

Department of

GEOLOGY

Alumni Newsletter

October 2008



Message from the Chair, Steve Driese

The 2007-08 Academic Year for the Geology Department



This Year's Geology Newsletter Theme: Searches and construction, both signs of changes for Geology!

During this academic year the Geology Department conducted searches for three separate faculty positions, which is a record, I am told by my colleagues in the Department. And it appears that we have made successful hires in all three (read more to hear about the latest new Geology faculty members). After our sadness in losing the old Annex, we now have a newly constructed Carlile Geology Research Building that is attached to the Baylor Sciences Building. Purposefully designed and well-constructed, it is a beautiful facility, even for "dirty" activities involving sand and mud! (Please see the accompanying photos of construction.)

And of course we look forward to seeing all of you alumni again at the Geology Alumni Homecoming event on Friday evening, October 31st, 2008, from 7:00-9:00 PM in the 4th floor clocktower (room E401) of the Baylor Sciences Building, and around the elevators at the Geology end of the 4th floor. Come visit with former faculty, classmates, and staff!

Administrative, Faculty, and Staff Changes:

After intensive national searches conducted in the fall of 2007 and spring of 2008, we have successfully hired three new faculty members in Geology. Dr. Jay Pulliam was hired as the new W.M. Keck Professor of Geophysics. A seismologist, Jay is a graduate of the University of California at Berkeley, and was formerly a Research Scientist at the University of Texas-Austin in the Geophysical Research Institute. You can read more about him in a later article. Dr. Daniel Peppe was hired as a new Assistant Professor of Geology, emphasizing paleoclimatology. A paleomagnetist and paleobotanist, Dan is a graduate of Yale University and will be joining the Department in August of 2009 after he completes a post-doctoral appointment at Wesleyan University. Dr. Boris Lau was hired as a new Assistant Professor of Geology, emphasizing contaminant hydrogeology. A nanoparticle specialist working in saturated flow systems, Boris is a graduate of the University of Wisconsin at Madison (in Environmental Engineering) and was formerly a post-doctoral researcher at Duke University. He will be joining the Department in January of 2009. You can also read more about him in a later article.

Dr. Stacy Atchley was promoted to the rank of full Professor in the spring of 2008, and in addition, was appointed for 3 years as the new Associate Chair of Geology. He had previously

served 5 years as the Graduate Program Director. Dr. Rena Bonem graciously agreed to serve another 3 year term as Undergraduate Program Director, and currently advises all undergraduate majors in our program. Dr. Shane Prochnow (Baylor Geology Ph.D. graduate) has left the Center for Spatial Research in the summer of 2008, to join the IT group at ExxonMobil in Houston, TX. He was instrumental in providing excellent instruction for the Geology Department as a part-time lecturer for our two GIS courses, and will be greatly missed. The Department is currently searching for a ½ time lecturer in GIS, after University approval of a request for that position.

Fellowship Events:

The annual late summer Welcome Picnic was once again held in August of 2007 for faculty, graduate and undergraduate students, spouses and children, but this time indoors at the Mayborn Museum on the Baylor University campus, in an attempt to move the event out of the heat and humidity to a more comfortable environment. But the indoor atmosphere was just not the same as having a real outdoor picnic, so the event is once again scheduled to be held in the backyard at Steve and Marylaine Driese's home in McGregor in August of 2008. The Geology Alumni Homecoming Event with food and refreshments was again hosted by the Geology Department in the Baylor Sciences Building in November of 2007 (see photographs later in newsletter). Steve and



Fall 2007 Welcome Picnic at the Mayborn Museum

Marylaine Driese held their annual Christmas Party for faculty and staff in December of 2007 at their home. And the Geology Department held its second annual Spaghetti Supper event at the Harrington House on the Baylor University campus in April of 2008 for faculty, staff, graduate and undergraduate students, and their spouses and children. Dr. Driese gave out some “real awards” to mainly undergraduate students, (which are described in later story) followed by “tongue-in-cheek” presentations. Two prospective future Geology students (one 5th and one 6th grader) from the Waco Rapaport Academy also attended the event.

Development Efforts and Geology Alumni Events:

The Baylor Geology Alumni Board of Advisors held a business meeting in the afternoon, prior to the Geology Alumni Homecoming Event in November of 2007. The Board met with all of the College of Arts and Sciences Development Officers, which included Eric Abercrombie, Rose Youngblood, and Karen Martin, in order to talk about ways in which Board members can work with the Department and the Development Office to identify potential donors, and to initiate and conduct special fund-raising projects. They also discussed planning for a Baylor Geology alumni reception, which was held on April 21st, 2008 in the Grand Hyatt Hotel in San Antonio, in conjunction with the AAPG-SEPM Annual Meeting.

The Baylor Geology Alumni event in San Antonio was attended by an estimated 35-40 people, and included several Development Office staff (Eric and Rose) and A & S College Dean Lee Nordt, as well as Drs. Driese and Atchley (see related photos in this newsletter). There was much fellowship and “catching up”, and great food provided by alumnus Jack Trice and his wife Cindy. Afterwards Dr. Driese gave a brief Departmental update and Dr. Atchley spoke of the accomplishments of the Applied Petroleum Studies Group, and the need to secure resources to support a second faculty member in Petroleum Geology in order to meet student demand. A second Baylor Geology Alumni event is planned for the GSA Annual

meeting that will be held in early October of 2008 in Houston, so be on the look out if you are attending that meeting, and we hope to see you there!

Dr. Driese and his wife Marylaine, with Dr. Harold Beaver and wife Dorcas, and Dean Nordt and wife Kathy, also attended a Baylor University Philanthropy Banquet and celebration on April 18th in which Dr. Ken Carlile and his wife Celia were honored for their generous support of the Geology Department and Baylor University. The event was held in the Ferrell Center, which was transformed from a basketball arena to a formal banquet hall. BA Earth Science student Janet Cabeen, along with Drs. Driese and Beaver, were filmed in advance of the event and appeared on the “jumbotron” expressing thanks to the Carliles for all that they had done for the Geology Department.

The Elan Allen Field Safety Award became fully endowed in 2008, and two M.S. students working with Dr. Peter Allen were honored as the first recipients of the awards (see separate article on student awards). Baylor Geology alumna Marlow Anderson-Newton was instrumental in seeing that the Endowment became a reality, and we thank her for her generous efforts. We also hope that this fund ensures safe practice in the field for students engaged in field work.

A mineral collection was contributed to the Geology Department through a bequest from the estate of Mr. Samuel L. Murphy. This collection of more than 5,000 specimens will be used by our Geology Department to benefit the faculty, students and visitors of Baylor University.

Graduate Program:

The Department successfully recruited 7 new graduate students in the fall of 2007 (3 Ph.D. and 4 M.S. students), 2 new Ph.D. students in the spring of 2008, and 7 new students (4 M.S. and 3 Ph.D.) in the fall semester of 2008. Of the 22 graduate students in residence during the 2007-2008 academic year the Department had 15 students supported as Graduate Teaching Assistants, plus 6 students supported on externally funded

research grants, which is a record for the Department! The graduate student body is now approximately 50% Ph.D. and 50% M.S. students. All of our 2007-2008 M.S. graduates secured employment in the oil and gas industry or in the environmental industry. Recent M.S. graduates going into the petroleum industry had job offers ranging from \$80-\$90K, and Ph.D. job offers are as high as six-figures! These offers reflect not only the quality of our M.S. and Ph.D. programs, but also the critical shortage of trained geoscientists relative to current industry demand. Geology Ph.D. candidates published 7 research papers in peer-reviewed journals and 2 of the Ph.D. dissertation proposals were later submitted as grant proposals to the National Science Foundation.

Undergraduate Program:

The enrollments in Geology major courses such as mineralogy, paleontology, structural geology, petrology and stratigraphy are only slightly higher compared to the past academic year — this is very surprising in view of the current “hot” employment market in geology, which normally translates to rapid growth in the numbers of majors in Geology programs. We are still seeing only modest growth in our numbers of B.S. majors in Geology (currently 50) that almost certainly correlates with increasing prices of a barrel of crude oil (currently at record high levels). Another measure of growth is that the summer field



Dr. & Mrs. Don Parker & Dr. Rena Bonem at the 2007 Christmas Party

camp course in 2007 had 6 students, and in 2008 it had 10 students! The Geo 43C1 capstone colloquium course had 7 students in the spring of 2007, and 6 in the spring of 2008. The number of students majoring in Geophysics (B.S.) has been relatively low but shows signs of recent increases (to 4 students). Numbers of majors in both the B.A. in Geography and Earth Sciences are both currently low (2 and 4, respectively). Five Baylor Geology undergraduate students are currently engaged in Senior Thesis projects under the direction of faculty members. Four undergraduate geology field assistants supported by the James W. Dixon Undergraduate Field Assistant award helped graduate students in the summer of 2007, and three more will be helping graduate students in the summer of 2008 as well.

Ms. Sharon Browning, the new Geo laboratory coordinator has been exploring both revision and consolidation of the current plethora of introductory course laboratories offered in Geology and Earth Science in order to streamline lab course preparations and still maintain student satisfaction with our freshman courses.

Research Productivity:

Research accomplishments for the Geology Department for the 2007 calendar year included 17 publications, 41 professional presentations, and circa \$750K in external funding. There are also 14 papers for 2008 already published, accepted or in press as of May, 2008. Journals in which articles by Baylor Geology faculty were published include: *Biogeochemistry*, *Bulletin of Volcanology*, *Chemosphere*, *Chinese Scientific Bulletin*, *Geoderma*, *Geological Society of America Bulletin*, *Geology*, *Geophysics*, *Hydrological Processes*, *International Journal of Ecohydrology and Hydrobiology*, *Journal of Biogeography*, *Journal of Geology*, *Journal of Hydrology*, *Journal of Sedimentary Research*, *Palaeo*³ (*Palaeogeography*, *Palaeoclimatology*, *Palaeoecology*), *Plains Anthropologists*, *Quaternary Research*, *Soil Science Society of America Special Publications*, and *Vadose Zone Journal*.

Abstracts or posters were presented at the Geological Society of America Annual Meeting in Philadelphia (11 papers!), 4th SWAT International Conference, TRRMS, Association of Environmental and Engineering Geologists, Society of Exploration Geophysicists, American Geophysical Union Annual Meeting, Texas A & M University Soil Survey and Land Resources Workshop, US Department of Energy Project Review Meetings, Workshop on Teaching Geophysics in the 21st Century, the Texas Section American Society of Civil Engineers, the Tulsa Geological Society, the Texas Academy of Science, International Symposium on Asian Monsoon Under Global Warming, International Symposium on Paleopedology and Landscape Evolution, and the Society of American Archeologists — as is apparent, Baylor Geology research has been presented at a large number of professional organizations!

Some major grants were awarded to Baylor Geology faculty this past year. Dr. Steve Driese secured a National Science Foundation (NSF) grant to study the mineral siderite in soils and its relationship to temperature, for use in paleoclimate studies in paleosols containing siderite. Dr. Joe Yelderman received three new research grants from the Texas Commission on Environmental Quality for wetland and wastewater research. Both Dr. Steve Dworkin and Dr. Stacy Atchley received support from the oil and gas industry (EnCana Oil and Gas (USA), Inc., and Auriga Energy, Inc., respectively) for applied petroleum studies research. Dr. John Dunbar continues to be supported on a US Department of Energy (DOE) research grant to use resistivity methods to survey the Gulf of Mexico for gas hydrates. Dr. Jordan Feng continues on an NSF grant to reconstruct climate for the past 50,000 years in central Asia. Drs. Stacy Atchley and Lee Nordt continue with a Petroleum Research Fund (PRF) grant to study the sequence-stratigraphy and paleoclimatology in Triassic paleosol-bearing alluvial successions. And Drs. Peter Allen and John Dunbar completed a USDA-funded project evaluating the use of Lake Whitney as a source of potable water.

This increased emphasis on publishing, giving professional presentations, and securing

external funding is part of an ongoing effort to increase Geology Department visibility at a national level. (For a complete summary see the Geology Department 2007-2008 Research Report available on the Geology Department's website)

Guest Lecturers for Geology 5050 Colloquium Series:

The Geology 5050 Colloquium Series continued with regular schedule of talks held at 3:30 PM in room E231 on Friday afternoons, and we continued to hold a 3:00 PM reception prior to each guest lecture in the 4th floor clocktower, as well as occasional Saturday field trip and short course experiences. The Department continues to support funding for up to 4 to 5 far-away (outside of driving distance) speakers each semester, in an effort to increase Department visibility at a national level and to expose Geology students to researchers from across the country.

Notable out-of-town guest speakers in the fall semester of 2007 included Dr. Lynn Soreghan (Univ. of Oklahoma); Dr. Chris Fielding (Univ. of Nebraska); Dr. Don McGookey (Midland, TX); Dr. Jeff Wilcox (Univ. of North Carolina-Asheville); Dr. Maya Elrick (Univ. of New Mexico); Dr. Julia Sankey (Cal State Univ.-Stanislaus); Dr. Anthony Runkel (Minnesota Geol. Survey); Dr. Kirk Johnson (Denver Museum, AAPG Distinguished Lecturer); Dr. Christa Ziegler (ExxonMobil, Houston); and Dr. Paul McCarthy (Univ. of Alaska-Fairbanks). Dr. Stacy Atchley coordinated this Geo 5050 seminar series, which was excellent.

