I am pleased and excited to convey the many positive developments in Geology in the past few years. My association with the Geology Department began 20 years ago when I became an associate dean responsible for the science departments in what was then the College of Liberal Arts. Since that time, I have watched the Geology Department reestablish itself with a focus on environmental issues. Geology added three faculty members over that time: Mark Baskaran in 1999, Ed van Hees in 2001, and Larry Lemke in 2003. Together with Jeff Howard and Dave Lowrie, they have established a vigorous research effort and increased the number of Geology majors at both the undergraduate and graduate levels. In collaboration with Biological Sciences faculty, they also launched a BS degree in Environmental Science in 2004.

The Geology faculty and staff have been remarkably successful. Professor Lemke received a prestigious CAREER Award from the National Science Foundation and was awarded tenure last year. Professor Baskaran was awarded a Distinguished Faculty Fellowship in 2010. All of the faculty are actively engaged in research, publishing their findings and collaborating with colleagues across the university on environmental initiatives in Southeastern Michigan. Dave Lowrie, who curates the department’s vast mineral collection, recently secured several major contributions to the collection. There are plans now in the works to establish a permanent display area in a room next to the planetarium in Old Main.

The educational mission of the department is also strong. Always popular as a General Education course, GEL 1010 now satisfies the Physical Science requirement in the College of Liberal Arts and Sciences. Our faculty have made a sustained and successful effort to attract majors into the Geology and Environmental Science Programs. We now have close to 100 undergraduate majors in Geology and Environmental Science, along with a dozen graduate students in Geology. The number of female and minority students continues to climb.

Perhaps the best news of all is that the Department of Geology is growing again. This fall, we welcomed Dr. Sarah Brownlee to our department as its fifth faculty member! I am very proud of these developments. Much of our success is possible because of the continuing support of our alumni and friends. For that we are very grateful. Please keep in touch, and let us know from time to time how and what you are doing.

Sincerely,
David Njus, Ph.D.
Professor and Chair
Departments of Geology and Biological Sciences
Dr. Jeffrey Howard

Jeff Howard recently published a paper in *Sedimentary Geology* dealing with the sedimentology and paleogeography of late Pleistocene glacial paleolakes in the metro Detroit area. He also published a paper in *Environmental Pollution* on the effects of weathering of waste building materials on lead in contaminated urban soils of downtown Detroit. Dr. Howard recently completed a study using potassium adsorption isotherm analysis for relative dating and correlation of a glacial soil chronosequence near Detroit. He is currently studying the effects of artifact weathering on lead bioaccessibility in an urban soil chronosequence in Detroit spanning 100+ years of weathering.

Dr. Mark Baskaran

Mark Baskaran is actively involved with the GEOTRACES Research Program, an international study of the marine biogeochemical cycles of trace elements and their isotopes. This is continuation of the Intercalibration project. The GEOTRACES projects are funded by the National Science Foundation. Dr. Baskaran is also funded by the US Army Corps of Engineers to investigate the sediment dynamics in dams, a joint-project with colleagues in Civil and Environmental Engineering at Wayne State. He is finishing up a project on tracing the pathways of lead using their isotopes from the environment to human body. He spent his sabbatical in 2009 at Oxford University and delivered invited lectures in Sweden, England, and Spain.

Dr. Lawrence Lemke

Larry Lemke’s research focuses on the spatial variability and transport of contaminants in air and water. In the past two years, he and his students have analyzed geologic heterogeneity in glacial sediments in Washtenaw County, Michigan, the relationship between natural radioactivity and texture in glacial sediments, and air quality in the cities of Detroit and Windsor. Shannon Molaroni, Dr. Lemke’s second graduate student, successfully defended her thesis entitled “Modeling Ambient Air Quality in the Detroit-Windsor Airshed” in 2010. At present, Dr. Lemke advises four graduate students who are investigating contaminant transport in groundwater and air in southeast Michigan, and one undergraduate student who is investigating the spatial variability of lead in urban garden plots.

Ed van Hees and his Students

Ed van Hees and his students have been busy working on gold projects. Two graduate students are working on projects in the world-famous Porcupine Gold Camp of Northern Ontario and a third on a deposit in southern Peru. A fourth graduate student is working on the origin of diamonds hosted in an Archean conglomerate near Wawa, Ontario. Two undergraduates are helping with a study to find geochemical traces that can be used to find gold mineralization buried under deep overburden.

