nevada desert.



## DRI hosts 2015 conference on military geosciences

The 11th International Conference on Military Geosciences (ICMG), was hosted in June 2015 by DRI at the U.S. Naval Academy in Annapolis, Maryland.

Held every two years, alternately between North America and Europe, the conference provides a venue for military personnel, academics, and practitioners from government service and commercial enterprises to explore a wide range of military geosciences. The 2015 conference theme focused on The Future of Military Geosciences: Scientific Capabilities, Global Security and Sustainability.

For more than 40 years, DRI research scientists, students and staff have been supporting the missions of our U.S. Department of Defense, U.S. Army Research Office and many other federal and private-sector military partners.

Military geosciences remains one of DRI's core scientific focus areas and the future of applied research and application in this field is critical to our nation's security.

# DRI'S KNOWLEDGE FUND PORTFOLIO

*Nevada's Knowledge Fund was created in 2011 to spur research, innovation and commercialization in Nevada.  
In 2015, DRI received support for four unique projects.*



## Applied Innovation Center

- A unique team of scientists and engineers creating a new era of weather intelligence, solving the world's toughest data problems, and translating innovative scientific ideas into real-world solutions.
- AIC staff unveiled a cutting-edge weather intelligence and numerical decision platform (WINDS) at TechCrunch Disrupt in September, 2015 in San Francisco.



## WaterStart

(formerly the Nevada Center of Excellence in Water)

- A cluster of global leaders in the implementation of water innovation. Providing channels for innovation for various stakeholders and water resource managers including technology companies, management agencies and policy makers.
- Partnered with the Nevada Governor's Office of Economic Development on three international trade missions to attract more than a dozen water technology companies to Nevada in 2015.



## Unmanned Cloud Seeding Aircraft

- Working with Drone America and AviSight to design, develop and test unmanned aircraft systems focused on increasing winter precipitation and snowpack depths through aerial cloud-seeding applications.
- Project focuses on reducing risks, increasing cloud seeding efficiencies and helping alleviate ongoing drought impacts.

## UAS applications for wildland fire fighting

- Providing eyes in the sky for wildland firefighting crews and fire management agencies.
- Partnered with NASA's Applied Science Program in 2015 to develop UAS as geospatial intelligence tools to improve the safety and effectiveness of fire management, and forecast fire and smoke movement.

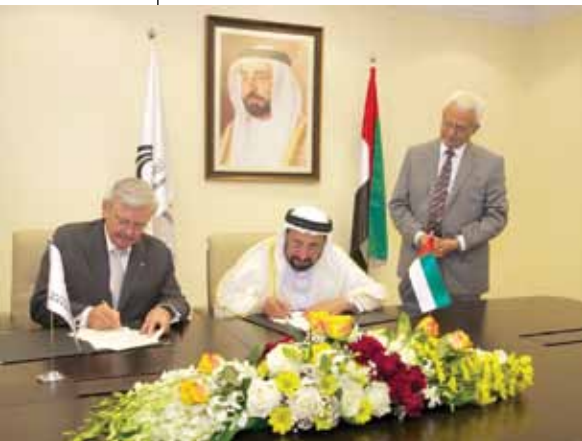


# DRI'S INTERNATIONAL IMPACT

## Ghana university officials visit DRI to renew teaching and research partnership

Faculty and higher education leaders from the University for Development Studies (UDS) in Ghana, West Africa visited DRI in August 2015 to engage with DRI research faculty and students, tour laboratories, and renew a long-term teaching and research partnership focused on addressing the need for water, sanitation and hygiene (WASH) solutions and capacity building in developing countries.

DRI and UDS have established an innovative education center in Ghana to fill gaps in WASH knowledge in the region and conduct applied environmental research in the rural communities of Northern Ghana.



