

# Geosciences Fall 2012 Varve

Keeping in touch with Alumni, Students, Friends and Faculty  
of the Department of Geological and Atmospheric Sciences



## Rock Stars!

IOWA STATE UNIVERSITY  
COLLEGE OF LIBERAL ARTS & SCIENCES



Alex Morrison (Master's student), Alan Wanamaker and two NSF Research Experience for Undergraduate visitors (Bekah Burket and Bianca Bello) doing field work in Iowa



Above: Neal Iverson looking nervous as he has just handed Josh O'Brien a geology hammer as part of Josh's "Pick of the Year" award



Neal Iverson, with Graduate Student Seminar Top Paper Awardees (left to right): Tom Parham, Shelly Griffin, Andy Fornadel, Ben Petersen

# Varve

Varve is published once a year for the alumni, friends, and faculty of the Department of Geological and Atmospheric Sciences at Iowa State University, an academic department in the College of Liberal Arts and Sciences.

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# Greetings from the Chair



## University and Department News

Although the floods of recent Iowa summers were replaced this year by drought, there was a flood of students into Ames this August. There are 31,040 students enrolled at ISU this fall, up from 29,887 last year and with a growth rate twice that at the University of Iowa. Burgeoning enrollment was not predicted by ISU officials several years ago, based on state-wide demographics that indicated shrinkage was more likely. However, those demographics have been more than compensated by the excellent value and welcoming atmosphere that ISU works hard to provide students and their parents.

Big changes have occurred at ISU during the last year. Steven Leath was installed as the 15th President of the University. He was formerly vice president for research and sponsored programs for the 16-campus University of North Carolina system. One of his major goals is to encourage more numerous and effective partnerships between ISU and the business community. Over last summer, former College of Engineering Dean Jonathan Wickert replaced Elizabeth Hoffman as Provost. Interim Dean David Oliver of the College of Liberal Arts and Sciences (LAS), who served last year in the wake of Mike Whiteford's retirement, stepped aside in April for new Dean Beate Schmittmann. Previously, she was chairman of the Department of Physics at Virginia Tech University. She has listened intently to the diverse concerns of the many departments of LAS and brings to the job an unusually good awareness of the geosciences. An additional big change is that this year state support for ISU, for the first time in several years, went up (3%) rather than down. This increase, and more significantly, revenue from tuition associated with the high student enrollment, will allow ISU administrators to continue to recover some of the faculty positions lost over the last decade due to reductions in state support.

Speaking of faculty positions, the department had a pleasant surprise this year. In January, after the initial phases of a faculty search for a sedimentary geologist produced a shortlist of exceptional candidates, we optimistically requested from LAS permission to hire two new faculty members rather than one. We were delighted when the College granted us that permission. As a result, two new sedimentary geologists, Beth Caissie and Franciszek "Franek" Hasiuk, began in the department this fall semester (see cover page). Beth studies Quaternary sediments and microfossils in the Arctic Ocean to infer past sea-ice coverage. Her research provides critical context for understanding severe modern reductions in sea ice as the Arctic climate warms. Franek studies the genesis and geochemistry of carbonate rocks from the standpoint of both a petroleum geologist and a geochemist interested in the properties of ancient oceans. He spent the previous four years at ExxonMobil, with field work in the Middle East and Southeast Asia. We are very happy to have Beth and Franek onboard, and we welcome them and their families to Ames.

Shrinking state support for higher education in Iowa over the last decade has been accompanied by increasingly close scrutiny of the productivity of academic units, so I'm happy to report that the department continues to perform very well. Per budget dollar provided to the six science departments in LAS, no department is responsible for more teaching, as measured by total credits earned by students, than our department. The number of undergraduate majors in geology and Earth science has more than doubled in the last five years. During the last fiscal year for which data are available (2011), the department secured more grant funding per operating budget dollar than any other department in LAS, save one (Biochemistry, Biophysics, and Molecular Biology).

Department productivity depends foremost on the efforts of the faculty, and there were many highlights for geology faculty members this year. Kristie Franz, our surface water hydrologist, was tenured and promoted to associate professor in the spring. Kristie uses innovative modeling strategies to improve stream flow and flood forecasts—a problem that is highly relevant to Iowa as land-use and climate changes affect the frequency and magnitude of floods. Cinzia Cervato was a Fulbright Scholar in Italy during spring semester. Paul Spry toured Europe and the U.S. giving lectures as the Society of Economic Geologists 2012 Thayer Lindsley Visiting Lecturer. Carl Jacobson and Bill Simpkins, were elected, respectively, as a fellow and councilor of the Geological Society of America. Al Wanamaker lead-authored a paper in *Nature Communications* on surface changes in North Atlantic circulation during the last millennium. I and four of my former graduate advisees were fortunate to receive GSA's Kirk Bryan Award for research in geomorphology.

## Alumni News

This fall we again honored two alumni with Geology Distinguished Alumni Awards at the fall banquet and awards ceremony hosted by LAS. Last year we honored Tom Bown (B.S., 1968; Ph.D., Wyoming, 1977) and Tracy Vallier (B.S., 1962; Ph.D., Oregon State, 1967) for their contributions to paleontology and marine geology, respectively. This fall we honored Lyle Sendlein (Ph.D., 1964) and Jack Troeger (M.S., 1971). Over the course of his long career, which started



as a faculty member in our department, Lyle had a major influence on applied coal and water resources research as director of the Coal Research Center at Southern Illinois University and later as director of the Institute for Mining and Minerals Research and Kentucky Water Resources Research Institute at the University of Kentucky. For many years, Jack taught Earth science at Ames High School with such heartfelt enthusiasm and creativity that he became legendary among students there. By energizing them and steering many of them toward college degrees and careers in the geosciences, he positively influenced many young lives.

Two fellowships that would not exist without the kind support of our alumni were awarded this year. The David Morehouse Faculty Fellowship was awarded to one of our new faculty members, Franek Hasiuk (see article in this issue). He will use support from the fellowship to help build his research laboratory and will hold the title of Morehouse Faculty Fellow for three years. Al Wanamaker was the first recipient of this fellowship, which helped him to renovate his stable isotope laboratory last year. Last spring, a second fellowship was made possible by a generous gift from Bruce Bowen (B.S., 1967; M.S., 1970; Ph.D., 1974). The Bruce Bowen Graduate Fellowship was awarded this year to Maddie Mette, an advisee of Al Wanamaker. To help strengthen our graduate program, it will be awarded every year to a different particularly promising graduate student recruit.

Alumni events over the past year included a spirited gathering of alumni and many faculty, staff, and students at an Irish pub in Minneapolis during last year's GSA meeting in October. Also in April, former chairman, Carl Jacobson, met with alumni at the AAPG meeting in Long Beach, California. Stay tuned for alumni activities this year, including an on-campus alumni reunion during fall semester of 2013.

### Field Camp News

For the third summer since its construction, the Smith Lodge was the focal point for learning and living at the summer field camp. We thank Tom and Evonne Smith for the gift that paved the way for the lodge and the other alumni whose generous gifts also helped make it possible. Enrollment in the field course was very close to capacity again this summer, with a total of 37 students from ISU (15), the University of Nebraska (10) and elsewhere (12).

As usual, teaching at the camp was a group effort. Nebraska faculty members Chris Fielding and Tracy Frank again taught the first 2.5 weeks of the course. ISU instructors included the camp director, Carl Jacobson, with Jane Dawson, Susy Ankerstjerne, and Mark Mathison. Mark was there for the duration of the camp in his role as both camp manager and teacher. For Mark's ingenuity and energy both at camp and in the department, he was awarded the LAS Professional and Scientific Staff Excellence Award this year. It's hard to imagine the camp or the department running smoothly without him. The field course also greatly benefited again this year from the involvement of alumni Erik Kvale of Devon Energy and Rick Chamberlain of IHS CERA. Also involved was their colleague Ben Burke of Noble Energy. Their project on the Greybull Sandstone is one of the highlights of the course. As a bonus, students received a lecture on the Athabasca oil sands by the camp's most famous former teacher, Carl Vondra, who visited for several days and joined students in the field.

There were a number of unusual events at the camp this year, most of which cannot be recounted here, lest individuals be incriminated. Unusual natural events included bears twice wandering onto the grounds of the camp (see photo above). They were presumably following their noses, although it's uncertain which of the diverse odors at the camp attracted them. Although the weather for the first part of the course was quite pleasant, it was unseasonably hot for the last couple of weeks, with many days around 100°F. For the first time in many years there was no snow on the ground in the Wind River field area. Also for the first time in a while, the camp served as the base for the thesis research of an ISU graduate student: Ning Zhang, who is advised by Carl Jacobson, spent the summer characterizing fractures in the Mowry Shale.



A "bearly" dressed visitor to field camp!

## Charitable Giving

Thank you for your outstanding support. Without it, diverse needs in the department would be either impossible or very difficult to meet, including the improvement of infrastructure like the field camp, providing scholarships to undergraduates, purchase of research equipment, support for student field trips, and stipend support for graduate students, to name only a few.

I'd like to highlight a few fundraising priorities aimed at benefiting students. Although ultimately the student living quarters at the field camp will be replaced, a need that is both more urgent and more modest is to improve the bathroom and shower facilities at the camp. For about \$120,000, flush toilets, separate shower facilities for men and women, and a laundry facility could be constructed that would greatly improve the student experience. In addition, student support for scholarships and field trips are vital to help offset the cost of being a geology or Earth science major, which includes extra tuition and fees for field camp (~\$3,450). Keeping costs down for students will promote continued increases in the number of geology and Earth science majors—a necessity for stimulating increasing support from LAS for the geology program. One fund, in particular, that we would like to see grow is the Quentin Schmidt Memorial Field Trip Fund aimed at helping reduce the cost of field trips for students. The fund is currently about \$8,500 short of the value required by the ISU Foundation for it to become endowed and, thereby, generate interest to make it self-sustaining. A more ambitious goal is to establish a large endowment to support assistantships for graduate students. Excellent academic departments at research universities require quality graduate programs. That quality is challenging to sustain in our department because the gap between the student stipends we can provide and those offered by most competing universities is widening. An endowment of \$1,000,000 that would provide ongoing, competitive stipends for our most outstanding graduate student recruits is thus a major fund raising goal.

To learn more about the department, please take a look at our newly designed web site at <http://www.ge-at.iastate.edu/>. Have a great year and thanks again for your interest and support.



Neal Iverson  
Professor  
Smith Family Foundation Chair in Geology



Alumnus Jaimie Addy (BS 2010, center, facing camera) providing a tour of the Rock Springs quarry in the Baraboo Quartzite to the undergraduate structure class in April, 2012



1960 Wyoming field camp. Students had to provide their own field transportation. Lee Backsen (BS 1961) is standing by the drivers door talking to Jim Poland (BS 1963) in back. Roger Siglin (BS 1962) is in the middle of the group of three on other side. The other two standing with him are Rodney Gardner (BS 1962) and Henry Amenson (BS 1962). The car was Ken Issenberg's (BS 1963) 1958 Ford retractable hardtop (good for going to Greybull on a Saturday night!)



# Alumni Notes

## Ray Bisque

MS 1957; [ramon@bisque.com](mailto:ramon@bisque.com)

I am conducting research on uses of fly ash “geopolymers.” It relates directly to the research I did in the “North Forty” in 1957-59 while characterizing the behavior of clays in carbonate rocks. For the younger folks, the “North Forty” was in the basement of the Science I building where we shared space with G.O Henderson. I would like to hear from anyone with memories of that era. I have included it in my autobiography and would send one on to anyone interested.

As an editor's post-script after one of Ray's friends read his autobiography he commented “ Two great marriages took place in Iowa, one to a coed, Marie Livingston Young, and the other in combining chemistry and geology in a Ph.D. program, fostered and shepherded by Dr. Charles V. Banks of the Ames Laboratory and Dr. Chalmer J. Roy, then head of the Geology Department.”

## Bjorn Brooks

PhD 2009; [bjorn@climatemodeling.org](mailto:bjorn@climatemodeling.org)



Bjorn Brooks (PhD 2009) collecting new tree cores from a post-disturbance stand of black cherry trees in northern Wisconsin

Bjorn Brooks is wrapping up post-doc work on the PalEON project at the University of Illinois. Over the past year, he has spent the majority of his time developing climate drivers, and running ecosystem models to simulate forest growth in the eastern U.S. over the past 2,000 years. His model results are validated against growth estimates from tree cores and other paleo-proxies.

## Clint Carney

BS 1997; [tatankaiv@gmail.com](mailto:tatankaiv@gmail.com)

All things considered, life is pretty good here on the Front Range sans the wildfires and drought. I've been busy with my consulting job with Olsson Associates working on a myriad of topics ranging from groundwater modeling projects in Nebraska to reclamation plans for oil and gas development on BLM lands in Wyoming. 2012 has been a lesson in patience; however, as I ruptured my right achilles tendon trying to do my best impression of Royce White during a Saturday morning recreational league basketball game in February. After surgery and months of physical therapy, I'm just now beginning to be active again (see photo, taken approximately 6 months after surgery). Thank goodness the Cyclones basketball team was fun to watch last season and provided excitement while I recovered! Now that I'm mobile again, I'm hoping to hit the mountains hard this fall with fly fishing and hiking. It is crazy how such a small and relatively simple part of the human body like the achilles tendon can really mess things up, but on the flip side, it's amazing how the body can heal as well. I see the President



Clint Carney (BS 1997) recovering from Achilles tendon surgery (left) and a much happier Clint in full recovery mode looking dapper in his ISU cycling shirt (right)

was on campus this fall, I watched it live over lunch on the internet... great to see such a turnout!

## Thure Cerling

BS 1972, MS 1973; [thure.cerling@utah.edu](mailto:thure.cerling@utah.edu)

Thure and Mahala Kephart returned from a sabbatical that was split between Kenya and Cal Tech. We had a terrific time in Kenya - one month on Lamu (no cars), one month at a field station near Lake Turkana, and one month in Samburu Reserve studying elephants, and various smaller trips in between. We were reminded of how good we have things in the USA with universal electricity and clean



Thure Cerling (BS 1972, MS 1973) hanging out on an OSHA unapproved ladder/tree in Kenya!

water to drink in towns and cities. We greatly enjoyed life in the slow lane where our grocery store was smaller than the cereal aisle at a typical supermarket; great “star shows” every night; and evenings and mornings where we could discern no human sounds. Cal Tech was quite a different speed and a greatly stimulating intellectual environment. So now the sabbatical is over - not as much writing occurred as was in the original plan, but we were greatly refreshed.

## Jim Crowther

BS 1956; [jimnhats@gmail.com](mailto:jimnhats@gmail.com)

As was reported in last year's Varve, Bill Boyd, one of the three amigos, Bill Boyd, Jim Crowther, and Dave Schacht died in February 2011. Although Bill has sadly passed, Jim and Dave

continued their visit to Mammoth Lakes, California for golf each September. The photo shows that Bill is still with them in spirit and their memories.



