An SNC Geology Update:

Hello again, from your SNC Geology friends! We have had quite a busy year since the last issue and we are looking forward to sharing all of the great things our students have been up to! We have more geology majors than ever (for reference: Tim’s Mineralogy course has 15 students!) and they are truly an active bunch, doing research and internships, getting involved across campus, and making us proud.

Probably the biggest news for Geology has been the renovation of JMS (soon to be GMS – see photo above). Construction equipment began showing up over spring break, starting with a large addition on the east (river) end of the building. That addition will house office and classroom space as well as the facilities for the Medical College of Wisconsin (check out www.snc.edu/webcam for live and archived images of the east addition). The west half of the building was gutted (see photo to left), and the new facilities (including most of Geology) are being constructed inside. Our new facilities will now be on the ground floor and will include upper-level and introductory class/lab rooms, dedicated research space for students, lots of storage space, a core room, a rock cutting and polishing room, and a fossil preparatory lab.

Presently, Geology exists where it always has, now sandwiched between two construction zones. The temperature fluctuates wildly, it is dusty and super noisy at times, but we are SO excited. We expect to move in at the end of this academic year, at which point they will begin renovating the east half of the building.

Also new is the addition of a GIS course specifically for Geology majors, taught by Jeff DuMez (Brown County Planning Office). Our students have been learning the basics of GIS and how it is used in geology, including how to collect their own data using their cell phones (see photo to right). The course has been incredibly valuable and we hope to continue offering it.

The St. Norbert Geology Club has been very active in the past year, with students sharing their summer geology experiences, a trip to see Jurassic Park in 3D, and a trip to the Wisconsin Geological Survey’s core repository (see photo to left). Ten students also traveled to the October national GSA meeting in Denver, where they attended sessions, networked with graduate schools, and met SNC alums.

In this issue, you’ll find a recap of our most recent field trip to the Driftless Area, profiles of our many current research students, updates from our faculty, and information about other things our current and former students have been up to. Please keep staying in touch with us – we love hearing from all of you!
St. Norbert Geology Field Trip to the Driftless Area of Wisconsin:

Since the Maymester timing worked out so well last year, Nelson and Becky decided to do another Maymester trip, this time to the southwestern part of the state of Wisconsin, known as the Driftless Area. We took 11 students on a week-long trip, spoiling them with some pretty luxurious lodging. That’s right – no camping this year! Nelson lined up a great lodge and some homey cabins.

A large component of the trip focused on environmental issues. The trip began with a tour of the Leopold Center, near Baraboo. Students learned about the Sand County Almanac, the concept of land ethic, and saw Aldo Leopold’s famous shack. The following day our students met with Duke Welter of Trout Unlimited. He talked about poor management of the land surface in the early 1900’s being responsible for decreasing the health of streams in the Driftless Area. Then he showed us some of the work that Trout Unlimited is doing to restore these streams. Later in the trip, we traveled to the Kickapoo Valley Reserve. Students learned about the environmental issues surrounding the La Farge Dam, a dam designed for flood control that was ultimately never finished.
Nelson brought his knowledge of glacial geology to the mix throughout the trip. He pointed out numerous glacial landforms to students while on the road (including moraines, drumlins, and glacial lake plains). Students visited Devil’s Lake and Roche-a-Cri State Park to learn even more about the extensive glacial history of their home state.

Students also had a few opportunities to learn about the Paleozoic history of the Driftless Area from Becky. At Parfrey’s Glen (near Devil’s Lake), students examined curiously large, rounded purple boulders in the cliff walls. They also had a chance to see Paleozoic carbonates and eolian deposits at Governor Dodge State Park and at a random highway outcrop!

Cave of the Mounds was a fun side trip where students learned about how caves form and heard some truly terrible jokes from our guide while wandering through the cold, damp cave.

