

UMD Geological Sciences

Newsletter for Alumni & Friends

Editors: Charlie Matsch, Claudia Rock, Colleen Wergin

Greetings from Duluth. Changes in the department are finally slowing down a bit. We only had two this year: one addition and one retirement. The addition is the new director of the Large Lakes Observatory, Steve Colman, who came aboard July 1, 2004. For those of you who remember the geology t-shirt that depicted the four grand men of the department: OJ, JCG, Charlie, and Dr. Grant carved into the side of Mount Rushmore, the last of them, Jim Grant, retired in May. He is still active in the department, as are Dick, John, and Charlie.

In May we celebrated our 50th anniversary in tandem with the Institute on Lake Superior Geology. It was a blast. We had over 230 guests to our alumni event! I had so much fun visiting with you. Last summer I had hoped to put a web page together depicting the event, but I didn't get around to it. Luckily, we have a web-master this year, who along with Charlie Matsch, will get a page up shortly. However, for our event we did produce a slideshow of people and events over the years. We would like to make this CD available to you. So if you are interested, give us a call, a letter, or an email and ask for the "Fifty Years of UMD Geology" CD.

Over the next three to four years, the physical plant of the department will undergo some changes. The Swenson Science building will be finished this academic year. It is located just west of and connected to the Life Science Building. Biology and Chemistry will begin moving their teaching and research labs into this building in early spring. Most of the Life Science Building will be taken over by the new School of Pharmacy, and that's where the moving starts for us, as our intro labs as well as my X-Ray lab are in Life Science. So next summer we will be moving these labs to remodeled space in the Chemistry Building. At the same time, ITSS is slowly moving into the old library space in Kirby

Plaza and Computer Science will move into ITSS's old space in MWAH. This means we should be able to expand upstairs onto the third floor of Heller Hall by spring 2007. So, right now we have a space committee trying to "justify" our expansion. Doubtless you will hear about this over the next few years.

In addition to moving, we are also beginning a long-term process of building up the teaching and research infrastructure in the Department. We have set ourselves a broad goal of acquiring more instrumentation and laboratory equipment in support of undergraduate teaching and research. Initially, we hope to build a new student microscopy lab which will include new microscopes, video image projection, and image capture and analysis. A new microscopy lab will provide the observational foundation on which to build additional facilities. We hope to fund this equipment with seed money from our alumni which will be used as matching funds (with college money) to granting agencies. So, if you are interested in this, please let us know and we will designate any funds donated to this endeavor.

Last spring we hosted faculty and staff members of the Twin Cities Geology and Geophysics Department for dinner (the year before, the TC hosted us). These dinners are a way of staying in contact, both personally and professionally, as we continue our cooperative PhD program. We currently have five PhD students admitted through the TC program who take most of their courses, do their research, and work with faculty here at UMD.

On a personal note, our son was married in October in Madison, Wisconsin, so we now have another daughter. Tracy and Chris have moved to the San Francisco area, so I guess Ron and I will travel west more often. Our daughter will graduate this year from Northeastern University in Boston with a degree in civil engineering. I can remember

when they were small, and the graduate students believed their names were galena and sphalerite!

That always makes me laugh! Hope all is well with you.

ERIK BROWN Research: I'm continuing to develop new projects using moored instruments that measure dissolved oxygen and carbon dioxide. I just received new funding from Minnesota Sea Grant to expand this line of research. This should let us evaluate biological activity in more detail than would be possible with ship-based surveys. In addition, we will have information on what happens during the winter months when no one in their right mind is out on the lake. I am also co-editing a book (to be published as a GSA Memoir) on geological applications of cosmogenic nuclides. This is based on a special session that some French colleagues and I convened at last summer's 32nd International Geological Congress in Florence, Italy.

New hires at LLO: This fall we are in the midst of a search for new faculty members at the LLO. The new hires will have joint appointments in Biology, Chemistry or Physics. Our plan is to expand our expertise in modern lake processes, complementing our strengths in paleolimnology. Running a search is a lot of work, particularly with the involvement of multiple departments. Once we have our new colleagues next year it will all be worthwhile!

Commencement: One big event this past spring was the "opportunity" to give the address at UMD's Graduate School Commencement. This was one of the "strings" attached to the Chancellor's Research Award that I received in 2003. It ended up being a lot of fun to put together and to deliver. See this past summer's Bridge for details.

Cabin: We try to get to the cabin with the kids (Andrew, 8; Lianna, 6; and Matthew, 2) most weekends from June through August. The kids never want to

come back into town. Can't say I disagree with them! Once again the weeklong stay we had planned never happened. Maybe next year.

STEVE COLMAN My first few months as a member of the department have been good ones, though full to overflowing with new things. I arrived in July, eager to make the transition from the USGS to UMD. My wife arrived in late August and we moved into our new house at the end of the month. Marian is an instructor in the School of Fine Arts, teaching art education and art foundations courses. After some initial trepidation about moving to Duluth, she is really enjoying the city and the University. Our two kids are both second-year medical students, Matt at the University of Chicago and Betsy at the University of Massachusetts.

So far, the Large Lakes Observatory and the Department of Geological Sciences have been everything I hoped they would be. Both groups are vibrant and collegial, and everyone has been very welcoming. Tom Johnson did a wonderful job in establishing LLO and managing its first ten years of research. Now I can give him a hard time about all his free time. Tom and I share a vision of LLO as an oceanographic department dedicated to a global effort of research on inland seas. I hope to lead LLO along the same path that Tom began, while managing a slow growth in faculty size and a substantial growth in scientific reputation.

I am looking forward to teaching in the department once I get settled. I have ideas for everything from freshman seminars to advanced courses in the geological aspects of limnology and climate. I also am trying to find time to finish up several papers on my work in Bear Lake, Utah-Idaho, with the USGS. On the future research front, I hope to get projects started on the

sedimentary processes and glacial history of Lake Superior. I am also heavily involved in an international effort to drill the sedimentary record of Qinghai Lake, the largest lake in China. I recently wrote a large NSF proposal to fund U.S. participation in the drilling project. I also spent more than two weeks in China in September, partly to plan the Qinghai Lake Drilling Project, and partly on a tour of research sites with the National Geographic Society's Committee for Research and Exploration, of which I am a member.

I'm happy to be in Duluth and to be part of the Department of Geological Sciences. This first year will be an interesting and challenging one, which I hope will be a good one for all involved.

TIM DEMKO My second year at UMD was a busy one. After preparing two new courses, Sedimentology and Stratigraphy and Depositional Environments and Stratal Architecture, and revamping a popular existing course, Life and Death of the Dinosaurs, which left little time to do much else during the school year. I was able to get out and do several lectures at other universities (Ohio, Wyoming, Iowa, and Akron), give presentations, short courses, and talks at AAPG and GSA. I also got a week of field work in on the Colorado Plateau over Spring Break with my graduate student, Joe Beer, and undergraduate research students Erik Gulbranson and Dan Perrault. Joe is working on a project in the San Rafael Swell, Glen Canyon, and Waterpocket Fold regions of central Utah regarding sequence stratigraphy and depositional environments in fluvial and lacustrine deposits of the Upper Triassic Chinle Formation. Erik is working on carbonate petrography of Mesozoic terrestrial calcretes and palustrine limestones, while Dan was working on the paleosols associated with an Upper Cretaceous dinosaur nesting site. My other graduate student, Marsha Meinders Patelke, is working on the subsurface sequence stratigraphy of the Salt Mountain Limestone in the Gulf Coast region of Mississippi and Alabama. I have been

pursuing my own research interests in the Triassic and Jurassic fluvial and lacustrine rocks of the Colorado Plateau, including collecting and correlating existing subsurface data from helium and carbon dioxide fields in northern Arizona to my outcrop sections, and working again, after a long hiatus, on the geology of Petrified Forest National Park in association with the National Park Service. Over the summer, I was mainly involved with a NSF-funded research program for under-graduates that involved working on dinosaur-bearing deposits in the Bighorn basin in Wyoming (see article elsewhere in this newsletter). At the end of the summer, I went to eastern Turkey for two weeks to work with an archaeological research group excavating an ancient Assyrian city. My part of the project was involved with investigating the use of ground penetrating radar (GPR) in subsurface mapping of both archaeological and geological features. This was quite intellectually, culturally, and physically challenging, to say the least! Through all of this, my family has been very supportive and active in their own right. My wife, Laura, has been working part-time at the Richard I. Bong World War II Heritage Center in Superior, Wisconsin (with Christabel Grant), and my son, Noah (now 3), has started pre-school. They both were able to spend part of their summer with me in Wyoming. Noah even found a dinosaur bone! Yes, we're starting him young!

CHRISTINA GALLUP PhD student Kristin Riker-Coleman, MS student Leah Gruhn, and I are beginning to wrap up our work on the fossil corals we brought back from the sea bottom offshore of Papua, New Guinea in 2001. These

corals grew in shallow waters on a subducting plate and are progressively moving down toward the trench. Leah has finished collecting her trace element and stable isotope data and is in the process of reconstructing the corals' original environments. Kristin's efforts to date the samples have been hampered by extensive alteration of the uranium-series isotopes in the samples, but through doggedly staying at it, she has identified the best approach to measuring the samples. Her recent data suggest that the model we had for the subsidence of the coral reefs may have been wrong. MS student Nick Freiburger joined the group to undertake research on Barbados fossil corals, with the goal of reconstructing past sea level changes. He also may be able to join me and Fred Taylor (University of Texas at Austin) for a fossil coral collection trip to Vanuatu, Solomon Islands, South Pacific within the next year.

