

Department of Geological and
Atmospheric Sciences
College of Liberal Arts and Sciences
Iowa State University
Ames, IA 50011-3212

Geosciences

Varve

Summer 2004

Paul Spry, Editor
DeAnn Frisk, Production Coordinator

Greetings from the Chair

I hope all of you had a productive year. On the whole, it was good year for the department (although, as I will elaborate below, the budget situation continues to be a problem). As you know, we've had quite a number of hires in geology in the past half-dozen or so years. The new faculty have done a superb job of getting their teaching and research programs off the ground, and our senior faculty continue to be extremely productive, too. In fact, last year our department had the highest percentage (93%) of faculty with external grant funding of any department in the College (Liberal Arts and Sciences – LAS). Furthermore, despite the fact that the availability of grant funding is not nearly as high in geology as it is in most other sciences, our level of dollar funding per faculty member is also among the highest in the College. This is particularly impressive considering that we also have one of the highest teaching loads of any of the science departments in LAS. These successes reflect very positively on the ability and dedication of our faculty.

One interesting aspect of research conducted in universities these days is that it is much more collaborative than in the past. Let me cite just two of the many examples from our department. First, as I noted last year, one of our new faculty members from the fall of 2001, Cinzia Cervato, is the lead investigator on a large project funded by the National Science Foundation known as CHRONOS.

The goal of CHRONOS is to create a network of databases and visualization and analytical tools to help improve the understanding of fundamental Earth processes through time. CHRONOS kicked off last August with a workshop at ISU that included researchers from Harvard, MIT, Purdue, UC Berkeley, Scripps Institution of Oceanography, Texas A&M, the U.S. Geological Survey, and the Smithsonian Institution, among others. This was a very exciting event and a great way to showcase our university to a highly distinguished group of geoscientists. Similar publicity for the university and department was provided early this summer by a CUAHSI workshop (Consortium of Universities for the Advancement of Hydrologic Science, Inc.). Bill Simpkins serves as the ISU representative to the organization and was the lead organizer of the ISU CUAHSI workshop, which focused on the hydrology of intensively managed farm landscapes in the Midwest. As with the CHRONOS meeting, the CUAHSI workshop brought in a significant number of guests from outside ISU, but also involved many units on campus. Our department and Agronomy were the two best represented, but because a major emphasis of the workshop was on “societal impact,” various non-science departments, such as Economics were involved, as well. Interdisciplinary research truly is the order of the day.

I have one very pleasant piece of news to report. This spring, our secretary, DeAnn Frisk, was selected by the College as a recipient of the *Merit Excellence Award* (“Merit” refers to the category of university employees that includes secretaries). Many of you know DeAnn, either because you overlapped with her in the department (she has

been with us since 1990), or because you have met her through various alumni events. DeAnn is a model departmental member; we are extremely lucky to have her on board and it is thrilling that her excellence is now recognized officially at the College level. I would like to thank the many alumni who contributed letters in support of our nomination of DeAnn for this award. These letters were solicited through our alumni e-mail mailing list. If you are not on this list (it includes about a quarter of our alumni), please consider dropping us a line so we can add you. You can contact me (cejac@iastate.edu), DeAnn (dfrisk@iastate.edu), or Paul Spry (pgspray@iastate.edu).

Also on the positive side, it seems that the job market for our students is picking up. This year I received quite a number of inquiries from employers looking for recent graduates either for permanent positions or internships. Many of these requests came from our own alumni, and we really appreciate that you think of us when trying to hire. We've always received a reasonable number of calls from the environmental consulting companies (although even here activity seemed particularly high last year), but what really impressed me is that we're starting to see an improvement of opportunities in the oil & gas industry. We've not had much success placing our students in the latter market in the past few years and we would very much like to see that change. We do encourage students to attend the AAPG/SEG Spring Student Expo, as we know that it's a great place to make connections in the petroleum industry.

In contrast to the above positive items, I must, unfortunately, report one setback to the department. Donna Surge, a paleoclimatologist hired in fall of 2001, has left us for the University of North Carolina at Chapel Hill. Donna is a great faculty member who contributes to the fullest in all her responsibilities – teaching, research, and service. We wish her the best and will miss her. The bad news is that, due to budget cuts discussed below, we will not be able to refill Donna's position.

The past year was an active one for alumni activities. In September we held one of our approximately biennial Alumni Days reunions. Format followed that of the past with luncheon, dinner banquet, evening receptions, meetings with faculty, and a panel discussion for students. This year our distinguished alumni lecture was presented by Dr. Gary Johnson of Dartmouth College. The title was *Uplifting mountains - what we know about collisional tectonics as recorded in the Himalayan foreland basin: Curries, chapatis and a very old Landrover*. Thanks Gary for a very interesting talk. Thanks also to all the other attendees. We had a wonderful time and appreciate your support of the department. A few photos from the event are included on subsequent pages. A pdf version of this and past issues of the *Varve*, with color versions of photos, can be found on our web site (<http://www.ge-at.iastate.edu>).

The next Alumni Days event is tentatively scheduled for Sept. 23-24, 2005. Registration materials will be included in the *Varve* a year from now. Since the *Varve* generally doesn't come out until late summer, we will send out an e-mail notification in early summer. Once again, please contact us if you would like your e-mail address added to the mailing list.

Although we will not hold an Alumni Days, this fall, Ken Windom has graciously offered to lead an **ALUMNI PHEASANT HUNT**. It's scheduled for Oct. 23 at the Winterset Hunt Club, south of Winterset. This date is actually a week before regular pheasant season begins, which is made possible by the private nature of the club. There is a fee of \$15 per bird. The club offers an excellent lunch, the cost of which will be covered by the department. If you are interested, please contact Ken for details (kewindom@iastate.edu, 515-294-2430). I know this does not provide much lead time, but it would help greatly if you could let us know of your interest as early in September as possible.

As many of you know, when Carl Vondra was Chair he instituted a spring alumni luncheon in Houston which we continue to run most every year. This year, however, we skipped Houston in deference to the annual AAPG meeting, held in Dallas. As it turns out, travel budgets appear to be limited these days, and not as many of you made it to Dallas as we had hoped. The department was represented by me, Carl Vondra, and Cinzia Cervato. Alumni at the meeting included Tracy Frank, Joe Jensen, Mike Kozimko, Mark Mathisen, Tom Smith, and Lynn Watney. Congratulations to Tracy, who was just appointed to a tenure-track faculty position at the University of Nebraska, Lincoln. Joe has also recently undergone a change of employment and is now working for PetroKazakhstan. He works 35-day shifts in Kazakhstan alternating with 35-day stints at home in Houston.

Although we did not hold the normal Houston luncheon this past spring, we do expect to resume the tradition in 2005. There's a group of luncheon "regulars," and we will get in touch with you as soon as we set a date. If you would like to come to the luncheon, but have not been contacted about it in the past, please let me know so we can get you on the call list.

Speaking of alumni, Felix Oyarzabal (Ph.D., 1996), who works in Argentina for Petrobras Energia, will be leading a field trip to the south-central Andes for the department this coming Christmas break (Dec. 22-Jan. 6). Those of you on the e-mail list already know about this trip. This promises to be a spectacular excursion and the cost is quite reasonable, about \$1,000 plus or minus for all food, lodging, and transportation within Argentina (airfare to Argentina is extra). I'm not sure whether or not we can add anyone at this point, but let me know if you might be interested.

There's much to tell about field camp. This was the first time in over 40 years that Carl Vondra was not at camp. Alumnus Erik Kvale (B.S., 1978; M.S., 1982; Ph.D., 1986) is now the sole camp Director. As usual, Paul Spry was out for a week to take the group to the Wind River Mountains to map Archean rocks, and Dave Loope, Dave Watkins, and Mary Ann Holmes from the University of Nebraska at Lincoln, our partner institution in this endeavor, were also out at various times. The group was quite small this year – only three students each from ISU and UNL and six from various "outside" schools. I'll spare you the explanations as to why this was a particularly down year for enrollment. In any case, based on this fall's pre-registration for the "gateway" courses to field camp at both

ISU and UNL, we expect the combined headcount next summer to be much healthier – probably around 30.

One highlight of camp this summer was that Erik enlisted two of his former ISU classmates, Rick Chamberlain and Howard White, to come out to Shell for several days (at different times) to provide an industry-related experience for the students. Howard led a project on core and well log interpretation and Rick provided an exercise on the hydrocarbon resource potential of the Greybull Sandstone. This was a very special experience, and we truly appreciate the generosity of Rick and Howard, who both donated their personal time to make it happen (thanks also to Howard's employer, Kerr-McGee, who donated an extensive set of cores to the camp). We are hopeful that Rick and Howard will return to camp in subsequent years. In fact, there's always a standing invitation for alumni to visit camp, either just to stop in to say hello or to share your knowledge with students in the field. By the way, next year the camp will institute projects related to ground water issues.

An important milestone is that the camp is now on city water. In the past, we derived our water from a shallow well. However, with increasing development in the area, we became concerned about the safety of this source. Unfortunately, the cost of hooking up to the Greybull city line was not cheap. There's a hefty fee to cover the tap and meter, and the cost of trenching and laying pipe all the way from the highway to the pump house is quite something on its own. Fortunately, we were able to move forward with this project thanks to the extreme generosity of Tom (B.S., 1968; M.S., 1971) and Evonne Smith of Seismic Micro-Technology, Inc. fame (Evonne is also an ISU alumnus, but not in geology). Tom and Evonne provided a gift to the department that covered the entire cost of installation of the water line. To boot, they also made a generous contribution to the Georgia L. and Carl F. Vondra Graduate Fellowship fund. Thank you Tom and Evonne.

There's one more major upgrade we need to make to camp facilities. Namely, both comfort and environmental considerations demand that we replace the current outhouses with a septic system. Specifically, it appears that relatively "raw" effluent from the outhouses is making its way into Shell Creek, which is not acceptable. In addition, continued success of the camp relies on attracting a significant number of students from outside ISU and UNL. These students can choose from a wide variety of camps, and creature comforts do make a difference to them. Moving to "indoor plumbing" will involve construction of a restroom building combined with installation of a mounded septic system, the latter required by the high water table in the area. A conservative estimate for cost is \$20,000. Believe me, I realize this is not a glamorous cause and that people will not be queuing up to have this particular building named after themselves. Nonetheless, we will not be able to implement this much needed change without significant gifts from alumni. Let me point out that we cannot ask the College to help cover the cost. The College already puts \$20,000 or more *per year* into covering staff salaries beyond what the camp earns back from tuition payments. As the College constantly reminds us, geology camps are not cheap to run,

but they do remain a vital part of the training for our profession. Please, we need your help.

Sadly, I need to move from one financial issue to another. As you've been hearing from us for quite a number of years, budget cuts are the word of the day at state universities. This year was no exception. In fact, for the fiscal year that began this July 1 (FY05), our budget was cut over \$70,000. Also lost this spring were "end-of-year" funds from the College. That is, as we come to the end of the fiscal year, there are usually leftover funds that the college will apportion to departments. We've generally received about \$20,000 per year from this source. Such monies have been used for student microscopes, fume hoods, laptop computers and led projectors for classroom teaching, start-up funds for new faculty (the department still owes about \$150,000 in start-up monies to junior faculty), etc. The end-of-year monies have been critical for maintaining our operations and I can only hope that their elimination this year was a one-time occurrence.

I need to reiterate that the cuts mentioned above were simply the latest round. These amounts are on top of about \$100,000 of permanent cuts to our base budget over the previous three years! The combined cuts are balanced somewhat by the addition of a new faculty member, Chris Harding, who I mentioned last year. Chris is a geoscientist/computer scientist who we obtained as part of a university initiative in "human computer interaction" (see Chris' write-up to learn about what that entails). However, as you've already seen, Donna Surge's position was lost, as was that of Gene Rankey, who left us two years ago. Other consequences of the cuts were the loss of the Scott Thieben's technical support position and the elimination of the electron microprobe, along with Alfred Kracher who managed the probe (the good news is that Alfred has been hired back by the Ames Laboratory to manage their new probe). Also problematic is that our teaching assistant budget is now the smallest it's ever been, despite the fact that we're teaching far more students than ever before in our service courses. Having fewer TA lines puts a strain on the individual students who are asked to shoulder the increased class loads. In addition, it decreases the number of graduate students we can recruit to the program, thus having a negative impact on research.

