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TRAVELOGUE

My time in Kenya
by Alex Gutth

On Vitas Lake, at the terminus of the Bering Glacier. From left to right, undergradate geophysicists students Endsley, Richardson, and Espino.

ASSOCIATE PROFESSOR John Gierke, and applied geophysic laboratory students Kevin Endsley, Josh Richardson, and Silvia Espino recently traveled with the Michigan Tech Research Institute (MTRI) to project sites in Alaska.

While there, the group worked with MTRI to conduct research at the terminus of the Bering Glacier, including Vitas Lake, Midsummer Lake, and Seal River.

MTRI’s scientists and engineers support a Bureau of Land Management (BLM) and US Geological Survey (USGS) hydrological study of the Bering Glacier—the largest and longest glacier in continental North America.

The MTRI team, working with USGS and BLM scientists, designed an autonomous sensor that enabled BLM to accurately measure and analyze the melting of Bering Glacier.

Their findings indicate that Bering Glacier is melting at double the rate that scientists thought. The glacier is releasing approximately 30 cubic kilometers of water a year, more than twice the amount of water in the entire Colorado River, said Robert Shudman, codirector of MTRI and adjunct professor in GMES.

“This could potentially change the distribution of coastal currents in the Gulf of Alaska,” Shudman said. And, as glaciers melt, sea levels rise. “If it continues to rise at this rate, parts of the state of Florida could be under water at the turn of the next century,” he added.

Gierke and the three GMES undergraduates conducted studies new to the glacier, designed and coordinated by the students.

One study looked into the transition between the salt water of the Gulf of Alaska and the fresh (or brackish) water of Vitas Lake. Because Vitas

continued on page 11

Bering Glacier melting faster than scientists thought

WELCOME TO ANOTHER ISSUE Of the Faulkline. We have changed the appearance of the newsletter—I hope you will agree it is for the better. The new format should also allow us to publish this twice a year, enabling us to touch base with you, our alumni and friends, more frequently.

In this issue, we have tried to emphasize a certain theme. In service to the world. Many of our faculty and students are involved in research and outreach programs that have as their primary goal the good of society. We interact with government agencies both domestically and abroad to ensure that our policymakers are well-informed on important issues regarding Earth and its resources and hazards.

Photo-ops. You may have noticed the fuzzy (cell phone camera) picture of me with Senator Carl Levin. Senator Levin is a collector of antique maps of Michigan, and something of a geology buff, but he did not have an antique geologic map on his office wall in Washington, DC, so the GMES department provided him with one “on permanent loan.”

Elsewhere in this issue, you may also notice a picture of graduate student Agustín Robles-Morua meeting President George W. Bush. An accompanying article describes the background of that meeting.

Other topics covered do not have accompanying photos with political celebrities, but are certainly significant. John Gierke was named Michigan Distinguished Professor of the Year. The State of Michigan developed new laws to govern mining of non-ferrous minerals, developed by a team that included Ted Bornhorst. Bill Rose was a member of the authoring team of a National Academy of Sciences report that advises NASA on its priorities—which have been shifting of late.

You will also find articles about field work in Africa, the poorest continent, artwork by our students now on display in a new coffee shop on campus; and inter...
GMES students win Aftermath Café art competition

ROX CROUCH

Here’s the short story on the drawing: Art class was strange. I felt out of place with all of the students—you know, the ones that take introduction to astronomy for their one science class. During the class I tried to produce art pieces that related to science just to maintain my identity in the herd of liberal arts majors. This drawing is that class. I was still working on a physics problem when the art instructor directed us to draw something meaningful that we had on our person and the medium was graphite—one hour limit. My calculator, TI Voyage 2000, was already in hand and soon found its way to the paper (eighted by twenty-four inches). I finished the physics problem and didn’t think about the drawing again until Dr. Pennington asked students in his department to submit an art piece for the Aftermath Café art contest.

This is a watercolor painting that I did in one of Mary Ann Beckwith’s art classes here at Tech (I adore her classes!). It was done using techniques like stamping and stenciling, with the large trilobite being a stencil I cut by hand specifically for this work. Trilobites are among my favorite ancient critters, and I thought they would make for an interesting subject, allowing me to blend two things I love (geology and art).

