Retired Professor Maps Migrant Trails

By Margaret Regan

Ed McCullough retired as a geosciences professor at the UA 10 years ago, and he stepped down as dean of science way back in 1992. But retirement hardly keeps him out of the field.

On a blazing summer morning, he's bouncing north along Old Ruggles Road just west of Arivaca, a little town of ranchers and hippies some 10 miles north of the Mexican border. The dirt road might as well be called Old Rutted—it's that rough—but McCullough doesn't seem to mind. At 75, the snowy-haired scientist still loves driving his giant 4x4 into the wilderness— the “tulies,” as he calls them—and getting out to hike through the desert.

“I was a field geologist for years,” he says, explaining away his impressive fitness. Some days, he admits, he treks for 12 hours, drinking water as he goes from the camel pack on his back.

During his university days, he studied geologic hazards in the desert—what happens when rainwater floods the land, or conversely, what happens when too much groundwater has been pumped out underneath. Now, when he strides out into the desert on his long legs, he’s not looking for landslides, or earth cracks, or other signs of subsidence.

Instead, he’s searching for trash and clothes and footprints, the traces of desperate human beings, migrants trying to slip illegally into the US.

“There’s the trail over there,” he says, easing his huge vehicle to a stop. He’s spotted a path threading through the cactuses and mesquites.

When he climbs out, he sees two pairs of men’s pants and two water bottles lying at the bottom of the hill. When he walks up the slope, he finds a couple of bottle caps and a mud-caked backpack, sure signs that this prickly path has been trod by undocumented migrants. It’s one of scores of treacherous Arizona trails that border crossers walk to get farther into the United States. And they yield a deadly annual toll. Last year, a Tucson activist group, Coalicion de Derechos Humanos, tallied up 237 deaths in the deserts of Southern Arizona.

“The deaths are taking place all along these corridors,” McCullough says.

For the last three years, he’s been marshalling his science skills to mitigate the humanitarian crisis of migrant deaths. If he can get accurate maps into the hands of volunteers, and tell them where the migrants are walking, maybe, just maybe, they can find travelers in trouble and help them before they die.

“What I’m doing is a teeny, tiny Band-Aid on the whole thing,” McCullough says. “We’re looking at 1,800 square miles, and 5,000 miles of trails. We think we know where the trails are, but we’ve only mapped about 20 to 30 percent of them.”

He sets off on this new trail through the mesquites, the sun glancing off the leaves, yellow butterflies flitting through...
From the Department Head

A sure sign of the end of the semester is that so many faculty and students have disappeared into the field. Those of us who are office-bound because our field areas are too hot in the summer (I’m in that category), or who are feeding samples to their analytical gear, or who are creating models on their computers are still here. But it sure seems like everybody else is in Argentina, Africa, Iceland, Turkey, or somewhere else more exotic than Tucson.

Oh yes, then there’s the summer field camp crew: Professors Mark Barton and Mihai Ducea with teaching assistants Robinson Cecil and Doug Kreiner, undergrad preceptor Jennifer McGraw, and 19 students. Field camp this summer is at the University of California’s White Mountain Research Station. Especially noteworthy is the fact the field camp enrollments are up after many years of low numbers. The future looks bright.

As you know from watching the news, the mortgage crisis has hit Arizona pretty hard: from a housing boom to a housing bust in near-record time. That means hard times for the state budget, and that means hard times for the UA budget. We don’t yet know how hard because the legislature is still in session and isn’t likely to solve this problem until the last minute.

The state budget, plus the rise in energy prices, means that Geosciences is likely to be especially hard hit. Until somebody develops a high-clearance, high-occupancy 4WD Prius, field trips for classes and field work for students (and faculty!) will cost a lot more than they did just one year ago. This is a serious problem for a strong field-oriented program like ours. But as Steve Naruk points out in his report from the Advisory Board, this is an area where you can help by “adopting a field student.” Donations from alumni and friends are critical in helping to keep the Department strong.

This spring saw a big change “on the Hill” as Professor Jay Quade moved his lab and office back to campus after many productive years of directing the Desert Lab on Tumamoc Hill. The Desert Lab continues under the directorship of Ecology and Evolutionary Biology Professor Mike Rosenzweig. Mike’s plans for Tumamoc include making it a natural laboratory for what Mike calls reconciliation ecology—the science of accommodating wild species within a human-modified or -occupied landscape. The Desert Lab will continue in its grand tradition of understanding environmental and biotic change at all geographic and temporal scales. And Geosciences faculty and students will continue to be an important part of that effort.

The Mineral Museum, now housed at the Flandrau Science Center, received two big gifts this year. The first was a major mineral and rare book collection from the late Hubert Charles de Monmonier. De Monmonier was a relatively unknown collector who amassed a unique and comprehensive private collection recently valued at more than $71 million. The collection is composed of 871 mineral specimens, many of which are very rare, very old, and very beautiful.

The second major gift was a $1 million donation from the Freeport McMoRan Copper and Gold Foundation. Freeport McMoRan acquired Phoenix-based Phelps Dodge in March 2007. The $1 million gift will be invested in an endowment to help the Mineral Museum maximize its presence as part of the Science Center and expand its outreach and public education in the Earth sciences. The endowment also will be used to encourage other donors to actively support the long-term growth and sustainability of the Mineral Museum. The UA and the city of Tucson are moving ahead with plans to construct a Science Center downtown.

