

Geology News

A Report to Alumni and Friends

Department of Geology, The University of Montana
2003

Fall

MESSAGE FROM THE CHAIR

Steven D. Sheriff

There are a-periodic crystals, quasi-periodic depositional events, noncyclic changes in the magnetic field, and chaotic distributions of earthquakes. And then there's our newsletter; we only threaten to make it annual. We missed a couple, next year remains to be seen. But the news has been piling up, along with the entertaining comments, donations, postcards, and corrected addresses that alums keep sending in.

The last two academic years brought some big changes in faculty and staff positions and there are more coming up this year. In 2001, both Ian Lange and Dave Alt decided to retire. It is a select group who get this newsletter and who did not learn something from Dave or Ian.

Dave Alt joined The University of Montana Geology faculty back in 1965 following a stint at the University of Florida. In the following 37 years he taught a spectrum of geology classes from geochemistry to the summer field course. In 1971, Dave was designated The University of Montana Teacher of the Year. Sometime during Dave's tenure he gained infamy for binocular-based roadside geology. Among graduate students, Geology 501 (a.k.a. "Lunch with Dave") gained its own share of notoriety. Dave's field observations, trips about Montana, and creativity gave birth to the *Roadside Geology* series and, along with Don Hyndman, Dave produced books on various western states. And they've been the editors on many more, some of you being among the authors. Dave's latest trade book, *Glacial Lake Missoula and Its Humongous Floods*, is a regional best seller. At least some of you were attracted into Geology directly through Dave's intro course. Dave is currently on a post-retirement contract, teaching upper division classes. So, if you gained something from Dave, send him a postcard--I know he'll appreciate it.

Ian Lange retired from UM after a mere thirty

years of research, teaching, and service. Ian's publications ranged from first-authored papers in *Science* regarding infrared surveys to predict volcanic eruptions to a coffee table book on Pleistocene megafauna. Bracketed between those end members is career-length international recognition in exploration for, and understanding of, metallic mineral deposits--a field where Ian sat on the editorial board of the discipline's most prestigious journal, *Economic Geology*. UM recognized Ian's scholarly accomplishments with The University of Montana's Distinguished Scholar Award in 1998. Ian's classes ranged from *Earthquakes and Volcanoes* to *Environmental Effects of Metallic Mineral Deposits*. Whether mapping isolated terrain in Alaska for the USGS, deciphering hydrothermal alteration in the Peruvian Andes, teaching freshman geology, working with students in the field, chairing the department, serving on NSF review panels, or dominating his age group in foot-races throughout Montana, Ian's infectious (or perhaps I should say infected) sense of humor elevated the experience of his colleagues and peers. Ian is also on a post-retirement teaching contract so drop Ian a card and razz him about retirement too.

On the staff side, Jim Bigley, our electronics and computer technician, left UM in the summer of 2001 for enhanced career opportunities running his own business. Not as many students got to interact with Jim as with Dave and Ian but among several of us in the department Jim was an entertaining source of knowledge of all things electronic and mechanical. Jim built prototype equipment used throughout our spectrum of geological experiments, and worked on the equipment distributed among our geophysical, geochemical, x-ray, and groundwater labs. As the desktop computer industry began and evolved, Jim got to build his expertise and knowledge directly parallel to the growth of the hardware and software in that industry. Jim built early computers from kits before the Wintel revolution and later built PCs from parts and upgraded OEM boxes, all the while keeping up with Microsoft's operating systems. Those changes in operating systems lead to web developments. A cracked cylinder head in his GM 6.2L diesel lead to a repair in his

shop and a short note on his web page regarding cracked cylinder heads. Jim is now a successful entrepreneur running a web site centered on GM diesels with a growing, international subscriber base. If you've got 6.2 – 6.5L diesel motor and have questions, Jim is the man.

A couple shorter-term technicians also left for different opportunities. Anna Breuninger had been our GIS technician for a year or so before she left in 2001 for a teaching job in Missouri. Anna's now deep into a Ph.D. on paleoclimate research at the University of Washington. Temple McKinnon was our Laboratory Manager for about the same time span. Anna and Temple were both graduates of the department and exceptionally fun, conscientious, and rewarding people to have around. Labs and GIS work were zipping along nicely with Anna and Temple in charge. We miss them but can't blame them as they both went on to new challenges.

Change helps keep departments alive. On the staff side, we decided to collapse our traditional three staff positions, Lab Manager, GIS Technician, and Electronics Technician, into two better-paid positions, an enhanced Lab Manager position and a GIS-Computer Administrator position. Heiko Langner, our Lab Manager, has been with us for a couple years. Heiko came to UM from a similar position at Montana State University and has the geochemical labs operating so smoothly that Johnnie has been expanding them. Brian Collins, a departmental alumnus, is providing an ever-increasing amount of network and computer service as well as supporting and developing GIS applications for students and faculty. Last month, Donna Smith joined us as a technical specialist to operate an ICP-mass spectrometer facility that Johnnie is developing with colleagues in Chemistry and Toxicology. In August of this year, Manny Gabet joined our faculty. Manny left a post-doc position in Santa Barbara to be our geomorphologist. Manny has a lot of experience in hillslope and fluvial processes, will be teaching classes and leading research around those topics, and has been exploring the mountain biking around town. But don't let the changes scare you. Stop by and you'll still recognize a number of us.

In the spring of 2002 we held our first undergraduate research conference. We call it Rocky Mountain GeoDays, and you can check it out at: http://www.umt.edu/geology/GeoDays_03/GeoDays_Home.htm. This is an undergraduate organized and operated research conference which has been a huge success. A number of students get a lot of credit for these successful events, but Shishona Thurston and Tracy Iob, the past conference leaders, really went the

extra distance in terms of work and commitment. At its second offering, we had student presentations from as far away as Colorado. It happens in April, there is a lot of student involvement, and we think it is an outstanding way to get and keep undergraduates involved in their own research efforts. Watch the calendar and stop by if you are around town for the 2004 conference--I think you'll be impressed.

Getting students to professional meetings to present graduate or senior theses is something we believe in and strive for. Using a portion of your donations enables us to defray student expenses so they can attend GSA, AGU, NWMA, ACS, and AAPG meetings. A van full of students just returned from the annual GSA meeting in Seattle, and a few more will be presenting at the AGU meeting in San Francisco. Someday, when somebody is feeling particularly generous, we hope to have an endowment to support field trips, student trips to meetings, and student field work.

By now, you know the pitch is coming; my hand is out--your donations assist students. We use your donations to support student research, field trips, small scholarships, and educational and instructional materials. If your pockets are really deep, think about endowing a field trip fund or a lecture series. You keep helping us and we'll help the students.