Bill Boyd (BS 1956), the invisible amigo, between Jim Crowther (BS 1956) and Dave Schacht (BS 1956) in front of the Sierra Star club house at Mammoth, California

## Ray Ethington

**BS 1951; EthingtonR@missouri.edu**

It has been nearly 60 years since I took my last examination as a graduate student at ISU and more than that since the end of my undergraduate career there. The Korean fracas and the U. S. Army intervened between those events. This means that very few, if any, of the people who shared those experiences with me are still around who might care what I have been doing since. For the record, I spent the past half century and more as a professor, briefly at Arizona State University and for most years at the University of Missouri, and I have been retired for 11 years. In addition to teaching, I spent my spare time pursuing conodonts in Ordovician rocks of central and western United States. I continue, as my old bones will allow, to work with collections from Oklahoma to Colorado, Utah, and Nevada, some of it in collaboration with former students and with colleagues at other institutions. I write this on my 83rd birthday, and that number of birthdays explains why I am here and not in the desert of western Utah looking for more conodonts. Life is still good but I do miss the dirt, the sun, and the solitude of the Utah-Nevada border.

## Hal Frank

**BS 1972; frank.iowa.us@gmail.com**

I still work for the Iowa Department of Natural Resources in the Drinking Water section. The section ensures that public water supplies meet health based standards. I work in the database part of the process. My wife is a web developer at a computer programming firm and my two children are now both in college at Iowa State, Kate in geology (graduate school) and Ian in computer science.

## Tracy Frank

**BS 1989; tfrank2@unl.edu**

Tracy Frank is still living in Lincoln, NE with husband and fellow geologist, Chris Fielding, and faithful cat, Archie. She recently travelled with Chris to Shell, WY to help teach field

camp. Following years of toil, the University of Nebraska - Lincoln recently saw fit to promote her to full professor. Rather than taking the opportunity to take up pipe-smoking, Tracy agreed to serve as the next editor-in-chief of *Sedimentology*, the journal of the International Association of Sedimentologists (IAS). If you do not hear from her by 2016, you can assume that she met her end in an avalanche of manuscripts.

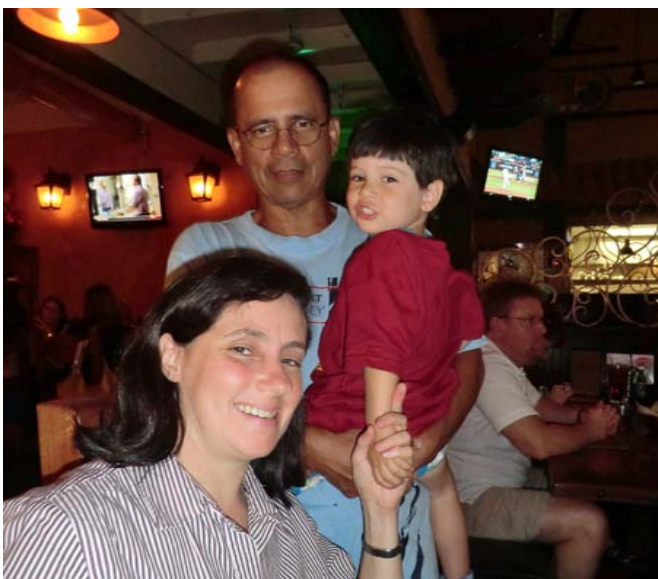


Tracy Frank (BS 1989) and husband, Chris Fielding, doing fieldwork in the highlands of Scotland

## Adriana Heimann

**MS 2002; PhD 2006; Heimanna@ecu.edu**

Adriana is in her third year as assistant professor of mineralogy/ petrology at East Carolina University (ECU). Her husband, Manuel, continues to be an Instructor of Physics and Astronomy at ECU. Adriana has been very busy and just took on four new graduate students to work on stable iron isotopes of iron formations, and the geochemistry and origin of garnite in pegmatites as an exploration guide to lithium deposits. She hosted Paul Spry as part of his Thayer Lindsey lecture tour where he gave a presentation on gold telluride deposits. Adriana and Paul continue to work on collaborative projects concerning the use of rocks and minerals as guides to ore deposits. She also has a full teaching and service load to go along with her research efforts. Nicolas, their son, is now two years old and loves day-care.



Adriana Heimann (MS 2002, PhD 2006) and her husband, Manuel, and son, Nicolas, in Greenville, North Carolina



### Daniel Hummer

BS 2004; mnrlboy@gmail.com

In April 2012, Dan finished a postdoctoral fellowship at the Carnegie Geophysical Laboratory, and moved to Los Angeles to start a postdoctoral position at UCLA. Unfortunately, the move was hampered by a severe foot injury. But after four months of not walking, the foot is finally on the mend! Dan will be using high pressure experiments and X-ray scattering to study the solubility of carbonate minerals at different pressure-temperature conditions, and examining the atomic structure and behavior of calcium silicate/calcium carbonate magmas. He is also working to develop software for doing kinetic refinements of geochemical processes, and is hoping to make it available soon to the geochemical community. Dan still enjoys working on music, practicing Spanish whenever possible, and is looking forward to experiencing the sights of LA once his foot has fully recovered. He is actively looking for faculty positions in geochemistry/mineralogy/ petrology.



A slightly impaired Dan Hummer (BS, 2004) getting ready for his move to UCLA

### Ken Issenberg

BS 1963, MS 1966; kenyonj@msn.com

I am still having fun, and still working out of Denver for a large national heavy construction/mining company. This work has involved construction materials and metallic ore prospecting, development and production; involvement in bidding and managing civil engineering projects and, of course, environmental permitting and compliance. It sounds like a resume!

### Richard "Dick" Iverson

BS 1977; riverson@usgs.gov

I continue my work at the USGS Cascades Volcano Observatory in Vancouver, Washington. Most of my research continues to focus on the dynamics of debris flows and rock avalanches. During the past year we've made great progress with predictive modeling of these phenomena. With colleagues, I've also gotten involved with work on breaching of dams by overtopping flows of water. The breach-growth process is a fascinating phenomenon that involves mechanics quite different from those

of conventional fluvial sediment transport, because the system may be very far from equilibrium.

### Christos Mantzios

BS 1984; MS 1986; chrismantzios@yahoo.com

I started a new job in June 2012 as Director of Sales and Marketing for Los Gatos Research located in Mountain View, CA (<http://www.lgrinc.com/>). Previously, I was the National Sales Manager for LI-COR Biosciences, Lincoln, NE (September 1996 to June 2012). My wife, Melanie, is an attorney and partner with Wolfe, Snowden, Luers, Hurd & Ahl. Our son, Nicholas, is a senior at Case Western Reserve University in Cleveland, OH studying biomedical engineering, and our daughter, Sophia, is a sophomore at the University of Missouri-Columbia studying international business and finance. I would love to hear from my old friends via LinkedIn <http://www.linkedin.com/in/chrismantzios> or email.

Go Cyclones!

### Cal Mather

BS 1992; calmminer@yahoo.com

After receiving my BS in geology from ISU in 1992, I became an environmental consultant. I worked in the leaking underground storage tank assessment and remediation and air quality programs in Iowa for about seven years, taking some time off in the middle of it to get my MS in Geology from the University of Idaho in 1999. My M.S. thesis involved constructing a geochemical model of the Coeur Rochester gold-silver mine in Rochester, Nevada.

For three years, starting in 2003, I became the environmental protection specialist for one of my clients, the National Animal Disease Center in Ames. I was then promoted to be the Safety, Health and Environmental Manager for the Midwest Area of the Agricultural Research Service, the research arm of the USDA. From this position, I assisted twelve research locations in eight states in the upper Midwest maintain regulatory compliance and manage their safety, health and environmental programs. This summer, I was promoted again and am currently the Environmental Protection Specialist for the Agricultural Research Service, where I now work on environmental policy and issues for the agency as a whole, encompassing approximately 100 research locations across the country.

I am married with three kids between 5th and 9th grades. My wife, Dena, works in the surety division of RLI Insurance. Both of my daughters play basketball and soccer, and I manage their soccer team. My son plays baseball, basketball and football. We reside in West Peoria, IL, although our time at home seems very limited these days, as there is always something going on.

### Bill McCrackin

BS 1993; bmccrackin@mac.com

The McCrackins are moving back to the Minneapolis area after 5 years in NH where my wife, Ann, was a professor of law and I spent time as a firefighter and EMT. We have also traveled

extensively in India (8 or 9 trips) and were able to visit South Africa just before they hosted the World Cup. Ann has taken a new job as president of Black Hills IP, a domestic outsourcing firm for intellectual property work. As for myself, I have a farm to renovate in Nowthen, MN.

### David Pals

BS 1998; MS 2002; David.Pals@dnr.iowa.gov

### Diane Pals

BS 1995, MS 1998; Diane.A.Pals@us.mwhglobal.com

The Pals family moved to Fiji this year with Dave taking a position with Lion One Metals based out of Vancouver to work on the Tuvatu gold deposit. David is overseeing a drilling program associated with the deposit that alumnus, Nancy Scherbarth (M.S. 2002), worked on with Paul Spry. David has dealt with the rainy season but has also appreciated the idyllic setting of this beautiful resort island. He also notes that his favorite beer in Fiji has the serendipitous name of "Fiji Gold."



Above: Dave Pals trying to get to work on the flooded road to the Tuvatu gold deposit, Fiji

Below: David Pals (BS 1998; MS 2002), with other geologists, at the Emperor gold mine, Fiji



### Bruce Petersen

BS 1967; blptrsen@gmail.com

I retired from USG Corp about four years ago after eight years of mining and thirty years of product and process development, getting nine patents. About two years ago, I discovered competitive robotics and am mentoring two teams in the Chicago area. One is a south side neighborhood team based out of IIT and we are starting the other at TCD in Addison. This seems a good way to use some of the experience I accumulated and give back to the community. Robotics is an effective way for kids to learn STEM technologies by means of projects and hands-on, which they love to do. I have four children. Two are married with two grandchildren and two just graduated from Lisle High School. I also keep in touch with Jack Troeger, who

learned geology with me, and Lindy Solon, who lives in my area and was my science teacher at Ames High.

### James Poland

BS 1963; JTPOLAND@aol.com

James has written to tell us that he has "kinda" retired. He has residences in both Pineville, Missouri and Bentonville, Arkansas. Jim would love to hear from his contemporaries.

### Robert "Bob" Powell

BS 1982; Bob.Powell@dvn.com

I am now a Senior Geologic Advisor at Devon Energy in Oklahoma City. I am currently directing Devon's horizontal drilling program in the Granite Wash of the Texas Pan-Handle Region. I spent the previous 28 years working for Questar Exploration and Production in Oklahoma and Texas.



Bob Powell (BS 1982) at work!

### Kaylee Richter

BS 2011; kaylee.richter@gmail.com

I recently graduated from ISU with a Master of Arts in teaching (MAT) along with Melanie Marzen and Dylan Shoemaker. I just began my first year of teaching in the Urbandale Community School District in Urbandale, IA as a high school science teacher. I teach 9th grade Earth science! In addition to my first year teaching, I am also planning my wedding for next summer!

### Tim Ryan

MS 1982; TIM\_2007RYAN@comcast.net

This is the second year I have been involved in the seafood industry after 25 years as an oil and gas exploration geologist and software sales executive. My primary responsibility is as an investor and sales executive for Trace Register (a Seattle based seafood software company). Trace Register's emphasis is on seafood traceability and sustainability for major seafood suppliers. I visit Seattle numerous times a year and enjoy the Pacific Northwest. Every year to escape the heat of the Texas summer, Diane and I (Diane was the cook at the 1980 ISU Field



Camp) vacation in Colorado to reminisce on my ISU graduate field work in the Sangre de Cristo Mountains of northern New Mexico and southern Colorado (Geochemistry of the Basaltic Rocks of Fishers Peak Mesa, Colorado). This year's trip is to Fossil Butte near Rock Springs, Wyoming. Last year's trip was to Durango, Telluride and Mesa Verde. We also make it back to Iowa every year to check up on the family farm near Iowa Falls and to visit relatives. Of course, I stop at ISU and the Ames area! This year it's for the Iowa State vs. Kansas State football game. This year we also visited Paris, France. We live in The Woodlands, Texas, and have three grandchildren ranging in age from 9 to 16. Our daughters, Debbie and Carrie (they were also guests at the 1980 ISU Field Camp), live in Dallas. We enjoy antique shopping, sports events (Astros, Texans and Cyclones when they come to Texas), and walking the numerous trails throughout The Woodlands.



Tim (MS 1982) and Diane Ryan sitting on a conglomerate at Omaha beach, France (May 2012)

### Scott Siman

**BS 1973; ssiman@landtechnologyinc.com**

I am the President of Land Technology, Inc. in McHenry, Illinois. The biggest news in the Siman family is my wife, Darlene, and I just became grandparents for the first time. Our son Brad and wife, Amie, presented us with a grandson, Jacob Robert Siman, on 3/23/12. The coolest thing about that is that it is also my father's birthday who was there to welcome Jacob into the family as the new standard bearer of the Siman name. Other than that, things are pretty quiet. Work has improved despite the governments' best efforts to the contrary.

I enjoy pheasant hunting. Buck my 10 year old black lab and I had an excellent season last year hunting and guiding. This spring, I bought a lab puppy who I named Colt who is on his way to stardom in the fields. Now 4 months old and 43 pounds, I expect him to be about 90 pounds. He loves to chase pigeons and retrieve bumpers. His obedience is also coming along nicely. The closest I get to campus these days is Newton where I hunt with a fraternity brother.

### David E. Simon

**MS 1968; PhD 1972; desconsulting@sbcglobal.net**

It finally happened, I officially retired from ConocoPhillips April 1, 2012. The time since then has been getting used to not having to get up to go to work every day, and dealing with other retirees driving around town.

I am now forming a technical consulting company, DES Consulting, in which I will continue to perform materials science technology in the area of Rietveld refinement analysis of X-ray diffraction data and work with customers on X-ray fluorescence interpretations of materials. It will be fun seeing what other companies are doing in this area.

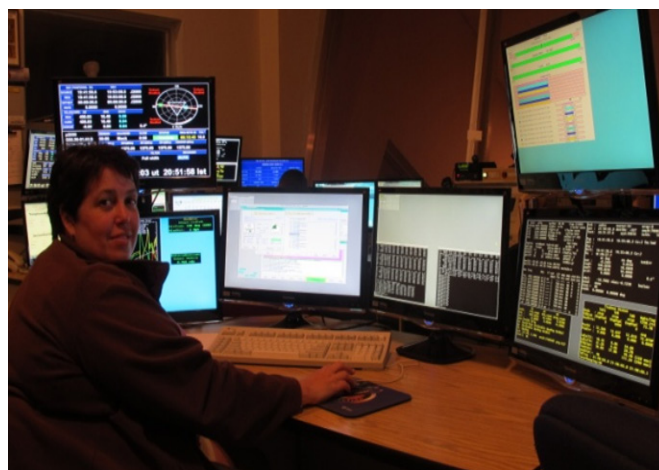
Kathie and I are enjoying our time with our grandchildren, gardening and putting up with record temperatures again this summer in Oklahoma.

### Beth Spear

**MS 2003; beth\_spear@hotmail.com**

This will be my ninth year teaching science at Central High School in Salem, WI. Last September, I was lucky enough to travel to Puerto Rico as part of my Research Experience for Teachers program. We operated the Arecibo telescope to search for candidates and confirmed at least two previously unidentified pulsars. Luckily, the hurricane threatening to cause us travel complications, swung north of Puerto Rico and all we experienced was a little rain and some excellent waves at the beach.

