MSU GEOSCIENCE NEWSLETTER FALL 2018

The MSU Geoscience Department newsletter is published once per semester in electronic format. It contains news of MSU Geoscience activities, what our current students and alumni are up to, descriptions of useful materials, potential job and internship opportunities, and reports of recent scientific discoveries and publications by your current and former MSU professors.

Sign up for the Newsletter by sending a request to be added to **msugeoscience@gmail.com**. The newsletter is currently edited by Dr. Collette. Please distribute this newsletter to anyone who might find it interesting!

GEOSCIENCE DEPARTMENT NEWS AND HAPPENINGS

A lot has been happening around the department since the Fall newsletter went out! Dr. Webster has put together a new advising guide for our Geoscience students designed to help them navigate through the University and program requirements of our BA and BS. The new advising guide is available as a pdf from our main MSU Geosciences website, or you can access it directly from this link.

Bachelor of Science in Geology Approved at MSU! Yes, you read that correctly – our students asked for a second option, and your faculty responded! We now have two baccalaureate program options for students in the central and western parts of the state – a Bachelors of Arts with a major in Geology and a brand new Bachelors of Science with a major in Geology. The new BS will have more supporting science and math, but the core geology courses will remain the same. We envision the new major as a way for our students to be more prepared when going on to graduate schools, or to demonstrate additional math and science background in technical fields.

Join us for Science at Noon this Semester: Upcoming Senior Seminar Presentations! This semester, we will have three Geoscience students presenting Senior Seminar projects – Jesse Dalle, Halley Hanna, and Calob Were. Jesse will be presenting her work using Cambrian-age ripple marks to estimate nearshore depths and depth gradients on April 24th Haley will be presenting her work on GIS mapping glacial features of ND that she began with Dr. Hopkins on April 26th. Calob will be presenting work that he's been doing with geometric landmark analyses of some Cambrian age trilobites to see if trends in variation can be visualized using principal component analysis, and whether there is utility in these methods in helping to define or distinguish species. Calob will be presenting his work on April 12th. All seminars are at noon and take place in Cyril Moore room 231. If you have an hour for lunch, you live close by, are an alum, and want to listen to some science done by MSU students and faculty, swing on by for any of these talks!

Dr. Collette just began his one year appointment as the President of the North Dakota Academy of Science. He would like to encourage any of our current and past students to join the academy and to think about presenting research at the meeting that will be happening at the North Dakota State Museum and Heritage Center on Friday, April 3rd, 2020. Your registration gets you access to some fantastic talks by undergraduate and graduate students, and faculty other professionals; access to the poster session that will be held in a public display area so that the public can interact with students and faculty working on Science in ND; and the annual meeting and catered dinner after the day of talks! You can find more information at the North Dakota Academy of Science website here, including information on membership and abstract submission (if you're an early bird!).

New Carrot for Completing your Course Evaluation (SPL) Surveys. This semester, the Committee on the Evaluation of Teaching (of which Dr. Collette is a member), made some suggestions to administration in helping to increase student participation in SPL surveys. Your ideas count, and you cannot pass those ideas along if you do not fill those ideas in on your SPL forms! Be constructive, and let us know ways that you think your courses can be improved (but no, exams will not be eliminated!). For your participation, Amazon gift cards are up for grabs! Complete one SPL, get one chance of winning; complete five SPLs, get entered to win five times!