Notable developments this spring also include the promotions of Paul Kapp to Associate Professor with Tenure and Bob Downs to Full Professor. And my postdoc Laura Lopez-Hoffman got a tenure-track position in UA’s School of Natural Resources. Congratulations Paul, Bob, and Laura!

When in doubt: Party! This year’s annual meeting of the Geological Society of America will be in Houston, October 4–9, 2008. I know that we have a lot of loyal alumni in the Houston area because I was lucky enough to meet many of them this May at the Inman Gallery for the annual Happy Hour for Houston-area alumni. And I know that a lot of alumni are regulars at the GSA meeting. So the result is sure to be a major, Texas-sized UA alumni party at the 2008 meeting. We’ll be sending out invitations early in the fall, so be on the lookout.

See you in Houston!

Donors
The Department thanks our alumni and friends for their charitable gifts. Geosciences has been able to offer more financial support and field experiences to both undergraduate and graduate students as a result of your generous support.

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the grasses. It’s monsoon season, and the desert is refreshingly green, but at 101 degrees, it’s hot. Make that broiling.

“This is a great time of year!” McCullough exults as he zips along. “And this is a great county for quartz,” the geologist in him adds, kicking at a white rock. “One of the nice things about being out here is you see Gila monsters, tarantulas, and dung beetles.”

And water bottles, they litter the rocky trail, and McCullough gives them a once-over with his scientist’s eye. He knows all about their life cycle, having once conducted an experiment in his Tucson driveway to test their longevity. He filled a plastic bottle with water and left it out in the sun to see how long it would take for the plastic to break down.

“In six weeks, it’s brittle,” he says, demonstrating on an old bottle on the trail. He grasps it, and it cracks. Ancient history. The migrant who quaffed that water passed through here before mid-July.

He hasn’t forgotten his mapmaking. A GPS unit dangles from a cord looping around his neck, and every 300 feet, he pushes a button on it to record a “waypoint.” Magically—or scientifically—a virtual trail takes shape on the GPS screen. He’s creating a map of the trail, bit by bit. When he gets home from his hike, he’ll feed it into a computer and print out an up-to-the-minute map for the activists trying to save lives.

On his treks, he ranges through a region that stretches 30 miles along the border, from Nogales west to Sasabe, and north about 50 miles, from the Tumacacori Mountains on the east to the Baboquivari on the west.

“There are three main corridors from the border,” he says, each with three or four trails. “They meet up north of Arivaca Junction. The Border Patrol knows all about it.”

And in a never-ending cat-and-mouse game, once the Border Patrol zeroes in on a particular path and arrests illegal migrants there, the coyotes—people smugglers—quickly change their routes. And just as quickly, the activists and agents try to alter theirs. The maneuvering reminds him of the adaptations of evolution.

“It’s Darwinism,” McCullough declares.

In 2004, the first summer that assorted activist groups in Tucson joined forces to create No More Deaths, McCullough and his wife, Debbi, an artist, volunteered down at the group’s base camp in Arivaca. Like the others, they’d walk the desert, looking for migrants to help. But there wasn’t enough information to suit the scientist in him. No hard data.

“We’d go out onto the trails, but you had no idea where they went. When you came back to camp, you couldn’t tell anyone where you’d been. We were just wandering. There was no systematic approach. I didn’t like being out there and not knowing where I was.”

Likewise, the Samaritans, who roam the countryside in vans and walk into the desert, “had no records or maps.” So the retired geologist formulated a plan.

“The first thing, I drove the ranch roads in low gear. They’re all dirt roads. Some haven’t been used for years. My father-in-law went with me. I’d look outside one way; he’d look out the other. When I saw a trail, I’d get out and map it.

“A pattern started to emerge. The migrants are mostly going out of Nogales and Sasabe, heading northeast to Tucson. Since they were going northeast, I’d drive roads going northwest. And the trails would cross the roads.”

Many of his fellow activists are “faith-based,” but McCullough is not a church-going man.

“I was raised Southern Baptist, and that was enough to make me not religious,” he says, laughing, his voice still slightly tinged by the soft accents of his native West Virginia. “I was not always interested in immigrant issues, but when people started dying ....” His voice trails off.

“What makes me mad is you’ve got a problem, and nobody is addressing the causes.”

The problem is that people are dying out there, in Arizona’s desert cauldrons, of heat stroke and dehydration and exposure and hypothermia. Last year was more deadly than the year before, with the desert yielding up more bodies, of men and women, of the young and the not so young.

On August 29, 2007, for instance, the day before McCullough mapped the trail near Old Ruggles Road, Juan Montes Mendez, a 51-year-old Mexican man, died of exposure about a mile southwest of Sells, on the Tohono O’odham Nation. And Sonia Alvarado Soriano, a 25-year-old woman from parts unknown, died of exposure near Douglas.