Ed has also published a paper on trace element pollution in the Clinton River system and is working on two papers dealing with the timing and sources of trace element, as well as PCB pollution in the river. He is also studying the origin of PCB pollution in the canals in St. Clair Shores, Michigan. That study has led to a collaborative project with Dr. Donna Kashian of the WSU Biology Department on the effects of PCBs on invertebrates living in the canals. Ed is also studying the origin of high boron found in water near some tailings dams in the Porcupine Camp.
Geology Faculty Grows with Addition of Dr. Brownlee

The Geology Department’s newest hire, Dr. Sarah Brownlee, began her appointment this fall. Dr. Brownlee earned her bachelor’s degree in Geosciences from Princeton University in 2003 and her PhD in Earth and Planetary Science from the University of California, Berkeley in 2009. Her doctoral research focused on 40Ar/39Ar thermochronology and paleomagnetism of plutonic rocks in northwest British Columbia. Her postdoctoral research was conducted at the University of California, Santa Barbara, and focused on the causes of seismic anisotropy in the continental lower crust. Her main research interests involve understanding how material is transported through the crust and what processes govern this transport. She uses a variety of analytical techniques combined with numerical modeling in order to better understand crustal processes and their associated time and length scales.

Sarah Brownlee has done more with her time than just research and study, however! She is an avid skydiver, with over 1,500 jumps to her credit. She played ice hockey while an undergraduate at Princeton, and intends to join a hockey league here in Detroit, where she’s glad to be. “I like the idea of being somewhere I can make a difference,” she says of the city, “and WSU offers a unique opportunity to make an impact, not only in the small Geology department, but also in the community at large.”

Recounting her own path to a Geology degree, Brownlee says that she was “an indecisive undergraduate student. I loved science, but I couldn’t pick just one science to major in. Earth science includes every branch of science, and this intrinsic multidisciplinary nature is what drew me in. And as it turns out, I like rocks.” Lucky for her—and lucky for the Wayne State students she will be teaching, students in whom she will no doubt instill a similar fondness for geology. “The only way I know to convey enthusiasm is to be enthusiastic,” she says, “which is something that comes naturally when teaching geology.”

Recent Grad Finds Work in Mining Industry

As a new graduate with a BS in Geology, my first job is with Lake Shore Gold in Timmins, Ontario. I was hired as a core logger—one who examines the intervals of core brought from the surface drills and lists the important attributes of each 1m to 1000m + of core. The attributes are: lithology, alteration, mineralogy, structure, and veining.

As part of this, I measure and comment on the competency of the core; mark the lengths of core to be sampled for gold; and enter all data on a spreadsheet. This information is then analyzed and sets of maps showing the depth, direction, lithologies, mineralogy, and mineralization percentages are produced.

Do I enjoy my job? Yes, very much. Do I find gold? Yes! Do I get bored looking at hundreds and thousands of meters of gray rock? Yes, sometimes, but I’m not only looking for gold. I’m looking for the conditions and structures that create the environment that gold is found in. And personally, my greatest enjoyment is being able to see a length of 0.0475m X 2600m cylinder of the earth, from lithified turbidites, massive basalt flows and monzonite-syenite intrusions, in all their tectonic complexity, and all their chemical and structural alterations, and try to make sense of it!

Another wonderful benefit of such work is the friends you make. Almost every day, you and your colleagues will be unloading 10 to 40 boxes of core, each weighing 65 to 75 lbs. Wow! What fun we have in the core farm, and it’s good for your health too! (You also get paid handsomely to boot!)
WSU Geology and Environmental Student Awards and Honors

Carrie Addis
• 2009 WSU Environmental Science Program Student Merit Award

Ayodeji Akinpelu
• 2010 Cardno-JF New Scholarship in Environmental Conflict Studies

Phillip Blount
• 2011 Branson Field Camp Scholarship; University of Missouri-Columbia

Lauren Bugdalski
• 2010 WSU Environmental Science Program Student Merit Award
• 2011 WSU Honors Undergraduate Research Grant