New horizons on the research front include potential collaborative projects on lake sediments and speleothems from Mesoamerica. Dave Hodell and Mark Brenner at the University of Florida have done extensive work in the region and shown that there is evidence for significant climate change during the time that the Mayan civilization collapsed. Constraining the timing of climate change is critical, and uranium series dating of gypsum in the lake sediments and of the speleothems will help to solidify the story.

JOHN GOODGE The past year has been great for me. A year ago, I was headed down to Antarctica again, leading a geological-geophysical expedition to run a broad aeromagnetic and gravity survey across the Transantarctic Mountains. The goal of this project was to use geophysical methods to

see through cover of the polar ice cap to basement rocks of the underlying East Antarctic shield. We started with a helicopter-borne survey over the mountains, which I have mapped and studied during previous seasons, so that we could tie magnetic anomalies to known geology. Once that was completed, we flew a long corridor survey across the adjacent ice sheet by Twin Otter. We now have one of the highest resolution aeromagnetic data sets in Antarctica, and are in the process of interpreting our data in the context of exposed geology. This project was a larger undertaking than my prior expeditions to the ice; normally I work in small field parties of about four, but this project had twenty people on the ground doing science, air support, and field camp operations. Along with graduate student Michael Rieser, this project was a collaboration with researchers from the USGS and their equivalent from Germany.

After returning to Duluth in January, I had fun revising the Petrology curriculum during spring semester. In addition to hand samples and lots of thin sections – surely everyone can recall many hours looking down the microscope! – we also developed a suite of new labs including use of the electron microprobe on the Twin Cities campus, modeling magma chamber processes with M&M's, studying lava viscosities with corn syrup experiments, and working with geochemical data from intrusions related to the Duluth Complex. This year we're going to add melting experiments of real rocks with a 1-atmosphere kiln.

My research continues to take new turns. In addition to the aeromagnetics project, I also received funding to use glacial-marine deposits of the Antarctic margin as proxies of the ice-covered shield. The common thread here is to find ways to "see" beneath the ice, short of drilling (prohibitively expensive) or waiting for the ice caps to melt away ("Day After Tomorrow" scenario). Undergraduate students, Katie Brosch and Diane Curelli, are working with me to characterize clasts of igneous and metamorphic rocks dredged from glacial

deposits on the continental shelf. We will be applying standard petrologic techniques to these clasts (thin section petrography, geochemistry, U-Pb age dating) in the hopes of documenting what types and ages of materials underlie the adjacent ice sheet. In addition, working with researchers from Australia, we will be using the ages of detrital zircons in matrix of the glacial diamicts to document the sources of material carried to the continental margin by the glaciers. This is the first study of its kind in Antarctica, and could provide a model for proxy sampling of Earth's last continental frontier by letting glaciers do the hard work.

JOHN GREEN Since our last newsletter, I've been up to many of the same activities as last year, enjoying the freedom of retirement. Professionally these include working with Minnesota Geological Survey geologists Jim Miller and Terry Boerboom on local mapping projects (Duluth area and Split Rock Point quads), and helping to guide two field trips for the Institute on Lake Superior Geology in May. In June I put on a weekend Naturalist Program on Waterfalls of the North Shore for the Sugarloaf Interpretive Center Association (SICA), and in August ran a four-day adult-education course on North Shore geology for the North House Folk School in Grand Marais, followed by two afternoon programs there in late October.

I have continued to serve on the Commissioner's Advisory Committee for the Minnesota DNR's Scientific and Natural Areas and Natural Heritage programs, as well as on the Boards of Directors of the Superior Hiking Trail Association and SICA. The hiking trail project through Duluth is finally becoming a reality; after

much time working out and tweaking the route, we got it approved by the main public landowners (City of Duluth, Town of Midway, St. Louis County), and have constructed the first beautiful eight miles this summer and fall.

Jan and I took our usual summer trip to New England in July to visit our daughters Martha (in Maine) and Sarah (in Vermont). The whirlwind tour also included a Green family gathering in New Hampshire and Jan's (Curtis) family meeting in Maine. We achieved at least temporary satiation in blueberries and seafood.

The year's biggest trip was a three-weeker in March to southern California, where we stayed at Jan's brother's house in Los Angeles. From there we explored the San Bernardino Mountains, up the coast to Morro Bay, and east through the desert into northwest Arizona, where we had several beautiful days in the Flagstaff area (Sunset Crater, etc.) and at the Grand Canyon, reviewing Colorado Plateau stratigraphy and the wonder of it all. I figure we crossed the San Andreas Fault at least six times – didn't feel a thing!

VICKI HANSEN Wow, it is hard to believe that another year has flown by, and that I am starting my third wonderful year at UMD! Dr. Duncan Young joined the UMD Planetary Research group in July 2003 for one year. In researching Venus surface processes, Duncan established digital cartographic capabilities that allow us to map areas using the highest-resolution Magellan radar data, yet combine the map products into a coherent global view. This non-trivial task represents an important key to discovery and analysis of global-scale patterns that will unlock a better understanding of first-order processes in Venus' dynamic evolution. Duncan also further developed his software to create digital synthetic-stereo (red-

blue) anaglyphs using Magellan data; these 3D images allow us to map the Venusian surface in a manner akin to flying overhead by helicopter. As I write this, Duncan is on to a new adventure, for which he trained well last winter in Duluth—almost four months “on the ice” in Antarctica; he follows in the footsteps of several UMD faculty! Duncan will be working with a group from the University of Texas, Austin using remote sensing instruments originally designed for Europa (one of Jupiter's icy moons) to see into and through the ice. So Duncan has gone from hot dry Venus to glacial studies on Earth's South Pole!

PhD student Nick Lang continued with mapping his “small” piece of Earth's sister planet, covering some 7.5 million km². Nick is also studying channels on Venus - long narrow, commonly sinuous features that might be analogous to meltwater channels that we found cutting through Duluth's seasonal ice last spring. There are, of course, significant differences: on Venus the erosive fluid - possibly basaltic magma - differs a bit from water, and the carved substrate a thin, but extensively developed, veneer of felsic material, differs from ice. MS student Kelly McDaniel continues mapping circular lows, which might just represent ancient impact craters, rather than the subsurface diapiric structures they have thus far been purported to be. Stay tuned to see what Kelly's mapping and analysis reveals. Roger Bannister, hailing from The University of Illinois, joined our group and will be mapping parts of Artemis, perhaps the largest circular feature in the solar system (spheres are not circles!), and a real enigma on Venus. I continue with mapping lowland regions with an emphasis on piecing together the story held by isolated kipukas of highly deformed terrain, as well as other circular lows.

I was lucky enough to participate in two NSF-sponsored workshops including: 1) using visualization in teaching geoscience and, 2) teaching structural geology in the 21st century. Seeing the wide range of work by others

across the country is both humbling and inspirational. In addition to some new ideas for teaching, I am hopeful that we'll also expand planetary mapping collaborations through these experiences.

In addition to planetary work, I have finally begun to make it back out into the field here on Earth, and Minnesota in particular! I am very excited about possible projects centered on Minnesota's crystalline basement. The advanced structure class journeyed north to Tower, Minnesota to have a look at the Mud Creek Shear zone, with many thanks to Dean Peterson's guidance. Clearly there is much potential for interesting studies. Now if we could only figure out how to make our days longer!

On the home front, we moved into what we think of as the most perfect house in all of Duluth, and perhaps the world—complete with a large outcropping of Duluth Complex in the entry. The rock could only be improved if it had “enjoyed” an ancient ductile shear event—but we won't lobby for that now that we live here. We so enjoy watching the seasons change from our tree house-like setting, feeding the critters (birds, deer, and bears, and our kids), hiking along Tischer Creek, and keeping the moss and lichen short on the front “lawn”. Every day I quietly thank Dr. Wallace, the home's builder, who had such a fine vision with every regard for nature's incredible beauty and peace more than forty years ago, providing a gentle reminder that today's actions may persist long after we've moved on.

TOM JOHNSON The year marks a great change for me at UMD. After having served at the helm for its first ten years, I stepped down as director of LLO in July. I am

delighted that we were able to recruit Steve Colman as our new director, a well-known and talented limnogeologist who came to us from the USGS in Woods Hole. I am looking forward to Steve taking the LLO into its second decade of growth and accomplishment, and I also relish having more time for my research and teaching activities.