Weather plays some role in pushing the deadly numbers up and down, and the summer of 2007 was hotter than the summer of 2006. Still, Kat Rodriguez of Derechos Humanos blames last year’s higher numbers primarily on the “militarization” of the border. With the national arguments over illegal immigration reaching a fever pitch, the feds have increasingly fortified the international line between Arizona and Sonora.

Just in the Tucson Sector, which covers all of Southern Arizona except for Yuma County, the Border Patrol added 18 new miles of fence and 27 new miles of vehicle barriers during fiscal 2007, says Border Patrol spokesman Jesús Rodriguez. ...cont’d page 4
And some 100 to 200 new agents were deployed.

But the Border Patrol argues that the principal culprits for the deaths are coyotes—paid trail guides—who leave their customers to die. The agents are “doing our part to minimize deaths in the desert,” Jesús Rodríguez says. “We have BORSTAR (the elite rescue teams) out. Our job is to secure the border, but at the same time, we wear our rescue hats and save people. Our job is not to lead people out to the desert.

“We’re not the ones that take them out to the desert—they (coyotes) just leave them there.”

In fiscal 2007, he adds, the Tucson Sector agents rescued 554 people in 176 incidents.

But McCullough’s data show that increased patrols and surveillance have pushed walkers farther into the dangerous desert. Before the crackdown of the last few years, walkers farther into the desert—avoid the patrols and the heavily policed roads. And the longer people are in the desert, the greater the danger they will die. McCullough plots the death locations on his computer maps, and his findings correlate with Humane Borders’ data:

“The peak deaths take place at 40 miles.”

“Because of the increased number of agents, the farther the migrants have to walk, the more are going to die,” he says.

Plenty of scholars predicted the onslaught of these largely rural migrants from Mexico before NAFTA was enacted back in 1994. McCullough says. With corn flowing freely from the US into Mexico, researchers calculated that hundreds of thousands of farm workers would lose their livelihood, and the means of supporting their families. And that’s just what happened. The displaced workers fled in torrents, to take up new American lives as crop pickers, meat packers, construction workers, nannies, and housekeepers.

“Papers were written, predictions were made, that people would come to the US,” says McCullough. “The whole thing was just ignored.”

So he does what he can. And off he trots, at breakneck pace, through creek beds, under low-lying mesquite, around prickly pears, up into the saddle of a mountain, clicking on his GPS as he goes.

After all, as he says, “We need more information.”

**Faculty News**

Susan Beck has been named chairwoman for the Incorporated Research Institutions for Seismology’s (IRIS) board of directors. Iris has more than 200 members in the US and internationally. The organization gathers and distributes earthquake and related data. For more information, see http://uanews.org/node/18742.

Susan also received the 2008 Outstanding Faculty Award from the Geosciences Advisory Board for her contributions to teaching and research and for her exceptional leadership in the Department.

Julia Cole received a 2008 fellowship from the Aldo Leopold Leadership Program, whose goals are to advance environmental decision-making by providing academic scientists with the skills and connections needed to be effective leaders and communicators.

Pete DeCelles has been awarded a Cox Visiting Professorship at Stanford University for one year.

Bob Downs will be co-investigator of the CheMin component of the Mars Science Laboratory for NASA’s 2009 Rover mission. This mission is planned to operate for one Mars year (687 days) and travel over a wide range of the surface on a nuclear-powered rover. It is anticipated that X-ray diffraction experiments performed by the CheMin instrument will provide the first unambiguous identification of Martian mineral phases.

C. Vance Haynes, Regents professor of Anthropology and Geosciences, received a Career Achievement Award from the Geosciences Advisory Board and the Department of Anthropology.

Paul Kapp has been named as the 2008 recipient of the Donath Medal. This award is given to a young scientist (35 or younger) for outstanding achievement in contributing to geologic knowledge through original research that marks a major advance in the Earth sciences. The award, a gold medal, and a cash prize of $20,000 will be given at the annual GSA meeting in Houston this October.

Jonathan Overpeck testified before a hearing of the US House of Representatives’ Committee on Science and Technology titled “Water Supply Challenges for the 21st Century,” on May 14, 2008. The purpose of the hearing was to examine the challenges of managing water supplies to meet social, economic, and environmental needs in the US. The hearing also examined the role of the federal government in helping states and local communities meet their water management challenges.

From UANews: For the full story, see http://intelligencer.ccit.arizona.edu/node/19720; for Overpeck’s testimony, see http://www.science.house.gov/publications/Testimony.aspx?TID=13761.

**Student News**

Meg Blome, graduate student, received a FLAS fellowship (Foreign Language and Area Studies) to continue studying Arabic next year. The award is funded through the US Dept. of Education and given by the UA Center for Middle Eastern Studies (CMES).

Jessica Conroy, graduate student, received a $7,000 scholarship from the Phoenix Chapter of Achievement Rewards for College Scientists (ARCS).