In order not to end on a dreary note, let me come back to where I started this letter and emphasize that, despite budget woes, the department is now the strongest it's ever been. We are very well respected at the university level and we're making significant progress in attaining recognition on the national front, as well. We can do even better, but there are labs to supply, students to support, and so on. Every single dollar counts as never before. The dictum that applies to us and universities across the country is that, in the past, alumni contributions were a nice extra. Now they're essential. Most of you who have given to the department in recent years tend to do so every year. Those gifts do not disappear into an anonymous bureaucracy. We see them directly in the department and we thank you so much. If you have not been donating to the department lately, please consider making this the year to start. Your support does make a difference. As always, gifts to the Geology Development fund provide us with the most

flexibility. If you prefer to designate to a specific fund, let me suggest the John Lemish or Georgia and Carl Vondra graduate fellowships or the field camp fund, consistent with our most pressing needs as described above. A form is enclosed for your convenience in making a contribution. If you choose to donate during a call-a-thon from the Alumni Foundation, please specify that you wish your donation to go to the department. Otherwise it will become part of the general university fund.

Thanks once again and have a good year.



Carl E. Jacobson

2003 Contributions

Geology Alumni Development (1900040)

Gene DeKoster (MS 1960)

Rodney Gardner Scholarship (1900078)

Quentin Schmidt Memorial Field Trip Fund (1900138)

Patricia Dickerson (MS 1983)

Peter R. Johnson Memorial Scholarship (1902832)

Carolyn Jones-Eiler Scholarship (1908641)

James Eiler

Robert Ladd (MS 1979)

John Lemish Memorial Scholarship (1914321)

William Boyd (BS 1956)

John O'Sullivan (MS 1958)

John Spencer (MS 1974)

W. Lynn Watney (MS 1972)

Conoco Phillips Foundation

Geology Field Camp Fund (1948312)

William Boyd (BS 1956)

Richard Brown (BS 1953)

Paul Carlson (MS 1957)

Steven Condon (BA 1973)

Larry Garside (BS 1957)

Daniel Hansen (MS 1978)

Kenneth Harpole (BS 1973)

Gary Hauser (BS 1961)

Leo Kozimko (MS 1977)

James Kringlen (BS 1985)

Craig Lyon (MS 1955)

Robert Martin (BS 1984)

Mark Mathisen (PhD 1981)

Leroy Shaser (MS 1978)

Hugo Sindelar (BS 1952)

Tom Smith (MS 1971)

James Zalesky (BS 1977)

Chevron Texaco

Conoco Phillips Foundation

Yates Petroleum Corporation

Geology Development Fund (1949512)

Gary Anderson (MS 1963)

Lee Backsen (MS 1963)

Richard Brown (BS 1953)

Robert & Anita Cody

Rodney DeBruin (MS 1975)

James Eberle (BS 1981)

Richard Fox (BS 1963)

Charles Fudge (BS 1956)

Ronald Garrison (BS 1973)

Kent Gorham (BS 1979)

Susan Green (BS 1980)

Daniel Hansen (MS 1978)

Allen Hanson (BS 1947)

Gerald Hunt (BS 1959)

James Jacobs (BS 1961)

Nancy Jensen (BS 1980)

Beth Johnson (MS 1995)

Kenneth Manahl (MS 1981)

David Morehouse (MS 1970)

David Pals (MS 2002) & Diane Pals (MS 1998)

Curtis Peck (MS 1980)

Sally Peterson (BS 1973)

Clay Postlethwaite (PhD 1988)

Lee Potter (MS 1988)

Dennis Powers (BS 1967)

Darvin Rehms (BS 1958)

Dennis Reida (BS 1974)

John Rielly (BS 1971)

George Rosenfeld (BS 1956)

Timothy Ryherd (MS 1982)

Carl Shaw (MS 1986)

W. Lynn Watney (MS 1972)

Lowell Wille (MS 1984)

Mark Wiseman (BS 1974)

Chevron Texaco

Halliburton Foundation Inc.

Georgia L. and Carl F. Vondra Graduate Fellowship (2700426)

Hoyt Acuff (PhD 1976)

Mark Finley (MS 1982)

Carl & Carol Jacobson

Tom Smith (MS 1971)

Carl & Georgia Vondra

Huedepohl Geology Field Camp Scholarship (2701147)

Bradley Huedepohl (MS 1956)

Geological Sciences

Funds and Endowments

Huedepohl Geology Field Camp Scholarship: Established in 2004 by Bradley Huedepohl (M.S., 1956) to provide a \$250 scholarship for an undergraduate to attend the summer field camp.

Carolyn Eiler-Jones Scholarship: Established in the memory of Carolyn Eiler-Jones (B.S. 1973) by her family, this fund provides a \$500 scholarship for an undergraduate student to attend the summer field camp.

Geology Alumni Development Fund: Established by Geology alumni, this fund provides support for travel and other expenses associated with development activities.

Geology Development Fund: This fund is unrestricted. Generally, it has been used to support purchase and maintenance of equipment used in research and teaching, and to cover start-up funds for new professors.

Geology Field Camp Fund: This fund allows improvements in the facilities at the Wyoming Field Station.

Georgia L. and Carl F. Vondra Graduate Fellowship: Established in 2000 in honor of the distinguished contributions of Carl Vondra to the Department of Geological and Atmospheric Sciences. This fellowship is to attract an outstanding incoming graduate student by providing a fellowship above and beyond the stipend the **Peter R. Johnson Memorial Scholarship:** Established in the memory of Peter R. Johnson (B.S. 1977) by his family, this fund provides a \$500 scholarship for an undergraduate student to attend the summer field camp.

Quentin Schmidt Memorial Field Trip Fund: This fund furnishes financial support for class and departmental field trips.

Rodney D. Gardner Memorial Scholarship: Established in 1995 by the children of Rodney D. Gardner (B.S. 1962), this fund furnishes a \$1,500 scholarship to an undergraduate student on the basis of scholarship and financial need.

student will already receive from a research or teaching assistantship.

John Lemish Memorial Scholarship: Established by Dr. Ramon Bisque (Ph.D. 1959) in 1989 in honor of John Lemish (Professor Emeritus) and was called the *John Lemish Award for Earth Science*. It provided an award of \$250 to an outstanding graduate student with demonstrated research ability.

O'Brien-Lonsdale Endowment Fund: This fund will establish an endowed chair in geology.



Jim Eidem (M.S. 1996), Beth Johnson (M.S., 1995) and faculty member, Bill Simpkins at the 2003 Alumni days banquet



2003 Alumni days gathering in Science I

Alumni Contributions to Geological Sciences: Iowa State University

I wish to support programs in Geological Sciences at ISU. Enclosed is my gift of:

_____ \$1000 _____ \$200 _____ \$50 Other \$_____.

Please specify the Geological Sciences fund that should receive your gift:

_____ **Geology Development Fund (1949512)**

_____ **Geology Field Camp Fund (1948312)**

_____ **Quentin Schmidt Memorial Field Trip Fund (1900138)**

_____ **Geology Alumni Development Fund (1900040)**

_____ **Carolyn Jones-Eiler Scholarship (1908641)**

_____ **Peter R. Johnson Memorial Scholarship (1902832)**

_____ **Rodney D. Gardner Memorial Scholarship (1900078)**

_____ **John Lemish Memorial Scholarship (1914321)**

_____ **O'Brien-Lonsdale Endowment Fund (1936212)**

_____ **Georgia L. and Carl F. Vondra Graduate Fellowship (2700426)**

_____ **Huedepohl Geology Field Camp Scholarship (2701147)**

_____ I will request that my employer match my gift (if appropriate) to the same fund noted above. My employer is _____

Your check, which may be made payable to the **ISU Foundation**, is tax deductible. Please include the fund number on your check, and return it with this form to:

Dr. Carl E. Jacobson, Chair
Dept. of Geological & Atmospheric Sciences
253 Science I
Iowa State University
Ames, IA 50011-3212



A picture from the past. From left to right, deceased faculty member John Lemish, Lillian Hussey (deceased) and former Chair, Keith Hussey (deceased), talking with alumnus Dick Handy (B.S., 1951; M.S. 1953; Ph.D., 1956)



The three amigos!! From left to right, Jim Crowther (B.S., 1956), Dave Schact (B.S., 1956), and Bill Boyd (B.S., 1956)

News about yourself and your family for next year's Varve or send by e-mail to pgspry@iastate.edu.

NAME: _____



Alumni Days discussion of geology careers



Graduate student, Bjorn Brooks, being honored for his 2004 Graduate Spring Teaching Excellence Award at ISU (second from the left in the back row)

Alumni Notes

Ray Bisque (Ph.D., 1959; M.S. 1956) reports that his company Earth Sciences Inc. finally ceased exploration in Venezuela due to the political situation. In 1997, he purchased and then spun off ADAES a company specializing in retrofitting coal-fired power plants to meet environmental standards. Information about ADES can be seen at www.adaes.com and Ray's e-mail address is: ray@bisque.com

Thomas Bown, (B.S., 1968) is the new Senior Associate Geologist with Erathem-Vanir Geological Consultants, Inc., based in Pocatello, Idaho. In recent years, Tom has been working on coal bed methane drilling and gas and CO₂ pipeline projects in Wyoming, as well as consulting on paleontological expeditions to Ethiopia, Egypt, and Argentina. In 2002, Tom was field guide and historical consultant in the Great Sand Sea of Egypt for the making of the British Channel 4 Documentary "*The Lost Army of King Cambyses.*" Tom can be reached by e-mail at KANPRIMATE@aol.com

Paul Carlson (MS., 1957) has worked with the U.S. Geological Survey in marine geology since 1967, just after finishing a Ph.D. in geological oceanography at Oregon State University, until he retired in 2000. His major areas of study were San Francisco Bay, the Gulf of Alaska, Glacier Bay, Bering Sea, and Prince William Sound (home of the Exxon Valdez oil spill). Paul is presently on emeritus appointment with the marine geology division at the U.S.G.S. doing follow-up studies in Glacier Bay doing multi-beam imagery of bio-geo--habitats on the seafloor.

Jim Crowther (B.S., 1956) and two of his friends and fellow alumni, Bill Boyd (B.S., 1956) and Dave Schacht (B.S., 1956) (see photo on page 7) get together at his home in Phoenix to escape the cold of the Midwest, to play golf and tour, and also to attempt to relive those good old days at Iowa State when our only concerns were girls, hunting and fishing. Jim adds that they also pursued (and obtained) degrees in Geology. Dave Schacht is a successful attorney in Beaver Dam, Wisconsin. Bill Boyd (right) is a successful Philips Petroleum Company marketing manager (mostly retired) living in Spencer, Iowa. Jim retired as a mining engineer for a government agency (BIA). Together, Jim, Bill, and Dave are still friends and brothers who, sometime in the distant past, attended Iowa State and have somehow survived, and flourished, in the outside world. Jim's e-mail address is jimcr@juno.com.

Richard Handy (B.S., 1951; M.S. 1953; Ph.D., 1956) the Department's first Ph.D, recently celebrated his 75th and is still active writing and consulting. He is a Distinguished Professor Emeritus in geotechnical engineering at ISU.

Dick's humorously concocted book for homeowners, "The Day the House Fell," is still selling well and is available on Amazon.com. The book starts by

suggesting that Jack and Jill went the wrong way to get water, and maybe they had something else in mind. "Jack and Jill went up the hill to have a little action," he writes. "Jack fell down and broke his crown, and spent a month in traction." Dick explains that since the book editor cut that out he thought that the Varve might be a fitting place.

Dick recently was involved as an expert witness on a \$17 million lawsuit where the opposing expert laid all of the blame on expansive clay minerals that are "unknown in the loess of Illinois." Dick writes, "Since the problem was a perched groundwater table that had nothing to do with expansive clay, and it has been known for at least 50 years that Illinois loess contains expansive clay minerals, let's just say that the witness's credibility was damaged."

Other recent activities include work on the 5th edition of a soil engineering textbook, the only one that features chapters on geology. He also manufactures and sells soil and rock testing instruments that were developed during his tenure at Iowa State. For more details and some insight on landslides see <http://handygeotech.com>. (The introductory photo came from another lawsuit.)

One of the inventions measures lateral pressure in soil, which previously was very difficult to measure because anything you do changes it. The "Stepped Blade" relies on extrapolation to get undisturbed pressure. Dick writes that because it has never been done before, it should be an opening shot for new understanding of soils because lateral stress affects everything from foundations to landslides.

A former student who aided in this development, Dr. Nat Fox, invented a new method that substitutes high lateral soil pressure and coarse aggregate for concrete foundations. The process works, saves money, has gone world-wide, and is increasing at about 30 percent per year. Iowa people are heavily involved in the research and in construction. The parent web site is www.geopiers.com.

Many others of Dick's former graduate students have gone on to establish major consulting engineering firms and demonstrate a loyalty to Iowa State, at least up until the VEISHEA riots. One graduate built "the highest highway in the world," across the Karakorum Mountains from Pakistan into China. Another invented a new method for building canals on expansive clay, allowing development of a new agricultural area that turned India from being a food importer into a food exporter.

