



WESTERN  
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UNIVERSITY

College of Arts & Sciences

## *Department of Geosciences*

# newsletter

Volume 1 No. 23

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Dear Alumni and Friends,

1998 has been an interesting year for the Geology Department, starting with a faculty retreat in January in which we voted ourselves out of existence. Actually, what we decided to do was change the name of the Department to the Geosciences Department, which better reflects the interdisciplinary scope and breadth of our activities in geochemistry and geophysics. The name change has worked its way through the approval process and is now final.

I also have some changes in the faculty to report. George Guthrie, who just joined us in the 1997-1998 academic year, decided to return to Los Alamos National Lab, where he had been before Western. All of us in the Department were sorry to see George leave. In one year, he had become an integral part of the geology faculty and the university as a whole. We are now in the process of beginning a new search to find a geochemist/mineralogist. In other faculty news, we were joined this year by Dan Cassidy, who brings our hydrogeology/environmental area back to full strength. Dan has a varied background in geology and engineering, and specializes in bioremediation. We feel very fortunate to have someone of Dan's caliber come on board.

As a result of progress on the new science pavilion, we are now spread out beyond Rood Hall. The renovated Wood Hall opened last spring and we use four lab rooms to teach our Geology 100 course, including a computer lab. Ron Chase is redesigning the lab component of Geology 100 to make use of the computer lab. In January or February, Haenicke Hall will be completed and we will move some of our research activities into a group of labs there, along with the Chemistry, Bioscience, and Psychology Departments. There is a substantial fund of money that will be used for equipping the building with state-of-the-art instruments. We look forward to upgrading our research capabilities over the next several years so that we can do our share in helping the University achieve Carnegie Foundation Research II status.

Personally, the year was a good one for me. My main research focus continued to be glacial geologic mapping with the STATEMAP program of USGS. Our work is done as a subcontract through the MDEQ Geological Survey Division. After four years at this, there is a chance that we may eventually understand something about the glacial geology of southwestern Michigan. Actually, it is not quite that bad, but it is a very complex area. I also still participate in various other projects involving groundwater quality and bluff erosion. In June I had a great time on the WMU Foundation Grand Canyon rafting trip led by Lloyd Schmaltz. Several members of the departmental advisory council (and alums) were on the trip, including John Yellich, Tom Kamin and Jerry Aiken. My 14-year old daughter, Liz, went along with me and enjoyed just about everything except putting up with Dad for a whole week. On a related note, congratulations are in order for Lloyd, who just received the Bill Brown Award for Exemplary Leadership and Service from the WMU Foundation for his many contributions to the foundation as a rafting trip leader and scholarship donor. Kudos also for John Yellich, who was awarded the first College of Arts and Sciences Alumni Achievement Award (Geology Department) at a reception on Homecoming weekend.

Another highlight for me was a trip to Kiruna, Sweden in August for an International Glaciological Society symposium, where I gave a presentation on the STATEMAP work. Despite the weather, which was rainy and cold the entire time, I enjoyed the conference and field trip. Among other things I didn't know about Swedish Lapland was how many ways there are to eat reindeer.

As always, we enjoy your visits back to the department and the news items you send us. We are especially grateful to those of you who support us financially. I hope you have a happy holiday season and productive new year.



**Alan Kehew**

Dr. Alan Kehew, Professor and Chair



**faculty news**



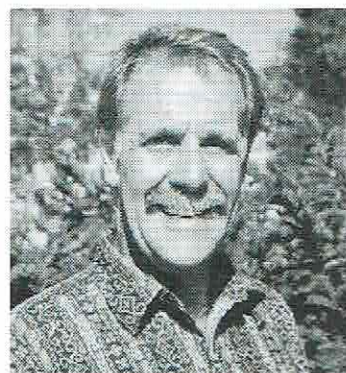
**Estella Atekwana**

Greetings to all alumni and friends. This has been an extremely busy year for me. I guess I always say this. This is in fact true. I have been busy both at home and at school. As I write this, I am on sabbatical this year and on my way to Cameroon and Botswana. In Botswana, I will be teaching a course in Exploration Geophysics. I plan to be there until June 1999. I am both excited and nervous, but I am hoping that we will have a wonderful time there. Our Geophysics program continues to grow and we have two new graduate students (Jeffrey Groncki and Justin Bailey). We attended the Symposium on the Application of Geophysics to Environmental and Engineering Problems (SAGEEP) in Chicago last winter and presented three papers. One of our papers "Characterization of a Complex Refinery Groundwater Contamination Plume Using Multiple Geoelectric Methods" was selected as one of four best papers. Additionally, this paper was selected by NGWA to be presented at their annual meeting this fall. This paper will be published in the Journal of Applied Geophysics.

Dr. Sauck and myself co-taught the Environmental Geophysics Field course last spring. This course was taught at the Wurtsmith Air Force Base, in Oscoda, MI where more than 80 or more plumes of different chemical compositions exist. We had a wonderful time and I am sure the students learned a great deal. Thanks once again to

Dr. Michael Barcelona for granting us access to the base. Results from some of the work we did at Wurtsmith Air Force Base will be presented at the upcoming SAGEEP meeting next winter.

On the home front, Kyra is now a first grader, while Kyle is in third grade. Baby Kyne is now 17 months old and quite a terror. Watch out! Anything he can get his hands on ends up in the trash can or in the toilet. Eliot is doing fine and now teaches hydrogeology at Indiana University-Purdue University at Indianapolis.



**Dave Barnes**

Hello to all! The last year has been an interesting one with progress in the areas of coastal geological studies and computer techniques for geological data analysis. Field work on coastal monitoring funded by State of Michigan Legislative initiative funds was concluded this last summer and final reports of these studies are in progress. WWW format reports were generated and are available at [http://GEOSERV.GEOLOGY.WMICH.EDU/dave/coastal\\_monitoring/reports.htm](http://GEOSERV.GEOLOGY.WMICH.EDU/dave/coastal_monitoring/reports.htm)>

A presentation at the American Shore and Beach Preservation Association in Long Island on interim results of these studies was well received last fall. A couple of students have shown interest in continued, smaller scale coastal monitoring projects. I continue my interest in the use of offshore geophysical data (mainly GPR data with the guidance of Bill Sauck) for both coastal environmental studies and Quaternary stratigraphy.



We conducted a class last winter in techniques in geospatial data analysis with an emphasis on the use of raster GIS software (Grassland) for the compilation, analysis, and display of a variety of geological data from Asylum Lake. All of you who have been involved in field camps at Asylum or who have done thesis or project work in this area will be pleased to know that we hope to compile a GIS data set from Asylum and use it for the creation of geochemical and groundwater flow models. Paul Pare, a current PhD student, received a nice grant from the Kalamazoo Foundation for "The Use of Geographic Resources Analysis Support System (GRASS) for Quantitative Analysis of Geochemical and Hydrogeological Data" this spring.