Alena Kimbrough, undergraduate student, received a Mellon Interdisciplinary Environmental Research fellowship to support her work for the next two years on drought in the Southwest.
The Chernoff Family Geosciences “Field Experiences” Endowment

This new endowment was established by Carlotta Chernoff (PhD 02) in honor of her father, Charlie Chernoff. Charlie Chernoff was the first in his family to enter the Earth science field. He was born and raised on a farm near Kamsack, Saskatchewan. He completed his formal Earth science education at the University of Saskatchewan. For several years, he was involved in field mapping in the Rocky and Mackenzie Mountains of Canada for Standard Oil (later Chevron Oil Company). In 1960, Charlie began what might be called his second career, and he transformed himself into a geophysicist.

Over the course of his professional career, Charlie saw the petroleum industry transition from analog to digital data, and move through the hectic days of seismic and digital signal processing advances. He also had the opportunity to observe first hand the revolutionary impact of 3D seismic data in the search for hydrocarbons.

In 1992, Charlie retired from his position as Chief Geophysicist of Chevron Geosciences. Throughout his technical journey, he received encouragement from his late wife, Helen, who was an unselfish cheerleader for 49 years.

Endowment Specifics

The initial Chernoff Family Geosciences Field Experiences endowment is for $50,000, which includes matching funds from ConocoPhillips. The Department hopes to raise funds from other sources to match this amount and bring the endowment to $100,000.

Funds generated by this endowment will be used as scholarships for students in the Department of Geosciences who are conducting or participating in field studies. Endowment funds may be used to help graduate students cover the costs of field study or to help undergraduate students cover the costs of summer field camp. Awards will be based on financial need as determined by the Department Head.

Funds may also be used to help defray the costs of individual or group field trips (groups must include at least 70% students). Funds for field trips require a short proposal requesting support and should be submitted to the Geosciences Academic Advising office.

Consider adopting a field student, and send in your donation to the Chernoff Family Geosciences Field Experiences endowment.

Adopt a Field Student!

By Steve Naruk, Advisory Board Chair

Geosciences at the UA continues to be one of the best in the world! US News and World Report has once again ranked the Department among the top 10 Geoscience Departments. Graduate and undergraduate enrollments are both up ~10%. Endowments for student support were up $206,000 in 2007. Industry competition for Department graduates continues to be intense, and the Department continues to be one of the most admired within the University, within academia, and by industry.

You alumni help make those accomplishments possible! Your individual donations were up 40% in 2007!

ExxonMobil alumni, led by Ken Evans and Carlos Dengler, have paved the way for ExxonMobil to sponsor a multi-year, $500,000/year research project supporting multiple faculty and students. ConocoPhillips alumni (led by Bob Krantz and Marc Sbar), ChevronTexaco alumni (led by Chuck Kluth), and Midland Valley alumni (led by David Richards) have all donated considerable software and hard-to-obtain seismic data and are sponsored multiple professional training shortcourses. The Alumni Advisory Board sponsors a Grand Canyon field trip for incoming graduate students every year. They also sponsor various alumni events in Houston and receptions at professional meetings like the GSA and AAPG. Finally, The Chernoff family and ConocoPhillips recently established a new endowment called “The Chernoff Family Geosciences Field Experiences Endowment” to support field studies.

That’s the good news. The bad news is that state funding for the University continues to erode at a rate of 5-10% per year, and those annual reductions are passed on directly to the Department. State funding for the Department for 2008-09 will most likely be less than the Department’s salary commitments, and will certainly hobble the Department’s ability to support graduate students. So the Advisory Board is asking you to “adopt a field student.”

The current Advisory Board consists of myself, Nancy Beckvar, Regina Capuano, Carlotta Chernoff, Timothy Demko, Steve Enders, Jim and Jamie King, Kit Marrs, Steve Natali, Marc Sbar, Will Wilkinson, and Mark Zoback. Past members include Kerry Inman, Chuck Kluth, David Lowell, Steve May, David Loquist, Bob Krantz, David Rea, and Jeff Seekatz. We are targeting donations for specific funds to get them up to a critical mass where they can generate significant student support.

This year we’re targeting field support. Field work may seem “low tech,” but it “ain’t cheap.” Think how many fill-ups you required for your thesis, and consider that one Suburban’s worth of gas per year currently requires an endowment of ~$1800!! So when you make your donation to the Department this year, consider increasing it by a tank of gas or two, or a few pounds of copper, and directing it to the Chernoff Family Field Fund or the Summer Field Camp Fund.

Make your check out to “The University of Arizona,” and send it to The UA Department of Geosciences, PO Box 210077, Tucson, AZ, 85721. Please include a note stating that your gift should go to one of the above funds. To see a complete list of scholarship funds, go to: http://www.geo.arizona.edu/about/support.htm.
Hohokam Snowbirds
Archaeology, Geochemistry, and Seasonality in the Puerto Peñasco Region

By David Dettman and Gary Huckleberry

Three years ago, David Dettman, Research Scientist, and Gary Huckleberry, Adjunct Research Scientist, spent a long weekend looking for datable material in prehistoric shell middens along the Gulf of California coast in the Puerto Peñasco region. The push to more precisely date the middens in this region grew out of field mapping of these archaeological features by Doug Mitchell and Mike Foster, two archaeologists from SWCA Environmental Consultants in Phoenix.

