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Miners' Stories Recorded and Preserved in Mobile "Story Trailer"

By Shirley Wetmore

The Miners' Story Project aims to preserve and share the Southwest's rich mining heritage by recording stories told by current and retired miners, and their family and friends.

A mobile "Story Trailer" is currently visiting mining towns around Arizona and New Mexico to collect stories and photographs. Anyone with a story about mines or life in the mining towns is invited to come in for a fun and relaxed trip down memory lane.

People's stories are captured as high-quality digital audio recordings that will become a digital oral history archive at the UA's Mineral Museum. Visitors will be able to listen to the stories using a touch screen computer.

The Miners' Story Project began at the Tucson Gem and Mineral Show in 2005. By March of that

year, individuals were being interviewed in Clifton, Morenci, and Safford, Arizona, and by August, interviews were being conducted in Silver City, New Mexico, and the surrounding Mining District.



Lou Osmer told a story about a Runaway Hoist.



Les Presmyk told a story about the Lost Gold Mine.



Linden "Fuzzy" Edwards told a story about a Green Miner.

To date, over one hundred interviews have been conducted. Recordings include a range of fascinating

and inspirational stories about experiences in the mines and mining towns of the Southwest.



The copper-topped, mobile "Story Trailer" that visits mining towns around Arizona and New Mexico.

Thanks to funding from the Phelps Dodge Mining Company, the fascinating stories of the men and women who worked in mines of the Southwest will be shared with future generations. A few of the stories can be heard on the Miners' Story web site at www.minersstory.org. For more information call 866-406-4637 or email info@minersstory.org.

Donors

The Department wishes to thank our alumni and friends listed below for their generous contributions that support programs, scholarships, and fellowships.

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From the Interim Department Head

Academic years have well-defined beginnings and endings, from the giddy first days of classes, to the triumph (for most!) of graduation. My year as Interim Head has had a well-defined beginning as well, from my first lunch with staff, to graduation, to this, my last Newsletter. It has been an excellent year, both personally and for the Department.

The year began with the inaugural field trip to the Grand Canyon for incoming graduate students (cover article of the last Newsletter), and highlights included: 1) the arrival of our newest faculty member, Joellen Russell, and new researcher, Paul Goodman (see page 5); 2) Spence Titley, the newest member of the National Academy of Engineering, giving the Halbouty Distinguished Lecture at the GSA meeting in Salt Lake City; 3) Jonathan Overpeck's Guggenheim Fellowship and *Science* article connecting melting of ice on Greenland and Antarctica for the first time, with the possibility of a nearly 100-foot sea level rise by the end of this century; 4) Jay Quade and colleagues finding a 400,000-year-old hominid cranium in Ethiopia that is likely to supply critical constraints on human evolution; and 5) Bob Downs' and students' work on the RRUFF project, with the potential of a handheld 'tricorder' instrument to identify minerals in the field and as far away as Mars (see page 6).

It's been an outstanding year for me personally as well. The opportunity to work closely with faculty, students, staff, alumni, and friends of an outstanding Department is a dream come true. It is truly a testament to all students and faculty, past and present, that the first national rankings in a decade from *US News and World Report* ranks the Geosciences Department 8th in the

nation, one of the highest rankings for any of the more than 120 departments at the UA (more details on page 7).

In the last Newsletter, I listed goals for my year as Interim Head, and I feel very good about progress. We had one of our best-ever Advisory Board meetings this spring, with new membership contributing significantly. The Board truly came together in support of the Department, taking on the challenge of leading the alumni effort to fund the annual field trip to the Grand Canyon for incoming graduate students. The 34th annual GeoDaze Conference (Page 8) was a highlight of the year, and next year we're working on ways to include more alumni and friends in the event. The Houston Happy Hour was a great success, with Susan Beck and Joaquín Ruiz representing the Department. Our most recent crop of graduating students is headed off to exciting jobs in academia, industry, government, and continued education. We remain one of the top ten schools in the country in terms of placing our students in academic positions.

The Department has had an outstanding year, and it would not have been possible without the continued support of our alumni and friends. The list of people and corporations listed above is a testament to your continued commitment to the Department. I encourage you to pull out the enclosed envelope and consider giving back to the Department by making a tax-deductible contribution. Our continued excellence, especially in terms of serving students, depends upon your generosity. I thank you, sincerely, on behalf of the Department.

It's been a great year, and a great pleasure to serve the Department as Interim Head. For all of you that I've gotten to know and work with this year, thank you, and please stay in touch.