## Emirate of Sharjah ruler signs research agreement with DRI

IN November 2015, H. H. Dr. Sheikh Sultan bin Mohammed Al Qasimi, Supreme Council Member and Ruler of Sharjah, and Dr. Stephen Wells, President of the DRI, signed a Memorandum of understanding between Sharjah Research Academy and DRI.

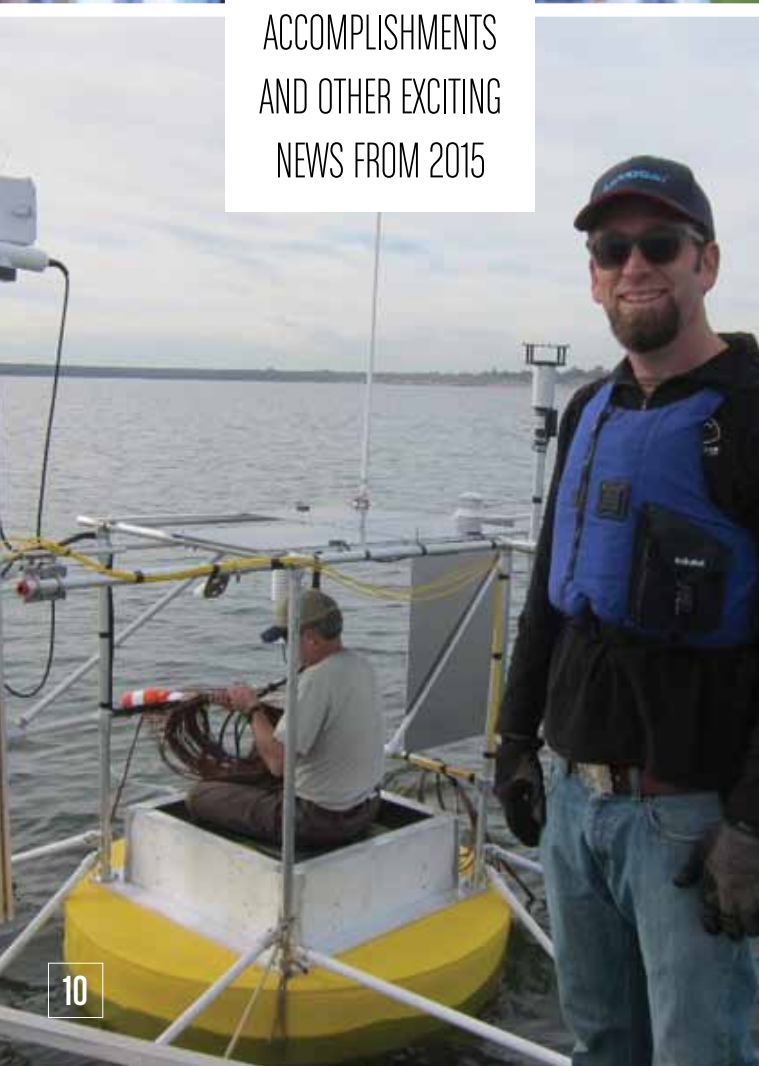
The agreement is supporting desert research in the Emirate of Sharjah and the UAE, along with protecting natural and environmental life and increasing plant and livestock production under different desert conditions.

Dr. Wells and a DRI delegation visited Sharjah to strengthen cooperation between the Institute and academic institutions in the emirate. His Highness the Ruler of Sharjah stressed the importance of strengthening cooperation between scientific research centers and institutes to maintain the quality of the environment, people's lives and achieve sustainable development.



## FACULTY

ACCOMPLISHMENTS  
AND OTHER EXCITING  
NEWS FROM 2015



## Fenstermaker named Project Director for Nevada's NASA EPSCoR and Space Grant

Lynn Fenstermaker, Ph.D., was named Project Director for Nevada's NASA Experimental Program to Stimulate Competitive Research (EPSCoR) and Space Grant Programs in January 2015.