I hope to hear from our alumni and have special interest in your professional activities and any guidance we can pass along for the professional opportunities for our current group of students. We hope to re-establish a more active program in the traditional, subsurface geology area. My crystal ball suggests that some opportunity in the world of energy resources may develop in the not too distant future!



**Dan Cassidy**

Greetings friends and alumni of the Department of Geosciences at Western Michigan University! I am brand new this year, and have been made to feel most welcome by everyone. It is indeed a pleasure and an honor for me to be here.

My research expertise is in the general area of bioremediation. My doctoral and post-doctoral work focused on biological treatment of contaminated soil and wastewater, and the factors affecting the bioavailability of organic contaminants in the subsurface. I plan to continue research efforts in this area. I will have more to report on in next year's newsletter, if they keep me around that long.

I am delighted to be surrounded by other faculty members with expertise that is so complimentary to my own. The applied and environmental focus of this department is what attracted me in the first place. I have already been to see the old refinery site in Carson City, which I consider to offer a lot of applied research potential. I am excited about collaborating with the individuals who have already worked at Carson City: Profs. Duane Hampton and Estella Atekwana, and Dale Werkema, who has been doing his PhD research there.

This semester I am teaching GEOL 512-the graduate intro hydrogeology class. We are a small class, but cozy and focused. I am teaching a bioremediation class in the winter semester, which will be quite a treat for me.

In short, I am very happy in Kalamazoo and here in the department. Please feel free to contact me at any time. I look forward to meeting many of you readers in the near future.

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faculty news



**Ron Chase**

Greetings once again from a friendly hard-rock geologist. It seems only yesterday that I arrived at WMU (1973 actually) and now I am the resident departmental "old fart" as many of your former professors enter retirement one by one. My enthusiasm for teaching and research remains as strong as ever. I have no plans to retire as long as I can contribute and have fun in the process. I hope that my former students will tell me about themselves by letter, by phone (616-387-5500) or by Email (chaser@wmich.edu).

The 1997-98 academic year was a great one for me. I was on sabbatical leave the entire time! In September and early October, I travelled around western Montana and northern Idaho collecting samples from Cretaceous and Tertiary stocks, dikes, and batholiths for isotope analysis. Late October and November were "meeting months" as I presented papers in Salt Lake City at the Annual Meeting of the Geological Society of America and in Washington, D.C. at the U.S. Department of Education FIPSE (Fund for Improvement of Post-Secondary Education) Conference. I spent most of January and February in Syracuse, NY running a mass spectrometer in the laboratory of M. E. Bickford. The remainder of the sabbatical was devoted to bluff failure measurements along the Lake Michigan shoreline and publication preparations regarding data from my sabbatical activities.

In the realm of research, I currently have three things happening, all of which are continuations of long-term projects. The U.S. Army Research Office grant supporting the Lake Michigan bluff degradation studies co-PI<sup>ed</sup> by myself and Al Kehew will continue until May 1, 1999. To date, we have completed extensive geological mapping, piezometer installation and monitoring, and monitoring of slope displacements over a 2 1/2 year period. We have processed huge quantities of data and are now drawing some pretty firm conclusions about the role of ground water and pore pressure fluctuations in bluff destabilization. Pat Bickford and I are examining the geographical distribution of  $^{143}\text{Nd}/^{144}\text{Nd}$  isotope ratios in igneous bodies scattered throughout the Montana-Idaho overthrust belt. We are trying to identify plutons that were decapitated and translated eastward by thrusting. This project is nearing the publication stage, but the results have not been satisfyingly definitive. I also continue to develop the laboratory curriculum for the Earth Science components in the Elementary Education Program. More recently, I have taken on the task of developing computer-based laboratory activities for our introductory geology courses.

It has been fun watching my wife and children succeed. Chris is still teaching Social Studies courses in the Comstock High School adult education program. She also works very hard at making life easier for me, an activity that I dearly appreciate! Karl is now the Business Sales Manager for the Clarion Hotel in Kalamazoo. He has proven to be extremely successful as a salesman and hotel promoter, using his people skills to their best advantage. Andy continues to work for Medius Graphics in Seattle, producing and updating web sites for Major League sports franchises (including the New York Yankees, voted best web site recently by Baseball Digest). Scott is in his third year of medical school at Barry University in Miami, FL. He is now a "student doctor" and spends much of his time following "real" doctors around and performing various tasks in



area hospitals (as in scenes from "ER"). Jamie is in his second year of Law School at Georgetown University. He was recently named as a reporter and researcher for the Georgetown Law Journal, received the West Publishing Company "Best First-Year Student" Award, and is currently receiving summer employment offers from several law firms that make my salary pale by comparison. Wouldn't it be wonderful if the mission of a teacher could be supported by the salary of a lawyer?



**Duane Hampton**

Hello to our many alumni. I hope you are enjoying life, and that your stay at Western facilitated your current enjoyment.

I am serving on too many committees, and not getting enough research work done and published. I hope to finish (by submitting papers on) some long-term projects on modeling a tracer site and improving hydrocarbon monitoring and recovery wells. Dan Cassidy and I have worked with Estella Atekwana and Bill Sauck to develop ties with the MDEQ to fund some field studies in Carson City, and we will continue to explore those opportunities. But we are also open to new funding sources and research opportunities.

Although we have a healthy new crop of graduate students this fall, our hydro enrollments have declined over the last three years. I currently get more inquiries from companies looking for new

hires than from students looking for jobs, which indicates to me that the university and the job market are out of sync again. Perhaps that will lead to an increase in salaries!



**William Harrison**

During 1997-1998 I was on sabbatical leave to study horizontal drilling technologies and evaluate the results of horizontal wells in the Michigan Basin. The project involved studying the latest technologies that are used in horizontal drilling and compilation of a database for all existing and pending Michigan horizontal wells. Preliminary results of the Michigan study were presented at the biannual Michigan Geology and Its Resources Symposium sponsored by the Geological Survey Division and at the Eastern Section AAPG annual meeting. A presentation was also made to the WMU Geology Department to kick-off the 1998-99 Departmental Seminar Series.

Research concluded this year on a three year research project to evaluate Michigan Dundee oil reservoirs for potential of improved recovery using horizontal drains. This project was a joint effort between Michigan Tech University, WMU, and Terra Energy Co., a mid-sized Traverse City independent oil and gas company. The project



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was a great success and culminated in the drilling of a successful horizontal oil well in an old Dundee field. To date the well has produced over 75,000 barrels from this supposedly depleted field. Results of this project were published in two separate papers in the Oil and Gas Journal and as the lead paper in the August 1998 issue of the AAPG Bulletin.