Notable out-of-town guest speakers in the spring semester of 2008 included Dr. Susan Eriksson (UNAVCO); Dr. Chris Mathewson (Texas A&M University); Dr. Russell Davies (Rock Deformation Research, USA); Dr. Keith Sverdrup (NSF and Univ. of Wisconsin-Milwaukee); Dr. Nancy McMillan (New Mexico State University); Dr. Judith Chester (Texas A&M University); Dr. Jay Pulliam (Univ. of Texas-Austin); Dr. Constantin Cranganu (City University of New York-Brooklyn); Dr. Daniel Peppe (Yale Univ.); Dr. Yongxiang (Frank) Li (Tulane Univ.); Dr. Ranjan Muttiah (Texas

Christian Univ.); and Dr. Boris Lau (Duke Univ.). Dr. Vince Cronin coordinated this Geo 5050 seminar series, which was excellent and which included many faculty search candidates inserted into the schedule at the last minute.

Acquisition of New Teaching and Research Equipment:

We have acquired a new Thermo-Electron gas-source stable isotope mass spectrometer that will be shared by faculty and students in Geology, Biology, Environmental Sciences, and Archeology/Anthropology. It was secured with assistance of the Vice Provost for Research Office (Dr. Truell Hyde). Measurement of $\delta^{13}C$, $\delta^{18}O$, $\delta^{15}N$, and $\delta^{34}S$ in solids and other natural materials is essential to Baylor Science programs, and we are very grateful to the VP for Research and BSB Building Manager Dr. Jim Karban for acquisition of this vital piece of instrumentation. Several geochemistry courses will use the instrument for teaching, and students and faculty will no longer need to drive to UT-Austin to use their facility. Dr. Steve Dworkin will be the initial director of this laboratory, but we hope to be approved to conduct a search for a Baylor University-supported instrumentation technician during the 2010 budget year.

We still have a Geology "wish-list" for equipment items ranging from \$1K to \$400K, and we welcome alumni support at all levels in our attempts to modernize the Department's equipment base. Dr. Ken Carlisle has pledged financial help with setting up the paleomagnetism laboratory for Dr. Daniel Peppe, which requires a special shielded room and expensive demagnetizing instrumentation to accompany the magnetometer. And Dr. Boris Lau is also in need of additional research equipment for his new nanoparticle laboratory.

Construction of a New Carlile Geology Research Building:

Thanks to an initial gift by Dr. Ken Carlile, and generous additional support by Baylor University, a new Carlile Geology Research Building was constructed during the summer of 2008, on a site situated on the southeastern edge of the Baylor Sciences Building. The new

5400 ft² building includes six faculty labs, a small teaching classroom for use with lab sections and storage space for soil, sediment and rocks. Two of the new Geology faculty members have asked for, and been assigned space in this new facility. The building also provides a location for the Department of Geology to process samples (rock prep room) and a loading dock from which to stage field activities. The Carlile Geology Research Building is named in honor of Quinton and Mildred Carlile of Marshall, TX. Funds for Baylor's first geology facility, also named in their honor, were provided by the Carliles' three sons: David Carlile, Kenneth Carlile and Steve Carlile, and other generous supporters of the Baylor geology program.

The Geology Department dirty sediment and rock labs moved from their temporary quarters in the O'Grady Building at 2nd and LaSalle during September of 2008 to the new facility. Large Geology research equipment, including the drill truck, research boats and trailers (and other items) is now stored in space owned by Baylor University near the football stadium.

Construction of a New Hydrology Laboratory for Dr. Peter Allen.

A new hydrology laboratory is to be constructed for Dr. Peter Allen in the 4th floor C-wing (also known as "the water wing") of the Baylor Sciences Building. Dr. Allen previously had no access to a laboratory in the Baylor Sciences Building; however, funds were made available for construction of this lab through a major strategic proposal (MSP) for enhancement of the Center for Reservoir and Aquatic Systems Research (CRASR) approved by Baylor University in August of 2007.

Major Strategic Proposal in Terrestrial Paleoclimatology:

The Major Strategic Proposal (MSP) entitled: "*Research Initiative in Terrestrial Paleoclimatology at Baylor University*", was fully funded by Baylor University commencing in August 2007. It takes advantage of the existence of a core group of five faculty in Geology currently engaged in studies of the geologic record of climate change and proposes purposeful growth in this niche area, which no other Geology Department in North America can lay claim to at this time. The plan calls for the hire of three new faculty staged over five years, to complement the existing faculty areas of expertise. Dr. Dan Peppe is the first of the three new hires. An instrumentation technician to be hired in 2009 is also budgeted as part of this MSP. A first-year assessment report for the Terrestrial Paleoclimatology MSP is available on the Geology Department website.



Dr. Ken Carlile



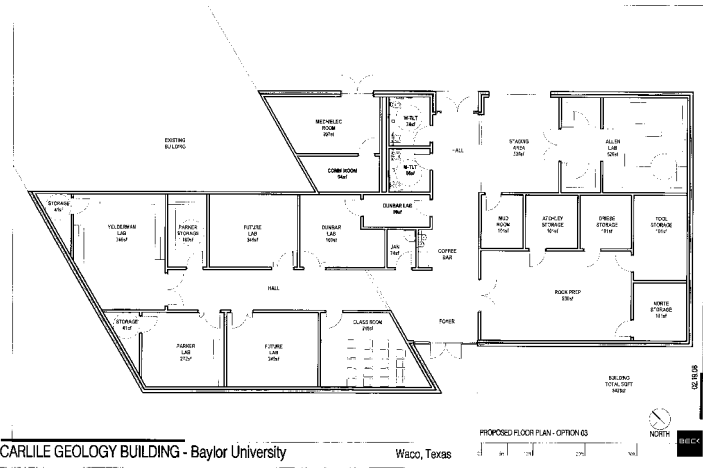
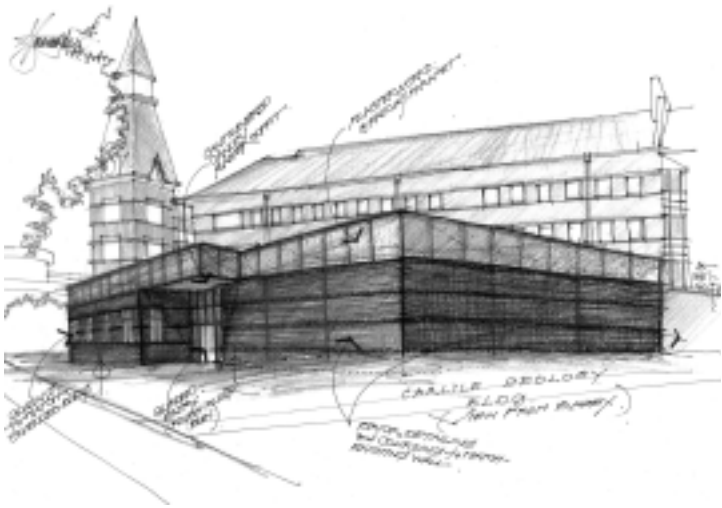
Bob Rodgers



Bill Walker

Photos from the Baylor Geology Alumni reception held on April 21, 2008 at the Grand Hyatt Hotel in San Antonio at the AAPG Annual Meeting

Scenes from the New Carlile Geology Building



Geo Lake - An unmarked waterline.



Foundation



Installing new utilities pipes



Piling driller



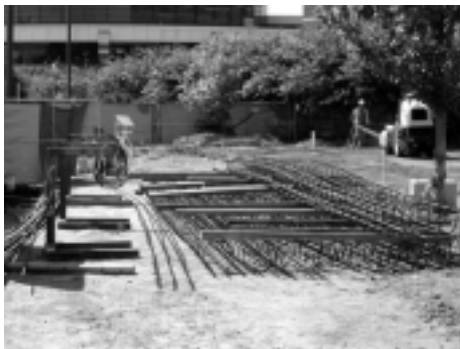
Foundation footers



Foundation footers



New utilities pipes



Site Grading



Removing brick from existing building

From the professors....Dr. Peter Allen

Well, this year was a blast. Peggy and I traveled to Europe to attend and give a talk at the 4th International SWAT Conference in Delft, Netherlands. We went via England, the Channel, Paris and Amsterdam. The conference was held at the DELFT Institute of Hydrology and Hydraulics and was well represented with over 100 participants from all over the world who use the SWAT (Soil Water Assessment Tool) model. In this regard, Jeff Arnold (Research Professor and Director of the ARS/USDA lab in Temple) and I among many others internationally are working on the next edition of the SWAT model. This will involve routing water, sediment and pollutants through the landscape which should be a real break through in large watershed modeling approaches. Jeff and I and Bill Komar (ARS) are putting together a simple version of the model for use by engineers and geomorphologists to assess downcutting and erosion in urban watersheds. This should be out for beta testing this fall.

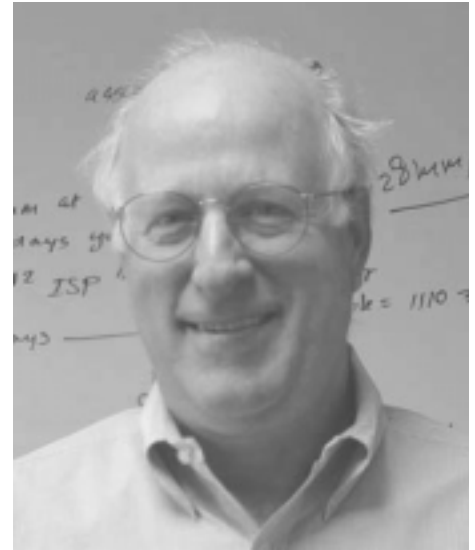
In the States, I went to the GSA Conference in Denver where we interviewed for the newly filled Hydrogeology position. Stephanie Capello and I presented a paper on her MS thesis work... meaning she did all the work and I watched her give an excellent talk. Of course I found time to take my daughter

Annabel out to dinner; she will be a senior at the University of Colorado.

I continue to teach Physical Geology and graduate courses in Hydrology and Engineering Geology although lately, the price of oil is affecting the student's interests. They are being drawn away from the pristine blue waters of the surface into the sticky black subterranean realms delineated only by the inferences of e-logs and the occasional seismic smiley face; Ok, and the salaries are incredible. Anyhow we are still having fun on many of the same slopes and streams many of you remember (Childress, Ash, HydroCenter). I am still requiring memos and reports... yes with still the same level of resistance.

The Lake Whitney Salinity Project is beginning to wind down and modeling has taken over from data collection. This is good as the sensors continue to drop and be lost due to stressful weather conditions on the Lake and we would be running out of replacements! The Whitney Team has expanded to include work by former student Bob Rodgers who did a great report on the Salt Fork and saline groundwater.

Masters research continues on area streams with Stephanie Capello defending this summer, Dave Coffman winding up this fall, and Matt Schreiner next Spring. Stephanie



has produced the first study which links laboratory tests erodibility to actual field erosion rates. This should be a widely used piece of work as we plan to move toward publication later in the summer. Dave is working on a Woodbine Stream in Lewisville. Beside monitoring and erodibility testing, Dave is working on new monitoring procedures with time-lapse photography and integrated sediment sampling. Matt is just getting started on GIS procedures to predict erosion set-backs for stream channels in the Metroplex. This fall we expect Joseph Sang, a Kenyan, who is coming from Africa to work on his PhD. on modeling stream sedimentation. Stephanie and Dave also assisted me on a Stream Erosion Assessment of Stewart Creek in the Colony and Timber Creek in Grapevine. These involved both extensive field work, laboratory work and reports to engineering firms to assess the fluvial evolution and erosion status of these streams.

John Dunbar and I were part of a Workshop given to the Texas American Society of Civil Engineers in Austin, Texas on "Stream Restoration". This was attended by over 100 engineers from all over the State. John and I also went out to the Brady, Texas area along with Dave Coffman and Bob Wilkins to assess the chemical trap efficiency of 4 floodwater retarding structures as part of and EPA Grant. This involved using kinematic



Dave and Stephanie at a Woodbine outcrop on Timber Creek.



Eager students examining a "flood level" on beautiful Ash Creek. Right, examples of sample extraction and the Jet-Test for soil erosion with Stephanie and Dave on Stewart Creek.

GPS, fun four wheelers, the sub-bottom acoustical profiler and vibra-coring rig. We even came up with another impact rig which is powered off a fence post driver for cores on land. The results will be worked up this summer.

I also went up with the Engineering Firm of Freese and Nichols to assess their evaluation of Bois d' Arc Creek for a future Dam site in North Texas. This stream is in the Blackland Prairie but differs from the Waco area in that it has about 2X the runoff. This assessment is part of the 404 Process. Later on this year, Dr. Craig MacCrae of Aquafor Beech in Ontario, Canada and I reviewed this report.

On the home front, Peggy and I still spend equal time on the I-35 Corridor splitting time between Sarah and our two grandchildren and Waco. Maggie finished up her Pediatric Nurse Practitioner MS and after a trip to New Zealand to visit her sister, Annabel (semester abroad in Christchurch), she will be starting work in Norwood Massachusetts.

Well, again, it is always a treat when you all stop by... I'm sorry if I have missed some of you but it always the highlight of the semester.