Randall M. Richards

Drought and Shrub Survival at the Desert Laboratory

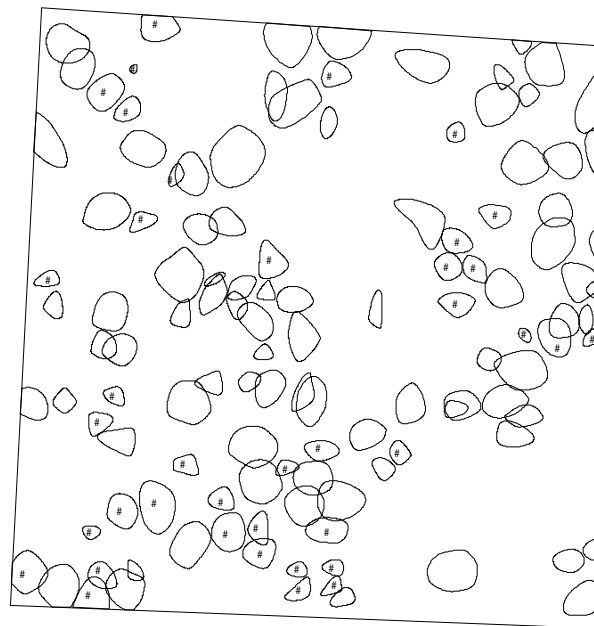
By Janice E. Bowers, USGS

Sonoran Desert shrubs and trees are adapted in various ways to deal with a scanty and irregular water supply: small, drought-deciduous leaves; stems and trunks that store water; branches that self-prune during drought; and so forth. By these and other means, woody plants in our region manage to get through two seasonal droughts every year (late spring and early autumn) and through occasional failure of the winter or summer rainy season. But what happens during major drought? Do adaptations that ensure short-term survival keep woody plants alive during several years of below-average rainfall?

I studied the effects of drought on shrub survival at the Desert Laboratory on Tumamoc Hill in the spring of 2004. Although rain in 2003 was close to the long-term annual average, the two previous years had been unusually dry, and whenever I walked across the Desert Laboratory grounds, I was struck by how many supposedly long-lived plants had succumbed to drought. Before 2003, for example, I had seldom seen a dead creosote bush in more than 20 years of research in the Sonoran Desert. Now I knew of two or three within 100 meters of my office. But I also knew that 20 years is nothing to a plant that can live for centuries. I needed a longer perspective.

I got that by analyzing maps of 16 vegetation plots that were established on or near Tumamoc Hill in 1906 or 1928. Each plot is 10 meters by 10 meters. Perennial plants on these plots were mapped in 1906, 1928/1929, 1936, 1948, 1957/1959/1960, 1968/1969, 1978, 1984/1985, and 2001. Not all plots were mapped at every census, and some censuses extended over two or more years. Early on, researchers used measuring tapes and graph paper to map plant locations; more recently, surveyors used a plane table and alidade or a total station. Except in 1906, when individual plants were shown as single dots, researchers mapped plant canopies as outlines. This level of detail makes it possible to track individuals from one map to the next. For the most part, only living individuals have been mapped, so when a plant present in one census is missing at the next census, we can safely conclude that it died.

I selected six shrubs for analysis: triangle-leaf bursage (*Ambrosia deltoidea*), creosote bush (*Larrea tridentata*), white ratany (*Krameria grayi*), brittlebush (*Encelia farinosa*), janusia (*Janusia gracilis*), and wolfberry (*Lycium berlandieri*). Of these, triangle-leaf bursage, janusia, and brittlebush have relatively short life spans, between 20 and 50 years on average.



Triangle-leaf bursage on plot 7 in 2001, showing plot boundary and outlines of plant canopies. Black dots denote plants that died between 2001 and 2004.

Creosote bush, white ratany, and wolfberry are all long lived, averaging 200 years or more. In the spring of 2004, I visited every plot and, with the most recent map in hand, noted which individuals had died since 2001. Back in the office, I examined the entire series of plot maps to determine first how many plants of each study species had been mapped in every census year, then how many of these individuals had survived until the next census year. Altogether, I gathered data for more than 8,000 individuals. From numbers of persistent and dead plants, I calculated per-capita annual survival probability for every species in each of eight intercensus periods (1928-1936, 1936-1948, etc.). (Per-capita annual survival probability is simply the probability that a single plant in a population will survive from the beginning to the end of a year.) Next, I summarized winter (November through March) and

summer (July through September) rain to get percent average accumulation within every intercensus period. For example, if accumulated winter rain averaged across all possible seven-year-long periods was 800 mm, and the seven years from 1928-1935 received 900 mm of winter rain, the percent of average accumulation in that period would have been 113%. Finally, I analyzed per-capita survival probabilities as a function of seasonal rain during each intercensus period.

Averaged over eight intercensus periods, survival probabilities of long-lived species turned out to be quite high (creosote bush, 0.9861; white ratany, 0.9702; wolfberry,

0.9910), whereas those of shorter-lived species were somewhat to considerably lower (triangle-leaf bursage, 0.9167; brittlebush, 0.7952; janusia, 0.9334). Winter rain exceeded 90% of the long-term average accumulation in every period except 1948-1959 (65% of average), and 2001-2003 (49% of average). Summer rain never dropped below 90% in any period. Although shrub survival declined during both drought periods, dips during 1948-1959 were relatively modest, perhaps because nearly normal summers ameliorated the impact of successive dry winters. Effects of the recent drought were much more pronounced, with five of the six species reaching their lowest survival probability in 75 years — 0.6057 for brittlebush, for example, and

0.9445 for creosote bush. Higher mortality during the recent drought probably reflected greater drought severity. Not only was winter rain much lower in 2001-2003 than in 1948-1959, but summer rain was also lower. Plants thus experienced extreme winter drought during 2001-2003 with little chance to recuperate during the summer rainy season.