Their work has documented 49 midden sites along ~80 km of coastline (see map below). These middens are currently under significant threat from the explosion of tourism in the area, development of shorefront property, and improved access due to the construction of a new coastal highway. INAH, the Mexican National Institute of Anthropology and History, is performing limited salvage archaeology in the path of the new coastal road and along newly developed shoreline. Mitchell, Foster, Dettman, and Huckleberry are now working with faculty and graduate students in the Department of Anthropology to develop a systematic archaeological investigation of this area.

Shell middens in the Puerto Peñasco area are distributed along the coast and in estuary embayments stretching from western Bahia Adair to Estero Morua. Most of the middens are thin, with sparse cultural material at the surface including ceramics, ground and flaked stone tools, and modified shell, suggesting that these are short-term occupations, e.g., seasonal fishing and shellfishing camps. This is also an area that has long been thought to be the source of marine shell used in Hohokam (AD 500–1400) jewelry manufacture and trade in central and southern Arizona.

It is generally believed that the Hohokam procured shell from the northern Gulf of California both directly and through trade with neighboring groups. Indeed, Hohokam, Yuman, and Trincheras pottery are present on the surface, but several middens lack pottery and a few contain Late Archaic projectile points implying use of the area extending back as early as 1200 to 800 B.C.

Previous, nonsystematic 14C dating of shell from the surface of these middens has been plagued with uncertainty due to the high variability in the marine reservoir effect in the northern Gulf of California and the poorly defined context of the dated samples in relation to the artifacts. Some samples yielded ages older than 37,000 years BP suggesting older fossil shell was being reworked into some of the younger midden material.

Our geochemical work on these middens has been focused in three areas: dating the middens, determining the season of occupation, and developing geochemical tracers that can be used to identify shell from this region. We focused our initial 14C work on sites that may be older than Hohokam, i.e., those with no ceramics and those that contained buried charcoal as revealed in naturally eroded exposures.

With the help of ethnobotanist Karen Adams, we have identified the charred remains of saltbush and other shrubs that were used to cook the shellfish, and we can use these remains to more precisely date human activity associated with the middens. Thus far, the ages range from about 5500 cal yr BP to 1900 cal yr BP, thus predating the Hohokam and extending back as far as the Middle Archaic. The hearth dated 5500 cal yr BP appears to be the oldest dated archaeological feature from this part of the Sonoran coast and suggests that people were utilizing coastal habitats around Puerto Peñasco soon after stabilization of the early Holocene sea level rise.

Working with burned shell from well-dated midden fires leads to a number of interesting avenues for research. Mollusks from midden contexts were collected alive by prehistoric peoples and cooked and consumed on the beach. These shells carry both morphological and geochemical records of seasonal environmental change that allow us to determine the season in which this activity occurred.

Both growth banding in the shell (see Figure 1 on page 7) and oxygen isotope ratios of shell carbonate respond strongly to the seasonal temperature cycle, and the time of death within this seasonal context (represented by the outermost band) gives us a good estimate of when during the year the shell was harvested.

In this area the oxygen isotope ratio of seawater doesn’t change, leaving temperature as the only factor affecting shell oxygen isotope ratios. Ratios are most negative in the warmest months and most positive in the fall and winter. Winters are
too cold for most mollusks, and there is usually a hibernation break in the shell growth that lasts from six weeks to two months.

Our data show that oxygen isotope ratios are on an increasing trend when the animals died (see Figure 2), implying that shells were collected in the late fall to winter. Many seem to have been collected in the hibernation interval. None measured so far show a reversal to more negative ratios in the final growth. This suggests that people visited the area in the fall and winter to harvest fish and shellfish. Interestingly, these people left before the spring started to warm up into summer temperatures.

What caused this departure while temperatures were still relatively cool? Perhaps water availability played a role, or the need to return north to prepare fields for spring and summer irrigation. As more data are collected, we will better understand how different groups of people seasonally utilized these resources through time. Marine shell has long been a prized commodity throughout the Southwest, utilized in the production of bracelets, pendants, and beads. Indeed, some archaeological sites are believed to have served as specialized manufacturing centers, where marine shell was processed and exchanged for food, cotton, obsidian, and other valued items. Although the northern Gulf of California is thought to be the main source of shell traded across this region, some species are also common to the Pacific coast in California and Baja California and may have been procured from greater distances through trade or migration.

Oxygen isotope ratios can be used to uniquely identify the source areas for these shells, because they respond strongly to water temperature. Upwelling along the Pacific coast leads to significantly cooler water temperatures, whereas the Sea of Cortez is isolated from upwelling and is a relatively shallow sea in a region with very hot summers. Both regions have clear seasonal cycles in δ18O, but the ranges barely overlap. Sourcing studies are also aided by the large plume of Colorado River water that hugs the western shore of the Sea of Cortez. Our provenience work can therefore distinguish three different sources for shell: the Pacific coast, the Gulf of California (east side), and the Colorado River delta.

Working with geochemical cycles in marine shell gives us a very powerful tool for studying human behavior and seasonal environmental variability over the course of several thousand years. Our work will continue to document the age and seasonal patterns in the harvesting of fish and shellfish by prehistoric peoples in the northern Gulf of California and beyond. For more than 5,000 years, groups of people have been going down to Puerto Peñasco. With isotope geochemistry, we are able to follow them through the seasons.

