Fall 2009

Geosciences Newsletter - 2009

Department of Geosciences

Follow this and additional works at: http://scholarworks.wmich.edu/geology_news
Part of the Earth Sciences Commons, and the Higher Education Commons

WMU ScholarWorks Citation
http://scholarworks.wmich.edu/geology_news/32

This Newsletter is brought to you for free and open access by the Geosciences at ScholarWorks at WMU. It has been accepted for inclusion in Geosciences Newsletter by an authorized administrator of ScholarWorks at WMU. For more information, please contact maira.bundza@wmich.edu.
Dear Friends and Alumni

I was told one time by a high-ranking administrator on campus that Geosciences is one of the most successful departments on campus, but in contrast to the other successful departments, Geosciences’s success is “all across the board.” When I inquired about what he really meant, he replied Geosciences has the right balance between rigorous educational and vigorous research programs. Not only that, but the concentration areas in ongoing funded research in the department are quite varied, covering the existing expertise in the department. What he was trying to say is that just about every faculty member in the department is doing his or her part when it comes to developing an active research program in his/her area of expertise.

I could not agree more, our faculty managed over the years to develop aggressive and well-funded programs in just about every discipline, in basin analysis, environmental geochemistry, engineering geology, and carbon sequestration. The number of publications (45) in refereed journals, and presentations (70) by our faculty and students in regional, national, and international meetings attest to the research productivity of this department.

Regardless of which program (Geology, Hydrogeology, Geochemistry, Geophysics), our graduating student completed, he or she knows that well-paid and challenging jobs are waiting for them upon graduation even at this difficult economic time. We all know this is not the case for students graduating from other disciplines or from Geology departments elsewhere. I would like to believe that our educational and research programs are balanced and unique in many ways; they adequately cover the scientific fundamentals, and teach the students the “know how” when it comes to applied research. The competing programs across the nation, as we all know, tend to prepare students to join the academic ranks or to work for the industry. In a nutshell, students are getting the credentials and skills they need to compete for and secure their dream jobs, regardless of the nature of the job being sought.

Enrollment up

While enrollment in the university has suffered from the economic strains on Michigan’s economy, students have been lining up to get in our programs. We jumped from 70 majors in the 2007-2008 academic year to 90 majors in 2008-2009 and this year we have 120 undergraduate students enrolled. Forty one graduate students are enrolled—up from 38 last year. This all reflects confidence from the students in our programs and we feel proud of it. Our capable undergraduate advisor, Michelle Komins, was always there for our students,

continued on page 2
mentoring them, answering their inquiries and keeping them in line. Michelle is a dedicated scientist who never lost track of what is really important, the student. This is why she was selected to be our undergraduate advisor and one of the reasons she was awarded the departmental appreciation award. She shared the award with Heather Petovic who was able to secure multiple NSF grants with colleagues from the Mallinson Institute and the Department of Geography.

Many awards were bestowed on our faculty in recognition to their achievements and roles, Mike Grammer won the Emerging Scholar Award, Bill Harrison and Dave Barnes, the AAPG Public Service Award, and the 2008 Outstanding Geologist Award from the AIPG, respectively. Bill and Linda Harrison received recognition from the College of Arts and Sciences with a Dean’s Staff and Faculty Appreciation Award. Their commitment and dedication to the development of the MGRRE facility has not gone unnoticed.

The department continued to build its facilities, Carla and Heather established a new geochemical lab in Rood Hall using NSF and WMU funds specified for instructional purposes, Dan Cassidy built his new lab in Haenicke, and an XRD and IC were acquired. In addition some 25 new computers were bought using (DCP) Distributed Computer Plan funds to replace the old computer lab in Wood.

Research

Our research group now encompasses three Ph.D. students, Zhanay Sagintayev, Mohamed Ahmed, and Talal Al Harbi; three masters students: Jinal Kothari, Dee Becker, and Dale Dailey; two computer scientists: Rajesh Balekai and Ben Welton and a senior research scientist, Adam Milewski. We have ongoing projects in Pakistan and Sinai related to the assessment of the groundwater potential in the area that are funded by the USAID and NATO, respectively.

We are working on a NASA funded project over the Nubian Aquifer in NE Africa to assess the utility of GRACE data for extracting hydrogeologic observations from GRACE data, and we started a pilot study in the Mojave desert to examine whether the dextral fault systems in the area could be acting as conduits for ground water transport. Our recent findings were presented in over 15 talks by members of our research team in various national and international platforms and were summarized in four new articles that appeared in Holocene, J. Hydrology, J. Great Lakes Research, and Computers in Geosciences.

MGRRE Progress

MGRRE continues to blossom. K-12 activities led by Mike and Susan Grammer have brought some 2500 students to the facility. Dave Barnes is becoming the state expert on issues pertaining to carbon sequestration in Michigan. They have been quite successful at attracting students and considerable funding to the facility. Linda and Bill Harrison continue to play a pivotal role in the facility and have now acquired some 90 percent of the sedimentary cores available in the state of Michigan.

Alumni

Our Alums and friends are the extension of this department, they are the loyal sons and daughters of the Department of Geosciences. The Advisory Council is a testament to the dedication of a group of very loyal graduates. Many of our alums and the Council members continue to extend a helping hand.

They show up at the fall and spring meetings, participate in our recruitment initiatives, go on our field trips, and mentor our students. We want to connect with all of our alums, so please update your information on our web site (www.wmich.edu/geology/alumni_form.htm). The spring banquet is our largest gathering, so mark your calendar for Friday, April 23. We will be looking for you during our upcoming spring banquet to meet with our students and faculty and to learn about your achievements.

Also do not forget to visit our Facebook (Friends & Alumni of WMU Department of Geosciences) that is now run by one of our alums, Kim Finkbeiner Steinmann, and is providing an avenue for connecting the alums, the students, faculty and staff.
Hello to all alumni and friends of the department. I am pleased to report a very rewarding year, and a high level of engagement in research, service, and teaching activities. My research activities are still intensely focused on Geological Carbon Sequestration evaluation in Michigan. We are completing our funded research (through the Midwest Regional Carbon Sequestration Partnership, one of seven DOE-NETL funded regional CSP’s) on Phase II “Demonstration Phase” work including continued regional GS characterization in Michigan and direct support in Michigan for one of the three small scale CO2 injection demonstration projects conducted by the Partnership. This injection demonstration project was conducted in two stages with a total of 60,000 tons of CO2 injected into the Silurian Bass Islands “dolomite” in northern Lower Michigan.

The first (10,000 tons, in 2008) injection test was so successful that DOE authorized and additional 50,000 ton program (in early 2009) and the final result is that this experiment is (as of this writing) the largest saline reservoir, CO2 injection project in the US. The test indicated the high probability for industrial scale CO2 injection into this injection zone. Very significant results for the demonstration of industrial scale Carbon Capture and Geological Storage (CC&GS) in Michigan! Two publications (see below, one with lead author, recently ex-graduate student, Josh Kirschner) were the direct result of our MRCSP research activities.

Our other funded research activities for feasibility studies of GS in central, southwestern, and north-eastern Lower Michigan related to pending Electric Power Industry coal plant permit applications (these reports are now public record as part of these permit applications) were successful and were the basis for several funding applications (see below). One publication was also an outcome of these research activities. We continue to work with the Electric Power Industry in Michigan and will continue geological characterization work and the development of injection simulation modeling capabilities in the coming year. Duane Hampton is actively participating in the modeling work with the help of funded graduate students Tony Clark, Farshid Keshavarz, and Kyle Patterson. Undergraduate research assistant Jason Asmus is also making very significant contributions to the research effort.

Our group was also active in attending meetings and professional presentations. We had a strong presence at the Eastern Section Meeting in Pittsburg in 2008 with several presentations. Amanda Wahr, Stephen Kelley, and Jason Asmus all attended and presented their research work at the National AAPG Meeting in Denver in 2009. I attended and presented a poster at a recent (August) AAPG Hedburg Conference on Geological Carbon Sequestration: Prediction and Verification in beautiful Vancouver, B.C. I was also invited to present overview talks on GS in Michigan at several diverse professional meetings including the Michigan Economic Development Association, Keystone Youth Policy Summit (in Kalamazoo), Mid-America Regulatory Commission (in Traverse City), Michigan Chamber of Commerce (in Lansing), and the Michigan’s Future Conference (at Crystal Mountain). Geological sequestration is clearly a very hot topic and of interest to a broad spectrum of professional organizations.

Regarding service activities, one of the more rewarding activities that was concluded in May of this year, was my participation in the Midwest Governor’s Association Greenhouse Gas Accord Advisory Committee. Our Committee generated a recommendation for the development of a Midwest region-specific cap and trade program that was influential on the development of pending Federal Clean Energy Legislation, The American Clean Energy and Security Act. This intensive extra-curricular activity (resulting in travel all over the Midwest, as well as Washington, D.C. in October and Winnipeg, Manitoba, Canada in November (brrr)), was one of the activities that was cited in my (unsuccesful) nomination for a University-wide service award. This was heady, big-world stuff and very rewarding.

Teaching activities were also very successful last year with a best-ever field trip to Kentucky with the Sed Strat group featuring several special guest geologists including Dr. Paul Potter, Dr. Chris Kendall, and Kentucky geological survey geologists (and

continued on page 4
friends) Dave Harris and Marty Parris. Weather was
great and all had a very edifying time!

I had a very good experience teaching a gradu-
ate sedimentary petrology class for only the second
time in a decade or so and it was apparently well
received. We are doing lots of reservoir charac-
terization and petrophysics so I am pretty up on this
stuff again (after a sojourn as a coastal geologist
last century). For some reason, my eastern section
AAPG colleagues (especially Dave Harris) were kind
enough to acknowledge some of these student ori-
ented activities with the 2009 Outstanding Educa-
tor award. I am grateful for this acknowledgment.

I look forward to another very rewarding year of
work in 2009-10 in your Department of Geosciences!

Ron Chase

Here I am continuing to teach and publish
long past normal retirement time. I continue to love
what I do and can't think, at this moment, of more
attractive alternatives. I do find that, toward
the latter stages of
one's career, little
things mean a lot. For
instance: 1) I keep
hearing success stories
from or about former
students that make
me proud (please
keep me supplied
with these when you get a chance); 2) I am back into
the freshman geology teaching mode after a 10-year
absence and loving it; 3) I am finally learning how
to tolerate faculty meetings; 4) younger faculty's
research successes mean more to me than my own;
5) my love of the outdoors only increases with time;
6) as grandchildren appear and grow, I continue to
see a life that is larger than research and publication;
and 7) life improves dramatically with early morning
yoga.

On the academic side, things are humming
along as they usually do. No new courses! The usual
ones I teach continue to challenge students and
produce a few courses along the way, but also produce
appreciative comments when they are completed. I
would not want it to be otherwise. Recently, I have
reduced my Upper Peninsula field course to the
mapping segments required of geology majors and
have left the earth science teaching components to
Robb Gillespie. I am not yet ready to pass on the
field teaching. It will be a sad day when I no longer
pound on rocks and jockey Brunton compasses. The
U.S. Army Corps of Engineers funding provided to

continued on page 5
Great Lakes coastal landslide activity was diverted to disaster relief and construction projects two years ago and I have not received any new data from the bluff dewatering project. However, I have at my disposal a three-year data set that numbers in the millions of entries.

Publications for the next several years are in the making. I am particularly proud of Rennie Kaunda (Golder Associates, Reno, Nev.) who has managed to develop new digital processing techniques for landslide analysis and early warning strategies and parlay his entire dissertation (Ph.D., 2007) into several refereed publications in international journals (see faculty publications list).

My personal life has been enhanced lately with new and continuing grandchildren. Chris is a wonderful wife and the rock that keeps me upright. She is also a grandmother who is just as good as she was as a mother (add her companionship to my list of things that mean a lot). Karl, Sandy, and granddaughter Ella are leaving Telluride, Colo., to pursue employment in the east coast area closer to family. Karl’s dream of mountain life sort of fizzled out when he realized that the work pressure is intense and Telluride is unaffordable without family money. Scott and Colleen provided us with grandson Ethan in May. Along with granddaughter Maddy, they reside in Indianapolis (in a new home) where Scott makes a living performing foot and ankle surgery. Jamie and Kate, and grandson Joey, are still in the Washington, D.C. area and work as attorneys in different law firms (that do not compete).