New funding and research activities include a \$27,000 project to evaluate Michigan Traverse Limestone reservoirs for potential additional oil recovery using horizontal wells and a 3-year, \$114,000 DOE joint study with Michigan Tech to evaluate the role of fractures in Michigan oil and gas reservoirs. March 1, 1998 marked the establishment of the Michigan office of the Petroleum Technology Transfer Council, a nationwide organization, partially funded by DOE to enhance communication and apply technology to improve domestic oil and gas development. The Michigan office is housed in the Michigan Basin Core Research Lab. I am the Director, Paul Daniels is the Associate Director and Linda Harrison is the Administrative Assistant. First year support for the office totals about \$90,000. Department of Energy support is expected through the year 2000.

I traveled to a DOE/SPE conference on enhanced recovery technologies in Tulsa. I also traveled extensively throughout Michigan to visit oil and gas operators and attend meetings of the Michigan Oil and Gas Association, the Society of Petroleum Engineers and the Michigan Basin Geological Society.

I received two honorary awards in 1998. I was conferred with an Honorary Doctorate Degree from the University of Latvia for activities relating to working with students, faculty and helping enhance the infrastructure in the Department of Earth and Environmental Sciences at the University of Latvia in Riga. I made three visits to Riga during 1994-1996. I was also awarded the Outstanding

Educator of the Year by the Eastern Section of the American Association of Petroleum Geologists during their 1998 Annual Meeting.

Trips to Hawaii and Iceland to see recent volcanoes in action were shared with Linda and my dad. Seeing the volcanoes of Hawaii and the rift valleys and glaciers of Iceland up close and personal are a must for every geologist.



**Michelle Kominz**

Hello friends and alumni of the Western Michigan University Geosciences Department. I am now a one year veteran of Kalamazoo and I'd like to know - why didn't anyone tell me how beautiful it is here in spring and summer?

Teaching two units of the large enrollment oceans systems class was good fun last fall. I guess I did okay, as the department has allowed me to try again this semester. It is taught in the new facilities (read, auditorium in this case) in the recently reopened Wood Hall. It is very hi-tech and so far I never quite know which bits will be working, but when it does, it's great.

Last summer I did something very new for me. I taught an earth science course "Our Earth, a World of Change" through WMU's education department to K-9th grade teachers in Grand Rapids. It was advertised as 3-9 but attracted some of the lower grades as well. We did lots of hands-on experiments while we learned a lot about weather,



climate and magnetics. I even got to teach about the Coriolis effect, what it is, where it comes from, and how it impacts on Earth systems. I figure there is no time better to learn about the Coriolis effect than the period when kids still play on merry-go-rounds and enjoy getting dizzy. A playground in NW Michigan together with three Barnes children later in the summer (while helping to collect beach profile data) brought this home to me. They could experiment all day (e.g., tossing balls while spinning at high rates), I could only stand the merry-go-round in small and infrequent doses.

I also took the opportunity in the summer to join the hydrogeology field camp during geophysics week. Most of the geophysics equipment that we have in this department is much newer than anything I have been exposed to in other geology departments. It was a great opportunity to work with the equipment and meet many of the students who are now enrolled in my 560 (Introduction to Geophysics) class.

Yes, Estella Atekwana is on sabbatical and it has fallen on me to make sure our seniors and beginning graduate students are well "grounded" in basic geophysical methods. We are deeply involved in electrical techniques as I write and hopefully will all emerge out the other end of the semester with new knowledge and not too many scars. Weather has remained excellent this fall so field trips to the Asylum Lake properties for electrical surveys have been very successful.

In the winter semester I taught a small, but elite group of students (mainly graduate with one stalwart undergraduate enrollee) quantitative stratigraphy. In the process of applying backstripping techniques to well data from the Michigan Basin, we found ourselves doing cutting-edge work. Our results suggested that early basin subsidence was, indeed, thermal (a hypothesis often suggested and often rejected for this basin) with an eustatic (global) sea-level signal identical to that seen in the west coast passive margin of the same time period. I am in the process of writing that paper up for publication with my students as co-authors. We also performed sequence

stratigraphic interpretation of east-coast seismic data which I acquired the year before while teaching at Rutgers University, New Jersey. The scope and scale of the seismic data raised a lot of excitement in a department where most seismic targets are within the first hundred meters.

Research continues on development of models to backstrip two-dimensional sequence stratigraphic data on thermally subsiding basins. Any day now I expect to be able to push a button and tell you the tectonic and sea-level history of the east coast continental margin, the North Sea and the northeast Gulf of Mexico margin.

There was very little snow last winter, although there was also very little sun. Perhaps this year I will get to try those cross country skis. I did buy sailboard equipment and with the aid of the Barnes family am becoming a little more skilled in that activity. Mainly biking (the Kal-Haven trail) and swimming kept me active in the summer months. I also took a short vacation in the Adirondacks where I made it to the top of the highest peak and was awed by the metamorphic rocks exposed along the way.



**R. V. Krishnamurthy**

The past year was as exciting as the many years before that. Work at the stable isotope laboratory continued as vigorously as ever. The year marked



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a poignant transition when the early settlers namely, Madhav Machavaram, Eliot Atekwana, and Norman Lovan successfully completed their doctoral degrees and set sail in search of new pastures. Each one of them did find one; Madhav joined the Kellogg Biological Station (Michigan State University) as a post doctoral researcher, Eliot joined as an Assistant Professor at Indiana University-Purdue University and Norman joined the faculty at Central Michigan University. Luckily, the old guards have left a good legacy behind which has attracted a new crop of graduate students to the stable isotope laboratory.

Our research programs were very successful in terms of the applications of stable isotope techniques to some new environmental research. The NSF funded study on global change produced some very unexpected results. This study, initially aimed at studying lake sediments, was extended to Mediterranean samples in collaboration with Professor Meyers of the University of Michigan. The preliminary results are very startling, to say the least. I also carried out collaborative research with Professor Lal of the University of California and scientists from the Chinese National Science Academy. This research produced new information on the vegetational history in the Chinese Loess Plateau during the past 3 million years. We continued the work on dissolved inorganic carbon in the hydrosphere using the techniques developed by us in our laboratory. Going by the number of reprint requests, this technique since published in the *Journal of Hydrology*, has attracted wide international attention. I also got an invitation to write a chapter for a forthcoming book that will deal with analytical techniques in stable isotope geochemistry.

On the family front, my wife Sujatha's efforts at her work were acknowledged by giving her a permanent position requiring more of her time. This also meant that my family now had to negotiate more and more of my culinary talents! My daughter Sowmya, now a ninth grader was selected to the

Kalamazoo Area Math and Science Program and also received a scholarship to attend the internationally known Blue Lake Arts Camp this summer. While her stay at the camp for two days made her realize the importance of home, her enrollment at the KMSC has forced me to brush up my own knowledge of math and biology! My son Rohan is now a well-recognized musician among several Indian Classical Music centers of North America. Last year he performed in Cleveland, Chicago, Albany, Detroit, Flint and New Jersey. He received wide coverage in the press managed by Indian publishers in USA and Canada.