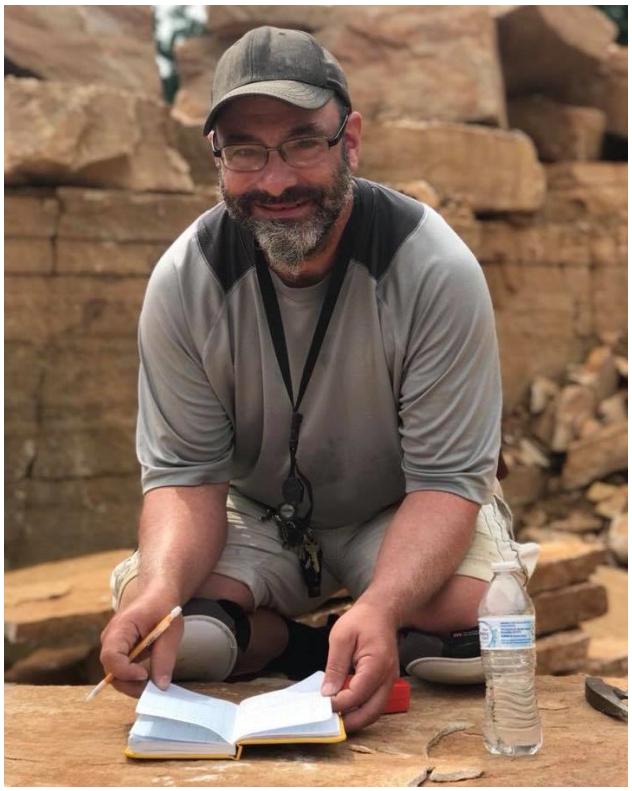
Dr. Hopkins Has Accepted An Offer for a Position at Tulane University! We were very disappointed with Dr. Hopkins' departure from the Geoscience Department here at MSU, but completely understand given the circumstances. Please drop Dr. Hopkins an email or a Facebook message to congratulate him on his new teaching position at Tulane University in New Orleans! Great news!

MSU Giving Day and the Division of Science. **Giving Day**, on Wednesday, April 10, 2019, is Minot State University's second one-day fundraising event. The goal is to inspire people everywhere to come together, demonstrate their pride for MSU by making a gift of any size while providing essential resources for generations of MSU students. This year, the Division of Science is seeking funds to help establish a few one-time scholarships to help attract students to the Division. You can find additional information on MSU's Giving Day campaign here.

FACULTY NEWS AND HAPPENINGS

Dr. Joseph Collette

Update Fall 2018.—It's been a quieter semester for me this Spring. I've been working on putting together a second online-only class to allow students enrolled in MSU's online degree programs to get both of their lab science requirements done at MSU (currently, they can only get one online lab science course here). That second lab science course is tentatively called "Earth Materials and Health", and should be a really interesting class. Building the labs is proving challenging and time-consuming, however. When completed, it should be a course that generates a lot of interest from many areas across campus. However, the primary cohort this course is designed for are online-only students.

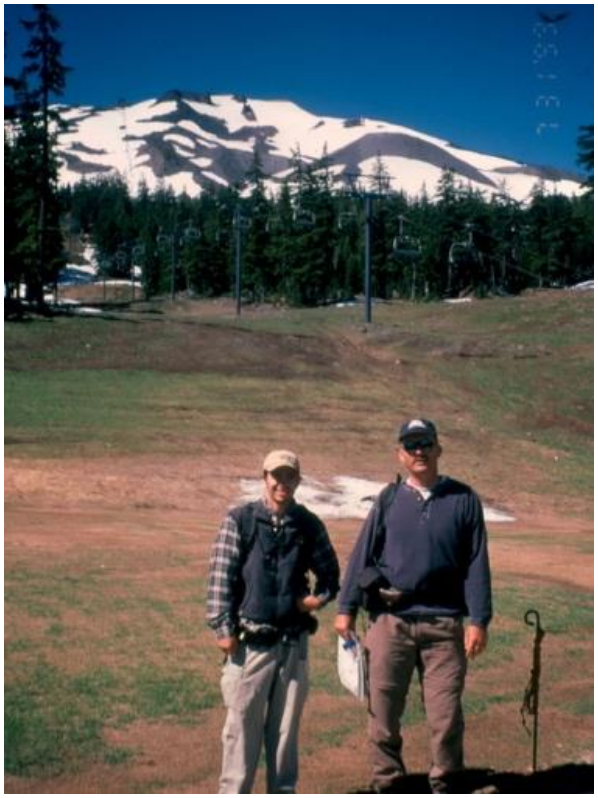


Dr. Collette making field notes during August 2018 fieldwork somewhere in central Wisconsin. If you're interested in doing a field-based project, Minot State Geosciences can make that happen! Image by Ana Swor.