Memorials

George Allen (MS 85) died on June 25, 2007, after 29 months of treatment for metastatic colon cancer.

George received a BS degree in geology from Colorado College in 1981 and an MS degree in Geosciences from the UA. He was one Joaquin Ruiz’s first students. Joaquin hailed George as someone with the enthusiasm of a little kid: “not impressed by what others think should impress them, a self-starter, and a highly motivated and disciplined student.”


George was proud that fines levied as a result of his investigative work for the US government returned more money to the US Treasury than he was paid. In his OSHA position, George responded to the World Trade Center disaster and spent a week overseeing the cleanup effort. The “toxic soup” to which he and countless others were exposed may have cost him his life. George was someone with the highest level of integrity. He lived—and died—by doing the right thing.

Vernon DeRuyter (MS 79) passed away March 24, 2008, after struggling with colon cancer for seven years. He received his BS degree in geology from the University of Minnesota, and he received his MS degree in Economic Geology from the UA. His passion and career was mineral exploration. He worked in many states and numerous countries, and he always took a special interest in the people, culture, and language of each place he visited.

Godfrey Sill (PhD, 76) died December 18, 2007, after a brief struggle with brain cancer. He pursued research on the chemical composition of planetary atmospheres at the UA’s Lunar and Planetary Laboratory until his retirement in 1988. He also served as a Senior Research Associate at the Jet Propulsion Laboratory.
The 36th Annual GeoDaze

The 36th annual GeoDaze Symposium was held at the UA Student Union on April 3rd and 4th, 2008.

The 32 talks and 26 posters showcased the diversity and multidisciplinary nature of Geosciences research today. Presentation and poster topics included structural and economic geology; planetary geology; geophysics, geodesy, and seismology; paleoclimate, surface processes, and geoscience education; paleontology; geochronology and geochemistry; tectonics; and hydrology.

Both graduate and undergraduate students participated, and the audience included faculty, staff, and students from the Department; Geosciences Advisory Board members; alumni; and individuals from other academic and professional communities.

Dr. Tekla Harms, Professor in the Department of Geology at Amherst College in Massachusetts, was the keynote speaker. Dr. Harms’s talk was titled “A Map-Scale Sheath Fold in the Tobacco Root Mountains, Montana, and its Role in the Evolution of the 1.78–1.72 Ga Big Sky Orogeny.”

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

Activities ended with the annual GeoDaze party at the Tucson Botanical Gardens. Tucson alumni and friends were invited, and approximately 150 individuals attended the festivities this year.

Dr. George Davis from the Department led the GeoDaze field trip. The trip focused on “A Very close Look at the Catalina Granite.” Our thanks go to ConocoPhillips for sponsoring the field trip.

A big round of applause goes to co-chairs Alyson Thibodeau and Lepolt Linkimer for all of their dedication and hard work, and to all of the individuals on various planning committees who made the event possible.

A special thanks goes to all of our alumni, friends, and sponsors whose financial support makes GeoDaze possible each year.

Finally, thanks to all of the students, faculty, staff, advisory board members, alumni, and friends for making the GeoDaze tradition of showcasing student research a great success again this year!

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GeoDaze Donors

Special thanks goes to the following individuals and organizations for their financial support, which helps make GeoDaze possible each year.

— Individuals —
Joseph Acaba
Megan Anderson
Jon Baskin
Gerard Beaudoin
Keith Blair
Elwood Brooks
Linda Buczynski
Cheryl Butler
Carlotta Chernoff
Anthony Ching
Gary Colgan
Donald Dietrich
John Dreier
M. Stephen Enders
Terrence Gerlach
Patrick Gisler
John Guilbert
Jerome Guynn
James Hardy
Tekla Harms
Vance Haynes
James Hays
Gary Huckleberry
Kerry Inman
William Jenney, Jr.
Richard Jones
Gary Jones
Stanley Keith
John Kerns
Susan Kidwell
Scott Lewis
Steven Lingrey
Joseph Lyonski, Jr.
Paul Martin
John Matis
Edgar McCullough, Jr.
Sally Meader-Roberts
Keith Meldahl
Mark Melton
Gopal Mohapatra
Kevin Mosser
Nancy Naeser
Dale Nations
Robert Parker
Fred Pashley, Jr.
Richard Pfirman
Bernard Pipkin
Bruce Prior
Miles Shaw
Donald Silver
Anna Spitz
Gilbert Stern
Louis Taylor
Margaret Venable
Trey & Jennifer Wagner
Marianne Weaver
Herbert Wellhener
Edward Wellman
Isaac Winograd
John Zumberge

— Corporations —
BP Corporation
ChevronTexaco
ConocoPhillips
Errol L. Montgomery & Assoc.
ExxonMobil
Golder Associates, Inc.
Hydrogeophysics, Inc.
From England to Arizona

By Paul Stockwell, Russ Edge, & Abi Hackston

Over the past academic year, plenty of fresh faces have been wandering around the Department, least of all, the “British Mafia” (quoting Mihai Ducea): students on exchange from the University of Leicester for one year.