**Bill Sauck**

The fall 1997 term brought a number of outings with an enthusiastic Electrical Methods class (and fortunately without any shocking events). It was interrupted in October by a trip to Sao Paulo for the International Brazilian Geophysical Society Congress, where both Elen and I presented papers and posters. I also gave another pre-Congress short course on GPR, at the University of Sao Paulo. The second week was spent at Manaus working with INPA researchers on the Manaus project. The strong El Nino had left Sao Paulo flooded, while the Amazon region had gone one month without rain and was choked with smoke from numerous fires. I spent a day on the river, sampling seeps and springs along a 20 km extent of the North bank which was exposed by the low stage of the river (50 feet below high water mark).

Back at Western, Estella and I went with students several times to Carson City to install and measure Vertical Resistivity Probes in the south LNAPL plume. We can document with unprecedented



detail the changes in resistivity in and below the LNAPL, with electrodes at 1" spacings from the surface down to 25 ft.

I received contracts for more sub-bottom GPR profiling on Lake Michigan in the Fall; from the Mich. DEQ/Univ. of Mich.; and from the U.S. Army Corps of Engineers via a subcontract from TolTest of Toledo.

Our family spent the year-end holidays in Belem and Sao Luis, Brazil, with quality time on two isolated tropical beaches.

In March, 1998, our geophysics group was well represented at the SAGEEP meeting in Chicago with Estella Atekwana, 5 students, Dave Nobes (sabbatical visitor from New Zealand), and I; contributing a poster and four presented papers. (One of those papers was selected for an invited presentation at the Las Vegas NGWA meeting in Dec., 1998.)

In April, I helped Dr. Mike Nassaney of the Dept. of Anthropology with the geophysical characterization of another 19<sup>th</sup> century site in Battle Creek, the Ellen White House in Adventist Village. With the help of graduate student Hidetsugu Kosaka, we covered the site with GPR, EM31 and Magnetometer at 1 meter line intervals, thus providing guidance for the subsequent excavation phase of the Archaeology Field Course.

In May, I presented two papers at the 7<sup>th</sup> International Conference on GPR at Lawrence, KS. Also in May, Estella, Dale Werkema, and I took another group of geophysics students to Wurtsmith AFB for 2+ weeks of intensive training as part of the Field Geophysics course. As a result of being asked to look at one of the U of M bioremediation project areas in downtown Oscoda, we discovered two very large USTs right on the axis of the old PCE plume on which they were about to start a major injection experiment. (Two years ago we discovered an LNAPL plume midway between two of their principal research plumes on the Base.) They may not invite us back if we keep finding these unpleasant surprises right in the middle of

their project areas! The summer was taken up by responsibility for the Field Hydrogeology course (6 weeks), with occasional calm days devoted to the sub-bottom surveying on Lake Michigan.

June was also occasion for celebration of daughter Carolyn's H.S. graduation - in the Fall she left the nest to become a freshman in the University of Michigan's College of Engineering.



**Raj Sharma**

Hello, alumni and friends. The past year was very significant regarding learning new computer languages. I learned C++ and I am currently learning Tcl/Tk and POV-ray tracing languages at the computer science department. These computer languages are used to develop interactive 3-D graphics. As you know, not only in geology but in most of the sciences, there are not many interactive 3D graphic softwares that can model a given scientific phenomenon. Currently, I am also testing a geochemical software version 1.01 which I developed using visual C++ to model the effects of venting, replenishment, assimilation, and fractional crystallization on the major, trace and rare earth elements in a magma chamber. This change in my focus of research is due to the fact that geology as a field in itself is becoming stagnant. In order to make it more marketable we need to merge it with computer science, which as we know is expanding and seems to continue to expand at least until the year 2010 AD. By including computer language programs (writing



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codes, not just using some inflexible software) with traditional geology, it is possible to give most of the students flexibility of changing fields in case of hardships regarding the job market. If you have any suggestions or comments on how to make geology more visible and attractive in the current job market then e-mail me at [raj.sharma@wmich.edu](mailto:raj.sharma@wmich.edu).



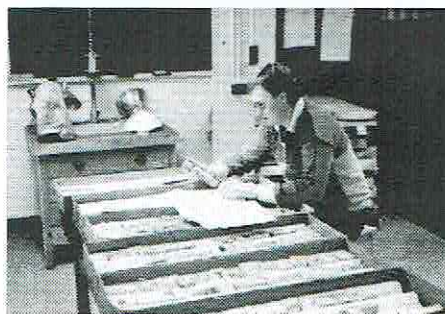
**Michael Dalman**

Hi, I would like to introduce myself, my name is Michael Dalman and I am the new Geosciences Technician. I am not exactly new to the department. I have been a student at WMU since 1993. In 1995 I received my bachelor's degree in Hydrogeology. I jumped right into the master's program and I'm just a few steps away from reaching that goal. I have a broad range of research interests from delineate wetland boundaries using color infrared photography, to surface-water groundwater interactions. But as you can see I don't stray too far from wetland research. I have some really big shoes to fill since Bob Havira retired, and I must say that I am learning new things everyday. One of the best parts of this job is that I get to be a little bit involved in just about all of the research that goes on in the department. Of course that has it ups and downs too, from waking up at 5:00 am on a Saturday to go drilling up in Carson City to finally convincing a manufacturer to donate a piece of equipment that we need.

This summer was very memorable for me. Once again I assisted Dr. Sauck with WMU's Hydro

Camp. This year's camp was the first year in a long time that we only held one session. It made my job a little easier trying to find drillers to donate their time and efforts. With the help from one of Dr. Kehew's grants we did get to see a sonic rig in action. And as a bonus Dr. Kehew now has some nice small pieces of wood to carbon date. For me that was not the big memorable event, Dr. Sauck let me take the last week of field camp off so that I could take my girlfriend on a trip to the Upper Peninsula, where I asked her to marry me. Of course she could not resist saying yes with a beautiful Lake Superior sunset in the background.

I am looking forward to all the joy and excitement that this year will bring. Dr. Sauck and I have already started to plan for next year's Hydro camp. I will have the new Hydro camp's web page up and running soon, so make sure to stop by and take a look.



## Michigan Basin Core Research Lab

The Michigan Basin Core Research Lab continues to act as a repository for Michigan Oil and Gas data. Additional collections of well reports, logs and cores were added in the past year through donations from several companies and individuals. The wireline log collection is being catalogued into an Excel Spread sheet and will be available on line before the end of the year.

The lab is now also incorporated with the Michigan Office of the Petroleum Technology Transfer Council. It is a DOE funded nation-wide organization that acts as a liaison for information and technology transfer to oil and gas operators



in the state. This office was established in March, 1998 and will be funded for several years. There has been a recent workshop presented for the Michigan oil and gas community on the Internet for the Petroleum Professional. Future workshops are currently being planned. A website has also been developed and has much information about Michigan petroleum geology.