I suppose I can’t conclude without mentioning my recent hobby and the satisfaction it has brought. After rekindling a long-postponed love of the French horn in late 2007 and the starting of lessons with the WMU horn instructor, I have now latched on with the Kalamazoo Philharmonic Orchestra, the Kalamazoo BeethovenFest Orchestra, various substitute and extra positions in the Kalamazoo area, a summer workshop in Pennsylvania with faculty and graduate students from the Juilliard School of Music, and an international woodwind quintet workshop in New Mexico where the quintet in which I played was voted “best in camp” for the past two summers. My original plan was to play music after I retired in order to wind down from teaching and research. Things happened faster than I thought they would. It’s been a great ride!

Greetings to all of my former students. You now know some of the details of my life. Please let me know how you are doing at ronald.chase@wmich.edu

Johnson R. Haas

During the last few years my research has focused primarily on studying how bacteria and other microbes influence the geochemistry of natural systems, with an emphasis on heavy and rare metals. My work has focused in particular on how anaerobic bacteria—microbes that don’t inhale oxygen—can live and breathe using, instead, things like iron rust, sulfate, methane, and even uranium. As geomicrobiologists have learned in just the last two decades, microbes can adapt to essentially any environment where water remains liquid and where there is an environmental energy source from which to feed. This realization leads to a fairly profound implication: that life can arise and persist in environments—and on worlds—very different from Earth.

To date, 315 other star systems with planets have been discovered in our sector of the Galaxy. We don’t yet know if or which of those other solar systems include planets that bear life, but the search is on for some indication of an alien biosphere. It is

continued on page 6
highly likely that convincing evidence of life outside our solar system—perhaps only microbial life, but life nonetheless—will be found within the next few years.

How can anyone detect microbes from light-years away? By looking for traces of their influence. On Earth, microbes give us an oxygen atmosphere, by absorbing solar energy and using it to drive their own replication. In the process, these microbes—cyanobacteria and their descendents—spew out waste that includes oxygen gas, which we happily breathe. Without those cyanobacteria Earth couldn't maintain an oxygen atmosphere. Oxygen gas is far too reactive and corrosive to last long in a planet's atmosphere, unless something is constantly making more. Astronomers looking for exoplanet (a planet outside our solar system) biospheres are looking mainly for telltale of O2 in sunlight bouncing or radiating out from an exoplanet's surface and through its atmosphere. If O2 is present in the air of some exoplanet, in principle we can detect it. Doing so would prove beyond any reasonable doubt the existence of life beyond our planet.

What does this have to do with geochemistry? Microbes control our planet's atmosphere, oceans, fresh water, ground water, surface geology, resource deposits and climate. It's very likely that wherever microbes arise they eventually grow to dominate and control their planetary environments to much the same extent as they have on Earth. How many different ways can microbes influence the worlds on which they evolve? We don't really know, yet. But we can make educated guesses on what to look for, and what not to look for, by using the tools of chemical thermodynamics, astronomy, geochemistry and geology to constrain the possibilities.

For example, on some planets microbes might evolve the capacity to emit chlorine gas instead of oxygen, and as geologic time wears on such worlds would take on atmospheres filled with the products of that metabolism, such as Cl2, CH3Cl, CCl4, and related gases. Pale yellow light reflected out of such an atmosphere would carry a signature that can't easily be produced in any other way than by life.

My most recent paper, now in press with the journal Astrobiology, explores this possibility, and suggests that astronomers ought to include the telltale of chlorinic gases in their roster of high-probability life signatures. Some of my other current research projects include a theoretical examination of the possibility of life evolving in a subsurface water ocean inside Saturn's moon Titan, exploring the influence of active galactic nuclei on the evolution of life in exoplanetary-system Kuiper belts and Oort clouds, thermodynamic constraints on alternate compositional and metabolic paths for bacteria in exotic geochemical environments, and investigating planetary accretion and differentiation processes in high-metallicity, carbon-enriched solar nebulae.

Alan Kehew

The past year has been fairly typical for me. In the fall semester, I attended GSA in Houston and in the spring semester, the North Central GSA in Rockford, Ill. In Houston, I became a GSA fellow, which was a nice experience. At the Rockford meeting, I was asked to consider whether the department would host a future North Central Meeting as we did in 1976 and 1994. With the concurrence of Mohamed and the rest of the faculty, we are now scheduled for the 2013 meeting. It is a lot of work, but brings quite a bit of exposure to the department and its programs.

In the spring semester, I helped Robb Gillespie teach the Civilization and Geology in Egypt course and went on the trip at the end of the semester. The trip was really exceptional and I think that all of the students got a lot out of it. It was really a fantastic experience. Some of the geological highlights for me were seeing the fluvial potholes in the Aswan granite exposed in the first cataract of the Nile (Fig. 1) and seeing ancient quarries in the eastern desert. For example, we saw the exposure of the Precambrian breccia verde antico, a beautiful, multi-colored conglomerate that was quarried by the Romans and used throughout the Roman Empire (Fig. 2). We also visited some archeological sites that I hadn't been to before, such as Abu Simbel and the pyramids at Dashur.

continued on page 7
Research-wise, I have been concentrating on glacial mapping with the MDEQ Office of Geological Survey through the Great Lakes Mapping Coalition funded by USGS. This summer I mapped two quads in Barry County.

As part of this project, we drilled two rotasonic borings in tunnel channels (subglacial meltwater channels), in order to better understand the stratigraphy and origin of these features (Fig. 3). One of them had a thick section of coarse gravel, which is what I was expecting, but the other one had only a very thin section of gravel, underlain by interbedded tills and lacustrine sediments. This one requires some revision to the model of these channels that I have been developing for some time. Stephanie Ewald is doing the textural analysis on these sediments for her undergraduate Lee Honors College thesis and we, along with Andy Kozlowski and John Esch of OGS will be giving a paper on tunnel channels at GSA this fall in Portland.

This year Kay and I proceeded with our long-planned home building project in Maine. The house came out beautifully, which is amazing since we were not around most of the time it was being built. This will be our eventual retirement home. In the meantime we will spend some time here in the summer and Christmas. One of my daughters will be house sitting for at least the next year or so.

Michelle Kominz

Hello alumni and friends. It is the height of the semester and time to review my activities of the last academic year.

Fall 2008. When I began the semester there was a chance that I would be going to sea in November and December on the R/V Resolution IODP leg 317. Because of this I reconfigured geophysics to do the lecture part in September and October and leave the labs to my trusty TA, Travis Hayden. Fortunately I learned pretty quickly that the expedition was postponed. Believe it or not it was because the petroleum exploration business was booming so that the R/V Resolution, which was in drydock being overhauled, kept being postponed to make way for customers with more cash. This was fortunate for the geophysics class, which was hard enough without trying to cram it into 10 weeks. I tried to cut back on the workload compared to the first time I taught Whole Earth Geophysics (yes, I do read student reviews) but it remained a really high-work-load class.

Spring 2009. Teaching Ocean Systems was fun in the spring. It had been over a year since I had last taught it (fall 2008). So it felt fresh. Of course there were updates to be made, so it was fresh. The instant response system works well for me in this class. I get to ask the students questions as part of the learning process, not just as an assessment exercise (that is, for grading). Shawn McCloskey helped me out as my TA. This was the first time since arriving at WMU that I had to teach about "global warming" during a remarkably cool winter and spring. Fortunately Geology Seminar hosted Mark Pagani, a climate change...
expert from Yale, early in the semester and he had data showing that most of the world had the typical warm climate while Kalamazoo was lucky enough to be sitting in the middle of a local cold snap. If Mark is ever speaking in a venue near you I highly recommend him.

Departmental Undergraduate Advisor. While I wasn't working with the geophysics students or preparing clicker questions for ocean systems, I was advising our non-teaching undergraduate majors and minors. Remarkably, some of you graduates are now students with whom I worked when you first signed up to major in our department. I wonder what you are doing now? I made some minor changes to the Hydrogeology Major (with the okay of the Hydrogeology professors) to make it a little more flexible. Basically, except for moving Structural Geology and Geochemistry to the fall (only in 2009-2010) and moving Hydrogeology to the spring (permanently), and thus messing up most of the schedules that I had devised, advising has become something that I can handle pretty well.

Graduate Advising. My other advising job was working with my two graduate students. Josh Kirschner finished his master's and submitted a manuscript to "Tectonics" on the extension of passive margins and their impact on the volume of the oceans and sea level change over the last 150 million years or so. Josh also submitted a manuscript based on his (partly undergraduate) work with Dave Barnes on sequestration of carbon dioxide in the Michigan Basin. He defended in July and has now begun gainful employment Devon Energy in Oklahoma. Travis Hayden has been working with core data from his Ph.D. research area, the Victoria Land Basin in Antarctica. We have now modified the backstripping method to take into account erosion by an ice sheet. Preliminary results of this work were presented at the fall AGU (American Geophysical Union) annual meeting and updated for presentation at a science workshop for participants in the ANDRILL MIS program in Wellington, New Zealand in February.

As for myself, my efforts are largely involved in expediting my students' work. I remain involved in the next phase of the Chesapeake impact through my colleagues at Rutgers. I also have completed, with the aid of several undergraduates over the years (primarily Danielle Odette and Kyle Patterson) a compilation of porosity data as a function of lithology from ODP (Ocean Drilling Project) cores. Some preliminary statistics have been done and I have begun to write. I have been an editor of Basin Research but am in the process of rotating out of that position this fall. I have begun to look into the tectonics of the east coast of New Zealand's South Island. With luck, IODP Expedition 317 will sail this November and December with me on board. Ryan Sibert, an undergraduate geology major, helped me compile data for analysis of several exploration wells drilled in the region. These results, added to the Clipper data (many of my GEOS 6550 Basin Analysis students will remember that well) will help in the eventual analysis of the results of that expedition.

So, if all goes well I will sail, as a physical properties specialist, on IODP Expedition 317 to Canterbury Basin and Travis will sail on the next leg, again as a physical properties specialist, on IODP Expedition 318 to the Wilkes Land margin of Antarctica.

Carla Koretsky

Hello friends and alumni! I hope it has been a good year for all of you. It has been a busy year for "Team Geochemistry."

Melinda Schaller finished her undergraduate work, and after much consideration, decided to pursue medical school at Wayne State University. We tried to talk her into graduate school to study geochemistry instead, and although we came close, medical school won out. Melanie Haveman has been working for the EPA in Chicago, and should hopefully be finishing off her M.S. thesis sometime soon.

continued on page 9
Trevor Whitlock continues his Ph.D. research, studying Ni and Cu adsorption on sediments and pure minerals. Angel Cuellar and Martin Akafia both began working on their thesis research in the past year. Angel is becoming a microbiologist, growing Shewanella putrefaciens, an Fe-reducing microorganism; Martin is busy trying to quantify metal adsorption on montmorillonite. Thomas Reich and Ryan Sibert, both undergraduate geology students, have been working hard in the lab, as well. Thomas and Ryan will both be presenting their work this June at the annual Goldschmidt meeting, the premier international meeting for geochemistry. Lucky for them, this year the meeting will be held in Davos, Switzerland.

Patrick Donovan, another geochemistry undergraduate, joined the group recently. He has been working with Angel and Ryan to calibrate a sequential extraction method to better understand trace metal speciation in the environment. Last summer, two teachers, Keith Lang and Lance Goodlock, also worked with the group, on an NSF-sponsored Research Experiences for Teachers grant. They learned to use a microelectrode system for measuring submillimeter scale dissolved oxygen, sulfide and pH and were brave enough to deploy the system in the field (at Kleinstuck Marsh).

As many of you know, Thomas and Melinda convinced me to run the Chicago Marathon last year. I ran for Children's Memorial Hospital and raised over $1000 in honor of my late father, Sonny Koretsky. Thank you so much for all who contributed, both financially and via encouraging words! The marathon training was tough, and the race, especially in the unseasonable heat (near 90 F by race finish), was tougher, but the experience was great. In fact, I am currently training for my second marathon. If all goes well, I will be running the Marathon Du Mont Blanc in late June, just after the Goldschmidt meeting.