I attended several conferences last year. I worked for the National Oceanic and Atmospheric Administration (NOAA) at the New Orleans regional National Science Teacher Association (NSTA) conference in November 2011. While there, I took advantage of an organized field trip to the nearby Laser Interferometer Gravitational Wave Observatory (LIGO), an amazing place. In March, I presented my NOAA shark talk at the NSTA national conference in Indianapolis, while in April, I attended the Wisconsin Society of Science Teachers conference in Madison with three of my students. We presented the pulsar



Beth Spear (MS 2003) at the controls of the radio telescope in Arecibo Observatory in Puerto Rico

research they had been working on all year. I also presented a poster with our school librarian and technology director at the International Society of Technology Educators conference in San Diego about our school's one to one program.

However, being Aunt Beth to a nephew and two nieces is still my favorite thing. We rented a lake cabin this summer and the kids loved jumping in the lake, using the paddleboat, and doing a little fishing. I also cashed in some travel miles and visited the San Juan Islands in Washington. I saw a variety of beautiful plants and flowers and lots of wildlife including an orca diving under our boat, several fox, bald eagles, many deer, and harbor seals.

### **Matt Stamp**

**BS 1993, Matt.Stamp@kiewit.com**

My wife, Kimberley Hughes, and I live in Omaha, Nebraska where I work for Peter Kiewit Sons' Inc. I'm in the Underground District (we build tunnels), which is a perfect fit because I am able to utilize my geology and law backgrounds. We have a three year old daughter, Eva Isabelle Stamp, who likes everything but particularly rivers, rocks, ice cream, and now Jimi Hendrix (we recently have been building sand castles while I taught her the lyrics and melody of "Castles made of sand melt into the sea eventually"). My wife is not thrilled!



Eva Isabelle Stamp (three years old), daughter of Matt Stamp (BS 1993)

### **James Sturm**

**BS 1996; james.a.sturm.mil@mail.mil**

Hello from the Sturm Family. My wife (Audrey Terry) and I have great news, we are expecting our first child in late October. Audrey and I recently moved to El Paso, Texas for my new posting as the Deputy Division Engineer in the 1st Armored Division at Fort Bliss (U.S. Army Corps of Engineers). I hold the rank of Major. We are enjoying a return to the west, and I haven't seen rocks this well exposed since field camp. We

anticipate that we will be in El Paso for the next two to three years, and I am looking forward to spending some quality time at home with the family.

### **Tracy L. Vallier**

**BS Geology, 1962; tlvallier@hotmail.com**

Many thanks to the Department's faculty and staff for treating me so graciously during my visit last October. It was great to be "home" after a long absence from Iowa State.

I'm still involved with field studies in Wyoming and Hells Canyon. I did some preliminary mapping east of Thermopolis in early July and missed the field camp group by only a day or two as they traveled to Shell from the Wind River Range. I'll be returning to Hells Canyon in September and October to map and to lead a field trip for U.S. Forest Service personnel. I finally have three 7.5-minute quadrangle maps nearly completed from the southern part of the canyon. There are at least a dozen more to finish before I leave for that "Great Rock Outcrop in the Sky." For more information on our work in Hells Canyon please look at <http://www.hellscanyongeology.com>

### **Lynn Watney**

**MS 1972; watney@kgs.ku.edu**

It is hard for me to believe but I am in my 36th year at the Kansas Geological Survey/University of Kansas and am as busy as I have ever been as Project Manager/PI on two large interdisciplinary academic-industry partnerships funded by the Department of Energy. One project has gone into its 3rd year to evaluate carbon storage in southern Kansas in the deep saline Cambro-Ordovician Arbuckle aquifer and to evaluate its potential in five overlying oil fields for CO<sub>2</sub>-EOR. Three new basement wells have been drilled with the newest one at 7,500 ft and another 1,200 ft of core to be taken. Also, over 20 mi<sup>2</sup> of multicomponent seismic have been acquired in two oil fields and some 120 mi<sup>2</sup> of donated seismic lines that are being used to calibrate the storage estimates and refine the structure and stratigraphy. Static and dynamic coupled geomechanical-flow modeling of the oil reservoirs and underlying Arbuckle aquifer and caprocks are being used to evaluate physical processes and chemical reactions of CO<sub>2</sub> interacting with the host rocks and brine. A newly funded activity will inject 70,000 tons of CO<sub>2</sub> as a small scale test at Wellington Field, Sumner County KS. We'll evaluate the models and use the information to better predict efficacy and safety of commercial scale CO<sub>2</sub> sequestration and utilization. We may have the first successful application for an EPA Class VI in the country. It is never a dull moment it seems and there are four more years to go.

I am obviously very consumed in carbon sequestration research these days dealing with what I call "a lot of moving parts." My family is fine with Karen working as the Director of Human Resources at the Kansas Department of Education and our daughter Chris as CEO of the nonprofit Colorado Children's Campaign in Denver, CO.

**Send us news about yourself and your family for next year's Varve by e-mail to [pgspry@iastate.edu](mailto:pgspry@iastate.edu).**



# Awards & Publications

## GEOLOGY STUDENT AWARDS

(Presented at the 2012 Spring Banquet)

### UNDERGRADUATE AWARDS

**Carolyn Jones-Eiler Summer Field Camp Scholarship**  
Zak Ward

**Peter Johnson Memorial Scholarship**  
Hannah Steinfadt

**Beck Family Scholarship**  
Hunter Smoak

**Kevin Connolly Field Camp Scholarship**  
Kate Frank  
Jinchun Qiu

**Huedepohl Geology Field Camp Scholarship**  
Jamie Harrington  
Josh Asplund

**Smith Foundation Scholarship**  
Christina Murphy  
David Llewellyn  
Andrew Lane

**Jon Martin Peckenpaugh Memorial Scholarship**  
Haniff Bin Hamdan  
Heather Kitzman

**Geology Scholarship**  
Nathaniel Gilbert  
Nicholas Hanrahan  
Florianne Rivera  
Dan Zordell

**Rodney Gardner Scholarship**  
Jamie Harrington  
Zak Ward  
Deserae Wojcik

**Outstanding Undergraduate Award**  
Ethan Dalhauser  
Kate Frank

### GRADUATE AWARDS

**Pick-of-the-Year**  
Josh O'Brien

**Outstanding Teaching Assistant**  
Jake Smokovitz

### John Lemish Award

Angela Bowman  
Erin Lower  
Beth Moss  
Josh O'Brien

**Graduate Student Seminar  
Top Paper Award**  
Ben Petersen

**Runner-up Paper Award**  
Andy Fornadel  
Shelly Griffin  
Tom Parham

**Outstanding Contributions**  
Josh Asplund  
Ethan Dalhauser  
Tom Parham

## Other Undergraduate and Graduate Student Awards

Fornadel, Andrew – Goldschmidt Travel Grant, Goldschmidt Conference, Montreal, Canada, \$1,000

Frank, Kate - Graduate Student Fellowship, Society of Economic Geologists, \$7,500

Mette, Madelyn - Bruce Bowen Graduate Fellowship, Department of Geological and Atmospheric Sciences, \$10,000

Morrison, Alex - application of stable isotopes and modeling to understanding effects of agricultural drainage on flood peak flows. Geological Society of America Student Research Grant, \$2,000

O'Brien, Josh - The chemistry of gahnite as an exploration guide to metamorphosed massive sulfide deposits. Hugo Dummett Mineral Discovery Fund, Society of Economic Geologists Foundation, \$5,000

O'Brien, Josh - Trace element partitioning in gahnite-bearing metapelites: Implications for high-T, high-P metamorphic processes and exploration for Pb-Zn-Ag mineralization. Geological Society of America Student Research Grant, \$2,000

O'Brien, Josh - Goldschmidt Travel Grant, Goldschmidt Conference, Montreal, Canada, \$1,000

Zhang, Ning - Investigation of fracture systems in the Mowry Shale, Bighorn basin, Wyoming: Implications for unconventional energy resources. Geological Society of America Student Research Grant, \$3,000.

Zhang, Ning - Investigation of fracture systems in the Mowry Shale, Bighorn basin, Wyoming: Implications for unconventional energy resources. Norman H. Foster Memorial Scholarship Award, Rocky Mountain Association of Geologists, \$2,500.

## GRADUATING STUDENTS

### Fall 2011

Broc Burmeister (BS)  
Mitchell Cline (MS)  
Anson Flaspohler (BS)  
Alyssa Howlett (BA)  
John Hoyt (BS)  
Andrew Lane (BS)  
Jessica Lehman (BS)  
Rachel Lishansky (MS)  
Michael Reeder (BA)  
Ning Zhang (BS)

### Spring 2012

Lisa Burnside (BS)  
Ethan Dahlhauser (BS)  
David Llewellyn (BA)  
Jordan Nystrom (BS)  
Amanda Patras (BS)

### Summer 2012

Joshua Asplund (BS)  
Shelly Griffin (MS)  
Haniff Bin Hamdan (BS)  
Katherine Frank (BS)  
Erin Lower (MS)  
Ben Petersen (MS)  
Hunter Smoak (BS)

## Graduate Students and their Research Projects

Bowman, Angela - Investigating Evapotranspiration Dynamics and the Hydrologic Response of Midwest Watersheds (Franz); Ph.D.  
Bristol, Samantha – Geology, Mineralogy, and Geochemistry of the Shear-Zone Hosted Stanos Copper-Bismuth Gold Deposit, Northern Greece (Spry); M.S.  
Davidson, Adam - Quantification and Tracking of Human Enteric Viruses in the Ames Aquifer (Simpkins); M.S.  
Day, Sarah - Reassessing End Moraines of the Des Moines Lobe with LiDAR Data (Iverson, Harding); M.S.  
Dziubanski, David - Identifying SNOW17 Model Parameters from MODIS and NOHRSC Products for use in Streamflow Prediction Models (Franz); M.S.  
Faeth, Adam - (HCI/CompE) Expressive Feedback from Virtual Buttons (Harding); Ph.D.  
Fornadel, Andrew - Stable Tellurium Isotope Systematics of Gold-Silver Telluride Deposits: A Theoretical and Experimental Approach (Spry); Ph.D.  
Forsythe, Nathan - The Geology and Geochemistry of Gold Telluride Mineralization in the Navilawa Caldera, Fiji (Spry); M.S.  
Frank, Kate – The Geology of the Stollberg Lead-Zinc-Silver Ore Field, Sweden (Spry); M.S.  
Griffin, Shelly - Creating Master Shell Chronologies of Arctica Islandica in the Gulf of Maine to Monitor Environmental Change (Wanamaker); Ph.D.  
Hamden, Nick - Cellular-Automata Simulation of Two-Phase Fluid Flow in Porous Media (Beresnev); M.S.  
Koopman, Jim (HCI) - Creating Mental Routes from Audio Descriptions (Harding); M.S.  
Hoyt, John – Tectonic Significance of Low-Angle Normal Faults in the Picacho Area of Southeasternmost California (Jacobson, Harding); M.S.  
McFadden, Scott - The Genetic Relationship of Nodular

Sillimanite Rocks to Metamorphosed Cu-Zn deposits, Colorado (Spry); M.S.

Mette, Madelyn - Marine Climate Change in Northern Norway during the Last Millennium (Wanamaker); M.S.  
Morrison, Alex - Application of Stable Isotopes and Modeling to Understanding Effects of Agricultural Drainage on Flood Peak Flows (Simpkins); M.S.  
Moss, Elizabeth - Transforming Science Education at ISU: Implementation of a Research Project in Introductory Geology Labs (Cervato); M.S.  
Newcomb, Matthew - A Multimodal Interface for Road Planning Tasks using Vision, Haptics and Sound (Harding); M.S.  
O'Brien, Josh - Trace and Major Element Studies of Gahnite as a Guide in the Exploration for Broken Hill-Type Lead-Zinc-Silver Deposits (Spry); M.S.  
Parham, Tom - The InVEST Volcanic Concept Survey and Student Understanding of Volcanoes and Volcanic Processes (Cervato); Ph.D.  
Smokovitz, Jake – Estimation of Groundwater and Nutrient Flux to Deer and Pokegama Lakes, Itasca County, MN (Simpkins); M.S.  
Spies, Ryan - Satellite-Derived Potential Evapotranspiration for Distributed Hydrologic Runoff Modeling (Franz); M.S.  
Zhang, Ning – Investigation of Fracture Systems in the Mowry Shale, Bighorn basin, Wyoming: Implications for Unconventional Energy Resources (Jacobson); M.S.

## Faculty and Student Publications, 2011

### Journal Articles/Chapters in Books

Beresnev, I., Gaul W., and Vigil R. D., 2011. Direct pore-level observation of permeability increase in two-phase flow by shaking. *Geophysical Research Letters*, 38, L20302.  
Beresnev, I., Gaul W., and Vigil R. D., 2011. Forced instability of core-annular flow in capillary constrictions. *Physics of Fluids*, 23, 072105-1–072105-7.  
Beresnev, I., Gaul W., and Vigil R. D., 2011. Thickness of residual wetting film in liquid-liquid displacement. *Physical Review E* 84, 026327-1–026327-8.  
Bonsall, T.A., Spry, P.G., Voudouris, P., St. Seymour, K., Tombros, S., and Melfos, V., 2011. The geochemistry of carbonate-replacement Pb-Zn-Ag mineralization in the Lavrion district, Attica, Greece: Fluid inclusion, stable isotope, and rare earth element studies. *Economic Geology*, 106, 619-651.  
Butler, P. G., Wanamaker, A.D., Jr., Scourse, J.D., Richardson, C.A., and Reynolds, D.R., 2011. The stability of shell <sup>13</sup>C with respect to biological age in mature specimens of the long-lived bivalve *Arctica islandica*. *Palaeogeography, Palaeoclimatology, Palaeoecology*, 302, doi:10.1016/j.palaeo.2010.03.038.  
Cervato, C., 2011. Killer waves on the airwaves: new media, traditional media, and students' conceptualization of tsunamis. *GSA Today*, 21, 36-38.  
Cervato, C., Gallus, W., Boysen, P. and Larsen, M., 2011. Dynamic Weather Forecaster: results of the testing of a collaborative, on-line educational platform for weather forecasting. *Earth Science Informatics*, 4, 181-189.  
Fornadel, A.P., Spry, P.G., Melfos, V., Vavelidis, M., and Voudouris, P. Ch., 2011. Is the Palea Kavala Bi-Te-Pb-Sb±Au