One way to contribute, besides sending me all your money, is to work in a stop at UM during one of your trips. Visit the department and give us a seminar on your recent career work or research. We do not get nearly enough speakers from the commercial/industry end of geology. We do not have a speakers budget and visiting speakers is one of the best ways our students learn about what really goes on when they go to work in geology. As it turns out, this request is slowly becoming more successful. Check out our seminars list at http://www2.umt.edu/geology/News_Information/guest_speak.htm and you'll see several alumni among the speakers. This works great for us, particularly when we get speakers from industry as they are generally harder to attract and yet give our students a great taste of what really goes on behind the desk and/or workstation. Recent talks from UM Geology alums include: Mark Lorang (Flathead Lake Biological Station), Dougal McCarty (Texaco), Joe Leimkuhler (Shell Oil Company), Mark Cunnane, (Western Groundwater Services), Kenn Wells, (British Petroleum), John Wheaton, (MT Bureau of Mines and Geology), Derek Sjostrom (MSU-Billings), Lynn Dickman (USFS), and Muhammed Farooqui (University of Baluchistan)--thanks! Of course, there's always room for more!

Finally, If you need a temporary lab, field or office assistant, think about hiring one from UM. And if

you have an appropriate, isolated problem that needs to be solved maybe it would make a good senior or M.S. thesis. Have fun--we are.

What are the Faculty and Staff up to?

Brian Collins

Well, I'm pleased to announce that I'm back in the department, this time on a professional level. After I graduated from Geology with my B.A. in 1998, I took a couple years off to regroup. In the fall of 2000 I enrolled in the M.A. program in the Geography Department with an emphasis in GIS and cartography. During my masters work, I was employed by the U.S. Forest Service in the Lands and Minerals Division as a GIS specialist. I graduated from Geography in 2002, and in an ironic twist of fate, the Geology Department happened to be advertising a position for a GIS / Technology Specialist. Much to my chagrin, my one-time professors have now become my co-workers!

In the year and a half that I've been working in the department, I've been involved in countless projects related to GIS and the geosciences. I primarily serve as technical assistant to students and faculty with regards to implementing GIS into their research. I've also adopted the departmental role of "the computer guy," which seems to work out well since I spend 99% of my day working at the computer! In the spring of 2002 I took over the position of GIS Technical Contact for the College of Arts and Sciences. This position is administered by the university's site license with ESRI, a company which currently dominates the GIS industry. I generally spend a couple of hours a week helping other departments on campus understand the finer points of all things Arc! Needless to say, it keeps me on my toes with regards to GIS. In addition to my technical duties, the department affords me the opportunity to collaborate in research projects. I'm currently working with Jim Sears and master's student, Ryan Portner, on implementing geoscience data models in a GIS environment. We'll be presenting our research, entitled "Implementation of a geologic data model: Plains 30' x 60' Quadrangle, Western Montana," at the annual GSA meeting this fall in Seattle.

Manny Gabet

I'm the newest addition to the Geology Department faculty. I received my Ph.D. at UC Santa

Barbara studying hillslope processes and I also did a year of post-doctoral work there investigating the links between climate, tectonics, and erosion in the Nepalese Himalayas. Because a river runs through it, my focus in Missoula is shifting from hillslopes to fluvial processes. In particular, I'm interested in investigating how rivers deal with large, sudden pulses of sediment. Does the sediment travel as a coherent wave downstream? Does it slowly disperse? Who knows? That's why it's so interesting. Erosion of the burnt hillslopes ringing Missoula will likely deliver large, nearly instantaneous pulses of sediment that I plan to track as they are routed downstream.

Marc Hendrix

It's been a couple of years since the last newsletter and quite a bit has happened. Probably the biggest development is that the new research program I've been establishing with Johnnie Moore is really taking off. We're looking at the record of sedimentation in Flathead Lake as a means of understanding paleoclimate change in the northern Rockies since the last glacial maxima. This project has involved analysis of a variety of data sets, including a close look at a bunch of 3.5kHz seismic data Johnnie and his students collected back in 1980, the recovery of a suite of long piston cores from the lake, and a fair amount of good, old-fashioned onshore geologic mapping. What we're finding is that there appear to be several significant lake level fluctuations in the Holocene that likely are related to evolving paleoclimate. We're also finding that seismic activity on the Mission Fault really was a significant influence on both geometry of the Flathead basin and the nature of sediments within the lake--the normal "background" suspension settle-out style of sedimentation is periodically interrupted by mass wasting events that correlate chronologically with a couple of paleo-seismic ruptures others have documented from trenching studies of the Mission Fault. All and all it's pretty exciting stuff.

This new Flathead Lake project has meant a significant turn-around in the students I'm working with--most are relatively new. A couple of my "earlier generation" MS students finished up since the last newsletter went out. Andrew Urie completed a nice study of the Triassic Chugwater Group down around the Wind River Mountains. Andrew's now working for Nance Petroleum over in Billings as their staff geologist. Jessie Mitchell put the lid on his thesis last year, finishing up a detailed stratigraphic analysis of Cretaceous and Tertiary syn-orogenic units in the Big Horn basin in Wyoming. Last time I saw Jessie, he had his skis over his shoulder and was heading to Alaska.

Brigette and I continue to enjoy life here in

Montana. She's managed to get me into dancing (everything from jazz to various ballroom styles); meanwhile, I'm working on getting her more into hunting.... Feel free to give us a call if you'd like to do either (or both) on your next trip through Missoula.

Nancy Hinman

Over the past years, Nancy Hinman and her students have studied aspects of thermal spring chemistry, hydrology, and geology. After serving as Geothermal Geologist for Yellowstone National Park for a year, Nancy returned to UM. Turns out that the government is even more insane than you think it is. At any rate, Nancy, along with Bill Woessner, directed graduate student, Matt Vitale, and undergraduate student, Payton Gardner, in studies of the geochemistry and hydrogeology of a small thermal drainage in Yellowstone. Their work confirmed results from past graduate students, Jenni Esser (DeMonge) and Matt Gibson, that the unusual armoring of thermal springs in Yellowstone is a consequence of groundwater surface water exchange. Armoring occurs along losing stretches of thermal streams and is a seasonal event. No doubt such armoring influences scaling of those channels on Mars. Although still without enough frequent flyer miles to get to Mars, Nancy Hinman continues to study the biogeochemical reactions occurring in the thermal springs of Yellowstone and elsewhere.

Don Hyndman

I spent most of my non-teaching time continuing to work on my "Natural Hazards and Catastrophes" textbook, a project that seems endless. I am, however, now working with son Dave at Michigan State and the collaboration makes it even more fun. It is almost complete and ready for the publisher. I have learned far more than I knew existed about various aspects of geology and hazard-related things. The project has also provided a great excuse to travel to places that I had no previous intentions to visit; all were worthwhile and really interesting, including South Carolina, Texas, central Colorado, California, Oregon, Acapulco, and southern Florida. Teaching an introductory class with emphasis on natural hazards has been great! And with photos of various hazards and disasters so important to the subject, presenting them with power point makes it easy to integrate the images directly into the lectures.