I am in the midst of turning out a number of new PhD's this year. Jim Russell defended his dissertation last spring on “The Holocene Paleolimnology and Paleoclimatology of Lake Edward, Uganda-Congo,” in which he undertook a number of biogeochemical analyses of cores that we collected from the lake in 1996. Jim found that this part of equatorial Africa has experienced prolonged droughts every 725 years, and the timing appears to be linked to a 1500 year cycle that oceanographers observe in the North Atlantic. The official signature and submission date of Jim's dissertation was July 14, 2004 (Bastille Day!), and I had the great pleasure of congratulating him on this date in front of an audience on the shores of Lake Tanganyika, just a few kilometers away from the village of Ujiji, where Stanley met up with Dr. Livingstone back in the late 1800's. It was great fun to begin the festivities with, “Dr. Russell, I presume!” Jim is staying on as a post-doc with NSF funding at present, and plans to move on to another position next fall. In August, Chad Wittkop defended his PhD thesis, “Paleoenvironmental Reconstruction Using Laminated Sediments Containing Authigenic Carbonate Minerals: Case Studies from the Great Lakes Region of North America.” Chad cored a number of deep lakes, mostly in Michigan, yielding varved sediments that varied considerably in composition. The stories from each lake were unique, and perhaps the most intriguing one was from Derby Lake,

which appears to bury more precipitated calcite in cool, rainy years than in hot, dry ones, due to reduced algal production in the cloudy summers. Go figure. Chad has moved on to Maine, where he is preparing manuscripts for publication and, hopefully, searching out weekend hockey groups where he can demonstrate the swift moves that he learned on the rinks of Duluth! Andy Breckenridge and Lindsay Powers will be the next of my PhD students to finish up, and both should be moving on to new positions later this year. I will write about their great accomplishments in next year's newsletter. I will miss them all!

Kate and I are doing well. We took a fascinating trip last summer, first to the Royal Museum of Central Africa just outside of Brussels, and then on to Africa to look into some future research possibilities on Lake Tanganyika. We flew to Lusaka, the capital of Zambia, where we met with university geologists, then traveled by road for two days up to the village of Mpulungu on the shore of Lake Tanganyika. After meeting with fisheries officers there, we traveled by ferry up the lake for two days, stopping at several villages en route to take on passengers and produce, and finally arrived at Kigoma, Tanzania. The ferry, called the Liemba, was built by the Germans in 1916, and shows its years. Kate and I were the only ex-patriots aboard – we enjoyed getting to know some of the passengers, and we ate well in the salon as television sets showed old Rambo movies over and over again, while African music blared from the speakers. We were especially amazed by the process of taking on people and cargo while anchored off of each village, as small boats would aggressively vie for prime locations along the ferry's hull, amidst the shouting participants of all ages, grasping for ropes, scaling up the side of the hull, at times falling back into the arms of people below. In one instance, we saw an outboard-powered long boat run over a dugout canoe, with the paddler leaping onto the longboat's gunwale and being dragged through the water, somehow miraculously avoiding

being crushed against the hulls of other boats that were tied up alongside the ferry. We joined American and African teachers and students of the Nyanza Project in Kigoma for a few days, where I helped Jim Russell and colleagues prepare a Congolese cargo boat for a coring expedition farther south on the lake. Kate and I managed to spend one day at Gombe National Park, just a two-hour boat ride north of Kigoma, where Jane Goodall has carried out her pioneering research on chimpanzees. We hiked through the beautiful jungles of Gombe, seeing several chimps, numerous baboons, and a few monkeys in the tree tops, along with an incredible array of brightly colored butterflies and birds. All in all, it was a memorable trip, and I made some valuable contacts for future research projects on the lake.

Kate and I continue to enjoy our cabin on Lake Vermilion, paddling our kayaks on Superior and the smaller lakes around here, and life in Duluth. Daughter, Heidi, and son-in-law, Neil, are still living nearby, much to our delight, and grandson, Jonas, now 17 months old, continues to charm us on just about a daily basis – pretty nice! Son, Ryan, is still crafting software for aircraft electronics in Cedar Rapids, Iowa (Baja Minnesota), and he continues his training to become a helicopter pilot in the Army National Guard. This worries us, of course, but he seems to thrive on the challenges of it all.

So the year has been one of change, much productivity, fun and adventure. Oh yes, do you remember my writing about that Malawi drilling project? The contracts are signed and the drill rig is en route to Africa as I write. We expect to get on the lake in January, so hopefully by the time you read this, we will have

retrieved our first long core from the African tropics.

CHARLIE MATSCH There were lots of comings and goings since the last time I wrote to you. In late winter the faculty of the Twin Cities geology department came to Duluth for a dinner with our faculty, and Penny graciously invited the UMD emeriti to participate. It gave me an opportunity to catch up with Professor Emeritus H.E. Wright. He was my inspiration to enter the field of glacial and Quaternary geology when I was a graduate student there. I had arrived from the University of Maine determined to pursue studies in igneous petrology. Herb's course in geomorphology changed my mind. Early June 2004, the Friends of the Pleistocene gathered at St. John's University for a field conference and to honor him, along with Al Schneider, one of his first PhD students, as the leaders of the first FOP meeting in Minnesota fifty years ago. Yes, we sang the Digging Song.

In early April, I fled the monotony of springtime in Duluth with a sojourn in and around Tucson, Arizona. Lots of great scenery, sunshine galore, and a wonderful birding side trip to the San Pedro River Valley and to Madeira Canyon. Upon my return, I received the good news that Howard Mooers had won an All-University Distinguished Teaching Award and nomination to the University's Academy of Distinguished Teachers. It was my honor and pleasure to join him and Penny at the award ceremony presided over by President Bruininks in Minneapolis.

By far the biggest spring event for me was helping to plan a celebration to honor the 50th anniversary of the founding of the Geology Department by Robert L. Heller. It was timed to be held concurrently with the Institute on Lake Superior Geology. A gathering

of alumni and friends in the old Duluth Depot brought several hundred of you for good food, bountiful refreshments, excellent reminiscences, an opportunity to renew friendships, and to just catch up on what was happening. I had one of the best times of my life. Thanks.

I was off to New England in early June after attending a retirement party for Jim Grant hosted by Beth and Tim Holst at their lake cabin in Wisconsin, and the FOP gathering. I never get tired of the coast of Maine. Back in Minnesota for July, and a return to Maine in August. Shortly after my return in early September, I teamed up with John Green for a field trip to show off the local geology to our graduate students. A great time was had by all. Later in the month, I had the opportunity to revisit my old geological stomping grounds in southwestern Minnesota. Dick Ojakangas invited me to come along on a swing through that territory to gather some stops for his newest work in progress, a book entitled *The Roadside Geology of Minnesota*. It was a nostalgic foray for me to renew acquaintance with the glacial stratigraphy and landforms. Early in November he and I celebrated the 25th anniversary of our departure from Duluth to join an expedition to the Ellsworth Mountains in West Antarctica via New Zealand, an experience that turned out, for both of us, to be the most exciting geological adventure of our lives.

I continue to keep track of what's going on in the department, and I find things to do that keep me going on a comfortable and interesting track. Again, it was great to see so many of you at our celebration in May. Have a great New Year.

HOWARD MOOERS Greetings from England! I, Sir Howard of Duluth, am over here with Lady Kathleen, Squire Ian, and Lady Lillian, teaching in the Study in England Programme. We are trying to take advantage of the English setting whilst teaching geology and astronomy in the shadow of Hutton and Newton. However, the setting is marred by English weather. You verily think that the

weather is easy to predict with your astrological charts and tea leaves. Alas, not here. Observations of the past two months have indicated that the English weather can be best described by a 2 x 2 matrix as shown. The table changes seasonally with "Kinda Cold" and "Kinda Not So Cold" on the vertical axis during the summer. The real trick to weather prediction is determining the shifts of weather conditions among the four groups. Over the past two months, there has been no clear trend. The weather shifts from one mode to another hourly as if controlled by a coven of witches. One would be happy if the spirits allowed the weather to follow a clockwise or counter clockwise rotation, but the changes seem to be controlled by opposing spirits.

	WET	NOT SO WET BUT STILL HUMID
KINDA COLD	Wet and kinda cold	Not so wet but still humid and kinda cold
KINDA NOT SO COLD	Wet and kinda not so cold	Not so wet but still humid and kinda not so cold

There is a corresponding dress code associated with each weather condition.

	WET	NOT SO WET BUT STILL HUMID
KINDA COLD	Raincoat, Umbrella, Polar fleece	Raincoat around waist, Umbrella on belt, Polar fleece

KINDA NOT SO COLD		
	Raincoat, Umbrella, Polar fleece around waist	Raincoat around waist, Umbrella on belt, Polar fleece around waist

Despite the weather we have been able to see many of the geological sites: the Lake District, the Cliffs of Dover, and two important sites here in Birmingham, Wren's Nest geological park and the Netherton anticline.

As for things back at UMD, the lab is quiet at the moment. The four-year Camp Ripley project has come to an end and the staff has drifted to the winds. Gone is Sir Ben of Bertsch, Sir Dave of Stark, and Lady Andrea of Grygo. The two gallant Knights are still living under the "Fleur de lis" (you figure it out) whilst Lady Andrea is in Maine.

As for the Knights who say, "I wanted to go to graduate school but now I am really questioning my judgment" they appear to be making progress in their search for the Grail. Phil, Duke of Larson, and his court have moved on to Anchorage on Cook. The Duke is also searching for diamonds in the Northwest Territories of Canada. John, Earl of Quinn, is still working at Argonne on Contaminated Groundwater, and has passed his preliminary exam in the search for the Grail. The questions were difficult, but he knew his favorite colour and the flight speed of an unladen European swallow. Lady Margretta Meyer, Princess of Beloit, is pursuing the elusive moraine of Røgen in northeastern Minnesota.