Mike Doyle
• 2011 CLAS Kehrl Endowed Scholarship

Andrew Frahm
• 2008 WSU Environmental Science Program Student Merit Award

Jennifer Fugaban
• 2010 McNair Scholarship
• 2011 National Conference on Undergraduate Research Travel Grant

Thomas Gebhardt
• 2009 Branson Field Camp Scholarship; University of Missouri-Columbia

LeAnn Germer
• 2008 SALNB - WSU Retention Scholarship
• 2008 Michigan Mineralogical and Lapidary Society Scholarship
• 2009 SMART Grant
• 2009 WSU Honors Undergraduate Research Grant
• 2010 WSU Board of Governors Academic Grant
• 2011 Branson Field Camp Scholarship; University of Missouri-Columbia
• 2011 WSU Len Cargan Scholarship

Carolyn Holmes
• 2010 McNair Scholarship
• 2010 WSU Geology Undergraduate Student Merit Award

Kurt Hnatiuk
• 2010 The Suburban Collection Scholarship
• 2010 Branson Field Camp Scholarship; University of Missouri-Columbia

Jessica Kash
• 2009 Branson Field Camp Scholarship; University of Missouri-Columbia

Jacob Korte
• 2009 WSU Environmental Science Program Student Merit Award

Timothy Lenane
• 2010 WSU Geology Undergraduate Student Merit Award
• 2010 Geological Society of America ExxonMobil Bighorn Basin Field Award

Shannon Molaroni
• 2009 WSU Geology Graduate Student Merit Award

Nicholas Morelli
• 2008 WSU Environmental Science Program Student Merit Award

John Niedermiller
• 2009 WSU Geology Undergraduate Student Merit Award
• 2009, 2010 Golden Key International Honour Society
• 2009, 2010 National Society of Collegiate Scholars

Christa LaShawna Powell
• 2009 WSU Board of Governors Grant
• 2010 WSU Board of Governors Grant
Wayne State University strives to deliver a world-class education in the real world to its students. For Geology and Environmental Science students, an important part of their education now includes the opportunity to complete a 40-hour responder-level Hazardous Waste Operations and Emergency Response (HAZWOPER) training at WSU.

Students who successfully complete the course are awarded HAZWOPER certification – a credential that can give them a competitive edge toward obtaining internships and full-time employment in the environmental and regulatory fields.

The first group of fourteen geology and environmental science students completed their instruction during the 2011 spring break under the able instruction of Wally Pociask, associate director of the WSU Office of Environmental Health and Safety. Mr. Pociask has more than 30 years of emergency response experience. The course included table-top exercises, hands-on emergency equipment demonstrations, and a full-scale emergency response drill in which our students dealt with a mock hazardous chemical spill in the Department of Geology Core Warehouse facility.
2011 Donors

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Faculty Award

Mark Baskaran received the Board of Governors Distinguished Faculty Fellowship Award, which was created to recognize and provide support for members of the faculty whose continuing achievements and current activities in scholarship and research are nationally distinguished. The citation reads: “Mark Mahalingam Baskaran is an outstanding scientist, mentor, and collaborator who has made substantial contributions to the prestige and reputation of Wayne State University. Recognized around the world for his expertise in the field of geochemistry, Dr. Baskaran has more than 100 peer-reviewed journal articles in the top journals.”
David Lowrie Endowment Fund Established

David Lowrie is an Academic Services Officer IV who has been employed in the Department of Geology since 1964. He has been an active and central contributor to the department’s mission to educate geologists and advance geological research for more than 47 of the department’s 64 years of existence. Throughout his long tenure, Dave has managed the department’s field camp, overseen the Physical Geology teaching lab, curated the department’s rock and mineral collection, and assisted with research projects too numerous to count. It is estimated that Dave Lowrie has touched the lives of more than 500 undergraduate and graduate students who received degrees from the Geology Department during his time here. For these reasons, the David J. Lowrie Endowed Scholarship Fund is being established to honor Dave’s many contributions and to preserve his legacy of service to the students of Wayne State’s Geology Department.

Dave provides invaluable continuity: he is the person who connects the department’s past to its present and—with the establishment of this scholarship—to its future as well. When we get calls from alumni, sometimes the only person they know in the department is Dave. It is therefore fitting and timely that we establish our first endowed scholarship fund to honor Dave’s innumerable contributions to the department. All of the full-time faculty members and several close friends have generously pledged more than $60,000 to launch this effort. With your support, the David J. Lowrie Scholarship Fund will help us meet the challenge of providing high-quality academic training and field experiences to our growing body of students for many years to come. Please help us achieve our goal to establish the David J. Lowrie Scholarship fund as a legacy for a man whose spirit has enriched us all by making your gift today!