One area subjected to multiple visits was coastal California. It has been amazing to watch where people build in high hazard sites. It has also provided,

of course, the opportunity to take a breather for tasting at the occasional winery. For example, in Pacifica, just south of San Francisco, we have watched coastal cliff-top houses progressively succumb to cliff collapse over the last three or four years. Along the southern California coast, people build on obvious old landslides and then blame various others when their house falls apart. They also build or buy right on the beach, sell after a couple of years when it becomes apparent that it was not a smart place to live, and someone else buys the house to start the cycle all over. It would be entertaining if weren't for the tragedy of people's huge financial losses, since insurance is not available for landslides.

A short but fun excursion was a field trip for a few days to the central Oregon Cascades with students from my graduate volcanology seminar last fall. It was a bit of a whirlwind trip since people had to get back for various classes but we saw some great geology.

The biggest change (not yet finalized but almost certain) is my plan to retire in June, 2004. After 40 years (I can't believe it has been that long!) it seems time to change emphases. It will provide more time and flexibility for Shirley and me to travel to see parts of the world that we haven't been to and to go back to places like southern France, Spain, and Portugal that we really enjoy. I plan to continue to write but to also have more time for leisure activities including hiking, cycling, and reading.

The change comes with mixed feelings. It has been a terrific career here at UM and I hope to see more of my many former students and colleagues in coming years. I plan to teach my Natural Hazards and Disasters course each spring semester for the next three years and expect to spend some time in the department and lots of time at the library. I am still very much interested in petrology but natural hazards has grabbed more of my attention and interest in the last three or four years.

Ian Lange

I am now in the second year of my post retirement teaching and can only say that one is never too young to retire. So start thinking about it because retirement gives you time to do many of the things you always wanted to do such as more research, book writing, traveling, and/or trying to improve your golf game. Lately, fortunately or unfortunately, my involvement in city government is taking more time than I would like. When not attending city and UM committee meetings I am trying to write a couple of books and investigate some U-rich volcanic rocks located in western Montana. Seasons Greetings!

Heiko Langner

I am directing what is known as the Murdock

Environmental Biogeochemistry Laboratory (MEBL), and we are finally planning to change the lab's name so it will better reflect who we are: UM Geology Analytical Laboratory. The lab provides facilities for sediment and water analyses for students and faculty campus-wide. We support research projects in which students learn how to prepare their samples for analysis, determine the contents of C, N, various ions and a wide range of environmentally significant constituents found in waters and sediments. In addition, we conduct contract analyses for off-campus entities such as the Missoula County Health Department, the National Park Service, and the US Forest Service, as well as for private persons and companies. Johnnie Moore has been essential in starting and maintaining the lab, and he just landed another half-million dollar grant to build a clean lab which will be housed in our department. In the new facility, we will have an ICP-Mass Spectrometer and a mercury analyzer for extremely low-level environmental analyses.

I can't complain about a lack of analytical and management work, so I haven't found much time yet for research projects of my own that would continue my doctorate and postdoc work at MSU in Bozeman. I am hopeful though that my expertise in arsenic biogeochemistry will come in handy for future projects concerning the Clark Fork River/Milltown Dam remediation.

Besides that I am trying to keep up with the department's newest faculty member, Manny Gabet, mountain biking the trails around town. We have already topped a number of the surrounding hills, but there are more to go before the snow gets too deep. At home, three children make sure that my wife and I won't run out of things to do.

Johnnie N. Moore

My research and teaching concentrates on understanding processes affecting watershed health and stream restoration, specifically the contaminant hydrology of aquatic and floodplain systems, and human impacts on earth systems. I am still conducting geochemical and hydrologic research on scales ranging from the large basin to local river reaches. At the basin-wide scale, my research group continues work in the upper Clark Fork River Basin examining the processes controlling metals and arsenic transport and release, and availability to aquatic biota from mining wastes. At a somewhat smaller scale, we are examining the processes fixing and mobilizing arsenic and metals in sediments and soils and how physical processes in rivers affect storage in and removal of metals from floodplains. We have also begun research on the

geochemistry of mercury in river basins contaminated by gold mining. Most of that work is in northern California, but we have also started investigating how remediation and river restoration release mercury from mining wastes.

I continue to supervise the Geology Analytical Lab (funded by the Murdock Foundation in 1995). That lab now serves faculty and students in a wide array of disciplines. The laboratory is the mainstay of environmental chemical research on campus. Along with other researchers, the lab now does a booming business in contract and research analyses and is directed by Dr. Heiko Langner.

My newest research is on the sedimentology and history of Flathead Lake. We dusted off old 3.5 kHz seismic records that Tony Qamar, Jerry Kogan, and I collected in the early 1980s and used those to plan a coring expedition for the last two summers. We now have an excellent stratigraphic and geochemical record of the climate change in the basin for the last ca. 15,000 years and also some detailed records of metals chemistry over the last few hundred years. We hope to expand this work this summer to the area surrounding Flathead Lake to decipher the relationship of Flathead Lake to Lake Missoula and the details of Pleistocene-Holocene history in the Flathead and Mission valleys.

My teaching continues to evolve around "environmental geoscience." I teach the Junior-level Environmental Geology Course, a Senior-level Global Change course, and advanced courses in Environmental Geochemistry and River Restoration. Recently Bill Woessner and I started a new research center on campus (The Center for Riverine Science and Stream Re-naturalization) to look at the science of riverine processes and restoration (see the web site at www.umd.edu/rivercenter). The inaugural event was a two-day conference on restoring rivers impacted by mining wastes. It was a great success and we are already planning next year's event. We are hopeful that the "River Center" will bring in a number of colleagues to help us expand our efforts in river restoration and offer opportunities to students for graduate research.

Jim Sears

Jim Sears has been enjoying a global time for the past couple of years. He was selected to take part in an international faculty exchange program in Helsinki, Finland, during the fall of 2002. There he taught a couple of graduate courses on the tectonics of North America, served on a Ph.D. thesis committee, and attended an international symposium on anorogenic granite. Sears and family set up residence on the Baltic Sea coast in a small town that had been built as a summer residence by the last Czar when Finland was under the flag of Russia. The

Sears children went to Finnish schools, but the language of instruction was Swedish. That made it a little (but not much) easier. Finland has a history of Swedish and Russian occupation and was finally liberated during WWI by the Germans while the Russians were distracted. There are still signs of bombardments and defenses all around, with overgrown foxholes, trenches, and bomb craters throughout the forest. It looked like an old Montana mining district!

In November, Jim and son Robert, now a junior at UM, were able to go over to St. Petersburg, Russia, from Helsinki on the ice-coated train, *Sibelius*. Robert studies Russian and was an invited foreign student at the University of Helsinki for the fall. In St. Petersburg, Jim and Robert were hosted for a week by geology colleague and friend, Andrei Khudoley. They had a great time visiting cultural sites and meeting Russian geologists to plan an expedition to eastern Siberia for July, 2004, to test Sears' Siberian-North American connection hypothesis (see article and cover photo in GSA Bulletin, August, 2003). After Sears' NSF grant was approved, Andrei visited Jim in the USA for the month of August, 2003, attended the Belt IV Symposium, and toured the Cordillera from Washington to California. They dodged the heat around Death Valley in August (120F), looking for rocks that might match those in Andrei's field area in the Siberian permafrost. They found some good look-alikes, especially at 10,000 feet elevation in the White-Inyo Range of California. Next year, Jim will go to Siberia, meet Andrei, fly into the remote Verkhojansk Range in a Soviet-era military helicopter, and float down the Belaya River for about five weeks, comparing the rocks over there with the ones over here. Field observations will be followed by isotopic studies of possibly correlative rocks. Sears thinks that the Cambrian explosion of shelly animal life occurred in the narrow Siberia-Laurentian seaway as the continents were first breaking apart.