He learned a lot from former Department Head and Dean of Science Chalmer J. Roy. He tried to pass it on. The good stuff, that is, the part about skepticism and not believing that something can't be done because nobody has done it. Dr. Roy and Dick didn't agree on a lot of things, including whether he should stay on at Iowa State, but that was the strength of his teaching."

Dick and his wife and caretaker Kathryn live on 50 acres of hills south of the Ledge State Park in Boone County, about 15 miles west of Ames. He would like to hear from fellow fossils who may still remember the days of Gwyne, Roy, Hussey, Thomas, and Lemish (see photo on page 7). Dick's e-mail is rlhandy@iowatelecom.net.

Paul Hardeson (B.S., 1997) greets everyone from the frigid plains of North Dakota! Paul supposes that the

greatest realization he has had in the past year is that the transition from "student life" to "real life" has been dramatic, continual, and ever-changing. He has survived his first year as an assistant professor and it seems UND wants to keep him around. The combination of teaching, research, and his observatory project is keeping him very busy. He has taught two classes thus far (observational astronomy and astrobiology) and will teach two additional classes in the next year or so. He has had his first science article published and has another in review. He is continuing his work on constraining the mineralogies of the M-type asteroids. According to Paul his results have irritated some and infuriated others. He finds it interesting to see how some scientists react to conflicting or contradictory results and interpretations. Paul's efforts to construct and operate North Dakota's first professional astronomical observatory is moving forward. He began fundraising efforts in April and has written several grant applications to private foundations and the National Science Foundation. He is hopeful that he will receive some significant funding by the end of the year. If he is able to raise \$2 million by the end of 2005, the observatory should be operational by 2009. As if all of that wasn't enough, he will soon begin co-authoring a graduate level textbook on observational astronomy techniques. That will be a 2+ year project. Personally, Paul and his wife, Cristina, bought a new home in May and have been valiantly trying to get settled. Alas, they have not succeeded yet. The echos reverberate in the house as it is still mainly empty. They should have some furniture by September. Cristina has successfully finished her first year of family practice medical residency and has begun her second year of training. Paul states that "If anyone from ISU Geology is ever in Grand Forks, be sure to look me up. I hope everyone is having a good year with success and happiness." Paul's e-mail is Hardersen@skyview.space.und.nodak.edu

Wendy Fry Palmer (B.S. 1995) had an exciting year, with getting married in June 2003, and then having a baby girl March 2004. Wendy's husband, Eric, and her found out she was pregnant in August, and the baby was due April 20th. However, on March 8th she went in to labor early and had to be hospitalized for 8 days. When the baby didn't come, they sent her home for 5 days, but then she started having contractions. So, their daughter was born 4 weeks early, healthy but small. Her name is Niamh (pronounced Neeve) Marie Palmer. Wendy had about 10 weeks off from school but finished her second year of teaching chemistry, physics, Earth science, and astronomy at Mediapolis High School Alumnus Lynn Bachellor (B.S., 1995) visited Wendy in July. Wendy's new address is 1910 Bertsch Ave, Burlington, IA 52601 and her e-mail is: wendy_fry@excite.com.

Allen Hanson (B.S., 1947) is enjoying retirement in Ventura, California, after a long stint (1959-1980) in the oil industry in that city. Prior to this period of time Allen worked in the industry in Sante Fe Springs. His wife, Evelyn, attended a Sigma Kappa Reunion at ISU in September. She has been busy with club work. Allen has

revived interest in jazz and big bands, playing reed instruments in two bands.

Diane Pals (M.S., 1998) is still working at Montgomery-Watson although she and husband **David Pals (M.S., 2002)** spend considerable time with their recent arrival, Noah (see page 17) who is always more fun and entertaining. The Pals family enjoys their garden and recently headed out on vacation to teach Noah how to camp. This was his second vacation as he dipped his feet in Lake Superior when he was 7 weeks old. Already a traveler! As for Dave, he is still at the Iowa Geological Survey and anticipating the start of a PhD program at the U of I this fall working on the Manson Impact Structure. Other than that, they are well and continually amazed at how fast time goes by. Diane says hello to the folks that are still around from her era. She can be reached by e-mail at Diane.A.Pals@us.mwhglobal.com. Dave's e-mail is dpals@igsb.uiowa.edu

John Spencer (M.S., 1974) had a career in the coal fields of Montana and North Dakota with the USGS and BLM but got the opportunity to retire early. His wife, a University of Kansas geology graduate, took advantage of a similar opportunity. Now they both wonder how they worked and lead outside lives before. John has gotten involved with a local group in Billings that is promoting and building the greenway along the Yellowstone River in Montana. With fundraising for facilities, planting literally thousands of trees, shoveling gravel on trails, and building benches and picnic shelters, life for him remains quite busy. He was elected as president of the group for the next four years, probably because, in his words "I didn't look busy enough." This spring some of his group, supporting a local science teacher, took two dozen 8th graders on a one week class trip to the Oregon coast: tide pools, ocean fishing, old growth forest, and geology the whole way out and back. John's e-mail address is jspencer.billings@worldnet.att.net.

Karen Van Wert (B.S., 1985) has worked the majority of the past 20 years in the high tech market space. She spent 11 years at a mortgage company designing software used throughout the company and also lived in California for 6 months while designing the Quicken Mortgage website for Intuit. Karen is currently working for Stellent, Inc., a content management software company based in Eden Prairie, MN. Her position as Sale & Marketing Trainer affords her many opportunities to travel around the world teaching the company's partners how to sell their products. Stellent has a wide variety of customers including Regional EPA offices, the National Nuclear Labs, Oil Companies, and Colleges. In addition, Karen is in the process of starting her own photography business. She spent a day at ISU this spring adding more thin section photos to her portfolio. Karen's e-mail address is Karen.VanWert@stellent.com

Department

GEOLOGY STUDENT AWARDS

(Presented at the 2004 Spring Banquet)

UNDERGRADUATE AWARDS

Carolyn Jones-Eiler Summer Field Camp Scholarship
Nicki Shea

Peter Johnson Memorial Scholarship
Nicki Shea

Outstanding Undergraduate Award
Sarah White

Rodney Gardner Memorial Scholarship
Carrie Carlson
Nicki Shea

Outstanding Senior
Dan Hummer

Laura Vernon Scholarship
Nicki Shea

GRADUATE AWARDS

Pick-of-the-Year
Alessandro Zanazzi

Outstanding Teaching Assistant
Bjorn Brooks
Matt Graesch

John Lemish Award
Jason Thomason

Ames Rock & Mineral Club Award
Adriana Heimann

**Graduate Student Seminar
Top Paper**
Jason Thomason

**Graduate Student Seminar
Runners-up**
Bjorn Brooks
Adriana Heimann
Meaghan McLoughlin

Outstanding Contributions
Cammy Bright
Patrick Hook

Other Student Awards

Cammy Bright
Paleontological Society Grant. \$500

Bjorn Brooks
The Cambrian Institute, \$1,000

Bjorn Brooks
Spring 2004 Teaching Excellence Award at Iowa State University

Bjorn Brooks
The American Geological Institute Minority Fellowship, \$5,000

Matt Dvorak
A NOAA Graduate Student Fellowship through the National Estuarine Research Reserve System Program, \$20,000

GRADUATING STUDENTS

Summer 2003
Colleen Fowle (MS – Water Resources)

Fall 2003
Andrea Ferrell (BA - Earth Science)
Chris Jutting (BS – Geology & Environmental Science)
Josh Rohret (BS - Geology)
Beth Spear (MS – Geology)

Spring 2004
Dan Hummer (BS – Geology & Chemistry)
Megan Haring (BS – Geology)
Moses Langley (BS – Geology)
Andrew Storjohann (BS – Geology)
Stacy Weems (BS – Geology)
Joan Jach (MS – Geology)

Graduate Students and their Research Projects

Agarkar, Netra - Piezophilic Bacteria in the Deep-Sea: Taxonomy, Diversity, and Biotechnological Potential (Fang); M.S.

Bright, Cammy - Faunal and Stable Isotope Study of Late Glacial and Holocene Abrupt Climate Changes in the Mediterranean Sea (Cervato); Ph.D.

Brooks, Bjorn - CHRONOS and the Cambrian Explosion: Chronostratigraphy and Paleontology of the Globally Distributed Soft Bodied Fauna in the Cambrian: (Cervato); Ph.D.

Chan, Olivia - Membrane Fatty Acids of Deep-Sea Piezophilic Bacteria (Fang); M.S.

Cheng Cheng – An Evaluation of the Bear Creek Riparian Buffer Strip (Simpkins); Ph.D.

Chulin (Mike) Chen – The Effectiveness of Riparian Forest Buffers in Head-Water Watersheds of the Western Corn Belt (Simpkins); Ph.D.

Dudding, Allan - The Use of Ground Penetrating Radar to Evaluate Concrete Deterioration in Iowa Highway Concretes (Beresnev); M.S.

Dvorak, Matt - The Effects of Land-Use Changes on the Health of Coastal Environments (Mora); M.S..

Goewert, Ann - Sclerochronology of Endangered Fresh Water Mussels of Iowa (Surge); M.S.

Graesch, Matt – Interpreting the Origin of the Madison Drumlin Field using the Magnetic Properties of Till (Iverson); M.S.

Heimann, Adriana - The Origin and Exploration Significance of Garnet and Gahnite to Broken Hill-Type Lead-Zinc-Silver Deposits in the Curnamona Province, Australia (Spry); Ph.D.

Hook, Patrick - Reduction of Concrete Deterioration by Ettringite Using Crystal Growth Inhibition Techniques (Spry); M.S.

Iassonov, Pavel - Enhancing Fluid Flow in Porous Media by Applications of Sonic Vibrations (Beresnev); Ph.D.

Jach, Joan - Using the Lexis-Nexis Database to Identify Relevant Topics for Introductory Geology Classes (Cervato); M.S.

Kutz, Brenda – The Geology and Geochemistry of Barite Vein Deposits, Northern Ontario, Canada (Spry); M.S.

Loving, Theresa - Teaching the Relationship between Land-Use and Flooding (Windom); M.S.

Mann, Janet - Experimental Study of Debris Flow Mobilization (Iverson); M.S.

McLoughlin, Meaghan - Determination of the Microfabric of Sheared Till using X-Ray Goniometry (Iverson); M.S.

Thimmesch, Carrie - Spatial and Temporal Variability in Groundwater Quality at Riparian Buffers on Bear Creek, 1996 to 2002 (Simpkins); M.S.

Thomason, Jason - Experimental and Field Studies of Clast Plowing and Till Deformation Beneath Past Ice Sheets (Iverson); Ph.D.

Twedt, Trent - Water Movement in the Unsaturated Zone of a Multi-Species Riparian Buffer Strip in Central Iowa (Simpkins); M.S.

Wang Weihong - Using Stable Isotopes to Distinguish Root Respiration from Microbial Soil Respiration (Mora), M.S.

Zanazzi, Alessandro - Assessment of Weather Patterns in the Great Lakes Region for the Last 400 Years (Mora), M.S.

Faculty and Student Publications

Books

Eliopoulos, D., **Spry, P.G.**, and 30 others, 2003, Mineral Exploration and Sustainable Development. Proceedings of the Seventh Biennial Society of Geology Applied to Ore Deposits meeting. Balkema, Rotterdam, 1010 pp (editor).

Journal Articles/Chapters in Books

Barth, A.P., Wooden, J.L., Grove, M., **Jacobson, C.E.**, and **Pedrick, J.N.**, 2003, U-Pb zircon geochronology of rocks in the Salinas Valley region of California: A reevaluation of the crustal structure and origin of the Salinian block: *Geology* 31, 517-520.

Beresnev, I.A., 2003, Uncertainties in finite-fault slip inversions: To what extent to believe? (A critical review), *Bulletin of the Seismological Society of America* 93, 2445-2458.

Cervato, C., 2003, Getting help from the Internet to teach a large-enrollment introductory geology class. *Journal of Geoscience Education* 51, 185-193.

Cervato, C. and Burckle, L., 2003, Pattern of first and last appearance in diatoms: Oceanic circulation and the position of the Polar Fronts during the Cenozoic. *Paleoceanography* 18(2), 1055, doi:10.1029/2002PA000805.

Fang, J., Chan, O., Kato, C., Sato, T., Peeples, T., and Niggemeyer, K., 2003, Phospholipid fatty acid profiles of deep-sea piezophilic bacteria from the deep sea. *Lipids* 38, 885-887.

Grove, M., **Jacobson, C.E.**, Barth, A.P., and Vucic, A., 2003, Temporal and spatial trends of Late Cretaceous–early Tertiary underplating of Pelona and related schist beneath southern California and southwestern Arizona, in Johnson, S.E., Patterson, S.R., Fletcher, J.M., Girty, G.H., Kimbrough, D.L., and Martin-Barajas, A., eds., *Tectonic evolution of northwestern Mexico and the southwestern USA: Boulder, Colorado, Geological Society of America Special Paper 374*, 381-406.