- district, northeastern Greece, a reduced intrusion-related system? *Ore Geology Reviews*, 39, 119-133.
- Franz, K.J., and Hogue, T.S., 2011. Evaluating uncertainty estimates in hydrologic models: borrowing measures from the forecast verification community. *Hydrology and Earth System Sciences*, 15, 3367-3382, doi:10.5194/hess-15-3367-2011.
- Gentoso, M.J., Evenson, E.B., Kodama, K.P., Iverson, N.R., Alley, R.B., Berti, C. and Kozlowski, A., 2011. Exploring till-bed kinematics using magnetic and pebble fabrics: North-central, New York. *Boreas*, 20.1111/j.1502-3885.2011.00221.
- Halfar, J., Williams, B., Hetzinger, S., Steneck, R.S., Lebednik, P., Winsborough, C., Omar, A., and Wanamaker, A.D., Jr., 2011. 225 years of Bering Sea climate and ecosystem dynamics revealed by coralline algal growth-increment widths. *Geology*, 39, 579-582.
- He, M., Hogue, T.S., Franz, K.J., Margulis, S.A., and Vrugt, J.A., 2011. Corruption of parameter behavior and regionalization by model and forcing data errors: A Bayesian example using the SNOW17 model. *Water Resources Research*, 47, W07546, doi:10.1029/2010WR009753.
- He, K., Hogue, T.S., Franz, K.J., Margulis, S.A., and Vrugt, J., 2011. Characterizing parameter sensitivity and uncertainty for an operational snow model across hydroclimatic regimes. *Advances in Water Resources*, 34, 114-127.
- Heimann, A., Spry, P.G., Teale, G.S., Connor, C.H.H., and Pearson, N.J., 2011. Chemical and crystallographic constraints on the composition of garnet in garnet-rich rocks, southern Proterozoic Curnamona Province, Australia. *Mineralogy and Petrology*, 101, 49-74.
- Iverson, N.R., and Petersen, B.B., 2011. A new laboratory device for study of subglacial processes: first results on ice-bed separation during sliding. *Journal of Glaciology*, 57, 1135-1146.
- Iverson, N.R., and Person, M., 2011. Glacier-bed geomorphic processes and hydrological conditions relevant to nuclear waste disposal. *Geofluids*, doi: 10.1111/j.1468-8123.2011.00355.x.
- Jacobson, C.E., Grove, M., Pedrick, J.N., Barth, A.P., Marsaglia, K.M., Gehrels, G.E., and Nourse, J.A., 2011. Late Cretaceous-early Cenozoic tectonic evolution of the southern California margin inferred from provenance of trench and forearc sediments. *Geological Society of America Bulletin*, 123, 485-506.
- Moore, P.L., Iverson, N.R., Brugger, K.A., Cohen, D., Hooyer, T.S. and Jansson, P., 2011. Effect of a cold margin on ice flow at the terminus of Storglaciären, Sweden: implications for sediment transport. *Journal of Glaciology*, 57, 77-87.
- Parham, T., Cervato, C., Gallus, W., Larsen, M., Hobbs, J., and Greenbowe, T., 2011. Are movies and popular media driving students' poor understanding of volcanic processes? *Journal of College Science Teaching*, 41, 14-19.
- Sadler, P. and Cervato, C., 2011. Data and tools for geologic timelines and timescales. In: Keller, G.R. and Bar, C. (eds.), *Geoinformatics*, Cambridge University Press, 145-165.
- Schöne, B.R., Wanamaker, A.D., Jr., Fiebig, J., Thébault, J. and Kreutz, K.J., 2011. Annually resolved  $^{13}\text{C}$  shell chronologies of long-lived bivalve mollusks (*Arctica islandica*) reveal oceanic carbon dynamics in the temperate North Atlantic during recent centuries. *Palaeogeography, Palaeoclimatology, Palaeoecology*, 302, doi:10.1016/j.palaeo.2010.02.002.
- Steffens, K., and Franz, K.J., 2011. Late 20th century trends in Iowa watersheds: an investigation of observed and modeled hydrologic storages and fluxes in heavily managed landscapes. *International Journal of Climatology*, DOI: 10.1002/joc.2361.
- Voudouris, P., Melfos, V., Spry, P.G., Moritz, R., Papavassiliou, C., Falalakis, G., and Eleftheroglou, T., 2011. Mineralogy and geochemical environment of formation of the Perama Hill high-sulfidation epithermal Au-Ag-Te-S deposit, Petrola Graben, NE Greece. *Mineralogy and Petrology*, 103, 79-100.
- Voudouris, P., Spry, P.G., Sakellaris, G.A., and Mavrogenatos, 2011. A cervelleite-like mineral and other Ag-Cu-Te-S minerals  $[\text{Ag}^2\text{CuTeS}$  and  $(\text{Ag,Cu})^2\text{TeS}]$  in gold-bearing veins in metamorphic rocks of the Cycladic Blueschist Unit, Kallianou, Evia Island, Greece. *Mineralogy and Petrology*, 101, 169-183.
- Wanamaker, A. D., Jr., Kreutz, K.J., Schöne, B.R., and Introne, D.S., 2011. Gulf of Maine shells reveal changes in seawater temperature seasonality during the Medieval Climate Anomaly and the Little Ice Age. *Palaeogeography, Palaeoclimatology, Palaeoecology*, 302, doi:10.1016/j.palaeo.2010.06.005.
- Wanamaker, A. D., Jr., Hetzinger, S., and Halfar, J. 2011. Reconstructing mid- to high-latitude marine climate and ocean variability using bivalves, coralline algae, and marine sediment cores from the northern hemisphere. *Palaeogeography, Palaeoclimatology, Palaeoecology*, 302, doi:10.1016/j.palaeo.2010.12.024.

## New Faculty Research Grants in 2011

- Cervato, C., Academy of Applied Science, Research and Engineering Apprenticeship Program, summer 2011, \$5,200.
- Franz, K., and others, Proposal to the City of Ames to update their current flood forecast modeling system, City of Ames, Iowa, 01/2011-08/2011, \$20,011.
- Simpkins, W.W., Using human enteric viruses to track groundwater contaminants to a municipal drinking water supply in an alluvial aquifer, Center Health Effects of Environmental Contamination, University of Iowa, 2011-2012, \$29,857.
- Simpkins, W.W., Franz, K., and others, Hydrologic impacts of drainage systems, Iowa Department of Economic Development, 07/2011 to 06/2013, \$242,684.
- Spry, P.G., Stable tellurium isotope systematics of gold-silver telluride deposits: a theoretical and experimental approach. National Science Foundation, 02/2011 to 01/2014, \$294,571.
- Spry, P.G., Mineralogy and chemistry of tellurium in the hypogene and supergene environments. U.S. Geological Survey, 01/2011 to 01/2012, \$45,000.
- Thompson, J. (ISU NREM), Franz, K., and others, Developing predictions of urban headwater stream dynamics under climate change scenarios for central Iowa, Center for Global and Regional Environmental Research, University of Iowa, 07/2011- 06/2012, \$29,897.

# Iowa State geology students go low-tech and high-tech studying isotopic composition of 2012 precipitation

## Students learn about scientific technique to trace the hydrological cycle and even tell about climate change

Ames didn't see much snow this past winter. Yet, each time it did snow, or sleet or rain, several Iowa State University undergraduate students made sure they collected samples.



Alan Wanamaker making a point to students in the Stable Isotope Laboratory.

The resulting analyses of the moisture revealed the source of the precipitation event, which most likely came from a storm that originated in the Pacific or the Gulf of Mexico. Perhaps more important, the students learned about a valuable scientific technique that can be used to trace the hydrological cycle and even give us a better understanding of Midwest climate change. Students in the upper-level Iowa State geology course titled Stable Isotopes in the Environment studied the isotopic composition of the precipitation during the spring 2012 semester. The samples were collected using low-tech methods, such as catching snowflakes in plastic sandwich bags. The analyses, however, were high-tech and conducted in Iowa State's Stable Isotope Laboratory, a teaching and research facility for students and faculty.

"Water has very distinct isotopic signatures," said Alan Wanamaker, assistant professor in the Department of Geological and Atmospheric Sciences. "Students get to act like detectives, and through analysis they can determine the source of the precipitation. It's an important tool that we can use in studying water quality issues and even climate change."

## Good learning experience for Iowa State students

Wanamaker said isotopes are variants of chemical elements. Isotopes of a particular element, such as hydrogen or oxygen found in water, share the same number of protons, but have different numbers of neutrons. "A very small mass difference in the elements causes the associated molecules, such as water, to behave differently," he said.

The unique isotopic composition of water makes it possible to determine the source when compared to baseline isotopic data. "The exercise is a good learning experience for the students," Wanamaker said. "They get to collect and analyze samples, organize and synthesize their data, and then tell their findings in a class presentation."

Wanamaker's students found out more than just the source of their precipitation samples. They also learned that the relationship between the isotopic signature of the precipitation is strongly related to air temperature during the precipitation event. However, because of the atypical warm 2011-12 winter, students found the isotopic values this year were more variable compared to earlier studies of this region.

"The students are doing real science – it's not a textbook problem set with established answers. It gives them an opportunity to collect real data useful to a lot of people."

Wanamaker said students in his course saw how isotopic analysis is used in real-world research, such as monitoring water quality and studying climate change. For example, researchers can use stable isotope analyses to trace water movement. "We learn more about how water arrives at a location by identifying its source," he explained. "Once we look at groundwater or storm water, we can determine whether the water is moving from the ground to a stream or vice versa."

Studying isotopic composition of precipitation over time could also provide data that scientists can watch for subtle changes in climate.

Wanamaker, holder of the David Morehouse Faculty Fellowship in the College of Liberal Arts and Sciences, is a paleoclimatologist. He uses geochemical tools for reconstructing past climates and environments.

## Understanding past climates

"We try to understand how the atmosphere and oceans behaved in the past," he said.

His research is largely devoted to documenting and understanding past climates, especially in the North Atlantic



Ocean during the last millennium. His work helps document the natural range of marine climate variability and gives scientists a better understanding of the impacts of global climate change caused by humans.

One way he does this is by studying clamshells. These mollusks live in large numbers in the area where he is conducting research (in the Gulf of Maine and Iceland), can live more than 400 years, record the ambient environment (through the stable isotopic composition of carbon and oxygen in their shells), and signal environmental changes as they grow.

"There are many ways and methods to investigate past climates and environments, and stable isotope geochemistry is perhaps the most powerful and reliable method," he explained.

Wanamaker said it's important to study climate change to see if trends are occurring beyond the natural range or if they're within range. "By comparing the past and present, in an educated way we can suggest if the current climate, whether warming or cooling, is beyond the natural cycle or not."

*(excerpted from College of Liberal Arts and Sciences Newsletter)*

## Characterizing shallow and deep groundwater flow and nutrient flux to Deer and Pokegama Lakes near Grand Rapids, MN

**Jacob Smokovitz (Master's student)**

A diagnostic study of water quality in Deer and Pokegama Lakes was initiated in 2010 under a Clean Water Partnership with MPCA to estimate groundwater nutrient flux to the lakes. Deer and Pokegama Lakes are 36-m-deep, 1,600-ha and 34-m-deep, 2,675-ha lakes, respectively, near Grand Rapids, Minnesota. Thirteen seepage meter and minipiezometer sites were installed along the shoreline in both lakes to characterize the shallow groundwater system in 2011. Lake water was sampled monthly, minipiezometers were sampled biweekly, and private well groundwater (18 at Deer Lake and 14 at Pokegama Lake) was sampled in summer and winter of 2011. Groundwater was analyzed for TN, NO<sub>3</sub>-N, SRP, TDP, TP,  $\delta^{18}\text{O}$  and  $\delta^2\text{H}$ ; some samples in private wells were analyzed for enriched  $\delta^3\text{H}$ . Precipitation was collected from May to August 2011 in order to establish a local meteoric water line (LWML). Results from topography and lake stage elevation relationships suggest that a shallow water-table flow system supports Deer Lake as a flow-through lake and that Pokegama Lake as a discharge lake. However, seepage meters and minipiezometers on both lakes demonstrate inflow from the shallow groundwater system. Shoreline seepage rates range from 100 to 1100 m<sup>3</sup>/d at Deer Lake to 200 to 25,000 m<sup>3</sup>/d at Pokegama Lake. Nutrient concentrations (N and P) and fluxes in both lakes are very low and near their respective detection limits. However, well logs suggest that multiple sand and gravel aquifers are present at depths between about 90 to 300 ft. Because hydraulic head relationships in these systems are not known, stable isotope samples from groundwater in private wells were used to help assess the groundwater flow directions. Mean  $\delta^{18}\text{O}$  values of Deer and Pokegama lake water are -4.97 per mil and -7.03 per mil, respectively, and their positions on the LMWL suggest evaporative enrichment. Using this relationship, it appears that lake water is flowing into and mixing with deeper groundwater on the east side of Deer Lake. At Pokegama Lake,  $\delta^{18}\text{O}$  values in groundwater suggest that meteorically-derived groundwater in the deeper aquifers discharges to the lake in all areas. Enriched

$^3\text{H}$  analyses of deep groundwater sampled in eight private wells on both lakes showed values from <0.8 to 17.2 TU, suggesting the presence of pre-bomb, modern, and bomb-era water, with no strong trend of age with depth. In summary, isotopic data suggest that groundwater in both shallow and deeper groundwater flow systems could be feeding the two lakes, whereas lake water could mix with deeper groundwater and exit the lake through those aquifers. With the possibility that nutrients enter and exit the lakes from multiple sources and multiple aquifers, it is important to characterize each potential source and its water/nutrient contribution. Work in summer 2012 was directed towards better characterizing the geology, geochemistry, and hydraulic head relationships in the deeper aquifers.

*(Excerpted from the Iowa Ground Water Association Underground Newsletter – "Student Research Spotlight")*



# Earth science literacy, geoscience education research, and multimedia technology: an example from Iowa State University

**Cinzia Cervato**

One of the most significant aspects of my work as scientist and educator is the training of informed citizens and policy-makers of the future. Science literacy and the nature of science (i.e. how science really works) have been identified by the National Research Council of the U.S. National Academies as fundamental underpinnings of science education in the United States at all grade levels. Working in the Earth sciences gives me the opportunity to address science literacy in the context of some of the most pressing economic and cultural issues of our time: managing the sustainable use of mineral and energy resources, mitigating the devastating effects of natural hazards, and predicting the effects of climate change.

For more than a decade, my research has focused on the development, implementation, testing, and dissemination of modern multimedia and web-based instructional technologies that address key aspects of Earth systems. Funding from the National Science Foundation and the Howard Hughes Medical Institute, as well as the expertise and hard work of many other scientists, educators, graduate, and undergraduate students at several U.S. institutions of higher education, have supported me in these inherently cross-disciplinary and collaborative endeavors. To date, my research and teaching has involved the development and implementation of curriculum material and instructional strategies that make extensive use of the web and information technology (IT).

## IT products

With a team of IT developers, scientists, and educators we have developed two virtual reality applications (Virtual Tornadoic Storm and Virtual Volcano) that offer interactive 3D models of atmospheric and volcanic systems and realistic visualization of their physical and chemical structures.

Using an e-learning platform for problem-based learning, one of my graduate students developed an online case study on budgets and climate change, based on the documented poor understanding of stock-flow relationships in students that may contribute to public complacency about the rising levels of atmospheric carbon dioxide.

In my introductory meteorology course, I focus on weather forecasting using an online weather forecasting assignment (Dynamic Weather Forecaster) that has been shown to help improve students' performance in introductory meteorology. In addition, students explore atmospheric processes through a series of homework assignments based on a suite of web-based Java simulations on radiation, adiabatic processes, and advection.