What a trip! Being close to home, we were able to keep the cost of the trip pretty low for our students, which meant many of our majors were able to attend. For more information and photos from the trip, please visit our website at http://www.snc.edu/geology/fieldtrips/2013wisconsin.html
**Current Research Students:**

**Shannon Fasola ’14**

**Title:** Studying Aftershocks from the Mw=7.6 September 5, 2012 Nicoya Earthquake, Costa Rica

**Faculty Advisor:** Dr. Nelson Ham

**Description of Project:** Shannon is in the process of participating in a Keck Geology Consortium project. She spent four weeks this summer on the Nicoya Peninsula in Costa Rica (see Student Summer Experiences). During this time, she installed a small array of seismometers and GPS stations (see photo) for the purpose of locating aftershocks ten months after the Mw 7.6 Nicoya Earthquake. Once a week, her team of students traveled to the stations to service them and to collect data. Her project utilizes the program SEISAN to locate the smaller aftershocks of the five largest aftershocks of the 2012 Nicoya Earthquake. Shannon will be comparing these earthquakes to the main earthquake to determine the location of stress release on the Nicoya Seismic Gap and seeing if these earthquakes can predict future potential rupture.

**Outcome of Project:** Shannon will present her work at the Keck Annual Research Symposium at Mount Holyoke College in Massachusetts in April.

**Zach Osborne ’14**

**Title:** Magnetic and Geochemical Characterization of In Situ Obsidian, New Mexico

**Faculty Advisor:** Dr. Tim Flood

**Description of Project:** Zach spent four weeks this summer doing field work in New Mexico as part of a Keck Geology Consortium research project studying the chemical and magnetic properties of obsidian (see Student Summer Experiences). His field work involved collecting and geo-referencing obsidian samples (see photo to left, Zach is on the far left) at three sites around New Mexico, including Mule Creek, Mount Taylor, and Valles Caldera. Since his summer field work, Zach has done laboratory research on his samples at the Institute for Rock Magnetism at the University of Minnesota, using a Vibrating Sample Magnetometer and an AC Susceptibility Bridge. He will use his results to determine how to distinguish obsidians according to a number of magnetic properties.

**Outcome of Project:** Zach will present his work at the Keck Annual Research Symposium at Mount Holoyoke College in Massachusetts in April.
Allison Shackelton '14

Title: Pteranodon Preservation in the Late Cretaceous Niobrara Chalk of Western Kansas

Faculty Advisor: Dr. Rebecca McKean

Description of Project: Allison really loves pterosaurs, so she talked to Becky about coming up with a research idea. For her project, Allison traveled to the University of Kansas Natural History Museum over the summer (see Student Summer Experiences), where she examined over 80 specimens of Pteranodon (see photo to right). She closely examined their preservation (degrees of completeness, abrasion, fracturing, etc.) and used this information to draw conclusions about the depositional environment they were preserved in. Her work was funded by a Kresge Summer Research Grant.

Outcome of Project: Allison presented a poster on her work at this fall's national GSA meeting in Denver.

Projects Just Getting Started:

Cody Heinze '14 – Cody will be conducting a sedimentologic and stratigraphic study of Cretaceous conglomerate deposits that occur sporadically throughout the Driftless Area of Wisconsin. His work will involve field work to collect samples and measure section, and lab work to analyze his samples.

Faculty Advisor: Dr. Rebecca McKean

Trevor Osorno '14 – Trevor will be constructing a conceptual flow model for the Spring Green flooding event.

Faculty Advisor: Dr. Nelson Ham

Chaz Topacio '14 – Chaz will catalog the geochemistry of Holocene basalts from Four Craters Lava Field in eastern Oregon. This data will aid in the interpretation of the eruptive histories of the four cinder cones found at the lava field.

Faculty Advisor: Dr. Tim Flood
Celebrating Student and Faculty/Staff Collaborations:

An on-campus event, Celebrating Student and Faculty/Staff Collaborations showcases a variety of research projects and creative works that are accomplished at St. Norbert. It takes place in April each year in Todd Wehr Hall (formerly the library, now a sort of one-stop shop for students that houses offices like the Bursar, Registrar, Financial Aid). Geology was well-represented at the event this year, with 5 posters presented by 9 different students! Students in Petrology presented the results of their class projects on the Wausau batholiths while our two seniors (now alumni) presented the results of their senior theses.

