ISSUE 42

2019

UMD

Earth & Environmental Sciences Newsletter for Alumni and Friends

Greetings from the department!

I hope this finds you well. We have had a number of changes this past year in Earth & Environmental Sciences, one of them being that I am writing this letter instead of Howard Mooers. Howard stepped down after many years of service in January, passing the reins on to me. Other changes visible to everyone who walks through Heller Hall include several new maps of Mars, Venus, and the Moon as well as a classic outcrop of banded iron formation from the Soudan State Park that have been installed on the floor. Many thanks to Vicki Hansen for spearheading those efforts, and you can read more about that from her. If you have not seen them yet, it's definitely worth a trip back to UMD.

We are also very pleased to welcome a new faculty member. Dr. Wendy Smythe joined us this fall through a unique joint hire opportunity with the American Indian Studies Department. Dr. Smythe came to us from the National Science Foundation where she was working as a AAAS fellow. Her research focuses on geomicrobiology systems, as well as strengthening participation in STEM fields by Native American/Alaska Native students. She is teaching both in our department and in the Master of Tribal Resource and Environmental Stewardship program through American Indian Studies.

My own lab continues to be busy. I have five graduate students right now, and if everything goes as planned, they should all finish this year. Brian Sockness is studying channel network development and evolution in post-glacial systems. Lara Scott has been investigating surface water-groundwater connectivity within a local river restoration site. Emma Burgeson and Hannah Behar, co-advised with Salli Dymond, are studying the hydrologic implications of beaver dam removal on low flows. Emilie Richards has been mapping and analyzing landslides in northeastern Minnesota. This fall, I have also had a chance to dip back into my Mount Pinatubo research, with two invited talks on post-eruption river evolution. One of those was at an EGU Galileo conference in Nepal, an amazing opportunity to learn more about the impact of extreme events on geomorphology in one of the most dynamic landscapes on earth.

Many of us in the department are on the planning committee for the North-Central section meeting of the Geological Society of America, which is being held at the DECC in Duluth on May 18-19th, 2020. What a great chance to come back to Duluth for field trips, talks, posters, and fellowship! The Institute of Lake Superior Geology is being held in Mt. Iron, Minnesota, the week before, so if you plan it right, you can hit both conferences back-to-back.

We have an excellent group of students right now, with over 150 graduate and undergraduate students. You are all invited to come celebrate their achievements at the Awards Banquet on April 9th at the Greysolon Ballroom in downtown Duluth. We hope you can join us! Happy Holidays and best wishes for 2020!

Check us out on Facebook and Instagram @umdees

To Our Donors

We thank the following alumni and friends who have supported our students and programs with a charitable gift in the past year. Listed below are the names of individuals and organizations who donated to the funds of the Department of Earth & Environmental Sciences, and includes those donations that the University has posted to our department accounts at press time.

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Upcoming Events

Earth and Environmental Sciences Department 2020 Annual Banquet

Please join us at Greysolon Plaza's Moorish Room on Thursday, April 9th for an evening to reconnect with faculty, alumni and friends, and to meet our current students!

Social hour starts at 5:30 pm - cash bar

Dinner served at 7:00 pm - Italian buffet with dessert

Program and award presentations begin at 7:30 pm

Parking is free after 5:00 pm (parking ramp behind the Sheraton, handicap accessible)

Price: $25 per person

Please RSVP by Friday, March 27, 2020

Phone: (218) 726-8385
or
E-mail: dees@d.umn.edu

Faculty News

Latisha Brengman

It has been an exciting year for our lab! M.S. candidate Sam Duncanson presented their recent research findings at the annual GSA conference in Phoenix this September. Sam also won three awards – the Continental Scientific Drilling Division Award for GSA, the Geological Society of America Student Grant, and an Institute of Lake Superior Geology Research Award - for their proposed research project "Deciphering Precambrian seawater composition using primary mineralogy in the ~1.9 Ga Biwabik Iron Formation". In addition, graduating senior Mady David (Spring 2019), and current undergraduate Dani Stolze worked in the lab preparing and analyzing Precambrian sedimentary rocks to determine their mineralogy. This fall, we also started working with a group of four undergraduate students – Elizabeth Boor, Logan Carpenter, Heidi Krauss, and Emily Wojtowicz – examining textures, mineralogy, and geochemistry of some of the famous Archean turbidites in the region! We look forward to presenting some of this research at the upcoming regional GSA in Duluth.

Erik Brown

I continue to help out in UMD's Grad School and Research Office, supporting graduate students and highlighting UMD's research enterprise. We are working to foster interdisciplinary collaborations on campus, seeking external funding in support of our undergraduate teaching mission and to provide more support for faculty and staff working with research partners in the private sector.