Long-term studies such as this one require the unselfish participation of many people over many decades. Volney Spalding and Forrest Shreve established the vegetation plots at the Desert Laboratory, and 20 additional researchers and technicians maintained them over the years. Thanks to their ingenuity, foresight, and dedication, the Desert Laboratory provides a unique long-term perspective into ecological systems and processes in the Sonoran Desert.

Ores and Orogenesis: Circum-Pacific Tectonics, Geologic Evolution, and Ore Deposits

A Symposium Sponsored by Arizona Geological Society
Honoring the Career of William R. Dickinson



September 24-30, 2007

Hilton El Conquistador Golf & Tennis Resort
Tucson, Arizona

The focus of Ores and Orogenesis is on tectonics, geologic evolution, and ore deposits in the circum-Pacific region; it seeks to attract industry, academic and government geologists, mining engineers, mining industry strategic planners, and managers. Cosponsors of the symposium include the Society of Economic Geologists (SEG), the Tucson section of the Society of Mining Engineers (SME), the US Geological Survey (USGS), and the Geological Society of Nevada (GSN).

Venue: Hilton El Conquistador Golf and Tennis Resort, 10000 N. Oracle Road, Tucson, Arizona

Sessions: Plenary Keynote sessions, Island Arcs and Back-Arc Basins, Circum-Pacific Orogenesis, NW Plate Tectonics, SW Pacific Plate Tectonics, South American and North American Tectonics, Porphyry Systems, Epithermal Systems, Volcanic-Hosted Massive Sulfide Ore Deposits, SW Pacific Ore Deposits, NW Pacific Ore Deposits, North American Ore Deposits, South American Ore Deposits, Mining Life Cycles (From Exploration to Reclamation), Porphyry Copper Life Cycles, Southwest US and Mexico Geology and Ore Deposits, Hot Topics in Tectonics, and New Discoveries and Exploration Frontiers

Symposia: UNESCO IGCP Symposium – “Palaeoproterozoic Supercontinents and Global Evolution”
SEG Symposium – “Supergene Processes”
SME Symposium – “Future of Mining”

Dickinson Banquet: Thursday Evening, September 27, 2007

Reunion Night: Reunion functions for corporations, universities, and friends of Bill Dickinson

Special Attractions: Core Shack, Vendor Exhibit Hall, Short Courses and Workshops, Family Recreational Activities

Contact: See the Symposium web site for contact instructions and further information: <http://www.agssymposium.org>



Mark Your Calendars

Plan to attend the **Tucson Alumni Reception** on Tuesday, October 10th, 2006. Look for more information to arrive in the mail during September, or call 520-626-8204, or email lesa@geo.arizona.edu.

Events Planned in 2007

GeoDaze 2007 will take place April 12-13 in the Student Union on the UA campus. Plan to be there!

Plan to attend the **Ores and Orogenesis Symposium** at the Hilton El Conquistador Resort in Tucson, Arizona, September 24-30, 2007.

Alumni Drawing Winner

Hillary Brown from Laramie, Wyoming will receive a Geosciences T-shirt for sending in her updated contact information.

Send in your updated contact information, and have your name added to the next drawing for a Geosciences T-shirt!

Retiring from Tumamoc Hill



In July of this year, **Janice Emily Bowers** will retire from her post as botanist and plant ecologist for the USGS group at the Desert Laboratory on Tumamoc Hill. You may or may not have met Jan, but chances are that you and your friends have used one of her many field guidebooks. Maybe you've read her rich natural history essays published by the University of Arizona Press. Perhaps you have a copy of the spectacular picture books that Jan has coauthored with

photographers Jack Dykinga and Carll Goodpasture. Or if you are really lucky, you have actually read Jan's biography of Forrest Shreve. Shreve was stationed at the Desert Laboratory from 1908 to 1940 and considered the dean of Sonoran Desert ecologists.

Julio Betancourt recently had the honor of writing a dedication for the Lifetime Awards that were bestowed to Jan and her husband Steve McLaughlin by Arizona Botanists. The following paragraphs are from Julio's dedication to Jan.

Like her hero Forrest Shreve, Jan has a wonderful sense of place. And it would be fair to say that Tumamoc Hill has been that place for both Shreve and Bowers. Like Shreve, Bowers has been a powerhouse for the Desert Laboratory, contributing mightily to our knowledge and appreciation of the Sonoran Desert. During the 2002 Ecological Society of America meeting, Jan, Ray Turner, Betsy Pearson, and I hosted a formal field trip to the Hill, followed by a candle-lit dinner in the Desert Lab "library." It was a magical, summer evening, topped off by Jan reading from one of her many trade books, *Fear Falls Away and Other Essays from Hard and Rocky Places* (University of Arizona, 1997).