Hruby, C.E. and **Beresnev, I.A.**, 2003, Empirical corrections for basin effects in stochastic ground-motion prediction, based on the Los Angeles basin analysis, *Bulletin of the Seismological Society of America* 93, 1679-1690.

Iassonov, P.P. and **Beresnev, I.A.**, 2003, A model for enhanced fluid percolation in porous media by application of low-frequency elastic waves, *Journal of Geophysical Research* 108(B3), ESE 2-1 – 2-9.

Iverson, N.R., Cohen, D., Hooyer, T.S., Fischer, U.H., Jackson, M., Moore, P.L., Lappégard, G., and Kohler, J., 2003, Effects of basal debris on glacier flow. *Science* 301, 81-83.

Kopf, A., **Mora, G.**, and Deyhle, A., 2003, Fluid geochemistry in the Japan trench forearc (ODP Leg 186): A synthesis. In: Sacks, S. et al. (Eds). *Proceedings of the Ocean Drilling Program. Scientific Results* 186.

Lee, H., **Cody, R.D.**, **Cody, A.M.**, and **Spry, P.G.**, 2003, Reduction of concrete expansion by ettringite using crystallization inhibition techniques. *Environmental and Engineering Geoscience* 9, 337-350.

Mora, G., and Jahren, A.H., 2003, Isotopic evidence for the role of plant development on transpiration in deciduous forests of southern United States. *Global Biogeochemical Cycles* 17, doi: 10.1029/2002GB001981.

- Namocatcat, J.A., **Fang, J.**, and Barcelona, M.J., 2003, Biogeochemical evidence of intrinsic bioremediation in a shallow sand aquifer contaminated with jet fuel hydrocarbons. *J. Contaminant Hydrology* 67, 177-194.
- Pals, D.W., **Spry, P.G.**, and Chryssoulis, S., 2003, Invisible gold and tellurium in arsenic-rich pyrite from the Emperor gold deposit, Fiji: Implications for gold distribution and deposition. *Economic Geology*, 98, 493-514.
- Pals, D.W. and **Spry, P.G.**, 2003, Telluride mineralogy of the low-sulfidation epithermal Emperor gold deposit, Vatoukola, Fiji. *Mineralogy and Petrology* 79, 285-307.
- Roumelioti, Z. and **Beresnev, I.A.**, 2003, Stochastic finite-fault modeling of ground motions from the 1999 Chi-chi, Taiwan, earthquake: Application to rock and soil sites with implications for nonlinear site response, *Bulletin of the Seismological Society of America* 93, 1691-1702.
- Shackleton, J.L. and **Spry, P.G.**, 2003, Antimony-rich montbrayite ((Au,Sb)₂Te₃) from the Golden Mile, Western Australia, and its compositional implications. *Neues Jahrbuch für Mineralogie Monatshefte*, 3, 113-125.
- Shackleton, J.M. **Spry, P.G.**, and Bateman, R., 2003, Telluride mineralogy of the Golden Mile, Kalgoorlie, Western Australia. *Canadian Mineralogist*, 41, 1551-1572.
- Simpkins, W.W.** and **Burkart, M.R.**, 2003, Hydrogeologic settings of earthen waste storage structures associated with animal feeding operations in Iowa. *Proceedings of Conference on Application of Waste Remediation Technologies to Agricultural Contamination of Water Resources*, Kansas City, 22 pp.
- Spry, P.G.**, Teale, G.T., and **Heimann, A.**, 2003, Speculations concerning the origin and exploration significance of lode rocks in the Curnamona Province, in Peljo, M. (ed.), *Broken Hill Exploration Initiative*. Geoscience Australia, Record 2003/13, p. 162-165.
- Surge, D.M., Lohmann, K.C. and Goodfriend, G. A., 2003, Reconstructing estuarine conditions: oyster shells as recorders of environmental change. *Estuarine, Coastal and Shelf Science*, 57(5-6), 737-756.
- Tsiklauri, D. and **Beresnev, I.A.**, 2003, Properties of elastic waves in a non-Newtonian (Maxwell) fluid-saturated porous medium, *Transport in Porous Media* 53, 39-50.
- Zhang, C.L., Li, Y., Ye, E., Fong, J., Peacock, A., **Fang, J.**, Lovley, D., and White, D.C., 2003, Carbon isotopic signatures of fatty acids in *Geobacter metallireducens* and *Shewanella putrefaciens*. *Chemical Geology*, 195, 17-28.
- to the deep-sea high pressure environment: astrobiological implications, 20 pp.
- Raich, J.W., Cambardella, C.A., Isenhardt, T.M., Schultz, R.C., and **Simpkins, W.W.**, 2003, Final Report to North Central Region SARE: Perennial Grass Covers Affect Long-Term Soil Quality, 30 pp.
- Simpkins, W.W.**, 2003, Final Project Report: Water-Table Mapping and Analytic Element Modeling of Groundwater Flow at the Camp Dodge National Guard Facility (submitted for the Integrated Resource Management Techniques for the Prairie Pothole Ecoregion Project, D.J. Quade, Project Manager), 21 pp.
- Simpkins, W.W.** and **Burkart, M.R.**, 2003, Hydrogeologic settings of earthen waste storage structures associated with animal feeding operations in Iowa. *Proceedings of Conference on Application of Waste Remediation Technologies to Agricultural Contamination of Water Resources*, Kansas City, 22 pp.
- Spry, P.G.**, and **Cody, R.D.**, 2003, Reduction of concrete deterioration by ettringite using crystal growth inhibition techniques. Part II. Field evaluation of inhibitor effectiveness. Annual report to the Iowa Highway Research Board, 15 pp.

Paper, Panel, or Poster Invitations (Conference-Abstracts)

- Barth, A.P., Coleman, D.S., Grove, M., **Jacobson, C.E.**, Miller, B.V., Wooden, J.L., 2003, Geochronology of the Randsburg granodiorite: reevaluation of the tectonics of the southern Sierra Nevada and western Mojave Desert: *Geol. Soc. Am. Absts. with Progs* 35(4), 70.
- Beresnev, I.A.**, 2003, Capillary-physics mechanism of elastic-wave mobilization of residual oil. Abstracts and Program of the Society of Exploration Geophysicists' Development & Production Forum "Old Oil, New Geophysics: Rejuvenating and Extending Field Life", Big Sky, Montana (invited).
- Beresnev, I.A.**, Nightengale, A.M., and Silva, W.J., 2003, Characteristics of vertical ground motions. *Seismological Research Letters* 74, 225 (invited).
- Billor, Z., and **Spry, P.G.**, 2003, Geological setting and origin of the Kisecik gold deposit, Hatay, Turkey. *Geol. Soc. Am. Absts. with Progs* 35(2), 12.
- Brooks, B.**, **Reed, J.**, **Cervato, C.**, and **Fils, D.**, 2003, Integrating Databases: the development of **CHRONOS**, a query-based, multi-source host database network for geoscientific and public use. *International Symposium on Modern Computing (JVA03)*, Ames IA.
- Cervato, C.**, Huber, B., Keane, C., Leckie, M., Marshall, C., Ogg, J., Sikora, P. and Wardlaw, B., 2003, **CHRONOS** network for Earth system history: development of integrated databases and toolkits accessible through a common portal. *Geol. Soc. Am. Absts. with Progs* 35(6), 365.

Technical Reports

- Fang, J.**, Peeples, T., 2003, Annual report to Iowa Space Grant Consortium. A molecular, biochemical and biophysical study on piezophilic bacterial adaptation

- Cervato, C.**, Rudd, J. and Ridky, R., 2003, Calibrated Peer Review for the Earth sciences: a prototype assignment on earthquakes and plate tectonics. *Geol. Soc. Am. Absts. with Progs* 35(6), 441.
- Cervato, C.**, **Jach, J.Y.**, and Ridky, R., 2003, Using news media databases (LexisNexis) to identify relevant topics for introductory Earth science courses. *Eos Trans. AGU*, 84(46), Fall Meet. Suppl., Abstract ED32C-1210.
- Cohen D., **Iverson, N.R.**, Hooyer, T.S., Fischer, U.H., Jackson, M., Moore, P.L., Lappégard, G., and Kohler, J., 2003, Importance of debris-bed friction in resisting sliding of a hard-bedded glacier. *Geophysical Research Abstracts*, 5, 01220 (invited).
- Day, H.W., Blake, M.C., Ernst, W.G., Hacker, B.R., Howard, K., **Jacobson, C.**, Springer, R.K., Todd, V., and Wentworth, C., 2003, A preliminary metamorphic map of California: *Geol. Soc. Am. Absts. with Progs* 35(6), 96.
- Fang, J.**, Kato, C., Sato, T., Peebles, T., **Chan, O.**, Bilden, L., and Niggemeyer, K., 2003, Fatty acid composition of taxonomically diverse groups of piezophilic bacteria from the deep sea, American Society for Microbiology 2003 General Meeting in Washington, D.C.
- Fang, J.**, **Chan, O.**, **Agarkara, N.**, Kato, C., and Sato, T., 2003, Production and Dietary Uptake of PUFA by Piezophilic Bacteria, Implications for Marine Biogeochemistry. American Geophysical Union Fall Meeting, San Francisco, CA.
- Fang, J.**, **Chen, T.-C.**, and Kato, C., 2003, Numerical Simulation of the Coupled Pelagic and Benthic Ocean Carbon Cycle. 2003 Iowa Academy of Sciences Annual Meeting, Des Moines, IA.
- Fang, J.**, and Alvarez, P.J., 2003, The use of lipid and isotopic techniques to link biodegradation of toluene to specific microorganisms. 2nd European Conference on Bioremediation (invited). Chania, Crete.
- Fang, J.**, and Alvarez, P.J., 2003, Lipids, isotopes, and biodegradation of contaminants. 4th Annual North Central Region Symposium on Natural Organic Matter in Soils and Water. Iowa State University.
- Fang, J.**, **Chen, T.-C.**, and Kato, C., 2003, Biogeochemistry of Deep-Sea Sedimentary Piezophilic Bacteria and Numerical Simulation of the Coupled Global Ocean Carbon Cycle. The 3rd Third International Ocean-Atmosphere Conference.
- Fischer, U.H., Cohen, D., **Iverson, N.R.**, Hooyer, T.S., Jackson, M., Moore, P.L., Lappégard, G., and Kohler, J., 2003, Motion of a temperate glacier over a soft bed: Subglacial experiments at Engabreen, Norway. *Geophysical Research Abstracts*, 5, 10565.
- Fowle, C.R., **Simpkins, W.W.**, Isenhardt, T.M., and Schultz, R.C., 2003, Application of an analytic element model to understanding groundwater flow and nitrate flux in the Bear Creek watershed in central Iowa. *Geol. Soc. Am. Absts. with Progs* 35(2), 16.
- Grossman, E., McArthur, J., Bowring, S., **Cervato, C.**, Davydov, V. et al., 2003, **CHRONOS** network for Earth System History and Geochemical Cycles-through-Time Node. Geochemical Earth Reference Model (GERM) workshop, Lyon.
- Helmke, M.F., **Simpkins, W.W.**, and Horton, R., 2003, A practical approach for simulating solute transport in fractured till. *Geol. Soc. Am. Absts. with Progs* 35(6), 126.
- Iverson, N.R.**, Cohen, D., Hooyer, T.S., Fischer, U.H., Jackson, M., Moore, P.L., Lappégard, G., and Kohler, J., 2003, Bed-deformation experiments beneath a thick temperate glacier. *GSA Abstracts* 35(6), Annual Meet. Suppl., Abstract 122-8 (invited).
- Iverson, N.R.**, Moore, P.L., Hooyer, T.S., Thomason, J.F., and **Mcloughlin, M.P.**, 2003, Laboratory studies of till mechanical behavior and fabric evolution during shear. Abstracts of XVI INQUA Congress, Reno, Nevada, p. 124 (invited).
- Jach, J.**, **Cervato, C.** and Ridky, R., 2003, New methods for assessing introductory Earth science courses for non-science majors to determine effectiveness. *Geol. Soc. Am.*, North-Central meeting 35(2), 9.
- Jach, J.Y.**, **Cervato, C.** and Ridky, R., 2003, Using news media databases (LexisNexis) to identify relevant topics for introductory Earth science courses. *Geol. Soc. Am. Absts. with Progs* 35(6), 441.
- Johnson, C.C., Pratt, L.M., Kauffman, E.G., **Mora, G.**, and Carmo, A., 2003, High-frequency oceanographic and climatic fluctuations in a subequatorial mid-Cretaceous basin, northeastern Brazil. *Geol. Soc. Am. Absts. with Progs* 35(6), 494.
- Mcloughlin, M.P.**, **Iverson, N.R.**, **Thomason, J.F.**, and Hooyer, T.S., 2003, Determination of the microfabric of sheared till using high-resolution x-ray texture goniometry. *Geol. Soc. Am. Absts.* 35(6), Annual Meet. Suppl., Abstract 122-11.
- Mora, G.**, 2003, Isotopic evidence for the expansion of C4 plants in the tropical Andes during glacial intervals. INQUA meeting, Reno, Nevada, Congress of the International Union for Quaternary Research 16, 112.
- Mora, G.**, 2003, Temperature and salinity changes in the Caribbean Sea during glacial/interglacial intervals as inferred from isotopic and elemental data. *Geol. Soc. Am. Absts. with Progs* 35(6), 540.
- Mora, G.**, 2003, Isotopic evidence for the expansion of C4 plants in the tropical Andes during glacial intervals. INQUA meeting, Reno, Nevada.
- Owens, S.** and **Surge, D.**, 2003, Geochemical variation in microstructural layers of bivalve shells (*Mercenaria campechiensis*). Geological Society of America Abstracts with Program, National Meeting.
- Pennington, W.D., Turpening, R.M., and **Beresnev, I.A.**, 2003, Sonic stimulation of hydrocarbon production: Calibration of borehole tools. Abstracts and Program of the 2003 IRIS (Incorporated Research Institutions for Seismology) Joint Workshop, Fish Camp, California.
- Schultz, R.C., Isenhardt, T.M., **Simpkins, W.W.**, Colletti, J.C., Raich, J.W., Mickelson, S.K., Cambardella, C.A., and Parkin, T., 2003, Recreating natural riparian buffers in agroecosystems. Invited Presentation in Riparian Soils – Properties, Processes and Management Symposium, ASA meetings.