Trevor Osorno ’14 and Cody Heinze ’14.

Amy Hamby ’13; Grant Zwiefelhofer ’15, Chaz Topacio ’14.

Ken Oxendorf ’14, Allison Shackelton ’14, Zach Osborne ’14; Karen Zelzer ’13.
Updates from the Geology Faculty:

Tim Flood

Greetings rich alums and friends of the College. The big news this year is the renovation of the science building. By and large, the project will result in a significant improvement of our facilities. For example, many of you will remember our one room with no storage where we taught all of our major courses and intro-geology. Soon we will have a new and separate sed-strat/paleo lab; glacial/hydro lab; min-pet lab; and a large intro-geology lab; each with an adjacent storage area. We will also have a designated rock preparation room in the basement. On the down side, we lost the large wooden table in the front of the intro-lab. Somehow it “spontaneously” rotted just as the renovation began. Outside of Becky and Nelson, we have no suspects in the table’s demise. Also, as renovation began, we were requested to move much of our rock collection to storage. It is hard to believe that in 1987 there were no rocks to move.

Otherwise, life is good academically and personally. Our number of majors is up. Fall of 2013 found 15 students enrolled in mineralogy; seven majors will graduate this year; and five incoming freshman declared as geology majors. Last summer we had two students participate in Keck Summer Research Experience for undergraduates. Shannon Fasola ‘14 worked on a geomorphology/geophysical project in Costa Rica and Zach Osborne ‘14 worked on a geophysics project related to obsidian and archeology in New Mexico. I was fortunate to spend a few days with Zach in the field outside of Albuquerque looking at obsidian. One student, Allison Shackelton ‘14, worked with Becky on her paleontology work in Utah and was lead author on a poster at GSA this year in Denver. Nine other students also attended GSA.

For me, my teaching and research march on. I am teaching mineralogy F-13 and expect to hear over 100 tray reports. Becky, Nelson and I are taking 14 students to Nicaragua in January for 16 days. None of us have been there before so it should be exciting. I am teaching a yearlong section of intro-geology for pre-service teachers as part of my NSF grant. I was co-author with Scott Kirst from the SNC Education Department on a talk at GSA in Denver related to this course and we will be presenting a one hour talk at the National Teachers Association meeting in Boston in April. I am also still futzing with the geochemistry of some mega-amphibole crystals from the Wausau area and some possible base metal sulfides from Antarctica. I am keeping myself busy but it could just be a function of getting less efficient as I get older.

My family is great (knock on wood). Sally and I participated on the 2-week SNC Heritage Tour to Italy last spring. Geologic time can be overwhelming but the cultural antiquity of Italy can be equally impressive. My boys seem to be growing up way too fast. Connor is 10 and Ryan is 9. Connor has already had 4 years of Spanish (way beyond me) and Ryan has taken the same amount of Mandarin. They are both good-natured kids. To sum, life is good. I am hoping you can say the same.
Hello everyone...thanks again for your phone calls, emails, and campus visits this past year (especially if you braved the construction and actually found your way to the 4th floor of JMS!). As most of you probably know, this past year has been busy for us in many ways, but it is all good and exciting. First, Becky has done such an outstanding job with the newsletter that Tim and I voted her as permanent SNC Geology Newsletter editor (until she retires!). We haven’t told her about this honor just yet, but we think all of you would agree that neither Tim nor I would do nearly as spectacular a job. Go Becky!

The big news of course is that construction is in full force on JMS, and essentially all of the new geology space will be finished by the coming summer (2014). One tiny exception will be my personal ‘no-one-can-find-me’ Quaternary Research Lab that will be next to the field storage area and the new loading dock. But I’ll survive the extra wait—it will be worth it. To be serious, we are overwhelmed (in the best of ways) thinking about the new space for teaching and labs, and especially the space dedicated for student-faculty research. We will post photos as soon as we are up and running. This is amazing.