Jet Sample and Testing



EnCana Oil Well Field Trip

April, 2008



Accomplished petroleum geologist Josh Talbert expounds upon the well logs for the site



Baylor students learning about oil wells

Dr. Stacy Atchley

I write this newsletter contribution having just returned from my 7th semi-annual Graduate Sequence Stratigraphy field course. For all of my former students that have taken the course, you would still recognize its content and rigor, although I've modified some of our field venues to include geographic locations of ongoing research, e.g., Big Bend National Park or Petrified Forest National Park. The trip this year had the largest enrollment on record with 12 students in attendance. The large enrollment slowed



Dr. Stacy Atchley - Stratigraphy field course 2008

us down a bit in the field, but even more so when it came to cooking and cleaning-up the evening meal. Yes, I still require that each dinner-time meal include a main course, two sides and a desert, and that no dinner meal can be repeated without unanimous vote from the students...and yours truly. Most notable on this year's trip was the weather. We typically have beautiful clear skies with hot days and cool nights. This year we endured a constant onslaught of bad weather that included overcast skies, rain, sleet/hail, gail-force winds, two tornadoes (from the same wall cloud), and typically cool to cold daytime temperatures. We were shut out of one campsite on the Wasatch Plateau of central Utah due to snow, one campsite in the San Rafael Swell of central Utah due to flooding, and one campsite in the Guadalupe Mountains of southeastern New Mexico (Last

Chance Canyon) due to fire hazard. In spite of everything, I still think that the students would say they had a great time and fantastic learning experience on the trip. Very little course content was compromised due to the adverse circumstances.

I'm currently advising five students Three M.S. and two Ph.D. My M.S. students include Nate Ball (B.S. Baylor University), Chris Gotcher (B.S. Midwestern State University) and Luke Hunt (B.S. McMaster University). Nate and Luke's thesis projects will be derived from an enhanced oil recovery project (sponsored by Husky Energy) that they will be working on alongside me this summer in Calgary. My Ph.D. students are all co-advised with Drs. Nordt and/or Driese, and include Aislyn Trendell (B.S. McMaster University) and Michael Zahler (Northern Arizona University). Aislyn's dissertation involves portions of the Triassic Chinle Formation at Petrified Forest National Park, and Michael's dissertation will likely involve the early Tertiary of northwestern New Mexico. These are a great bunch of students and I'm really excited about working with them!

My family is well, although they will not be able to join me in Calgary this summer due to our inability to locate accommodations of adequate size. Consequently, I'll be in Calgary solo for most of the summer,



although the plan is for Janelle and our daughters Dallas (age 15) and Audra (age 10) to join me for two weeks in July. Frankly speaking, the girls are delighted to stay in Waco for the summer since they've only done so once before. This will allow them to be with their friends and participate in summer camps that they've missed in previous years. Our biggest news from the past year is that we've moved back to Waco from China Spring. We decided to put Dallas back in private school, and as such, the long daily commute no longer made sense. We sold our house in March, and moved into a house in north Waco. As far as plans for the upcoming year, we hope to take a trip to Europe in May of 2009.



2008 Stratigraphy field course group

Dr. Rena Bonem



With the increasing price of oil, this has been another busy year for academic advisement within the department with an increase in undergraduate Geology majors. Many of the new majors are coming from Engineering and Computer Science and Physics. That means they already have the math background and can focus on Geology Courses. The number grows daily right now, but I think there are about 50 undergraduates pursuing a B.S. in Geology. At the same time, there are fewer Earth Science and Geography majors. Geophysics is also increasing slowly and many students seem to be coming in with the skills necessary to handle the program. The undergraduate structure class will have the highest enrollment since the early 80's with 28 students because petrology will not be offered this fall. Paleontology has 21 students which suggest that our number of majors will probably end up about 60 to 80 with the new students coming in this fall.



Texas Academy of Science 2007 field trip to Dinosaur Valley

In the fall, I taught Invertebrate Paleontology and World Oceans and went to GSA in Denver. At GSA, I gave one of the presentations in a workshop on Undergraduate Recruitment and Retention in the Geosciences. In the spring, I taught World Oceans and Earth Through Time (Historical) and tried to get over the allergies I have had for the last year. Isaac Westfield is completing his M. S. and we will be attending the International Coral Reef Symposium this summer in Ft. Lauderdale where he will present a poster on the source of the sediment that is covering Pear Tree Bottom reefs since construction of the new coastal highway and the Bahia Principe Hotel. Isaac was successful in obtaining in external grant support from GSA, Sigma Xi, Project Aware (IPADI) and Dallas Paleontological Society to support his work.

On a personal note, my dachshund pack is stable at 6 though I do have 2 fosters right now. Lucy and Tess have done very well with agility (Lucy has won lots of agility ribbons and now has 14 titles to Tess's 3). I am still on the board for Central Texas Dachshund Rescue, Waco Agility Group, and Small Paws Over Texas Agility. There is never a quiet moment around my house!

As always, I look forward to seeing those who have not been around Baylor lately and hope that all of you will be able to come and visit us soon.



Christmas 2007



Dinosaur Valley



Joey and Lilly



Tess at San Marcos



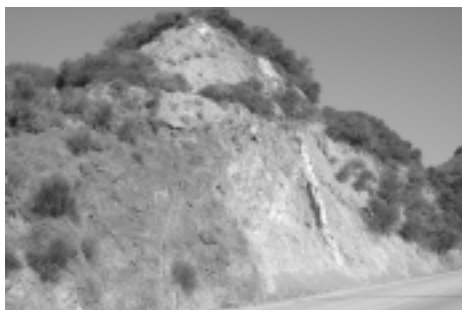
Lucy at San Marcos

Sharon Browning



Looking back on my first year as lab coordinator, I have found a professional and supportive group of colleagues, graduate students, and staff here at Baylor. We are continuing to work together to make all of the freshman labs a hands-on experience, which should result in more interest and enrollment in our courses, as well as students who are better educated in science. In addition, I am attending a conference this summer hosted by Carleton College in Northfield, Minnesota whose focus is teaching geosciences in the 21st century. I anticipate meeting many new colleagues in the field of geoscience and gaining even more ideas for our freshman courses. I am proud to be able to assist the faculty in the administration and improvement of labs, as we welcome new faculty members and strive to maintain excellence in our undergraduate program.

On a personal note, we have adjusted well to the move from Tennessee to Texas. My daughter has made many new friends here, and stays busy with softball and other interests. Our five cats look forward to chasing crickets again as the weather warms up.



Newly recognized fault in outcrop along Kanan Dume Road in the Santa Monica Mountains above Malibu. The main displacement zone is conveniently marked by a vertical white stripe, formed by vein calcite.

Dr. Vincent Cronin



Newly recognized fault displacing a stream bed near Temple, Texas.



Striated slip surface of fault on Kanan Dume Road, showing that this previously unknown fault has a strike-slip sense of motion with minor dip slip.



John Dunbar taking a photograph of the Teton Range while on a field trip associated with the "Teaching Geophysics in the 21st Century" workshop.



John Dunbar in a small-group discussion with Don Forsythe (Brown University), John Taber (Incorporated Research Institutions for Seismology — IRIS) and John Stockwell (Center for Wave Phenomena, Colorado School of Mines) at the NSF-sponsored workshop on Teaching Geophysics in the 21st Century. These geophysicists are working at the University of Michigan field station near Jackson, Wyoming.



Cindy Ellis Cronin and I celebrated the 20th anniversary of our wedding this year. Kelly and Connor are busy as always and are doing reasonably well.

This was also my 20th year teaching geology as a university faculty member. I want to acknowledge and thank Brian Bayliss, Lauren Seidman and Mark Millard for their hard work, which resulted in their graduation with MS degrees in geology during 2007. All are (quite) gainfully employed in the oil business: Brian with Devon, Lauren with EOG Resources, and Mark with Pioneer Oil and Gas.



Ryan Lindsay visualizing the geometry of newly found faults near Temple, Texas.



Stephen Secrest visualizing the geometry of newly found faults near Temple, Texas.

Dr. Steve Driese



I was reappointed as Chair of the Geology Department for another three-year term, so I continue as theoretically a 50% administrator and 50% researcher/teacher. However, the spring semester of 2008 turned out to be an administrative “bear” with having three faculty searches, on top of the normal administrative load of faculty performance reviews and budget preparation, plus coordinating planning for construction of the new Carlile Geology Research Building. Of all of these administrative tasks the most satisfying is seeing the Department grow by addition of new faculty and especially adding some “young blood” to a faculty with many gray hairs. I was also elected President-elect of SEPM (the Society for Sedimentary Geology) and will have much additional travel in conjunction with helping direct a 4000-member international society during the next 2 years.

In the fall semester of 2007 I taught the Geo 5342 Micromorphology of Soils and Paleosols course to 6 students, and I also taught the graduate Seminar on Grant Proposal-Writing to 3 Ph.D. students. In the spring semester of 2008 I had my usual Geo 43C1 Senior Capstone Colloquium course, which had 6 students — a new twist for the 43C1 course this year was that the students had the option to prepare a poster display for

the first annual Undergraduate Scholars Day event held on April 21st in the Ken and Celia Carlile Atrium of the Baylor Sciences Building, and all of the students elected to participate.

I continued supervising four Ph.D. students and one Senior Thesis student. Deb Jennings has moved to Houston taking a job with Core Labs, and from there will complete her dissertation on Jurassic paleosols from the Morrison Fm. of the western U.S., and related studies of barite-bearing soils from the US. Julia Kahmann Robinson continues reconstructing the paleoclimate history and sequence stratigraphy of upper Mississippian paleosol “cycles” in the Pennington Fm. of southeastern Kentucky, and has one paper published in *Palaeo*³ and a second in the *Journal of Geology*, so she is 2/3 of the way to being able to defend her Ph.D. dissertation, which hopefully will occur in September of 2008. Aaron Shunk continues researching the paleoclimate records of late Miocene to early Pliocene paleolacustrine and paleosinkhole deposits in eastern Tennessee and north-central Indiana, and has one paper in press in the *Journal of Paleolimnology* and another in review in *Palaeo*³. Jason Mintz successfully defended his Ph.D. dissertation proposal in April of 2008 and will be engaged in studies of Middle Devonian paleosols in the Catskill succession of upstate New York. Jason also co-authored an NSF proposal, which was not funded, to support his research that was submitted to the new program “Paleo-Perspectives on Climate Change”. Alex Dixon’s Senior Thesis investigates Morrison Fm. paleosols and a fluvial sandstone and conglomerate succession in Utah, and he should complete this research in the fall semester of 2008.

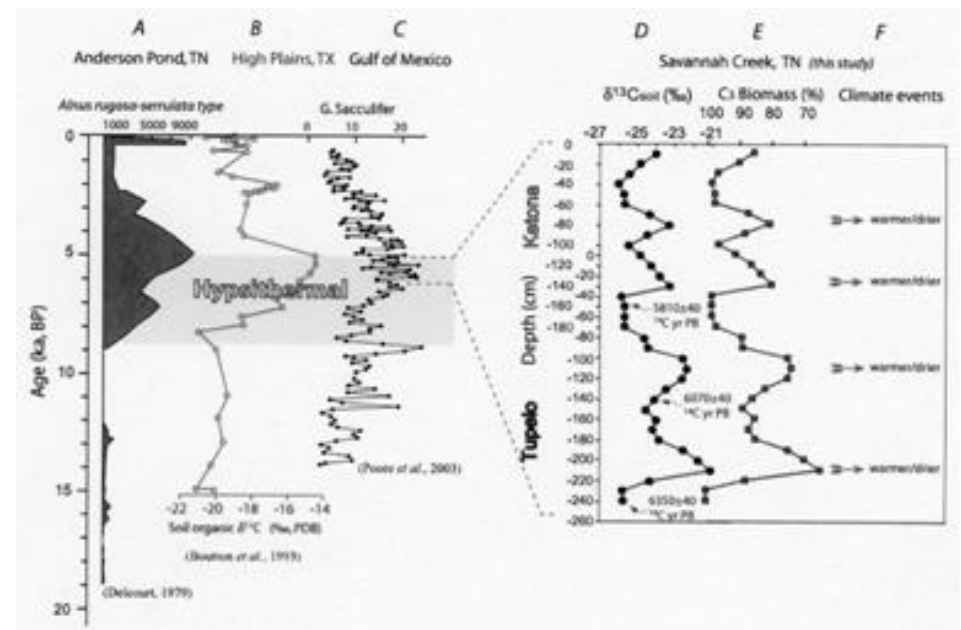
My own research continues to focus on paleoclimate and paleolandscape reconstructions using fossil soils, or paleosols, as well as on studies of modern soil systems to develop climate proxies and analogs of ancient soils. I published 4 refereed journal articles in 2007

and have 4 papers accepted or in press for 2008. I presented 3 papers, as either an author or co-author, at the Geological Society of America Annual Meeting in Denver, was a co-author of 2 papers presented at the American Geophysical Union meeting in San Francisco and 1 paper at the AGU meeting in Acapulco. I also presented a paper for the Texas Soil Survey and Land Resource Workshop at Texas A & M University. I was awarded an NSF grant proposal (with Drs. Greg Ludvigson and Luis González from the University of Kansas Geology Department) on paleoclimate reconstructions and modern calibrations using pedogenic sphaerosiderite, and also submitted 2 additional NSF grant proposals in 2007, which were not funded. I submitted 2 new NSF proposals in 2008 that also were not funded; one is a detailed climate study of the mid-Holocene in the southeastern US (collaborative with several University of Tennessee researchers) and the other is a study of Catskill paleosols in the Devonian of upstate New York, with Stacy Atchley as a co-PI. I continue to work on the genesis of clay-rich soils (Ultisols) near Knoxville, TN, with Dr. Larry McKay (University of Tennessee Department of Earth and Planetary Sciences), as well as on climate studies of Kenyan soils and Quaternary paleosols, with Dr. Gail Ashley (Rutgers University Department of Geological Sciences). I also began a new collaborative project with Lee Nordt, Dr. Mike Waters (TAMU Anthropology), Dr. Tom Hallmark (TAMU Soil and Crop Sciences) and Dr. Zheng-Hua Li (Tennessee Earth and Planetary Sciences) on a possible pre-Clovis archaeological site near Salado, TX. I continue to serve my profession by reviewing submitted manuscripts for many of the sedimentary and soils journals, and am an Associate Editor for the journal *PALAIOS*. I reviewed grant proposals for the National Science Foundation and the Petroleum Research Fund and continue to serve on the Editorial Board of *Sedimentary Geology*.