"The ground is soft from previous rains. My feet sink a full inch into the soil as I walk to the weather station.... Nearly two-tenths of an inch of rain fell overnight and early this morning.... Already people are talking about the possibility of a good spring, meaning a spring riotous with poppies and lupines and delphiniums.... This autumn's rainfall has had more immediate consequences. A shadow of gray-green seedlings spread under every brittlebush. A low shrub with felty white stems, brittlebush has cheerful yellow flowers the size of quarters. Last May, the plants seeded abundantly, and despite the best efforts of house finches and harvester ants, much seed was left on the soil and in it. Now hundreds of thousands of brittlebush seedlings have emerged around the Desert Laboratory.... In the last eight winters, brittlebush seedlings emerged in mass five times. All they need is seven-tenths of an inch of rain — a good, thorough soaking — to leach the germination inhibitors from the seed coats. Most desert annuals require that amount of water for germination...."

This comfortable and accessible prose belies meticulous observations and insights gained over a quarter century. For almost 25 years, Jan maintained the Tumamoc Hill rain gauge and kept record while also monitoring local vegetation. This allowed her to evaluate and model the influence of local weather and climate on phenology, seed germination, seedling survivorship, and plant mortality. Her well-deserved Lifetime Award would have made Forrest Shreve immensely proud of his biographer. The Desert Laboratory and Tumamoc Hill will sorely miss Jan's quiet intellect and spirit, but we wish her and her husband Steve the best of times for their upcoming retirement in the Owens Valley.

New Faculty



Joellen Russell joined Geosciences in January as an Assistant Professor in Biogeochemistry.

Joellen integrates carbon cycle observations with cutting-edge coupled land-ocean-atmosphere climate models to study the mechanisms and rates of carbon exchange between earth system reservoirs on modern and paleo time scales. Her current research focuses on the Southern Ocean around Antarctica, which acts as the lungs of the ocean, "inhaling" oxygen and "exhaling" carbon. As Joellen discovered during fieldwork, the important role of the Southern Ocean in global climate was largely overlooked until recently, due to its remoteness, the difficult weather conditions, and likelihood of seasickness. She is delighted to tackle the challenge of teaching the class that George Gehrels has made the most popular undergraduate science course at the University — Introduction to Oceanography.

Inspired by her childhood in Alaska and Montana to study climate change, Joellen received her AB from Harvard University and her PhD from Scripps Institution of Oceanography. She arrived in Tucson after working at Princeton University to help develop one of the premier US climate models. Joellen looks forward to bringing her enthusiasm and numerical models to new collaborations with faculty in Geosciences and at the Institute for the Study of Planet Earth.

New Researcher



Paul Goodman joined Geosciences in January as a Research Scientist. Paul's work is in numerical modeling of ocean, atmosphere, chemistry, and climate in the Biogeochemical Dynamics Laboratory.

Paul's research is focused on the response of the coupled climate system to the observed increase in atmospheric carbon dioxide concentrations as simulated in numerical models on both global and regional scales. Paul uses a variety of different models, from the regional-scale to the fully coupled global ocean, atmosphere, land, ice model developed by NOAA's Geophysical Fluid Dynamics Laboratory for the latest scientific assessment of the Intergovernmental Panel on Climate Change. He also employs a host of numerical techniques to diagnose the model simulations, including a particle tracking (trajectory) algorithm, as well as realistic and idealized tracers.

When he's not looking at the earth through his computer screen window, Paul has been exploring the local hiking trails and mountains with his wife, Joellen Russell. Suggestions of favorite local hikes and campsites are welcome: send them to pgoodman@geo.arizona.edu

RRUFF Project provides Undergrads with Valuable Research Experience

By Claire Lankowski

The University of Arizona's Department of Geosciences is home to the RRUFF Project, which, under the leadership of Dr. Robert Downs, is working to create a complete set of spectral data for all the minerals found on Earth. This data will be used to identify and characterize minerals, and it may also be used on the Mars 2009 Rover to identify minerals on Mars. It is the single, largest, most comprehensive research project on minerals in history.

Dr. Downs' lab uses a combination of X-ray powder diffraction, single-crystal diffraction, electron microprobe, and Raman spectroscopy to identify minerals and populate the database. This library will set the standard for mineralogists, geoscientists, gemologists, and the general public for identification of minerals both on Earth and in planetary exploration.

In the RRUFF lab, diffraction and microprobe are used to determine and verify the identity of minerals used for the database, and then Raman spectra are collected on polished, oriented samples.

"Raman spectroscopy is a valuable tool for identifying minerals because the results are instantaneous and unequivocal, and there is no need for sample preparation," said Dr. Downs.

The project plans to send its database to Mars on the 2009 Rover, which will



Picroparmacolite, from Saxony, Germany.

carry a Raman spectrometer for the first time. NASA hopes that the identification of rocks and minerals on Mars will help contribute to theories about how the Red Planet formed, as well as provide insight into our own planet and the formation of the solar system.