This past year was also busy with new field trips and courses. Becky and I took 11 students to the Driftless Area of southwestern Wisconsin for a Maymester trip last summer. It was fun to dedicate a field trip to Wisconsin geology. And we had a great time integrating geology with local environmental issues and history in the region. Eric Carson, geologist at the WI Geological & Natural History Survey, and Duke Welter, from Trout Unlimited, each spent a day with us talking about their ongoing research into the geological history of the Driftless Area and trout stream restoration, respectively. We were very lucky to have them with us.

Also, this semester marked the first edition of ‘GIS for Geosciences,’ a 2-credit course for our majors taught by Jeff Dumez, GIS specialist for Brown County. Jeff is a top-notch GIS specialist in the state who was interested in working with St. Norbert students. He also has a keen interest in geomorphology. Becky and I sat in on this evening course and really appreciated the great job he did with our students. We are hoping to work with Jeff again this coming semester and in the future. We have long known about the need for developing basic GIS skills in our majors, and this is the first step.

On the research front, I’m planning to be on sabbatical next spring semester (2015) building on a project I started this past year working with the former state chair of Trout Unlimited to write a book about the connection between geology, land use, and trout streams in Wisconsin---especially the ways in which the past few decades have seen innovative hydrologic techniques applied to restoring spring creeks in the southwestern part of our state (the Driftless Area). If in, say, April or March of 2015 you think you see me in the Driftless Area casting a fly rod---I’m doing research (remember that).

Lastly, the most important stuff. Elias is now 1 ½ years old. He is all boy, all the time. This past weekend he drank all the water out of the cat bowl and said ‘ahhhhhhhhh’ before we could stop him (true). Zinash will be 7 on December 21. She is all (sassy) princess, all the time. But she also doesn’t blink an eye any longer when ripping loose teeth out of her mouth---so all (sassy & tough) princess, all the time. Staci, my much better half, will be a certified yoga instructor in a few more months. I am so proud to say I have officially mentored 4(!) yoga instructors in my career, all without knowing anything really about yoga.

As always, please keep in touch! And we hope you are all doing well. Take care.
Becky (Schmeisser) McKean

It is hard to believe, but this is the start of my 4th year back at the college! Things from the other side of the desk are certainly different than they are from the student side, but all of the unique things you know and love about St. Norbert are here in full force. For one, I am lucky to have two supportive colleagues that I get along with fantastically. We have built a great community with our students and I have really enjoyed getting to know this year’s cohort of geology majors. We have a huge senior class (we are graduating 7 this year!) and they have really impressed us with their motivation and excitement for geology. Although most are currently dealing with the stresses of applying to graduate school and jobs - Tim, Nelson, and I know some great things are on the horizon for this group.

Somehow, we are surviving the excitement of teaching in a construction zone. It is such a joy to see the building literally being built around us! We hope you’ll stop by to check out the progress if you are in the area, though be warned that none of the old doors exist anymore! To get to us, you’ll have to come in a new door that was drilled into the side of the building across from Bergstrom!

I taught Sedimentology and Stratigraphy again this past spring to a very full class and have also been teaching a number of courses that fill the science requirement in our new Core Curriculum program. I am really looking forward to teaching Historical Geology again this spring (fossils!). Nelson and I traveled to the Driftless Area of Wisconsin in May for our annual trip, which was a big hit. I learned a ton on this trip - Nelson has a wealth of knowledge about this region and it was really fun being in the field with him.

In November, I competed in the Honors Program’s Life Raft event again. If you recall from last year, this event has a panel of faculty argue as to why they should be the last person the Honors students save given a hypothetical world catastrophe. I won last year by arguing that I would be able to provide the students with the one thing most critical to their survival: water. As the reigning champion, it was my job this year to argue that the students were smart enough and self-sufficient enough to survive on their own. A vote for me meant that none of the faculty members on the panel would be saved! Through a message of hope and humor, plus a few jibes at the panel, I earned their votes yet again! And so the trophy (a wooden panel) remains with geology for another year!