My family and I enjoyed a 1-week vacation in June last summer to Port Aransas with the Diaz-Granados family (Jim is Chair of Psychology and Neuroscience at Baylor), and also made a trip in August to see family in Atlanta, Chattanooga and Knoxville. I also had the opportunity to visit these same cities in December after conducting a program evaluation of the Geography Department at the University of Tennessee. Marylaine and I completed our outside patio and landscaping project, complete with fish pond, fire and horseshoe pits, and croquet course, so we are ready to use the backyard for entertaining this summer. Marylaine continues her part-time job as archivist for McLennan Community College, and was involved in writing a paper on the early history of the land upon which the College was built – this even involved visiting some old, forgotten cemeteries and photographing tombstones, when I was the field assistant! Mary Catherine has graduated from the 10th grade at Midway High School, is doing well in her pre-AP courses and in regional swim meets, and after turning 16 became a licensed driver! She is already being deluged with ads from Colleges and Universities competing for her attention, and is thinking about journalism as a possible major. Our oldest son Nathan is continuing in the Ph.D. program in Philosophy at the University of Kansas, and presented his first professional paper at a national philosophy meeting held at the University of Florida. Our younger son Trevor still lives in Knoxville and works for a mortgage company however, he has aspirations of continuing graduate work in photojournalism. In spite of the distance, Nathan, Trevor and in-laws Tex and Dottie Hight, manage to make frequent visits to Waco. Steve and Marylaine continue to be dedicated Lady Bears' season basketball fans, and also enjoy singing together in the chancel choir at First Presbyterian Church, where Steve also serves on the Session.

Publications:

Driese, S.G., Orvis, K.H., Horn, S.P., Li, Z.-H., and Jennings, D.S., 2007, Paleosol evidence for Quaternary uplift and for



(1) Late Pleistocene to Holocene paleoclimate records from southeastern US, Gulf of Mexico and US High Plains. (From Driese et al. (2008) *Quaternary Research*, v. 69, p. 276-291.)

climate and ecosystem changes in the Cordillera de Talamanca, Costa Rica: *Palaeogeography, Palaeoclimatology, Palaeoecology*, v. 248, p. 1-23.

Driese, S.G., Medaris, L.G., Ren, M., Runkel, A.C., and Langford, R.P., 2007, Differentiating pedogenesis from diagenesis in early terrestrial paleoweathering surfaces formed on granitic composition parent materials: *Journal of Geology*, v. 115, p. 387-406.

Miller, D.L., Mora, C.I., and Driese, S.G., 2007, Isotopically concentric growth in large carbonate nodules in Vertisols: implications for climate and ecosystem assessments: *Geoderma*, v. 142, p. 104-111.

Vulava, V.M., McKay, L.D., Driese, S.G., Menn, F.-M., and Saylor, G.S., 2007, Distribution and transport of coal tar-derived PAHs in fine-grained residuum: *Chemosphere*, v. 68, p. 554-563.

Driese, S.G., Li, Z.-H., and McKay, L.D., 2008, Evidence for multiple, episodic, mid-Holocene Hypsithermal recorded in two soil profiles along an alluvial floodplain catena, southeastern Tennessee, USA: *Quaternary*

Research, v. 69, p. 276-291.

Driese, S.G., and Medaris, L.G., 2008, Evidence for biological and hydrological controls on the development of a Paleoproterozoic paleoweathering profile in the Baraboo Range, Wisconsin, USA: *Journal of Sedimentary Research*, v. 78, p. 443-457.

Kahmann, J.A., and Driese, S.G., 2008, Paleopedology and geochemistry of Late Mississippian (Chesterian) Pennington Formation paleosols at Pound Gap, Kentucky, USA: Implications for high-frequency climate variations: *Palaeogeography, Palaeoclimatology, Palaeoecology*, v. 259, p. 357-381.

Kahmann, J.A., Seaman, J., III, and Driese, S.G., 2008, Evaluating trace elements as paleoclimate indicators: multivariate statistical analysis of Late Mississippian Pennington Formation paleosols, Kentucky, USA: *Journal of Geology*, v. 116, p. 254-268.

Presentations:

Sankey, J.T., Atchley, S., Nordt, L., Dworkin, S., and Driese, S., 2007, Dinosaurs and dirt: dinosaur paleoecology, paleosol stratigraphy, and isotope geochemistry from the upper

Aguja Formation (Late Cretaceous: late Campanian - early Maastrichtian), Big Bend National Park, Texas: submitted to 67th Annual Meeting, Society of Vertebrate Paleontology, Austin, Texas. *Journal of Vertebrate Paleontology*, Abstracts of Papers.

Driese, S.G., Medaris, L.G., Ren, M., Runkel, A.C., and Langford, R.P., 2007, Differentiating pedogenesis from diagenesis in early terrestrial paleoweathering surfaces formed on granitic composition parent materials: GSA Annual Meeting in Denver, CO.

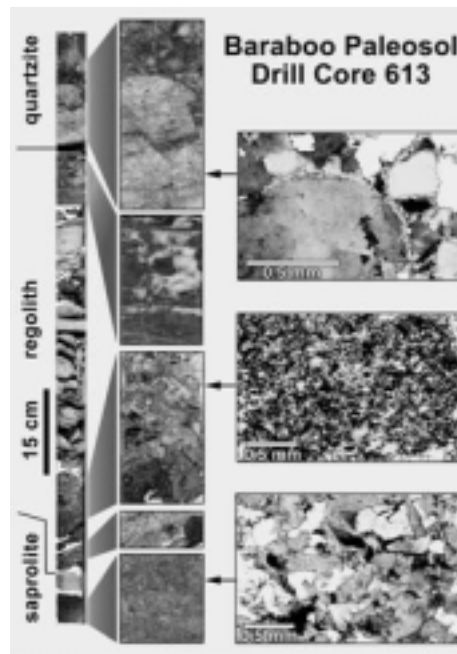
Jennings, D.S., and Driese, S.G., 2007, Using comparative micromorphology and geochemistry to distinguish paleocatena relationships in barite-bearing paleosols: GSA Annual Meeting in Denver, CO.

Dixon, A.H., Driese, S.G., and Jennings, D.S., 2007, Provenance and the early diagenetic alteration of volcanoclastic material incorporated in fluvial channel sandstone deposits, Morrison Fm. near Capitol Reef National Park, Utah: GSA Annual Meeting in Denver, CO.

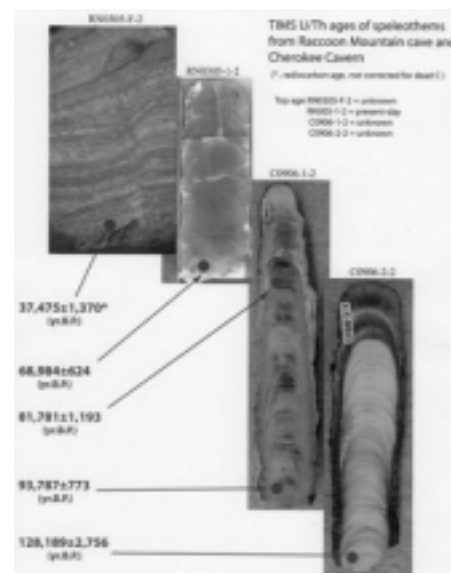
Kahmann, J.A., Seaman, J., III, and Driese, S.G., 2007, Multivariate statistical analysis of Late Mississippian paleosol trace element chemistry and application to interpreting pedogenic processes and climate through time: American Geophysical Union Meeting, San Francisco, CA.

Shunk, A.J., Dunbar, J., and Driese, S.G., 2007, Solar periodicities and a monsoon climate phase recorded at the latest Miocene to earliest Pliocene Gray Fossil Site, northeastern TN, USA: American Geophysical Union Meeting, Acapulco, Mexico.

Shunk, A.J., Driese, S.G., Farlow, J.O., and Fluegeman, R., 2007, A rare Early Pliocene record of paleoclimate from north-central Indiana, USA: American Geophysical Union Meeting, San Francisco, CA.



Photograph of upper 1 m of 1.7 Ga Baraboo paleoweathering profile examined in drill core 613. (From Driese and Medaris (2008) *Journal of Sedimentary Research*, July issue.)



Photographs of slabbed speleothem deposits sampled from cave in eastern Tennessee and dated using TIMS U/Th. (From Li et al., in preparation.)

Undergraduate Scholars Day Posters Dominated by Geology Students

URSA (Undergraduate Research and Scholarly Achievement) sponsored the first Baylor University Undergraduate Scholars Day programs in Spring 2008. Twenty-nine oral presentations in social science and the arts were given on April 22, 2008 in the Bill Daniel Student Center. On April 24, thirty-one poster presentations in science, engineering, business, and education were displayed from noon until 4 PM in the Ken and Celia Carlile Atrium of the Baylor Science Building. Eight of the poster presentations were given by Geology majors. Physics came in second with 3 presentations. Geology student participants were: Gabriela Keeton (Grain Size Distribution and Organic Matter Content from Paleosols that Span the Cretaceous-Tertiary Boundary, Big Bend, Texas, senior thesis under Steve Dworkin); Davis Walker (The Anatomy of Petroleum Exploration in the Gulf Coast, colloquium project); Adam Damman (Archean Glaciation: Mechanisms and Termination, colloquium project); Stephen Secrest (Newly Recognized Faults near Belton, Texas: A Display of Preliminary Results and Measurements, senior thesis under Vince Cronin); Alexander Dixon and Debra Jennings (Provenance and the Early Diagenetic Alteration of Volcanoclastic Material Incorporated in Fluvial Channel Sandstone Deposits, Morrison Formation Near Capitol Reef National Park, Utah, senior thesis under Steve Driese); Chris D'Aiuto (Understanding and Solving Water Issues, colloquium project); Ryan Lindsay (Applying SLAM to the Wells, Nevada Earthquake, February 21, 2008, senior thesis under Vince Cronin); and Michelle Diehl (The North American Outlook for Petroleum, colloquium project). Deadline for submission of abstracts for the Spring 2009 Scholars Day will be in late fall 2008.

Dr. John Dunbar

2008 was a year of finishing externally funded projects for John Dunbar. A joint Biology/Geology study of salinity in Lake Whitney, funded by the EPA, a study of reservoir survey methods, funded by the Texas Water Development Board, and a survey of flood control reservoirs in McCulloch County, funded by the Texas Soil and Water Conservation Board were all brought to successful conclusions during the year. John and graduate students Sikiru Amidu and Heidi Estep presented results of these and other projects at the SAGEEP conference in Philadelphia in the April. One of the highlights of the trip was trying out a range of near surface geophysical instruments in the mall between Independence Hall and Liberty Bell Center. Sikiru defended his dissertation in July and has moved on to a position with ExxonMobil. Heidi is teaching geology at Houston Community College while finishing her dissertation.

In June John went on a research cruise to Mississippi Canyon Block 118, Gulf of

Mexico as part of his DOE funded electrical resistivity study of methane hydrates. The cruise was to be the initial sea trial of John's new seafloor resistivity instrument. However, during the initial experiments, sharks bit off 200 m of the 500 m long electrode array. While sharks are known to bite seismic streamers, it is rare. John seems to have had some bad luck. After repairing the electrode array, John will try again in the fall. The worst part of the experience for John, as wife Anna describes it, was having to explain to DOE how "a shark ate his homework".

On the home front, John's daughter Tamura is 15 years old and will enter the 10th grade at Vanguard College Preparatory School in the fall. She attended Baylor's University for Young People in June. In July she visited Vanderbilt University and the Great Smoky Mountains National Park in Tennessee with her parents. She is also looking forward to volunteering at the Mayborn Museum and learning to drive this summer!



John's wife, Anna, who is a 1978 Baylor Graduate, continues her job as the Regional Director of the Waco office of the Texas Commission on Environmental Quality. Anna doesn't expect the work in the Waco region will slow down anytime soon. On weekends, she is enjoying taking classes necessary to become a certified Master Naturalist. The Master Naturalist program is coordinated by Texas Agrilife Extension (formerly Texas Extension Service) and Texas Parks and Wildlife. The mission of the program is to develop a corps of well-informed volunteers to provide education, outreach, and service dedicated to the beneficial management of natural resources and natural areas within their communities. The Master Naturalists are not nudists (as one person once inquired) nor are they environmental extremists. They are just a group of folks interested in the natural world around us — a group in which Anna fits in quite nicely.