Some members of "Team Geochemistry" (Michelle Barger, Patrick Donovan, Martin Akafia, Thomas Reich and me) have also been running quite a bit lately. In fact, in late March, we ran the Kalamazoo Relay—a 33.5 mile relay race, which we completed in about five hours and 15 minutes. Please send me an email (Carla.koretsky@wmich.edu) and let me know what you've been up to lately!

R.V. Krishnamurthy

Last year marked one of those events that occur rarely, in fact only once in seven years, in an academic's life. Yes, I am referring to the sabbatical leave! I was on my second sabbatical since joining Western. During the first sabbatical, way back in 2000, I had spent the bulk of the time in Germany alone (thanks to schoolgoing kids) and was eager to visit that country, especially with my wife. This time around, I could do one better. I could get an invitation from institutions not only in Germany, but Finland, Paris and India.

During the first two months of the sabbatical, I was associated with the University of Helsinki; one of the top rated universities of the world. I was asked to teach a course for their graduate students and they found my Thermodynamics for Geologists very new and uncommon. The only limitation to teaching there was that the students were not required to take any tests or return home work assignments if they did not want to. And of course, the State pays for the education, which meant one couldn't argue with them that it was their money.

Still the students showed a good degree of interest and attendance was not a problem. Alongside the course, I worked with one of the employees of the Geological Survey, helping her with the interpretation of her isotope data so that it could be written up as a paper one of these days. I also delivered two talks for the department as part of their departmental seminars.

When not involved with work, we moved around the city of Helsinki, rated the third best city in the world to live. One could easily see why. Helsinki has an excellent transportation network, hundreds of restaurants and parks, and is relatively crime free. Within walking distance from most parts of the city is the Baltic Sea, which pro-

continued on page 10
vides exquisite cruises to Tallinn in Estonia as well as an overnight cruise to Stockholm. And how can one not taste the famous Finlandia and salmon from the Baltic? The one-day trip we made to each of these cities was just barely adequate to see famous landmarks like the Nobel Museum.

From Helsinki, we went to the Physical Research Laboratory (PRL), Ahmedabad, India. PRL is my Alma Mater and the reception I got was one befitting of an alumnus. The next five months were to be spent in India, keeping the PRL as the main base. PRL has initiated a massive national program on isotope measurements in fresh water systems, funded by the Ministry of Water and irrigation and have acquired additional mass spectrometers for the purpose.

My visit was timely in that I could help them set up the Dissolved Inorganic Carbon analysis system that we have pioneered here. We also discussed possible future collaborations. At the PRL, I had the honor of delivering their annual colloquium and a special lecture commissioned by the Indian National Science Academy.

Other academic activities in India included the invitation to present the Prof. Ghosh Memorial Lecture at the Indian Association for the Cultivation of Science in Calcutta where C.V. Raman discovered the Raman Effect. A Nobel Laureate who was visiting from the US followed my talk. I was also appointed to the board of directors of the International Symposium on Quaternary Climate Change in the Himalayas. Among my responsibilities was, in addition to presenting an invited talk, to chair a session and participate in a plenary panel discussion. This symposium took place in the city of Chandigarh and was attended by over 100 participants from all over the world. At the conference, I could initiate collaboration with scientists from the University of Nainital who wanted isotope expertise on their climate research. We are working on how to ship samples of lake sediments from India, which has now become almost impossible.

Being in a large country like India and admitting that one has friends and family all over, it is impossible not to attend to some non-academic and tourist activities. While we tried to make best use of the time available, one of the most memorable trips was to the Taj Mahal (pictured here), made even more famous in the US by President Clinton. Luckily, our children were able to join us on this adventure and they couldn't believe that it was the first time even for me, in my relatively long life, that I was visiting the monument! Legend has it that the mogul, Emperor Shah Jahan, who built the monument as a mark of love for his wife, had the hands of all the 20,000 craftsmen involved in its construction chopped off so that replica of the Taj will never be built again.

We left India in March, in good time, when the daytime temperatures were soaring to a comfortable 100 degrees (locally speaking) and returned for a month to Kalamazoo which was just emerging from one of the worst winters. After a month at home, it was time to pack up and visit the Helmholtz Institute for Hydrology in Halle, Germany. Halle, the birthplace of the famous musician Handel, was originally part of East Germany. Today it boasts of several educational institutions of which ZED is one. We spent two months at the Institute and the facilities there are astounding. There are six mass spectrometers, one or two for each of the isotopes hydrogen, oxygen, carbon, nitrogen and sulfur, a radio carbon dating facility, several hydrochemical laboratories all under one roof. My host jokingly mentioned that the isotope lab we have here is pretty much a museum piece for them! But he was apologetic when I had finished my series of six lectures outlining all the research we have done here during the past two decades with my museum piece.

With all their infrastructure, their research activities looked limited and I could discuss some possible joint work with them, involving graduate students. If it comes through, long-term marriage with them is a possibility. Another lecture visit was to the Max Planck Institute for Microbiology (Oceanographic) at Bremen, also the headquarters of mass spectrometer giants Finnigan. In between, we made a dash to the Max Planck Institute in Jena to enable me to complete a paper that we have been working on for awhile.

Weekends in Germany are all yours. Between

continued on page 11
Friday afternoon and Monday morning you are not supposed to think of work, not even in your dreams. This was good for me as I could travel the length and breadth of that relatively small nation (compared to India). We got a taste of the biggest city and the smallest village, all easily accessed by their famous railroad system. Language was a bother at times, but who wants to waste time talking to people when the main exercise was for one’s eyes! What will remain in memory for long is the Bavarian Alps, the Hofbräuhäus in Munich, the Zwinger Palace in Dresden and the main railway station in Leipzig.

Halle itself is picturesque town with more than 70 percent of the land covered by vegetation. A very walker-friendly city, Halle has excellent trekking routes shaded copiously by huge trees. The Saale river cuts through the city and when one has had enough of trekking, one just hopped onto a floating restaurant on the Saale and relaxed. The Handel Music festival took place during our stay although it was difficult to get tickets to any of those. The Handel museum itself features more than 700 musical instruments still functional.

An unexpected chance that came up was an invitation to Paris where one of my old colleagues from CalTech is the director of the Natural History Museum. The Museum has an excellent research wing with instruments like Nano SIMS (a million-dollar baby) and other mass spectrometers. Their research is world-class and focuses on planetary geology, mostly dealing with terrestrial and extra terrestrial rocks. They were keen to listen to some low temperature isotope geochemistry talks and my week long visit was approved. It was a great gift since the cost of living in Paris would never have made me consider going there. To describe Paris would be to haul coal to New Castle and I prefer not doing that.

One more country that we visited was the Czech Republic; Prague in particular. In my book it is also a “must” city for any one interested in European history. My own ignorance was exemplified when I told my host how happy I was to visit Czechoslovakia and she retorted, “It is not Czechoslovakia. That was then and now we are two nations, Czech and Slovakia, both separated by mutual consent.” I realized soon that CNN or Fox is not the means to be up to date accurately on world affairs. For me Prague holds a special charm if only because one of my literary idols, “Franz Kafka,” lived and wrote there. The visit to his museum therefore was very poignant and thought provoking.

Like all good things, the sabbatical officially came to an end when we boarded the return flight in Frankfurt and prepared ourselves for the long haul. What echoed in my ears was what my host at the Helmholtz Institute had remarked on the day he came to receive us at the Halle-Salle bahnhof (railway station) “We academics are very poorly paid,” he said, “but this is a profession where you can see many places at others’ expense.”

Heather Petcovic

Greetings geosciences friends and alumni! The past year has been busy with research projects and teaching classes, not to mention the fun of watching my girls change and grow. Allie had her first birthday and Jessica will be four this fall.

I continue to teach the Earth Science for Elementary Educators course that I was hired to develop and supervise. I also have been teaching the upper-division Minerals and Rocks course for Earth Science and Earth Science Teaching majors. Unfortunately, I was unable to attend the Field Methods course in the Michigan Upper Peninsula this summer, due to a conflict with a teacher workshop. However, I am looking forward to being involved in this course again in the coming summer.

A major project in the past year was a Michigan Department of Education-funded professional development workshop for southwest Michigan high school science teachers. Together with colleagues from the Mallinson Institute for Science Education—Herb Fynewater (Chemistry), Charles Henderson (Physics) and Marcia Fetter (Education)—we worked with area teachers to study and develop aspects of their teaching practice, and to develop new lessons that are aligned with current high school science content standards. The teachers involved presented their projects at the Michigan Science Teachers Association (MSTA) meeting, held in Detroit in March, and wrote articles about their lesson plans for the MSTA journal.

Two major NSF-funded research projects have been keeping me busy. Carla Koretsky and I have

continued on page 12
a grant to develop an environmental geochemistry field course and to study how the course affects student understanding of complex environmental problems. In the first offering of the course, students will visit Woods Lake in Kalamazoo, conduct an original investigation of the water quality in the lake, and present results to the community. Course development took place this past spring and summer, with the first students enrolled in fall 2009. Volunteers from the course are participating in surveys, observations, and interviews as part of the research on student learning. Initial results of the research will be presented at the 2009 Geological Society of America (GSA) meeting in Portland, Ore.

My second NSF-funded project is a continuation of the research on problem-solving in the field, with a focus on better understanding the skills and knowledge that underlie field work in bedrock mapping. We are also interested in how these skills and knowledge transition from novice (student) to expert (professional geologist). By comparing the strategies, behaviors, and thought processes of the students to the professionals, we hope to understand where the “gaps” are between student and professional thinking in the field.

Together with collaborators Kathleen Baker (Geography, WMU), Julie Libarkin and Zach Hambrick (Michigan State University), Joe Elkins (Northern Colorado University), and several doctoral students from MSU and WMU, I spent a week in the Rocky Mountains in Montana collecting data on 29 participants as they completed a battery of cognitive measures plus a 1-day mapping project. We also were fortunate to acquire an eye-tracking system, which is basically a set of tiny video cameras mounted on glasses. When analyzed, the eye-tracker shows where the wearer’s gaze is directed, allowing us to compare how different people look at features in the landscape or in an outcrop. Initial results from this project will also be presented at the Portland GSA meeting.

Continuation of these projects plus advising, teaching, and working with graduate students promises to keep the coming year interesting!

William Sauck

Hello again friends and alums! In the Fall, 2008, semester I again taught a section of Geos 1000 (Earth Studies). The radio responder (clicker) is now a routine part of teaching those larger classes. Teaching during Spring term included a small class (5) for Gravity & Magnetic Methods (Geos 5620). For the second year in a row, I did not teach the Geophysics module of the Hydrogeology Field course during Summer II, again turning that over to recently graduated Dr. Laura Sherrard. During March 29 - April 2, the SAGEEP (Symposium for the Application of Geophysics to Engineering and Environmental Problems) meeting was held in Ft. Worth. My paper, describing the lessons learned from 10 years of using the Geophysical test site at Asylum Lake, was presented by Dale Werkema as I was not able to attend.

Our exchange program with several Egyptian Universities was more active than ever. Dr. Ayman AlTemamy came here as a postdoc in August 2008 and returned in May 2009. Akram Aziz Ghatas arrived to work on his Ph.D. research in geophysics in September 2008, channel program) and his wife and child arrived this Spring. Another geophysicist arrived as the dependent of one of Dr. Grammer’s Ph.D. students (Tariq Anan). His wife, Lamees, was a lecturer in geophysics at Mansoura University, and she has graced many of our classes, labs, and

continued on page 13
seminars with her presence.

On the family side, Christine has been turning in drafts of her dissertation in Clinical Psychology at Clark University in Massachusetts, and will probably be defending by December. Carolyn (our mechanical engineer) was released from SABO USA (a Brazilian auto parts supplier) due to the downturn in the automotive industry. She has moved to Colorado to establish residency and has been admitted to the Environmental Engineering M.S. program at the Colorado School of Mines. Eric is finishing his B.S. in M.E. at U of M this fall. His spring break trip this year with a U of M class was to Patagonia, Chile, to study a proposed hydroelectric project. He worked at the California branch of Toyota Engineering during the summer of 2009. Oldest son Jeff and his wife live in Crystal Lake, IL, with our two grandsons, ages seven and three.