On the research front, I have continued my work in the late Cretaceous Tropic Shale. I prepared the fossils I brought back with me last summer and currently have a student (Allison Shackelton ’14) working on identifying one of them, a new variety of fish not yet described from the Tropic Shale. Allison also worked with me this summer. She traveled with myself and another student (Shannon Fasola ’14) to southern Utah to excavate a plesiosaur skeleton that I found last summer. This specimen will come back to SNC for study once the fossil prep lab in the new building is complete. She then completed a project on pterosaur taphonomy and did a great job presenting her results at this year’s GSA meeting. I also presented there, showcasing a set of long neck plesiosaur vertebrae that serve as the first evidence of the long neck variety in the Tropic Shale (previously, we have only found the short neck variety).

Personally, Colin and I are enjoying living in east De Pere. We have been running a lot and recently competed in the Milwaukee Brewers Mini Marathon (Colin did the half marathon, I did the 10k). We also traveled to Italy this summer for 2 fabulous weeks of food, history, sights, and more food.

Thanks to all of you who send us notes throughout the year. We love hearing from all of you!
Student Summer Experiences:

**Amy Hamby '13** – field camp with Boise State University - field area in Sardinia, Italy (see 2013 SNC Geology Graduates for more about Amy).

**Karen Zelzer '13** – field camp with University of Missouri - field area in central Wyoming (see 2013 SNC Geology Graduates for more about Karen).

**Chaz Topacio '14** – field camp with University of Oregon - field areas in central Oregon, southwestern Montana.

**Trevor Osorno '14** – internship with AECOM in Green Bay. Trevor assisted with drafting annual reports and permit applications for landfills which were submitted to the EPA. He also performed aquifer tests and groundwater analyses, created multiple piezo maps, a conceptual flownet, and a conceptual site model. Trevor is continuing to work for AECOM this semester.

**Shannon Fasola '14** – research experience with Keck Geology Consortium in Costa Rica. Shannon spent 4 weeks installing seismographs around the Nicoya Peninsula. She is currently analyzing earthquakes from those and other seismographs for her senior thesis project (see Current Research Students for more about Shannon).

**Zach Osborne '14** – research experience with Keck Geology Consortium in New Mexico. Zach conducted field work at several volcanic sites in northern New Mexico over the summer. He recently traveled to the University of Minnesota to analyze the samples and is continuing this work as a senior thesis project (see Current Research Students for more about Zach).

**Allison Shackelton '14** – research experience with Becky McKean. Allison conducted two weeks of field work in southern Utah, helping to excavate a partial plesiosaur skeleton. She also did a project on pterosaur preservation that included traveling to the University of Kansas Natural History Museum to study pterosaurs in their collections (see Current Research Students for more about Allison).

2013 SNC Geology Graduates:

**Amanda (Amy) Hamby**

Amy is currently working on her masters in hydrogeology at the University of Wisconsin – Green Bay. Her project focuses on groundwater in Cambrian-Ordovician bedrock in northeastern Wisconsin. She will be examining groundwater chemistry changes from before and after communities switched their municipal water supply from groundwater to surface water, the role fractures play in supplying contaminants to the deep aquifer, and the compartmentalization of the aquifer due to local faults.

**Karen Zelzer**

Karen has begun work towards a master's degree in Geospatial Science at Missouri State University. Her project utilizes geospatial analysis to study shoreline erosion and land use along the Jamaican shoreline. She will be traveling to Jamaica to collect GPS data of the current shoreline in January. Her research will be used to help communities in the area with coastal planning and future land use. Karen is also working as a Research Assistant for the Ozarks Environmental and Water Resources Institute, working with water quality testing and sediment analysis for the city and private companies.
Student Awards for 2012-2013:

**Academic Achievement Award**
Allison Shackelton ’14
Highest GPA over the past academic year, awarded The Glossary of Geology.

**Outstanding Field Geologist**
Trevor Osorno ’14
Voted on by their peers for enthusiasm and excellence in the field, awarded a rock hammer.

**ROX Award**
Cody Heinze ’14
Voted on by their peers for “getting caught in the act of being themselves”.

We have been working hard to update and improve our St. Norbert Geology webpage. We added information and photos from several recent field trips, a page for our Geology Club, and old issues of this newsletter!

Please check out the new look at:

[www.snc.edu/geology](http://www.snc.edu/geology)

Thank you for your continued support of the geology program!