We are the first students (hopefully of many) to benefit from the new international exchange agreement between the University of Arizona and the University of Leicester enabling students to study abroad for a year as part of their undergraduate degree course work. Students from Leicester are enthusiastic to come to Arizona in future years, and hopefully, Arizona students will make the return trip.

So what brought us to Arizona? Well, the weather certainly had something to do with it! The sunny Arizona climate was just too tempting to resist after years of dreary English weather in our “little” island nation. It was nice to be able to associate summer with sunny weather. The infamous Tucson monsoon season briefly brought back nostalgic memories of weather from home. But seriously, you’ve got it good out here!

Arriving in Tucson in early August 2007 (that was a climate shift!), we were immediately welcomed into the University, Department, and classes. Mihai Ducea cracked us up in Regional Tectonics. Roy Johnson confused us with all that seismic wave equation stuff, and the less said about carbonate weathering equations in Geochemistry the better. Roy still tortured us during the spring semester with Fourier transforms, but he made up for it with the seemingly sporadic introduction of chocolate and sweets!

One of the most memorable modules at the UA was Field Studies in Geophysics. Despite having to be present for fieldwork duties at 6:30 am on both Saturdays and Sundays for many weekends, lifelong friendships were created as we banded together to achieve the prized status of “geophysical publicists.”

With our experiences in Arizona, we want to encourage students to come to Leicester to experience the UK. Accommodation and public transport are reasonably priced and efficient, the Geology Department at Leicester is one of the best in the country, and you’ll be sure to broaden your cultural and employment horizons.

What’s more, you’re only a cheap flight away from great European sights—Paris, Rome, Berlin, Athens, etc. We know it’s a big step, 5,172 miles in fact, but often edging out of our comfort zone can yield massive rewards. Britain is the home of sport, outdoor adventures, diverse cultures, international cuisine, and of course, awe-inspiring geology!

The last year has been a true once-in-a-lifetime experience for all of us, and whilst we’re looking forward to going back home to friends and family, our year in the desert will always be remembered.
Winter Degrees

Bachelor of Science
Cassandra Pollock

Master of Science &
Doctor of Philosophy

Andrew Kowler, MS
“The stable carbon and oxygen isotopic composition of pedogenic carbonate and its relationship to climate and ecology in southeastern Arizona,” Jay Quade

Rachael Novak, MS
“Climate variability and change in the Chuska Mountain area: Impacts, information, and the intersection of Western science and traditional knowledge,” Jonathan Overpeck

Jennifer Roskowski, MS
“A late Miocene–early Pliocene chain of lakes fed by the Colorado River: Evidence from Sr and stable isotopes of the Bouse Formation between the Grand Canyon and the Gulf of California,” Jonathan Patchett

Jennifer Sano, MS
“Diffusion of neodymium in orthopyroxene: Experiment, theory, and applications,” Jiba Ganguly

Robert Scott St. George, PhD
“Hydrological and paleo-drought variability in the Winnipeg River basin, Canada, and the Canadian prairies,” Laboratory of Tree-Ring Research, Michael Evans

Sarah Thompson, MS
“First results from a dense semi-continuous GPS deployment during the September 2005 northern Cascadia slow slip event,” Richard Bennett

Congratulations and best wishes to all of our graduates!

Spring Scholarships

Undergraduate Students
Alysha Coppola received a Keith Lovestrom scholarship for $684 and a David Moore scholarship for $16
Carla Eichler received a Reuben Winslow scholarship for $250
Alena Kimbrough received a David Moore scholarship for $700
Andrew McCallister received a David Moore scholarship for $250
Jennifer McGraw received a David Moore scholarship for $250

Graduate Students
Todd Engelder received an ExxonMobil scholarship for $4,550
Christine Gans received a ConocoPhillips scholarship for $4,575
Lepolt Linkimer received an ExxonMobil scholarship for $4,550
Joel Saylor received a Peter Coney scholarship for $4,700
Alyson Thibodeau received an ExxonMobil scholarship for $4,575
John Volkmer received a ConocoPhillips scholarship for $4,575

Field Camp Scholarships

Undergraduate Students
Guleed Ali received an Evans Mayo scholarship for $1,500
Nicolas Breckenfeld received an Evans Mayo scholarship for $1,500
Claire Landowski received a Diane Ferris scholarship for $1,500
Jonathan Ondracek received an Evans Mayo scholarship for $1,500
Javier Benji Rojas-Pochyla received an Evans Mayo scholarship for $1,500
Gari Salais received an Evans Mayo scholarship for $1,500
Sally Thurner received a David Moore scholarship for $1,500
Carrie Welty received an Evans Mayo scholarship for $1,500