"I presented a talk at the North Dakota Academy of Science annual meeting in Grand Forks on work done by myself and undergraduate students Ana Swor and Jesse Dalle. The talk summarized new data on the geometry of the Cambrian nearshore depositional environments, including a water depth estimate computed from oscillation ripples. Because ripple marks are primary sedimentary structures that do not change their orientation post-deposition, they may have utility in assessing whether tectonics has altered bedding plane orientations. So far, estimates of slopes from the ripple marks are very similar to bedding plane orientations measured in the field in 2015 and 2016 – so tectonics may not have significantly altered the bedding orientations in outcrop today, even given past glacial-interglacial cycles! Stay tuned!

Dr. John Webster

Update Spring 2019.—This semester I am teaching Seminar; five students are finishing up, including three from Geology. As usual for the spring, I am teaching Minerals and Rocks—it's nice to see enrollment up this year. Finally, I am also teaching Igneous and Metamorphic Petrology. We are continuing a class research project on a suite of samples collected at Mount Bachelor in the central Oregon High Cascades—work started with Justin Dauphinais's research project (see photo). During the class research project, I am using some software (Magmatica) that I wrote that is used to carry out a variety of calculations and modeling for igneous petrology. I've been busy this school year updating and testing the software.



Dr. Webster and Justin Dauphinais during fieldwork for his student research project on Mount Bachelor (sometime during the recent Anthropocene). Samples from Mount Bachelor have also been used for several petrology class research projects.

I have continued to be busy with departmental business and committee work. Work on a new degree program – Bachelor of Individualized Studies (a design-your-own-major program) – is complete. This new program was approved by the State Board of Higher Education and will appear in next fall's catalog. The small faculty group I've been working with has a little more work to do, preparing for initiation of the program (e.g., identifying a director). In Geosciences, work on a new degree program is also complete—a Bachelor of Science in Geology. I was not sure we would have time to complete the approval process in time to appear in next fall's catalog, but it worked out and the new option will be in the catalog!

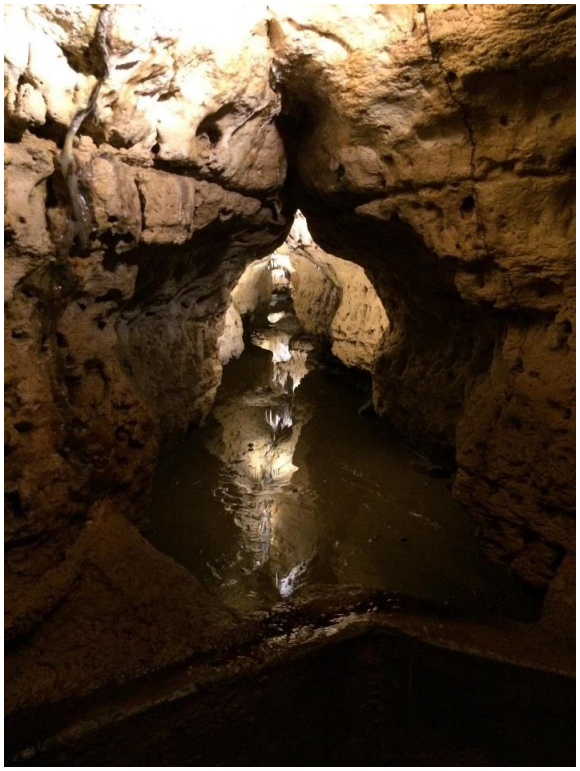
This semester I have made some progress on my heavy mineral analysis research. Right now I am focusing on analysis of very fine-grained fractions from some early samples that to this point have only had heavy minerals quantified from their medium-grained fractions.

Dr. Kati Kilroy

Dr. Kilroy During the Spring Break Geology 290 fieldtrip.

GEOL 290 Spring Break Fieldtrip Photos

The entire GEOL 290 crew in Mammoth Cave.



GEOL 290 students camping during one of their stops along the fieldtrip route.