## Instructional strategies

Together with a professor of astronomy, I developed a one-semester online Earth and space science course based on Earth science literacy principles and scientific inquiry. This self-paced course is delivered through BlackBoard, one of the leading course management software packages available in the U.S., and takes advantage of the wealth of visual material (e.g., short videos, animations) freely available online.



Some of my research has utilized news media databases (LexisNexis) to identify Earth science content that is relevant to students and critical for science literacy the issue of content relevance and science literacy. Finally, with a team of scientists, science historians, and science educators, I worked on a suite of short stories designed to bring science and scientists to life. The stories are created to counter the trend of textbooks to present science as a linear, sterile process, ignoring the nuances that are critical to science literacy and the understanding of the nature of science.

## My Fulbright experience

Until June 2012, I will be a guest at the University of Genova's Centro di servizi di Ateneo per la Ricerca Educativa e Didattica (CARED) funded in part by the Fulbright Specialist Program. The goals of my stay are to teach courses on various research and education topics and establish research partnerships with colleagues in Italy and possibly Europe. While virtually unknown in Italy, the field of geoscience education research has grown tremendously in the U.S. over the last 15 years. The number of professional researchers in geoscience education and graduate degrees awarded in the field are increasing, as suggested by the exponential growth of sessions dedicated



to this field at professional meetings. As a result, the level of federal funding devoted to geoscience education research is also quickly catching up with the more established fields of physics, chemistry, and math education.

*[Excerpted from the Fullbright – Italy Newsletter (Linking Minds Across Cultures), Issue No. 8, Spring 2012]*

## Hall of Fame Inductee

**Samuel W. Beyer**, former Head of the Department of Geology, was elected to the Iowa State University Sports Hall of Fame Class of 2012.

In 1891, Samuel W. Beyer was appointed assistant professor in zoology and geology, and in 1892 the course offerings were increased to three: geology, economic geology, and mineralogy. He became the first Head of the Department of Geology, and led the department from 1898 to 1931 (33 years!!!!). He was a keen sportsman and was elected to the ISU Sports Hall of Fame for his outstanding administrative leadership. He was cited for the following achievements:

- Iowa State's first athletics director (1896-1908) and "Godfather" of athletics at Iowa State.
- Iowa State's first faculty representative for athletics.
- Active in the formation of the Missouri Valley Conference, Iowa State's first league affiliation.
- Major player in the formation of the National Intercollegiate Athletic Association, which later evolved into the NCAA.
- Served as the vice-chairman of the NIAA/NCAA for 25 years.
- Spearheaded construction of State Gym and Clyde Williams Field.



## Franek Hasiuk named second holder of David Morehouse Faculty Fellowship

Franciszek “Franek” Hasiuk, assistant professor in the Department of Geological and Atmospheric Sciences, has been named the second holder of the David Morehouse Faculty Fellowship in the College of Liberal Arts and Sciences at Iowa State University. Hasiuk joins Alan Wanamaker, assistant professor in the Department of Geological and Atmospheric Sciences, who was named the first holder last year.



Franek Hasiuk at the world's most famous hummocky cross-stratified bed, Utah

The fellowship will provide Hasiuk with supplemental annual funds for his teaching and research efforts. The funds can be used to support students, purchase additional equipment and supplies and provide travel to professional meetings or for professional development.

A Charles City, Iowa, native, Morehouse earned an M.S. in geology with a minor in economics from Iowa State in 1970. He recently retired after 37 years of federal civil service, the first four with the Planning and Special Projects Division in the Federal Power Commission's Bureau of Natural Gas. He spent the remainder of his service in a series of supervisory petroleum geologist and senior petroleum geologist positions at the U.S. Energy Information Administration.

Morehouse established the fellowship to assist the department to hire new faculty and give an early boost to their careers.

“I’ve always been grateful for the outstanding instruction and guidance I received from the entire Department of Geological and Atmospheric Sciences faculty,” Morehouse said. “Fortunately I’m now able to give back by helping to advance the research and teaching of a clearly promising early-career faculty member.”

Hasiuk joined the department this fall. He is developing a research program around the study of limestone both as a record of climate changes and as a reservoir rock for water, oil and natural gas. This work will be carried out in two laboratories he is building: the Foram Farm and the Sedimentary Technology Laboratory.

On the Foram Farm, his research group will raise microbes called foraminifera and investigate how changing chemistry and temperatures will affect these single-celled organisms.

“From these experiments, we hope to produce a record of ocean temperature and glacial ice volume from the greenhouse climate of 100 million years ago when crocodiles lived in the Arctic to the modern icehouse climate when they are conspicuously absent from the Arctic,” Hasiuk said.

In the Sedimentary Technology Laboratory, his research group will investigate new and important problems related to limestone reservoirs: developing mathematical models for porous materials, understanding the growth and distribution of non-carbonate reservoir cements (like sulfates and bitumen), and how to apply concepts from the study of limestone to natural gas-rich shales.

Hasiuk said monies from the Morehouse Faculty Fellowship will help purchase a research-grade petrographic microscope with digital camera and image analysis software to aid in the studies at the Sedimentary Technology Laboratory.

(Excerpted from the College of Liberal Arts and Science Newsletter, September 10, 2012)



Franek atop an erosional remnant, Qatar



## Mock trial finds companies ‘not guilty’ of contaminating water supply

A Civil Action mock trial, 2011

It was a stunner. The jury said, “Not Guilty.”

Thus was the verdict in December when Iowa State University students in Professor Bill Simpkins’ hydrogeology course re-tried the toxic tort case that became *A Civil Action*, a bestselling book and motion picture. It was the fourth time in the mock trial’s nine years that a jury of ISU students sided with the defendants.

*A Civil Action* is a 1995 Pulitzer Prize-winning book by Jonathan Harr about a toxic tort lawsuit brought by Woburn, Mass., residents in 1982, charging that multiple companies (including W.R. Grace and Beatrice Foods) had allowed the solvent TCE (trichloroethylene) to leak into groundwater and be drawn in Woburn’s city wells G and H (John Travolta starred in the 1998 movie version.)

The landmark environmental case was tried in 1986 and used expert testimony by hydrogeologists to prove or disprove that the companies contributed to groundwater contamination in the wells. The plaintiffs alleged that the TCE in those wells had contributed to an increase in unexplained illnesses and a leukemia cluster, which ultimately led to the death of five young children in Woburn.

Students first read the book as part of the assignment. “After reading the book they can see how the testimony was correctly or incorrectly used to make key points,” said Simpkins, a professor in the Department of Geological and Atmospheric Sciences. “Reading the book also highlights for them the difficulty of using scientific experts to unravel a complex hydrogeologic problem for what is essentially a lay jury.”

The senior-dominated class was divided into two teams, one representing the plaintiffs and one representing the defendants Beatrice Foods and W.R. Grace combined. The students assume the identities of real characters in the case and argue in front of a jury consisting of primarily non-science majors from a Geology 100 class. Students had access to an additional resource – *Science in the Courtroom: The Woburn Toxic Trial* – hosted by the Science Education Resource Center at Carleton College (<http://serc.carleton.edu/woburn/>). Three years ago, Simpkins participated in a workshop with Dr. Scott Bair of Ohio State University and others and helped to design the modules that appear on the site. Simpkins was the only one with class mock trial experience, “...so they relied on my experience with the ISU mock trial quite a bit,” he said.

Despite the wealth of information available now for the mock trial (including witness transcripts on the web site), the results are different every year. Although the book is used in place of deposition material, Simpkins said testimony is not scripted and the verdict is always in doubt. “I was surprised with

the verdict this year,” he said. “The expert witnesses for the plaintiff were very good, but they were countered by experts for the defendants, who succeeded in sowing doubt into the minds of the jurors. The jury voted not guilty because the plaintiffs couldn’t counteract the doubt factor introduced by the defendants.”



Based on previous course reviews, the event continues to be an excellent learning tool and students in the class and in the jury also have a great time participating. “Humorous moments this year included a visit from Texas geologist “Tex” McCallahan, complete with cowboy hat and Texas accent. Objections from the attorneys were fewer, perhaps because we engaged Peter Hapke as the judge and consultant for the trial. He is a student in the class and former Vice-President of the ISU Mock Trial Association.”

“It’s a great learning experience for the students,” Simpkins added. “It forces them to integrate their knowledge in the course and then use it to convince a jury that may know quite a bit less about the subject than they do. It’s exciting to see how they show what they have learned in the context of the case. It also highlights parts of the course that I may need to emphasize a bit more.”

Geology and environmental science students that comprise most of the class also get a glimpse of their future profession, part of which may be spent in courtroom cases like this one, said Simpkins. “In the field of groundwater and hydrology, you’ll likely end up testifying in a courtroom someday. In that sense, this is a good trial run.”

*(Excerpted from College of Liberal Arts and Sciences Newsletter)*











# Faculty & Staff Notes

## Suzanne Ankerstjerne, Stable Isotope Lab Manager

This year has been very busy and full of great experiences. I have been lab manager of Alan Wanamaker's stable isotope lab for a little over two years. The lab underwent a total renovation over the winter break. It has been very rewarding to be part of this project and the space is now a pleasure to occupy. We continue to provide services to various ISU departments and expand our customer base outside the university. I will be attending this year's GSA conference in Charlotte, North Carolina to help with graduate recruiting and to promote and advertise our lab's services to the geology community.



Left: Suzy Ankerstjerne at Chain of Craters Road, Hawaii  
Right: Suzy at Luau, Maui, with her sister

This summer, my time in the lab was interspersed with assisting with ISU Field Camp. I led a four-van convoy of students across Nebraska to the Big Horn Basin and assisted with four of the six-weeks. Like many of the students, this was my first time seeing Yellowstone, the Tetons, and the Wind River Range. I had a great time getting to know the students and helping them learn about the amazing geology of this region.

With student enrollment greater than ever this fall, my role as instructor includes administering two online introductory geology courses and assisting Pete Moore with the sedimentology/stratigraphy lab.

The year hasn't been all work. Last spring I enjoyed a relaxing yet geology-filled trip to Hawaii with my sister. I have always wanted to visit this paradise and we had an amazing time. I look forward to the travels and adventures of the coming year.

## Igor Beresnev, Professor

No changes were made to my typical course line-up in the past year. I started with half of "Geology for Engineers and Environmental Scientists" in the fall, which is a large-enrollment introductory class that the department offers to primarily civil-engineering audience. I then taught the upper-level "Applied and Environmental Geophysics" and "Meteorological Instrumentation and Measurements" in the spring. The instrumentation class has been significantly enhanced (with David Flory) by the acquisition of several modern weather stations by the department, which are now being used to enrich the students' laboratory experience.

On the research side, I have been primarily concerned with wrapping up and summarizing the results of two recent multi-

year projects. One was from NSF that virtually ended several years of continuous effort to identify and theoretically describe the mechanisms by which acoustic waves can stimulate the flow of oil and gas, surrounded by water, in the reservoir formations toward producing wells. The effect has been known to the industry but never well understood on the rock-physics side. In the most recent three-year phase of the principally NSF-funded effort, we built the theoretical understanding of the phenomenon based on a conceptual model of a non-wetting droplet (oil or gas) moving in the wetting phase (water) through tortuous porous channels with constrictions. The capillary physics alone is sufficient to describe the entrapment of the droplet by capillary forces and its release by inertial shaking induced by the passage of a seismic wave. The theory of the phenomenon has allowed us to predict the amplitudes and frequencies of the vibrations under which the flow stimulation takes place. The key point was to verify the theoretical predictions in a controlled laboratory experiment. We created small glass capillaries with variable profile, imitating a natural pore, and entrapped small droplets of oil in them. We then applied vibrations and directly observed, using high-speed photography, the liberation of the entrapped oil by vibrating the capillary longitudinally along its axis. The theoretically calculated amplitudes matched the observed ones sufficiently well. The findings were published in a 2011 paper in *Geophysical Research Letters*. The understanding of the enhancement of the two-phase flow by vibrations can now be applied to field situations in which real reservoirs in real production wells will be acoustically stimulated. This understanding has also become part of a 2012 review paper "Changes in permeability caused by transient stresses: field observations, experiments, and mechanisms", which I co-authored in *Reviews of Geophysics*.

The other line of investigation that needed a state-of-the-art summary was the one performed under the sponsorship of ConocoPhillips. The crux of the matter is that seismic vibrators, which dominate modern oil and gas exploration on land, are complex hydraulic devices that attempt to mechanically radiate signals of presumably known shape into the earth. The problem with this approach is that the vibrating plate interacts with the geologically complex ground in an unknown, often nonlinear, way. In addition, the plate is flexing. As a result, what field geophysicists think they radiate is not what they realistically radiate. This significantly limits the target resolution of the seismic method. The solution has been to build the systems of "vibrator control," or feedback that obtains an approximation to the realistically radiated signal, compares it to the theoretically prescribed one, and "corrects" the former if differences are detected. This is the so-called correction for the "transfer function" of the ground. The problem is how to obtain a reliable approximation to the radiated signal on a flexing baseplate. For example, what kind of sensor to use: displacement of the plate, acceleration, or some combination of the plate signal with the hydraulic pressure that creates the vibration? The goal of the project has been to provide a theoretically motivated answer, based on the modeling of the radiation process. I have proposed a new approach to the vibrator control based entirely on plate



displacement, which seems to be better justified. The respective paper appeared in 2012 in the *Journal of Sound and Vibration*. The next step will, of course, be to test this new approach in a field situation. I am planning industry collaborations along both research avenues that I have described.

### **Beth Cassie, Assistant Professor**

As one of two new sedimentologists in the Department, I'd like to take this opportunity to tell you about the somewhat wandering path that led me to ISU and to look ahead at what my future plans might be.

I received a BA in photography and children's writing from Hampshire College in Massachusetts. This may seem like an odd background for a paleoclimate researcher, but I credit Hampshire with teaching me how to question and how to think critically—two essential skills for a scientist. My goals at Hampshire College were to observe how humans interact with the natural world and translate those observations to others. As a researcher studying how sea ice has changed over hundreds to hundreds of thousands of years, I also get to spend time making observations in the natural world and then translate those observations into testable hypotheses shared through manuscripts, presentations, and posters.

After college, I moved to Fairbanks, Alaska, where I spent six years living (some time in a tent, some time in a cabin with no running water!), working (as a communications specialist for a local environmental organization), and playing (cross country skiing, camping, and canoeing). The problem was that I didn't feel intellectually challenged. Thumbing through the course guide for the University of Alaska, I stumbled on a class called "The Dynamic Earth" and I was hooked. I received a second bachelor's degree, this time in geology.

I left Alaska for graduate school at the University of Massachusetts and worked with Julie Brigham-Grette, earning my PhD last May. My research uses diatoms preserved in marine sediments to reconstruct sea ice extent and duration. I've collected both surface sediments and long sediment cores from the Bering Sea. In 2009, I sailed with the Integrated Ocean Drilling Program, sampling at 7 sites in the Bering Sea. We collected sediments that span the last 5 million years. Part of my dissertation looked at Marine Isotope Stage (MIS) 11 in these cores. MIS 11 occurred 400,000 years ago when the climate was slightly warmer than today and sea level was also higher. An understanding of how sea ice retreated during this warming period can help us predict and prepare for the warming that is occurring now and over the next several decades.