But perhaps the most exciting facet of the RRUFF lab isn't the progress of the database, but the lab's staff itself.



Robert Dembowski works on the Almega Raman Spectroscope, one of two Raman instruments in the RRUFF lab.

Since the project's inception almost two years ago, the lab has employed 26 undergraduates, including 17 that currently work in the lab—far more than any other group in the Department. Furthermore, the undergrads are involved in every aspect of the project, from initial screening, to crystal orientation, to the final Raman spectrum, to development of new software used to operate the instruments and the database itself.

In the project, undergrads are receiving training on instruments that normally are only used by graduate students.

"There isn't an instrument here that our undergrads can't run, given the proper training," said Dr. Downs, who explained that from the project's inception, it was a goal of the program to involve as many undergrads as possible to give them a valuable research experience in the Department.



Dr. Downs tests the Delta Nu on a sample of olivine.

So valuable is the training received in the RRUFF lab that undergrads who have spent time with the project have accumulated a knowledge base that rivals that of graduate students and researchers, making them extremely attractive to graduate schools. A professor at the University of Hawaii said that he would accept to his program any undergraduate from the group because of the training they have received in Downs' lab.

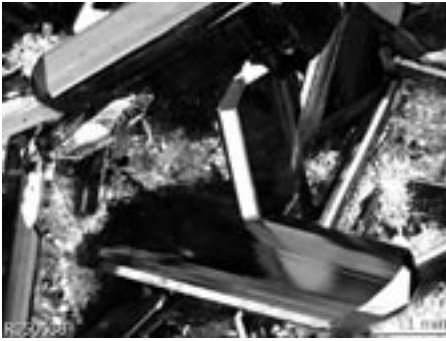
Sue Robison, RRUFF project director, said that the experience gained by undergrads is more significant than just the research. "The lab really creates a family away from home, and in a university as big as the UA, that's really important," emphasizing the friendly, collegial atmosphere of the lab.

The undergraduates themselves are as different as the tasks they perform, with backgrounds and majors ranging from elementary education, to accounting, to aerospace engineering, to geosciences, which Robison feels adds to the strength of the project.

"When you have so many different people in the lab, everyone brings different perspectives to the project," said Robison. "So much of what we do is problem solving, and with so many perspectives, it is easier to solve problems and make progress."

The project is able to attract a diverse group of students through classes taught in the Geosciences Department, including general education requirements.

Robert Dembowski, an accounting senior, took NATS 101 from Dr. Downs and became involved in the project through an interest in lasers. Dembowski has since become an expert in Raman spectroscopy, and has



Azurite, from Zacatecas, Mexico.

authored a paper that should be published later this year.

Though he does not plan to pursue a career in mineralogy, Dembowski values his experience in the lab for the collaborative practices he's developed. "As an undergrad given the opportunity to work with experts in many different fields, all working together, the growth and development in these fields has been tremendous," said Dembowski.

Layne Trinkley, a sophomore in Geosciences, began working in the lab after taking mineralogy from Dr. Downs. Her own research in the lab, which attempts to correlate the location of peaks in a Raman spectrum to the chemical composition of a mineral, was presented at the 2006 GeoDaze Symposium and is an ongoing project.

Trinkley hopes that eventually the spectroscopy information obtained by Raman will be good enough to completely replace microprobe analysis.

"The Raman would save tons of time, and maybe errors, not to mention the money that it costs to buy and maintain a microprobe machine," said Trinkley.

Though Raman spectroscopy is still a relatively new field, its reliability and implications are growing. Because Raman spectroscopy produces a spectrum unique for every material, not just minerals, Dr. Downs suggests that it will become commonplace in other areas of science like chemistry, ecology, botany, and pharmacy, where identification can be costly and time-consuming.

Though the database grows every day, information on most common minerals has already been collected, and now the lab faces the daunting task of locating samples of very rare minerals to study. If you are interested in getting involved with the project or donating samples, please contact Dr. Robert Downs at downs@geo.arizona.edu.

Department News

Six University of Arizona, College of Science disciplines were ranked among the top 20 in their field by *US News & World Reports*. Of that six, three disciplines are from the Department of Geosciences: Geology was ranked 7th, Geophysics was ranked 12th, and Geochemistry was ranked 16th. The Department was ranked 8th overall.

Faculty News

Vance Holliday is now an associate editor for the journal *Quaternary Research*.

Joellen Russell was elected into membership of the American Meteorological Society.

Graduate Student News

Kevin Anchukaitis received a two-year, Lamont-Dougherty Postdoctoral Fellowship from Columbia University.

Robinson Cecil received a GSA award.

Shundong He and **Chao Li** welcomed a new baby girl to their family on April 30th.

Kevin Jones received an ISPE Graduate Travel Grant this spring and a ChevronTexaco Geology Fellowship for the summer.

David Keeler received the 2005 J. Harold Courtright Scholarship from the Arizona Geological Society. The \$1500 award was presented in Early December.