ALUMNI NEWS AND HAPPENINGS

Paul Vogelsang – '16

"Since graduating from MSU in 2016 with my Geology degree and again in 2017 with my Master's degree in Management, I have been employed by several companies, mostly on a contractual basis. Each gave me a different view into the industry and how competitive things can be.

"I began working with AECOM out of White City in Saskatchewan as a management trainee. Since it was industrial construction management, nothing was particularly geo-related, but it gave great insight into how multiple companies offering a variety services work together to bring a project to completion. While there, I worked contracts in remote camps in northern SK and BC, and being remote offered its many challenges - keep your eyes open for bears and have your bear spray easily accessible!!

Paul Vogelsang working at a survey site on Johnny Mountain) in northern British Columbia, close to Alaska. Check out the hat! How many miles is on that MSU beaver hat, Paul?

"My first contract with was with NexGen Energy, a uranium exploration company. I logged core and provided lithological, geotechnical and radiometric data to the senior geologists so they could plan the next drill holes and further develop the uranium resource. Currently, NexGen is in the middle of a large drill program, of which approximately 100,000 meters of core will be drilled, much of which will contain very high-grade uranium mineralization. As of the fall of 2018, the Arrow deposit being developed was estimated at $3.7 Billion and is one of the largest undeveloped uranium deposits in the world.

"Following that contract, I worked as a field tech for DIAS Geophysical. We would be contracted out by exploration companies and conduct induced-polarization (IP) surveys on whatever resources they wanted to develop. By sending a current of about 4000 volts in to the ground, we could collect subsurface conductivity and resistivity data. That data would be used by the company that hired DIAS to plan their next exploration season. DIAS actually assisted NexGen in finding the Arrow deposit, which is located along a series of graphitic shear zones,

graphite being highly conductive. Being a field tech doing IP surveys is VERY labourious, with long days in tough conditions, traversing very difficult terrain with a heavy load on your back. However, if you're cut out for it, there is lots of work to be had in beautiful locations.

"I am currently employed by an environmental company, Buffalo Head Environmental, out of Estevan SK. We service the oilfield and provide a variety of environmental services. I work on the 'front end' of things, which means conducting field assessments of sites where oil companies plan on drilling or laying pipeline to get proper government approvals. This involves doing soil analysis, vegetation analysis, identifying wildlife in the area, checking if there are any species at risk in the area, and identifying and classifying any wetlands that may be impacted. I am currently learning as much as I can about local vegetation and wildlife! Buffalo Head is a great company, with great people who are passionate about the outdoors and the environment!

"Many of the classes I took at MSU have benefited me - from mineralogy/petrology, structural and chemistry to soils, field methods and sed/strat. All have provided insight. I've realized there are many different areas in Geology and Earth Sciences that you can get involved in, and there definitely is an area that you will thoroughly enjoy!

Spencer Wheeling – '13

"I graduated from MSU in Spring of 2013 with my bachelor's degree in geology and minors in chemistry and environmental geology. I went to SD School of Mines for field camp immediately after graduation. Field Camp seemed like a burden at first, but it was one of the best experiences I have ever had, and I thought it was fun to finally be able to apply all those lessons learned in class to real life examples and scenarios. While at field camp, I found out I was accepted to the PhD program at the University of North Dakota. I started the program immediately in the fall semester of 2013 and graduated in the summer semester of 2018.

USGS Hydrologist Spencer Wheeling at Rush River at County Hwy 32 near Amenia, ND, March 22, 2019

"While attending graduate school, I started working for the US Geological Survey (USGS) on the Pathways Internship Program in the spring of 2014. By fall of 2016, I was working full-time. While working for the USGS in Grand Forks I was a part of what we call our data section. This involved collecting hydrologic data for the eastern half of ND and into about a quarter of MN. Our primary task was making discharge measurements year-round (this included during the frigid months of January and February under ice) and working a continuous hydrologic record. We also kept track of ground water well stage levels, collected water quality samples, serviced continuous water quality monitors, surveying in gage equipment, and various other tasks to keep a stream discharge gage going.