I am also managing to sustain some of my own research activities, with a continuing focus on results from the Hominid Sites and Paleolakes Drilling Program and the MexiDrill Program, which target environmental records in East Africa and the Mexico City region.

Fred Davis

It feels like winter is setting in a little early this year, so we will see what the cold weather brings. Last year's extreme cold was too much for the air conditioning system that cools the chiller in my lab. We got an upgrade, so hopefully we will be able to warm ourselves by the piston cylinder as we melt rocks at 1400°C all winter long! In the past year we finally ran our first sets of experiments. Grad student Andrew Regula finished up experiments that taught us more about using trace elements to identify the types of rocks in the mantle that melt to make basalt. He will present his results at the AGU Fall Meeting in San Francisco. Four more undergraduate students have also performed experiments learning about how trace elements partition between cpx and melt in igneous systems and how the mineralogy of peridotites changes with temperature just below the solidus. Hopefully many of these students will present their results at the GSA North Central section meeting here in Duluth next year. I taught Mineralogy and Geology & Earth Systems this spring, and I am having a blast teaching Igneous Petrogenesis to grads and advanced undergrads this fall.

Salli Dymond

Happy Holidays! 2019 has been a great year for the WaTER Lab (Watershed and Tree Ecohydrology Research). My first graduate student, Kinzey Stoll, defended her thesis in May, while my current students, Emma, Hannah, and Shelby spent long days in the field in both Minnesota and California. I was honored to bring on three new graduate students – Mitch Ihlang (co-advised with John Swenson), Julia Petreshen, and Erin Bergen (co-advised with Julie Etterson in the Biology department). Meanwhile, my research technician, Peter Bouchard, keeps the lab running smoothly. I've had a fair bit of travel this year - In January I attended a snow-science school in Bozeman, Montana, I was out at my California field site in May, and attended a Gordon Conference on Catchment Sciences in June. In my spare time, I've been focusing on getting papers out the door, keeping my students on track, and developing new hydrology courses for the department.

Outside of work, the family had a great summer in our new pop-up camper. We had a nice road trip to Oregon to visit family and camped in four Minnesota state parks this summer. We look forward to lots of upcoming adventures with Cece (5) and Tilly (3)! My husband, Ben, and I also had a much-needed trip to Oahu – we are extremely grateful for grandparents who enjoy watching the kids for a week!

Cheers to all and have a wonderful 2020!

Christina Gallup

This past September, I made a research trip to Vanuatu, a small island nation in the south Pacific between Fiji and New Guinea. It is an amazing place from both a geologic and cultural perspective. I was there to sample coral terraces on the small island of Araki, which has a very unusual tectonic history. Until about 100,000 years ago the island was sinking, but then as a topographic high on the nearby subducting plate interacted with the upper plate on which it lies, the island started rising and is now rising as much as five meters per thousand years. I was collecting fossil coral and coralline algae samples to improve our understanding of the details of this history.

About 200 people live on Araki in a village, with a chief, on the broadest coral terrace. There is no running water, they get their water from a well or rain barrels. Because of the volcanic arc associated with subduction, volcanic ash fall over the years has created a rich soil and the richness of what grows on the island is amazing. They have coconuts, pineapples, pamplemousse (grapefruit), soursop (like a citrusy banana), cacao, kava, sweet potatoes, yarrow, taro, greens, nuts, and they have chickens, cows, and pigs. There is much less junk food on the shelves in the stores than in the USA. There is a cell phone tower on top of the island and almost everyone has phones, but most of them aren't smart phones. They are incredibly self-sufficient and have a fairly agrarian pace of life. They are kind, generous and passionate. They speak pigeon English with each other, which, if they slowed down, I could understand sometimes. As is often the case, the experiences you have while collecting geologic samples in remote places has a much bigger impact on your life and on your perspective than just the advancement of science. My world is a little bigger now and I will keep in touch with the friends I made in Vanuatu.

John Goodge

I have been teaching intro, petrology and field methods, which all went smoothly. I presented talks at a subglacial access workshop in Washington, DC in March and at a quadrennial Antarctic earth science meeting in South Korea in July. I recently finished work on a review paper for Gondwana Research on geology of the Transantarctic Mountains. It covers geologic time from 3.1 billion years ago to the present for the >3,000 km-long mountain belt, including periods of continental rifting, Andean-type orogenesis, plume magmatism, continental glaciation and crustal extension. No small topic, and no small manuscript! I will head back to Antarctica in early December for the next (and final?) round of testing of the Rapid Access Ice Drill (www.rapidaccessicedrill.org). I head up a team of 11 engineers and drillers at a test site near McMurdo Station. Check the blog on the project website for updates!