Jeff Pigati received a USGS Mendenhall Postdoctoral award.

Tim Shanahan was a finalist for the Daly Postdoctoral Award in the Department of Earth Sciences at Harvard University, and he was awarded both a Woods Hole Oceanographic Institute Postdoctoral Fellowship and the prestigious NOAA Global Change Postdoctoral Fellowship.

William Stavast and his wife welcomed a new baby boy to their family on May 4th.

Kim Tait received a Philanthropic and Educational Organization (PEO) Scholarship for \$10,000. The sole focus of this organization is women's education. Kim's award is one of six given in Arizona this year.

Memorials

Don Elston (PdD 68) passed away in February. Don was a graduate student under the guidance of professor Spence Titley. Don received the Ninger Meteorite Prize for his geologic work. He was also an infantry veteran of WW II in Europe. Don lived in Flagstaff, Arizona, and he was 79 years old.

Richard Hay passed away in February after a sudden illness. Dick was an adjunct faculty in the Department of Geosciences. He was also a Professor Emeritus of the University of Illinois. In 2001, he and Garniss Curtis received a Leakey Foundation award recognizing the monumental impact of their pioneering research on the field of paleoanthropology. Dick's geologic fieldwork at Olduvai Gorge and Laetoli, in collaboration with Mary Leakey, was crucial to establishing the relative antiquity and paleoenvironmental context of key fossils and artifact assemblages.

Timothy Mague (BS 81) passed away in April after a valiant fight with cancer. He was a graduate of Palo Verde High School, and the UA's Department of Geosciences. Tim was an avid fisherman and hunter, and was in his element in the streams and mountains of Colorado and Arizona.

GeoDaze 2006

The 34th annual GeoDaze Symposium was held at the UA Student Union on April 6th and 7th. The 24 talks and 13 posters exemplified the diversity and multi-disciplinary nature of geosciences research today. Topics included structure and tectonics, geophysics, economic geology, geochemistry, geomorphology, Quaternary geology, and paleoclimatology. Both graduate and undergraduate students participated, and the audience included faculty, staff, and students from the Department; alumni; and individuals from other academic and professional communities.

Dr. Wesley Ward, a USGS Western Regional Geologist from Tucson, was the keynote speaker. Dr. Ward's talk was entitled "From the South Side of Chicago to the South Side of Mars."

Twenty awards were given during a ceremony that followed the keynote address and a slide show.

Drs. Mark Barton and Eric Seedorff from the UA's Department of Geosciences led the GeoDaze field trip. They presented a 3-D view of the Laramide Arc, related to Hydrothermal systems, and Cretaceous to Middle Tertiary Structural Development in the Northern Tortilla Mountains, Arizona. Our thanks go to ConocoPhillips for sponsoring the GeoDaze fieldtrip.



2006 GeoDaze award recipients; see the list of students and awards on page 9.



Co-Chairs Sarah Thompson and James Girardi with Randy Richardson.

Activities ended with the annual GeoDaze party at Randy Richardson's house. Around 80 individuals attended this year.

A special thanks goes to Co-Chairs Sarah Thompson and James Girardi for all of their dedication and hard work, and to all of the individuals on their planning committees who made this event possible. A special thanks also goes to all of our alumni, friends, and sponsors whose financial support makes the GeoDaze Symposium possible each year.

Finally, a big round of applause goes to all of the students, faculty, staff, and alumni for making the GeoDaze tradition of showcasing student research a great success again this year!



Photos of Geosciences faculty and students in the field from this year's GeoDaze slide show.

GeoDaze Awards 2006

The Best Overall GeoDaze Talk
Jerome Guynn

**The ChevronTexaco
Best Geophysics Talk**
Patricia Alvarado

**The ChevronTexaco
Best Geophysics Talk, First Runner-up**
Owen Hurd

**The William and Hallie Keller/ConocoPhillips
Best Geophysics Talk, Second Runner-up**
Arda Ozacar

**The ChevronTexaco
Best Quaternary or Paleoclimate Talk**
Robert "Scott" St. George

**The Geosciences Alumni
Best Quaternary or Paleoclimate Talk, First Runner-Up**
Kevin Anchukaitis

**The ChevronTexaco/Hydrogeophysics Inc.
Best Quaternary or Paleoclimate Talk, Second Runner-Up**
Jessica Conroy

**The Geosciences Alumni
Best Structure/Tectonics Talk**
Alexander Pullen

**The Geosciences Alumni
Best Structure/Tectonics Talk, First Runner-Up**
Jennifer Fox

**The Tom L. Heidrick/William W. Jenny Jr.
Best Structure/Tectonics Talk, Second Runner-Up**
Andrew Frassetto

**The John M. Guilbert
Best Economic Geology Talk**
David Maher

**The Applied Geoscience LLC/ M. Stephen Enders/
Liberty Star Gold Corp./Newcrest Resources
Best Economic Geology Talk, First Runner-Up**
Mayo Thompson