- Schultz, R.C., Isenhardt, T.M., **Simpkins, W.W.**, Colletti, J., Raich, J.W., Nelson, J.E., Lee, K.H., Marquez, O., Tefekcioglu, A., Wineland, T.R., Maiers, R., Johnson, A., 2003, The Bear Creek Watershed Project: re-establishing riparian buffers within intensively agricultural watersheds of the Midwest – an agroforestry practice. Proceedings of the North American Agroforestry Conference, Corvallis, OR.
- Schultz, R.C., Isenhardt, T.M., **Simpkins, W.W.**, Colletti, J., Raich, J.W., Nelson, J.E., Lee, K.H., Marquez, O., Tefekcioglu, A., Wineland, T.R., Maiers, R., Johnson, A., 2003, Design, installation, and maintenance and function of riparian buffers – phytoremediation for diffuse pollution. Proceedings of the International Symposium on Phytoremediation for a Clean Environment, Suanbo, South Korea.
- Schultz, R.C., Nelson, J., Haake, D., Zhang, H., **Simpkins, W.W.**, Isenhardt, T.M., Raich, J.W., Parkin, T.B., 2003, Soil quality differences under riparian forest, pasture, and row-crop cultivation in N.E. Missouri. Proceedings of the North American Agroforestry Conference, Corvallis, OR.
- Sharma, S., Zanazzi, A., Mora, G., Johnston, J.W., Thompson, T.A., and Baedke, S.J.**, 2003, Assessment of the influence of climate on the water balance of Lake Superior during the late Holocene as inferred from stable isotope ratios in swale sequences. *Geol. Soc. Am. Absts. with Progs* 35(6), 210.
- Simpkins, W.W.**, Fowle, C.J., Wineland, T.R., **Thimmesch, C.A.**, Isenhardt, T.M., and Schultz, R.C., 2003, Integrating site-scale and regional modeling studies to understand groundwater flow and nitrate transport in the Bear Creek watershed. *Geol. Soc. Am. Absts. with Progs* 35(6), 49.
- Simpkins, W.W.**, Fowle, C.J., Wineland, T.R., Isenhardt, T.M., and Schultz, R.C., 2003, Understanding the effect of riparian buffers on groundwater quality at site-specific and regional scales. 64th Midwest Fish and Wildlife Conference.
- Simpkins, W.W.**, Wineland, T.R., Isenhardt, T.M., and Schultz, R.C., 2003, Hydrogeologic setting controls NO₃-N removal in groundwater beneath multi-species riparian buffers. AWRA Spring Specialty Conference on Agricultural Hydrology and Water Quality. Kansas City, Missouri.
- Simpkins, W.W.**, 2003, Quantifying groundwater-lake interaction in Clear Lake using traditional field methods and an analytic element model. *Iowa Groundwater Quarterly* 13(5).
- Simpkins, W.S.**, 2003, Understanding the effect of riparian buffers on groundwater quality at site-specific and regional scales. 64th Midwest Fish and Wildlife Conference, Kansas City, MO.
- Simpkins, W.S.**, 2003, Quantifying Groundwater-Lake Interaction in Clear Lake Using Traditional Field Methods and an Analytic Element Model. Presented at the Iowa Groundwater Association Spring Meeting, The Hotel at Gateway Center, Ames.
- Simpkins, W.S.**, 2003, An Integrated Field and Modeling Approach for Understanding Lake/Groundwater Interactions. Presented to Agriculture and the Environment: Research and Technology Update for Water and Air Quality, Scheman Building, Iowa State University.
- Spry, P.G.**, Pals, D.W., and Scherbarth, N.L., 2003, Geochemical characteristics of epithermal gold mineralization along the Viti Levu lineament, Fiji. *Geol. Soc. Am. Absts. with Progs* 35(2), 12.
- Spry, P.G.**, Teale, G.S., and **Heimann, A.**, 2003, Multiple origins of gahnite (zincian spinel) associated with Broken Hill-type lead-zinc-silver mineralization in the Proterozoic Curnamona Province, Australia. *Geol. Soc. Am. Absts. with Progs* 35(7), 402.
- Surge, D.** and **Owens, S.**, 2003, Oxygen and carbon stable isotope and Sr:Ca records in outer and middle microstructural layers of bivalve shells (*Mercenaria campechiensis*). EOS Transactions American Geophysical Union, Fall Meeting Suppl., Abstract #B21A-06
- Surge, D.**, Walker, K. J., Owens, S., and **Langley, M.**, 2003, Skeletal recordings in shells and otoliths: archives of preindustrial climate change, southwest Florida. Charlotte Harbor Conference, Mote Marine Laboratory, Sarasota, Florida.
- Thomason, J.F.**, and **Iverson, N.R.**, 2003, Flow mechanism of ice sheets on un lithified sediment: plowing of clasts at the ice-bed interface. *Geol. Soc. Am. Absts.* 35(6), Annual Meet. Suppl., Abstract 122-9.
- Invited Talks (Universities, Research Centers, Non-conference, etc.)**
- Beresnev, I. A.**, 2003, Capillary-physics mechanism of elastic-wave mobilization of residual oil, Center for Environmental and Applied Fluid Mechanics, Johns Hopkins University. Invited by Markus Hilpert.
- Cervato, C.**, 2003, 'CHRONOS' - oral presentation to ISU Geology Alumni.
- Cervato, C.**, 2003, 'CHRONOS - a network of chronostratigraphic databases and tools', lecture for the Integrated Solid Earth Science (ISES) Forum on Cyberinfrastructure, Seattle WA.
- Cervato, C.**, 2003, 'CHRONOS - a portal to integrate biostratigraphic and taxonomic data', Town Hall Meeting, Seattle WA.
- Cervato, C.**, 2003, 'CHRONOS - a network of chronostratigraphic databases and tools', lecture for the Geol. Soc. Am. Sedimentary Geology Section, Seattle WA.
- Iverson, N.R.** Role of debris in resisting glacier flow: Experiments beneath the Svartisen Ice Cap, Norway. University of Nebraska, Lincoln, NE (45 minutes).
- Jacobson, C.E.**, 2003, Multi-stage exhumation history of the Orocochia schist subduction complex of southeastern California, University of Texas, Austin.
- Mora, G.**, 2003, Geochemical and Isotopic Evidence for Quaternary Climate Change in the Tropical Andes of Colombia. University of Minnesota-Duluth,

Department of Chemistry, Seminar Series, Duluth, MN.

- Mora, G.**, 2002, Geochemical and Isotopic Evidence for Quaternary Climate Change in the Tropical Andes of Colombia. University of Pennsylvania, Department of Geological Sciences, Seminar Series, Philadelphia, PA.
- Spry, P.G.**, 2003, Geology and geography of central Australia. Department of Botany. Iowa State University.
- Spry, P.G.**, 2003, Unusual rock types as guides to metamorphosed massive sulfide deposits. Department of Geology, Cukurova University, Adana, Turkey.
- Spry, P.G.**, 2003, Unusual rock types as guides to metamorphosed massive sulfide deposits. General Directorate of Mineral Research and Exploration, Ankara, Turkey.
- Spry, P.G.**, 2003, The geology and geochemistry of alkaline igneous rock related epithermal low sulfidation gold-silver telluride deposits. Department of Geology, Cukurova University, Adana, Turkey.
- Spry, P.G.**, 2003, The geology and geochemistry of alkaline igneous rock related epithermal low sulfidation gold-silver telluride deposits. General Directorate of Mineral Research and Exploration, Ankara, Turkey.

New Research Grants in 2003

- Cervato, C.** Research and Engineering Apprenticeship Program 2003, Academy of Applied Science. \$2,500.
- Cervato, C.** Collaborative Research: Chronos Network for Earth System History: development of integrated databases and toolkits accessible through a common portal. National Science Foundation. \$1,295,000.
- Cervato, C.** Introducing a web-based writing and peer-review component into introductory-level earth science classes: adaptation of the Calibrated Peer Review tool successfully used in chemistry. National Science Foundation. \$39,828.
- Fang, J.S.** A molecular, biochemical and biophysical study on piezophilic bacterial adaptation to the deep-sea high pressure environment: Astrobiological implications. Iowa Space Grant (NASA). \$30,000.
- Fang, J.S.** Lipid biomarkers as indicators of extant or extinct life on Mars. NASA. \$18,250.
- Iverson, N.R.** Landslide Prediction: Measurement of Rock Movement on Turtle Mountain, Alberta, Canada. College of Liberal Arts and Science Faculty Development Grant. \$15,175.
- Mora, G.M.** Environmental effects on stable isotopes and carbon cycle processes in agricultural settings of Iowa. CGRER (Center for Global and Regional Environmental Research). \$14,000.
- Mora, G.M.** Using isotopes to untangle ecosystems. College of Liberal Arts and Science Faculty Development Grant. \$15,000.
- Mora, G.M.** Assessment of carbon-isotope ratios of n-alkanes as a stratigraphic tool for Aptian deposits. Petroleum Research Fund, \$8,000.

Simpkins, W.W. Enhancing water quality in agricultural landscapes: The Bear Creek Watershed Project. US EPA. \$191,127.

- Simpkins, W.W., et al.**, Effectiveness of riparian forest buffers in head-water watersheds of the Western Corn Belt - part of the Univ. Missouri Project - A floodplain analysis of agroforestry's physical, biological, ecological, economic and social benefits U.S. Department of Agriculture. \$199,997.
- Simpkins, W.W.** Contract well installation and water-table mapping, Camp Dodge surficial geology project. Iowa Department of Natural Resources. \$5,610.
- Spry, P.G.** Trace element contents of garnet and gahnite as guides in the exploration for metamorphosed copper-lead-zinc-silver-gold deposits: A laser-ablation inductively coupled plasma mass spectrometry approach. ISU College of Liberal Arts and Sciences, Faculty Development Grant. \$14,306.
- Spry, P.G.** The origin and exploration significance of gahnite- and garnet-rich rocks in the Willyama and Olary Domains of the Curnamona Province (New South Wales and South Australia). Primary Industries and Resources South Australia. \$25,000.
- Spry, P.G.** The genetic relationship of garnet- and gahnite-rich rocks to Broken Hill-type lead-zinc-silver deposits in the Curnamona Province, Australia: Implications for exploration. National Science Foundation. \$167,571.
- Spry, P.G.** Foreign Travel Grant to Broken Hill, Australia, ISU Faculty Senate. \$1,300.
- Surge, D.** Controls on $\delta^{18}\text{O}$ and Mg/Ca ratios of the European oyster, *Ostrea edulis*: Archaeological and paleoclimate implications. American Philosophical Society, \$5,000.
- Surge, D.** Geochemical proxies of the southern quahog (*Mercenaria campechiensis*): Implications for Late Holocene subtropical seasonality and climate variability, SW Florida, \$35,000.
- Surge, D.** A geochemical survey of Iowa's freshwater mussels: Understanding their historical decline CGRER (Center for Global and Regional Environmental Research). \$20,000.
- Surge, D.** Collaborative Research: Calibration of Sr-Ca and $\delta^{18}\text{O}$ proxies of the southern quahog, *Mercenaria campechiensis*, to reconstruct Late Holocene climate, SW Florida. National Science Foundation. \$303,630.