Bad news was that Elen’s abdominal liposarcoma was declared inoperable by the Mayo surgeons (after three interventions in the last six years) in September. We got into another promising experimental chemotherapy program (with ET-747) in Chicago, but after three cycles, she was too weak and her blood counts too low to continue. After a week in Borgess, she was released to Rose Arbor Hospice, where she gracefully spent the next nine weeks saying her goodbyes to family and friends. She died quietly in the night on April 15, 2009. I thank all my colleagues and friends in the Geosciences community for their visits and support, and for the reduced teaching and committee loads. Her memorial is a geography scholarship fund in her name via the WMU Foundation.

Chris Schmidt

I know I must have done something interesting during the last academic year, but, with the exception of fly fishing for Bonefish and Tarpon in the Florida Keys, I can’t remember anything that any of you would want to hear about. I do remember that Chris Whisner (M.S. 1998) and I, along with Steve Harlan (George Mason) and John Geissman (New Mexico) finally had our paper on paleomagnetics of folded sills in Southwest Montana published in the GSA Bulletin (Sept. ’08) The bulk of Chris’ work is still in manuscript form, so Chris, you need to get that done before I’m too old to care. That day is approaching, so PLEASE finish it.

The rest of this narrative amounts to what I did on my summer vacation. There were two things that might be of some interest to some of you out there:

Geology Club trip (April 26 - May 3)

This was a fun and exhausting whirlwind trip with some great students. We started in Las Vegas and spent time at: 1) The Virgin River Gorge at the Nevada/Arizona border (Basin-Range and Colorado Plateau boundary. That’s where we took the picture above); 2) Zion; 3) Grand Canyon (two days); 4) SP Mountain Cinder cone and Sunset Crater north of Flagstaff. Several of the students, including Gene Schmidt were ¼ of the way to the top of the SP cone when I decided we needed to push on to the next stop, sorry guys;

continued on page 14
5) Hoover Dam (there were some great volcanic rocks here), but three of us nearly got arrested by an overzealous security person who apparently had the spotting scope on us as we were examining a rock outcrop along the road cut on the Arizona side. In retrospect we probably should have left the hammers in the vans. Anyway my students convinced the guy that they would be lost without me (they lied), so he let me go. Fortunately the guy was unaware that I had a Saudi (Talal), an Iraqi (Muthana) and an Iranian (Farshid) with me or we might have created an international incident; 6) thrust faults of Red Rocks Scenic Loop west of Las Vegas; 7) overview of Yucca Mountain (proposed high-level waste storage site); 8) Death Valley; and 9) two famous stops at the southern part of the San Andreas fault east of LA.

**Southwestern Montana:**

In August my son Gene (current geology major) and I did some mapping and interpreting structures of the Montana thrust belt at the Lewis and Clark State Park along the Jefferson River. Gene is the most recent of a number of undergraduate students who have worked with me in this area (notably Scott Badham, Jake Marson, and Danielle Odette among others). Gene did a great job and helped me see some of the structure in a new light (see picture left). We also did some fishing (see picture below).

I'm currently working with a Montana Bureau of Mines geologist (Susan Vuko) to publish the Bozeman 2 degree map sheet and several 7 ½ ft. quadrangle maps in the Butte-Bozeman area. I'll be going back to Argentina this winter to work on the tectonics of the Carboniferous System.

---

**Robb Gillespie**

Cheers to all alumni and friends. It's been another great year!

Things continue to happen at MGRRE. Hard work has led to opportunities that may possibly take MGRRE and the Department of Geosciences to the "next level." Much remains to be done, and it will prove to be an exciting year as efforts are made to help make these opportunities bear fruit.

The 2010 Eastern Section meeting for the American Association of Petroleum Geologist (AAPG) is to be held here in Kalamazoo. Bill Harrison and I will be co-general chairs and Mike Grammer and Dave Barnes will be chairing the program and short course committees. We have already started work. The theme of the meeting is "Perseverance - Pipeline to Prosperity." The logo has been designed, and initial advertising has been submitted for inclusion in this year's program. We anticipate somewhere between 300 - 500 geologists in attendance. Be sure to keep the week of Sept. 28, 2010 open on your calendar so you can attend.

The new course, GEOS 2020 “Egypt-Civilization and Geology” was taught for the first time this past spring semester. Dr. Alan Kelew co-taught the course with me, and Dr. Howard Dooley from the Department of History, and Dr. Mustafa Mughazy from the Department of Foreign Languages were guest lecturers. It was well received, and the two week field trip to Egypt during the first two weeks of May was a smashing success. We had fewer students than we would have liked, but we anticipated this being a first-time offering, a new type of class combining semester coursework with summer travel, being “off-cycle” for deadlines due to the spring semester coursework and taking a “hit” from the world economy to a class with additional international travel expenses. But, we had a great bunch of students (most from the Lee Honors College) and a very high level of interest from everyone involved. The depressed economy

---

**continued on page 15**
actually helped with prices, and hotels were more than willing to up-grade facilities, at reduced fares, just to get the business. “Word-of-mouth” advertising has already spread, and we are getting student requests for sign-up information a semester ahead of the next course offering. Numerous alumni, friends and family are requesting information to get in on the trip. We might have to think of some way to run a trip for them. We are optimistic about next year’s course.

The GEOS 1500 “Geological Hazards and Disasters” course was taught for the second time last fall. We had 72 students in the class and it is becoming a popular offering. We already have 68 students signed up for this fall’s course as of July 1, so we expect an even larger course this semester. The course is getting good “word-of-mouth” advertising by the students around campus, and it is obviously catching on. I’m also teaching both sections of GEOS 3220 “Ocean Systems” this semester, with more than 275 students already signed up. This should keep me more than busy.

I am currently on a thesis committee. I’m still looking over Jennifer Schulb’s shoulder. She is working hard to finish her M.S. thesis by the end of summer so she can begin her new job.

The “Michigan Copper Erratic” project still continues (I guess it’s my own fault for thinking it was completed last year). Last year we finalized a 45 minute Power-Point presentation about “Michigan Copper” that now runs on one of the new flat-screen panels inside the Schmaltz Geological Museum.

This year’s efforts will hopefully blossom into another flat-screen presentation showing still photographs of various types of copper samples currently in the collections at the Seaman Museum (the official State of Michigan Mineral Museum) at Michigan Technological University. An animation concerning the geological evolution of the Keweenaw Peninsula (Copper Country) will hopefully also be available to include in the new presentation. Discussions are currently being conducted with the Seaman Museum to secure a visiting collection of copper specimens for display in the Department of Geosciences’ Museum.

I once again had the opportunity to help Ron Chase teach the GEOS 4380 “Field Studies in Geology” course this past summer. It was a great bunch of students, and the beautiful spring weather was at its best.

The geology of Michigan’s Upper Peninsula is impressive. I never get tired of: 1) seeing the eastern limb of the Lake Superior Syncline where it crops out along one the world’s most impressive thrust faults to form the spine of the Keweenaw Peninsula; 2) seeing the great Greenstone flow (one of the largest basalt flows on earth); or 3) standing on the 2.5 billion year old Serpentinite at Presque Isle. This is truly extreme geology, and it just doesn’t get much better than this.

This year, for those students that went to copper country, we included an excursion into the Quincy Copper Mine. Students went into the old mine at level seven, about 390 feet underground, and back into the mine for about a quarter of a mile. It was an eye opening experience to stand “inside” the Hancock Fault where it cuts through the mine tunnel. Everyone gained insight into the geology of copper exploration and mining, and a much greater appreciation for how hard life was for a copper miner during the 1800s and early 1900s.

Tres Rios Resources, Inc., the small Texas-based oil and gas company I’m associated with, had a reasonably good year. Oil prices were down, and are just about where they should be around $60 per barrel. That’s a fair commodity price for consumers and oil companies alike. But, I probably should have sold out last year at $130 a barrel.

The new/getting-older house continues to be a black hole for all forms of currency (I don’t anticipate I’ll ever change this sentence). All the wood from last year’s tree/storm disaster is now split, and I have firewood for a lifetime. Now, the ash trees in the neighborhood are beginning to succumb to the ash borer, and we will be lucky if the three remaining ash trees on our property last another two-three years. Two others have already gone. After only seven years in the house (hard to believe it’s been that long already), I now have two hot water heaters that need to be replaced (hard to believe they only lasted this long). Linda points out that this is really just an opportunity to go green, and install tankless water heaters. I just point to my checkbook and watch the green go.
BARNES


CASSIDY

CHASE


HAAS

HAMPTON


KOMINZ


KORETSKY


continued on page 17


**PETCOVIC**

**SAUCK**

**SULTAN**


**Departments of Geosciences Staff**
Kathy Wright ... Administrative Assistant Sr.
Beth Cheeseman ... Newsletter Editor
Michael Durham ... Technician

Cover from Sept. 2009 AAPG Environmental Geosciences featuring photography by Linda Harrison and figures from a paper by Harrison, Grammer and Barnes from this special edition of the journal.
Calvin (of Calvin and Hobbes) really nailed it when he said, “The days are just packed.” Our work here at MGRRE just keeps expanding and we wish you could all come in for a visit to see it yourselves.

Repository news—our collections grew even more this past year with the addition of several large collections of cores, cuttings and well records from governmental agencies, private industry and other educational institutions. We received cores and thin sections from the West Branch field (previously housed in Denver at the USGS) representing one of the biggest oilfields in the State. We packed up about 70,000 pounds of cuttings and cores at another Michigan university and are now reboxing and inventorying them. They represent some very old wells and stratigraphic tests from the ‘30s and ‘40s and would have been sent to a landfill if we had not taken them very quickly.

Through a collaboration with the State of Michigan, Linda Harrison and a team of 12 work-study students inventoried large collections at MGRRE. We are very grateful to Steve Wilson of the Michigan Geological Survey for all his help on this project, especially with metadata entry. This work is part of a national data repository program funded by the USGS.

We inventoried over 75,000 boxes of cores and entered actual cored intervals, merged well logs from about 17,000 wells, finished hand-entering data from core analyses for over 2,100 wells. Niah Venable directed a team of students who scanned mudlogs from 3,700 wells.

We are especially grateful to those work-study students who did all the heavy lifting, literally and figuratively, to get all that work done—thank you so much.

All these data are now easily accessible, both in-house and on-line, due to the careful attention to detail given them by our administrator, Niah Venable. She rides herd on our databases, implements data sharing, trains students in software applications, and assists everyone in their research.

Industry outreach—Bill and Linda Harrison organized two workshops for the PIT this past year with a total of 270 attendants. MGRRE also welcomed dozens of professional visitors who were looking for information on oil and gas as well as mineral resources. After a week-long visit by Whiting Petroleum, we received a very nice thank-you letter from them saying, “We routinely use core repositories in the United States and Canada. We find the facilities at MGRRE more than hold their own when compared to the other repositories. MGRRE has assembled a core collection of great

continued on page 19
breadth. MGRRE exceeds other institutions in the diligence of their efforts to enable digital access to data such as core analyses and recent efforts at re-indexing actual cored intervals sets a new standard for diligence in archiving. The cooperative and supportive nature of the staff exceeds all expectations. This is simply one of the finest facilities available to the industry.”

MGRRE was very well represented at the Eastern Section of the AAPG last year when Drs. Grammer, Harrison and Barnes and several students made presentations. Jennifer Schulz won the best student poster award.

**Research and Publications**—We are very excited to have been awarded several major grants this year. With support from Rep. Fred Upton, MGRRE was awarded $600,000 in Federal funding to establish MICHCARB, a geological carbon sequestration research and education program in Michigan.

Dave Barnes leads a team from MGRRE in securing nearly $600,000 in Federal funding for three new research projects that will evaluate the potential for CO2 storage in various deep underground geological formations in the Michigan Basin and nearby areas. The MGRRE team includes Bill Harrison, Duane Hampton, and four students.

MGRRE’s work in CO2 sequestration was the subject of the September, 2009, volume of Environmental Geosciences. All four articles were about our work. Authors included Dave Barnes, Bill Harrison, and Mike Grammer and two of our talented students, Josh Kirschner and Steve Kelley.

Several AAPG special publications focused on MGRRE researchers’ work in CO2 sequestration and increasing domestic oil production.