Steve Sheriff

I've been gathering dust (its not really gray hair) as chair for quite a while. My spinner magnetometer has been gathering dust ever since Brian Priest broke loose from its grip in Y2K. My recent students (abstracts and titles on the web) have been much more interested in geophysical details of the shallow subsurface than in paleosecular variation, other intricacies of the magnetic field, or geotectonics. The last couple of summers found some of my students stuck with fieldwork in two interesting places. Bonnie Pickering was in the Centennial Valley (just west of

Yellowstone and not nearly as crowded). Chris Hawkins and Nate Harrison have been in the Nyack area just west of Glacier Park--tough life working on the periphery of national parks. Tony Berthelote and Dave Nyquest opted for East Missoula (what's with that guys?). Despite student interests in the shallow subsurface, I managed a recent talk at an AGU meeting on a topic with little application and few attendees; it was just the break I needed. I'm going to try to quit kicking and screaming as Woessner *et al.* drag me into this shallow subsurface stuff.

To support current student interest I have added a lot of new equipment to my inventory, some of which is best suited for experiments at the backhoe scale. What's been fun is that I have totally revamped my senior level geophysics courses into two courses that combine some theory (never enough) with student-directed projects where they get to fiddle with the equipment on their own. So far, after two years, I've only had to repair the magnetometer, ground penetrating radar, gravity meter, and seismograph a couple of times. Of course, the resistivity box had to go back to the factory twice and the gravity meter is in the shop now. I guess that is the cost of doing lots of fieldwork in classes. Nevertheless, it has worked out well for education, I like the project reports people turn in and participants seem to gain a lot from the classes. Look at my web pages for the courses and for our recent graduate theses.

Recreationally, life has been rewarding as well. Chris and I have been getting a week or so of backcountry skiing in British Columbia during the winter breaks and local skiing has been as good as usual. The last two summers found us mountaineering in the BC Coast Range. That's spectacular country with semi-infinite opportunities for sparsely visited and spectacular routes and summits. Have fun -- I am.

George Stanley

As the paleontologist in the Department, I find that there is always strong interest in fossils, global change, and Earth history. We are surrounded by ancient life, and I am in contact with a lot of students who enjoy the study of fossils, as well as members of the public who are interested in the subject.

During the past years, I've kept busy teaching old and new courses. In addition to teaching History of Life, undergraduate geology courses and advanced graduate topics, I taught "Paleontological Techniques" and all those dirty tricks employed to prepare and get at those fossils! I continue to maintain the departmental Paleontology Research Museum collections, established in 1898. Each semester, I offer an intern program that allows interested UM students to work with the

collections and the developing research database [see the website - <http://www2.umt.edu/geology/Museum/Welcome.htm>] and the management and curation of over 200,000 plant and animal fossils, representing the ancient heritage of Montana. During Spring, 2002, I organized and taught a different kind of course for the Davidson Honors College. Entitled "God, Darwin, and Dinosaurs," this course blended philosophy, religion, and science and exposed students to what constitutes science and what demarcates it from religion and pseudoscience. In the Spring of 2001 and again in 2002, I organized and secured funding for the Geology Department's "Rocky Mountain Geodays," which allowed our undergraduates to showcase projects and to increase their engagement within the Department.

In 2001, I was greatly honored to be the first recipient of the Jane and George Dennison Award, for outstanding accomplishments at UM. In 1999, my alma mater, the University of Kansas bestowed upon me the Haworth Distinguished Alumni Award, and in 2002, I was elected to a five year term on the KU Advisory Board to provide feedback on the Geology program at Kansas. At UM I continue to be active in research work on invertebrate paleontology, publishing a book and a series of professional papers on paleontology and stratigraphy. During the past several years I've kept up research visits and collaborative endeavors with colleagues in Alaska, Canada, Mexico, Japan, China, Australia, Austria and Germany. Thanks to my good fortune to have nearly continuous funding from the National Science Foundation, I've been able to support UM graduate students to get involved in thesis projects in Mexico, Alaska and the Yukon.

Being on several International Geological Correlation Projects, the past three years has kept me busy serving as chair of a Geological Society of America committee and on several science review boards. My most recent projects with two UM graduate students involve using fossils and sedimentary successions in Alaska to unravel Mesozoic paleogeography and tectonostratigraphic terranes and also to understand how marine organisms recovered following upheavals of life near the end of the Triassic. My newest project deals with the celebrated Cambrian Chengjiang biota based on an ongoing field project in Yunnan, China. Last year I initiated a cooperative program between UM and Yunnan University. Some new book and monograph projects currently underway, along with teaching and research, should keep me out of trouble for a while. I always take breaks to lead groups of school children through our departmental collections and to identify fossils brought in by the

public. My home page:

<http://www2.umt.edu/geology/faculty/stanley/stanley.htm>

Gray Thompson

Thompson teaches undergraduate mineralogy/petrology, two 100-level introductory geology courses, the clay mineralogy/shale petrology and X-ray diffraction methods graduate courses, and summer field mapping. He continues to write books at a rate of about one each year. The latest, "Earth Science and the Environment--3rd Edition," is in production now, and is scheduled for publication in 2004.

Chevron/Texaco donated a "new" X-ray diffractometer and clay preparation instruments to the Clay Research/XRD Lab two years ago, and that equipment has replaced our older analytical facilities.

Thompson continues to climb, spending parts of recent summers in the Canadian Rockies and Beartooths.

Don Winston

The last couple of years have been both good and busy. I have continued to teach sedimentation and stratigraphy, sedimentary petrology, and the field trip in the spring semesters, but the spring of 2004 will be my last year of regular teaching after 42 years at the university. This helps open a slot for a new faculty member. The faculty has kindly allowed me to hang around by my gums, and I plan to volunteer one class in coming spring semesters. In the summer and early fall I still measure Belt sections, although recent tectonic uplift in western Montana has made the mountain slopes a little steeper than they used to be. As it gets cold and the snow flies, I move out to Camp Quack on the Missouri River, where Bente, Gray, Eloise, Marc, Brigitte and others help defend our country against those winged invaders from Canada!

The Belt effort continues to charge ahead. In August we, together with the Tobacco Root Geological Society, staged Belt Symposium IV in Salmon, Idaho, where Paul Link from Pocatello and I have proposed new correlations of the Lemhi Group and Yellowjacket Formation with the Belt where Russ Tysdale and Karen Lund have been mapping for the USGS. Jim Sears and I led a field trip north of Missoula, Reed Lewis from Idaho, Jeff Lonn from Butte, and I led a field trip up Flint Creek Hill, and Paul Link and I led a field trip in the "Yellowjacket" around Cobalt, Idaho. Montana students under the guidance of Jim Sears presented a series of posters on Belt tectonics. Joining Belt workers with Tobacco Root Society stalwarts such as Larry Johnson, Bruce Cox, Tony Van der Poel, Derick and Sue Feeback produced an enthusiastic, rewarding meeting.