Paul Daniels and Linda Harrison are assisting Dr. Harrison in running the Office. An extensive file of new petroleum technologies is maintained at the office. Anyone interested in the PTTC activities should contact the office at (616) 387-8633 or visit our web site at <http://www.wmich.edu/geology/corelab/pttc.htm>

### Groundwater Education of Michigan



**Lauren Hughes**

The G.E.M. Regional Center has continued its support of the Dowagiac River Watershed and Nottawa Creek Watershed Projects. The Center provides support to these projects through improved land use planning techniques and water quality analysis.

The Center has completed a project funded by the Kalamazoo Foundation to identify existing sources of data and analyses pertinent to the Portage Creek Watershed in Kalamazoo County. A comprehensive, annotated bibliography was created listing the reports and sources for the information.

EPA Region V has funded the Center to create a curriculum for teaching the process for developing a Wellhead Protection Plan to be taught in

community colleges. The curriculum will also be adjusted to provide a one day seminar for local communities interested in developing a Wellhead Protection Plan. The Center's partners in the project are Tri-County Regional Planning, Lansing, MI and the Michigan Department of Environmental Quality Drinking Water and Radiological Protection Division, Wellhead Protection Unit. Community College instructors from Lake Michigan College, Kalamazoo Valley Community College and Lansing Community College are developing and piloting the curriculum.

With funding from the W. K. Kellogg Foundation, the Center has developed and produced the Southwest Michigan Resource Network Directory. This directory lists county, regional and state resource providers that serve southwest Michigan in both water quality and land use management areas of concern. Over 400 copies of the directory were provided to township supervisors, state and federal legislators, watershed projects, and wellhead protection communities throughout our nine county region. The Resource Directory is also available from our web page and the Center will maintain all updates on the electronic copy.

The G.E.M. Center has undertaken a large project that will be executed over the next five years. The federal Safe Drinking Water Act (SDWA) Amendments of 1996 requires states to craft statewide Source Water Assessment Programs, which address non-community public water supply systems (NCPWSSs) operating in the state. For the State of Michigan, this covers over 10,500 NCPWSSs which rely on groundwater as their sole source of drinking water. The Drinking Water and Radiological Protection Division (DWRPD, MDEQ), is undertaking this task by developing a state/local partnership with local health departments throughout the state. In order to provide support to the local health departments, DWRPD, MDEQ has contracted with Michigan State University, who has then subcontracted with the statewide G.E.M. Centers to provide technical assistance and quality assurance on the project.



## Department of Geosciences

### Advisory Council 1998 Activities

The Geosciences Department Advisory Council met twice formally during 1998 and reviewed a number of operating and development topics and issues facing the Geosciences Department and the University. Western's Geosciences Department has been meeting the challenge of the changes in the Geosciences through the training and education of undergraduates and graduate students in meeting today's business goals and the Council is poised to continue to support these efforts. The Council renewed their endorsement to provide undergraduate field camp/class scholarships through council member donations.

The Council was introduced to new faculty and reviewed the staffing requirements, enrollment status, research funding, presidential search and selection, curriculum assessment, and established an employment forum. Council members had an informal discussion with President Elson Floyd and with Dr. Alan Kehew met with the Provost, Tim Light and Vice President, Keith Pretty. The Council also met the new Director of the Environmental Research Center, Dr. Charles Ide, who is involved with the development of large Intra University proposals having multiple scientific tasks. Many of these projects have state and/or federal funding with technical components requiring scientific skills of the department as well as those developed by the existing Water Science groups. Our discussions with Dr. Ide were well received and the Council will continue to support the technical skills of the Water Science group and assist the department in evaluating these geoscience strengths and how they can be integrated into the new Environmental Research Center and their proposals.

The Council also reviewed opportunities to support the Michigan Oil industry and established committees to support the College of Arts and Science's request for an undergraduate curriculum assessment and structured a self-defined task of an employment forum for evaluating future

opportunities in the geosciences for recent graduates and alumni. The Council is currently positioned to support the Department through discussions with University officers, Deans and Directors in providing options for curricula, funding and staff increases.

Council members held informal and formal discussions on the challenges facing the Department. Many of the topics will require more than the time spent at our two meetings this year. The Co-Chairmen of the Council recognize that we will have the support of the other Council volunteers and the faculty as we evaluate the curriculum and establish the employment forum, to name two of our tasks.

The October meeting had John A. Yellich, Jerry Aiken, and Tom Kamin who traveled from out of state, Lloyd Schmaltz, Paul Daniels, Hal Fitch, Bobby Glasser, and John Fowler from the Michigan area, while the spring meeting had, in addition to the fall attendees, Mick Lynch, Jim Nicolas, Kevin Walsh, Kevin Kincare and Dennis Gebben.

The Council is looking forward to reporting on these projects and tasks to the Department and the University at the April 1999 meeting. President Elson Floyd has also indicated that he would like to attend our Spring Council meeting to hear the results of our efforts.

Co-Chairmen John A. Yellich, Mick Lynch

### ***Geoscience Faculty & Alumni Awards***

***William Harrison*** Honorary Doctorate Degree,  
University of Latvia  
Outstanding Educator of the Year,  
Eastern Section of the American Association of  
Petroleum Geologists

***Lloyd Schmaltz*** WMU Foundation  
Bill Brown Award for Exemplary Service and  
Leadership

***John Yellich*** College of Arts & Sciences  
Alumni Achievement Award



**Dr. Lloyd J. Schmaltz**  
**Professor Emeritus of Geology**

Lloyd and Marilyn continue their interest in visiting unique and scenic geological locations in different parts of the world. In 1997 they had a great trip to China. Especially interesting was the 500 mile trip along the Yangtze River through the Three Gorges and the exposed, deformed Paleozoic section of rocks. They also spent three weeks in Mexico visiting many Mayan ruins in the karst area of the Yucatan Peninsula. This September they enjoyed touring the Alps in Italy, Switzerland, and Austria.

Lloyd revisited the Grand Canyon this past June as leader of a WMU Foundation river raft field trip down the Colorado. Twenty-eight participants attended the week-long trip, that included alumni, faculty, administrators, and friends of Western Michigan University. Helping Lloyd explain the geology of the Canyon were WMU alumni and Advisory Council members, Jerry Aiken, Tom Kamin, and John Yellich. Dr. Alan Kehew, the current chair of the Geology department, also participated in this adventure.

This winter Lloyd and Marilyn will return to Destin, Florida to enjoy the sun and white sand beaches.

This fall, Lloyd was honored by the WMU Foundation who bestowed on him the prestigious Bill Brown Award for Exemplary Service and Leadership. Keith Pretty, WMU Vice President for External Affairs said of Schmaltz, "Over the years he has served the University as an employee, volunteer donor, and ambassador, generously donating his time, energy, and expertise." Dr. Schmaltz has been responsible for the establishment of three significant student scholarship funds at WMU, including the Lloyd J. Schmaltz Geology Scholarship Fund, the Elizabeth M. Garrett Scholarship for Women in Science and the Major Henry Schmaltz United States Air Force Endowed Scholarship for Aviation Sciences.