Mike Grammer and Bill Harrison were also awarded almost $400,000 from the Department of Energy to evaluate and model stratigraphic control on the distribution of hydrothermal dolomite reservoirs away from major fault planes.

**K-12 Outreach**—Our K-12 outreach program, CoreKids, has had a busy year as well. Susan Grammer, Mike Grammer and Jennifer Porter, along with several geosciences graduate and undergraduate students, visited with over 1,600 K-12 students in southwestern Michigan during the 2008-2009 school year. The sixth grade teachers from one local school district wrote: “Every year we look forward to your program coming back to our school. We can’t thank you enough for adding another valuable dimension to our geology unit.” Another teacher wrote, “The lessons are tailored perfectly in order to enhance our curriculum. It is always obvious how much the children enjoy the lessons and the hands-on activities they bring. This outreach program is truly an asset to our school system…”

Susan and Jennifer also presented workshops for teachers on natural resources and climate change curriculum at the Michigan Science Teachers’ Association meeting and staffed an exhibit highlighting CoreKids and the Geosciences Department during the conference. Several Geosciences faculty, staff and students joined CoreKids for an exhibit and presentation at the Kalamazoo Gem and Mineral show where hundreds of area school children arrived by the busload to learn about geology.

CoreKids also partnered with the Keystone Center for Public Policy and Keystone Science School, of Keystone, Colo, to organize a Youth Policy Summit on greenhouse gas reductions in Michigan. In July, 27 high school students and eight teachers from across the State gathered on the WMU campus for a week-long conversation on public policy surrounding climate change and reduction in atmospheric greenhouse gases. We welcomed participants with a BBQ at MGRRE on the day they arrived and were amazed to be in the company of so many bright and highly motivated high school students. During the week Keystone staff kept the teachers busy with a workshop for YPS teachers and 20 other local teachers on their Climate Status Investigations curriculum for middle school and high school students. We hope to run the program again next summer and look forward to a whole new crop of students!

This year’s activities were sponsored by grants from DTE Energy Foundation and Consumers Energy Foundation.

---

*A fourth grader working hard in the lab.*
<table>
<thead>
<tr>
<th>Project Director</th>
<th>Title</th>
<th>Sponsor</th>
<th>Funding Source</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adam Milewski</td>
<td>Developing Cost-effective Methodologies for Groundwater Assessment and Exploration in Sinai</td>
<td>US Department of Agriculture</td>
<td>Federal</td>
<td>7/08-6/09</td>
</tr>
<tr>
<td>Carla Koretsky</td>
<td>CAREER: Generation of sediment heterogeneity by macrophytes and macrofauna and consequences for redox chemistry and trace metal speciation</td>
<td>National Science Foundation</td>
<td>Federal</td>
<td>8/04-7/10</td>
</tr>
<tr>
<td>Dan Cassidy</td>
<td>Evaluation of Samples from Orlando, FL</td>
<td>URS Corporation</td>
<td>Private</td>
<td>6/09-12/09</td>
</tr>
<tr>
<td>Dan Cassidy</td>
<td>Evaluate Samples from Streator, IL</td>
<td>URS Corporation</td>
<td>Private</td>
<td>7/09-11/09</td>
</tr>
<tr>
<td>Dan Cassidy</td>
<td>Evaluate Samples from Boston, MA</td>
<td>URS Corporation</td>
<td>Private</td>
<td>9/09-12/09</td>
</tr>
<tr>
<td>Dave Barnes</td>
<td>Strategic Planning for Carbon Geostorage II</td>
<td>Burns and Rowe</td>
<td>Private</td>
<td>2009</td>
</tr>
<tr>
<td>Dave Barnes</td>
<td>Geological Characterization of the Mount Simon Sandstone Saline Reservoir CO2 Sequestration Target, Holland, MI</td>
<td>Battelle Memorial</td>
<td>Private</td>
<td>2009</td>
</tr>
<tr>
<td>Dave Barnes</td>
<td>Midwest Regional Carbon Sequestration Partnership (MRCSP); Regional Geological Sequestration Assessment, Phase III</td>
<td>Battelle Memorial/DOE</td>
<td>Federal</td>
<td>2009-2018</td>
</tr>
<tr>
<td>Dave Barnes</td>
<td>Regional Simulation of CO2 Injection into the Mt. Simon Sandstone along the Midwest Arches Province</td>
<td>Battelle Memorial/DOE</td>
<td>Federal</td>
<td>2009-2012</td>
</tr>
<tr>
<td>Heather Petcovic</td>
<td>Development and evaluation of a problem-based field and laboratory environmental geochemistry course.</td>
<td>National Science Foundation</td>
<td>Federal</td>
<td>9/08-8/09</td>
</tr>
<tr>
<td>Heather Petcovic</td>
<td>Alignment of Secondary Science Teacher Practice Materials in the Battle Creek Region</td>
<td>Michigan Department of Education</td>
<td>State</td>
<td>9/07-6/09</td>
</tr>
<tr>
<td>Heather Petcovic</td>
<td>Improving the STEM workforce by improving community college teachers of science</td>
<td>National Science Foundation</td>
<td>Federal</td>
<td>8/08-8/13</td>
</tr>
<tr>
<td>Michael Grammer</td>
<td>Keystone Youth Policy Summit</td>
<td>DTE</td>
<td>Other</td>
<td>7/08-8/09</td>
</tr>
<tr>
<td>Michelle Kominz</td>
<td>Disentangling Eustasy, Sedimentation, Tectonics and Ice Loading Using Antarctic Drilling Results</td>
<td>National Science Foundation</td>
<td>Federal</td>
<td>6/07-3/10</td>
</tr>
<tr>
<td>Mohamed Sultan</td>
<td>Assessment and Development of Renewable Groundwater Resources in the Quetta Valley, Pakistan</td>
<td>The National Academy of Sciences</td>
<td>Federal</td>
<td>3/07-1/10</td>
</tr>
<tr>
<td>Mohamed Sultan</td>
<td>Assessment and Development of Alternative Water Resources in the Sinai Peninsula, Egypt</td>
<td>NATO Science Program</td>
<td>Foreign</td>
<td>2/07-12/09</td>
</tr>
<tr>
<td>Mohamed Sultan</td>
<td>Integration of Grace Data with Inferences from Hydrologic Models, Geochemical Data, and Field Data for a Better Understanding of the Time-Dependent Water Storage Variability in Large-Scale Aquifers: Case Studies from North Africa</td>
<td>NASA</td>
<td>Federal</td>
<td>4/08-4/11</td>
</tr>
<tr>
<td>Mohamed Sultan</td>
<td>A Proposal to Evaluate the Jet Propulsion Laboratory Mars Exploration Public Engagement Program and Mars Student Imaging Project</td>
<td>NASA</td>
<td>Federal</td>
<td>2007-2009</td>
</tr>
<tr>
<td>Mohamed Sultan</td>
<td>The Mesopotamian marshlands from disintegration to restoration</td>
<td>National Science Foundation</td>
<td>Federal</td>
<td>9/04-8/09</td>
</tr>
<tr>
<td>William Harrison</td>
<td>Petroleum Technology Transfer Council Michigan Center</td>
<td>Petroleum Technology Transfer Council</td>
<td>Other</td>
<td>10/97-9/09</td>
</tr>
</tbody>
</table>
GEOS 2020 Egypt-
Civilization and Geology

by: Robb Gillespie

Our first offering of GEOS 2020 “Egypt-Civilization and Geology” was rolled-out this past spring semester. The course was held in two parts. The first spring-semester portion was designed to provide the students with all the background materials they needed to fully understand and appreciate the second portion of the course, a two week field trip to Egypt. We covered Egyptian geology, history, anthropology, cultural studies, religion, art, literature, and just about any other discipline you can name. Dr. Mohamed Sultan and Dr. Adam Milewski conducted laboratory sessions teaching students about the Egyptian basement complex and groundwater resources, while Dr. Robb Gillespie and Dr. Alan Kehew taught the overall lecture sections. Dr. Mustafa Mughazy from the Department of Foreign Languages and Dr. Howard Dooley from the Department of History were guest lecturers, and were both very well received.

The course culminated with an in-depth field trip throughout Egypt. It was the first international travel-abroad experience for some of the students. Not only did they see and learn about Egypt, but they were also introduced to the excitement of global study and travel at the same time. Alexandria, the Pyramids at Giza, the Sphinx, Cairo, Abu Simbel, Aswan, Luxor, Karnack, the Valley of the Kings and the Red Sea Coral Reefs were just some of the many sites we visited. We were all only inches away from King Tut’s mummy, looking him right in the eyes.

We snorkeled around the Red Sea coral reefs, some of the finest in the world. We saw what would have been the world’s largest obelisk, but cracked and still unfinished in an Aswan quarry, we stood in admiration in the new Library of Alexandria (the original library was the center of knowledge for the ancient world). We viewed Alexandria from Fort Quaitby (the site originally occupied by the Lighthouse of Alexandria—one of the original Seven Wonders of the World). We spent three days sailing down the Nile from Aswan to Luxor, gliding past the great Siilsila sandstone quarries that supplied the stone for most of the tombs and temples in southern Egypt. And on the last day, we stood in the Grand Gallery and Kufu’s Burial Chamber in the middle of the Great Pyramid (the only surviving member of the Seven Wonders of the World). We all agreed that this was perhaps one of the most memorable experiences one can have in a lifetime.

Every evening we had a Power Point presentation from one of the students. Every student was responsible for at least one of the major sites we were to see. The night before our visit to their particular site, they acted as our expert “go-to” tour guide telling us the history of the site, its importance, its connection to the country’s geology and how it was constructed, how it fit into the Egyptian culture.

continued on page 22
its religious and artistic significance, how it evolved and how it was re-discovered. It was truly hands-on learning, and everyone had a great time learning about all things Egyptian.

There was also plenty of time to practice “retail therapy.” But, I noticed that most of the group needed no practice whatsoever for this activity. Our trips to the various Souks (markets) were always fun filled and interesting. Everyone loved the food. The evening with our friends from the TELF school in Alexandria and the “dinner of a thousand plates” was an overwhelming experience. Just ask one of the students from the trip.

I think Dr. Frank Severance (along as one of our students) and Dr. Alan Kehew were in a secret competition to see who could take the most photos during the trip (what would we do without digital photography?). Thousands of pictures were taken between the two of them. My wife Linda, who was also along on the trip, tried valiantly to keep up with the photopair, but she came in a distant third. (She says she was just being “more selective.”) It was quite a job trying to pick the best images to go along with this article, but there a few here to whet your appetite to join us next year.

All of us have our own thoughts about the trip. We all have our favorite moment, our best remembrance, our most cherished event. Stephanie Ewald, one of the students from the trip summed it up this way. “This trip exceeded my expectations in every way. We got to experience so many different aspects of Egypt: from the coastal city of Alexandria, to the Nile Valley cities of Aswan and Luxor, the geology of the eastern desert, snorkeling on the Red Sea, and finally the pyramids and Cairo. We also had wonderful accommodations in every city and our Egyptian travel agent and tour guide (Azz and Amr) did a superb job and were wonderful people to get to know. I had such a great time I didn’t want to leave and would love to go back as soon as possible. I highly recommend this class and trip to anyone who is interested in experiencing and learning more about Egyptian history and culture.”

The semester coursework was offered by the Department of Geosciences through the College of Arts and Sciences. The fieldtrip portion of the course was offered by Geosciences through the Haenick Institute for Global Studies – Study Abroad Program. This multi-organizational and multi-departmental interaction is proving to be a successful, new model for this type of innovative program. We are all very pleased with the way the course functioned this first time around. We plan to offer the course again this coming 2010 spring semester with only a few changes. Then, after these two outings, we will re-assess the program, and make any modifications and “tweaks” we think necessary for the 2011 spring semester. One of the major changes we plan to make then will be to offer the initial semester portion of the course as an on-line presentation. That way, students from other schools can become eligible to join us for the Egypt field-trip portion of the course.