Oddly enough, "molar-tooth structure," those

funny little squiggly things in Belt carbonates, have taken on a life of their own in the Proterozoic world. Molar-tooth structures are limited to the Proterozoic and probably reflect special conditions of the Proterozoic hydrosphere or atmosphere. Montana students have contributed the principal hypotheses for molar-tooth formation. George Furniss' and John Rittel's mud, sugar, and yeast experiments that produced gas bubbles and expansion cracks seem to be the favored way to produce the voids, and Annie Gellatly's experiments precipitating vaterite (hexagonal CaCO₃) that inverts to calcite seems to explain the calcite filling. Chinese and Canadian geologists organized an IGCP project on molar-tooth structure. The first meeting was in China in September of 2002, and was attended by John Rittel, George and Patti Furniss, and me. This September the project met in Missoula with Canadian, Chinese, French, Indian, and Australian geologists. We journeyed through fire and smoke to see molar-tooth structure, principally in Glacier National Park. So, although I will reduce my teaching commitments, I plan to continue to work with students and on the Belt. Why totally quit when you are having fun?

Bill Woessner

As usual, teaching, research and service have kept me busy over the last two years. My research focus is still broad as demonstrated by the six M.S. thesis that have been completed recently and the current work of two Ph.D. and six M.S. students. Projects have included looking at isotopes in the Missoula Aquifer, in Deer Lodge at assessing how sewage effluent is used to irrigate fields impacted soil water and groundwater, investigation of MTBE migration and interactions with a spring fed creek, and examining the presence of trace pharmaceuticals in septic system effluent. I am also a principle investigator on two large interdisciplinary projects characterizing how groundwater and streams interface: one with the Biostation, Middle Fork of the Flathead River, and the second on the Umatilla River, with the Umatilla Confederated Tribes in Oregon. Recently I seem to be focusing a large portion of my research efforts on the shallow groundwater systems associated with streams. This is also partly influenced by a successful effort that Johnnie Moore and I completed which established an official University of Montana Center for Riverine Science and Stream Re-naturalization (www.umt.edu/rivercenter/). The center is housed in our department. Approved by the Board of Regents last fall, the River Center focuses on promoting

interdisciplinary research on impacted and natural river systems with the goal of improving efforts to re-naturalize rivers. Faculty members include many schools and departments on campus as well as at Montana Tech and the Montana Bureau of Mines and Geology. We just completed our first two-day conference this September and plan another professional meeting next year.

I have also served on numerous university committees and I am now the Acting Director of the River Center. I was recently elected to a second two-year term on the Board of Directors of the Association of Ground Water Scientists and Engineers of the National Ground Water Association. I organized three professional meetings with Dave Rudolph from the University of Waterloo last December in Las Vegas and had a number of students attend and present papers. Join up if you are not already a member!

Jean and I are doing well. Last summer I had successful mitral valve repair and by fall semester was back in full force. Our kids are 25 and 22 for those of you who knew them as youngsters. Please stop by and visit or drop me an email telling me what you are doing.



David A. Bright (B.A. 1983) David established Geo Analysis, Inc. in 1992 which offers consulting services and software systems for environmental database management, 3D visualization, ground water modeling, and geographic information systems. He met and married his wife, Amy, at CU Boulder, in 1986, and has two sons, David and Peter. They live in Crested Butte, Colorado.

T. Scott Bryan (M.S. 1974) Retired! Now he can more freely get at all those projects he's had in mind for years, especially his specialty, "The Geysers of the World."

Bruce Carter (M.S. 1982) Bruce married Sheri Brownrigg, toy designer, in Ojai, California, on May 20, 2001. They are going to contrive to live at his house in Marina del Rey. Bruce is currently the first assistant director on the NBC series "Crossing Jordan."

Robert Egan (M.S. 1971) Robert still enjoys hearing what's going on in the Geology Department even though he has been in the restaurant/bar industry for the past thirty

years!

Randy Gould (M.S. 1998) Randy recently accepted a position as the Regional Water Uses and Stewardship Program Manager for the Pacific Southwest Region of the Forest Service. Managing and coordinating the water rights and uses on eighteen forests keeps him busy, but he enjoys the challenge. Corinne, his wife, is working at UC Davis while he works in the heart of earthquake country, Mare Island in Vallejo. He says they are both enjoying the sunshine and the wineries of the Napa Valley.

John Grotzinger (M.S. 1981) John was elected to the National Academy of Sciences at the Academy's 139th Annual Meeting, 2002.

Cora Helm (M.S. 1992) Cora and Scott adopted Sarah Urbati on May 17, 2000, after a challenging, month-long trip to Kathmandu, Nepal (21,964 miles). Sarah was born on September 18, 1999, and weighed 8 lbs, 12 oz.

Richard Huebschman (M.S. 1972) Richard is a retired exploration geologist and is now researching Proterozoic stratigraphy of the southwestern United States.

Gary Icopini (B.A. 1990) Gary received a M.S. degree in 1993 in geosciences from the University of Nevada, Las Vegas, while working at the Desert Research Institute. After working for a short while at DRI, he moved on to Michigan State University to study low temperature geochemistry for his Ph.D. which was completed in 2000. Since then he has been working at Pennsylvania State University as a post-doctoral research associate on various aspects of biological metal reduction and silica solubility in hydrothermal systems. Gary married Pat Danks, who is a veterinarian, in 1995 and has had a house full of animals ever since.

Tom Newman (B.A. 1980) Tom has been a field geologist for over twenty years now! His boots are never clean, and he can't believe they still pay him to have so much fun. He is the senior geologist for the world's largest cement company. "God bless Johnnie Moore and his sedimentology course!" "Where is Kern Beam?"

Howard Pederson (B.S. 1978) After graduation, Howard started working for NALCO Chemical Company. He spent twenty-two years there before leaving and starting his own chemical consulting company. This allows him to live again in Montana and have season

tickets to Grizzly football games!

Hollice A. (Andy) Snyder (B.A. 1983) Andy moved to California in mid-January, 2003, to take over the U.S. Geological Survey's activities at Parkfield along the San Andreas Fault. He'll be busy with experiments, research, outreach, dealing with the media and landowners, and maintaining the existing network of instruments. He said that over the next several years there will also be a lot going on with SAFOD (San Andreas Fault Observatory at Depth) which is part of the National Earthscope Project.

George Stovall (B.A. 1981) George has been busy traveling for his job as team leader for West Africa at Burlington Resources. His time at home is spent at the pecan orchard or chasing his two children. But just when he thinks he's getting too old for this lifestyle, he reads where Don Winston is naming formations after male body parts! You're only as old as you feel.