The goal of the Space Grant Program is to—  
*"contribute to the nation's science enterprise by funding education, research and public service projects through a national network of university-based Space Grant consortia."*

The program supports NASA's national mission to develop a strong S.T.E.M. (science, technology, engineering and math) education base through the funding of research and higher education programs, and by supporting students through scholarships, fellowships and internships, and by partnering with industry and local government.

Fenstermaker adds to a distinguished list of NSHE research faculty who have helped lead the NASA EPSCoR and Space Grant Programs since its inception.

## Huntington called to the Nevada Governor's Drought Forum

Governor Sandoval established the Nevada Drought Forum on April 8, 2015 to bring together the best minds, managers and all interested stakeholders to assess the drought in Nevada, identify best conservation practices and policy needs, and make recommendations to the Governor regarding next steps.

Sandoval called upon Justin Huntington, Ph.D., a DRI associate research professor of hydrology to serve on the Nevada Drought Forum.

Huntington's research focuses on remote sensing, drought monitoring and hydrologic modeling. Huntington and his colleagues leveraged 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.

This state-of-the-art drought monitoring web application ([www.ClimateEngine.org](http://www.ClimateEngine.org)) is accessible to the public and provides local communities with information to better understand changes in water use associated with changes in land use and climate.





## Agreement with Magee Scientific to sell Model 2015 carbon analyzer

In August 2015, DRI proudly announced it entered into agreement with Magee Scientific of Berkeley, California, and its European partner company Aerosol of Ljubljana, Slovenia, to manufacture and market the all-new DRI Model 2015 Multi-wavelength Laboratory Carbon Analyzer.

This cutting-edge instrument developed by Drs. Judy Chow and John Watson, internationally renowned DRI atmospheric scientists, provides advanced analysis of Black Carbon (a component of soot), and Brown Carbon (emitted from smoldering fires or biomass burning).

Black Carbon aerosol particles reduce visibility, adversely impact human health and are known to contribute to regional and global climate change. More recently, Brown Carbon (light-absorbing organic carbon) has attracted interest as a possible cause of climate change.

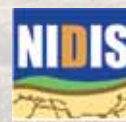
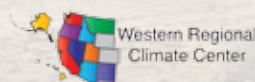
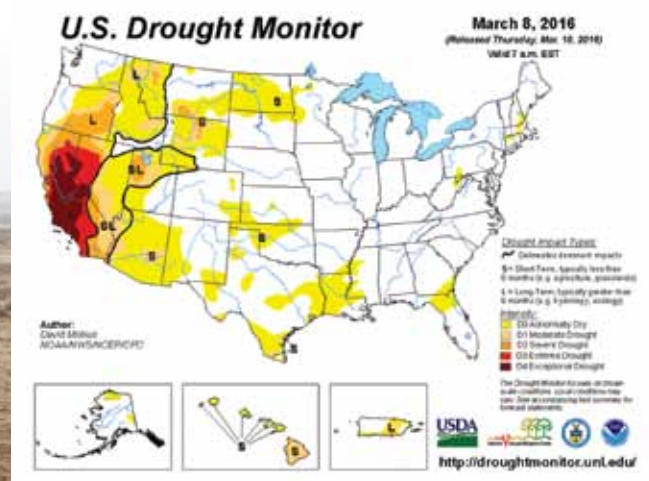
Magee Scientific is the originator of the Aethalometer, the most widely used instrument for real-time measurement of Black Carbon aerosol particles in the atmosphere, and their instruments are installed on all continents.

## DRI Hosts U.S. Drought Monitor Forum

IN April of 2015, the Desert Research Institute and the Western Regional Climate Center (WRCC) hosted the 2015 U.S. Drought Monitor (USDM) Forum in Reno, Nevada. This unique event included a keynote address from Ann Mills, Deputy Under Secretary for Natural Resources and Environment (U.S. Department of Agriculture) and Connie Woodhouse, Ph.D., a paleo-climate researcher from the University of Arizona.