I am looking forward to attracting new graduate students to the department and continuing with my work in the Bering Sea. I plan to look at past warming periods at very high resolution using varved sediments. In these cores, it's possible to use the SEM to see seasonal succession in diatom species as well as periods of time dominated by clay or silt sedimentation. I'd also like to continue to develop and calibrate better proxies for

sea ice. I plan more cruises to the Bering Sea to collect diatoms actively photosynthesizing under and around sea ice as well as additional sea ice and sediment cores.

I'm also looking forward to teaching the 350-student Environmental Geology course next spring (Geol 101) and co-teaching History of the Earth (Geol 102) with Franek Hasiuk. In the future, I will offer an upper-level course in Paleontology and a graduate-level seminar. If you happen to be around the department, stop by and say hello as I'm eager to get to know everyone.

### **Cinzia Cervato, Professor**

In July, I returned from my first faculty professional development assignment (aka 'sabbatical') at the University of Genoa in Italy as part of the Fulbright award I received last fall. It was an exciting period to be in Europe: uncertainties about the economy and the stability of the Euro made our stay everything but dull. The kids learned about unemployment, bankruptcy, and homelessness and now are also both fluent in Italian. I learned about Italian academia and taught courses to PhD students in geology, environmental science and botany on how to obtain an academic job and to in-service teachers about science education and learning technology.

The 2011 fall semester was very busy with Geology 100 and its lab, the orientation course for our new students as part of the Earth Wind and Fire Learning Community, and the new online course on Earth and Space science for elementary education majors with lab (expertly taught by Joe Kohlhaas) co-taught with Dr. Charles Kerton (Astronomy). This new course has now been taught for two semesters and we have learned a lot about students' attitude towards technology and distance learning and the value of assessment in these courses. The Geology 100L research experience involving the 8 wells that were drilled in the park east of Jack Trice Stadium is now a key component of the lab experience. Bill Simpkins, Mark Mathison, and my MS student Beth Moss worked very hard since last summer to drill the wells and install all the equipment that allows students to take measurements, collect samples, and test the research hypotheses that they develop early in the semester. Students enjoy the hands-on team experience and appreciate the significance of what they are learning about groundwater and surface water in the Ames region.

Beth is writing up her MS work on the impact that the research experience has on students' understanding of the nature of science and their self-efficacy for science. She plans to defend this November. PhD candidate, Tom Parham will spend his last year as a graduate student writing up the interpretation of the huge amount of data he has collected on the use of the Virtual Volcano in a variety of settings. Both have presented their work at national conferences last year and plan to present their most recent results at the next GSA meeting in Charlotte, NC, in November.

Our trip to Istanbul and Cappadocia over the 2011 Thanksgiving break was wonderful. The geomorphological formations and the history of Cappadocia are well worth the trip. While in Italy we visited several European countries including Spain, France, Switzerland, Malta and Hungary. Genoa is a very lively harbor city with a lot of artistic and architectural gems tucked away in the narrow alleys of the historic center where we lived. It was nice to see the sea every morning on our way to school and work. Ian completed 1st grade in Italy (no Kindergarten there) and after 4 months started speaking Italian with a Genovese accent. His final school report was exceptionally good and vastly exceeded my expectations. His sociable nature helped find several new friends there. Francesca completed middle school and passed a State exam with equally stellar results, in spite of the new subjects she had to learn, eg Spanish and Italian history and grammar. Ian practiced soccer in the alleys and beaches of Genoa, and Francesca played a piano inside a music store housed in a 12th century palazzo in desperate need of a restoration job. Ian started 1st grade at Fellows (this time in English) and Francesca moved to Ames High for 9th grade.

My warmest wishes to you and your dear ones for good health and a good year.

### **Jane Pedrick Dawson, Senior Lecturer**

Last fall I taught Mineralogy (Geol 315) for the second time, and continued to enjoy it. The class is full again this fall, due to healthy numbers of geology majors and also interest in the subject by non-majors, specifically agronomy and engineering students. I also taught Environmental Geology (Geol 101) online last fall, which I would characterize as an experience with a steep learning curve. I will be teaching 101 in a traditional face-to-face class this fall, which I think I will like better. This past spring I taught my usual two sections of Geol 100, and my last structural geology lab (Geol 356). I will miss teaching this lab, as well as the annual field trip and pilgrimage to Baraboo, WI. Instead of structure lab, I will be teaching Igneous Petrology (Geol 365) starting in the spring of 2013. I am excited about this opportunity to teach a subject I truly love, and to relearn everything I've forgotten since I was Ken Windom's graduate student!

I taught the last two weeks of field camp again this summer, and together with Mark Mathison and Susy Ankerstjerne, we took the students on our usual 8-day excursion to Yellowstone, the Tetons, and Wind Rivers. This year's hot and very dry weather (no camp fires!) was the exact opposite of last year's abnormally wet weather. The extreme weather even drove the bears down out of the Big Horns into the field station in Shell in search of food.

Our home life is much the same, except gardening has been tough this year with the drought. Bob's work as a geologist for the Iowa Department of Transportation continues to take him to quarries and mines in Iowa and the surrounding states. My

nephew is now a student at Iowa State, and it's been great for me to finally have a family member in Iowa!

### **Kristie Franz, Associate Professor**

The biggest event of the past year for me was to be promoted to associate professor with tenure. Tenure seemed like such a long way away (not to mention a daunting challenge) when I first started this job in 2006. But now that I have reached that goal, I look back and realize that the time went by very fast. That either means I really enjoyed the last six years, or I was working so hard I couldn't pay attention to the calendar. The reason is probably a mixture of both. I would like to thank my colleagues, friends and especially my former students for helping me get to this point in my career. And thanks to everyone who came to celebrate with me at my house last spring, it was a fun party. My research group currently consists of three graduate students and a post-doctoral researcher. Ryan Spies and Angela Bowman are both continuing their graduate studies from last year and David Dziubanski started a masters in the Geology program last winter. For their research projects, Angela and Ryan are both investigating the use of satellite-based evapotranspiration estimates for spring- and summer-time streamflow modeling and streamflow forecasting. David is investigating ways to incorporate snow cover data from satellites into the National Weather Service hydrologic prediction models. Ozlem Acar joined the group this July as a post-doc. She will be conducting a modeling study to investigate the impact of agricultural tile drainage on streamflow and flooding in Iowa. This is a collaborative project with Bill Simpkins and other faculty at ISU and UI. We hope to develop a better understanding of the hydrology of tile-drained watersheds in the state and develop advanced modeling capabilities for studying these systems. In addition to these projects, I am also part of a newly fund NSF EPSCoR project that is focused on building research capacity in the state for bioenergy. I am part of a group that is interested in environmental sustainability and will be developing a stream monitoring network for the Big Creek Watershed in Boone and Polk counties. Eventually we want to develop a highly instrumented watershed that can be used for modeling, water quality, and biogeochemical studies.

Speaking of monitoring networks, an automatic stream stage recorder has been installed at Stuart Smith Park as part of a project to establishing a hydrology field site near campus that will be used for instruction in undergraduate courses. Establishing the field site was a collaborative effort with Cinzia Cervato and Bill Simpkins, and Mark Mathison and my husband Martin did much of the installation. Soon the data will be available in real-time on the Iowa Environmental Mesonet. Finally, I always like to close with a personal update. If you recall from last year's newsletter, I had a baby girl in May 2011. She is doing great and my husband and I have really enjoyed having her in our lives. We took her to California this summer to visit family, so she got to experience the San Diego Zoo, good Mexican food, and dipping her toes in the ocean (which she really didn't like).



### DeAnn Frisk, Administrative Specialist

Classes are back in session for the fall semester. Along with the new students it is great to have two new faculty members in the department. I will be working with Beth Cassie and Franek Hasiuk to teach them all the university processes and procedures to get them started in their new positions.

If you regularly read my blurb each year, you will notice the new title for my position. The new title reflects more accurately the duties I have in the department. Last fall I started working on the reclassification to my position. Since it required substantial documentation for the duties of the position, I spent weekend and evenings preparing the proper documentation to submit to Human Resources. Once it was approved at the department and college level, Human Resources visited the office and preformed a desk audit of my actual duties. In mid-April, I was notified that my request to have the position reclassified was approved. A big thanks go to Neal and the department for supporting me in this reclassification!

Our vacation this summer consisted of camping in Iowa. We purchased a new travel trailer and have enjoyed many weekends at local county and state parks along with a longer time period in July when we were able to go to a bit further away. We enjoy the time we spend camping sometimes with family and sometimes alone. Hopefully, we will do more camping in retirement (still several years away!).

I'm sure this fall semester will be as busy past years! The university never seems to lack for changes, some positive and others not quite so positive. The key is to be able to adapt and move forward!

If you are in the area, please feel free to stop by and say hello. I do enjoy seeing you and keeping up with what's going on in your life.

### Chris Harding, Associate Professor

I continue my research into emerging technologies (also called Virtual Reality technology), human computer interaction (HCI) and Geographic Information Systems (GIS).

Last year, my research funded two human-computer interaction graduate students. Adam Faeth graduated in Summer 2012 with a PhD in HCI with a co-major in computer engineering. Adam thesis, titled "Expressive Feedback from Virtual Buttons" conducted a usability study to measure the effects of interacting with simulations of buttons (found on a phone or on a numeric keyboard) when different sensory modalities (vision, sound, touch) are switched on or off. My second graduate student, Jim Koopman, is pursuing a MS degree in HCI, his research exploring how listening to the audio description of a route can be used to create and measure the cognitive maps of the route. I co-advised two geology MS students: Rachel Lishansky (together with Carl Jacobson), who graduated in Fall 2011 and Mitchell Cline (together with Neal Iverson), who graduated in Spring 2012. Both used a Geographic Information System in

their research; Rachel created a digital version of a geologic map, Mitch worked on characterizing hill profiles derived from high-resolution terrain (Lidar) data.

My teaching activities still center on computer software systems. I will teach an introduction to Geographic Information Systems (Geol 452/552) in the fall. In spring, I teach a course on using the programming language Python in a human-computer interaction context (HCI 574) and an advanced GIS course (Geol 488/588).

### Franek Hasiuk, Assistant Professor

Hello! I am excited to have joined the department this fall! I obtained my Ph.D. from the University of Michigan in 2008. My dissertation involved understanding carbonate geochemical proxies (like the Mg/Ca ratio) for ocean temperature and chemistry and reconstructing their variability over the Phanerozoic. I graduated from another bird-mascot-bearing Iowa Regents university in 2003 with bachelors degrees in Geoscience and Classics (Greek & Latin). I finished high school in Abu Dhabi, UAE.

For the last four years, I worked for ExxonMobil in Houston as a petroleum geologist. In my short time there, I was able to work on exploration, development, production, and research projects with data from the US, Nigeria, Qatar, Abu Dhabi, Iraq, Libya, Vietnam, the North Sea, and Germany as well as teach courses in carbonate geology. I will miss my colleagues there, but not my commute!

My research plans include following up on my graduate work by starting a "Foram Farm" to experimentally investigate how changing seawater temperature and chemistry affect foram shell chemistry. I also want to start an on-line database of carbonate geochemical data, the "CO3DB." I will also be conducting research into improving the modeling carbonate pore systems. Finally, I hope to bridge the gap between carbonate and clastic depositional and diagenetic models to better analyze fine-grained sedimentary rocks common in unconventional reservoirs. I hope to be able to propose some interesting research projects along these lines to industry partners as well as public funding agencies.

In Spring 2013, I will co-teach History of the Earth with Beth Caissie and lead a Spring Break fieldtrip to west Texas and New Mexico; starting in Fall 2013, I will take over responsibility for Stratigraphy and Sedimentation; and in Spring 2014, I plan to launch a 3-credit Petroleum Geoscience and Engineering advanced undergraduate/graduate class.

My wife, Britta, and I also research strategies for minimizing free energy in small children (Lena 4½ and Lucas ~3) and how to repair/hide effects of the spontaneous release of this energy on residential structures and furnishings. Our dog, Biscuit, loves the variety of small animals that he can chase (but never quite catch!) in our backyard.

### Neal Iverson, Professor and Chair

An unforeseen benefit of being department chairman over the past year is that when I've managed to carve out some time for teaching or research, it seems sweeter than it did before—like sneaking a bit of chocolate when otherwise dieting. Teaching geomorphology last fall was an enjoyable respite. Similarly, over the winter holiday break, I wrote an NSF proposal to study the genesis of drumlins. Despite the swollen scientific literature about these subglacially formed elongate hills (~1300 publications in the last 150 years), they lack a definitive explanation. The grant proposal, to study a modern drumlin field in Iceland recently exposed by the retreat of the glacier Múlajökull, was funded for three years. The goal will be to determine subglacial stresses and till deformation kinematics based on, respectively, geotechnical testing and magnetic fabric analysis of intact till samples. Co-PI Tom Hooyer, from UW-Milwaukee, and I reconnoitered the area in August. We felt distressingly old as we camped, dug pits in till for sampling, forded streams, and shivered in persistent strong wind and rain. Fortunately, next summer we'll be joined by two graduate students and three undergraduates whose bodies we imagine being more resilient than ours.

A three-year NSF grant to study seismicity associated with the motion of the glacier Engabreen, in Norway, came to an end this year. This fall post-doc Pete Moore (Ph.D., 2009) will be submitting, as lead author, a paper to Science highlighting our principal finding: that frictional slip can occur at glacier beds without episodic inertial movement sufficient to generate seismicity. This project was frequently frustrating, with many equipment failures, Byzantine logistics, and too much Norwegian food. It's been 19 years since I first started working under the glacier there, and I'm pretty certain that I've had enough.

Mitch Cline (M.S., 2011) and Ben Petersen (M.S., 2012) finished their graduate degrees during the past year. Mitch used LiDAR data to study the spatial patterns and geometry of washboard moraines of the Des Moines Lobe. His results help confirm that the moraines are crevasse-fill ridges—a convincing indication that the lobe surged, rather than crept slowly, into Iowa. Current M.S. student, Sarah Day, is extending Mitch's work to other landforms of the lobe. Ben completed the first set of experiments with a new laboratory device for the study of glacier sliding. His results on ice-bed separation and a new related theory he developed should improve models of glacier slip dynamics and hydrology. This laboratory work is supported by a four-year NSF grant and will be continued by Lucas Zoet, who started as a post-doc this fall after completing his Ph.D. at Penn State. Luke brings considerable expertise in fault mechanics and glacier seismicity to this project; I'm happy to have him onboard. I was surprised to learn last spring that this fall I'll be receiving the Kirk Bryan Award—given by GSA each year at its annual meeting for research that advances geomorphology. The award is for a paper that I wrote several years ago on particle and magnetic fabric development in deformed till. Co-recipients of the award are co-authors Tom Hooyer (Ph.D., 1999), Jason

Thomason (Ph.D., 2006), Matt Graesch (M.S., 2007), and Jackie Shumway (M.S., 2007). I'm indebted to these former advisees whose graduate research helped make the paper possible.