2003-2004 Geological Sciences Seminar Series

Mark Person, Indiana University
Transient Groundwater Impacts on the Development of Pleaoclimate Lake Records

Susan Landon, AAPG Visiting Geologist Program
Gas and Oil Potential of the Midcontinent Rift

David Fox, University of Minnesota, Minneapolis
Neogene History of C_4 Biomass in the Great Plains, USA

Gary Johnson, Dartmouth College, Special Alumni Lecture
Uplifting Mountains -- What We Know About Collisional Tectonics as Recorded in the Himalayan Foreland Basin: Curries, Chapatis and a Very Old Landrover

Jennifer Rogers, University of Kansas
Mineral Stimulation of Subsurface Microorganisms: Release of Limiting Nutrients from Silicates

Dana Kolpin, US Geological Survey
Pharmaceuticals and Other Organic Wastewater Contaminants in Water Resources of the United States

Carol Wicks, University of Missouri, Columbia
Hydrological Disturbances and the Habitat of Stygobites

Annia Fayon, University of Minnesota, Minneapolis
A Shallow View of the Rapid Exhumation of the Deep Crust

Bernd R. Schöne, Institute for Geology & Paleontology, JW Goethe University Frankfurt
High-resolution, Century-long, Multi-proxy Records of Environmental Variables from Bivalve Methuselahs -- Global Change at Subsurface Waters

Leslie Perg, University of Minnesota, Minneapolis
Balancing the Budget: Cosmogenic Nuclides in the Swiss Alps

Tracy Frank, University of Nebraska, Lincoln
Marine Magnesite in the Precambrian?

Eliot Atekwana, University of Missouri, Rolla
Carbon Flow Diagnostics: Dissolved Inorganic Carbon in the Hydrologic Environment

Marc Hirschmann, University of Minnesota, Minneapolis
A Petrological Perspective on Cycling of Crust and Volatiles in the Mantle

Ken MacLeod, University of Missouri, Columbia
Hot Tropics and Regional Patterns of Temperature Change through the Cretaceous Greenhouse Interval

Carolyn "Molly" Davies, University of Missouri, Kansas City
Paleoenvironments of the Jordan Plateau: Climate Change and Human Settlement

Steven Emerman, Simpson College
Deforestation, Arsenic, and the Self-Organizing Jungle in the Terai Region of Nepal

David Malone, Illinois State University
A Stratigraphic Perspective on the Heart Mountain Detachment Fault, Northwest Wyoming

James Butler, Kansas Geological Survey
Groundwater Flow in Interconnected Stream-Aquifer Systems: from Models to the Field

Josef Werne, University of Minnesota, Duluth
Understanding the Sedimentary Archive: Molecular Isotopic Clues to (Paleo)environmental Controls on Organic Matter Sources, Alteration, and Carbon Isotopic Signature in the Cariaco Basin, Venezuela

Barbara Bekins, Birdsall-Dreiss Distinguished Lecturer
United States Geological Survey
Hydrogeology and the Weak Nature of Plate Boundary Faults

Jed Day, Illinois State University
Extinction Records of Late Devonian (Late and Latest Frasnian) Subtropical and Tropical Platform Shelly Faunas: Kellwasser Extinction Bioevents, Western Laurussia



Noah Pals is the son of proud parents Diane Pals (M.S., 1998) and David Pals (M.S., 2002). Thank goodness he has his mother's looks and that he apparently wants to be a geologist

Faculty and Staff Notes

Igor Beresnev, Associate Professor

Time to look back and see whether something worth telling you happened over the past year. This is always a challenge, to sort out noteworthy from routine.

Over the year, the group comprised of **Pavel Iassonov** (my Ph.D. student), Wenqing Li (Chem Eng Ph.D. student), Dennis Vigil (Chem Eng professor), Robert Ewing (Scientist in Agronomy Department), and me continued to work on the NSF funded project related to the explanation of the effect of vibrations on the mobilization of the residual oil. While Pavel and I focused on the physical mechanisms of sonic stimulation, the Chem Eng group conducted a series of laboratory experiments meant to demonstrate the amplitude and frequency dependence of the stimulation effects. The progress we have made seems to be the most significant achievement of the past year. We were able to explain the sonic effect on the fluids from the physical standpoint and verify the predictions in a laboratory setup.

This general theme has also been supported over the last three years by a DOE grant that we share with Michigan Technological University. I think the combined group effort has brought us much closer to understanding why and how the sonic tools and vibrators can enhance oil production in depleted reservoirs, with the knowledge affecting the field implementations. Two good papers should result from this effort: one with the explanation of the vibratory-stimulation mechanisms and one with the detailed account of the laboratory experiments supporting the inferences. The former paper has already been submitted to *Geophysics*, and I will also report these findings to a group of interested industry people and the sponsors at the DOE National Energy Technology Laboratory facility in Tulsa, Oklahoma this June.

It looks like I drifted entirely to the exploration/production geophysics over the last two years (at least, that's where almost all of my sponsored funding currently resides). We have continued productive work with Andrey Lebedev, a postdoctoral fellow from the Institute of Applied Physics in Russia, who has been with us for the last two years, on a WesternGeco contract involving explanation of various features of operation of Vibroseis sources. The goal is of course the improved understanding of what is going down to the earth. We tackled a problem of nonlinearly elastic ground under the baseplate (will be published in *Geophysics* in the July/August 2004 issue) and investigated the effect of baseplate flexure on the radiation (submitted to *Geophysical Prospecting*). The sponsor continues to show interest, and the contract has been recently extended for another six months.

Allan Dudding, my M.S. student, defended his thesis in July. He has worked on the application of georadar to the real-time evaluation of deterioration of concrete pavements. Historically, much less attention has been devoted to the application of radar to concrete roads than to asphalt roads, and we hope our effort has somewhat narrowed this gap. A paper with our principal findings has been submitted to the *Journal of Environmental and Engineering Geophysics* not long ago.

It was great pleasure to meet many of you at the campus reunion last September. Hope to meet even more folks in the nearest future.

Cinzia Cervato, Assistant Professor

This was a very busy year. I taught the usual three classes (two sections of Geology 100 in the fall and Meteorology 206 in the spring) and the more 'laid back' approach has paid off – my liver is in better shape than it was at the end of the first year! I have done a lot of traveling for CHRONOS and my PhD student **Bjorn Brooks** substituted for me in class when I was absent. He did a tremendous job and between his help, the hard work of work-study student Amy Rodgers, and Internet access, I managed to keep track of assignments and activities also when I was traveling.

CHRONOS is off to a great start and I have now become its executive director. This means more work than initially expected but we are getting a lot of PR from the National Science Foundation and this has generated a lot of interest in the project and good visibility to Iowa State University. Doug Fils and the team of programmers, including computer-engineering junior Josh Reed, consultant Pat Diver in Houston (ex Amoco database manager), Doug Greer at the San Diego Supercomputer Center, and Geoff Bohling at the Kansas Geological Survey, have made incredible progress in the 11 months that we have been working on the development of the IT network of Earth Systems History. Since the beginning of the project, we have organized an IT meeting in San Diego, a retreat for all participants in Ames, a Tools workshop in San Diego, a Permian/Triassic boundary workshop in Boise (Idaho), a Mesozoic planktonic foraminifer taxonomy workshop in Washington DC and a chemostratigraphy workshop in San Antonio, Texas. I have given presentations at GSA in Seattle, AGU in San Francisco, AAPG in Dallas, NSF, numerous talks to various organizations and workshops, and convened a topical session at the Cordilleran/Rocky Mountains GSA in Boise. I am also going to convene a session on CHRONOS and geologic time at the national GSA meeting in Seattle this November. You can follow our progress on the monthly newsletters on our web site (www.chronos.org). If you have not done it already, I encourage you to play the flash movie on the opening page. We are quite proud of its visual impact.

My graduate student **Joan Jach** graduated in May with a MS in geology with a minor in education. Both my PhD students, **Bjorn Brooks** and **Cammy Bright**, have passed their preliminary examination and are making good progress on their theses. Bjorn is planning fieldwork on Tasmania for his stratigraphic and paleontologic study of the Cambrian ‘explosion’, while Cammy is collecting data for her work on the late Glacial/early Holocene climate history of the Mediterranean and the Neolithic revolution. Two seniors from Ames High School, Shivgami Arora and Stephanie Schueller, are helping Cammy in the lab and Doug Fils with some CHRONOS-related activities this summer. Bjorn just spent one month in South Africa sponsored by a National Science Foundation project to bring two African-American science PhD students to South Africa and spend time with local students and share with them their experience as young scientists. Bjorn is participating in this program together with a student from Princeton.

Francesca started kindergarten last fall at Roosevelt. She enjoyed it tremendously after the initial adjustment and made a lot of friends. She is going to move to St. Cecilia in the fall. We have traveled to Italy over Christmas and were in Australia at the end of May. We visited both Adelaide and Sydney and Francesca enjoyed this trip so much that she wanted to move there – on her own! Seen with the eyes of a 6-year old, Australia is indeed a fantastic place to be with kangaroos and koalas roaming wild, thousands of multicolored birds and parrots, deserted beaches, and aquariums where she could see Nemo and Dori – alive! I have prepared my tenure and promotion documents, and the process is going to start this fall. Wish me luck! And make sure to stop by when you are in Ames or visit me at the CHRONOS booth in the exhibits area at the upcoming national GSA and fall AGU meetings.

Jane Pedrick Dawson, Lecturer

The years seem to go by faster and faster. In the fall, I taught the mineralogy lab and filled in for DeAnn after her surgery, which gave me a whole new appreciation for all that DeAnn does for us here in the department. We were all very glad when she returned to work, especially me! This spring, I taught the structural geology lab and both sections of Geology 100. Geology 100 is always a challenge, but it was more so this year as I made the leap from chalkboard to Power Point and completely revised the class.

I continue to work with Carl Jacobson on tectonic problems in California. Over the semester break, we collected upper Cretaceous – Eocene sediment samples from numerous locations in central California in support of an on-going detrital zircon geochronology project that deals with the provenance of the Pelona-Orocopia-Rand schists. Unfortunately, we didn’t even feel a large earthquake that occurred while we out there, but we did feel an aftershock. The samples we collected kept me busy in the lab this spring. My husband Bob Dawson works as a geologist with the Iowa Department of Transportation and enjoys studying the geology of Iowa and the bordering

states. He’s always bringing home interesting rocks from his travels that wind up in our perennial beds. The yard, garden, and work on the wood pile keep us busy this time of year. As always, stop by if you’re in the area!

Jiasong Fang, Assistant Professor

This past year I taught all three courses: Environmental Geochemistry, Environmental Biogeochemistry, and Contaminant Hydrogeology. In fall 2003, I started to use WebCT to post syllabus, lecture notes, problem sets and answers, laboratory assignments, supplementary reading, study guide, and web resources for student use.

This fall, I plan to offer a Geomicrobiology course (Geology/BBMB/EnSci/Micro 432x/532x) with Dennis Bazylnski in the Department of Biochemistry, Biophysics, and Molecular Biology. At the time of writing this essay, the course has been approved but is not yet “on-line.” Geomicrobiology is a new and rapidly-developing field that has led in the past decade or so to a radically-revised view of microbial diversity and activity and biogeochemical processes on earth. The cross-fertilization between geomicrobiology and other fields (Limnology, Oceanography, Ecology, Global Climate Change, Medical Microbiology, and Environmental Engineering) has led to important insights and discoveries. These discoveries have revitalized or refocused scientific research in related fields such as exobiology. Dennis and I hope that offering this course will bring interdisciplinary training to our students in both geology and microbiology at Iowa State University.

We are making decent progress in building a molecular microbiology capability in my lab. Several instruments/equipment were acquired in the past year, including a BranTech CO8000 cell density meter, an Eppendorf 5804R high speed centrifuge, a Thermo Electron 96-well thermal cycler for PCR (polymerase chain reaction), and a gel electrophoresis with BIODOC-IT system with M-26. Protocols for molecular analysis (DNA isolation, PCR, gel electrophoresis, etc.) are being worked out. With **Mark Mathison**’s help, we built another high pressure cultivation system with a larger internal volume (1,400 mL, compare to 800 mL for the first one built two years ago). That means we can get more biomass from growing those piezophilic bacteria for our experiments. Netra is examining the barotropic phase transitions of phospholipid membranes of piezophiles growing at different pressure (from 0.1 to 40 MPa) using differential scanning calorimetry (DSC). DSC is a technique we use to study the phase transition of membrane lipids based on curves of heat flow vs. temperature generated when membrane lipids of piezophiles are heated. We expect that results from DSC measurements will give a quantitative (as oppose to descriptive and phenomenological) definition of the role of polyunsaturated lipids in microbial adaptation to the deep-sea high pressure environments. Olivia is working on a project to characterize the microbial communities in deep-sea sediments using lipid biomarkers and stable carbon isotope signatures of lipids. These sediment samples are coming from the cold seep sites from the western Pacific. Specifically, we are interested in those consortia of sulfate-reducing bacteria and methanogenic

archaea that perform so-called anaerobic methane oxidation or “reverse methanogenesis” in the deep-sea.