John Dunbar with seafloor resistivity instrument

Dr. Steve Dworkin



This was a busy year that included quite a bit of field work and lab work. At the end of last summer, Isaac Westfield (masters student), two undergrad field assistants (Emyris Lane and Adam Damman), Sandy (my dear wife) and me all went to Jamaica to investigate reef mortality. We sampled marine sediments, soils, and rocks. In October Stacy, Lee and I went to the Petrified Forest National Park and began measuring section for a new terrestrial paleoclimate reconstruction project. Right before Christmas, Lee Nordt and I took two undergraduates, who are doing senior theses, to Big Bend and we sampled and described paleosols. We went back to the Petrified Forest over Spring

break, this time with two more undergraduates who are doing senior theses.

In the lab, I worked on getting the new laser grain-size analysis instrument up and running. My senior thesis student, Gabby Keeton, has now generated quite a bit of data on this instrument and she presented her results in a student research day at Baylor. I also worked on developing semiquantitative mineral abundance determinations on the X-ray diffractometer. Jenny Seitz, who is also working on a senior thesis, used this method to investigate the intensity of mineral weathering on paleosols in Big Bend. The two other senior thesis students, Lisa Turpin and Amy Fitzpatrick, have started to generate data but are in the early stages of their projects. EnCana donated a planetary ball mill to our laboratory, so we can now crush up rocks in an efficient manner. The last exciting addition to our laboratory facilities is a mass spectrometer that will apparently be installed some time in the upcoming year.

I have two other masters students who are studying organic geochemistry. Stephen Clark has been gathering Cretaceous rocks in central Texas in order to quantify and characterize the organic matter within

them. Jana Edwards is studying the organic geochemistry of the Barnett shale in a study that is being supported by EnCana.

If you throw in trips to GSA and AGU, my new responsibilities as graduate program director, chairing the search committee for the geophysics position, and a ski trip to Colorado — this was a busy year!



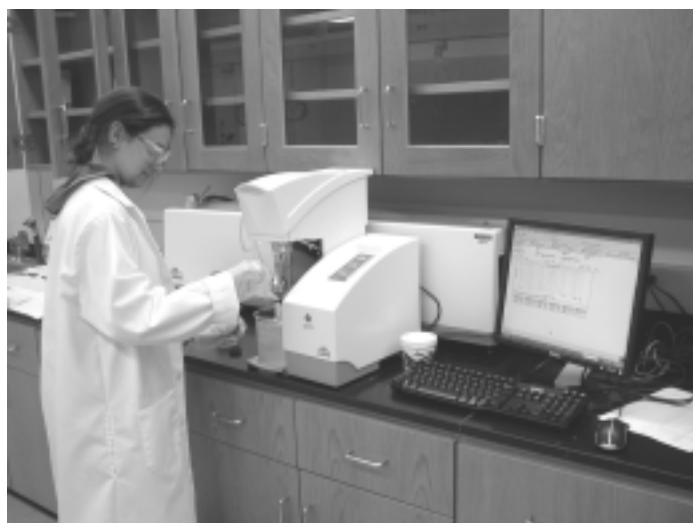
Sandy and Steve at Carnival



Steve and Sandy in Jamaica



Geochemistry Class Project



Gabby Keeton performing grain size analysis



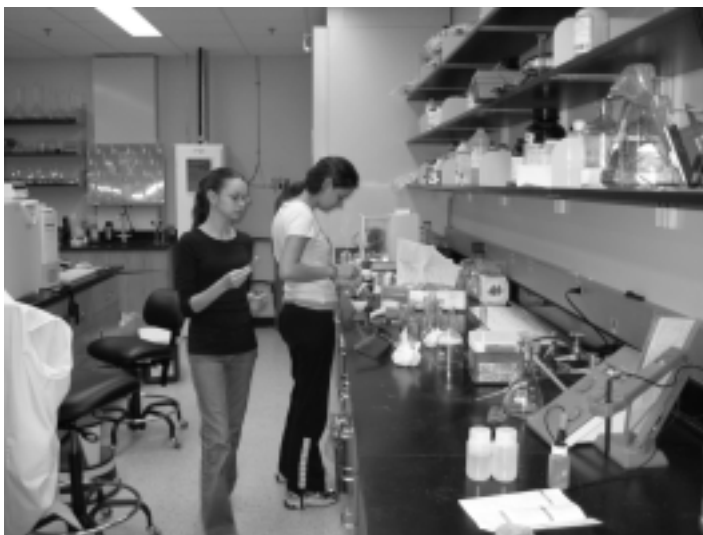
Jana Edwards in the lab



Funnel Heads: Gary Stinchcomb, Holly Meier, Jason Mintz



Jenny Seitz running samples on the X-ray machine



Lisa Turpin and Gabby Keeton in the lab



Jana Edwards collects samples for the isotopes class



Isaac Westfield and Emyris Lane in Jamaica

Field Camp 2008



All the boys on the edge of the Grand Canyon



Field Camp 2008



Breakfast in Yellowstone



Dr. Don Parker



Colby Wright, Jenny Seitz, Gabriela Keeton, & Alex Dixon



Dr. Steve Dworkin



Sandy Dworkin



Amy Fitzpatrick, Lisa Turpin, & Gabriela Keeton



Steven Secrest, the lunch lady



Animals in camp at Yellowstone

Field Camp 2008



Gabby & Jenny



Gabby, Lisa, & Sandy



Sic Em Bears



Hard at work



Laundromat fun



*Gabriela Keeton &
Jenny Seitz*



looking for quartz



Steve, Sandy, Ryan, Steven, & Adam

Dr. Zhaodong (Jordan) Feng



Last Year: 2007 was not supposed to be my lucky year (I “inherited” my superstition spirit from my Chinese ancestors) and indeed I had a worst fieldtrip experience ever. A group of us spent nearly two months in Kazakhstan (2007 summer) drilling Balkhash Lake and we were emotionally tortured and financially drained by the corrupted Kazakhstan political system. Following example (just one of many) may be sufficient to illustrate my point. Entering Kazakhstan and preparing for the fieldtrip within Kazakhstan nearly consumed all our VISA-granted time (30 days) and we have to extend our visas. We paid the fees and provided all required documents (seven official documents were needed), but we were rejected three times for no reason.

This Year: 2008 may be my lucky year and it is the year (among my 18 years of proposal writings) that marked my maximal effort in proposal submissions: I submitted as many as 5 proposals in a single year (I am sorry for myself: I have been using the number of proposal submissions to measure the level of my academic effort and using the number of funded proposals to measure the level of my academic success). Following is the list of those five proposals: (1) High-resolution Holocene Bioclimatic Reconstruction from Lacustrine Sequences in the

Westerlies-Dominated Central Asia (to US. NSF); (2) Mid-Holocene Bioclimatic Changes in Central Plain of China and Their Archaeological Implication (to US NSF); (3) MIS-3 Bioclimatic Differentiation in the Chinese Loess Plateau and its Large-scale Significance (to US. NSF); (4) Climatic and Environmental Changes in Northwestern Xinjiang of China since Late Glacial (to Chinese NSF), and (5) Investigating the Dynamics of Nature-Human Coupled Systems in Arid Central Asia (to Chinese Ministry of Sciences and Technologies). I will let you know the level of my 2008-proposal success in next annual letter.

Teaching: I offered EARTH SYSTEM SCIENCE (GEO-5389) for the first time at Baylor (it is the fifth time I taught the course). I have always enjoyed teaching this course because it forces me to streamline my knowledge that I have accumulated for my research (I have been constantly and tirelessly upgrading my knowledge in paleoclimate research). The streamlining processes in turn help me greatly in my research (e.g., paper and proposal writings). In addition, I have been benefited greatly from students’ participation in the class (e.g., presentations

and final papers) that effectively expanded my knowledge bases. Some of the students did extremely well. Some others may have felt overwhelmed by my teaching (I did cover a lot of ground in my lectures and asked them to read a lot too), but I am sure that they will appreciate some day what they have learned. I have to admit that I seem to have problem in attracting students in my EARTH SCIENCE (GEO-1408) teaching. My teaching of the same course was reasonably well received in New Jersey (I taught at Montclair State for 11 years). My “inadequacy” at Baylor is probably due to my accented and bookish English. I am determined to do my best in my 1000-level class teaching, although I am aware of the fact that my English is going to be slow to improve after my being in USA for 23 years.

Daily Life: I have been trying to swim on daily bases (for past 8 years), but the proposal writings interrupted my routine twice this year (around January 15 and around March 1, 2008). Shirley (my second daughter) has been doing extremely well in her school, being a straight A student. She wants to work (for the first time) this summer if she can find a job. My first daughter, Xueyan, has been working for CitiGroup for 3 years now and is thinking



Zhaodong (Jordan) Feng in Ulaan Baatar, the capital city of Mongolian Republic

of going to graduate school.

Personal Changes: Several “positive” changes resulted from passing one more year: 2.2% increase in weight; 3.3% increase in gray hairs; 4.4% increase in facial wrinkles, 5.5% increase in waist. “Negative” changes occurred only in following two areas: 3.333% decrease in height, 2.222% decrease in vision. I plan to improve those percentages in coming year.



Jordan and his Chinese colleagues were drilling Lake Ugiy in western part of Mongolian Republic



Jordan was with Kazakhstan colleagues in eastern part of Kazakhstan Republic (sampling loess-paleosol sequences)



Jordan with his colleague in western part of the Chinese Loess Plateau, China (investigating soil erosion problems)

Gary Stinchcomb, Ph.D. Student Summer Research Trip to China



Master Li: This is a photo of Jin Gua Li and myself. He is a local farmer that helped us dig trenches and steps to access the S5 and S4 paleosols along the Luochuan section. It turns out, he helped Tungsheng Liu over 20 years ago along the same section! I was honored to work with him!!!



Xi Gua: ... means watermelon. A shot of some local farmers and their produce. The watermelon is very good here and grown solely from precipitation derived from the monsoons... no irrigation.



LuochuanSection: This is THE classic section for Chinese loess studies. The monument is a tribute to Tungsheng Liu and his pioneering paleoclimate work here (... Liu et al 1985, “Loess and the Environment”).



Yardong: You can find these all over the plateau. They are typically found along or below paleosol layers. The enrichment of clay from soil weathering has reduced the permeability and acts as a natural “waterproofing”.

2007 GSA Meeting



Sikiru Amidu Luke Hunt Stephanie Capello and Jason Mintz



Aislyn Trendell & Dave Cleveland

Dr. Don Greene



In June, 2008 Don and Alison took an extended trip through the American west. This classic tour seemed to be a victory lap of most of the National Parks including Carlsbad Caverns, Grand Canyon, Zion, Bryce, and Rocky Mountain. Of course they visited much more between the Parks such as the Very Large Array in New Mexico and their favorite locations near Frisco, and Pikes Peak, Colorado. The enclosed photo was taken at Emerald Lake in Rocky Mountain National Park.

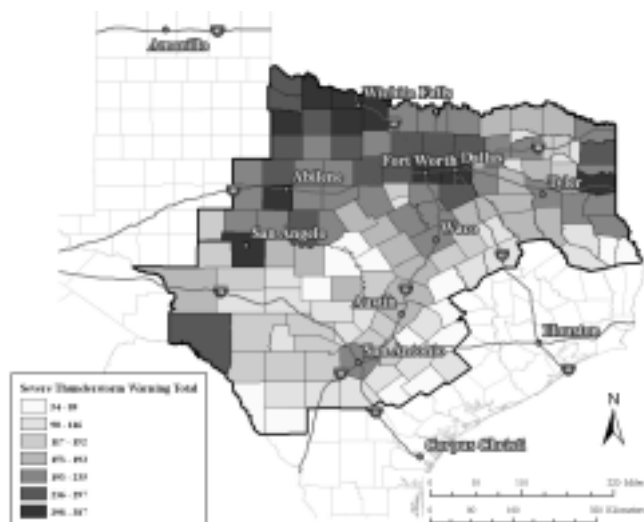
Don recently expanded his community service in behalf of the State of Texas and the

Texas Department of Transportation. In April, 2008 Don was selected to serve on the Citizens Committee for the Trans-Texas Corridor. The Trans-Texas Corridor is a proposed highway expansion that will parallel Interstate 35 from Laredo to Gainesville, Texas. As one of 18 committee members for the entire state, Don is specifically tasked with representing citizen, business, and government interests for Central Texas. This is a working assignment that requires a considerable amount of study and preparation as well as public interaction for each of the monthly meetings.

Future automobile traffic will dramatically increase along I-35, with 15 million Texans currently living within 50 miles of the corridor. Truck traffic alone will expand four-fold along the old I-35 corridor by 2020, so there is no question that a solution will need to be found. Happily, Don has noted a strong interest by the committee in the development of a high-speed passenger train as part of the solution. Regrettably, Don has also noted a strong “intensity of emotion” associated with the Trans-Texas Corridor. Perhaps the old Texas saying needs to be updated: “Whiskey is for drinking and water (and the TTC) is for fighting”. Thoughtful

ideas are gladly received at don_greene@baylor.edu.

Under the supervision of Dr. Don Greene, Mr. Kevin Barrett successfully defended his thesis in March 2008. Kevin originally completed his bachelor's degree in the late 1980's, while completing all but his master's thesis in the early 1990's. During the 16 year interval Kevin Barrett has been a broadcast meteorologist at several Texas stations. As you may recall, Don was also a broadcast meteorologist from 1996 to 2006. From this experience, Don and Kevin had both noted a seeming geographic disparity by the National Weather Service in the issuance of severe thunderstorm warnings in Central Texas. Accordingly, Kevin's thesis was able to statistically prove that there is a distance bias such that locations nearest the Fort Worth office are “over-predicted” for severe weather while more distant locations tend to be neglected. Since most severe weather in Texas sweeps in along a squall line from the northwest, a directional bias was also detected. “Upstream counties” such as Parker, Jack, and Wise were over-predicted while counties southeast of Tarrant County tend to be neglected. The accompanying map illustrates the uneven distribution of severe thunderstorm warnings for Central and North Texas. Kevin will continue his research in this vital area while pursuing his doctorate in Geography at Texas State University in the fall 2008.