This summer Kathy, Joe, Ellen and I camped and hiked in and around Yosemite and Sequoia National Parks for two weeks. Yosemite Valley was packed wall-to-wall with people and cars, so we retreated to the high mountains just east of the park. There we found a campground so underused and spectacular that I hesitate to disclose its name (Sawmill, Inyo National Forest). There were some low points, including a case of food poisoning and a collision between our rental vehicle and a large boulder, but it was great trip overall. Joe is at the University of Chicago this fall as a junior, and Ellen is a senior at Ames High. I'm hoping that during the coming year, before her departure next fall for college, time somehow slows down.

### Carl Jacobson, Professor

It's now been a bit over a year since I finished my stint as department Chair and I'm thoroughly enjoying my return to normal faculty duties. I currently have two graduate students, Ning Zhang and John Hoyt. Both Ning and John came out of our own undergraduate program. They received their B.S. degrees fall a year ago and then started in the M.S. program this past spring. Ning is conducting a fracture analysis of the Mowry Shale in the field camp area, including sites such as Alkali Anticline, which many of you will remember. Ning was based out of field camp this summer and was assisted in the field by one of our undergraduates, Ellyn Wilkerson. Ning and Ellyn collected a vast amount of data. The project is funded by Devon Energy and Ning and I just returned from a brief trip to Wyoming to review the project with Devon geologist and ISU alumnus Erik Kvale. Erik has been extremely supportive of our work. John is picking up some of my past work from the Picacho area of southeasternmost California. This is the same general area in which my former students Felix Oyarzabal, Matt Stamp, John Uselding, Jon Reis, and Rachel Lishansky have worked. John will conduct detailed mapping, combined with Ar/Ar and U/Pb dating, to help characterize early and middle Cenozoic low-angle normal faulting events. John's project involves a considerable amount of GIS, so our mapping expert Chris Harding will serve as co-advisor, as has been the case with several of my recent students.

In addition to Ning and John's work, I continue to be involved in a number of detrital zircon studies. One particularly interesting aspect of this relates to the origin of the Colorado River and Grand Canyon. The conventional view is that the Colorado River did not extend downstream of the modern Grand Canyon until the opening of the Gulf of California about 5 million years ago. In contrast, some workers have recently proposed that a paleo-Colorado River drained from the Grand Canyon area to the region of the modern Los Angeles basin as far back as the latest Cretaceous. However, the Paleozoic and Mesozoic cover sequences of the Colorado Plateau include a highly distinctive detrital zircon assemblage. We see no evidence of such zircons in our studies of Cretaceous to Miocene sedimentary units in

the Los Angeles basin and adjacent parts of southern California. This favors the standard view that the lower Colorado River did not tap into the Grand Canyon and Colorado Plateau until the Pliocene.

In terms of classes, I continue, as always, to teach the lecture part of the undergraduate structure course. For the past 10 or so years, Jane Dawson has been covering the structure labs, but I will take those back beginning this spring. Last fall, I taught a graduate/undergraduate seminar on the Sevier and Laramide orogenies, with particular emphasis on fracture patterns deriving from those events. I also continue to be involved in field camp.

My sons, Mark and David, still work in New York City and Washington, DC, respectively. Mark is getting married this fall to a woman who is a first-generation Thai-American. There will be ceremonies in both NYC and Thailand. We look forward to both. Carol now works for a company named Veeva Systems that provides customized software solutions to the pharmaceutical industry based on a platform from another vendor (Salesforce.com).

### **Mark Mathison, Teaching Laboratory Coordinator**

Field Camp has grown again! This year we had 37 students. All modifications to the building are now done. Everything is working great. We were sorry to not have Karen and Holly Noggle out this summer to the camp. Rick Chamberlain and Erik Kvale were out this summer to continue their Greybull Sand Stone exercise. This is a favorite project of the students. Carl Jacobson, Jane Dawson and Suzanne Ankerstjerne also were out this summer to help in the operations of camp.

This was also the first time in 20 years that bears were in the camp! We were visited by two black bears about a week apart. I participated in a short field season in Egypt looking for early primate this year. It was interesting to see how things have changed there. Our hotel was only 2 blocks Tahrir square! There were many people still protesting there but in a peaceful way. The best part of the trip was to be able to spend time with Tom Bown and hear his great stories about field geology trips. I was also fortunate to win the College of Liberal Arts and Sciences "Professional and Scientific Excellence Award". I am off next to Spokane, WA to help with some geophysics work on an epithermal gold deposit play. I will be attending AGU this year I hope to see many of you there.

### **Pete Moore, Postdoctoral Research Associate**

As fall semester 2012 begins, I have an exciting year ahead and many enjoyable things to look back on. I've recently completed my third year of a three year postdoc and am trying to avoid being intimidated by the mountain of data and model results looming on the corner of my desk. Sprinkled within my postdoc have been occasional teaching assignments, including co-teaching Geology 201 (Geology for Engineers and Environmental Scientists) with Igor Beresnev last fall. This fall,

I'm teaching Stratigraphy and Sedimentation (Geol 368) and Surficial Processes (Geol 479/579), both of which I've taught before, but never at the same time!

Nearly all of the research that I've been involved in while at ISU has been focused on glacier processes and the genesis of glacial landforms. Looking forward, I expect to continue to pursue these avenues of research. I have a new NSF grant that will support research on melting of ice beneath a blanket of rock or soil. Among the goals of this project will be to improve and extend existing models of the mass-balance effects of supraglacial rock debris to cases where the debris thickness exceeds one meter, a situation thought to have been common along parts of the Laurentide ice sheet margin during the last deglaciation. Meanwhile, I have begun to get my feet wet (so to speak) in a different realm: rivers. I've got a growing interest in the balance between sediment supply and transport and its influence on channel morphology in low-order midwestern streams. If all goes well, I'll be reporting on research in both fluvial and glacial processes in future editions of the Varve.

On the home front, my wife Lisa continues her stellar teaching in the Department of Natural Resource Ecology and Management. Her research on the ecological impacts and social dimensions of agricultural land management continues to impress her colleagues, garnering invitations to exclusive workshops and conferences. Our boys Ray (17 mo.) and Freddy (3 ½) are growing fast and keeping Lisa and I from getting too much rest. They do the things that boys do and enjoy just about any form of horsing around. We couldn't be more proud!

### **Karl Seifert, Professor Emeritus**

Carole and I remain in our Ames home hoping for more warm winters and wetter summers. Our flower and veggie gardens get watered a lot to keep them alive under these drought conditions. We have not traveled much this year except for a week in Colorado in May to see what our boys are doing. One of them has opened a nice restaurant in SW Denver called the Squirrel Creek Lodge after his pet squirrel while another has moved into the new expanded Microsoft Building in Boulder. Following the inspections of these buildings we moved to a B & B in Estes Park to relax and watch elk and mountain lions. The Colorado fires started later so fortunately we missed them. This winter we have booked a Caribbean cruise to the islands with friends from Madison. In my spare time, I have started comparing the anorthosite suite geochemical data from Quebec to those we published for the Adirondacks. There appear to be a few significant differences that might be interesting to explore and try to explain. Probably the source regions for the two groups of rocks are slightly different and the differences may help explain why large plutons of anorthosite suite rocks are largely confined to Proterozoic time rather than occurring over a larger time interval. Although I do not plan to attend this year's GSA in Charlotte, I frequently attend such meetings and hope to see some of you alums there from time to time.



### Bill Simpkins, Professor

My big news is that I now represent many of you as a GSA Councilor – the only popularity contest I can ever remember winning! I look forward to serving you and the Society for the next four years. In the meantime, Team Hydro continues to work on interesting projects. Adam Davison (B.S., University of Utah) has been sampling the South Skunk River and the Ames aquifer for human enteric viruses (Adenovirus, Norovirus, and Rotovirus) as part of a Center for Health Effects of Environmental Contamination (CHEEC) project. Although we have found viruses, their total numbers have not been spectacular. Extremely dry conditions have decreased hydraulic gradients and recharge (from sewers?) enough to decrease virus transport in groundwater. Kristie Franz and I made some progress on assessing the effect of agricultural drainage on peak flows and flooding and we decided to use the 3-D HydroGeoSphere model for the simulations in the South Fork watershed north of Ames. Graduate student Alex Morrison (B.S., University of Minnesota) is ramping up on the model – along with our new post-doc slem Acar – and has been sampling and analyzing stable isotopes (using Al Wanamaker's SIPERG lab) with the intention of using them for model calibration. Alex received a GSA Student Research Grant for his proposal on this topic and will present a poster at GSA in Charlotte this fall. Jake Smokovitz (B.S., University of St. Thomas) continues his research on estimating groundwater and nutrient fluxes to Deer and Pokegama Lakes in Itasca County, Minnesota. He identified areas where groundwater is entering and leaving the lakes using stable isotopes (courtesy of SIPERG) and has also sampled a range of groundwater ages (modern to pre-bomb) in deep aquifers feeding the lakes. He presented his research at GSA in Minneapolis last fall and at the Minnesota Groundwater Association meeting in St. Paul last spring. This summer, he measured hydraulic heads in private wells and took samples for geochemistry to further define flow directions and geochemical signatures in groundwater. He hopes to finish his M.S. thesis in fall 2012. Al Wanamaker and I supervised Bianca Bello from Boston College and Bekah Burket from Stetson University as part of an NSF Research Experience for Undergraduates (REU) program. Bianca studied the effects of drought on groundwater/Squaw Creek interaction at our Hydrology Field Station in Stuart Smith Park in Ames. Bekah studied the carbon and oxygen isotope chronology of tufa deposits and their relationship to springs in NE Iowa. This project has great potential for a collaborative paleohydrology/paleoclimate proposal to NSF. Both students were terrific and they will provide great publicity for our groundwater and paleoclimate programs at ISU. My personal research program has been equally active. I submitted a manuscript on the groundwater footprint of ethanol production in Iowa and, with the help of Al Wanamaker, I am updating my 1995 study of the local stable isotope composition of precipitation to 2012. Research by REU student Nicole Neira last summer suggested that isotopic composition has become more enriched in that 20 years and my preliminary analysis seems to corroborate that trend. This fall, I will be presenting research at GSA and the Midwest Groundwater Conference in Minneapolis on the effect

of the Flood of 2010 on the Ames aquifer.

Enrollments remain up in my classes. Last year, I taught 24 students in Hydrogeology, making our field labs crowded! This fall I have only 16 undergraduates and one graduate student in the course. We continue to use A Civil Action as a capstone project (<http://www.las.iastate.edu/lasnews/civilaction11.shtml>) and the plaintiffs hold a slim lead of 5-4. I taught Energy and the Environment to 210 students in spring 2012. Carl Vondra spoke on the Deepwater Horizon disaster and Dr. Stephen Osborn from Cal Poly spoke about the effects of hydraulic fracturing on groundwater. I also taught Applied Groundwater Modeling to the largest group I have ever had for that class –16 undergraduates and graduate students. In a broader teaching role to the public, I continue to be in demand by local radio and TV stations and the Des Moines Register for comment on water issues, particularly the current drought and hydraulic fracturing. On the family front, our son Scott and his wife Pauli will be starting Ph.D. programs in computational biology and cancer biology/immunology, respectively, at the University of Minnesota this fall. Daughter Kelsey graduated from Luther College with a B.A. in Art and spent six weeks at the Summer Institute for Art Museum Studies at Smith College in Massachusetts. Cathy and I took drove out for her “graduation,” visited friends along the way, and experienced the Berkshires, Catskills, Philadelphia, and Frank Lloyd Wright's Fallingwater. Kelsey is searching for employment in the art world, but is also thinking about graduate school in art history. Team Hydro would love to hear what you are doing! Please stop in and visit if you are in the area!

### Paul Spry, Professor

This year was probably the most unique among the twenty-nine I have spent at Iowa State. The Spring semester brought with it a faculty professional development assignment (FPDA) to Genoa, Italy. While I was at the University of Genoa, I taught a course on “Mineral Resources” to Ph.D. students, worked on various manuscripts, wrote proposals, started new research projects in Sweden and Sardinia, and gave several invited seminars at universities in Europe. I gave seminars in Sweden (Boliden Minerals AB, University of Stockholm, Uppsala University), Switzerland (University of Geneva, Swiss Institute of Technology – ETH), Greece (University of Athens, Aristotle University of Thessaloniki), Italy (University of Sassari), and Austria (Montanuniversitet – Leoben) as part of my appointment as 2012 Thayer Lindsley Lecturer for the Society of Economic Geologists. The University of Sassari, which is located in Sardinia, appointed me as a Visiting Scholar where I gave a lecture and visited many ore deposits. As a result of this visit, I commenced a new project on the origin of skarn-type copper-iron deposits in central Sardinia with Giacomo Oggiano and Paola Mameli. A newly funded research project also resulted from my visit to Boliden Minerals AB (third visit to Sweden this year) where Kate Frank, a new M.S. student (daughter of geology alumnus Hal Frank, who was a graduate student of Carl Vondra in the late 1970s), started a project on metamorphosed massive zinc-lead deposits in the Stollberg ore field. The FPDA was a great personal experience as I lived in the medieval part

of Genoa and was introduced to some amazing food, wine, and culture. While I was away, I communicated with my graduate students Samantha Bristol (M.S.), Andy Fornadel (Ph.D.), Josh O'Brien (M.S....but likely to switch to a Ph.D.) via Skype. I appreciated their patience with me, especially when I used to have to hang out the window to get a decent WiFi signal to talk with them. Josh and Andy both gave presentations at the Goldschmidt Conference in Montreal on our research, and Josh gave a workshop presentation on my behalf on the chemistry of gahnite and its potential as an exploration guide to metamorphosed ore deposits at a workshop on "Processes that control the composition of Fe-oxides in ore deposits." Sam Bristol's project on the Stanos copper-bismuth deposit, Greece, was given a big boost with a grant to help cover field and analytical costs from Eldorado Gold Mining Corporation (Canada). Andy Fornadel has obtained the first stable tellurium isotope data from an ore deposit and has already submitted a publication on the results of his study. Andy kindly gave my lectures in metamorphic petrology during my FPDA.

As a result of my on-going studies on the chemistry of tellurium and the origin of gold telluride deposits, I started a new project with Sarah Hayes (University of Alaska-Fairbanks) on the mineralogy and chemistry of tellurium in the hypogene and supergene environments. This project, which is financially supported through the USGS MERP program, will allow us to determine how tellurium is specifically bonded within various minerals, which will help in its recovery during ore processing. Although I did not teach any classes during the spring 2012 semester at ISU, I continued to teach Geol 316 Optical Mineralogy, Geol 105 Gems and Gemstones, and Geol 507 Midwestern Geology Field Trip during the Fall 2011 semester. Last year's field trip went to northern Minnesota where we visited iron formations, the giant Nokomis copper-nickel-platinum group element deposit, and the Duluth Complex, with 12 faculty and students from the University of Iowa. We enjoyed this trip so much that we ran another joint field trip to Colorado in the Fall.

Please continue to keep in touch by phone at (515) 294-9637, by e-mail (pgspry@iastate.edu), or just drop by.