Recently, former WMU President Diether Haenicke named one of the University's Medallion Scholarships in honor of Dr. Schmaltz.



Lloyd Schmaltz leads Grand Canyon Trip



Kneeling in front: Dave Milko  
2nd row (from left): Gretchen Pretty, Bill Brown, John Yellich  
3rd row: Liz Kehew, Michael Schmaltz, Lloyd Schmaltz  
4th row: Bob Shamu, Al Kehew, Brian Walters, Jason Yellich, Peter Brown



Tom Kamin, Al Kehew, Jerry Aiken, Lloyd Schmaltz

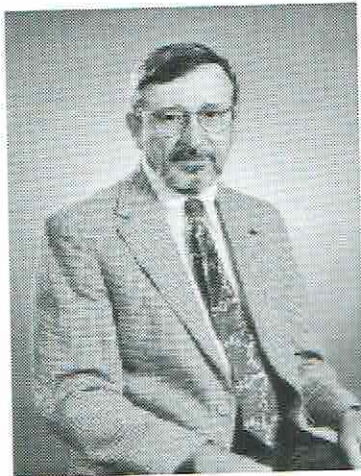


## Department of Geosciences

### GSA Meeting

The Geosciences Department made a good showing at the GSA Annual Meeting in Toronto in October. Our faculty and grad students authored nine papers. A large group of students attended the meeting, some of whom staffed a graduate student information forum booth to help recruit new graduate students. In addition, those of us at the meeting had a chance to visit with several alums, including Dr. Tim Clarey, Dr. Bill Montgomery, Dr. Eliot Atekwana, Jen and Chris Whisner, Kevin Kincare, Rich Kimmel and Matt Warner.

### Geology Technician Retires



Robert Havira

Robert Havira was born in 1939 in Detroit, MI. He attended Wayne State University and graduated in 1962 with a B.S. in Geology. After graduating from college, he served in the Air Force for 6 years. He married Barbara Jean Speas in 1967. He was honorably discharged from the Air Force with the rank of Captain in 1968. Robert returned to school at Western Michigan University in 1968 and graduated with honors in 1970 with a Master of Arts in Geography. He worked as a Technician in the Geology Department at WMU from 1970 until his retirement in 1998. During that same time he taught courses in Geology and Photography at WMU. He also taught Photography at Kalamazoo Valley Community College and Kalamazoo College. Photography has been a continuing interest for Robert all his life.

**David Andersen (1985)** works for Unisys Corporation as an Environmental Principal Engineer in the Corporate Environmental Affairs Department. He moved to New Jersey in January 1998 from the Detroit area with his wife (Kim Centilla-WMU, 1988) and son Austin who is four years old.

**Steve Bahling** works for Envirollogic Technologies Inc. in Kalamazoo, MI.

**Robert F. Batt** mentions that to give an idea of how far back he goes, in 1956 he got into a hellacious "discussion" with the geology instructor, Dr. Berry,

regarding that which we now call plate tectonics. It was his contention that the mathematics to prove these theories did not exist, therefore they were not worth studying. Robert thought at the time Dr. Berry wished to toss him bodily from the old East Campus Science Building, and in one of the few wise things he did at that age, he left his office and the discussion.

**James W. Bradley, CPG (1993)** owns Environmental Technology, L.C. with offices in Marshall and Battle Creek, MI.

**Gloria Britton (1997)** moved with her husband Walt to Stowe, Ohio and is working toward her PhD at Kent State University. Her research on the Flaming Gorge Dam impact on the Green River is

### alumni news

progressing. Her current slant is the environmental impact of the dam on the river. This is in conjunction with the Bureau of Reclamation-Salt Lake City office's re-evaluation of the EIS statement.

**Brian Chemielewski (1998)** is a geophysical trainee for Baker Hughes/Western Geophysical based in Houston, Texas.

**Dr. Tim Clarey (1996)** received the 1998 Bergstein Award for Teaching Excellence from Delta College located in Bay City, Michigan. Dr. Clarey is an Instructor in the Science Division.

**Chick Creales (1973)** an alumni living in Massachusetts, is now working for an environmental firm in the Boston area.



## Department of Geosciences

### alumni news

**Douglas I. Daniels (1973)** is a Senior Geologist, Geological Survey Division for the Michigan Department of Environmental Quality, Plainwell District Office.

**William B. French (1997)** is co-owner of the Western Group, Inc. a company in Galesburg, MI that builds and markets ground water simulator models.

**Nate Fuller** works for the Division of Geological Survey, Great Lakes Center, in Sandusky, Ohio. This year Nate went to Costa Rica, bought a new truck, is making plans to go to Alaska and purchased a new house about one block from the lake. He is still active in the theatre and local torch club as well as with the local Unitarian Fellowship

**Wayne Kukuk (1991)** has a position with the MDEQ in the Drinking Water Division working with community water supplies. He started out in the Lansing area but will eventually be stationed in the Plainwell District.

**Dr. Richie Laton (1997)** This past summer on the sandy beaches of Lake Michigan in Holland was the site of Richie's wedding. Many WMU alumni were present - it was a very large and gala affair. Richie and his wife Catherine are now living in Southern California.

**John Malenchak (1973)** is working for Aqua Terra Engineering in Jackson Mississippi. John, his wife Bettye and their daughter have been in Jackson for twenty years.

**Dr. J. Philip McLaren** is a professor of Biology and was one of W.D. Kuenzi's students. Dr. McLaren will be retiring and entering the consulting business full time. He is a consultant in Science Education and Ecotourism.

**Chris J Miller (1995)** works for RERC Environmental. Professional interests include involvement with the Atlanta Geological Society and volunteer work at the Fernbank Museum of Science and Natural History.

**Dr. William Montgomery (1998)** has moved to New Jersey with his wife Marcia and their children Kate and Evan. Bill is an Assistant Professor at New Jersey City State University. Bill says the department is small, but he is impressed with his students who are diverse and motivated. He is trying to build a GIS program there and bring some industry perspective to the department.

**Joe O'Sullivan (1972)** is still teaching in Brocton, MA and is now president of the Brocton Education Association.

**James C. Peterson (1971)** is the Exploration Manager, U.S. Division, for Richland Petroleum Corporation in Denver, Colorado.

**Bryan L. Roth (1988)** is a Geophysicist with Roth Exploration Geoservices in Westerville, Ohio.

**Dave and Robbie Seng (Zenero) (1995, 1994)** are enjoying living in Houston and their professions. Robbie works at Exxon. Dave is currently working at Veritas DGC as a processing geophysicist. They operate worldwide, onshore and offshore, acquiring and processing seismic data.

**Bill Steinmann and Kim Finkbeiner** are now living in Bolingbrook, Illinois. Bill is working for Emcon Inc. in Naperville, IL.