I actually did a mini series of three paintings, with “Trilobites” (featuring only the pygidium and inspired by an email that had funny answers found on real geology tests) and “Trilobit” (which features the shape of a trilobite made with B0 and 1 that spell out “trilobite” in binary) joining with “Primordial”—the painting I submitted for the contest.

Primordial

Alex Guth

TWO WORKS OF ART by GMES students were recognized in a recent campus-wide art competition at Michigan Tech. Rex Crouch received a third place prize, and Alex Guth received an honorable mention. Both works have since been matted, framed, and installed at Michigan Tech’s new Aftermath Café, located in Fisher Hall.

FOR MORE INFORMATION, check out the National Academy of Sciences report at www.nap.edu/catalog.php?record_id=11820

NASA’s shifting priorities—can we influence them?

“YOU HAVE TO MAINTAIN your own house first.” This was the response given by GMES Professor Bill Rose in response to the question of why it is important NASA continue to develop Earth observation programs instead of focusing only on future space explorations.

Rose, along with many of the country’s expert scientists, contributed to a report called Earth Science and Application from Space: National Imperatives for the Next Decade and Beyond, published by the National Academy of Sciences and the first of its kind. Six panels were convened, each one focusing on a different application for remote sensing of the Earth. Rose took part in the panel on solid-earth hazards, resources, and dynamics, his specialty being remote sensing of volcanic processes.

The National Academy of Sciences approached Rose to participate in the 426-page report which details the benefits of satellite-borne Earth observations, and the necessity of continuing those programs. Rose says this report was necessary because money is tight and politicians are currently trying to refocus NASA’s mission away from further development of Earth observation instruments. “Scientists are not opposed to space exploration,” says Rose, “but we don’t want NASA to forget stewardship of the Earth.”

Many of the instruments currently used are beyond what their lifetime was intended to be. There are now over a dozen new instruments at different stages of development that the scientific community has deemed critical to maintaining a sufficient Earth observation program. “The science community is many times the driver of the designs of these instruments,” says Rose, but also adds that politics can sometimes influence government agencies, like NASA, more than scientists are able to. “Our current government has politicized NASA’s role and turned it away from the Earth toward other planets,” he adds.

Rose says that one scientist alone is not enough to raise awareness about an issue. He uses the example of James Hansen from NOAA, who was, in effect, ostracized by the government for his findings on the impact of global warming. A report written by a large number of scientists, though, who have expertise in many fields, is harder to dispute. “It may be how scientists can influence the government,” says Rose.

The report sets a “decadal vision”, meaning it gives declarations on how NASA should carry out its Earth observation programs for the next decade. One of the major problems with setting a decadal vision, though, is that the mission of NASA often changes. “NASA’s mission is not very clear, and it can change with administrations,” says Rose. The current administration would like NASA to focus more on space explorations and manned space missions and less on Earth observation. In fact, by 2010, there is likely to be a 40 percent drop in the number of Earth-observing instruments on NASA satellites. For this reason, says Rose, it is imperative that the scientific community clearly state their concerns and present them to the community.

Rose says that the report is written for the general public, but “is a vehicle to guide the politics.” Rose also adds that it takes input from the scientific community to bring about changes in policies that will benefit society, citing how remote sensing of the ozone layer led to the Montreal Protocol and a decrease of chlorofluorocarbon emissions into the atmosphere.

His main concern is that the missions of NASA, whatever administration is in charge at the time, will focus on the importance of remote sensing applied to Earth processes. As the report states, “these observations have served the nation, helping to save lives and protect property, strengthening national security, and contributing to the growth of our economy through provisions of timely environmental information.”

“It’s a no brainer,” says Rose, “We have to take care of our family.”

Alex Guth

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Primordial

Want to make a gift to the GMES department?

ALTHOUGH Michigan Tech is a state institution, it receives less than one-third of its funding from state appropriations. Your gift helps keep the GMES department on the cutting edge. There are three ways to give:

Use Michigan Tech’s online gift form at www.mtf.mtu.edu/gift

Call the Michigan Tech Fund at 906-487-2310

Mail a gift to the Michigan Tech Fund using the enclosed envelope. In order to make sure 100 percent of your gift goes to the GMES department, please specify GMES account #1325AO. Many, many thanks!