Peter Taglia (B.A. 1998) Peter just got his M.S. in geology for his research in hydrogeology. His thesis was on measuring rates of anaerobic biodegradation in situ. He works at RMT, an environmental consulting firm in Madison, Wisconsin.

Brad Wolfinger (B.A. 2000) Brad is working for TRC Solutions, an environmental consulting firm in Denver, Colorado. TRC is one of the fastest 100 growing companies in the country.

Stuart P. Hughes (Class of 1956), died in Missoula on August 4, 2003, at the age of 77. A native of Lansing, Michigan, Stu saw Army service in both World War II and the Korean War. Before entering the University, he attended college in Shreveport, Louisiana and at Montana Tech. After graduation Stu began work with the U.S. Forest Service in Missoula as one of their pioneer geologists. From surface rights determination of mining claims, his work soon expanded to include such investigations as ground water, landslides, and sources of sand and gravel. About 1968, Stu was transferred to Washington, D.C. to head up geologic work for the Forest Service Watershed Division. In later years he held a similar position at the Washington office of the Bureau of Land Management. Upon retirement from government service, Stu was a consultant in Denver before moving back to Missoula, where he was a part-time consultant and an active member of the Hellgate Mineral Society. He is survived by his wife, June.

STUDENT AWARDS

AMERICAN WATER RESOURCES ASSOCIATION (AWRA) - Molly Johnson, Brian Boer, Matt Vitale, Cain Diehl

BERTHA MORTON SCHOLARSHIP - Emily Geraghty, Erik Katvala, Michael Hofmann

ROBERT M. AND LEIGH M. BESANCON FELLOWSHIP - Erik Katvala

NSF CLTW DOCTORAL FELLOWSHIP - Emily Geraghty, Matthew Zunker

NSF EPSCoR Ph.D Fellowship - Emily Geraghty, Sheetal Patel

NSF EPSCoR Program - UNDERGRADUATE RESEARCH INTERNSHIPS IN THE SCIENCES - Andrew Hennes, Bonnie Pickering, Payton Gardner, Shishona Thurston, Elizabeth Nichols, Jennifer Butler

ESTWING PICK AWARD - Damon Pellicori, Jessica Meyers, Matthew Hertz

EXXON INTERNSHIP - Michael Hofmann

FELLOWSHIP OF THE DEUTSCHER AKADEMISCHER AUSTAUSCHDIENST (DAAD-GERMAN ACADEMIC EXCHANGE SERVICES) FOR PH.D. RESEARCH STUDIES - Michael Hofmann

FRED HONKALA SCHOLARSHIP - John Paterson, Jessica Meyers, Andrew Hennes, David Beall, Grady Pearce, Bonnie Pickering, Payton Gardner

GEOLOGY ALUMNI SCHOLARSHIP - Damon Pellicori, Molly Johnson, Andrew Urie, Benjamin Swanson, P. Kevin Loustaunau, Brian Boer, Melanie Kay, Adam Johnson, Rebecca Kunz, Matthew Zunker, Erik Burtis, Nicholas Laatsch, Erik Katvala, Jessica Meyers, Matt Vitale, Michael Sperazza, Nathan Harrison, Ryan Portner, Michelle Foster, Jeremy Stalker, Andrew Caruthers, J. Cain Diehl, John Mocko, Matthew Affolter, Layaka Mann, Emily Godfrey, Noel Philip, Rachele Ambrose, Matthew Hertz

GEOLOGICAL SOCIETY OF AMERICA RESEARCH GRANT FOR GRADUATE STUDENT RESEARCH - Michael Hofmann

GEORGE C. MARSHALL AWARD, VIRGINIA MILITARY

INSTITUTE David Beall

INRA SCHOLARSHIP - Brian Boer, Christopher Hawkins, James Sweric, Eric Miller

James E. Hook Memorial Grant, American Association of Petroleum Geologists Foundation - Michael Hofmann

MCNAIR SCHOLARSHIP - Antony Berthelote, Deborah Bush, Jennifer Butler, Danielle Hughes, Elizabeth Nichols, Aaron Tenesch, Chantelle Begay

Missoula Water Quality District Internship - Tobias Hewitt

Montana Space Grant Scholarship - Cindy Wilson

NASA Summer Internship - Tommy Moore

PATRICK McDONOUGH MEMORIAL SCHOLARSHIP - P. Kevin Loustaunau, Andrew O. Urie, Matthew Affolter, Jeremy Stalker, Ryan Portner

ROCKY MOUNTAIN GEODAYS AWARD - Beau Pallister, Jessica Meyer, Andrew Hennes, Chris Dively, Deborah Bush, Shishona Thurston, Antony Berthelote

SENIORS GRADUATING WITH HIGH HONORS - John Paterson, David Beall, Jessica Meyer, Andrew Hennes, Thomas Gerber

SEPM Rocky Mountain Section Donald Smith Award - Michael Hofmann, Honorable Mention

Sigma Xi Research Grant - Cindy Wilson

UM GRADUATE SCHOOL TRAVEL AWARDS - Peggy Sue Clements, Noah Hughes, Adam Johnson, Karl Pracht, D. Matt Reeves, Michael Hofmann, Erik Katvala, Michael Hofmann, Rebecca Kunz, Michael Sperazza, David Tooke

UM GRADUATE SCHOOL DISSERTATION AWARD - Michael Hofmann

UM MORTARBOARD OUTSTANDING SENIORS - John Paterson, Andrew Hennes, Jessica Meyers, David Beall, Grady Pearce, Bonnie Pickering, Payton Gardner

ROBERT & ELEANOR WEIDMAN SCHOLARSHIP - Andrew Hennes, Rachel McCool, Shishona Thurston

TOBACCO ROOT GEOLOGICAL SOCIETY SCHOLARSHIP - Erik

Burtis (Harrison Scholarship), Rebecca Kunz (TRGS Field Scholarship)

2001-2002
GEOLOGY SENIOR THESES

Lindsey Bauman, *A Geologic Study of the Factors and Rates for Erosion Along Cattle Point Road, Richardson Quadrangle, San Juan Island, WA* - Directed by Donald Hyndman

Chris Brown, *Iron Cycling in Yellowstone National Park* - Directed by Nancy Hinman

Deborah Bush, *Decompression Remelting of the Idaho Batholith to Form the Lolo Batholith and Other Shallow Plutons, Western MT* - Directed by Donald Hyndman

Andrew Hennes, *Structural Contours at an Extension Fault Intersection: Gravity Modeling of the Northeastern Missoula Valley, MT* - Directed by Steven Sheriff

Melika Lechefskey, *Flash Floods/Debris Flows in Laird Creek Southern Bitterroot Valley* - Director Donald Hyndman

Tommy Moore, *Identification and Characterization of Naturally Occurring Schwertmannite, Paymaster Creek, Montana* - Directed by Nancy Hinman

Karen Olson, *The Plains Sill Near Plains, MT* - Directed by Donald Hyndman

Ian Rufe, *Maar Volcanism at the Wuski Chain, La Pine, Oregon* - Directed by Donald Hyndman