I am the new coordinator for the Geology seminar series. With everyone’s help, I have put together the fall 2004 lecture series. We have a very exciting lineup of speakers with a broad range of topics for the fall.

DeAnn Frisk, Secretary

At least I can’t say that time stands still. It seems to go by way too fast for me! Last summer I was anticipating the fall semester and the upcoming alumni reunion but instead I spent eight days in the hospital and several weeks at home recovering from emergency surgery. I’m doing fine now but missed the beginning of the semester and the alumni reunion. Then I spent the rest of the semester playing catch-up. **Jane Dawson** helped Carl cover the basic operation of the office during my absence.

It appears that Iowa State has decided that every possible process, procedure and form should be changed during the past year. I don’t know how many meetings and training sessions I’ve attended and then I have to figure out how everything really works! I’m all for progress and making things simpler but when time is short to begin with it makes it even more difficult to find the time it takes to learn even enough to function.

Steve and I took a spring break trip this spring – a first for us. We flew to San Antonio and spent five days along the Riverwalk area. It was wonderful weather and we had a great time. Of course, it seemed like everyone else was on spring break as well so we spent lots of time waiting in lines. The weather was so enjoyable that we didn’t mind waiting outside in lines. We had a rental car so visited many tourist traps around the area.

The four grandkids are getting more involved in activities each year. School and church activities along with 4-H and sports give the grandparents a lot to do in our “spare” time. I’m not complaining and I love having all of them close so I can participate in their activities.

I regret that I wasn’t able to see those of you that came to the Alumni Reunion last fall but I look forward to seeing those of you that are able to stop by the office for a visit. Hopefully I’ll see many of you at the next alumni reunion.

Neal Iverson, Associate Professor

I started two research projects last year that have been fun and frustrating in roughly equal measures. In August, we installed instruments in deep fissures on Turtle Mountain in the southern Canadian Rockies. In 1903, a rockslide occurred there that buried the mining town of Frank, Alberta. Since that slide, a rock wedge of five million cubic meters has become separated from the mountain’s summit by fissures and is thought to be unstable. We are monitoring creeping rock motion that could signal another catastrophic failure. The other project involves measuring crack growth in rock beneath the Svartisen Ice Cap in northern Norway, where we have worked for a number of

years. Crack growth that leads to erosion of the bed is measured using acoustic emission technology, with the aim of relating crack-growth rates to subglacial stresses. Most of the fun has come from collaborating with **Denis Cohen**, an affiliate faculty member in our department, and **Tom Hooyer** (Ph.D., 1999) at the Wisconsin Geological Survey. Their skills have made these projects possible and their enthusiasm, despite frequent setbacks, is unrelenting. The frustrating part has involved malfunctioning instruments, weather, and glaciers that have behaved as if they were indifferent to the success of these projects.

One sure way to avoid bad weather is to do laboratory experiments, and my students, **Jason Thomason**, **Meaghan McLoughlin** (B.S., 2002), and **Matt Graesch** (B.S., 2003), continue to do a lot of them. With our ring-shear device, they shear basal tills of the Laurentide Ice Sheet and study their microstructural characteristics as a function of shear-strain magnitude. They find that sand-grain and clay-mineral alignment and the magnetic properties of till are good indicators of deformation. Jason is beginning to apply these findings to sediments of the Lake Michigan Lobe to determine if it moved by pervasively shearing its till substrate. Matt will use his laboratory results to study the origin of drumlins of the Green Bay Lobe.

I worked on a theoretical model for estimating sliding speeds of past ice sheets from structures they leave in their basal sediments. Tom Hooyer and I used this work to estimate the speed of a pre-Wisconsin ice sheet from plowing structures preserved in outwash at Peoria, Illinois. This urban field experience was a nice change of pace, with fast food and cool beverages only minutes away.

This year has also involved the normal complements of teaching (geomorphology and a graduate seminar), proposal writing, paper writing, reviewing, and tasks too mundane to mention here. A welcome respite occurred during the summer when Kathy and I take our kids, Joe (12) and Ellen (9), to SW Colorado for two weeks of camping, hiking, and fishing. Best wishes to all of you for a great year!

Carl Jacobson, Professor and Chair

Being Chair is keeping me busy, but I’ve still had time to make at least some progress on my research. In the past, I’ve tended to spend a full month in the field over Christmas break, generally working in the California deserts. I’m now in a mode of doing several shorter field stints throughout the year. This is partly because it’s now harder to get away for a full month at a time, but partly it just reflects the nature of my current projects. In particular, I’m doing a lot of geochronology these days, so much of the field work is geared to sample collecting as opposed to the detailed field-based structural analysis and mapping that I emphasized in the past. In any case, when I wrote last year, I was about to head off to California with my former UCLA classmate, Mark Cloos, who is currently on the faculty at UT Austin. I’m helping Mark supervise a graduate student at UT who is determining ages of detrital

zircons from the Franciscan complex. The Franciscan has long been viewed as a type example of an ancient subduction complex, but there are still many aspects that remain poorly understood because of poor control on the age of the protolith. Recent analytical advances now allow the rapid, inexpensive dating of individual zircons. For sediments, depositional age can be no older than the youngest detrital zircon in a given sample. For sedimentary basins adjacent to active arcs, odds are that maximum ages determined by this technique will closely approach the true depositional age. Anyway, we spent a few very pleasant days looking at the spectacular melanges exposed along the beach near San Simeon, California and also checked out the eastern, “coherent” Franciscan in the Stony Creek area north of San Francisco.

During the Christmas break I did go back out to California for two weeks with **Jane Dawson**. This was also for a detrital zircon study – one we are finishing up on upper Cretaceous to Eocene sediments of the southern California forearc basin. Parts of that terrane have now been dispersed all the way up to the Bay area and beyond by slip on the San Andreas fault system, and we are trying to sample this entire area. Most of our time was spent in the coastal areas between Los Angeles and Point Sur, but we also did get out to the El Paso Mountains of the north-central Mojave. We ran into quite a bit of rain (you may remember the mudslides in the San Bernardino Mountains, which resulted from the same set of storms), but did manage to get most of the samples we were after. During spring break, it was back out to UCLA to run the samples and to also spend a couple of days in the Rand Mountains of the Mojave. By the way, the above studies also involve Ana Vucic, who received her M.S. from our department in fall of 2002. After receiving her degree, Ana was picked up as the Director of the UCLA Ar/Ar lab. However, Ana’s husband, Jovica, was recently offered a faculty position in chemistry at Ohio State, so they left UCLA in early May for Columbus.

Our sons Mark and David are now both at Iowa State. Mark is majoring in zoology and is entering his fourth year. He switched majors a couple of times, however, so will need an extra year to graduate. David just finished his Freshman year as a major in aerospace engineering. Carol is still enjoying her post-university life managing a small computer graphics company in the ISU Research Park. Carol and I just got back from a 10-day vacation to France and Italy. We had a great time.

Mark Mathison, Teaching Lab Coordinator

I have just finished my first year and a half in the Geology Department as teaching lab coordinator. It has been a busy year. I just returned from the Geology Field Camp. This marks the first year that Erik Kvale and I ran the camp from start to finish. It was a successful year with the help of alumni Howard White and Rick Chamberlain. Howard provided 70 boxes of well core from Kerr McGee and led the students in an exercise in well log interpretation. Rick led the students in a paleocurrent mapping exercise to determine the probability of an oil prospect. Both

exercises gave the students valuable practical experience. The Field Camp is now on city water and we are now looking to find the resources to build a new shower house with flush toilets! We hope to have this done in time for the next season.

I participated in field work in Egypt and Mongolia this past year. Work in Egypt involved Eocene primates in the western desert while work in Mongolia involved looking for dinosaurs in the Flaming Cliffs and other areas. The work was done in conjunction with the Tyrell Museum in Canada. **Carl Vondra** also participated in this work. I look forward to another season working with Tom Bown in Egypt this November. Tom has been working in Egypt for the past 20 years and is an alumnus of the Department. We hope to continue to help unravel the story of primate evolution. Watch your local book store for books by Tom on his search for Cam Iseses Army.

Germán Mora, Assistant Professor

It was a productive year for every person in my research group. Besides teaching “Stratigraphy and Sedimentology,” “History of the Earth” with **Carl Vondra**, and a seminar, I was concentrating on two main research projects. One deals with the evaluation of how rainfall patterns have changed in northern South America for the last half million years, relying on geochemical and micro-paleontological analyses. I presented some of the preliminary results of this NSF-funded project at the GSA and AGU meetings. My results and interpretations were well-received at both meetings. I am currently working on finishing up a couple of manuscripts related to this research, which hopefully will be in print earlier next year. The second project involves the isotopic study of fossil plants from Aptian sequences from Maryland. The Petroleum Research Fund provided the financial support to carry out this project. After two field seasons, my collaborators and I are finally getting ready to have a complete data set, which will be presented at the upcoming GSA meeting.

Besides working directly on these two projects, I was also supervising the research of my students and my post-doc. Dr. **Shikha Sharma**, who joined us in 2002, has been instrumental to the productivity of our research group. She did not only work on her own research, but also helped undergraduate and graduate students with their experiments and sample analyses and was responsible for overseeing the day-to-day operation of our mass-spectrometer. Shikha recently completed her research on the isotopic analyses of peat samples from Lake Superior to assess past changes in hydrological conditions. She identified two dramatic periods of reduced precipitation during the past 4,000 years, each one preceded by two periods of increased rainfall. She had already submitted a manuscript describing these results, and we are hopeful that it will get published in the Spring. Shikha will continue working in my lab, being responsible for carrying out a recently NSF-funded project that attempts to develop a model to assess the partitioning of carbon between temperate crops and the atmosphere. This project will be done in collaboration with Jim Raich, an ISU plant ecologist. We will be

analyzing meteorological, biological, and isotope information to quantify this partitioning and to develop a model to depict it.

Alessandro Zanazzi, a M. Sc. student, has been collecting mosses and their surrounding water in wetlands around Lake Superior. He has been extracting cellulose from the mosses and determining their isotopic composition to evaluate whether the isotopic composition of cellulose reflects the source of moisture for rainfall in this region. He has demonstrated that indeed the isotopic composition of moss cellulose indicates that the moisture in this region primarily comes from the Gulf of Mexico. With this information, he will study the isotopic composition of cellulose extracted from peat deposits to evaluate changes in weather patterns for the late Holocene in the Great Lakes region. Alessandro will be presenting his preliminary results and interpretations at the upcoming GSA meeting.

Weihong Wang, a M. Sc. student, has been busy collecting soil air from an experimental farm in Marshall County, Iowa, where several species of grasses were planted on a series of plots three years ago. Weihong has been collecting diurnal and nocturnal gas samples emitted from the soil for two growing seasons. The goal is to evaluate the factors that control grass respiration. We have found that plant growth plays a major role in determining the rate of soil carbon dioxide emissions. While some grasses grow late in Spring, others grow in the mid-Summer. We found a strong correspondence between maximum respiration rates and periods of maximum growth for the studied grasses. We also found that microbial decomposition rates of soil organic matter are temperature-dependent. Weihong is now writing her thesis that describes her findings and main conclusions.

Matt Dvorak, a M. Sc. student, joined our group last Fall. He was busy taking classes and collecting samples from four estuaries in southwest Florida during this academic year. Matt is interested in studying the effects of land-use changes on the health of coastal environments. In collaboration with Donna Surge, we selected four estuaries experiencing different degrees of land-use change in their watersheds, ranging from almost pristine to highly altered by agricultural and residential use. Because of the importance of this type of research, NOAA offered Matt a fellowship to support his graduate studies and sample analyses. Needless to say, he gladly accepted it.

With the work and enthusiasm of everyone in my group, the research program in isotope geochemistry at ISU is rapidly advancing. I am really excited about what we are doing, and I can't wait to see what else we discover. Expect some good news next year!!!