Cardno–JF New Scholarship Recipients

Ayodeji Akinpelu Kimberly Siegel

The first recipients of the Cardno-JF New Scholarship in Environmental Conflict Studies, which makes up to $2500 of funding available to Wayne State University students majoring in Environmental Science or Peace and Conflict Studies at the undergraduate or graduate levels, are Ayodeji Akinpelu and Kimberly Siegel.

The Cardno-JF New Scholarship is designed to help develop graduates with a strong knowledge of emerging environmental concerns along with skills in conflict management to help resolve environmental issues. Controversies over water resources, clean air, global warming, land and waterway use, and other issues related to resource disputes are increasingly difficult to manage in the US and around the world. Preparing graduates to promote constructive and scientifically sound solutions to these issues will promote international cooperation and sustainable habitation of our planet in response to increasing environmental stress and demand for natural resources.

In his letter of application, Ayodeji Akinpelu, who has worked for several Detroit-area environmental advocacy groups, said, “I am pursuing a degree in Environmental Science so that I may become an Environmental Consultant or an Environmental Planner [...] I would be able to restore land that was once viable. I will also incorporate permaculture and sustainable designs so that the land and buildings will help harness energy that would otherwise go to waste. I am double minoring in Geology and Biology as well, so I may be able to advise people about the proper materials to use to create residential, community or commercial properties.”

A double major in Environmental Science and Peace and Conflict Studies, Kimberly Siegel has worked with several student environmental groups. “My motivation to pursue co-majors in Environmental Science and Peace and Conflict Studies,” she wrote in her letter of application, “stems from my belief that it would be difficult to work as an environmental scientist without being conscious of the social impact of environmental policy, a relationship often overlooked by government and the media.”

The Geology Department wishes both Deji and Kim the best in their continued studies and in their post-WSU careers!
The Geology Department’s yearly trips to explore environmental and hard rock geological sites offer students like me the chance to visit locations and experience things that we might not ever be able to do on our own.

I took the Key Lime Tour to the Everglades and Keys in Florida. We camped at Clear Springs, Everglades National Park and on Long Key. I have never camped before so this was a new experience for me. The campsites were very nice and everyone pitched in to create a wonderful time. The Long Key campsite is located in a mangrove swamp and had what seemed to be a hundred raccoon eyes glowing in the dark each night. They were most interested in our food and managed to steal some items from one tent. We found these in the mangrove trees the next day.

We went on many exciting outings in Florida including a bike trip through crocodile alley (a wonderful day of biking and animal watching); canoeing through the everglades and mangrove forest (it was fun squeezing through the maze of vegetation); snorkeling on a reef at John Pennekamp State Park in Key Largo (we took a boat out to a coral reef and snorkeled where a bronze reproduction of “Il Christo Delgi Abissi” stands underwater). I have never snorkeled before and it was the most wonderful experience I have ever had!

I can’t even describe the beauty and awe that I felt when I was in the water swimming among the fish and the coral. It was a whole new world and an experience I would not have had without the opportunity afforded through the Geology Department.

I want to give a very big and heartfelt thank you to all the very generous field trip supporters and professors Ed van Hees and Larry Lemke, all of whom made this once in a lifetime experience possible for me and the other students on the Key Lime trip!
Grand Canyon Trip

by Carolyn Holmes

I am a non-traditional student in the Geology department. This was my first trip to Arizona and it was the most intriguing time of my life.

We began with a three-day stop in Tucson and camped beside the beautiful Catalina Mountains. I awoke that next morning to such a beautiful sight—the sun rising above the mountains—that it brought tears to my eyes to know that I have lived in the U.S. for 45 years and never knew that we had such marvels.

We hiked through different trails in the area and explored the many geological wonders and experienced first-hand the overwhelming size of a caldera and its effects on its surroundings. To experience these sights that I have only been able to imagine through photos was a once-in-a-lifetime opportunity for me that shall never be forgotten. I saw what a horst and graben are and could not believe the size of these formations when compared to viewing them on a map.