Don and Alison Greene

Background

I was born and raised in Hong Kong. I received my high school and undergraduate education in Canada. After that, I went to University of Wisconsin for my graduate degrees. My interest in water science developed gradually throughout my college and graduate school years. I am most interested in drinking water research because of its significant role in public health. One of my long-term goals is to conduct research that would improve the sanitation in developing countries through providing safe drinking water.

Research

As issues surrounding water research become increasingly complex, a thorough understanding of science and engineering factors becomes more critical to the successful resolution of current problems and the prevention of future problems. Despite moving full speed ahead on nanomaterial development and applications, the possible risks of this emerging technology have not fully been considered. To date, there are only a few recent studies that have discussed the potential negative impacts of nanotechnology. In the absence of sufficient technical data, the safety of engineered nanoparticles is unknown. Nanoparticles are ubiquitous in the environment. For example, metal-sulfide colloids are found in a variety of aquatic systems including mine drainage, anaerobic sediment porewater, wastewater effluent, and hydrothermal vent ecosystems. With large and active surface areas, engineered nanoparticles are expected to behave like naturally occurring colloids. They could provide an avenue for rapid and long-range transport of contaminants in the environment. Responsible researchers should not only demonstrate the benefits of nanotechnology but also characterize the potential risks associated with their implementation. My research interests lie in the science and technology of nanoparticles in aquatic systems. I am interested in identifying

the exposure through investigating the fate and transport of nanomaterials so that more accurate quantitative risk assessment can be performed. This is a broad line of inquiry deals with the behaviors of colloids on surfaces and interfaces. I would like to aim at addressing fundamental research questions, such as: What are the roles of environmental nanoparticles and biofilms in contaminant transport? and What processes promote/inhibit the stability and mobility of biotic and abiotic colloids?

Teaching

My primary interest is to teach undergraduate and graduate courses related to nanoparticle science and technology. I am interested in teaching my core research areas and develop new courses such as: (1) stability and mobility of aquatic nanoparticles: properties and processes, (2) sol-gel based nanomaterial fabrication and characterization, and/or (3) environmental issues of nanotechnology. In addition, I am going to teach a freshman-level course — Geo 1403 Environmental Geology. Last but not least, I look forward to collaborating with faculty members from across campus to teach interdisciplinary courses.

Integrating Christian Faith with Intellectual Life

As Christians, we are being called to respond to the Great Commandment (Mark 12:28-31). My calling is to contribute to the mission of providing sustainable access to safe water and an opportunity to hear the “Living Water” message (John 4:1-30) in developing countries and disaster areas. My response to the Great Commandment is to conduct water research and outreach in order to provide safe drinking water. One of the ways to implement my response is to develop collaborations with nonprofit Christian engineering organizations to enhance students’ participation in water works for developing countries. With a view to integrate my Christian faith and intellectual life, I will seek opportunities for service that will benefit the people in need, my students, and my scholarship.



Recent Publications

Gaillard, J.-F., C.Chen, S.H. Stonedahl, **B.L.T. Lau**, D.T. Keane, and A I. Packman. 2007, Imaging of colloidal deposits in granular porous media by X-ray difference micro-tomography, *Geophys. Res. Lett.*, 34, L18404, doi:10.1029/2007GL030514.

Lau B.L.T., Harrington G.W., Anderson M.A., and Tejedor I. 2005. Physicochemical aspects of *Cryptosporidium* surrogate removal in carbon block filtration. *JAWWA* 97(2): 92-101.

Lau B.L.T., Harrington G.W., Anderson M.A., and Tejedor I. 2004. Removal of nano and microparticle by granular filter media coated with nanoporous aluminium oxide. *Water Sci. and Tech.* 0(12): 223-228.

Hsu-Kim H. and **Lau B.L.T.** Aggregation of Zn-sulfide nanoparticles in the presence of thiolcontaining natural organic ligands. Submitted to *Geochim. Cosmochim. Acta*.

Lau B.L.T., Harrington G.W., and Anderson M.A. Bacteriophage MS2 and arsenate removal from groundwater by nanoporous aluminum oxide coated granular filter media: a pilot-scale evaluation on the effect of pH and coating quantity. Submitted to *J. Water SRT -Aqua*.

Lau B.L.T., Packman A.I., Atwill E.R., and Harter T. Influence of *Pseudomonas aeruginosa* biofilms on the interaction of *Cryptosporidium parvum* oocysts with streambed sediments. In preparation for submission to *Appl. Environ. Microbiol.*

Lau B.L.T., Chen C., Packman A.I., Gaillard J.F., Keane D.T. Pore-scale analysis of colloid deposition in porous media by synchrotron x-ray computerized microtomography: effects of particle size and chemical conditions. In preparation for submission to *Environ. Sci. Technol.*

Chen C., **Lau B.L.T.**, Packman A.I., Gaillard J.F., Keane D.T. Temporal evolution of pore geometry, fluid flow, and solute transport resulting from colloid deposition. In preparation for submission to *Water Resour. Res.*

Dr. Lee Nordt



David Cleveland completed his Ph.D. in December of 2008 and was able to publish three outstanding peer-reviewed journal articles on late Triassic sequence stratigraphy, paleosols, and climate of the southwestern U.S. Chris Gotcher has conducted similar field work in the upper Triassic at Petrified Forest National Park that will result in a manuscript submission in August of 2008. Steve Ahr has completed part of his field work for his dissertation on an Alfisol climosequence along Tertiary formations of west-central to east-central Texas. Holly Meier will begin her dissertation field work this summer studying the alluvial and archaeological history Owl Creek on the Fort Hood Military Reservation..

In the summer of 2008, Steve Driese and I will prepare a pre-meeting Vertisol Climosequence field guide for GSA in Houston (October). Steve and I will also host a Pardee Symposium at GSA on the critical zone and



Atchley and Nordt "on the edge" in Petrified Forest National Park.

modern-ancient soil analogs.

I taught *Global Soil systems* in the fall of 2007 for my graduate students. I continue to serve on the Editorial Board of the journal *Geology* and completed years of service on the editorial board of *Geoarchaeology-An International Journal*.

Garrison completed his second year at Mary Hardin Baylor playing on the golf team. Incredibly in the spring of 2008 Garrison's team won their conference and subsequently an invitation to the national tournament in Georgia. I am even more proud of him being recognized as Academic All Conference.

Kaylee has completed her freshman year in High School and will soon be driving! Kaylee made the freshman volleyball team at Midway and is playing select volleyball now. She also continues to maintain good grades in school.

Kathy continues to enjoy working as outpatient surgery interview nurse at Providence Hospital. As always, she keeps the household going and is in the process of planning our new home.

We make frequent trips to Brenham and continue to be grateful for the relationships we have with extended family.

We hope all is well with you and your families and look forward to seeing you all during homecoming weekend!

Publications:

Cleveland, D., **Nordt**, L., and Atchley, S. (2008). Paleosols, trace fossils, and precipitation estimates of the uppermost Triassic strata in northern New Mexico. *Palaeogeography Palaeoclimatology Palaeoecology* 257:421-444.

Nordt, L., von Fischer, J., and Tieszen, L. (2007). Late Quaternary temperature record from buried soils of the North American Great Plains. *Geology* 35:159-162.

Cleveland, D., Atchley, S., and **Nordt**, L. (2007). Continental sequence stratigraphy of the upper Triassic (Norian-Rhaetian) Chinle strata, northern New Mexico, U.S.A.: allocyclic

and autocyclic origins of paleosol-bearing alluvial successions. *Journal of Sedimentary Research* 77:909-924.

Presentations, Lectures, and Other Scholarly/Creative Activities:

Nordt, L. (2007). Grassland evolution of the southern Great Plains of the U.S.A. Society of American Archaeologists, Austin, TX (April) (invited).

Gotcher, C., D., Atchley, S., **Nordt**, L. (2007). The mid-Norian paleolandscape of the Newspaper interval within the Blue Mesa Member of the Chinle Formation in Petrified Forest National Park, Arizona. Geological Society of America meetings, Denver, CO.

Cleveland, D., **Nordt**, L., Atchley, S. (2007). Paleosols and pedogenic isotopes as evidence for extreme late Triassic climatic events, Chinle Formation, northern New Mexico. Geological Society of America meetings, Denver, CO.

Grants, Contracts, Patents, Software Copyrights:

Atchley, S. and **Nordt**, L. (2007). The interrelationship of sequence stratigraphy, paleoclimatology, and terrestrial ichnology in Triassic paleosol-bearing alluvial successions, Moenkopi and Chinle Formations, southwestern United States. Petroleum Research Fund (continuation, \$80,000).

I was fortunate to have the article above (*Geology*) recognized in:

Inside Baylor, President John Lilley
Post Chronicle of New York
Miami Herald
United Press International



Kaylee and Garrison at the beach in Pensacola, Florida.

Dr. Don Parker

Once again, Don taught field camp, spending most of his portion in Durango, Colorado, and the remainder in central Colorado near Buena Vista. There were five students in 2007 (and 12 enrolled for 2008 — numbers of majors are up). In August, Don went into the field in New Mexico and Colorado with Ph.D. student Daniel Wegert.



Conejos Formation



Natural Arch, Big Bend



Petrology Class examines ignimbrite in S. Colorado

They spent time sampling units of the Raton-Clayton volcanic field, the Nathrop rhyolite domes near Buena Vista, and the McDermott Formation (a late Cretaceous volcanoclastic unit in southwestern Colorado). They also visited briefly with Don's son, Travis Parker, who was stationed at Fort Carson in Colorado Springs and who is now serving in Iraq.

In fall 2007, Don taught Analytical Techniques in Geochemistry, focusing attention upon the newly acquired Rigaku automated X-ray fluorescence unit acquired in July 2007 with the help of geology alumnus Ken Carlile and the University. The unit was rapidly brought up to standards previously obtained by the older Siemens unit and awaits use in student investigations. Don also taught Petrology, which included a five-day field trip to look at volcanic terrains in New Mexico and Colorado.

In spring 2008, Don taught Volcanology and Rocks and Rock-Forming Minerals with 16 students. The Department's mineral collection was bolstered through the donation of an extensive, well-curated collection by the late S.M. (Pat) Murphy and his wife, Myrna Murphy, of Richardson, Texas. This collection will provide needed examples of



Yes, that looks like a Rattlesnake. Don Parker and Ph.D. student Daniel Wegert



rare minerals, some specimens for display, and money through the sale of some specimens.

Don was pleased to see Master's student Anna Perry finish her thesis on the Cascade Head Basalt of the Oregon Coast Range. Anna's work completes Baylor investigations of these interesting and anomalous igneous rocks. As this is written, major papers were being completed with former students John White and Minghua Ren on the Pantelleria volcano in Italy, and on a regional synthesis of Rio Grande Rift magmatism with Nancy McMillan of New Mexico State University.

Don is looking forward to a Sabbatical in fall 2008 (his first in 14 years), during which time he plans on field work in the Oregon Cascades and some badly needed writing.



Volcanology Class at Roadcut

Dr. Daniel Peppe



Dan Peppe points out ash deposits in the Paleocene Fort Union Formation in the Williston Basin of Montana

I would like to take this opportunity to introduce myself and my research to Baylor alumni. In August 2009 I will be joining the Baylor Geology Faculty as an assistant professor with a focus in paleoclimatology. I received my doctoral degree from Yale University in 2008 and am currently working as part of an NSF sponsored research project in conjunction with researchers at Wesleyan University.

My research focuses on integrating paleomagnetism, paleobotany, and paleoclimatology to reconstruct past ecosystems. I rely on this interdisciplinary approach to address the way that terrestrial ecosystems respond to climate change through time. My research program relies on the integration of two different methodologies to approach these questions: megafloral paleobotany and paleomagnetism. I use paleobotanical techniques to reconstruct paleoenvironments, estimate paleoclimate, and examine the evolutionary history of plant communities. Paleomagnetism is used for age dating and correlation. Through this integration, it becomes possible to study plant communities then make regional and global correlations to synchronous ecosystems. Using these

correlations, I can test local, regional, and global hypotheses about evolution, paleoenvironment, paleoecology, and paleoclimate.

While at Yale, my research was specifically focused on examining changes in plant communities in the Paleocene across North America and how these changes corresponded to climate. At Wesleyan I am examining leaf traits and their relationship to temperature and precipitation. The results of this study will help improve current techniques for estimating temperature and precipitation with fossil plants and will have broad applications for understanding climate change through geologic time.

In addition to my research on fossil plants in North America, I have begun work on collaborative research projects in Kenya and the United Arab Emirates (U.A.E.) focusing on the paleoecology of the Neogene and early Quaternary as it relates to hominoid evolution. All of the projects are in their beginning stages, and I plan to focus much of my future research in these areas. Two of the research projects in Kenya are in collaboration with faculty members in the Anthropology Department at Baylor, and I am excited for further inter-departmental collaboration.

I published two peer-reviewed journal papers in 2007 and currently have two papers accepted for publication in the first half of 2008. In 2007 and 2008, I have presented my research at the Geological Society of America meeting and at the International Organization of Paleobotany Conference. One of my research projects in Kenya, where we are studying the fauna and flora of the early Miocene on Rusinga Island, was funded by the Leaky Foundation and we expect to conduct a short field season in January 2009.