Rex Crouch

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John Gierke is one of the nine faculty members statewide to receive the first Michigan Distinguished Professor of the Year Award from the President's Council of the State Universities of Michigan.

Gierke, an associate professor of geological and environmental engineering in Michigan Tech's Department of Geological and Mining Engineering and Sciences, was cited for excellence in both undergraduate and graduate education. "Dr. Gierke and his student groups publish regularly, and students present their work at conferences among professionals. Sometimes, they are not even recognized as undergraduates," said Jacqueline Hunteon, dean of the Graduate School.

Gierke's nomination "has an easy-going, down-to-earth approach that allows him to interact in a collegial way with people from all walks of life," she said. "His ability to motivate students and community members is phenomenal. I can think of no other person who is more deserving of this honor."

Former Michigan Tech student Kathleen Lindstrom appreciated Gierke's teaching style, which relies on "handwritten notes and equations on the chalkboard."

"Rather than dazzle his students with pretty PowerPoint presentations, he really took the time to plan and carry out his classes in a way that led his students to a true understanding of concepts and techniques," she said.

Gierke stressed the importance of integrating mentoring and teaching. "Teaching without mentoring is, for me, only a transfer of facts and information," he wrote. Mentoring, especially through projects such as Aqua Terra Tech, "has allowed me to have the greatest impact on the most students, helping them develop practical and leadership skills that otherwise might not be experienced until their first professional position after graduation."

The other two recipients of the Distinguished Professor of the Year Award are geology professor Mark Franck of Central Michigan University and Heather Neff, a professor of English literature at Eastern Michigan University.

Undergraduate education is a central mission of the state's fifteen public universities, and the Michigan Distinguished Professor of the Year recognition program honors the outstanding contributions made by faculty in this arena, said Michigan Tech President Wayne Pennington.

"These fifteen nominees demonstrate the quality of education we celebrate. We'd like to thank every faculty member for their dedication to higher education and to each and every student."

Environmental Engineering PhD students in GMES

This issue of the newsletter mentions two environmental engineering PhD students—Agustin Robles-Morua and Domenico Bau. The advisor for both is Alex Mayer, a professor of geological and environmental engineering in the GMES department.

The PhD in Environmental Engineering is an interdisciplinary degree, currently administered through the Department of Civil and Environmental Engineering, but with faculty drawn from across the engineering disciplines. Many of the environmental engineering graduate students are part of the GMES family, a relationship we all find enjoyable and rewarding.

Q&A with Domenico Bai, PhD

Where did you go for your undergraduate degree/other graduate degrees?

I went to the University of Padua, Italy, where I obtained a joint BS/MS degree (or laurea, Italian for “degree”) in civil engineering in 1997.

When did you start at Tech?

I started in 2001. I came to the US and to Tech to pursue a PhD in environmental engineering under the supervision of Dr. Alex Mayer.

In brief, what was the focus of your research?

It focused on developing decision-making frameworks for the optimal design and management of groundwater remediation systems under conditions of parameter uncertainty.

What have you enjoyed most about the department?

It’s very dynamic academic environment, with the possibility to conduct research with a high degree of freedom. I have also benefited from interacting with students and faculty from different scientific backgrounds.

What are you doing now that you’ve graduated?

I recently began working as an assistant professor in the Department of Civil and Environmental Engineering at Colorado State University.

Q&A with Adam Durant, PhD

Where did you go for your undergraduate degree/other graduate degrees?

I completed my first degree, a Master in Science (MSci) in geology, from the University of Bristol, UK, in 2001.
HURON CREEK WATERSHED is located in Houghton County in the Upper Peninsula, a ten-minute drive from Michigan Tech. The roughly three-square-mile watershed encompasses much of the new commercial development for the City of Houghton and Portage Township.

Unfortunately, commercial development along M-26 has greatly impacted Huron Creek, which is important to various forms of wildlife. The creek also empties into the Portage Canal, which is hydraulically connected to the source of drinking water for the City of Houghton.

GMES Professor Alex Mayer has worked on the project—from geological, engineering, and environmental engineering perspectives. He and his students formed a watershed advisory group last year, consisting of residents, developers, representatives from the city and Portage Township, environmental groups, and the local schools, among others. “The public advisory group is supposed to motivate the watershed management plan, so the students have worked with the group to find out what is most important to them as far as restoring and protecting the creek.”