Now I am off to encourage a group of would-be Knights to saddle up their coconuts and join me on a quest of great knowledge. And, if a member of my court approaches your castle, please extend them hospitality with some haggis and ale.

RON MORTON It was an interesting and relaxing year. I was on sabbatical and spent the first part working on an electronic book titled "Geological Time in a Calendar Year, Holidays Included". The book is meant for nonscientists and teachers, and the Precambrian section will soon be coming to a web site near you. The second half of my sabbatical, plus most of the summer and fall, were devoted to hiking the Superior Hiking Trail and mapping and describing its geology. I did this with Judy Gibbs, a well-known local naturalist, and from our 34 hikes will come a field guide to the geology, flora and fauna seen along the trail - all 245 miles of it (this includes the new section through Duluth as well as all of the popular loop walks). The book will also include historical places of interest and features a CD with all the hikes and waypoints on it. Doing this has been one of the neatest "geological" activities I've done in awhile as well as tremendous fun. Charlie, our wire-haired dachshund and Judy's dog, Sammy, hiked the entire trail with us and had many interesting adventures, from meeting raccoons and a bull moose to Sammy sliding 25 feet down a rock face into the Split Rock River. We are now in the process of field checking some of the GPS waypoints.

Speaking of fun activities, I was out at field camp for the last two weeks. The wild flowers in Albion Basin were incredible (I could even identify some of them!) and Jupiter seemed like "moose heaven". The students were a really good group, especially the ones from UMD. After field camp, Penny and I went on a camping holiday to Arches, Canyon Lands, Mesa Verde and the mining district in Leadville. We also spent three days in Santa Fe visiting a friend.

The really big news of the fall (or year) was the marriage of our son, Chris, to Tracy Marshall. The wedding was October 16th in Madison, Wisconsin. Chris and Tracy have now moved from Minneapolis to San Manteo, California where Tracy is an epidemiologist for San Manteo County. Right off the bat she was busier than heck when the county

declared a state of emergency due to the flu vaccine shortage. Chris managed to keep his computer job in Minneapolis, and will thus be working from his new home as well as traveling back to Minneapolis once a month.

Megan is great and will be finishing the last semester of a five-year co-op civil engineering program at North-eastern University in Boston. Needless to say, she is a hopeless Red Sox fan and was ecstatic when I had to fork over twenty bucks.

Living in the country (it's our second year) is fabulous and I have not the room or time to list all the reasons why. One surprise benefit of living out here is a neighbor (one mile away) who grooms miles of cross-country ski trails on the 2500 acres of county land across from us. Because of this and our 109 inches of snow last winter, I not only skied for the first time in years but averaged over 40 miles per week! There is nothing more exhilarating, as well as serene, as to stand in the woods with the icy sparkle of snow all around you, the deep azure blue sky above, and not a sound in the world but your own breathing. The exhilarating part comes with the whoosh of wings from a great gray owl who almost takes your hat off as it glides into a nearby tree where it sits staring at you as if you were tonight's dinner!

Speaking of which, it's time to start ours. Its Thai shrimp tonight, a recipe from the cookbook I put together of my favorite dishes which I gave to Megan and Chris last Christmas.

So there you have it - hiking, cooking, and geology. I hope all of you are enjoying the land, its beauty and bounty, as much as I am!

DICK OJAKANGAS Another busy year! Don't ever retire—it leaves you no free time!

Most of my time is being consumed with field-checking and writing for *Roadside Geology of Minnesota*. From March - May, I taught a course on "Geology and People" for UMD University for Seniors. There are also ongoing research projects.

I continue to lecture aboard cruise ships—someone has to do it! Peaches and I flew to Chile in January for a Chile-Antarctica-Brazil cruise, but we jumped ship after two days, as Peaches' mother, who lived with us, died. (We are rescheduled.) The return trip necessitated a taxi ride through and over the Andes to reach the Argentinean border and an airport, and a long flight along the high Andes over glaciated peaks and active volcanoes. In October, we cruised for 19 days from San Francisco to Chile, with stops in Mexico, Costa Rica, Ecuador, Peru, and Chile. In November, we cruised from Honolulu through the islands and back to San Diego.

The Institute on Lake Superior Geology had its 50th annual meeting this past May in Duluth. I opened the technical session as "The Old Prospector", talking about "Gold is Where You Find It! So is Ag and Cu and Fe!". I also gave a talk co-authored by Greg Ojakangas on "Deposition of Paleoproterozoic Siliciclastics and Iron-Formation in a Tidally Influenced Shelf Environment, Animikie Basin, Lake Superior Region" as well as being a co-leader on two field trips—"Classic Outcrops of Northeastern Minnesota" and "Geology of the Eastern Mesabi Iron Range, Northeastern Minnesota". A highlight of this event was the 50th Anniversary of the Department of Geological Sciences and the return of so many former students and faculty to help us celebrate! A GREAT

event! It was so good to see each of you!

In July, Peaches and I, along with three of our grandchildren, rode an Amtrak train to Holden Village in the North Cascades in Washington. It was a memorable trip!

Miscellanea: Gave geological talks to the Mesabi Range Geological Society, Kiwanis (2X), and Rotary; had geological visitors from India and Australia; on a PhD committee for a Wright State University (Dayton, Ohio) student; on board with Duluth Habitat for Humanity; and singing in the DSSO Chorus (as a non-soloist).

Peaches' health is excellent—she is now a one-and-a-half-year survivor of breast cancer.

Hope each of you has a busy and fun year, too!

RIP RAPP Rip Rapp continues with his geoarchaeological projects at the famous Bronze Age site at Anyang in China and publishing books [two in press] and articles [also two in press]. He now "winters" just north of Tucson, Arizona and "summers" at UMD in Duluth. This schedule allows year-

round biking and hiking to complement the writing. Each year you can find him at the annual meeting of the Geological Society of America.

JOHN SWENSON As in previous years, 2004 was filled with much research-related travel to a variety of interesting places. My work with the Office of Naval Research's Euro-STRATAFORM program took me to San Francisco for a special session at the AGU Annual Meeting; Lamont-Doherty Earth Observatory in Palisades, New York for collaborative research; the AAPG Annual Convention in Dallas; and Keystone, Colorado, for our annual meeting of North American and European researchers. In late August, I traveled to Florence, Italy, to present three papers at the 32nd International Geologic Congress. In addition, I had the pleasure of presenting departmental seminars on my clinoform research at the University of Illinois and the University of New Mexico. I am currently preparing a presentation for the AGU annual meeting in December, and then I am off to Japan (Nagasaki University) in early January to conduct some flume experiments on clinoform dynamics.

Although I found Florence both visually and historically stunning, the highlight of my research travels was a trip to the Massachusetts Institute of Technology to be part of an NSF-sponsored "working group" on Novel Methods for Modeling the Surface Evolution of Geomorphic Interfaces. The idea behind the working group was to assemble a diverse group of approximately twenty researchers from the fields of Physics, Applied Mathematics, Mechanical and Civil Engineering, and Geology and Geo-physics,

and to have that group work on a specific problem at the intersection of these fields. The meeting was incredibly stimulating and a huge success; we will meet again in May 2005.

On the teaching front, I completely revamped my course in Stratigraphy and Basin Analysis and developed two new courses, Environmental Hydrogeology and Environments

of Deposition and Stratal Architecture II: Conceptual, Mathematical, and Physical Modeling.

This year has involved saying goodbye to a pair of great graduate students. In June, Darin Albrecht defended his thesis work on the fate of sediment from the Nemadji River; he is currently investigating several employment options. In September, Jere Mohr accepted a position with Barr Engineering; he will defend his thesis on experimental clinof orm dynamics in December. Jere presented papers on his work at the AAPG Annual Convention in Dallas and at the International Geological Congress in Florence. In addition, he recently submitted a manuscript for publication based on his thesis work.

NIGEL WATTRUS Much of my research the past year has focused on trying to understand what characteristics of a lake floor make it a successful spawning site for lake trout. Before World War II, the Great Lakes supported a significant commercial lake trout fishery. The combined affects of over-fishing and the migration of

sea lamprey into the Great Lakes decimated the native lake trout population, ending commercial fishing for trout. Efforts to restock the Great Lakes using fish raised in fish hatcheries have been successful only in Lake Superior. Lake trout return each year to the same spawning site. It appears that we don't understand just what it is that makes a particular lake floor structure a successful spawning area for these fish.

Over the past year, I have been working on several lake trout projects with researchers from UMD, the Great Lakes WATER Institute at the University of Wisconsin-Milwaukee and the University of Michigan. These projects have included work on Lake Superior and Lake Michigan. These have been incredibly interesting projects to work on because they bring together researchers with diverse backgrounds. My contribution to these projects has been to produce high resolution maps of the bathymetry and composition of the study sites.