My wife and I are looking forward to our move to Waco, and our integration into the larger Baylor community, in the summer of 2009. We hope to meet you then!

Publications:

Peppe, D.J. and Reiners, P.W., 2007, Conodont (U-Th)/He thermochronology: Initial results, potential, and problems: *Earth and Planetary Science Letters*, 258 (3-4): 569-580.

Peppe, D.J., Erickson, J.M. and Hickey, L.J., 2007, Fossil leaf species from the Fox Hills Formation (Upper Cretaceous: North Dakota, USA) and their paleogeographic significance: *Journal of Paleontology*, 81(3): 550-567.

Peppe, D.J., Evans, D.A.D., and Smirnov, A.V., *in press*, Magnetostratigraphy of the Ludlow Member of the Fort Union Formation (Lower Paleocene) of the Williston Basin in North Dakota: *Geological Society of America Bulletin*.

Peppe, D.J., Hickey, L.J., Miller, I., Green, W., *in press*, A preliminary investigation of the Aspen Shale flora (Albian, Wyoming, USA): a floral catalog: *Peabody Museum of Natural History Bulletin*.

Peppe, D.J., McNulty, K., Harcourt-Smith, W., Dunsforth, H., Cote, S., Van Couvering, J.A., *in review*, Stratigraphic interpretation of the Kulu Formation (Early Miocene, Rusinga Island, Kenya) and its implication for primate evolution: *Journal of Human Evolution*.

Presentations:

Peppe, D.J. and Hickey, L.J., 2008, Plant community response to mass extinction and climate change in the Paleocene Williston Basin of North Dakota, USA: *International Organization of Paleobotany Conference*.

Peppe, D.J., Hickey, L.J., and Evans, D.A.D., 2007, Floral change in the North American Paleocene: Abstracts with Programs — *Geological Society of America*, 39(6): 192.



Dan Peppe and a Ugandan researcher in Kibale National Park, Uganda conducting a botanical transect.

Dr. Jay Pulliam



Dr. Pulliam in Puerto Rico

I am joining Baylor after spending the last thirteen years as a research scientist at the Institute for Geophysics at UT Austin. I am excited about making the transition to being a member of Baylor's faculty and believe that my background will benefit the Geology Department and its students. I have felt the excitement that comes with making a new discovery about the Earth—or just learning something new to me—and I want to help Baylor students experience that same thrill. This is an especially good time to study geophysics in Texas—thanks, in part, to the high price of oil and the resulting resurgence of the petroleum industry but also to new research opportunities provided by both industry and the National Science Foundation. The sort of research I am pursuing concerns fundamental tectonic problems and connections between the lithospheric mantle and crust and surface geology, so it has some appeal for students who are heading toward industry as well as students who want to make a career in academia. Also, this sort of “field-based observational seismology” is accessible to both undergraduate and graduate students, so I think it is especially appropriate for Baylor. I will describe my research in more detail below but first I will give you a little of my personal history. It seems, in retrospect, like I made a long, roundabout journey to get here—but I am happy to have arrived at Baylor.

My personal history

I grew up in Delaware and southeastern Pennsylvania, then skipped across the country for my first two years of college (Deep Springs College, in eastern California), then back east to graduate from Cornell University in Ithaca, New York, then back to California to attend graduate school at UC Berkeley. After logging so many miles I was surprised to find two of my mates from elementary school in Newark, Delaware studying geophysics at Berkeley as well. All three of us graduated at about the same time and are all still in the academic side of geophysics—but I still don't know why we ended up in the same field, studying at the same school.

After Berkeley I spent two years as a postdoc in The Netherlands at the University of Utrecht. While in Utrecht I married Mara Pfund (who is American—we met in Berkeley) and our first son was born, so it was a busy time. When we announced to our Dutch friends that we planned to name our baby “Cody”, there were quite a few murmurs along the lines of “wow, what an unusual name... never heard of that one before... etc.” But the first time we took him to see a doctor in Austin (we moved there when Cody was three months old) there was a different sort of confusion in the waiting room. When the attendant called “Cody”, three other kids and their parents responded. We took that as a sign that Texas was intended to be our home and we have stayed here ever since. Cody is now 13 and his younger brother, Fox, is 10. Fox is the only one of us who can claim to be a native Texan, since Cody was three months old when he arrived (I was going to say “stepped foot in Texas”, but of course he wasn't walking at the time). Now Cody and Fox are both competitive soccer players and avid readers of fiction.

Mara is a teacher, currently of kindergarten, although she has taught first grade and special education in the past. Mara's first language was German because her mother is

from Berlin and her father's family is German as well. She also spent about half of her childhood in Austria and Germany—her father was a diplomat with the U.S. State Department. Since it is the language she speaks with her family, Mara has consistently spoken German with Cody and Fox since they were born. Although I still don't speak German myself, I have learned some, through listening to them.

Our household also includes two dogs—former strays that we adopted on separate trips to Puerto Rico—and two cats (also former strays that we adopted in Austin).

In 2004-2005 we all spent a year in Mayagüez, Puerto Rico, where I taught at the University of Puerto Rico and did research at the Puerto Rico Seismic Network and Mara home schooled Cody and Fox.

One component of my research focuses on the Northeastern Caribbean and, although I already had professional “contacts” in Puerto Rico and the Dominican Republic, spending a year there allowed us to develop real friendships as a family and be immersed in a very different culture. We took many “fieldtrips” as a family—some with my geologist colleagues—and it all fit nicely with Mara's home school program, taking full advantage of our flexibility. We now have close friends in Puerto Rico and hope to return regularly (although we can't afford to bring back any more dogs).



Dr. Jay Pulliam (on the right) in the Dominican Republic



In Sao Tome, off the Coast of Africa

I have a younger sister, a brother-in-law and two nephews in Austin and an older sister, brother-in-law and two nieces in Calgary, Alberta. My parents both retired from the University of Delaware a few years ago and now live in Canmore, Alberta—so after being scattered in four different locations for most of my adult life, my family has now gravitated into two clusters. With one cluster in central Texas and another in central/western Alberta, it is easier to see everyone regularly. When I was first looking around Baylor's web pages I came across a picture on Stacy Atchley's research page that looked very familiar. I finally realized that it was taken near my parents' house outside of Canmore, AB.

To round out my personal interests: I enjoy bicycling, hiking and cross-country skiing and have, at various times in my life, been a fairly serious player of soccer, tennis, and ultimate Frisbee. I still play all three of those occasionally but, more often, I drive my sons around to their soccer practices and games. I also enjoy traveling—whether work-related or not—and reading fiction and history.

Research interests

My research uses energy generated by earthquakes to study the structure of the deeper parts of the Earth—the deep lithosphere, mantle, and core. Since earthquakes tend to occur in the same locations over and over, I need to install instruments in some unusual places in order to record waves that illuminate interesting features. So far these activities have taken me to West-central

Africa (Equatorial Guinea, Cameroon, Gabon, São Tomé and Príncipe) and the Caribbean (Dominican Republic, Puerto Rico, U.S. and British Virgin Islands) as well as Texas, New Mexico, California, and Nevada, as well as offshore. Since more than three-quarters of the planet is covered by water, we have developed ocean-bottom seismographs (OBSs) that can record ground motion on the seafloor. Subduction zones, for example, tend to create nests of earthquakes that are just offshore, and so any seismographic network will be incapable of locating and evaluating earthquakes reliably. We need to deploy OBSs on the seafloor in order to understand what is happening in the subduction zone. The availability of this tool (OBSs) has also led to combination onshore/offshore experiments in which we record marine surveys with instruments onshore, to study the ocean-continent transition, for example, and to collaborations with companies in the exploration industry. I recently learned that an OBS project Mrinal Sen (of UT Austin) and I had proposed to study the plate boundary near the Andaman Islands will be funded. The Andaman Islands are part of India, although they lie close to Burma (Myanmar); the plate boundary is quite complicated there and it is where the rupture associated with the great Sumatra earthquake of December 26, 2004 stopped. The redistributed stress has led to an increase in earthquake activity in this region, which is what we will record with ocean bottom seismographs.

However, thanks to NSF's EarthScope project, a decade-long, multi-disciplinary initiative to study the North American continent at a variety of scales, I will be conducting most of my fieldwork closer to home for the next few years. I have a project funded by NSF (called *SIEDCAR: Seismic Investigation of Edge Driven Convection Associated with the Rio Grande Rift*) to study structure and processes associated with the Rio Grande Rift that will require me to deploy 75 instruments in eastern New Mexico and west Texas from 2008-2010. Another

EarthScope-funded project is aimed at the Gulf Coast margin, where deep sediments have kept us from learning the nature of the rift that created the Gulf of Mexico and details of the transition from oceanic crust across stretched transitional crust to the Llano Uplift.

My goals for Baylor students

I hope to prepare students for careers in academia, industry, and government research. Many of the techniques are directly transferable from lithospheric-scale studies to an exploration setting and the overall approach, which emphasizes integrated, multi-disciplinary studies, is one that is highly popular in the oil patch. Beyond specific techniques, carrying out a novel research project from conception to experimental design, data acquisition, analysis and publication is a valuable—and often difficult—experience for a student. Yet that is how one develops the skills and confidence to do research, so I will require my students to participate in all these stages of research. Although each graduate student research project I supervise will likely be related to an externally-funded umbrella project, each will require ingenuity and creativity on the part of the student advisee. My goal for each undergraduate who completes a senior thesis with me is that he or she should be in a better position to choose a career within the geosciences, know how to negotiate the myriad possibilities for further training, and be well prepared academically to be successful



In Equatorial Guinea, Africa

in that training.

Regarding Baylor's Central Texas location

Most of the continent's currently active tectonics occur in the west, which results in numerous outcrops. Who doesn't like to hold a rock in their hand and spin a story about regional geology? Studies of tectonics in the Texas region are, in comparison, underappreciated (even by Texans, in my experience). The heavy sediment load (second only to the Bengal fan) warps the Gulf Coast downward and must have produced uplift in the vicinity of Waco (along the Balcones Fault System), extension, and "active tectonics" in a unique fashion. In places along this margin there are 15 km of sediments lying on top of crust that is (perhaps) only 10 km thick. This is a unique situation (barring the Bengal Fan) and we therefore need to use remote-sensing tools, such as seismology, gravity, magnetics, and magnetotellurics, to model and understand what happened here. EarthScope is providing some of the tools we need, and a new program at NSF provides funding (on a competitive basis) to pay graduate students, undergraduate students, and field costs to conduct focused studies that require the acquisition of new data. In fact, there is a cadre of us that is trying to convince the National Science Foundation that this region should be a centerpiece of the EarthScope program, and thus receive a larger share of its resources. I will report our success or failure in this space next year.

Regardless of that outcome, however, Baylor students and I will carry out the sorts of studies I described above with the ample resources made available to us by the University. I therefore expect new insights to emerge concerning about Texas' new frontier—the one thousands of feet beneath us. These insights will extend far beyond Texas; since the majority of the world's continental margins are similar to ours.

Elan Allen Field Safety Scholarship

The Elan Allen Field Safety Scholarship emphasizes field safety and honors alumnus, Elan Allen. A committee of three faculty who actively work on field projects with students (Peter Allen, John Dunbar and Joe C. Yelderman Jr.) decided the awardee(s). The successful applicant must be recommended by at least one faculty member in the department and then provide the scholarship committee with an example of the way they incorporated safety into their field work. The awardees selected this year were MS students Stephanie Capello and David Coffman. It is the hope of the Department, the scholarship committee and the supporters of the scholarship, that the award and the competition for the award will increase student awareness of field safety. If you would like to contribute to the scholarship fund please send a check to the department with a note that it should support the Elan Allen Field Safety Scholarship.

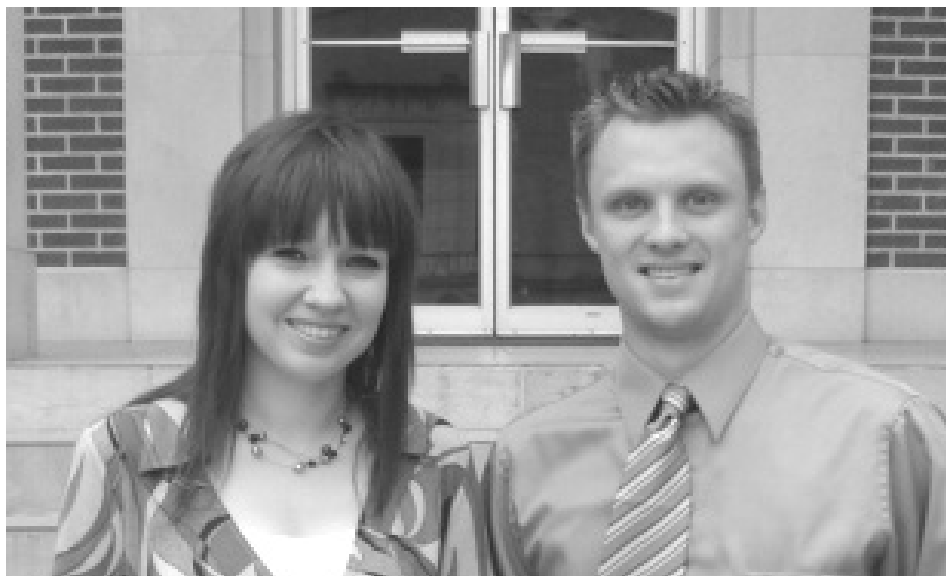


Dave Coffman



Stephanie Capello

2008 Honors Convocation



Janet Cabeen and Adam Damman at the 2008 Honors Convocation

Dr. Joe Yelderman



The big groundwater news this year is the establishment of the McLennan County Groundwater Conservation District (MCGWCD). After participating in the development of the Groundwater Availability Model (GAM) for the Northern Trinity Aquifer in 2004, Dr. Yelderman is now working with the GAM, once again, to aid the newly formed MCGWCD. To complicate the process, the Texas Commission on Environmental Quality (TCEQ) has proposed that McLennan be included in a Priority Groundwater Management Area designation with 4 other counties. These activities promise to provide research opportunities for new graduate students in hydrogeology and plenty of local controversy regarding groundwater.