2001-2003
GEOLOGY GRADUATE THESES

Brian Boer, M.S. 2002 - *SEPTIC DERIVED NUTRIENT LOADING TO THE GROUNDWATER AND SURFACE WATER IN LOLO, MONTANA*

Jeffrey Brooks, M.S. 2002 - *BEDROCK GEOLOGIC MAPS OF THE GRIFFIN CREEK AND BAILEY MOUNTAIN 7.5 MINUTE QUADRANGLES, POWELL*

COUNTY, MONTANA

Jennifer Bushur, M.S. 2001 - *PRELIMINARY ANALYSIS OF FACTORS CONTROLLING VIRUS TRANSPORT IN A FLOODPLAIN AQUIFER, WESTERN MONTANA*

John Corkery, M.S. 2002 - *MINERALOGY, PETROGRAPHY, AND GEOCHEMISTRY OF THE PIN PGE DEPOSIT, STILLWATER COMPLEX, MONTANA*

Geoffrey Gilbert, M.S. 2001 - *EXPLORATION, CHARACTERIZATION, AND ANALYSIS OF AN ECONOMICALLY VIABLE BRICK-CLAY DEPOSIT IN MONTANA.*

Noah Hughes, M.S., 2001 - *TECTONIC SIGNIFICANCE OF EARLY CAMBRIAN (AND OLDER?) EAGLE BAY ASSEMBLAGE, VAVENBY AREA, SOUTH-CENTRAL BRITISH COLUMBIA.*

Molly Johnson, M.S., 2002 - *THE FATE OF SEWAGE EFFLUENT NUTRIENTS APPLIED TO COARSE-GRAINED SOILS BY SPRINKLER IRRIGATION*

Melanie Kay, M.S. 2002 - *AN ANALYSIS OF METALS PROFILES IN SEDIMENT CORES FROM FLATHEAD LAKE, MONTANA: THE IMPORTANCE OF MULTIPLE CONTROLLING FACTORS*

P. Kevin Loustau, M.S. 2003 - *TRANSPORT AND FATE OF METHYL TERTIARY BUTYL ETHER (MTBE) IN A FLOODPLAIN AQUIFER AND A STREAM INTERFACE, RONAN, MONTANA*

Temple McKinnon, M.S., 2001 - *SOURCES AND SEASONAL VARIABILITY OF METAL AND ARSENIC CONCENTRATIONS IN THE SURFACE WATER OF THE CLARK FORK RIVER BASIN, MONTANA.*

Thomas Michalek, M.S. 2001 - *QUANTIFYING IMPACTS TO A FLOODPLAIN GROUNDWATER SYSTEM FROM LARGE-SCALE SAND AND GRAVEL MINING.*

Jesse Mitchell, M.S. 2002 - *SEDIMENTARY RECORD OF LATE CRETACEOUS THROUGH PALEOCENE EVOLUTION OF THE BIGHORN BASIN, WYOMING.*

Natalie Morrow, M.S. 2002 - *CHARACTERIZATION OF THE LITHOSTRATIGRAPHIC FACTORS CONTROLLING PETROLEUM HYDROCARBON MIGRATION IN A PORTION OF THE MISSOULA VALLEY AQUIFER, MISSOULA, MONTANA*

Stephen Moss, M.S. 2001 - *MAGMA MINGLING AS A TRIGGER TO EXPLOSIVE SILICIC VOLCANISM? A TEST OF MODELS INVOLVING THE INTERACTION OF MAFIC AND FELSIC MAGMAS IN THE EASTERN BEARPAW MOUNTAINS, MONTANA.*

Sonia Nagorski, Ph.D. 2001 - *SPATIAL AND TEMPORAL VARIATION IN THE GEOCHEMISTRY OF SEVERAL WESTERN MONTANA STREAMS AND RIVERS.*

David Nyquest, M.S. 2001 - *A BEDROCK MODEL OF THE HELLGATE CANYON AND BANDMANN FLATS AREA, MONTANA, THROUGH CONSTRAINED INVERSION OF GRAVITY DATA.*

Adam Perine, M.S. 2003 - *EXAMINATION OF SEPTIC EFFLUENT DENITRIFICATION IN NATURAL AND SAWDUST-AUGMENTED SOILS OF THE MISSOULA VALLEY, WESTERN MONTANA.*

Heather Perry, M.S. 2001 - *SOURCES AND PATHWAYS OF BACTERIAL CONTAMINATION OF GROUNDWATER RESOURCES WITHIN A RURAL MONTANA SUBDIVISION.*

Karl Pracht, M.S., 2001 - *FLOW AND AQUIFER PARAMETER EVALUATION USING GROUND-WATER AGE-DATING, GEOCHEMICAL TOOLS AND NUMERICAL MODELING, MISSOULA AQUIFER, WESTERN MONTANA.*

Matt Reeves, M.S. 2001 - *HYDROLOGIC CONTROLS ON THE SURVIVAL OF WATER HOWELLIA (Howellia aquatilis) AND IMPLICATIONS OF LAND MANAGEMENT, SWAN VALLEY, MONTANA*

Jan Shifflett, *THE EFFECT OF DISCHARGE VARIATION ON SUSPENDED SEDIMENT AND PARTICULATE CONTAMINANT TRANSPORT THROUGH MILLTOWN RESERVOIR, MONTANA*

Benjamin Swanson, M.S. 2002 - *BANK EROSION AND METAL LOADING IN A CONTAMINATED FLOODPLAIN SYSTEM, UPPER CLARK FORK RIVER VALLEY, MONTANA*

Andrew Urie, M.S., 2002 - *SEQUENCE STRATIGRAPHY, MINERALOGY, AND PALEOGEOGRAPHY OF TRIASSIC MARGINAL MARINE AND CONTINENTAL DEPOSITS OF THE WIND RIVER BASIN, WEST-CENTRAL WYOMING*

Matthew Vitale, M.S. 2002, *FACTORS CONTROLLING THE FORMATION OF MINERAL PRECIPITATES LINING THE CHANNEL IN RABBIT CREEK, YELLOWSTONE NATIONAL PARK, WYOMING.*

RECENT VISITING SPEAKERS
AND
FACULTY SEMINARS

February 7, 2001, **David Nimick**, USGS-WRD, Helena, MT, *Characterizing the Historical Mining Impacts to Watersheds.*

February 8, 2001, **Allen Hatheway**, Emeritus Professor Geological Engineering, *Site Characterization (for all purposes of applied geology, from engineered works, through ground water and natural resource recovery, to environmental protection and cleanup).*

February 8, 2001, **Allen Hatheway**, Emeritus Professor Geological Engineering, *Study of Organic Compounds in GW - PAH's.*

February 22, 2001, **Pat Kennelly**, *Geographic Information Systems and Geology: Data Input, Analysis, and Display.*

March 1, 2001, **Jeff Kuhn**, Department of Environmental Quality, Montana, *MTBE: Opening Pandora's Box: State and National Issues, Fuel Oxygenates in Groundwater.*

March 8, 2001, **Dan Hall**, Historical Archeologist, President of Western Cultural Consulting, *Geophysical Investigation and Cultural Resource Management.*

March 13, 2001, **Walter Mulica**, Global Technologies, Fort Collins, Colorado, *The Role of the International Environmental Consultant in Characterizing and Remediating Complex Hydrogeologic Issues.*

April 5, 2001, **Chris Gammons**, Montana Tech, *Water-Rock Interaction, Subaqueous Pyrite Oxidation, and Sulphur and Oxygen Isotopes of Mine Waters on Butte Hill.*

April 20, 2001, **Doug Parker**, ASARCO, *Coeu d' Alene Basin Superfund Site.*

April 24, 2001, **Tom Osborne**, Hydro Solutions, Billings, Montana, *Zortman Landusky: Environmental Aftermath.*

April 25, 2001, **John Wheaton**, Montana Bureau of Mines

and Geology, *Coal Bed Methane Development*.