This biennial meeting brought together authors of the U.S. Drought Monitor as well as federal, state and local contributors to explore the drought situation across the Western U.S., drought impacts, and provided a forum for discussion and improvements to the USDM. The final day of the forum was dedicated to a special session related to the ongoing drought in California and Nevada. Both states are entering a fifth consecutive year of drought, with several areas experiencing Level D4—Exceptional Drought.

This session included updates from Nevada State Climatologist, Doug Boyle and California State Climatologist, Mike Anderson; California Department of Water Resources Drought Emergency Program Manager, Bill Croyle; and a Great Basin Season Fire Outlook from the Bureau of Land Management Meteorologist, Gina McGuire. An afternoon panel discussion focused on improving inter-agency and stakeholder collaboration with the USDM.

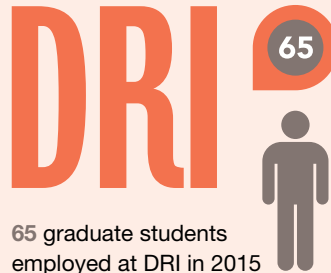


## Fostering scientific talent and providing research-focused educational opportunities

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 2015 for support of graduate students at UNLV, UNR, and Nevada State College



#### EXAMPLES OF KEY COURSES TAUGHT BY DRI FACULTY

- Atmospheric Physics
- 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



## 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 tools, resources and knowledge for communicating Next Generation Science Standards to Nevada students.

#### 2015 ACCOMPLISHMENTS

- 264 schools participating in 2015
- 402 GreenPower schools and organizations in Nevada
- 18,938 students reached through Green Boxes in 2015
- 480 teachers trained through our teacher trainings

*"The GreenPower program does a great job providing materials and training for teachers to help improve science and STEM instructions in Nevada classrooms."*

—DAVID CROWTHER, PH.D.,  
NATIONAL SCIENCE TEACHER  
ASSOCIATION PRESIDENT, DIRECTOR  
RAGGIO RESEARCH CENTER FOR  
STEM EDUCATION







CHARLES CREIGH

*Chair DRI Research Foundation,  
Principal NewMarket Advisors*

It is my pleasure to report to you on the DRI Research Foundation's activities during FY 2015. The year was a great success in terms of both fundraising and outreach to promote the unique and critical mission of DRI.

Over 1,000 people representing all sectors of the community came together as we celebrated our 28th annual DRI Nevada Medal Dinner events—DRI's premiere public engagement event, honoring the scientific achievements of Dr. Chris McKay, NASA Planetary Scientist. Led by presenting sponsor Switch, and thanks to the generosity of many individual, corporate, and Foundation supporters, the events drew record crowds in both Reno and Las Vegas and generated over \$370,000 in revenue.

As part of our Global Water Knowledge Campaign the Foundation was proud to play a lead role in securing the necessary funding and supporting DRI in establishing the Joint International Research Laboratory of Global Change and Water Cycle with China's Hohai University. The lab is providing critical direct and indirect research, education, training, and collaboration on water related issues in China and beyond.

As part of the Foundation's outreach efforts, grants funds were also raised to support DRI's STEAM (Science, Technology, Engineering, Arts and Math) education outreach program—GreenPower. With support from many prominent organizations such as NV Energy, Keyser Foundation and Sempra, GreenPower has increased its capacity and is delivering STEAM education to hundreds of schools and thousands of students throughout Nevada.

It was with great sadness that the DRI community said goodbye to DRI Foundation Trustee, Mr. John H. O. La Gatta in 2015. Serving on the Foundation Board of Trustees for over a decade, La Gatta's commitment and deep passion for education and the environment made a profound difference at DRI. In 1997, he created the Catamount Fund non-profit, which has since supported numerous education, art, and science initiatives and organizations across Nevada—including those at DRI. La Gatta not only served as a devoted DRI Foundation Trustee, but also opened his home in Reno annually to DRI Foundation events and community gatherings to celebrate his passion for education, art and science. He will be greatly missed.