### **Carl Vondra, Distinguished Professor Emeritus**

Georgia and I recently returned from leading another successful excursion for the Osher Lifelong Learning Institute (OLLI), formerly the College for Seniors (retirees). This year's excursion was entitled, "Fire and Ice" focusing on the glacial landforms of the mid-continent and the northwest and on the volcanics of the Columbia Plateau and the Cascades. We had twenty-nine very interested participants many of which were former ISU faculty or staff. During the spring I presented a series of lectures at Reiman Hall in the Alumni Center in preparation for the excursion. The lectures were also available on line. I am planning to offer a course during the spring of 2012 entitled, "The Yellowstone Supervolcano – its Past and Future" and then to follow with an excursion to Yellowstone National Park in July. In late May and June, Georgia and I traveled to the British

Isles to take part in an extensive tour of England, Scotland and Ireland. We enjoyed the tour and our Australian and Canadian companions. The weather, although mostly dry, was unusually cool. On our return in mid-June we traveled to Indianapolis for our grandson, Skylar's wedding (Carla's son). From there we visited our daughter, Cindy, in northern Minnesota and then our son, Charles, in Montana.

We joined faculty and alumni for the Alumni Days reunion and the dedication of the Smith Lodge at the Field Station. It was a successful event and Georgia and I enjoyed reminiscing with the alumni of days in the field and at the Field Station. We hope that you and your families are well and continue to be gainfully employed and prosperous. We wish all of you the best.

### **Alan Wanamaker, Jr., Assistant Professor**

Campus is once again busy with lots of new students. It is an exciting time of year. Last spring, I taught an upper level undergraduate/graduate level course entitled Stable Isotopes in the Environment. Students were able to process and measure the isotopic composition of various natural materials in the stable isotope facility as part of this class. A brief story was written about the undergraduate research project in this class by Steve Jones (College of Liberal Arts and Sciences), which highlighted research opportunities at ISU for undergraduates. If you are interested, you can read more about it here (<http://www.las.iastate.edu/lasnews/isotopeclass.shtml>). Prior to this class, the stable isotope laboratory was renovated. The renovation was largely designed to improve the functionality of the space, but it also made the lab look a lot nicer, too. Some of the funds for the renovation came from the David Morehouse Faculty Fellowship that I received last year. I am very thankful for this generous support. This fall, I am teaching Introduction to Oceanography and a graduate seminar (The role of polar regions on Earth's climate). In the spring semester, I will teach paleoclimatology again.

This past summer was very busy in my research group (details at <http://www.public.iastate.edu/~siperg/>) as two of my graduate students (Shelly Griffin and Erin Lower) successfully defended their MS thesis research in June. Erin Lower is transitioning into the "work force." Shelly Griffin has enrolled in our PhD program and will continue studying the oceanographic evolution in the northwestern Atlantic (Gulf of Maine region) during the last millennium. PhD student Madelyn (Maddie) Mette is developing a master shell chronology from northern Norway (within the Arctic) to better characterize the oceanography of that region in recent centuries. Both Maddie and Shelly utilize the isotopic composition of annual increments of the shell carbonate, along with the relative thickness of those increments (similar to dendrochronology), to infer past hydrographic and climatic variability. Additionally, Bill Simpkins and I co-mentored two undergraduate researchers this summer as part of an NSF sponsored research experience for undergraduates (REU) at ISU in the BioGeosciences. These projects included an isotopic investigation of tufa deposits in NE Iowa as potential archives of hydroclimate. Also, one student studied the impact the current



drought is having on surface water and groundwater in Ames utilizing the stable isotopic composition of water. I continue to be extremely grateful for the work of Susy Ankerstjerne and Mark Mathisom, both of whom keep the stable isotope lab operational and humming along.

My family (Ellen, Jayna, and Jack) and I are well. Ellen is teaching 2nd grade this fall. Jack is a 3rd grader, and Jayna has started at Ames Middle School. To complicate things a bit more, we bought a black lab puppy (Ziggy) last winter. Ziggy is now an 8-month-old pup that is a lot of fun. We are having fun walking and running him all around Ames. Please feel free to visit anytime you are in town. I wish you a safe and healthy year.

### **Ken Windom, Associate Professor Emeritus**

It hardly seems like a year has passed since writing something for the last Varve. If time flies when you are having fun, I must be having a ball! Despite being retired, I find myself busier than ever, the difference being that I can work at what I want to for as long at a time as I want to. Jane and I still live on our acreage with the horses and dogs (and one barn cat). In addition to the critters, I enjoy my garden and woodworking shop.

The family has grown by one more member since the last Varve was published. Our daughter, Kim, had a baby girl in March. Grandma spent a month in San Francisco helping Kim and her husband Mark when the baby was born, then I went out in May for a visit. Kim took off about 12 weeks from work, then went back to discover that the company she works for promoted her to Vice President of New Market Operations. Steve, our son, also has a new job. He is the Quality Assurance Automation Engineer for one of the insurance companies in Des Moines. His daughter is 2 now, and has managed to wrap all the adults around her little fingers. Amazing how kids can do that!

I wanted to say how much I enjoyed seeing the alumni who attended the reunion at the Field Station in July. It was certainly a lot of fun to get reacquainted with folks I haven't seen in several years. I know the rest of the faculty feels the same, and definitely encourage everyone who did not attend to make a special effort to come to one of the future events, either at the Field Station or on the ISU campus. Until then, my best regards to you all.

### **Lucas Zoet, Postdoctoral Research Associate**

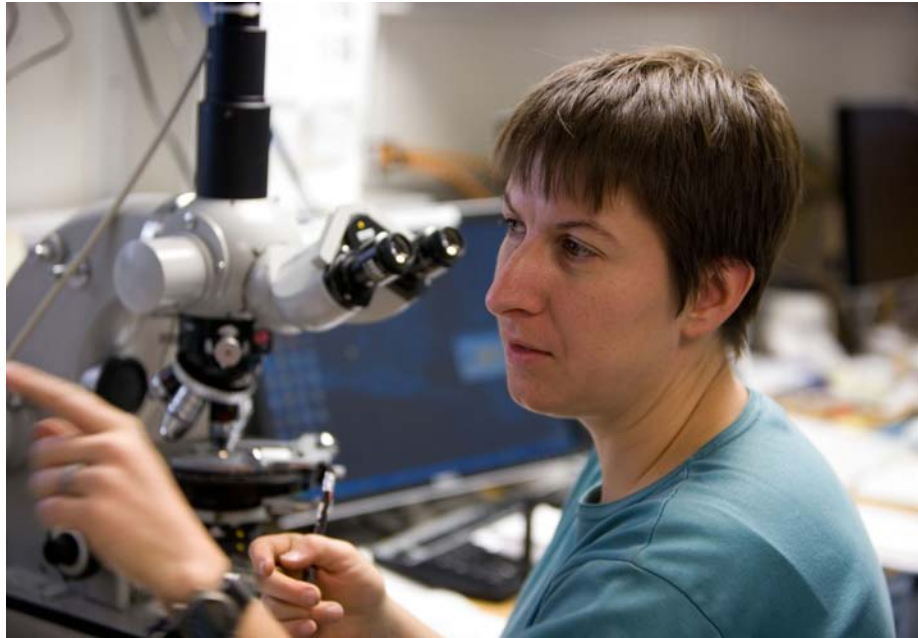
I'm a recent graduate of the Geoscience program at Penn State University, where I worked with Sridhar Anandakrishnan and Richard Alley on studies pertaining to the unstable sliding associated with stick-slip events occurring at the base of glaciers. Specifically, I apply passive seismology and laboratory techniques in the investigation of this phenomenon. For the field aspects of this research, I took several trips to Antarctica to deploy seismometers and GPS, and one trip to Norway to collect ice samples beneath Engabreen Glacier. I received doctorate and master's degrees from Penn State, and attended Michigan State University for my undergraduate work in Geology/Geophysics.

While in Norway, I met a large contingent of the ISU glaciology group and began to hear about the great work being done at the lab in Ames with a new apparatus. The ring-shear device had been built and was beginning to be operated. An opportunity arose to work with Neal Iverson using this machine, which brought me to ISU. The ring shear device is designed to study ice sliding over a soft or hard bed and to maintain the ice temperature very close to the melting point. I will be utilizing this equipment to conduct new research pertaining to sub-glacial mechanics. In addition to research, I will be teaching one course per year.

I moved to Ames with my wife, Lana, who is a graduate student in the Architecture program at ISU. She had been working as an architectural designer for the past six years while I was in graduate school in State College and is now seeking her own professional degree. We are looking forward to exploring Ames and to getting to know the community.









# Alumni Contributions to Geological Sciences: Iowa State University

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

\_\_\_\_\_ \$1000 \_\_\_\_\_ \$250 \_\_\_\_\_ \$100 \_\_\_\_\_ \$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)  
\_\_\_\_\_ Jon Martin Peckenpaugh Memorial Scholarship  
(2702869)  
\_\_\_\_\_ O'Brien-Lonsdale Endowment Fund (1936212)  
\_\_\_\_\_ Georgia L. and Carl F. Vondra Graduate Fellowship  
(2700426)  
\_\_\_\_\_ Huedepohl Geology Field Camp Scholarship (2701147)  
\_\_\_\_\_ Beck Family Scholarship (2702124)  
\_\_\_\_\_ Kevin Connolly Geology Field Camp Scholarship (2702214)  
\_\_\_\_\_ Bruce Bowen Graduate Fellowship (2703338)

\_\_\_\_\_ I will request that my employer match my gift (if appropriate)  
to the same fund noted above.

My employer is \_\_\_\_\_

\_\_\_\_\_ For gifts of \$100 and above you may choose to receive a 6" x 8" (landscape) plaque cut from a plank saved during the demolition of the renowned field camp "5-Holer." The plaque contains a metal plate with the inscription "Iowa State University, Carl F. Vondra Geology Field Station, From the "5-Holer" - In use 1958-2004, Certified Authentic by: [Carl Vondra's signature].

\_\_\_\_\_ For gifts of \$200 and above you may choose the 6" x 15" (portrait) version.

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. Neal Iverson, Chair, Dept. of Geological & Atmospheric Sciences, 253 Science I, Iowa State University, Ames, IA 50011-3212**

## Geological Sciences Funds and Endowments

**Beck Family Scholarship:** Established by Jim and Denise Beck to help the department recruit the best undergraduate students, with particular emphasis on providing assistance for students to attend the ISU 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 scholarship for an undergraduate student to attend the ISU 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 student will already receive from a research or teaching assistantship.

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

**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. Provides a cash award to one or more outstanding graduate students with demonstrated research ability.

**Jon Martin Peckenpaugh Memorial Scholarship (2702869):** Established in 2010 in the memory of Jon M. Peckenpaugh (B.S. 1970; M.S. 1973) by his family, to provide a scholarship for a graduate or undergraduate geology, environmental science, or Earth science major to attend the ISU summer field camp.

**Kevin Connolly Geology Field Camp Scholarship:** Established by Kevin Connolly (B.A. 1987) in 2008 to provide Geology or Earth Science majors with a scholarship to attend the ISU summer field camp.

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

**Peter R. Johnson Memorial Scholarship:** Established in the memory of Peter R. Johnson (B.S. 1977) by his family, this fund provides a scholarship for an undergraduate student to attend the ISU 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 scholarship to an undergraduate student on the basis of scholarship and financial need.

**Bruce Bowen Graduate Fellowship:** This fund was established by Bruce Bowen (BS 1967, MS 1970, PhD 1974) in 2012 to support graduate students enrolled in the geology program.

## Contributions from 7/1/11 to 6/30/12

### **Rodney Gardner Scholarship (1900078)**

Joan Barwin

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

Patricia Dickerson (MS 1983)

Larry Fellows (BS 1955)

Cheryl Peckenpaugh

Paul Spry

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

Sarah Chadima (MS 1982)

James Eiler

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

George Kunkle (BS 1956)

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

Benjamin Barnes (MS 1985)

Bruce Bowen (PhD 1974)

Richard Brown (BS 1953)

William Busch (BS 1974)

Steven Condon (BS 1973)

Larry Fellows (BS 1955)

Larry Garside (BS 1957)

Jane Grenier

Daniel Hansen (MS 1978)

Kenneth Harpole (BS 1973)

Gary Hauser (BS 1961)

John Hooper (MS 1978)

Carl & Carol Jacobson

James Kringlen (BS 1985)

Jonathan Maifield (BS 1997)

Mark Mathisen (PhD 1981)

Curtis Peck (MS 1980)

Robert Powell (BS 1982)

John Rudisill (BS 1976)

James Sallee (BS 1966)

Leroy Shaser (MS 1978)

Tracy Vallier (BS 1962)

James Zalesky (BS 1977)

### **Geology Development Fund (1949512)**

Gary Anderson (MS 1963)

Laura Anderson

Lee Ankeny (BS 1981)

Lee Backsen (MS 1963)

Karen Bartels (BS 1985)

James Beer (BS 1984)

Allen Berte (BS 1979)

Janet Boyd

Richard Brown (BS 1953)

Paul Carlson (MS 1957)

Clint Carney (BS 1997)

Dana Carson (MS 1988)

Robert Carson (BS 1974)

Robert & Anita Cody

Rodney DeBruin (MS 1975)

James Englehorn (BS 1958)

James Forsberg

Nathan Forsythe (BS 2006)

John Foster (MS 1969)

Richard Fox (BS 1963)

Charles Fudge (BS 1956)

Larry Garside (BS 1957)

Ronald Genter (BS 1958)

William Gibbons (MS 1995)

Greg Guyer (MS 2001)

Allen Hanson (BS 1947)

Maureen Holub (BS 1984)

Thomas Hooyer (PhD 1999)

Richard Iverson (BS 1977)

Nancy Jensen (BS 1980)

James Kipp (MS 1981)

Douglas Klein (BS 1963)

Erik Kvale (PhD 1986)

Robert Ladd (MS 1979)

Kenneth Lasota (MS 1982)

Brian Little (BS 1983)

David Morehouse (MS 1970)

Karen Noggle (MS 1986)

Curtis Peck (MS 1980)

Bruce Petersen (BS 1967)

Milton Pierson (MS 1987)

Clay Postlethwaite (PhD 1988)

Darvin Rehms (BS 1958)

Calvin Reppe (MS 1986)

George Rosenfeld (BS 1956)

Carl Shaw (MS 1986)

Hugo Sindelar (BS 1952)

Mark Smith (MS 1976)

John Spencer (MS 1974)

David Stangl (MS 1978)

Angelo Stefani

Tracy Vallier (BS 1962)

Georgia Vondra (MS 1993)

Lynn Watney (MS 1972)

Brian Wehner

Mark Wiseman (BS 1974)

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

Neal & Kathy Kramer Iverson (BS 1983)

Carl & Carol Jacobson

Kenneth Tindall (MS 1985)

Carl Vondra

### **Beck Family Scholarship (2702124)**

Bjorn Brooks (PhD 2009)

### **Geology General Scholarship (2707142)**

Paul Ebert

### **Kevin Connolly Geology Field Camp Scholarship Fund (2702214)**

Kevin (BA 1987) & Kerry Connolly

### **Smith Family Foundation Departmental Chair in Geology (2702478)**

Tom (MS 1971) & Evonne Smith

### **Jon Martin Peckenpaugh Memorial Scholarship (2702869)**

Mike Kozimko (MS 1977)

Cheryl Peckenpaugh

Marvin Taylor (BS 1970)

### **Bruce Bowen Graduate Fellowship (2703338)**

Bruce Bowen (PhD 1974)

### **Matching funds**

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Thank You!



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