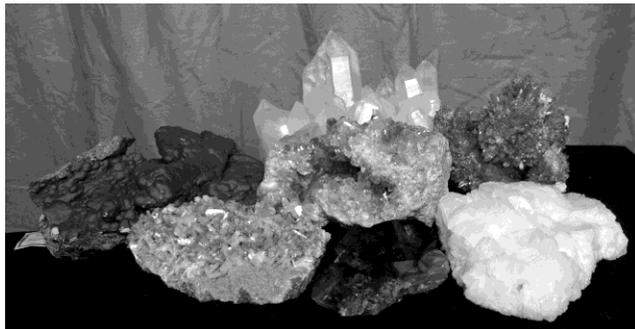
Most of our work has been directed to studying the spawning grounds of the shallow water varieties of lake trout. Earlier this

summer, we spent some time conducting multibeam sonar surveys off Isle Royale, a deep water area where deep water lake trout appear to spawn. Even less is known about the spawning needs of this type of lake trout. Maps produced by these surveys will be used in future proposals that we plan to submit to seek funding for larger studies. They also offer a tantalizing view of the incredible lake floor geology around the island.

Our research into the lake floor rings and fracture systems of Lake Superior continues. Earlier this summer we had a paper published in *Geology* describing the polygonal fault system we have mapped in Lake Superior. Recent multibeam sonar data collected off Thunder Bay suggest that the rings are actually coalesced chains of pockmarks that we've dubbed "ring-o-pearls". Similar structures have been described in the North Sea. They appear to be produced by episodic de-watering of the lake floor sediments.

On the personal side of things, my family and I spent the month of August in Britain. This summer was my parents' 50th wedding anniversary and it was good to get home for a visit. While there, we took our kids to Paris for a week. It was great fun but hard work for my rusty high school French!

Wendell Wilson Donates Mineral Specimens



Calcite

Middle Row: Malachite, Celestite, Creedite

Back Row: Quartz with Fluorite

Wendell Wilson, BA 69 (PhD University of Minnesota), Editor and Publisher of the "Mineralogical Record", recently donated eighteen museum quality mineral specimens to the department. We will display them in a case on the first floor of Heller Hall right next door to Heller Hall 120. Pictures of the specimens are also linked to our web page.

Front row: Cavansite in Stilbite, Fluorite,

50th Anniversary Celebration

Below are a few pictures from our 50th anniversary celebration which was held in May 2004. We are making available to you a CD (“Fifty Years of UMD Geology”) of the slideshow that was shown during this event which contains a parade of photos of the Department’s first 50 years. It will include some photos from the event as well. If you are interested in receiving a copy, please send a check for \$5.00 made payable to UMD Geological Sciences, along with your address, and we will mail it to you. If you have any questions, please contact us.



GOURMET GEOLOGIST JIM GRANT RETIRES

For the last 35 years, I have been paid to do what I would pay to do if only I had the money. Most of the time, anyway. So I start this by saying thanks to all the folk who made this possible: colleagues and students, staff and family. Particularly, if it weren't for Christabel and OJ, it wouldn't have happened. So how did I get so lucky?

Back in Scotland I grew up with U-shaped valleys and cirques and raised beaches (we lived on one). But it

wasn't until I was out gathering sheep within sight of the Moine Thrust that I actually looked at a rock and wondered how it formed. It looked like a bunch of pebbles had been cemented by some red stuff, and across the valley there was a big conical hill. Had this been a volcano and was the cement lava? My geography teacher introduced me to Holmes' "Principles of Physical Geology" and conglomerate. At the end of my third year, at Aberdeen University, I was off to Ontario as my Professor's field assistant, and got introduced to canoes and black flies and bush and then the lunar landscape of Sudbury and the Grenville Front and hard rocks that looked as if they had once behaved like toothpaste! After graduation, I worked summers for the (then) Ontario Department of Mines, and went to Queens' for my Master's. Then, much to my adviser's surprise, I was accepted into Caltech to work on the Front for my PhD. Was it a boundary between two different terranes or were rocks of the Superior province metamorphosed into rocks of the Grenville (as the field work suggested)? Alas, my petrography turned up nothing more interesting than one possible grain of staurolite in one thin section. Not much for a thesis. But Rb-Sr isochron geochronology was in its infancy and sounded just what I needed to test the nature of the Front. I managed to convince Gerry Wasserburg to let me into his lab, and I got initiated into one of the frontiers of geology. Thanks to him and to rocks that had behaved themselves isotopically, I was able to demonstrate that rocks of the Superior Province about 2.5by old had been metamorphosed at about 1by into rocks of the Grenville Province!

Meanwhile, an Irish lass turned up at Caltech to do research and came by my office looking for directions, which resulted in Christabel and me being married in 1964. I also finished my PhD, and accepted an offer from the University of Minnesota, in Minneapolis. In the summers, I worked for the Minnesota Geological Survey on the rocks of the Minnesota Valley, which led to finding some cordierite-anthophyllite schists that I thought might have been left over from partial melting. So I badgered Stuart Agrell, visiting from Cambridge, and he said, "Why don't you quit speculating and try to show whether that's possible". This resulted in the first P-T petrogenetic grid for partial melting of pelitic rocks, and set me on course for a career in melted mud. Meanwhile, I'd met up with this chap, Ojakangas, from UMD, first at Lake Vermilion, and then at the first Wasatch-Uinta Field Camp in 1967. A year later OJ said, "Why don't you come up to UMD. We've an opening in metamorphic petrology", and he coaxed us to come up for a look-see. The whole department came over to the party that Dick and Peaches threw. These folk clearly enjoyed each other and the work they were doing and I thought this is what I've been missing! So in 1969, Christabel, Fiona, Ian and I moved to Duluth.

What a great place to bring up a family and what a wonderful place to work! In the department, I loved teaching gourmet geology and theoretical petrology and eventually, aqueous geochemistry, and of course field camp. I found that I really liked helping students to understand problems and processes, as opposed to dinning facts into them, and treasured the occasions when a student would see the light and say "Wow! It works!" Some



of my graduate students became good friends and colleagues, and it was a pleasure to see them stretch themselves and blossom, whether they went on with geology or not.

In 1976, Christabel and I became naturalized U.S. citizens, and Peach and Dick hosted a moving and unforgettable party for us, convincing us that we had done the right thing in coming to UMD and in joining such a wonderful group of our fellow citizens. Then we left for a sabbatical in Germany, where I was to do experimental melting with Professor H.G.F. Winkler. The only problem was that he had not told me he had retired, and perhaps I could work with Edgar Hoffer, who would be back in November. So I'd plenty of time to do library work on melting mud, and develop an orgy of grids. (This turned out to be the basis for an invited chapter on pelitic migmatites that came out in 1985 and allowed me to get them out of my system.) Edgar and I did accomplish some experimental melting, and he invited me to go to Namibia with him sometime. Ian and Fiona went to the local German school, and Christabel got a bit house-bound. So it was a good thing when the family went off in our VW camping bus for a trip to Berlin or Vienna or Paris, the Danube or the Mosel, skiing in the Dolomites or spending Christmas with family in England. It took until 1980 for a trip to Namibia to gel, but it was absolutely stunning with new excitement every day, from migmatites to gemsbock to sunrise stealing over the Namib Desert. I was determined that Christabel had to come here, and we made it in 1989 for our 25th anniversary and Namibia's independence. In the fall of 1980, the family packed up again and was off to England for a year, to start UMD's Study in England programme at the University of Birmingham. This was a brainchild of Bob Heller, but the Birmingham connection was through Christabel's sister, Niki, a headmistress in Rugby (where the game comes from). The programme is still going strong, a life-changing experience for the fifty or so students who go each year.

While we were in Germany, Ron Frost took over our house and dog and my job. (Just as well Christabel came with me.) In 1979, Ron sent me a rock from Wyoming and asked if I'd I like to work on this. So en route to my last of eight sessions as director of field camp, I stopped off in Laramie and walked over the most gorgeous migmatites I'd ever seen. For the second time, I had the chance to work on world-class rocks! The country rocks had been regionally metamorphosed to amphibolite facies in the Archean and then thermally metamorphosed by the Laramie Anorthosite Complex 1.4by ago. Nothing much happened since except uplift and erosion, so there was an almost unique opportunity to find textures and mineralogy that were formed in the melting event. The project was funded by NSF in 1981, and I had about ten years of support to work on the mapping (with Ian as my invaluable field assistant), petrography, theoretical petrology and eventually experimental melting of a Laramie rock - very satisfying to do the whole thing, which was published in 1990. I think this was the first time that partial melting had been proven by experiment.

With Fiona and Ian safely in college, we decided that it was time we had a lake place, so we hunted for a suitable cabin, didn't find one, bought a lot on Lake Nebagamon in Wisconsin, and our dream cabin metamorphosed into our dream home. We moved in 1993 and it's great! This turned up trumps - marvelous for our latent creative genes. The proof of the pudding is that Ian and Fiona and our honorary Russian son, Sergey, and their spouses come up for R and R as often as they can.

My eight years as department head started with dark clouds of pending retrenchment, saw the successful start of the Large Lakes Observatory, under Tom Johnson, and ended with the coup of hiring both Christina Gallup and John Swenson. I finally got back in earnest to my experimental melting, and in the meantime Roger Powell's THERMOCALC had evolved and in 2001, for the first time, it was possible to calculate model grids for melting reactions. I thought that my experimental results could provide a nice test of their model, and went over to Melbourne to talk this up, and to visit many of the localities and people involving migmatites down under. A fabulous trip, in which I was joined by Christabel at the end, and we jaunted from snorkeling on the Great Barrier Reef to shining wombats on Tasmania. My paper on liquid compositions in experimental melting of pelitic rock, much enhanced by a couple of critical and constructive reviews, finally came out in February.