But the best part of my trip was the Grand Canyon. I have seen many photos and have heard many stories, but nothing prepared me for the true beauty of this magnificent geological wonder. I took many photos and none could compare with what I saw with my own eyes.

My professor, Dr. van Hees, hiked with me and other classmates to make sure we experienced and understood what had happened and what was continuing to happen at this geological miracle. He will not acknowledge this but if not for him I would not have seen this place and would not have had the courage to conquer my fear of heights as we walked along the trail. And there is no way I would have been able complete this two-day hiking trip without his constant encouragement along the trails into and out of the canyon. Although it was a difficult journey for someone like me who was not physically prepared for this, I would not change what I was able to experience for anything in the world.

Last, but not least, our final stop was to an area named Slide Rock. I am not a swimmer but could not end this trip without an attempt to jump in from a short cliff like I have seen so many times in movies. My classmates, professors, and even local residents who were visiting encouraged me to take this daring leap and they were all there to make sure I did it and made it out alive and it was the most thrilling thing I have ever done.

I would like to also add that since joining this department two years ago I have experienced nothing but constant encouragement from all of my professors—from Dr. van Hees, introducing me to the trials of research; from Dr. Lemke, who has definitely taught me the meaning of organization and dedication to work and studies; from Dr. Howard, for showing me how to love and appreciate what I do, and that it’s really not that tough if you put your mind to it; and from Dr. Baskaran, for the constant words of encouragement that I can accomplish my dreams.
Field Trips

Field trips to geologic locations beyond Wayne State’s urban campus continue to play an important part of our strategy to recruit and educate students. Field trips are a regular part of Physical Geology, Mineralogy, Petrology, Structural Geology, Sed/Strat, Hydrogeology, and Economic Geology courses. In addition, annual departmental field trips have given our students the opportunity to visit California and Nevada (2003), the Mississippi River Delta (2004), Grand Canyon (2005), Permian Basin of West Texas (2006), post-Katrina New Orleans (2007) and Yellowstone and the Grand Tetons (2008), the Bay of Fundy (2009), the Everglades and Florida Keys (2010), and Arizona Sonoran Desert and Colorado Plateau (2011). Alumni support continues to help us make these opportunities available to increasing numbers of students – thank you! More field trip photos can be found on the Geology Department Website: www.clas.wayne.edu/Geology.
Professor Baskaran Publishes New Handbook

Prof. Mark Baskaran has published a two-volume set, *Handbook of Environmental Isotope Geochemistry*, by Springer. It is the most comprehensive book on this topic that has been published so far. This volume presents a total of 40 articles that deal with the applications of isotopes as tracers and chronometers in various Earth’s sub-systems (lithosphere, hydrosphere, atmosphere and biosphere). Attempts to maintain both rigor in vertical depth and horizontal breadth of knowledge in each of the topics have been made in this handbook, with a coverage of about 50% of the elements in the periodic table that commonly occur in the environment [from hydrogen, (Z=1) to americium (Z=97); a total of 115 isotopes (A=1 to A=241) of 48 different elements].

The spectrum of the target audience is wide, ranging from upper-level undergraduate students to veteran practitioners in the field who look for applications of these isotopes in different Earth sub-systems. The book will serve as a solid resource not only for environmental companies, but also those who work in regulatory agencies, including local, state and federal agencies. It provides the required isotopic tracers tools for the investigation of fate and transport of many of the commonly-occurring organic and inorganic pollutants that occur in the environment introduced during anthropocene.

It is also anticipated that this book will serve those senior undergraduate and fresh graduate students who are in the process of making a decision on the field of research that they want to pursue, as isotopes hold the key to unlock many less-known and unknown biogeochemical processes related to the sources, fate and transport of contaminants in the environment.

Prof. Alex Halliday of Oxford says of the book: “The environment has never before been the focus of such fascination, challenge and global engagement. Yet trying to comprehend it or predict how it might evolve is difficult because of the complexities of the systems. This is a volume of immense scope that provides up to date information on the range of new isotopic tools that are being developed and utilised to assail this issue. It is an invaluable reference work that explains the range of techniques, the archives and the discoveries, and should be of interest to any environmental scientist who wants to explore and understand these same critical parts of Earth’s surface.”

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