Also, for the next Egypt field trip (first two weeks of May 2010), we are saving a very limited number of spaces for geo-alumni, friends and family that may wish to be part of the grand adventure. Contact us now at robb.gillespie@wmich.edu for more information. Oh yeah, and same as last year—don’t forget to include your down-payment—just make those checks out directly to Robb (yeah, yeah – that’s it).
“We chose to go to the moon in this decade, and do the other things, not because they are easy, but because they are hard.” With these words, President John Fitzgerald Kennedy rallied the American public, challenged the Russians, and began the official “Race for the Moon.” The phenomenal scientific and technical accomplishments of the next decade produced one of the most prolific periods of advancement in all of mankind’s history. Besides the introduction of numerous new technologies (computers, Teflon, lasers and Energizer batteries to name just a few), all the basic questions of the planetary mission were answered (What materials make-up the moon? How did it form? When did it form?). The science that answered those questions was geology.

The last Apollo mission to the moon (Apollo 17) carried the only scientist ever sent into space during the entire moon mission. He was Harrison Schmitt – a geologist.

GEOS 2500 Planetary Geology is being offered, not because it is easy, not because it is hard, but because it is fascinating and fun. It sets our place in the universe into context - why Earth, why here, why now? Only by understanding the similarities and differences of the other planets can we begin to better understand our own planet Earth. Only by looking for signs of life in other parts of the Universe can we begin to understand life here on Earth, and our significance in the cosmic picture.

So how do we go about conducting scientific investigations of other planets? Do we need to send scientists to all the other planets? Are the costs of all those “space missions” worth it?

We will examine the other planets by first seeing how we conduct geological investigations here on Earth, and by examining some of the basic geological principles those investigations have allowed us to develop. We will then apply these concepts to inter-planetary investigations, and see what we can learn about the rest of our solar system and the Universe. You’ll see Mars close-up in 3-D, and you’ll learn how to drive a Mars Rover. You’ll learn the difference between a comet and a meteorite, and find out what your chances are of being wiped-out by one of them. You can vote as to whether-or-not Pluto deserves to be a planet, or if it should demoted to the status of a dwarf planet. And you will discover what the ultimate fate of Earth, and all of mankind, really is.

So, who is winning the “Space Race” now? Well, mankind is. Come and see why.
GEOS 2200: Climate Change: Geological Perspectives

GEOS 2200 is a new three-credit class offered in spring 2010: Climate Change: Geological Perspectives. This general-education course will introduce non-majors to several important geoscience concepts, including uniformitarianism, plate tectonics, geologic time, the formation of the solar system, earth system science, the carbon cycle, and the functioning of the climate system. We will examine the long record of Earth’s climate and atmospheric content, focusing on more recent times. This record will be placed in context of what was happening on the Earth to help us understand why the climate changed.

Armed with this geological perspective on climate variability, we will examine Earth’s current climate, why it is changing, and how it is likely to change. As Winston Churchill said, “The longer you look back, the farther you can look forward.” Understanding the past is essential to understanding the present and future.

Similarly, Arthur Schlesinger Jr. posited that “a nation denied a conception of the past will be disabled in dealing with its present and its future.” The geological perspective of climate change is uniquely able to provide a big picture of this problem. It will help clarify what the natural and societal consequences of climate change could be, as well as what measures might be taken to adapt to climate change and to mitigate its deleterious effects.

This course will not be taught as “absolute truth” rather, we will present the current evolving state of knowledge. It will be structured to encourage students to search for truth, realizing that history and science are written only to be subsequently analyzed and rewritten. We hope to equip students with enough background to critically distinguish between science and conjecture.

A weekly discussion section will help students process information from their reading and the lecture, and evaluate what they believe in the context of their deepening understanding. The goal is to produce citizens who can see the big picture more clearly than their peers, and assume leadership roles in charting a responsible course in dealing with climate change.
GEOS 5020: Environmental Field Geochemistry

This is a new, senior undergraduate level course that is being developed by Dr. Koretsky, in close consultation with Dr. Petcovic. Development of this course is supported by a two year, $135,000 grant from the National Science Foundation, Geoscience Education Program and $35,000 of matching funds contributed by the WMU College of Arts and Sciences and the Department of Geosciences. The NSF support is being used largely to renovate and equip an outstanding aqueous geochemistry laboratory for undergraduate education in Roed Hall. This laboratory will be equipped with three UV/Vis spectrophotometers, an ion chromatograph, two pH meters, a microbalance, centrifuge, water purification system, new glassware, new variable volume automatic pipetors and other laboratory supplies.

New field equipment includes field DO, pH and conductivity probes, GPS and handheld weather devices, sediment corers, water sampling equipment, sediment grabs and a new canoe. The course will be open to upper-level students majoring in Geosciences or Environmental Studies.

Students in the course will work collaboratively to investigate real-world environmental systems. In the initial offering, the focus will be on Woods Lake, an urban lake with a history of eutrophication. Students will investigate water quality in Woods Lake, then prepare a written report and public presentation of their findings for interested community members and WMU students. Our hope is to train students in cutting-edge analytical water analysis and field sampling techniques and to give the students a chance to apply their knowledge in a real-world setting.

Dr. Petcovic will study student learning to gain insights into the novice-expert transition with respect to field and laboratory knowledge and skills and to assess the efficacy of a problem-based, service-learning undergraduate course in allowing students to gain these skills. In subsequent years, we plan to consider other local aquatic systems.
New Toys

X-ray Diffractometer (XRD)
In spring, the department purchased a used Rigaku Miniflex II powder XRD at a substantially reduced price from Pfizer. The instrument is 10-12 years old, which is a significant improvement over the non-functioning, nearly antique (estimated 1970's era) XRD formerly owned by the department.

Note: The new XRD is also currently non-functional, and has been since we purchased it, so I can't say too much about its capabilities right now!

Ion Chromatograph
This summer, a Dionex ICS1000 with autosampler and anions column was purchased using an NSF grant to Drs. Petcovic and Koretsky, which was supplemented by contributions from the WMU College of Arts and Sciences and the Department of Geosciences. The new IC can simultaneously measure fluoride, nitrate, chloride, sulfate and phosphate in aqueous samples.

Computers
The department recently acquired 25 new Dell Optiplex desktop workstations for our Wood Hall computer labs in the spring of 2009. This equipment was purchased as part of the Distributed Computing Plan (DCP) through the College of Arts and Sciences.

GPS
The department recently acquired 25 new Garmin eTrex H hand held GPS units for use in classroom and field exercises. This equipment was purchased with student fees.

Classroom Technology
The department recently outfitted three of our lecture classrooms in Rood Hall with updated and permanent classroom technologies. All three rooms have been equipped with ceiling mounted Epson multimedia projectors and dual DVD/VCR video equipment. This equipment was purchased as part of the 2009 One-Time Funding Initiative through the College of Arts and Sciences.

Brunton Compasses
The department recently acquired 20 new Brunton Conventional Pocket Transits compasses for use in classroom and field exercises. This equipment was purchased as part of the 2009 One-Time Funding Initiative through the College of Arts and Sciences.
How the undergrad stole the awards banquet

—An award-winning poem by Geosciences undergraduate student:
Tom Howe.

The entire faculty down at Rood Hall liked the Awards Banquet a lot... but the undergrad, who lived just west of Rood Hall, did not.

The undergrad hated awards banquets, the whole finals season, now please don't ask why, no one quite knows the reason.

It could be his Brunton wouldn’t read strike and dip; it could be, perhaps, he was hung over from the trip. But I think the most likely reason of all, was the lack of windows, inside Rood Hall.

But...whatever the reason, the compass or the beer, he stood there on Thursday, and he snarled with a sneer.

“The potluck is tomorrow, they’re making some dishes, out of beans, and cheese and possibly fishes.” Then he growled with his undergrad fingers nervously drumming, “I must find some way to stop this banquet from coming, for tomorrow he knew...

All the Geograds and docs, would wake bright and early and put on their plaid socks.

And then! Oh the rocks! Oh the rocks, rocks, rocks, rocks, ROCKS! That’s all they would talk about was ROCKS, ROCKS, ROCKS! Then the whole department would sit down to their feast, and they’d feast and they’d feast and they’d feast, FEAST, FEAST, AND FEAST!

They’d feast on the sundries that the faculty brought! — Then the undergrad rendered a sinister thought...

The undergrad rendered an awful, sinister thought.

“I know just what to do” the undergrad laughed in his throat, and he swiftly adorned his hat and his coat. And he chuckled and clucked, “What a mean, nasty trick” and he headed toward Rood, and he headed there quick.

He got on his snowmobile and with some old empty sacks, across west campus, the undergrad laid tracks. All the windows were dark, quiet snow filled the air, all the faculty were at home dreaming sweet dreams without care. When he came to the first door he saw from the square.

“Now to get in,” the undergrad hissed, and he climbed to the roof, empty bags in his fist.

Then he slid down the venting, with a four-letter word, the only witness to this, was a surprised looking bird. He got stuck only once, for a moment or three, and then found himself inside the old XRD.

Then he slithered and slunk, through the dim lighted hall, and he stole all the rock, the big and the small. Fold samples, and mylonites, feldspathoids and schists...Carbonates, turbidites, too many to list.

He stuffed them in bags and the sack from his tent, then he stuffed all the bags, one-by-one, up the vent. He slunk to the museum, and stole all the gems, the rare, the fluorescent, the Spelothems.

He cleaned out the museum, as fast as he could, he even took their Petrified Wood. Then he stuffed all his loot up the vent with glee, AND NOW! Grinned the undergrad, I’ll take the new XRD.

And the undergrad grabbed the XRD and started toward the door, when he was spotted by a custodian buffing the floor. The undergrad had been caught, by this custodian dude, who was just finishing up with the floors of old Rood.

He stared at the undergrad and said, “Who the hell are you?” And “what are you doing here at quarter past two?” But you know that undergrad was so smart and so slick, he thought up a lie and he thought it up quick. “The department didn’t tell you” the undergrad lied, “there’s a copper plate that’s mislabeled inside. I’m taking it back to my workshop, dude. Then I’ll fix it and bring it right back to Rood.” And the fib fooled the custodian, and he left with a shrug, his indifference may have been from the booze in his mug.

The last thing he took was Schmidt’s over-head projector, no one should have to sit through that 8 AM lecture. And the only thing that he left inside, was a set of markers that were totally dried.

It was quarter past dawn, all the faculty still a-snooze, all the alumni still a-snooze, when he packed up his sled. He packed it up with the fossils, and the gems and the rocks, the XRD, the projector and even the clocks. 200 feet up, to the top of the moraine, he drove with his load, like he was insane.

“Poo poo to the doctors, the undergrad was humming, they’re finding out now that no banquet was coming. “They’re just arriving, I know just what they’ll do, their mouths will hang open a minute or two, and then the faculty down at Rood Hall will all cry Boo-Hoo! That’s a noise, grinned the undergrad, that I simply must hear!” So he stopped, and the undergrad put his hand to his ear.

And he did hear a sound rising over the snow. It started in low, then it started to grow...

But the sound wasn’t sad, why, this sound sounded merry, it couldn’t be so, but it was merry, very!

He stared down at Rood Hall, the undergrad popped his eyes! Then he shook, what he saw was a shocking surprise. All the faculty down at Rood hall, the tall and the small, were CELEBRATING! Without any rocks at all. He hadn’t stopped the Alumni Banquet from coming, it came! Somehow or other it came just the same.

And the undergrad, with his beer-gut, ice-cold in the snow, stood puzzling and puzzling, “how could it be so?” It came without seminars on carbon sequestration, it came without lectures on zones of ablation...

And he puzzled 3 hours, till his puzzler was sore. Then the undergrad thought of something he hadn’t before. Maybe this banquet means a little bit more!

And what happened then, well in Rood Hall they say, that the undergrad’s heart grew three sizes that day.

And as soon as his heart didn’t feel quite so tight, he whizzed with his load through the bright morning light.

And he brought back the equipment and specimens he had hoarded, and to he...He himself!

The undergrad...a scholarship was awarded.
I still remember the day I got the admission letter from WMU; it was one of the most delightful days of my life. Before long it dawned upon me that I would soon begin a new chapter in my life. This realization made me a bit anxious as to how well I would be able to adjust to this new place.

It’s been a year since then and now I feel completely at home in Kalamazoo, my new home. Currently I am working with Dr. Sultan on the project which deals with estimating river discharge using remotely sensed data. Its been a semester since I joined his research group and the progress I made is with the help of Dr. Adam and colleagues from my research group. I have also been a TA for the past year and it has been a wonderful experience interacting with the undergraduates. I will be defending my research proposal soon and I am looking forward to the next semester to make substantial progress in my research as well as my courses.