**The Bruce M. Prior/Miles G. Shaw
Best Economic Geology Talk, Second Runner-Up**
Maria Zavala Quispe

**The Les McFadden/Mark A. Melton
Best Geomorphology Talk or Poster**
Joseph Cook

**The GeoMark Research Ltd.
Best Geochemistry Talk or Poster**
Joel Saylor

**The Geosciences Alumni
Best Poster Award**
Owen Hurd

**The ChevronTexaco
Best Poster, First Runner-Up**
Michael McGlue

**The ChevronTexaco
Best Poster, Second Runner-Up**
Michael Strickler/Morgan Helfrich/Gary Salais

**The Geosciences Alumni
Best Poster, Third Runner-Up**
Rita Pinto

**The SESS/TGMS
Best Undergraduate Talk or Poster Award**
Erin Brenneman

GeoDaze Donors

— Individuals —

Joseph Acaba
Gerard Beaudoin
Nancy Beckvar
Keith Blair
James Briscoe
Elwood Brooks
Cheryl Butler
Carlotta Chernoff
Anthony Ching
Jean Cline
Steve Enders
Michael Evans
Terrence Gerlach
Patrick Gisler
John Guilbert

James Hays
Tom Heidrick
Camille Holmgren
Gary Huckleberry
Kermit Jamison
William & Judith Jenney
Gary Jones
Richard Jones
William & Hallie Keller
Susan Kidwell
Charles Kluth
Louis Lepry
Julia Lewis Feeney
Paul Martin &
Mary Kay O'Rourke
John Matis
Edgar McCullough
Leslie McFadden
Rob McGill

Sally Meader-Roberts
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Mary Lin Windes
Isaac Winograd
Donald Witter
Kenneth Yeats
Mark Zoback
Kenneth Zonge
John Zumberge

— Corporations —

ConocoPhillips
ChevronTexaco
ExxonMobil
Tucson Gem &
Mineral Society

Winter Degrees

Bachelor of Science

Laura Huebner • Richard Paris • Cristin Taft

Master of Science & Doctor of Philosophy



Matthew Fabijanic, MS

"Synorogenic sediments in the central Lhasa terrane and implications for the tectonic history of Tibet prior to the Indo-Asian collision," Peter DeCelles



Facundo Fuentes, MS

"Structure, foreland Basin evolution, and kinematics of the Montana Disturbed Belt, northwestern USA," Peter DeCelles



Andrew Leier, PhD

"The Cretaceous evolution of the Lhasa Terrane, southern Tibet," Peter DeCelles



Marcus Origlieri, PhD

"Crystal chemistry of selected Sb, As, and P minerals," Robert Downs



Christa Placzek, PhD

"Stratigraphy, geochronology, and geochemistry of paleolakes on the southern Bolivian Altiplano," Jay Quade



Lawrence Rudd, PhD

"Using AVIRIS hyperspectral imagery to study the role of clay mineralogy in Colorado Plateau debris-flow initiation," Victor Baker



Frank (Trey) Wagner, PhD

"Cenozoic extensional tectonics revealed through seismic reflection imaging, southeastern Arizona," Roy Johnson

Spring & Summer Scholarships & Awards

Graduate Scholarships

Patricia Alvarado received a Galileo Circle Scholarship

Serkan Arca received a Galileo Circle Scholarship

Robinson Cecil received a Galileo Circle Scholarship

Anna Felton received a Sulzer Scholarship and summer support from ChevronTexaco

Erin Gleeson received a Galileo Circle Scholarship

Jerome Guynn received a Coney and a Galileo Circle Scholarship

Tessa Harden received a Sulzer/Butler/Evanson/Thompson and a Galileo Circle Scholarship; Tessa also received the Outstanding TA award

Kevin Jones received summer support from ChevronTexaco

Lynnette Kleinsasser received a Butler Scholarship

James Mayer received a Butler and a Katzer Scholarship

Michael McGlue received a Butler Scholarship

Brianna Muhlenkamp received a Galileo Circle Scholarship

Arda Ozacar received a Sulzer Scholarship; Arda also received an Outstanding TA award

David Pearson received summer support from ChevronTexaco

Lynn Peyton received summer support from ChevronTexaco

Alexander Pullen received a ConocoPhillips Scholarship

Amanda Reynolds received a Butler Scholarship and summer support from ChevronTexaco

Amanda Reynolds received a Short Scholarship

Joel Saylor received a Galileo Circle Scholarship

Hinako Uchida received a Tucson Gem and Mineral and a Galileo Circle Scholarship

William "Ross" Waldrip received a ConocoPhillips Scholarship

Undergraduate Scholarships

Joseph Amar received a Vorhees Scholarship

Carl Anderson received a Vorhees Scholarship

Erin Brenneman received a Vorhees Scholarship

Jessica Bressmer received a Vorhees Scholarship

Dana Brodie received a Vorhees Scholarship

Jennifer Fox received a Vorhees Scholarship

Erin Gleeson received a Vorhees Scholarship

Jared Hamilton received a ExxonMobil Scholarship

Owen Hurd received a Vorhees Scholarship

Ben Kaur received a Ferris Scholarship

Thomas Laetsch received a Vorhees Scholarship

Shannon Langdon received a Vorhees Scholarship

Jennifer McGraw received a Ferris Scholarship

Michael Strickler received a General Undergraduate Scholarship

A total of \$69,400 was awarded to Geosciences students.