September 18, 2001, **James Sears**, The University of Montana, *Icosahedral Hotspots: Geology, Geometry, and GIS*.

October 9, 2001, **Ken Wells**, Geologist, Egypt Support Team, BP Egypt Oil, *An Integrated Reservoir Study of the Nezzazat Formation, July Field, Central Gulf of Suez, Egypt*.

October 10, 2001, **Joe Leimkuhler**, Manager, Subsea Development, Gulf of Mexico, Shell Oil Company, *Deepwater Gulf of Mexico: Exploring and Developing World Class Oil and Gas Reservoirs*.

October 11, 2001, **Dougal McCarty**, Texaco- Houston, *Quantitative X-Ray Diffraction Analysis of Clay-Bearing Rocks from Random Preparations*.

October 12, 2001, **Dougal McCarty**, Texaco-Houston, *Quantitative Mineral Analysis - Part II*.

October 23, 2001, **Elizabeth McKenzie**, University of Auckland, Biological Sciences Library, *Trace Metal Geochemistry and Microorganisms in Active Terrestrial Geothermal Sinters, Taupo Volcanic Zone, New Zealand*.

October 30, 2001, **Mark Cunnane**, *Effects of Wells on Stream Flow*.

October 30, 2001, **Mark Cunnane**, *Using Electrical Resistivity to Characterize Groundwater Properties*.

November 15, 2001, **Mark Lorang**, Flathead Bio-Station, Montana, *Linking Fluvial Geomorphology to River Ecology and the Restoration of Flood Plain Habitat*.

December 4, 2001, **Bruce Pugesek**, U.S.G.S. Northern Rocky Mountain Science Center, Bozeman, Montana, *A Presentation on Moose, Birds, and Hot Springs: What Do They Have in Common?*

February 25, 2002, **Perry Rahn**, The Richard H. Jahns Distinguished Lecturer in Engineering Geology Award Recipient, Dept. of Geology and Geological Engineering, South Dakota School of Mines and Technology, *Ground Water Transmissivity Anisotropy*.

February 25, 2002, **Perry Rahn**, The Richard H. Jahns Distinguished Lecturer in Engineering Geology Award

Recipient, Dept. of Geology and Geological Engineering, South Dakota School of Mines and Technology, *Flood Hazards*.

February 27, 2002, **Gordon Grant**, Research Hydrologist, USDA Forest Service, Assoc. Professor, Adjunct, Department of Geosciences, Oregon State University, *Out, Out, Dam Spot!: Geomorphic Response of Rivers to Dam Removal*.

March 5, 2002, **Michael Sperazza**, Ph.D. Candidate, Department of Geology, The University of Montana, *The Response of a Regional Lake System to Variations in Climate and Wildfire Histories: Late Pleistocene through Holocene Sedimentation Record in Flathead Lake, Montana*.

March 26, 2002, **Richard Hauer**, U.M. Biological Station, *Environmental Assessment of River and Wetland Ecosystems: Integration of Biotic and Functional Approaches*.

April 4, 2002, **Jerry Miller**, Blanton J. Whitmire Professor of Environmental Science, Western Carolina University, *Application of Lead Isotopes to the Analysis of Heavy Metal Transport and Storage with the Rio Pilcomayo Basin, Bolivia*.

April 4, 2002, **Jerry Miller**, Blanton J. Whitmire Professor of Environmental Science, Western Carolina University, *Influence of Late Holocene Hillslope Processes and Landforms on Modern Channel Dynamics, Watershed Management, and Stream Restoration in Upland Watersheds of Central Nevada*.

May 10, 2002, **Mohammad Farooqui**, Fulbright Scholar, Utah State University, *Geology of the Makran Province*.

September 13, 2002, **David Hyndman**, Associate Professor, Department of Geological Sciences, Michigan State University, *Efficient Large-Scale Bioremediation in a Heterogeneous Aquifer: The Schoolcraft Bioaugmentation Experiment*.

October 15, 2002, **David Rudolph**, Department of Earth Sciences, University of Waterloo, Canada, *Assessment of Groundwater Flow and Transport Characteristics in Fractured, Low-Permeability Sediments: Combining Field Measurements with Simulation Approaches*.

October 15, 2002, **David Rudolph**, Department of Earth Sciences, University of Waterloo, Canada, *Hydrodynamics of a Large Oil Sand Tailings*

Impoundment and Related Environmental Implications: Field Investigations and Numerical Analysis.

November 19, 2002, **Michael Sperazza**, *Methodology for Lacustrine Sediment Grain Size Analysis by Laser Diffraction: A High Resolution Application.*

November 25, 2002, **William R. Lund**, Senior Scientist, Utah Geological Survey, *Long-term Slip Rates from Displaced Basalt Flows on the Hurricane Fault, Utah and Evidence for a New Seismogenic Fault Segment.*

November 26, 2002, **William Frangos**, Department of Geology and Environmental Science, James Madison University, *Shocking Garbage: Application of Near-Surface Geophysical Methods.*

November 26, 2002, **Mike Eagle**, Paleontologist, Auckland Museum and Auckland University, Auckland, New Zealand, *Prehistoric New Zealand.*

ALUMNI AND FRIENDS CONTRIBUTE
GENEROUSLY

Generous donations from alumni and friends have greatly helped the Geology Department and our students attend professional meetings and field trips, purchase computers, and conduct their research through scholarship support over the past two years. Your gifts have really helped to continue to make this a dynamic and fun place to study geology, and we thank you kindly for your support. If we've missed anyone, we apologize. If you would like to make a donation, please send it to the Geology Department, The University of Montana, 32 Campus Drive #1296, Missoula, MT 59812-1296.

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THAT'S THE END OF OUR NEWS

Well, that's our news for this year. Please feel free to drop by any time, either in person or in cyberspace-- it's always good to hear from our alums. Also, please let us know what you've been up to so we can include it in the next newsletter. Visit our web page at <http://www.umt.edu/geology/>

IF YOU HAVE NEWS OR IF YOU RECEIVED YOUR NEWSLETTER AT A FORWARDED ADDRESS, PLEASE RETURN THIS FORM.

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Recent events of interest, career changes, accomplishments, or whatever!

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