Since the last fall 2008 and spring 2009 I have been so busy with appreciable tasks in three main endeavors. First, my research project where I focused in-depth on finding and developing convincing ways to decipher the source of rainfall over the Sahara desert during Pleistocene time. My findings and results are presented in a poster gallery at the Annual Conference of Improving Michigan’s Access to Geographic Information Networks (IMAGIN) that was held in Lansing, Michigan in May 2009.

Second, the qualifying classes of my Ph.D. degree are successfully completed and my upcoming credits will be dedicated to research hours.

Third, acquiring remarkable feedback as being a TA of two important classes, Mineralogy and Petrology. Consequently, I have received the 2008-2009 Department Teaching Effectiveness award. In addition, I have received the department’s David W. Kuenzi Student Research Award.

I cannot believe how fast the days are going. It is barely three years since I came here and I have a strong desire to have a break and go home to see family and friends. In summer II 2009, I am a TA of the Hydro Field Course and I am planning to takeoff before starting the fall 2009 semester.

So my departure should be in August and I know that it is the hottest month in Egypt, so I feel it will be tough, but at the same time it will be good for me to taste that weather again after a long time being here in a snowy, cold environment.

Abstract:
New Graduate Students

Dale Dailey
Jennifer Trout
Mohamed Ahmed
Kathryn Titus
Kyle Patterson
Marcel Robinson
2009 Department Awards

Graduate Research and Creative Scholar Awards
Joshua Kirschner
Zhanay Sagintayev

Undergraduate Research and Creative Activities Awards
Thomas Reich
Ryan Silbert

Research and Creative Activities Poster Award
Travis Hayden
Heather Qualman

Graduate Teaching Effectiveness Award
Abdou A. Abou El-Magd
Meghan O. Good

Senior Honor Awards:
Earth Science
Marcel Robinson
Jennifer Trout

Earth Science Education
Samantha Bokor
Brad Pillen

Geology
Brian Eustice

Hydrogeology
Stephanie Ewald

Geochemistry
Kirk Wagenvelt

Geophysics
Ryan Silbert

Advisory Council Field Camp Scholarship
Jason Asmus
Brian Eustice
Thomas Howe

Kalamazoo Gem & Mineral Society Award
Stephanie Ewald

Laton Field Camp Scholarship
Kirk Wagenvelt

Lauren D. Hughes Environmental Scholarship
Thomas Howe

W. David Kuenzi Memorial Scholarship
Abdou El-Magd
Thomas Reich
Zhanay Sagintayev
Ryan Silbert

Lloyd and Marilyn Schmaltz Undergraduate Scholarship - MGRRE
Jason Asmus

Distinguished Student Service Award
John Thornton

Douglas Daniels Scholarship
Stephanie Ewald

Presidential Scholar
Stephanie Ewald

Envirologic Technologies Pete Marsala

Wirgau-McLean Award
Peter Feutz
Marcel Robinson

Department Appreciation Award
Ryan Bos
Jared Bowen
Susan Jager
Marie Lussier

The Graduate College Travel Grant
Martin Akafia
Michelle Barger
Doris Becker
Abdou El-Magd
Joy Gryzenia

continued on page 31
Recent Graduates:

Bachelor's Degree Recipients:

Earth Science Majors
Megan M. Barnhart
Andrew Garceau
Kristoffer Henshaw
Daniel Kroll
Ashley M. Kronshage
Daniel R. Priest
Marcel R. Robinson
Jennifer L. Trout

Geology Majors
Jacob E. Day
Kyle Patterson
Russell Platte
Wesley S. Pohl
Kathryn C. Titus
Kevin Wierengo

Hydrogeology Majors
Sara A. Snyder

Earth Science Education
Bonnie Cross
Rachel Salim
Emily Stone
Jennifer Van Hoe

Master's Degree Recipients:

Earth Science
Jeffrey A. Barney

Geology
Tamara DeFrain
Joshua Kirschner
Heather Qualman
Audrey Ritter
Terri L. Shattuck
Jessica Wold

Ph.D. Recipients
Lisa M. Anderson

2008 Geosciences Faculty Award Recipients

Dr. Sultan presented Dr. Heather Petcovic (left) and Dr. Michelle Koning (right) with the Department's Faculty Award. They have both contributed significantly to the Department activities in the past year.
Congratulations

We are pleased to announce that faculty member, Dr. David Barnes, was awarded the 2008 Outstanding Geologist Award by the American Institute of Professional Geologists (AIPG)! They presented the award to him at their meeting on December 2, 2008.

Congratulations to Bill and Linda Harrison for being selected for the College of Arts and Sciences Dean's Staff and Faculty Appreciation Award! They have given much of their personal time to build up MGRRE and the Department! Thank you! Your work is appreciated!

Congratulations to those who have gotten married this year!
Angel Cuellar
Joshua Kirschner
Benjamin Hoyt
Jennifer Lindquist (now Porter)
Beth Steele (now Cheeseman)

Geosciences Administrative Assistant Sr., Kathy Wright, was awarded a WMU Make a Difference Award. Kathy showed compassionate concern for a student that went above and beyond the job!

Congratulations to Bill Harrison! He has been selected to receive the AAPG Public Service Award! The award will be presented to him at the national meeting next year in New Orleans.

Congratulations to Mike Grammer! He was selected as a recipient of WMU’s Emerging Scholar Award for 2009-2010. He was presented with the award at the Academic Convocation on Sept. 10, 2009. Great job, Dr. Grammer!

Congratulations to Dr. Sultan! The Geological Society of America (GSA) selected him as a Fellow at their May 2009 Meeting.
Ford Field Event

Geosciences participated in a recruiting event at Ford Field last November. After the event, the students had the opportunity to enjoy a Lions game!

Michigan Graduate Education Day

April 23, 2009

Graduate student, Zhanay Sagintayev, participated in the Michigan Graduate Education Day in Lansing in April. He presented a poster regarding, “GIS Applications for the Renewable Groundwater Resources in Afghanistan and Pakistan.”

Major Excitement

The Geosciences Geology Club (member, Peter Marsala) was instrumental in getting materials together to recruit new majors. The Department is also fortunate to have alumni, Paul Daniels, Kim Finkbeiner, and Bill Steinmann on hand to explain the exciting opportunities in the Geosciences!
Undergraduate student working on an assignment.

The group on the Baraboo, Wisc. field trip.

Camping on the Missouri Field Trip.

Graduate Student, Muthanna Yaqoob, checking out the rocks.

Dr. Schmidt teaching on the field trip.
Back Row
Farshid Keshavarz, Akram Mekhail Aziz Ghaatas, Jeff Barney, David Barnes, and Stephen “Ace” Kelley.

Third Row
Adam Milewski, Kyle Patterson, Trevor Whitlock, Ben Hoyt, Thomas Howe, Kirk Wagenvelt, Jennifer Shultz, Wesley Pohl, Gene Schmidt, Stephen Tatum, Jason Asmus, Joe Adduci (with hat), Nick Palfey, Duane Hampton, Alan Kelew, and Ron Chase.

Second Row
Bill Sauck, Ayman Al-Temamy, Shawn McCloskey, Joy Gryzenia, Abdou Abou El-Magd, Brian Eustice, Christine Snyder, Chris Schmidt, Ruth Nair, Andrew Gospel (with shades), Ryan Bos, RV Krishnamurthy, and Emily Hartwick.

Front Row
Dr. Barry C. McBride earned his Masters of Science in Geology from Western Michigan University in 1988 and his Doctorate of Philosophy in Geology from the University of Colorado at Boulder in 1997. He has 20 years of oil and gas experience with several different companies.

Before arriving at Western Michigan University he attended field camp at Indiana University’s Judson Mead Geologic Field Station in Cardwell, MT, where he first met Dr. Ronald Chase and Dr. Christopher Schmidt; his future thesis advisors at WMU.

In 2006 McBride made a move to Cordillera Energy Partners II, LLC in Greenwood Village, Colorado as Manager of Geology. In 2007, his partners formed a second company called Cordillera Energy Partners III, LLC and both companies are run simultaneously. Both companies focus their efforts in solid, multi-pay areas such as the Texas Panhandle, deep Anadarko and East Texas basins.

McBride has published multiple publications and considers his strong suits to be structural geology and petroleum systems. He is a member of the Rocky Mountain Association of Geologists, AAPG, East Texas Geological Society and Houston Geological Society.
I currently live in Champion, Mich., and work as an exploration geologist for Kennecott Eagle Minerals Company (Rio Tinto’s - Eagle Project). I work out of the Ishpeming office for most of the year, and occasionally spend time at the Negaunee coreshed office. My primary job is to explore for nickel/copper in the central western Upper Peninsula of Michigan. Looking for other economical minerals is a secondary focus of the project. I also do landman work, and assist the environmental department on an as-needed basis. I previously did environmental consulting work for 4 years in PA, NY, WI, MI, and OH, so my previous geological experience allows me to bring another dimension to addressing the highly sensitive environmental nature of the project.

Day-to-day duties consist of field recon following up on our aero mag survey that was completed last year. Also, throughout the winter, I act as a Landman (real estate background helps) researching mineral rights, surface ownership, access, etc. for all the targets we have identified (over 150 so far). I am the company’s “Point-of-Contact” for local land owners and mineral owners. I also work with lands we already own, or would like to acquire, for various purposes. I research geologic data available at colleges, the DNR, the DEQ, or at various local facilities – just about anything I can get my hands on. During the winter, I also interact with local folks interested in geology and mining. I have given presentations at NMU and LSSU, and have served as guest speaker for high school career-day-programs in the UP telling them what I do, and how I got to where I am now. Specifically, summer duties require that I act as team leader for our recon program. That means we must complete a field visit to each of the targets identified by our mag survey. Each target must be inspected and evaluated by a geologist, along with a tech or safety person, to determine the area’s mineral potential. We investigate with rock hammer, hand lens, and instinct.

GPS is employed to guide us to the target, and we spend virtually all of our time out in the remote regions of the UP woods. I have seen numerous sights out in the woods, including moose, bear, wolves, old logging camps, etc., but, rarely people. We take notes about each target so we can re-rank our findings at the end of the season. This allows us to complete a more focused recon (or drilling) program each successive year. We will take whole rock samples for assay if we find something interesting (and own the mineral rights). We will also run full soil lines over such areas to get even more detailed data. After field season ends, or during inclement weather days, I will post sample locations on the maps, analyze results, evaluate additional magnetic survey leads and research various mineral or surface ownership position.

The project is moving ahead. We expect several important decisions during the coming months. We have every expectation that all the rulings will be in our favor, and we will be ready to move as soon as we can. We can not start any construction or mining at ‘the site’ until we have these rulings. However, we are continuing our exploration program, our mill plan, road plan, etc. Actually, any day we could hear word on our contested case ruling. These issues do affect me, but minimally, because I’m involved in the exploration end of things. But, I do hope to live up here for a long time, and I may need to transition into the production end of things as the project moves into the future.

After work, I also work as a real estate agent along side my wife (Wendy) for Northern Michigan Land Brokers. We pretty much exclusively deal with vacant land, camps, and timberlands. That job is almost as much fun as my full time work. And, of course, I usually have a hammer and a hand lens along with me when I’m out looking at real estate. We love what we do, and we love where we live.
Audrey Ritter
2008 Graduate, M.S. Degree

Howdy from Houston! My husband and alumni Chris Varga (M.S. ’08), and our daughter Emma have lived in Houston now for a year. We arrived last year just in time to experience our first hurricane. Obviously, living without power for 11 days in the late summer down here is not ideal living conditions, but we all survived as did our new house. I had the best winter of my life and do not miss the snow at all (despite the 105°F summer days).