**Kevin J. Sullivan (1986)** is a Senior Geological Consultant for WEPCO ENERGY, LLC in Traverse City, MI.

**Tim Turmell** works for Watermark Communication Software, Inc. in Grand Rapids, MI.

**David Wardwell (1992)** is a research engineer at Mission Research Corporation working with identifying and integrating environmental sensor technology with data acquisition systems and graphical interface software systems. He also is using state of the art sensors to complete a study of air sparging with Dr. Robert Hinchee, Dr. Paul Johnson (ASU), Dr. Rick Johnson (OGI), and Andrea Leeson (Battelle). He plans to have a paper out soon in 1998 on his results. He is also Vice President of HydroTechnics, a small company that makes in situ groundwater flow sensors, capable of resolving groundwater flow in 3-dimensions and as low as .01 ft/day. The sensors are in situ, installed in direct contact with the subsurface formation. The sensors are installed with a CR-10 data logger, with the capability of remote operation. He is close to finishing his MBA at the University of New Mexico.

**Mike Wireman (1980)** currently works for US EPA Region 8, Denver position as the Regional Groundwater Expert. His professional interests include groundwater hydrology and geochemistry in fractured rocks at precious metal mine sites/ groundwater sensitivity and vulnerability. He has been working extensively in Eastern Europe with projects in Estonia, Russia and the Ukraine. He has been working with Tom Straw and Dick Passero.



## graduate student news

### **Shafiul Chowdhury, PhD Candidate**

Project title: Evaluation of Groundwater Vulnerability to Contamination: A Comprehensive Approach

The objectives of this study are to test the accuracy and validity of two aquifer vulnerability models, DRASTIC and AQUIPRO, by comparing the vulnerability scores with the measured distribution of contaminants within Nottawa Creek Watershed, Calhoun County, and to develop a method by combining DRASTIC and AQUIPRO to prepare more reliable groundwater pollution potential maps to assist planners, managers, and administrators in evaluating the relative vulnerability of areas to groundwater contamination.

### **Mike Kirby, PhD Candidate**

Project Title: Tracking Vadose Zone Nitrate Transport to Improve Fertilizer Application Management

I am monitoring nitrate and major ion flux through the vadose zone and into the groundwater in an unconfined glacial aquifer in Cass County, Michigan. The nitrate source is manure from the hog farm on which I am working. Using lysimeters, monitoring wells, stable isotopes, electrical resistivity, and neutron moisture probes, I hope to monitor the flux and understand the transport mechanisms at the site.

### **Andrew Kozlowski, PhD Candidate**

Currently, I am near completion of my master's thesis project for southwestern Calhoun County. The project is funded by the U.S.G.S. EDMAP program and involves completion of a surficial deposits map at a scale of 1:24,000. A secondary goal of the project was to evaluate the glacial stratigraphy and the hydrogeologic implications of the glacial deposits in the region. Other goals of the project include deciphering the chronology and origin of landforms and relationships

between bedrock topography and glacial drift for the purposes of water quality.

This spring, I will commence work on my dissertation project which will include glacial geology and mapping of the Kalamazoo Moraine in southwest Michigan. The project will involve reconstruction of the glacial stratigraphy and delineation of aquifers in the vicinity of the moraine. The project will also focus on aquifer vulnerability and the use of Geographic Information Systems and near surface geophysics for a more comprehensive understanding of the glacial and hydrogeologic relationships for the moraine and surrounding area.

### **Linda Nicks, PhD Candidate**

I am completing a 3-dimensional glacial map of the southern portion of St. Joseph County, MI, to identify areas for groundwater protection.

### **Paul Pare, PhD Candidate**

I am creating a GIS based chemical and flow model whose primary objective is to quantitatively assess the viability of allowing natural attenuation to occur.

### **Douglas D. Werkema Jr., PhD Candidate**

This past spring I was awarded a Master's degree in Geology with emphasis in Geophysics. My thesis project developed a Windows based automated/semi-automated resistivity acquisition instrument. Results from this project were presented at the International Measurement and Technology Conference hosted by the Institute of Electrical and Electronic Engineers (IEEE). Additionally, a paper will be published in the AAPG journal *Environmental Geosciences* this December (1998), and a paper is in review for publication in *IEEE Transactions*.

Currently, I am beginning PhD studies focusing on the geoelectrical signature of a hydrocarbon impacted site. This study involves further

development of the automated data acquisition system, detailed subsurface microbiological, geological, and hydrogeologic characterization. Analysis is focused on the effect of these factors on the geoelectric signature and the implications to site characterization and remediation. Preliminary results from this study were presented at the Symposium on the Application of Geophysics to Environmental and Engineering Problems (SAGEEP '98). A paper is also in press in the *Journal of Applied Geophysics*.

### **Justin Bailey, Master's Candidate**

My research interests include the application of geophysics to environmental and hydrogeologic problems. Most of the research I have been involved with thus far includes detection and characterization of subsurface structures and contaminant plumes using several geophysical methods (electrical methods, magnetic methods, GPR, and seismic). I am currently working on a thesis entitled "Detectability and Resolution by Three Different Frequency Domain Horizontal Loop Electromagnetic Systems at the Asylum Lake Geophysical Test Site".

### **Michael Dalman Master's Candidate**

I am continuing the Ross Township Project by applying a groundwater model to the area. I plan on projecting the worst and best case scenarios for this area. For those of you who do not know about the Ross Township Project, the City of Kalamazoo is planning a new well field in this township and the residents are concerned about the adverse affects of this to their surface water features. We conducted a large aquifer stress test and monitored any change in groundwater-surface water interaction. The model will help determine the affects during worst case (drought) and max production of this planned well field.

### **Andrew Flint, Master's Candidate**

I am investigating the till stratigraphy



of Southwest Michigan using clay mineral analysis to distinguish units and sequences. The work involves collaboration with Dr. Alan Kehew, Andy Kozlowski, Jen Lee, Linda Nicks, and the Indiana Geological Survey.

### **Jeff Groncki, Master's Candidate**

The objective of my thesis is to monitor the temporal conductivity changes of the anomalous conductive zone often found at and below the water table at fuel spill sites. This zone is apparently produced by the degradation of the residual/free product hydrocarbons (LNAPLs). In this study I will relate the probe measurements to the water quality data, rainfall records, geology, and spill history at each site.

### **Jen Groth, Master's Candidate**

I am interested in research regarding manmade wetlands and natural wetland restoration.

### **Darren Lamsma, Master's Candidate**

My thesis is on the effects that shore-perpendicular structures (i.e. groins) have on longshore current and the beach profile. Over several months, and storm events, beach profiles will be taken. These profiles will assess the effect of groins on cross-shore transport and local coastal changes.

### **Tony Marfia, Master's Candidate**

I'm focusing on the stable isotopes of oxygen, hydrogen and carbon, to help indicate regions experiencing rapid groundwater recharge in Belize, Central America. If I have the cash, a few Carbon-14 samples will be run. Major Ion analysis will help identify processes influencing the Dissolved Inorganic Carbon pool.