I am also proud to announce that we have welcomed six new trustees to the Foundation Board this year. These extremely talented and influential leaders bring skills and experience to our Board in marketing, politics, research administration, management and much more.

For over 25 years, the Foundation Trustees have worked with DRI benefactors to support environmental science research aimed at improving people's lives throughout Nevada, the nation and the world.

I would like to thank our generous donors and all of you who took the time to attend DRI's events during the past year and engage with our faculty and students. Your time is greatly appreciated and you have our sincere appreciation for everything you do for DRI.

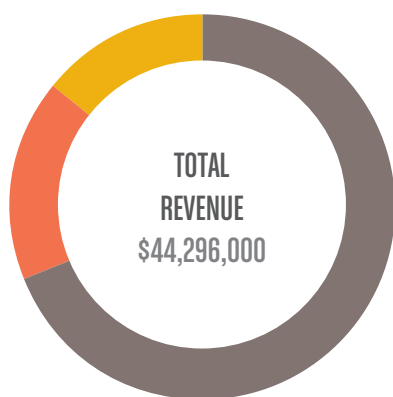
Sincerely,

CHARLES CREIGH,  
CHAIR, DRI RESEARCH FOUNDATION

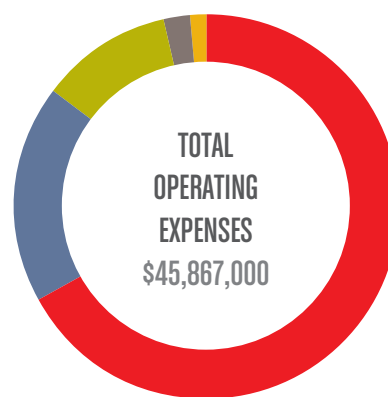


John H. O. La Gatta (center) at the 2015 DRI Nevada Medal with Former Nevada Governor's Bob Miller (far left), Richard Bryan (right), Nevada Governor Brian Sandoval (left), DRI President Dr. Stephen G. Wells (far right), and 2015 DRI Nevada Medalist Dr. Chris McKay (back).

## FOR THE INSTITUTE



<b>Total Grants &amp; Contracts</b>	<b>\$30,496,000</b>
Federal	\$22,584,000
Private & Foreign	\$4,348,000
State & Local	\$2,338,000
Other State Government	\$1,226,000
<b>Total State Appropriations</b>	<b>\$7,603,000</b>
State General Fund	\$7,455,000
Other Appropriations	\$148,000
<b>Total Other Resources</b>	<b>\$6,197,000</b>

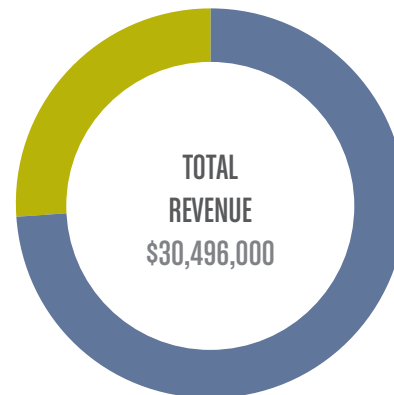


<b>Employee Compensation &amp; Benefits</b>	<b>\$30,748,000</b>
<b>Supplies &amp; Services</b>	<b>\$8,443,000</b>
<b>Depreciation</b>	<b>\$5,109,000</b>
<b>Utilities</b>	<b>\$953,000</b>
<b>Total Other Expenses</b>	<b>\$614,000</b>