In June, I got back to working with the THERMOCALC folk, and we are using my now reasonably intelligible results to refine their model and that keeps the grey cells active. It is a real privilege to volunteer at the Bong World War II Heritage Center in Superior, where Christabel is director, and to work with the "Greatest Generation". And, I enjoy keeping our mini-estate at Nebagamon somewhat in shape - that has never seemed to be work. We spent three superb weeks in Scotland this fall, including getting back to roots on the Moine Thrust, and taking in the Edinburgh Tattoo for the first time. We've plans for Ireland next year, and probably a spot of skiing

in the Rockies in the spring. But first we're looking forward to our first grandchild, courtesy of Ravi and Fiona, and perchance our priorities will change. Retirement is great: low stress, flexible schedule, no raises to fret about, and, with Tim, Vicki and John joining us, it is so satisfying to leave the department in such good shape. It was a great place to be when I joined and it's certainly a great department now!

Faculty and Students Participate in Dinosaur Project

Dr. Tim Demko and UMD Geological Sciences undergraduate students Sara Kubarek and Emily Swor participated in a National Science Foundation Research Experience for Undergraduates this past summer. This project combined field and laboratory work to study a Wyoming dinosaur site. The project's goal was to develop a broad understanding of the



Undergraduate research students, Sara Kubarek and Emily Swor, at work excavating Jurassic dinosaur remains in the Big Horn Basin of Wyoming.

ancient environments and fossils represented there. The National Science

Foundation has provided funding for ten full-time undergraduate research appointments to work at the site for three field seasons (2004 - 2007). The field locality is near Shell, Wyoming along the western slope of the Big Horn Mountains, on property administered by the Bureau of Land Management. The site, which has yielded a Camarasaurus skull and neck vertebrae, is adjacent to a privately held fossil site that has produced numerous fossils, including Allosaurus, Torvosaurus, and Stegosaurus. The participants collaborated with faculty (Dr. Brian Bodenbender of Hope College and Dr. Mark Uhen of Cranbrook Institute of Science, in addition to Dr. Demko) to design research projects that focused on specific aspects of the fossils or sediments at the site. The different topics that contributed to the overall goal of understanding the site's paleoenvironment included studies of dinosaur anatomy, sedimentary deposits and structures, plant remains, and the trace element chemistry of fossils and sediments.

A new vertebrate preparation lab is being built inside one of the large display cases on the first floor of Heller Hall. Sara and Emily will be finishing the preparation of the dinosaur fossils they found and excavated this summer in this lab and will be demonstrating to all of UMD our excitement about this project. Please stop by to see the products of their efforts!

Howard Mooers Receives Distinguished Teaching Award



In April, Howard Mooers received the coveted Horace T. Morse Alumni Award for Outstanding Teaching of Undergraduates. Following is the citation from the Awards Ceremony Program: "One of Howard Mooer's students got her introduction to the geology of coral reefs when she jumped off a boat into the warm waters of the Florida Keys. Mooers also helps students immerse themselves in the excitement of geology by leading field trips to Iceland and the Bahamas, among other places.

A specialist in glacial geology, Mooers brings his subjects to life, including the material in his introductory geology and astronomy courses. Few students enter UMD expecting to major in geology, but many switch to the field after taking a course from Mooers, and this infusion of "converts" has been a pillar of UMD's geology major. Mooers has taught eleven courses in the past three years – all of them new during that time frame.

Mooers is credited with turning a fledgling program in hydrogeology and environmental geology into a rigorous academic environment for students. He co-founded UMD's interdisciplinary Environmental Studies Program, which he co-directed for five years. He involves undergraduates in real-life research and sees that they have the support to finish projects and present their work at scientific meetings. His closeness to students shows in their habit of calling

him Howard. Says one, "On the first day of class, Howard put up a picture of the Race Tracks in Death Valley, smiled, and asked, "How did this form?" Nearly the entire hall got involved in a discussion. At the end of that semester, I switched my major to geology and signed up for another of his classes." Way to go, Howard!

GEOLOGY CLUB

So far, 2004 has been a busy year for the Geology Club, with many events for our members, including bowling nights, game nights, and pot-lucks, as well as the traditional trip to Camp Du Nord. The year started off with the annual club trip to Du Nord. Several of our members went on this trip, and thanks to Mother Nature, we were able to enjoy many opportunities for snowshoeing along with other enjoyable snow activities. As the year progressed, we had numerous opportunities for the club members to socialize and get to know each other. We had bowling nights at area bowling alleys, which seemed to be the most popular club activity, along with pot-lucks and social gatherings which were attended by many of the members. In April, about ninety 4th graders took over Heller Hall as part of the annual 4th Graders Geology Week. Club members taught the kids about rocks and minerals as well as how a volcano actually works. Since the club is also committed to giving back to the community, we have a two-mile stretch of U.S. Highway 2 to clean up as part of the Adopt-a-Highway program, which we do in early May, and again in mid-October. The semester ended on a high note with the annual Spring Banquet at Lafayette Square on Park Point. This was a great night of fun-loving geologists reliving the most entertaining moments of the year with the annual slide show and announcement of the new club officers for the 2004-2005 year. For many of the students attending it was also an opportunity to say good-bye to the faculty who have been a major part of our time here at UMD, including Dr. Jim Grant who retired at the end of the semester. The 2004-2005 school year started out with the annual Fall Picnic, and once again tradition held - the picnic got rained on as usual. Even with the rain, we still had a good turnout and fun grilling burgers and brats at Chester Bowl. The club has many new members this year, and where the club is headed is in their hands. Hopefully the club will continue its activities, giving back to the community, and having fun.

Matt Riederer

TWO VIEWS OF FIELD CAMP 2004

Field camp 2004 was one for the record books. There were seven universities that made the long journey in uncomfortable vans (halfway across the country) to join in the fray. Forty-three of us from Iowa, Minnesota, Wisconsin, Michigan, Illinois, and Kentucky participated in six short weeks of G.B.T. (Geologist Basic Training), where we honed our field skills while being introduced to the rigors of our chosen profession: steep hills, rock slides, high altitudes, long days, unpredictable weather...it was all par for the course and all taken in stride. The stay at the Chateau Après was enjoyable, most of the food was good, and our hosts, Ed and Jason Hosenfeld, were excellent. We discovered many new and exciting things in the Park City area, like stunning mountain vistas and inconceivable geologic formations. It was spectacular! The faculty was also outstanding. Andrew Wulff was the director once again this year, and eight additional part-time instructors including our own Tim Demko, Ron Morton, and the best T.A. ever, Adam Hoffman, attempted to mold our young minds into those of wise old geologists. The field trip to Grand Teton National Park was remarkable. The scenery is breathtaking, the opportunities for recreation are limitless, and the rock shop in downtown Jackson is a must see with specimens that rival those of Chicago's Field Museum. Additionally, those of you who share a passion for fly-fishing should be informed that the Provo River, a world-class trout stream, is only 15 minutes from Park City---bring your gear and see the guys at "Trout Bum 2." All things considered, field camp was an exceptional experience that was well worth the time and hard work required. We all made new friends, gained geological insight, shared beverages and shuffleboard at the "No Name Saloon" and had a great time overall.

Chris Frazer

I have never had a more intense six weeks of education! The first two days I saw more rocks and landforms than I had seen in my entire life. We drove around the Salt Lake Basin, stopping to talk about igneous rocks, metamorphic rocks, sedimentary rocks, and glacial and fluvial features. It served as a great introductory and background lesson for the mind. It did not, however, do anything to prepare the body for the "boot camp" it was to receive for the duration of field camp. Let's just say that I can remember feeling high in more than one way after hiking up some of those peaks near 10,000 feet. And then there was the two-day trip to the San Rafael Valley. I have never seen a more beautiful landscape! Spanning as far as my eyes could see was a green river valley that had sliced its way vertically through thousands of feet of alternating yellow, red and orange layers of cross-bedded sandstones. (At the time I was mostly thinking "ooooooh...pretty.") Later that evening, Tim Demko took us to our campsite in a very roundabout way that included navigating sage brush and boulders. When we finally got there, the general consensus of the campers was that it was time for some refreshments. (The professors agreed.) Sleeping with nothing but the stars over our heads was the perfect way to cap off the trip. A couple of long, gruelling weeks later, I saw the Tetons for the first time. This four-day extravaganza was one of the best vacations I've ever had. White water rafting, fly fishing, wilderness hiking and tours of Yellowstone were just a few of the activities available. I should probably make this disclaimer: field camp was not just one big vacation. It was a lot of hard

work in the field and long hours in the study lounge. But after completing field camp, for the first time in my life I felt like I was ready to enter the work force and succeed as a geologist.

Josh Dark

ALUMNI NEWS

Anderson (Hattenberger) Suzanne, BS 04, is working at EMR, Inc. in Duluth. Sue married Matt Anderson in September 2004. Their address is P.O. Box 397, Carlton, MN 55718.