The photo to the left was taken in 1946. These individuals were students in the UA College of Mines, and they were preparing to go on a field trip. From left to right the individuals are: Howard Clement, Sally Meshaw, unknown, Dr. Maxwell Short, John Anthony, and unknown. Thank you Howard Clement (BS 47) for sharing this snapshot of history with us.

If other readers have photos from the past they would like to share, call 520-626-8204 or email lesa@geo.arizona.edu.



Alumni News

Susan Dawson-Cook (MS 94)

I now work as a group exercise instructor and personal trainer at Miraval, Life in Balance, and at Saddlebrooke. I also work as a freelance writer.

~susan@corazondeloro.com

William Jefferson (MS 82)

William worked for Amoco from 1982-1985. He moved to New York City and started working as a carpenter. He operated a general contracting business from 1985-1992. He is also a Brazilian percussionist, jewelry designer, and cosmetics manufacturer. He has been a VP in the construction industry from 2000 to present.

~billjeffo1@optonline.net

Yohei Kaga (BS 00)

Yohei received an MSc in Geographical Information Science from the University of Edinburgh, Scotland, in 2001. He got married in 2003, and in 2004, he and his wife had a baby girl. He is currently working for ABS Consulting (an American risk management company) in Tokyo, Japan.

~kagayohei@gmail.com

William Keller (BS 96)

Bill with his wife Hallie and their two children this past Halloween as *The Incredibles!*

~wkeller@kmg.com



UA grads and current students who attended the Cordilleran Roundup Mining Conference in Vancouver, Canada, this past January.

Front row, left to right, Tyler Vandruff (graduate student), Scott McBride (graduate student), David Keeler (graduate student), Michael Takaichi (graduate student), Tom McCandless (PhD 94, Vancouver), Mike Waldman (75-76, Shreveport, LA), Brooke Clements (MS 91, Vancouver).

Middle row, left to right, John-Mark Staude (PhD 95, Vancouver), David Jones (MS 87, Tucson, AZ), Clancy Wendt (MS 74, Reno, NV), Matthew Gray (MS 88, Hermosillo, Mexico), Peter Megaw (PhD 90, Tucson, AZ), Wojtek Wodzicki (PhD 94, Vancouver), Tom Corbett (BS 80, Anchorage, AK), Ken Brook (MS 74, Reno, NV).

Back row, left to right, Fred Graybeal (PhD 71, Chatham, NJ), Eric Jensen (PhD 03, Tucson, AZ), Dave Johnson (PhD 00, Tucson, AZ), David Lajack (94-96, Tucson, AZ), Frank Nelson (MS 64, Tucson, AZ), Moira Smith (PhD 90, Vancouver), Rick Fredericksen (1974), Bill McClelland (PhD 90, Moscow, ID).

Les McFadden (PhD 82)

I really enjoyed the Fall 2005 Newsletter, and I was especially interested to learn that my good friend, Randy Richardson, is now the Interim Department Head. Thirty years ago, my contact with Randy mainly entailed playing volleyball with him in my last few years as a graduate student in the Department; Randy had played for the MIT team before embarking on his academic career in Arizona. As a fellow Geosciences Department chair, I know only too well how busy he'll be this year!

Speaking of volleyball, I still play the sport in a serious way, and am proud to note that my "old guys" team emerged as the winners of a recent New Mexico Senior Olympics Volleyball tournament.

Concerning "news" of my recent academic activities, the main thing I have to report that might be of some interest to other alums is a paper my colleagues and I

published last year in the GSA Bulletin the describes a new theory for the weathering of surface rocks in the world's extensive arid regions that, as suspected by geomorphologists over a century ago, fundamentally "fingers" the sun as a key actor. This new theory helps to explain a large number of heretofore unexplained features of desert pavements, as well as suggesting the possibility of solar-induced failure of man-made structures in favorable circumstances or surface rocks in potentially favorable places like Mars.
~lmcfadnm@unm.edu

Nievita Bueno Watts (BS 04)

Nievita got married in March 2005 to Neil Watts. She is currently working on her Masters degree at ASU.
~nievita.bueno@asu.edu

Please update your contact information!

Name: _____

(Please check one of the boxes below to indicate which address you prefer as your mailing address.)

Home Address:

Phone: _____

Email: _____

Company: _____

Department: _____

Job Title: _____

Business Address:

Phone: _____

Email: _____

Please share your news for the next newsletter!

New Job? Kids? Back in school? Retired? Attend a national meeting? Take a trip? See a classmate? Please send us your news (and a photo which will be returned) for the next newsletter.

Send your information by US mail, Email (lesa@geo.arizona.edu), or the web (<http://www.geo.arizona.edu/people/alumni.htm>).

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