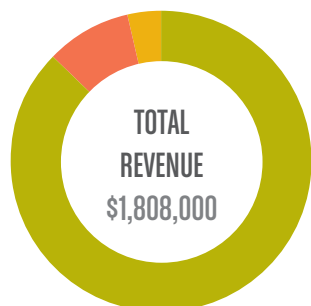
## GRANTS AND CONTRACTS FUNDING SOURCES

<b>FEDERAL</b>	<b>\$22,584,000</b>
Dept. of Energy (DOE)	18.9%
Dept. of Defense (DOD)	11.0%
National Science Foundation	11.6%
Dept. of Interior (DOI)	11.7%
Dept. of Commerce (DOC)	6.7%
Environmental Protection Agency	7.3%
NASA	4.3%
USDA	2.3%
Other	0.1%
<b>Total</b>	<b>74.1%</b>

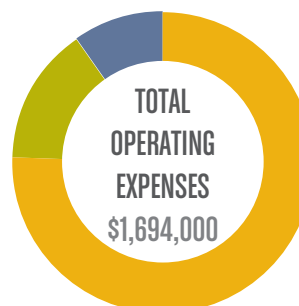
<b>NON-FEDERAL</b>	<b>\$7,912,000</b>
Private	12.7%
State Government	5.2%
Other State Government Agencies	4.0%
Local Government	2.4%
Foreign	1.6%
<b>Total</b>	<b>25.9%</b>



## FOR THE FOUNDATION



<b>Gifts, Contributions &amp; Events</b>	<b>\$1,580,000</b>
<b>DRI Support</b>	<b>\$163,000</b>
<b>Other Revenue</b>	<b>\$65,000</b>



<b>Gifts to DRI</b>	<b>\$1,283,000</b>
<b>Supplies &amp; Services</b>	<b>\$250,000</b>
<b>Contributed Salaries &amp; Wages</b>	<b>\$161,000</b>





## NEVADA SYSTEM OF HIGHER EDUCATION BOARD OF REGENTS

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Michael B. Wixom, Vice Chairman  
Dr. Andrea Anderson  
Cedric Crear  
Robert Davidson  
Mark W. Doubrava, M.D.  
Jason Geddes, Ph.D.  
Trevor Hayes  
James Dean Leavitt

Sam Lieberman  
Kevin C. Melcher  
Kevin J. Page  
Allison Stephens

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Daniel Klaich

### DRI PRESIDENT

Stephen G. Wells, Ph.D.

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President for Finance and  
Administration and Chief  
Operations Officer  
Alan Gertler, Ph.D., Vice President  
for Research and Chief Science  
Officer  
Rina Schumer, Ph.D., Assistant  
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Sciences  
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Director, Center for International  
Water and Sustainability (CIWAS)  
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## 2016 DRI NEVADA MEDALIST DR. MARY "MISSY" CUMMINGS



## THE SKY'S THE LIMIT

In April 2016, the Desert Research Institute proudly honored Dr. Mary "Missy" Cummings as its 29th DRI Nevada Medalist.

As the director of the Humans and Autonomy Lab at Duke University, Cummings leads a pioneering team of researchers and engineers focused on the complex interactions of human interaction with unmanned aerial systems (UAS), commonly known as drones; and the social and ethical implications of such new technologies that have the potential to dramatically impact both industry and humanity.

Cummings also spent eleven years (1988-1999) as a naval officer and military pilot, earning the rank of lieutenant, and was one of the Navy's first female fighter pilots, flying an F/A-18 Hornet. Following a successful career in the military, she directed her passion for technology to academia and became a strong public advocate for the promotion of the responsible use of drone technology and related policies for both the military and the growing commercial and civilian industries.

Justin Broglio, Communications Officer  
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## WHAT BROUGHT YOU TO DRI?

The exciting work being done on the archaeology of nuclear testing by DRI attracted my attention shortly after I relocated to Nevada for graduate school. It is situated at the intersection of my love of archaeology and my interest in the processes by which the Cold War has conditioned our present culture. Moreover, the experience is directly related to my post-graduation career goals, particularly attaining a position as a Post Archaeologist with the Department of the Army.

— LEVI KEACH, SEEKING HIS PH.D. IN ANTHROPOLOGY AT  
UNIVERSITY OF NEVADA, LAS VEGAS