In addition, Mayer says, students have had to realize that this is not a hypothetical project—the plan will be submitted to the Michigan Department of Environmental Quality (MDEQ) for approval, and if approved, will open the door to funds for implementing the plan.

The first group of senior design students wrote a proposal to MDEQ to fund the development of the plan, which was approved last year. This was a real-life funding proposal, which competed against proposals from watershed groups across the state. It was the only one approved in the UP last year. This was quite an accomplishment,” notes Mayer. “It couldn’t come soon enough.”

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Q & A WITH ROB PORRITT

What made you decide to major in Geological Engineering?
I initially came to Tech for a degree in chemical engineering, but decided that it wasn’t really for me. Next I decided to try for a degree in chemistry and during that time I was taking GE200 and I loved it. So, in the spring of 2005 I changed my major to Geology and I’ve loved every minute of it.

What was your favorite class in this department?
That is a tough one. I’d have to say any of Bill Gregg’s classes. I learned a lot and I got to explore. Having the lab portion of that class really helped.

What’s your favorite rock/mineral? Why?
My favorite rock is chert and my favorite mineral is specular hematite. I like chert because the outside of this rock can be so misleading and the inside has a waxy luster and can be quite unique. I like specular hematite because it is so unique to the UP and because it is shiny!

What are you planning on doing after graduation?
After graduation, I will be working for Baker Atlas as a junior field engineer in Rock Springs, Wyoming. I will also be getting married!

Any advice for first-year geo students?
Don’t be afraid to ask questions. Some instructors can be intimidating at first, but after you get to know them. Don’t ever listen to someone who tells you that you can’t do something, prove them wrong and do it!

Q & A WITH KATIE RICHARDS

What made you decide to major in Geology?
I heard about the volcanic research in the department, and it sounded like a good chance to travel and see the world.

What was your favorite class in this department?
Aqua Terra Tech Enterprise—the practicality of using what I learned in class, learning outside of class, and leading teams has been rewarding.

What’s your favorite rock/mineral, why?
Obsidian and beryl—I love the cool-looking, shiny, black, glassy surface of obsidian, and I've always liked emeralds.

What are you planning on doing after graduation?
In the summer of 2007, I will intern for Newfield Exploration in Tulsa, Oklahoma. After that, and for the next four to five years, I will be working on my MS/PhD in seismology at UC Berkeley.

Any advice for first-year geo students?
Get to know the faculty, challenge yourself, and look to help on a research project which interests you.
POSTSCRIPT: Katie indeed did get married, to the son of an alumnus, and is now in Rock Springs as planned. Rob completed his internship and is now at UC Berkeley.

Reflections from Adam Durant

When did you start at Tech?
I arrived in Houghton in September 2002, shortly after completing an internship at the Hawaiian Volcano Observatory. I then went on to earn MS and PhD degrees in geology from Michigan Tech in 2006 and 2007, respectively.

In brief, what was the focus of your research?
It aimed to improve understanding of the processes that cause fine particles to settle from clouds produced by explosive volcanic eruptions. It has provided a new perspective on this problem by combining atmospheric science and volcanology, and presents a new model for volcanic ash sedimentation.

What have you enjoyed most about the department?
The department is tight, and the people connected to the department are very sociable. The department supports its students well. I had a great view of the lake from my office window.

What are you doing now that you’ve graduated?
I am now at University of Bristol as a post-doctoral researcher in the Department of Earth Sciences.

What advice would you give to first-year graduate students?
Know your deadlines and observe them. Get comprehensive exams and proposals done as soon as possible. Talk to your advisor as much as possible.
On the Faultline  
Volume 2, Number 3  
Winter 2008

We encourage your comments and feedback. Please contact us at:

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Michigan Technological University is an equal opportunity educational institution/equal opportunity employer. Since 1885, we have offered educational excellence in beautiful Upper Michigan. Our students create the future in computing, engineering, the sciences, business, environmental studies, technology, and arts and human sciences.

“Reflection” is a neat scenic picture that I took at Magadi in Kenya. Because the waters are saline, they are denser than normal water and tend to make lovely reflecting surfaces.

—Alex Guth

Special thanks to GMES graduate student Alexandra Mielnicki Novak, who gathered and wrote much of the content in this newsletter.