### **Danielle Schmitt Master's Candidate**

I am analyzing stalactites precipitated from concrete structures to determine if stable isotopes can provide information about the mechanisms of stalactite formation and concrete degradation.

### **Matt VanderEide, Master's Candidate**

The focus of my study is to investigate the glacial geology in the Manistee area. The extent of the study will encompass the coast 1 mile south of Manistee to 5 miles north of Manistee. Data will be collected using a submersible Ground Penetrating Radar (GPR) System, and will be used to interpret the geology below Lake Michigan.

### **1998 Geology Department Awards**

#### **Presidential Scholar**

Adrienne Carr

#### **Senior Honor Awards**

**Earth Science** - Amber Crowell

**Geology** - Kara McCrimmon

**Hydrogeology** - Elise Ruehle

**Geophysics** - Tyler Knoll

#### **Sigma Gamma Epsilon**

**Tarr Award** - Jonah Fogel

#### **John Grace Field Camp**

##### **Scholarship**

Chris Carew

Chris Kersten

#### **Advisory Council Field Camp**

##### **Scholarship**

Amy Welling

#### **Kalamazoo Geological & Mineral Society Scholarship**

Chris Kersten

#### **Kuenzi Memorial Scholarship**

Tony Marfia

#### **Lloyd and Marilyn Schmaltz**

##### **Award**

Matt VanderEide

Dale Werkema

Danielle Schmitt

#### **Distinguished Student Service**

##### **Award**

W. Richard Laton

#### **W. Richard Laton Field Camp**

##### **Scholarship**

Christina Barker

## **Recent Graduates**

### **Bachelor's Degree Recipients Earth Science Majors**

Michael Donhost, Adam Gouda, Christopher Gray, Beth Ann Mann, Tonya Popke, Georgina Shafer, Heather Thomas, Penny Bauder, Mark Beougher, Laura Burger, Christopher Clark, Teri Faught, Christine Hake, Karen Kakabaker, Karen Lowder, George Marion, Nicolena McCune, Dana McGaffick, Valeria Roe, Paul Sachs, Donna Jo Schnepf, Corey Blaker, Amber Crowell

### **Field Hydrogeology Majors**

Charles McDonald, David Clausen, Jeremiah Lopang, Jacob Allen, Ian Becker, Theodore Sietsema

### **Geology Majors**

Jerrud Parker, Mariann Risdon, Eric Janness, Brian Chmielewski

### **Geophysics Major**

Jack Suehr

### **Hydrogeology Majors**

Heather Burkowski, David Bylsma, Adrienne Carr, Matthew VanderEide, Jonah Fogel, Stephen Tucker, Ryan Vannier

### **Master's Degree Recipients Earth Science**

Patrick Avendt, Nicholas Maloof, James Ferritto, Amy Hall, Chris Babcock

### **Geology**

Sherry Callaway, Renuka Fernando, Christopher Gardner, Carla Nascimento, Terri Smith, Christine Brand, Kirt Elliott, Bradley Green, Douglas Dale Werkema Jr.

### **Doctoral Degree Recipients**

#### **Geology**

Norman Lovan, William Montgomery



## DONATIONS for 1998

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

### alumni and friends

Ms. Laura Badalamenti  
Mr. John Yellich  
Mr. David Braganini  
Mr. Anton Gallas  
Mrs. Peggy Schreur  
Mrs. Luanne Steininger  
Mrs. Janet Jeffs  
Mr. Dane Alexander  
Mrs. Karen Kerhin  
Mrs. Nadezda Gallas  
Mrs. June Altamura  
Mrs. Debbie Hutton  
Mrs. June Altamura  
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Dr. Roger C. Steininger  
Mr. Daniel M. Truckle

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Union Texas Petroleum  
Matching Dr. Robert D. LoPiccolo

## contributions for 1999

We hope that you will consider making a contribution to the Geosciences Community. You may specify that your donation go to the Department of Geosciences Development Fund for any of the purposes listed, or write in a selection of your choice.

The Development fund is used to support a wide array of activities, including undergraduate scholarships, student travel, supplemental support for equipment purchases, student activities and a variety of projects for improvement of teaching and research in the Department.

The Kuenzi Fund is used to support graduate student research with emphasis on students studying sedimentology.

Make donation checks payable to the **Department of Geosciences** and send to:

**WMU Foundation**  
**Western Michigan University**  
**Kalamazoo, MI 49008**

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\_\_\_\_\_ Earth Science  
\_\_\_\_\_ Geology  
\_\_\_\_\_ Geophysics  
\_\_\_\_\_ Hydrogeology  
\_\_\_\_\_ Advisory Council Scholarship Award  
(amount awarded is \$250)  
\_\_\_\_\_ Core Research Lab  
\_\_\_\_\_ Lloyd J. Schmaltz Geology Museum  
\_\_\_\_\_ Other \_\_\_\_\_

\*To support student and faculty travel, field trips, student and faculty research, and visiting speakers



## Geosciences Community 1997-1998



Back row:

3rd row:

2nd row:

Front row:

Mark Worrall, Dr. William Sauck, Jeff Groncki, Dr. David Barnes, Paul Pare, Eric Janness, Darren Lamsma  
Dr. Duane Hampton, E. Tyler Knoll, Chris Carew, Andrew Flint, Steve Kirwan, Christina Barker, Eric Ruckert, Dale Werkema,  
Dr. Ronald Chase

Dr. George Guthrie, Andy Nicholls, Allison Manley, Amy Welling, Jen Lee, Amber Crowell, Mike Dalman, Elise Ruehle, Dr. Alan Kehew,  
Stephanie Kohlhaas, Brenda Baker, Andrew Kozlowski, Lauren Hughes, Mike Kirby, Tony Marfia, Bill Jackson, Sue Nap

Matt Malin, Bob Havira, Dr. David Nobes, Kathleen Keckler, Dr. Michelle Kominz, Brian Chmielewski, Jake Sarna, Chris Kersten,  
Gloria Britton, Bev Britt, Dr. Estella Atekwana, Dr. Norman Lovan, Dr. R.V. Krishnamurthy





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## Department of Geosciences

### mailing list

We are anxious to keep your current address on our mailing list and, therefore, ask for your cooperation in advising us if you move. Also, if you know of other alumni who do not receive this newsletter, please send their names and addresses, we would like to add them to our file.

Name \_\_\_\_\_

Major \_\_\_\_\_ Degree \_\_\_\_\_ Year \_\_\_\_\_

Address & Phone \_\_\_\_\_

Current Employment \_\_\_\_\_

Professional Interests \_\_\_\_\_

News Items \_\_\_\_\_

Return to: Dr. Alan Kehew, Department of Geosciences, Western Michigan University, Kalamazoo, MI 49008  
Phone (616) 387-5485 Fax (616) 387-5513 e-mail alan.kehew@wmich.edu