Armitage, (Drews) Sally, BS 89, is expecting a baby girl just in time for Christmas. Her address is 27677 Camargo Drive, Golden, CO 80401.

Aronson, Jason, BA 99 and **Diedrich, Tamara**, BS 99, welcomed their first child, Sofia, in September 2004. Tami continues to work on her PhD and Jason works as a geologist for LFR. Their address is 4533 East Devonshire Avenue, Phoenix, AZ 85018.

Barnes (Dykhuisen), Teresa, BS 94, received a Bachelors degree in Civil Engineering at the University of Cincinnati. Teresa spent time in San Antonio, Texas and has recently moved back to Ohio with her daughter. She is now working for Butler County, Ohio in their Engineer's Office. Teresa reviews commercial site plans and does some design work in regard to grading and stormwater management. Her address is 5708 Crestview Drive, Fairfield, OH 45014.

Boerst, Kevin, BS 99 (MS University of Witwatersrand) has moved to Ely and started his own silver smithing business called Oroubours Silver & Stone. His address is P.O. Box 133, Ely, MN 55731.

Carlson, Lindi, BA 03, had a gallery show and reception for her wood-fired teapots and tea bowls at the Blue Lake Gallery in Duluth. Her address is 731 East 1st Street #7, Duluth, MN 55805.

Carlson, Kurt, BS 99 (MS Western Michigan University), had been working for AKT Peerless Environmental Services in Michigan but has moved back to Duluth and is employed with Twin Ports Testing. Kurt's address is 445 East Oxford Street, Duluth, MN 55803.

Coupland (Husby) Karen, BS 77, went on to grad school at the University of Michigan where she met her husband, David. She worked as a research assistant in a benthos lab and as a chemical metallurgical technician before taking time to raise her two sons, Dan (20) and Ben (18). Karen is now a yoga instructor. She has good memories of the department, the students and field camp. Her address is 804 Mt. Vernon Avenue, Ann Arbor, MI 48103.

Craig, Andrew, BS 98, has been attending the University of Wisconsin – River Falls, finishing up license requirements for teaching middle/high school science. His address is 5555 Osgood Avenue S, Afton, MN 55001.

Evavold, Glenn, Adjunct Assistant Professor, retired from RLK-Kuusisto, Ltd. last December. Glenn taught courses in surveying and hydrogeology at UMD from 1987 to 2000. Glenn and his wife, Peg, enjoy traveling and spending time with their grandchildren. We wish Glenn all the best. His address is 401 West Arrowhead Road, Duluth, MN 55803.

Fritts, Melissa, BS 99 (MS University of Minnesota Duluth), is an environmental, health and safety specialist for Medtronic, Inc. in Shoreview, Minnesota. Her address is 6445 Christenson Lane NE, Fridley, MN 55432.

Goodner, David, MS 75, was with Mobil Oil for 25 years before he retired. Dave opened Mobil's office in Kazakhstan in 1994 and was VP of Operations until Exxon bought Mobil in 2000. Dave then joined Texaco as President of Exploration, Production & Marketing until Chevron bought Texaco and he retired again in 2002. Now he "just enjoys life" with his wife, children and three grandchildren. His address is 529 Edinburgh Lane, Coppell, TX 75019.

Goshey, Stephanie, BS 04, spent the summer in Wyoming working for Western Watersheds Project as a Student Conservation Association intern coring river sediment to determine stream health from the impact of cattle/sheep grazing. Steph is considering grad school. Her address is 218 East Main Street, Crosby, MN 56441.

Granley (Zapp), Melinda, BS 98 (MS University of Minnesota Duluth) completed her Master's degree in Water Resources Sciences this past fall and is working for the South St. Louis County Soil and Water Conservation District. Her address is 5312 Oneida Street, Duluth, MN 55804.

Grape, Tim, BS 98, is an environmental geologist working for STS Consultants, Ltd. Tim's address is 1593 Lois Drive, St. Paul, MN 55126.

Grygo, Andrea, continues to work on her Master's at the University of Maine. She was back in Duluth this

past summer and was able to enjoy some sailing when not working on her thesis. Andrea and her fiancé, Steve,

are also busy planning their wedding for next year. Her address is 2 Wallace Lane, Orono, ME 04473.

Heiling, Carrie, BA 01, and **Keith Markeson**, BS 00, were married in August 2004 and moved to Salem, Missouri where they work for The Doe Run Company. Keith is a mine geologist working primarily underground and Carrie is a contract geologist working for the exploration division as well as the mining division. Their address is HC 82, Box 1141, Salem, MO 65560

Jahn, Bill, BS 99, is working for Environmental Troubleshooters in Duluth. Bill and Barb welcomed their third child, Eric, in May 2004 and recently moved into a new home. Their address is 5404 Otter River Road, Duluth, MN 55803.

Johanson (Lund), Jennifer, BS 85, is teaching at Alverno College in the Geology Department. Jennifer is married and has three children. They live at S36 W26780 Genesee Road, Waukesha, WI 53188.

Johnson, Leif, BS 00 (MS South Dakota School of Mines) completed his Master's degree in 2003. His research involved spectroscopy and remote sensing to map mineral alterations in gold deposits in the northern Black Hills. Leif is now employed with Cleveland-Cliffs, Inc. as a mining engineer and works in a department that does special projects at all of their six mines. His address is 1101 Maas Street Apt. #5, Negaunee, MI 49866.

Keef (Thorkildson), Jill, BS 96, has been working as a staff hydrogeologist at ProSource in Coon Rapids, Minnesota for the past six years. Jill does phase I and phase II site assessments. Her address is 321 Hillcrest Lane, Burnsville, MN 55337.

Lachance, Eric, is working for Falconbridge in Sudbury, Ontario. Eric and his wife, Patricia, welcomed Samuel Noah, in December 2003. Their address is 1118 Arthur Street, Sudbury, Ontario, P3A 3C4, Canada.

Lambert, Brett, works for Wells Fargo in the home mortgage department. He has fond memories of hikes, mapping and trips up the North Shore. His address is 2206 California Street NE, Minneapolis, MN 55418.

Larson, Phil, BS 93 (MS Dartmouth) and **Katie (Peukert) Larson**, BS 94 (MS Washington State University), have moved to Alaska. Katie is a staff geologist at Golder Associates and Phil is finishing up his UMD PhD thesis work and doing various exploration, glacial and hard rock consulting jobs. Their address is 9540 Morningside Loop #103, Anchorage, AK 99515.

Leveinen, Jussi, MS 94, is working as a senior geologist for the Geological Survey of Finland. His email is jussi.leveinen@gsf.fi

Levy, Eric, MS 91, is working for SGS North America, Inc. in the Minerals Services Division. Eric's address is 11028 N. Brownstone Drive, Parker, CO 80138.

Manley, Andrew, BS 80, is a colonel in the United States Air Force. He is married and has three daughters and still has fond memories of his geology experiences at UMD. Their address is 12501 Alexander Cornell Drive, Fairfax, VA 22033.

MacDonald, Kay, BS 83, is currently working as a science lab coordinator at her children's elementary school but, at the first of the year, will return to Seafloor Surveys International which designs and builds sonar systems that survey the ocean floor. They are currently building a new instrument that will survey 70 km in one pass with a depth of approximately 3000m water depth. Kay's address is 4402 NE 60th Street, Seattle, WA 98115.

McNitt, Jim, BA 74, spent seven years after graduation with the United States Air Force (ROTC) before returning to UMD and taking classes in computers and science teaching. He now works as an electronic tech for the United States Postal Service at the Remote Encoding Center in Duluth. His address is 9231 Brook Street, Duluth, MN 55810.

Musielewicz Jim, BS 96, and **Sylvia (Barry) Musielewicz**, MS 01, Water Resources Sciences, have moved back to Seattle. Their address is 9848 44th Avenue SW, Seattle, WA 98136.

Neisse, Jeff, BS 00, is working for Delta Environmental Consultants, Inc. in St. Paul, Minnesota. Jeff's address is 5571 Mahoney Avenue, Minnetonka, MN 55345.

Noyes, Harold, BA 70 (PhD MIT), is the current Treasurer of the Society of Economic Geologists. While an undergrad at UMD, his interest was in economic geology. He was also inspired by the remarkable standards of service and volunteerism set by Professors Ralph Marsden and Don Davidson (who also were treasurers of SEG). Harold's address is P.O. Box 1186, Golden, CO 80402.

Perrault, Dan, BS 04, is attending graduate school at Vanderbilt University. His address is Peabody 590, 230 Appleton Place, Nashville, TN 37203.

Rantala, Heidi, continues work on her PhD at the University of Alabama. Heidi is working at the Arctic

Long Term Ecological Research Site in Alaska where she also did her Master's work. Her focus will be on insect communities on different-aged glacial tills. Her address is 1900 Rice Mine Road N, Apartment 810, Tuscaloosa, AL 35406.

Sampson, Thomas, BS 89, has been working as an environmental consultant for the past nine years with Timmermans Inc. in Grand Rapids, Michigan. Tom is married to Diane (whom he met at field camp from MSU) and they have two children, Paul (7) and Emily (5). Their address is 119 Elmwood NE, Grand Rapids, MI 49505.