Karl Seifert, Professor Emeritus

Retirement has been great! I have no meetings, committees, or schedule to follow and can do whatever I like. So far I have finished one paper on Lake Superior geology that is to be published in this July's issue of the Canadian Journal of Earth Sciences. This paper is coauthored by Jim Olmsted from New York, he is also

retired. A second version of a much longer manuscript on the Adirondack anorthosite has been sent to one of my coauthors from Washington University, Bob Dymek, for his comments. We hope to have this paper wrapped up before Christmas if possible. The third project I am working on is alteration in the Iowa basalt cores from the Midcontinent Rift. I plan to have much of that study finished by spring and travel to Switzerland for the final paper writing with my Swiss coauthor next May. It is so much easier to do research when no teaching or other distractions are necessary. Besides continuing to do research I get to play racquetball every day now that I am retired, racquetball has been my exercise program. Also I can travel when classes are being held which reduces the crowds and cost of travel. I just returned from Lake Tahoe, CA, and a family reunion with my three kids and five grandkids. We hiked, rode horses, and sailed around Lake Tahoe for a week. In two weeks, Carole and I are off to the UK on a month long Trafalgar tour of England, Wales, Ireland, and Scotland with a couple we met in Australia last year. Other than those activities we seem to be mowing the lawn a lot this year because our Iowa weather has been unusually wet this summer. I hope all of you are doing well and can get to our alumni days in 2005!

Bill Simpkins, Associate Professor

My stress level actually decreased a bit this year. In November 2003, I ended a long run (12 years) with the Management Board of the Hydrogeology Division of GSA. My last official act was to supervise and act as Master of Ceremonies for the Student Reception and Raffle at the Annual Meeting in Denver. After spending months begging vendors to give the Division free stuff, we gave away about \$25,000 of books, software, and memberships to about 80 worthy graduate students. Imagine receiving a full copy of GMS or Visual MODFLOW! I am now on the Division's Nominating Committee, charged with finding new people to take my place in the various positions I used to occupy.

A number of exciting publications are in the works. **Martin Helmke's** long-awaited graduation last May spawned 3 manuscripts on till fractures. Two of the manuscripts are in press in the *Journal of Environmental Quality* and *Vadose Zone Journal* (on-line journal). Martin is revising a 3rd manuscript that is slated for *Ground Water*. An article that I co-authored with Mike Burkart and others on phosphorus in groundwater will be in the *Journal of the American Water Resources Association* in June 2004. Finally, my article on the application of the analytic element model to Clear Lake, which was tied up in reviews and publication problems for nearly a year, should come out in *Ground Water* this year as part of a special CD-ROM volume on analytic element modeling. I have other manuscripts in the mill on buffers, so stay tuned. I also completed my 7th year as an Associate Editor for *Ground Water*.

A visit to ISU from Dr. Margaret Leinen of NSF last July finally sparked interest on campus to join the Consortium of Universities for the Advancement of

Hydrologic Science, Inc. (CUAHSI; www.cuahsi.org). By the end of the year, I had enough contributions from our department, our College, the Graduate School, and the departments of Agronomy and Natural Resource Ecology and Management (NREM- formerly Forestry and Animal Ecology) to pay the admission fee of \$2,000. The purpose of this organization is really to set the research agenda of hydrology within NSF and other funding agencies. As an outgrowth of this association, a small group of us (myself, Mike Burkart (NSTL) and faculty from Agronomy, NREM, EEOB, and Civil Engineering) submitted a proposal to hold Vision Paper Workshop in June 2004 on the topic of "The Hydrology of Intensively Managed Landscapes (IMLs) in the Glaciated Midwest U.S." The purpose of the workshop is to define the key scientific questions for future research in the hydrology of agricultural areas. The proposal was funded for \$5,000 and we are holding the workshop on June 15-16, 2004, at Reiman Gardens, the details of which can be found at www.iastate.edu/~nscntral/releases/2004/jun/hydroconf.shtml. In addition to hammering out the scientific questions, we will lead field tours in the Walnut Creek watershed and the Risdal Riparian Buffer as part of the workshop. This fall, our group will be responsible for writing up a paper from the workshop proceedings and presenting our results as a Cybercast.

My fall teaching load included Hydrogeology (11 students) and Watershed Hydrology and Surficial Processes (28 students; co-taught with Dr. Lee Burras). We tried "The Civil Action" case in Hydrogeology and probably had the best attorneys ever this year (www.las.iastate.edu/newnews/geologytrial03a.shtml). The class even made the Boston Globe (www.boston.com/news/local/articles/2003/11/23/lawsuit_inspires_a_real_class_action/). In the spring, I taught a new experimental course in Applied Groundwater Flow Modeling to 6 eager students (3 graduate, 3 undergraduate). The course went well and we spent about the first half learning how to program finite-difference solutions and water balances in spreadsheets. We spent the latter half learning how to operate and apply MODFLOW (through the pre-processor Groundwater Vistas) and GFLOW 2000 (an analytic element model written by Henk Haitjema). We examined the effects of different boundary conditions, calibration, and sensitivity analysis. Near the end of the course, my former graduate student Beth Johnson came down from Minneapolis to give a lecture on groundwater modeling in the real world. The final project involved a site in the arid west, where students calibrated the model, added pumping wells, pumped the wells, and then used particle tracking to determine discharge areas for potential nuclear waste. Students presented their results in groups of two using PowerPoint and all did a fine job. Also this spring, I co-taught Energy and the Environment with **Paul Spry** (I taught the environmental part) for the first time. This was my first big lecture experience (60 students), but I got over it quickly and actually got to know many of the students well. They really enjoyed the field trip to the Ames Power Plant, Resource Recovery Plant, a wind turbine in Nevada, and the car dealer to see a hybrid car. Finally, to round out the spring, I taught Field

Methods in Hydrogeology to 8, graduate students (<http://www.las.iastate.edu/newnews/hydrogeology04.shtml>) from May 10th to 21st. Although the class was very small, we were focused and got everything done, while still managing to dodge the rain.

In student news, I have taken on 3 new Ph.D. students this year, so I am optimistic for the future of hydrogeology at ISU. **Cheng Cheng** is from China, **Chulin (Mike) Cheng** is from Taiwan and **Maneesh Sharma** is from India. All three will be working on the riparian buffer project in Missouri or Iowa. Former Ph.D. student Martin Helmke will leave his position as a highly paid consultant for Versar, Inc., this summer and take a 2-year position teaching geology and geochemistry at Dickinson College in Carlisle, Pennsylvania. Graduate student Tim Wineland is working for MWH Americas in Des Moines and doing very well, including a new baby on the way. Colleen Fowle got a job with the City of Peoria, Arizona, as water conservation specialist and educator, where she is teaching people how to save water. *Beth Spear* returned to defend her M.S. degree in Geology and Water Resources this spring and is now certified to teach Earth Science in Wisconsin. Sarah Vlachos is married has taken a job with GeoTrans in Herndon, Virginia. Jim Eidem and Beth Johnson (both with Geomatrix in Minneapolis) attended the Geology alumni reception in the fall and told me about their work in the consulting world and their ever-expanding families. Greg Caron (Dept. of Ecology in Washington State) and Rachel Stansbery became proud parents of a baby girl.

On the home front, Scott and Kelsey will both be at Ames High School this coming fall. Scott was selected as an All-State trombone player in 2003 and was 4th chair in the band as a sophomore. He is the bass player Jazz Band I, played trombone in the Ames High Orchestra, sang in the Chamber Choir and Concert Chorale, and got a singing and dancing part in the musical "How to Succeed in Business without Really Trying." He also played varsity tennis for Ames High this spring. Scott is taking driver's education this summer so that he can drive when he turns 16 in August. Kelsey was selected for the SCIBA Honor Band Festival on French horn and the SATB choir at Ames Middle School. She still does Jazz Dance with the Robert Thomas studio. Vacation last year took us to the Glacier National Park, Banff and Jasper, Vancouver, Victoria, and Seattle. It was a spectacular trip, complete with Scott and me getting *giardia* and us losing a camping spot to a bunch of bison! This year we are going to visit Civil War battlefields in the eastern U.S. and also see Washington, D.C. and Cape Hatteras. We enjoy getting visitors so please stop in and see us!

Paul Spry, Professor

My philosophical approach to last year was to complete some long-standing research projects that I had been working on over the years and to not start new ones until the old ones were done. So much for philosophy!! I ended up starting several new projects but did manage to get some older projects completed. I had several papers come

out on two major research fronts: the mineralogy and geochemistry of gold deposits and the effects of chemical deterioration of highway concretes. Two papers were published on our studies of the Emperor gold deposit, Fiji, with former student David Pals, along with two additional papers on the mineralogy of the giant Kalgoorlie gold deposit Australia with former student Jill Murray (nee Shackleton). Two papers with former Master's students Nancy Scherbarth will be forthcoming on the Tuvatu gold deposit, Fiji, with one being accepted already. Over the last two summers, I have been to Australia with Ph.D. student, **Adriana Heimann**, to work on a project funded by the National Science Foundation concerning the origin of meta-exhalites in the Proterozoic Curnamona Province (South Australian and New South Wales). These horizons manifest themselves as extensive garnet and zinc spinel layers, which ultimately serve as exploration guides to lead-zinc-silver mineralization. The Curnamona Province hosts the largest massive sulfide deposit in the world at Broken Hill. This project has involved several collaborators including Sam Houk and his Ph.D student, Josh Messerly, in the Department of Chemistry at ISU, Graham Teale, a geological consultant from Adelaide, Australia, Ian Plimer (University of Melbourne), and Mark Fanning (Australian National University). This project required several trips to the University of Minnesota to collect electron microprobe data. Meanwhile, Adriana Heimann collected laser ablation-inductively coupled plasma-mass spectrometry data at ISU and Macquarie University (Australia), and U-Pb ages of zircon and monazite using the SHRIMP at the Australian National University.

Papers were presented at the Broken Hill Exploration Initiative Conference in Broken Hill, Australia, the regional North-Central meeting of the Geological Society of America (GSA) in St. Louis (with graduate students **Patrick Hook** and **Adriana Heimann**), and at the national Geological Society of America meeting in Seattle (where I was able to have dinner with alumni, Rachel and Greg Caron and Scott Hemingway). I also presented a paper at the AGU meeting in Montreal in May.

A highlight of last year was the initiation of a series of new projects with colleagues in Italy (Luca Bindi at the University of Firenze), Turkey (Zeki Billor, Cukurova University), and Greece (Stellios Tmbros and Karen St. Seymour, University of Patras). Papers have either been published or are in press with my European colleagues on rare tellurides from Australia, Colorado, and Tinos Island (Greece). I visited Turkey in late September-early October and gave four talks to the Turkish Geological Survey (Ankara) and at the University of Cukurova. In addition, Zeki Billor and I, along with 24 geologists from the Turkish Geological Survey, visited 15 gold deposits in western and central Turkey. I initiated projects on gold deposits in western Turkey and adjacent to the border between Turkey and Syria. The trip was sponsored by the Turkish Science Foundation.

Bob Cody, Anita Cody, Patrick Hook (M.S. student) and I finally completed our Iowa Department of Transportation (IDOT) supported project to evaluate "The reduction of concrete deterioration by ettringite using

crystal growth inhibition techniques." This was a field- and lab-based project. One paper was published, two are in press, and one other is in review.

Last year was also a lot of fun because I taught a new class for non geologists with **Bill Simpkins** on "Energy and the Environment." Somehow, I also managed to get buried with editing duties as I am now on the editorial boards of three journals: Economic Geology, Mineralogy and Petrology, and Canadian Mineralogist. It keeps me off the streets!!!

Please drop by when you are in Ames or keep in touch by e-mail (pgspry@iastate.edu). I would like to include information about you and your family in next year's Varve. Best of luck over the next year!

Ken Windom, Associate Professor

The past year has been a very busy one for me. Jane and I had a new house built on a 5-acre parcel of land we bought in southern Story County. Most of my free time has been spent converting the land from a soybean field to a place for us and our animals. All the effort I put into learning about soils, groundwater, and surface water in glacial materials for the Geology for Engineers and Environmental Scientists course has really paid off. The variability in soil type and related properties such as permeability varies greatly in just this small area. I now feel much more confident when teaching this course, and the Environmental Geology: Earth in Crisis course, because I can give examples from personal experience that I think resonate more with most students. They can see the practical applications rather than some abstract global concept. For example, the waste water is treated using a "mound" system, which is an engineered feature. This is very pertinent to the CE majors I teach.

One feature we installed in the new home was a ground-source geothermal heat pump. It is really performing well. We were very toasty last winter, and the cooling part has been fantastic (and cheap!). Best of all, it doesn't require burning any fossil fuels (except for any that might be required to produce the electricity to run the forced-air fan), nor does it contribute greenhouse gases to the atmosphere. An additional bonus is that hot water in the summer is free, as the heat from the air is pumped into the hot water heater.

Teaching has become the major component of my department responsibilities. In addition to the Geology for Engineers and Environmental Scientists and the Environmental Geology course, I continue to teach Mineralogy and Earth Materials with **Paul Spry**, along with the igneous portion of the Petrology course. During the coming year, I will begin teaching half the History of the Earth course.

I trust all of you are well. Please stop by and visit when you are in Ames.