Summer Scholarships

Graduate Students
Serkan Arca received an ExxonMobil scholarship for $1,500
Goran Buble received a ConocoPhillips scholarship for $1,500
Alyson Cartwright received a ChevronTexaco scholarship for $1,500
Robinson Cecil received a ChevronTexaco scholarship for $1,500
Majie Fan received a ChevronTexaco scholarship for $1,500
Andrew Frassett received a John and Nancy Sumner scholarship for $1,500
Facundo Fuentes received an ExxonMobil scholarship for $1,500
Christine Gans received a ChevronTexaco scholarship for $1,500
Austin Holland received a John and Nancy Sumner scholarship for $1,500
Andrew Kowler received a ChevronTexaco scholarship for $1,500
Christian Mathie received a ChevronTexaco scholarship for $1,500
James Mayer received a Maxwell Short scholarship for $1,162 and a Burt Butler scholarship for $338
Stephanie McAfee received a Wilson Thompson scholarship for $845
Michael McGlue received a Wilson Thompson scholarship for $4,575
Jill Onken received a Keith Katzer scholarship for $1,149 and a Geosciences scholarship for $351
David Pearson received a ChevronTexaco scholarship for $1,500
Lynn Peyton received a ChevronTexaco scholarship for $1,500
Andrea Philippoff received an ExxonMobil scholarship for $600
Ryan Porter received a ChevronTexaco scholarship for $1,500
Cody Routson received a Burt Butler scholarship for $1,500
Joel Saylor received a ChevronTexaco scholarship for $1,500
Alyson Thibodeau received an H. Wesley Peirce scholarship for $1,500
Maria Soledad Velasco received a ChevronTexaco scholarship for $1,500
John Volkmer received an ExxonMobil scholarship for $1,500
Alexander Winant received a David Moore scholarship for $1,500

A total of $78,070 was awarded.

Summer Internships

Undergraduate Students
Charlene Estrada, Carnegie Institute of Washington
Claire Landowski, Errol L. Montgomery & Associates/UA Water Resources Research Center
Andrew McCallister, USGS, Colorado
Whitney Rutherford, Freeport-McMoran, Mexico
Carrie Welty, UA/NASA Space Grant

Graduate Students
Meg Blome, DOE/EC
Alison Drain, ExxonMobil
Facundo Fuentes, ExxonMobil
Marlene Leclerc, Arizona
Scott McBride, ChevronTexaco
Kelley Stair, BP Corporation
Alumni News

Joe Acaba (MS 82)
Joe has been selected as one of the crew for NASA’s upcoming space shuttle flight, the Discovery STS-119 mission, targeted to launch in February 2009. The flight will deliver the final pair of power-generating solar array wings and a truss element to the International Space Station. Joe’s duties will include being on the flight deck for ascent and entry, operating one of the shuttle robotic arms, and being a member of the EVA (spacewalk) team, which may include up to two spacewalks.
~acaba@hotmail.com

Martha Coder (BS 81)
I graduated from the University of Colorado–Denver in May 2007 with a BS degree in Nursing. I am now working at St. Joseph Hospital in Denver on a surgical floor. Nursing challenges me to recognize changes in my patient’s physical status as well as to provide emotional support. I hope to work in diabetic care and education.
~martha_coder@yahoo.com

Julia Fonseca (MS 86)
I recently worked on getting the County Board of Supervisors to adopt new policies requiring scrutiny of ground-water impacts for new rezoning. I am currently working on ecological monitoring and mining issues for Pima County.

Essa L. Gross (BS 98)
Essa recently finished his master’s thesis at Michigan Technological University. It was three years in the making: one year at Michigan Tech, and two years in Nicaragua in the Peace Corps. For pictures and a few videos of his service, contact Essa at the email below.
~ essa27@hotmail.com

Tim Lawton (PhD 83)
I was awarded the Manasse Chair in the College of Arts and Sciences for 2007–2009 in recognition of “lifetime achievements as a geologist, teacher, and leader,” in the words of the college dean. The chair provides research funding to help support my current work in the western US and Mexico. I am currently a Fulbright-Garcia Robles Research Fellow for 2007–2008 in residence in Mexico City. My research focuses on the Upper Jurassic rocks in northern Mexico.
~ tlawton@nmsu.edu

L. Courtland Lee (MS 67)
Courtland gave a talk at the Tucson Convention Center as part of the Gem and Mineral Society show in February. His talk was on “America’s Newest State Gemstone: Petrified Bones and Teeth from the Cretaceous Arundel FM, and the Legislative Making of a State Gem.”

Gopal Mohapatra (MS 95, PhD 96)
After working for ExxonMobil for ten years, I joined the Hess Corporation, an integrated oil and gas company in Houston, in 2007. The job remains challenging in the sub-salt, deepwater exploration environment of the Gulf of Mexico. I have worked on some neat projects with a great set of people, which has made the last eleven years of my career in the oil industry very rewarding.
~gmohapatra@hess.com

Mark Your Calendars

There will be a UA Geosciences Alumni Reception at the annual GSA meeting in Houston, Texas. The reception will be on Monday evening, October 6, 2008, from 7–10 pm.

The 37th GeoDaze Symposium will take place April 2–4, 2009, in Tucson, at the Arizona Historical Society near the central UA campus.

Alumni Drawing Winner

Julia Fonseca from Tucson, Arizona will receive a Geosciences T-shirt for sending in her updated contact information. Send in your contact information, and have your name added to the next drawing for a Geosciences T-shirt!
Please update your contact information!

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- [ ] Business Address:
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  - __________________________________________
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  - 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 that will be returned) for the next newsletter.

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