Vicki Hansen

Teaching EDI (Earth's Dynamic Interior) and Astrogeology always reminds and amazes me how many first-order, 'discoveries' occur each year in our incredibly dynamic science! EDI found us exploring 'blobs' deep in Earth's mantle—fantastic emerging science leading to new understanding of huge deep-mantle structures. In Astrogeology we explored recent insights on Venus and Mars, and delved into completely new views of Pluto and Mercury (thank you New Horizons and Messenger Missions). Wow, a geologically active Pluto, and Mercury with its graphitic crust, and interior structure differing from other terrestrial planets—these small bodies are definitely not boring or predictable! We donned 3D glasses journeying to Venus (the best planet ever!), Moon and Mars by way of new Heller Hall floor maps. During midsummer Jon Dyess's (PhD 2014) incredible photo mosaic of Soudan Iron Formation folds—a truly gorgeous work of science-art—joined the Heller Hall floor-map collection. During late summer Latisha and I hatched a plan to study Archean tubidites (thank you Dick Ojakangas!) to gain insight into local Archean surface conditions. Team Turbidite (including John Goodge, and undergrads Lizzy Boor, Logan Carpenter, Heidi Krauss, and Emily Wojtowicz) spent a wonderful field day collecting samples, and learning lots. Rock cutting and crushing currently underway should lead directly to data collection, analysis and discovery. Serenity Mahoney (M.S.) continues with detailed mapping of Inari Corona—a truly spectacular feature in Venus' mesoland. Serenity's research promises to provide insight into potential processes of Venus heat transfer, hopefully to be presented at LPSC-2020 in Houston.

Howard Mooers

Happy Holidays everyone. I am still here but thinking hard about when to change it up. I have to get several graduate students through first, however. Nick Budde is working on hydrology of calcareous fens in the Lake Agassiz beach ridges of northern Minnesota. To show how things come full circle, Tim Cowdery (USGS), one of my first grad students, is a member of Nick's committee. Jackie Drazan is so close to completion that by the time you read this she will be done, which brings to an end my active Iceland projects. Caro Shull defended over the summer, bringing to a close all of my England projects. My only connection back to Britain is Paul Burley's ongoing work on Neolithic landscapes in southern England. So one final anecdote. I have a student in my Intro Geology course that came in during my office hours, first thing he said was "Hey, my dad had you for a professor in this class in 1993."

Meet Our Newest Faculty Member
Wendy Smythe

I am so happy to join UMD this year as a new faculty member in the Department of Earth and Environmental Sciences and American Indian Studies this fall.

I am an Alaska Native Haida from Hydaburg Alaska located on Prince of Wales Island in Southeast Alaska. My experiences growing up in Alaska set the stage for my interest in the geosciences. My geoscience and oceanography research focus is on microbial and metabolic diversity, microfossil formation, and biogeochemical cycling of metalliferous, iron and manganese enriched, groundwater ecosystems in terrestrial and marine ecosystems from deep-sea hydrothermal volcanoes to hydrothermal springs in Southeast Alaska, Hawaii, and Yellowstone National Park. At UMD my research will focus on the applications of novel manganese recovery and remediation from industrial discharge and elevated manganese concentrations in aquifer. I also work to couple Indigenous Knowledge systems with geoscience, and over the last decade I have served as the Director of the Geoscience Education Program working to incorporate culture and language into culturally aligned curriculum. Additionally, I serve on the board of directors for the Xáadas Kil Kuyaas Foundation a 501 (C) 3 whose mission is to promote, preserve, and perpetuate the Northern Haida language. Through this work, I seek to increase the number of Native American/Alaska Native students represented in STEM disciplines there by increasing diversity and innovations in STEM, and to teach the next generation of Native Leaders.

Byron Steinman

This past year has been full of fun and excitement. This past March my wife, Kristin, and I recently welcomed our daughter, Margo, into the world. She and our three and a half year old son, Charles, have been enjoying each other's company (most of the time at least). Recently, Margo started crawling, which has made things pretty interesting, especially when she decides to knock over Charlie's towers!