Sherman (Thimke) Mary Jo, BS 86, has been working in the field of environmental consulting for the last fifteen years as an independent contractor. She and her husband, Dan, have two sons, Matt (6) and Ian (3). They live at 9099 Highway 33, Angora, MN 55703.

Stark, David, MS 01, Water Resources Sciences, and his wife, Stacey, welcomed their first child, Tyler, born in August 2004. In addition to embracing fatherhood, Dave has been keeping busy coordinating the building of their new home: a passive solar timber-frame incorporating solar hot water, solar electric, a whole-house water-recycling system and many green building materials.

Williamson, Anne, BS 85, is a water quality program manager for Phelps Dodge Corporation in Phoenix. Her address is 1219 East Seldon Lane, Phoenix, AZ 85020.

Wirz, Eric, BS 02, is working for the U.S. Department of Agriculture at its Superior National Forest Headquarters

in Duluth. His address is 425 North 17th Avenue E., Duluth, MN 55812.

Wittkop, Chad, PhD, 04, has moved to Maine and is doing a post-doc with Herb Wright and applying for teaching jobs. His address is 77 Elm Street, Apartment 51, Waterville, ME 04901.

Michael Carnes, BS 87, passed away September 29, 2004. He was 39 years old.



DO YOU KNOW WHERE THEY ARE???

Below is a list of alumni we've lost touch with this past year. If you have any information on how to reach these individuals, please drop us an email at: geol@d.umn.edu. Thanks for your help!

Charles Baker (76)	Thomas Specht (84)
Bruce Campbell	Chris Tonia (99)
Eric Ellefson (98)	Scott Turner (90)
Troy Flicek (99)	Lori Tuovila (01)
Doug Green (75)	Steve Vergeldt (86)
W. C. (92)	T. W. (86)

Additional Recognition

Odin Christensen (BS 1970) was recognized as an outstanding alumnus at the Third Annual Academy of Science and Engineering Dinner and Award Ceremony held at UMD on October 1, 2004. The Academy of Science and Engineering was established to give public recognition to distinguished alumni and special friends of the College of Science and Engineering, who have brought distinction to themselves through their participation, commitment, and leadership in their chosen profession.

Andy Breckenridge, graduate student, won the Outstanding Student Paper Award at Institute on Lake Superior Geology which was held in May 2004.

Isla Castaneda, graduate student, won the Outstanding Student Research Award presented by GSA Sedimentary Geology Division for 2004.

Jennifer Frikken, undergraduate student, was selected to receive a rock hammer donated by Estwing for her exceptional performance in Geologic Field Methods.

Adam Hoffman, graduate student, was runner-up for Outstanding Student Poster Award at Institute on Lake Superior Geology which was held in May 2004.

Scholarships and Awards

The *Outstanding Graduate Teaching Assistant Award* was presented to **Adam Hoffman** in the amount of \$200 for the 2003-04 academic year.

The *Outstanding Senior Award*, (Ralph W. Marsden Fund and the SME) is a \$750 award given to one or two outstanding graduating seniors, on the basis of scholarship. The recipients' names are engraved on a plaque that is displayed in the Geological Sciences Department. The recipients for 2003-04 are **Christopher Frazer** and **Jennifer Frikken**.

The *Hugh Roberts Scholarship* is an award given to the outstanding junior geology major, determined by scholarship. This award is given in memory of Hugh Roberts who was an internationally known consulting geologist from Duluth. **Adam Johnson** is the 2004 recipient of this \$600 scholarship.

The *SME Tools-Of-The-Trade Award* is given to outstanding sophomores on the basis of promise in the Mineralogy/Petrology sequence and Geomorphology. Awards are given to students in the form of \$200 worth of geological field gear. **Katie Beth Heimgartner**, **Adam Johnson**, and **Michael Taylor** were presented this award at the 2004 SME Minnesota Section Mining Symposium luncheon, which was held in the spring.

The *Roderick Syck Field Camp Scholarship*, established by his family in his memory, is awarded to the UMD student with the highest achievement at field camp each summer. **Daniel Perrault** was awarded \$500 for his efforts at Wasatch-Uinta Field Camp in 2004.

This past summer, all students who went to field camp received \$1,400 in scholarships. The funds are listed below.

The *Robert C. Bright Field Camp Scholarship* is given in memory of Robert C. Bright, who was a paleontologist in the Department of Ecology on the Twin Cities Campus. Professor Bright was instrumental in establishing the Wasatch-Uinta Field Camp in 1967 and was its first director, a position he retained until 1972. The 2004 recipient of this scholarship is **Matthew Riederer**.

The *Robert L. Heller Field Camp Scholarship* is in memory of Robert L. Heller, who founded the Geology Department and became Chancellor of UMD. Four scholarships were awarded to UMD geology majors attending field camp, on the basis of scholarship and need. The 2004 recipients were **Joshua Dark**, **Christopher Frazer**, **Jennifer Frikken**, and **Alan Phillips**.

The *Lempi M. & John W. Pagnucco Scholarship*, established by Lempi (Erickson) Pagnucco to support field camp expenses for UMD students, awarded scholarships to **Elizabeth Baresch**, **Crystal Gilbertson**, **Abbey Hudler**, **Daniel Perrault**, **Alan Phillips**, and **Matthew Riederer**.

The *"Rip" Rapp Field Camp Scholarship* awarded scholarships to **Elizabeth Baresch**, **Crystal Gilbertson**, and **Rachel Peters**.

The *Charlie Matsch Field Camp Fund* awarded scholarships to **Rachel Peters**, and **Matthew Riederer**.

Faculty and students in the Department of Geological Sciences and Large Lakes Observatory made eleven presentations at this year's Geological Society of America annual meeting which was held in Denver, Colorado. They were:

1. Dr. **Tim Demko** and undergraduates, **Sara Kubarek** and **Emily Swor**, along with other faculty and students, presented "Paleoenvironmental Analysis of a Morrison Formation Dinosaur Site, Bighorn Basin, WY: Conducting an Interdisciplinary Field Study through Disciplinary Tasks".
2. Dr. **John Goodge** presented a poster "Crustal Structure of Ross Orogen Revealed by Aeromagnetism and Gravity".
3. Graduate student **Roger Bannister** presented a poster "Comparison of AMS and Strain-Analysis Results: Resolving Shortening Directions in Low-Strain Rocks of a Fold-Thrust Belt".
4. Graduate student **Andrew Breckenridge** presented a poster "The Lake Superior Varves: Records of Ice Margin Dynamics and Eastern Lake Agassiz Overflow, CA. 10,600 to 9,040 CAL YBP (9.5 – 8.1 ¹⁴C KA)".
- 5-8. Undergraduate **Erik Gulbranson** presented or co-presented several posters: a) "Calcretes and Palustrine Carbonates as Indicators of Climatic Shift, Late Triassic and Early Cretaceous of the Southwestern U.S.", b) "Spring and Shout: A Comparison of Early Cretaceous Cedar Mountain Formation Carbonate Textures to Modern Spring Deposits", c) "A New Ichnospecies of Aquatilavipes from the Albian-Cenomanian Dakota Formation of Northeastern Utah", d) "The Early Cretaceous Buckhorn Conglomerate Paleovalley: Implications for Sevier Foreland Basin Development".
9. Graduate student **Margretta Meyer** presented a poster "Paleoglaciological Context of Rogen Moraine, Northeastern Minnesota".
10. Graduate student **Deborah Rausch** presented a poster "Patterns of Holocene Sedimentation in Western Lake Superior".
11. Graduate student **Kristin Riker-Coleman** presented a poster "Evidence of Rapid Tectonic Uplift in East New Britain, Papua New Guinea".

Our students have received many external awards this past year including:

Paul Albers (Grad): U.S. Geological Survey, National Cooperative Geologic Mapping Program (\$9,000)

Joe Beer (Grad): Colorado Scientific Society in memory of Wm. G. Pierce (\$500)

Isla Castaneda (Grad): GSA Research Grant (\$3,300)

Erik Gulbranson (Undergrad): GSA North-Central Section Undergraduate Research Grant (\$300)

Adam Hoffman (Grad): Newmont Student Research Grant from the Society of Economic Geologists (\$2,000)

Melinda Huff (Grad): GSA Research Grant (\$1,000)

Jere Mohr (Grad): American Association of Petroleum Geologists Grant-in-Aid (\$1,570) and Society for Sedimentary Geology Student Presentation Award for travel (\$400)

Marsha Patelke (Grad): Gulf Coast Association of Geologic Societies (\$1,000) and American Association of Petroleum Geologists (\$1,250)

Michael Rieser (Grad): Sigma Xi (\$1,600)

Joy Turnbull Dunham (Grad): GSA Research Grant (\$1,800)

2004 GRADUATES

BA

Crystal Gilbertson
Ryan Smith

BS

Elizabeth Baresch
Jill Flater
Jennifer Frikken
Stephanie Goshey

BS

Kathryn Hafertepe
Suzanne Hattenberger

Abbey Hudler
Luke Johnson

MS

Diana Kniebush
Daniel Perrault
Daniel Phelps

Darin Albrecht (WRS)
Greg Joslin

Lisa Marlow

PHD

James Russell (EEB)

Chad Wittkop