"After I graduated with my PhD, my internship converted me to a full-time, permanent employee and I was transferred to our Bismarck office; which is where I am currently. My transfer also moved me to our studies section. Here I work on and have worked on various projects for many states. Primarily, I have developed and mapped out subsurface layers for various groundwater models, but I have also worked on water use studies and various other mapping projects and proposal writings. The ultimate career goal is to keep developing my studies section skills and become a research geologist with the USGS Energy Resource Program since my PhD is focused in

petroleum geology. The nice thing about working with the USGS is they are very fluent and will help you get to where you need to be.

A.U.G.I.T.E. NEWS AND HAPPENINGS

Jesse Dalle – President
Eric Bollefer – Vice President
Calob Werre – Treasurer
April Whittaker – Secretary

A.U.G.I.T.E.—The **A**ssociation of **U**ndergraduate **G**eologists in **I**ndustry, **T**echnology, and **E**ducation is the Minot State University Geology Club. It is an active University entity that sponsors geology-related fieldtrips outreach events, and brings in occasional speakers from geological industry to discuss issues that graduating students might soon face when entering the geological workplace.

Kyle Pay, a Biology major who is doing a Geology concentration engaging with visiting students during the Science Open House this semester. Great job to everyone who was involved!

During the Spring 2019 Semester, members of **A.U.G.I.T.E.** were involved in hosting various displays of geological materials around Cyril Moore. This included activities on the rock cycle, and for leading visiting students in discussions on the erosive power of streams – culminating in the 'Erosion Game', where visiting students place their house somewhere in a river 'landscape' in our stream table, and then we produce a 'flood' and everyone votes on who had their house in the safest place!

During the Spring semester, AUGITE was also involved in fundraising efforts for the Spring Break GEOL 290 Regional Geology fieldtrip to Mammoth Caves and points to the southeast. During these fundraising meetings, attendance was really very high - great job everyone and many thanks for your hard work!

SIGN UP FOR THE MSU GEOSCIENCES NEWSLETTER

MSU Geoscience Alums - KEEP IN TOUCH! We are continuing our efforts to keep in touch with our Geoscience alumni, and to enlarge and maintain our alum email contact list. If you know folks that have not received this newsletter who are MSU Geoscience alums, please ask them to get in touch with us so that they can be added to the list at **msugeosciences@gmail.com**. Likewise, if you think your company would be interested in receiving this newsletter, or if your school would be interested in receiving this list, please let us know!

We Are Always Seeking News Pieces and Short Features From Alumni! We are always looking for news and information on alumni and what you are all doing now! If you would like to share some of your experiences, news, events, information, current or upcoming internships, or other information you think is interesting, please send a 2-3 paragraph writeup to msugeosciences@gmail.com and I will add it to the next newsletter scheduled for Spring 2019.

Would You Like to Give A Talk About What You Do In Your Geology-Related Job? If so, we would love for you to come in to MSU and let out current students know about it! How you went about getting a job in geology, what you do in your current job, and some suggestions that might be helpful to people about to enter the workplace, we would love to host you! If you're interested please send an email to **msugeosciences@gmail.com**.

GEOSCIENCES Job and Internship Opportunities

GEOSCIENCE JOB AND INTERNSHIP OPPORTUNITIES. Many thanks to Thomas Filkins for sending us a link to the following paid internship opportunity in Bismarck. This listing is VERY TIME SENSITIVE – meaning go apply NOW if you are interested!

The North Dakota State Historical Society is seeking two paid Archaeological Interns. If you're looking for a paid summer internship opportunity, the State Historical Society is looking for two full-time paid interns to sort, categorize, and do digital records-keeping tasks for the state's Archaeological collections at the State Museum in Bismarck. The pay is pretty great as well - $16 dollars an hour! Applications should be put in as soon as possible if you are interested. Make sure you talk about your geology coursework, and any experience with software packages (MS Word, Excel, Adobe Illustrator, etc.) when applying. If letters of recommendation are required, ask your professors sooner rather than later. The link to more information and to apply is here. Thanks for the link, Thomas!

LOOK FOR OUR NEXT NEWSLETTER IN FALL 2019!