Dr. Yelderman chaired the hydrogeology search committee this past year as the department added a strategic faculty position to the rapidly growing water research program at Baylor. The search took Joe to the annual meetings for the GSA and AGU where numerous interviews resulted in new friends and colleagues as well as reunions with old friends (see photo). Dr. Boris Lau was chosen for the new Hydrogeology position and will be a great addition to the department. His nanoparticle research will add a new area of Groundwater expertise.

The TIEES program was finally established at BU and Dr. Joe along with several other geology professors have been selected to act as fellows.

The wetland studies continue and Dr. Yelderman is working with Dr. Margaret Forbes on a TCEQ grant with the Galveston Bays Estuary Program to model the hydrogeological functions of coastal prairie wetlands (see photos).

The Baylor Wastewater Research Program (BWRP) continues to flourish and Baylor now has agreements with the cities of Waco and Whitney (see photo) for cooperative research.

Dr. Yelderman is also working with the Center for Spatial Research (CSR) to provide GIS based maps for the City of Woodway to aid in the enforcement of their Escarpment Ordinance and to convert the Environmental Atlas for McLennan County to digital format. In addition, he and his brother-in-law, Rod Squires, are working with the CSR on Riparian buffers along west Texas streams (see photo).

Graduate student Jason Weckbacher completed his MS thesis in geology and is employed in the environmental consulting field in the Boston area.

One of Dr. Joe's most rewarding experiences this past year was working with At-Risk high school students in a program called "Gear Up" to develop math skills using piezometers and groundwater/surface water interactions (see photo).

Dr. Yelderman continues to teach Sunday School at Columbus Avenue Baptist Church. Diane continues to teach Kindergarten at North Waco Elementary. Logan (son #2) completed his sophomore year at Baylor and worked at Camp Ozark teaching skateboarding over the summer. Cal (son #1) is working on an MA in creative writing New Mexico Highland University. Married daughter, Abigail White, lives in Houston where she works as a media traffic coordina-

tor for MarCom Advertising and her husband, Jared, who received his CPA in May, works as an auditor for Price-Waterhouse-Coopers. Dr. Yelderman's mother, Ada Frances, now resides at St. Catherine's care facility off Highway 6 in Woodway. The Yeldermans spent their family vacation in the Texas Hill Country (see photo). The Yeldermans still live at 706 Woodland West, Woodway, Texas and visitors are always welcome.



Dr. Joe with Mentor Dr. Mary Anderson and UW officemate Rich Manser at AGU



Adam Clapp downloading data from waterlevel datalogger in wetland



Bruce Byars planting bulrush in the Whitney wastewater treatment



Cal and Diane Yelderman on vacation in the Texas Hill Country



Gear Up students learning math using piezometers



Abel Tellez and Rod Squires map riparian buffers in Transpecos, Texas



Adam Clapp and wildlife at Brazoria NWR



wastewater treatment wetlands

Graduates

Congratulations to our graduate students who completed their Graduate degrees in Geology this year!

December 2007

David M. Cleveland – Ph.D.

Fluvial Sequence Stratigraphy and Paleoclimate of the Upper Triassic (Norian-Rhaetian) Chinle Strata, Northern New Mexico.

August 2008

Sikiru Amidu – Ph.D.

Electrical Resistivity Imaging for Characterizing Dynamic Hydrologic Systems.

Stephanie Capello – MS

Modeling Channel Erosion in Cohesive Streams of the Blackland Prairie, Texas at the Watershed Scale.

Undergraduate Students

Adam Damman – 2008 recipient of the Robert T. Hill Award for Academic Excellence in Geology

Colby Wright – 2008 recipient of the Dixon Undergraduate Field Assistant Award

Janet Cabeen & Adam Damman – Chosen to represent the Geology Department at the Honors Convocation (2008)

Embrace the Present

*Like a kayaker in a set of rapids
A rower on a lake
Or a sailor on the ocean*

*In life you have to find the rhythm and flow of your life
The rhythm and flow of the environment around you*

*You don't accomplish this by looking behind you or off in the distance
You cannot concentrate on the set of rapids down the river
Or on the other half of the lake
Or on a distant puff of wind running across the waves*

*You find the rhythm and flow of your life by being in tune with the present
By accepting the present
In the act of accepting your current reality
You can then be open to studying it, searching it, and feeling it*

*By being in the moment / in the present
You can identify its unique rhythm and flow
And then embraced today's rhythm and flow
Only then can you can strive to settle into it and understand it*

*The benefit of this state of mind is that you can quit wasting energy fighting it
Then you can find ways:
to coexist with this unique rhythm
to blend with it*

*to use it's peaks and troughs to your advantage to power you through this days dilemmas
This way of being one with life's flow is more efficient
It is less stressful and maximizes the use of precious energy*

*Once you are in tune with today's rhythm and flow
You will be able to react appropriately when conditions change
When the winds shifts or the waves come from a different direction
You can accept your new reality, adjust and a settle into that new rhythm and flow
And find the sweet spot and keep going*

Suzanne Dahl-Crumpler
11/23/06

Baylor Geology alumni Dwayne Crumpler (MS-89) and Suzy Dahl-Crumpler (MS-90) have a daughter, Lydia, who has been diagnosed with leukemia. Suzy has written some poetry as a way to cope and share. We are privileged to be able to share one Suzy's poems in our newsletter with her permission. Please keep this wonderful family in your thoughts and prayers.

Where are they now?



Where are they:

Dr. Nolan G. Shaw (BA, 1951)

Nolan is Professor Emeritus at Centenary College, and after retiring from teaching he formed the company Shaw-Laird, LLC where he drilled, completed and operated wells. Nolan and his wife, Jane Craig Shaw, live in McKinney, Texas and have five children and nine grandchildren. He enjoys spending time with his family, studying Geology, flying, and “taking time to smell the roses”.

Brandee Whiting Lacy (BSED, 1995 & MA, 1997)

Brandee is still living between Ft. Davis & Alpine on the 06 Ranch. She is the mom of Christian, age 6, and Katherine, age 4.

Leah Graham (BA, 1998)

Leah is a registered nurse in the emergency room at North Central Baptist Hospital in San Antonio.

Mark Decatur (BA, 2004)

Mark is an Environmental Consultant in Ft. Worth for Dunaway & Associates. He currently lives in Keller with his wife Allisyn and son Hudson, and is pursuing his Master's degree at TCU.

Congratulations to:

Gary Henry (MS, 2004) & Shane Prochnow (MS, 2001 & PhD 2005) who recently passed the State's Licensing exam and are now registered Geologists.

Paige Clark Adelaide (BS, 1993) on the birth of her daughter, Clark Adelaide, on August 21, 2007.

Claus Hetzer (MS, 2000) and his wife who adopted Armand James Paul (A.J.) on September 9, 2007. A.J. was born on August 22, 2007.

Jason Cipriano (BA, 1998) and his wife on the birth of their daughter, Lainie Elizabeth Cipriano, who was born November 5, 2007. She weighed 7lbs. 13 oz.

Fred (MS, 1996) and Angela (MS, 1996) Nawrocki on the birth of their twins, Lucas & Natalie. Grandparents are Don and Vicky Gaitros.

Lisa Zygo (BS, 1997 & MS, 1999) and her husband on the birth of their second son, Ryan Peter Flynn, on February 18, 2008.

Farewell to:

Dr. Shane Prochnow — He and his family moved to Houston this past summer. Best wishes to them in their new home.

Condolences to:

Dr. Lee Nordt & Family on the passing of his father, Leroy Nordt.

Ruth King & family on the passing of her husband, George King (BA, 1956 & MS, 1963).

David Crass ('81, MS '87) and family on the passing of his wife, Cynthia (Cindi) Jones Crass ('78).



Brian, Kandra, and Kadin Clark visited Dr. Yelderman on 3/3/2008. They live in Little Rock Arkansas and Brian works for the USGS.

Personal Information Needed

Please complete the information and return along with any other information you feel would be useful to us.
This information will be used to update departmental files.

Name: _____ Class: _____

Degree (s): _____

Phone: _____ Email: _____

Mailing Address: _____

Type of Work: _____ Location: _____

Company Name: _____

Family Information: _____

Hobbies: _____

Interests: _____

Spare time activities: _____

Would you like to share information in the Homecoming Newsletter Section, "Where are they now"? Yes [] No []

If yes, write information here: _____

Are you willing to speak to the Department? [] Yes [] No

Topic: _____

Suggestions: _____

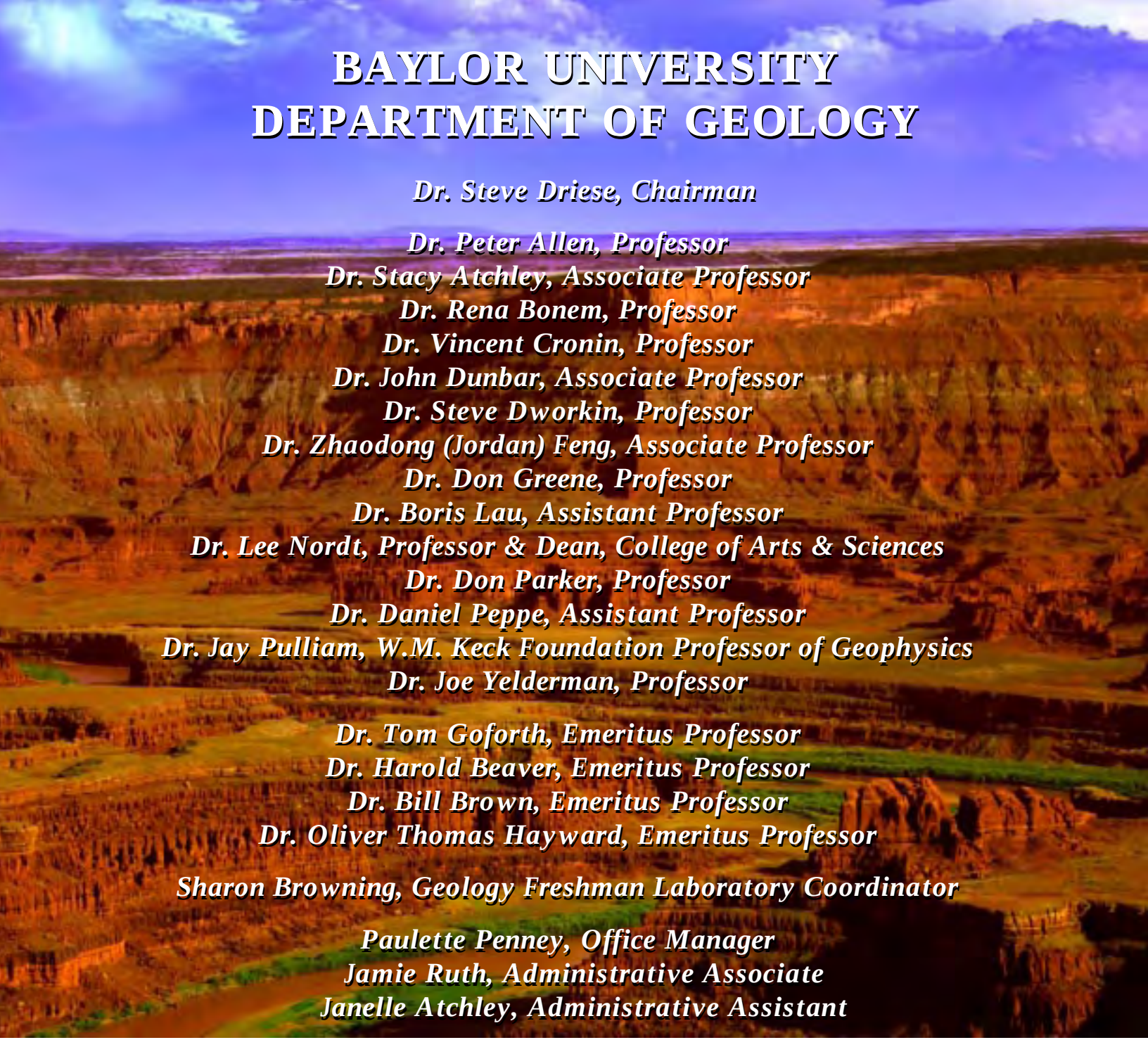
Tear out and mail to:

Department of Geology · One Bear Place #97354 · Waco, TX 76798-7354
Or Email to Paulette_Penney@baylor.edu



You are cordially invited to join the
faculty and staff of
Baylor University
Department of Geology
for
Homecoming 2008 Open House
Friday, October 31, 2008
7:00 pm – 9:00 pm
Baylor Sciences Building
Room E401





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