On the research side of things, I'm also pleased to report that my three current students, Ali Wiemer, Collin Murphy, and Alejandro Fernandez, are making excellent progress toward their degrees and should graduate next spring. Their research projects are on climate change in the Canadian Rockies using geochemical analyses of lake sediment, investigation of ancient mining on Isle Royale through analysis of metal pollution in lake sediment, and model based interpretation of lake sediment records for the development of drought reconstructions in western North America. I'm a co-author on papers published this past year in Geophysical Model Development, Frontiers in Forests and Global Change, and Nature Communications. The latter paper explores the potential absence of multi-decadal oscillations in both climate models and the real world, which has implications for decadal predictability of climate as well as the attribution of past and future global warming to human activity.

I'm hoping to do a little more ice fishing this coming winter. Hopefully baby Margo and Charles will cooperate!

John Swenson

This year has been as busy as ever. Not much new to report, and I don't want to hold up the newsletter. I have one new graduate student, Mitchell Ihlang, co-advised with Salli Dymond, who is working on understanding water exchange between surface water and shallow groundwater through a freeze-thaw cycle.

Nigel Wattrus

In June I spent two weeks in Galway, Ireland with two colleagues, Steve Matthews and Dave Woodward from UMD's Department of History, Political Sciences and International Studies, conducting geophysical surveys for a couple of archaeological investigations that they are running. We collected Ground Penetrating Radar (GPR) and EM conductivity surveys on a Bronze Age settlement on Inis Mor, the largest of the Aran Islands in Galway Bay and at Roscam Abbey, the site of a mediaeval monastery just outside the city of Galway. The GPR data proved to be very useful and we identified several targets that will be excavated next summer when we plan to run an archaeological field camp at Roscam. I'll be returning to Galway to run the geophysical component of the field camp. We also conducted an aerial drone survey of the Roscam site and hope to do the same for the site on Inis Mor.

Following my field work in Ireland I spent two weeks in July collecting high-resolution seismic data on Rainy Lake. This was my first time working on this cross-border lake. It truly is a spectacular lake to work on with hundreds of islands to explore. This survey was conducted for the NSF project that I have with Andy Breckenridge from UW-Superior and Tom Lowell from the University of Cincinnati. The project seeks to understand the late glacial/de-glacial history of the Laurentide Ice Sheet in NE Minnesota and western Ontario, specifically the role that Glacial Lake Agassiz played. One of the objectives of my Rainy Lake survey was to investigate the evidence for seismic activity linked to isostatic rebound after the ice sheet retreated. We collected several high density grids to map sub-lacustrine debris flows triggered by the seismic events triggered by the rebound. Next month I'll be presenting some of these results at the AGU meeting in San Francisco.

On a personal note, my daughter Sally and her husband moved to Duluth and bought a house in Lester Park this summer. Sally is working as a kindergarten teacher at Laura Macarthur Elementary School and her husband has joined Cirrus Aircraft as a quality engineer. Jane and I both love having them closer to us! My son, Sam, is in the 4th year of his PhD at Harvard. He got engaged to his longtime girlfriend Pamela this spring and they will be getting married next May just before Pamela graduates from Harvard medical school. Jane and I are very excited to welcome Pamela to our family and are looking forward to their wedding in Boston.

Faculty Emeriti News

Don Davidson

Hello all - The Davidsons enjoyed a good year including a ski venture in California as well as a few golf days at Lake Tahoe. ("Shot my age a few times as it gets ever easier", says Don.) And we had a bumper crop of tomatoes and beans. Still having weekly coffee with the geo profs (emeriti) and attending seminars at CSE. Mary keeps turning out lovely quilts and placemats.

Trust all goes well at UMD - it is a special department. Don and Mary

Jim Grant

As usual the New Year started with three weeks in Baja and a week in Park City. Our split living between Bluestone and Nebagamon continued, much to our delight. In April Christabel had her second knee replaced and Niki and Fiona came up to help the recuperation, bless them! In May the Lake reopened, and we had a continuous stream of welcome visitors including five first cousins from near Oxford! An all too short, long weekend.

We found that our roof had to be replaced, which took care of both excess moisture and not so excess funds. Two weeks ago I had a more pleasant surprise. C and I were invited to a gathering of folk from the first Study in England Program which we started in 1980-81. There was a very good turn-out and several said this was a major event in their lives.

Christabel is vice-chair of the DSSO, and Ian has started his dream-project in the form of a course "Object Lesson" which combines his love for different cultures and their works of art, supported initially by Gustavus. Fiona is back gainfully employed, and loving it, and Tara and Alex are both in Breck School which is marvelous for them!

John Green

We stayed pretty close to home this year (in our nice apartment on London Road overlooking Lake Superior). I'm still slowly working away at interpreting J. G. Norwood's report on the geology of the North Shore, published in 1852, and giving a couple of talks and field trips for local groups. Jan wound up her work on the Minnesota Breeding Bird Atlas project, and is trying to keep up on crazy current events and to purge lots of files from the house. Our daughter Sarah came out from Vermont with her fiancé in April and got married in the St. Louis County Courthouse!