I am currently working as a Senior Geologist for ExxonMobil Exploration Company (EMEC). My first assignment here has been working on the high-profile Brazil project. I have spent many hours processing and interpreting 3-D seismic data, creating depositional, sequence stratigraphic and diagenetic models, describing conventional cores and thin sections, and working on cathodoluminescence (CL) microscopy, the scanning electron microscope (SEM) and backscatter electron imaging (BEI) interpretations and results in conjunction with the Upstream Research Company (URC). Recently, I was part of a four-day technical meeting that took place in Rio de Janeiro, Brazil, which incorporated preliminary results from my work. I have attended field schools in New Mexico, West Texas, Utah, Colorado, Wyoming, and Idaho evaluating structural and stratigraphic traps/seals within petroleum systems, and ancient lacustrine depositional environments.

Based on my field performance, I was nominated to be an apprentice instructor for the carbonate sequence stratigraphy portion of a field school for early career professionals. My next assignment is scheduled to start in March, 2010 with the Production Company working on a project from Qatar.

Aside from work, Chris has joined a local crew team and has been rowing again for the first time in 20 years! Emma, who is now three years old, started ballet and tap dance class, and is already collecting rocks. For me, I am currently pregnant with our second daughter due in December, attempting to train for a triathlon (summer 2010) and I am researching universities and their associated programs to pursue a PhD here in Texas in the near future. We also have another addition to our family; our 13 week old puppy Belle, a “platinum” (white) Labrador Retriever. We have been spending most of our weekends on the beach in Galveston, TX, with friends and neighbors or working in our yard adding landscaping and a deck. If you are ever in Houston, do not be a stranger. Take care and best wishes!
Part-Time Workers: A Valuable Resource for Employers in Stressed Economic Times

by alumni: Niah Venable

I am a WMU alumnus with an M.S. Earth Science degree from 2006. My original intention when choosing and completing my degree at WMU was to find work in the environmental consulting field. Maintaining full-time employment however, meant personally compromising my role as the mother of two wonderful children and incurring substantial childcare costs that would essentially cut my paycheck in half. Though many women would tell you that having a full-time career and raising children is a necessity in today’s dual income and/or single parent society, I think that there may be and should be alternatives.

While attending the HAZWOPER training session at Western, I met a woman who mentioned that she worked part-time for a local consulting firm. I was amazed she was able to work part-time, because I had assumed that to be a professional in the sciences you had to work full-time. She did mention that she was finding it difficult to move up in her position, and that she had no benefits whatsoever, but that overall the job gave her the opportunity to spend time with her children and still use her education and professional skills.

After a series of lucky meetings I landed in my part-time position. I am employed by the Geosciences Department, at the Michigan Geological Repository for Research and Education as an administrator. With my husband working a flex schedule of four, 10-hour days and my schedule of three days a week, I only have to pay for two days of childcare, saving us money and leaving me with a decent paycheck. My children get to spend time with their parents and experience the institutions of daycare and school. The benefit for me is that I get to perform a variety of duties at least partially related to the geosciences and because of the nature of the facility, help other students reach their education goals. Though I don’t encourage most students to embark on child-raising while completing a degree and trying to start a career, I do feel that students need to be aware that it is viable to be a non-traditional student and succeed in your choice of degree program, even one as rigorous and complex as the Earth Sciences.

As an end note, though many fields do hire workers in part-time or flex positions, these jobs seem to be distinctly lacking in the sciences. I feel that employers have quite a bit to gain by hiring professional workers these positions, especially in tight financial times. They get employees that are more motivated to do their jobs because they are not only meeting the needs of their families but also fulfilling personal and professional goals. They can afford to offer a decent paycheck to the employees because they are generally not incurring as much cost, if any, for benefits. They also, and most importantly, get employees that are trained to fill positions where it really does matter what your education and skill sets are, rather than getting a “temp” from some random hiring agency.
W. Thomas Straw, Professor Emeritus

Odessa and I continue to enjoy retirement in New Harmony, Indiana. I occasionally give lectures to Elder Hostels that visit New Harmony and other local groups; and in the spring of 2008 I co-authored two guidebook articles and led one field trip for the North-Central Regional meeting of the Geological Society of America in Evansville, IN.

The past 18 months have been, interesting, challenging, rewarding, and strange as it may seem for a 77-year old, life changing. In February 2008 I was hired to work on an alleged violation of the Swampbuster provisions of the 1985 Food Security Act in south-central Tennessee. From the outset it seemed to be the sort of job one could easily love: wonderful clients, a clear-cut case of drained wetlands, relatively inept government experts and a reasonable hearing officer. Two tracts of land, two hearings, and we prevailed in both cases—almost. The Hearing Officer found for my client, but both cases were reversed on appeal to director of the National Appeals Division (NAD) of the Natural Resources Conservation Service. In a similar case in Iowa the Federal Appellate court found in favor of the land-owner farmer—with a bit of luck my client will be exonerated. Of course, the case is now in the hands of a very capable lawyer and the Federal Courts.

At about the same time I working on this case I entered Barnes Jewish Hospital in St. Louis to have a heart procedure designed to control atrial fibrillation (AF). Although I had episodic AF since 1995, it did not become chronic until late summer last year. Somehow, as I contended with the debilitating effects of this condition knowing that the famous British geologist-geochronologist Arthur Holmes had his career cut short by the same malady did little to comfort me. Careful monitoring for the past six months indicates the procedure was a success. Needless to say, Odessa and I are pleased with this outcome. She has her handy-man-yard boy (old man) back, and I have a more complete life.

I continue to delve into the subtleties of the Late Pleistocene glaciofluvial and glaciolacustrine deposits in the Ohio and Wabash River valleys upstream from the confluence of these streams. But, because deer ticks and chiggers, a.k.a. “red bugs” seem to find me as delectable as I find watermelon and ripe strawberries, and after having been treated for Lyme disease twice; I generally avoid wooded areas from June 15 until after the first frost.

We continue to travel but no longer have a motor coach. I was in Kalispell, MT in September, we visited Key West in February, New Jersey in April, and recently spent several days visiting our granddaughter, Abby in Alaska where she works for Bechtel. She and I spent a day fishing out of the “new” Valdez—she caught a 100+ pound halibut, and I brought in a 176 pounder. After about 20 minutes of cranking and pumping, I was able to bring it in without help. Yes, we are well supplied with fish.

I enjoyed the Spring Council meeting and we are looking forward to visiting Kalamazoo for the fall meeting.

Best wishes,

Tom Straw
Greetings to Alumni and Friends:

The Geosciences Advisory Council met on Oct 3, 2008 and April 17, 2009. These meetings achieved several milestones. Both President John Dunn and Dean Thomas Kent addressed the Council in October. President Dunn identified the Michigan Geological Repository for Research and Education (MGRRE or “Core Lab”) as a “Gem” of the University, and praised the Department of Geosciences for its insight in establishing this facility. In addition to serving as an educational and a research facility for WMU faculty and students, MGRRE also serves the natural resource industry in Michigan and the United States. WMU is one of five Research II Universities in the state of Michigan, and the Department of Geosciences faculty members strive to support the University in maintaining that recognition. President Dunn credited the Department for having an Advisory Council that helps support and direct the Department as the University looks to future academic programs, and to how these programs can provide employment opportunities for WMU graduates.

Dean Kent emphasized the importance of maintaining contact with Alumni and friends of the University, as WMU and the State of Michigan both look for support for current and future academic programs. Both the President and Dean encouraged Alumni and the Council to meet with the University to facilitate discussions on how we can all help maintain the academic programs of the Department.

At the suggestion of the President and Dean, the Council presented a written request to the President and an offer to meet with the Administration and the Department to seek a mechanism to fund two endowed positions for the MGRRE Facility, a Director and an assistant. Discussions with the Administration, the Department, the Council, and State agencies are currently in progress. Any support is welcome.

The Council has drafted multiple communication documents in both written and electronic format to assist the Department in establishing contact with Alumni and friends. We hope that we will capture the interest of those that have been out of touch with the Department, and that this will result in an expanding group of active Alumni and with others who have an interest in the Department and the University, namely, the Geosciences Alliance.

The Council elected Mr. James Duncan Sr. to Emeritus Council membership. He was an early Council member, and an avid supporter of the Department. His son, Mr. James Duncan Jr. was elected to Honorary Council membership. He is a valued friend of the department, and a major contributor to the Geosciences museum in Rood Hall. Both James Duncan Sr. and James Duncan Jr. are past residents of Kalamazoo, successful businessmen, and long time friends of the Department of Geosciences. We honor these two gentlemen for their outstanding contributions to the Department and to the Advisory Council.

The Council members look forward to seeing Alumni and friends at Homecoming in the fall.

John A. Yellich
Chairperson

Thomas C. Kamin
Secretary
Dear Alumni,

The WMU Department of Geosciences is pleased to announce to all of our valued alumni the initiation of the WMU Geosciences Alliance. The WMU Geosciences Alliance, in conjunction with the Department’s Geosciences Advisory Council, will provide you with a variety of opportunities regarding activities within the Department. More specifically, the WMU Geosciences Alliance will:

- provide an opportunity to you, as an alum, to elect to maintain a higher level of contact and common interest with the Department of Geosciences community;
- create and identify opportunities for alumni to be mentors, and to identify internships for students in the geosciences;
- promote the success and welfare of the Department, its faculty, staff and students;
- create, support and communicate opportunities for interaction between students, faculty, staff, alumni and friends in the geosciences;
- assist whenever possible in the employment of WMU Geosciences graduates and alumni.

As valued alumni of the WMU Department of Geosciences, membership in the Geosciences Alliance is automatic and without charge. We ask that you maintain current contact information with the Department and with fellow alumni. Important announcements and information will be sent to you. You are also urged to keep this important tie by joining the Friends & Alumni of WMU Geosciences Department group on Facebook!

We hope that you will take this opportunity to be an active alum and member of the Geosciences Alliance. Please feel free to contact any member of the Geosciences Advisory Council or Department of Geosciences faculty if you would like additional information.

Best regards,
John Yellich, Chair
Geosciences Advisory Council
Donations for 2008-09

Corporate donations for 2008-09

Air & Water Compliance Group, LLC
Bigard and Huggard Drilling
Columbus III Production
Consumers Energy Foundation
Cook Investments
Core Energy, LLC
Enviologic Technologies, Inc.
EOG Resources, Inc.
Fidelity Charitable Gift Fund
HFP Investments
Huffman Royalty, LLC
Innova Explorations
Marsh & McLennan Companies, Inc.
Michael Baker Corporation
Nexen Petroleum U.S.A., Inc.
Pale Morning Dove, LLC
Robert J. Manns Oil & Gas Exploration
Shell Oil Company
Summit Petroleum Corporation
Tamarack Resources, LLC
Tiger Development, LLC
Wavelet Investments, LLC
William J. Strickler, LLC

Thank You

Your generous contributions to the department support a wide array of activities and we appreciate your help. We try to thank each donor, but as with all bureaucracies we do miss someone occasionally. If we missed you, please know that we rely on your support and will continue to make every effort to acknowledge your gifts. Please accept our sincere thanks.
I support the Department of Geosciences with the following gift:

$1,000  $500  $250  $100  $50  $25

I would like to become a special donor to the Department of Geosciences with a gift of $____

Please designate your choice(s) for contribution

- Department of Geosciences Endowment
- W. Richard Laton Field Camp Scholarship Endowment
- Envirolecog Technologies Endowed Scholarship
- Geosciences Advisory Council Quasi-Endowment
- Lloyd Schmalz Quasi-Endowment
- MGRRE Quasi-Endowment
- MGRRE Operations Quasi-Endowment
- W. David Kuenzi Memorial Quasi-Endowment
- Unrestricted Development Fund
- Douglas Daniels Endowed Geosciences Scholarship and Award
- The William and Linda Harrison Endowment
- Geosciences Study Abroad Endowment
- Barry and Beth McBride Endowment for Geosciences
- Peter J. Kacor Geology Scholarship
- Other __________________________

My gift is to be paid via:

- Check (payable to WMU Foundation)
- Credit card (check one)
  - Mastercard  - Visa

  Account #: _____________________________________________
  Expiration Date: ____________________________
  Signature (required): _____________________________________
  3-digit security code: ____________________________

Name: _____________________________________________
Phone Number: (____) _____________________________

Credit card information will be shredded after transaction.

Please mail this completed form, along with your gift to:
Western Michigan University
WMU Foundation Office
1903 W. Michigan Avenue
Kalamazoo, MI 49008-5403

Give online at www.wmich.edu/foundation/gift
(under “other designation” indicate Geosciences)