Two major events have dominated our year. We finally faced reality and got in gear to sell our house in the woods, hiring an agent, doing various fix-up projects, and renting a storage unit for overflow. And who should end up buying it but my old student and North Shore geology colleague Terry Boerboom (M.S. 1987) and his wife Jane (Markland; B.S. 1986)!

The other notable item is Jan's development of a collapsed vertebra in mid-summer, which generated lots of pain, a short hospital stay, and an ongoing rehab program. The rest of the world finally seems to becoming more aware of the immediate, existential problems of global warming, while here in the U.S. the most popular cars sold are SUVs and pickups. We sure haven't come far in that respect since Earth Day, 1970.

Tim Holst

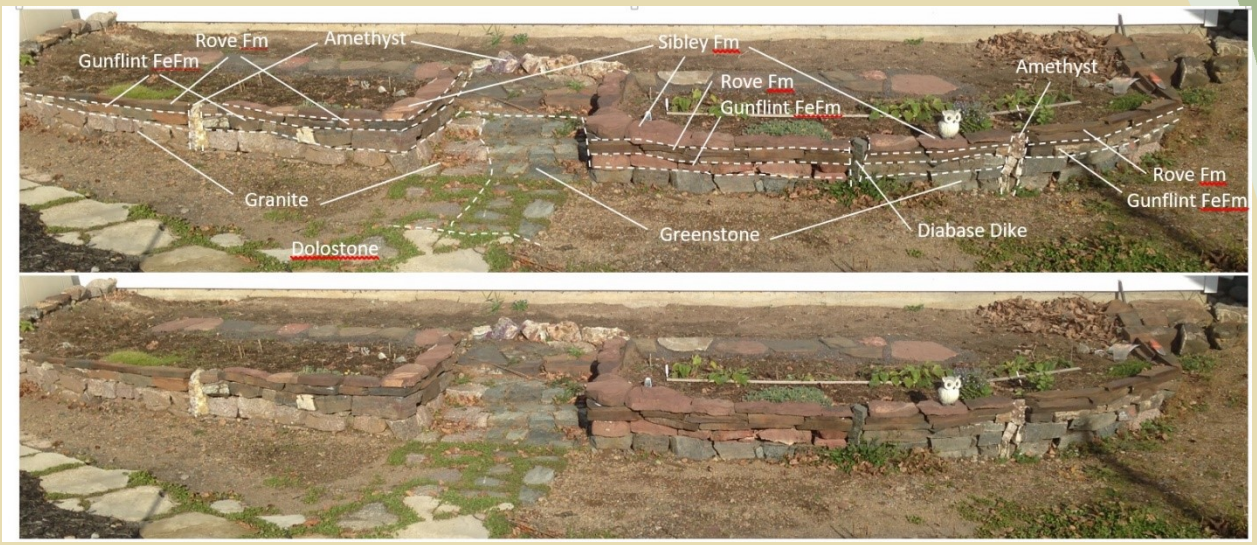
The past year saw the birth of our second grandson, Bjorn Selmer Holst, last March, to our older son Jeremiah, and his wife Katherine. They live three hours away in Bemidji. Bjorn's cousin Sage Isaiah Holst is now 15 months old. Sage, Nathan, and Sarah Holst live a mile away from us in Duluth. To be retired and have grandchildren is pretty darn good!

My PhD advisor, Peter Hudleston, retired last spring from UMTC after 49 years on the faculty. I was Peter's first PhD student. Several other UMTC grads and I cooked up a plan for a "Retirement Field Trip" to the Scottish Islands. So Peter's first and last PhD students, a couple in between, and a couple of his UMTC faculty colleagues enjoyed the geology (and the scotch) of the outer Hebrides (Lewis/Harris/Scalpay), the Orkney Islands, and the Shetland Islands, with a mainland stop at the type locality of the Moine Thrust thrown in. Highlights included beautiful complexly deformed gneisses of the Lewisian, the deformed Funzie Conglomerate on Fetlar, and the incredibly complex and varied geology of Shetland in general. Perhaps the most varied I have ever seen. We also saw great birds including Puffins, and a LOT of Viking history (I have really gotten into Viking history since retirement). Beth then joined me to see all those islands, plus Skye. We had also been to Tortola in April, where snorkeling was quite affected by recent hurricanes, but the reefs are coming back here and there.

Still lots of cross-country skiing for both of us.

Jim Miller

It's been another enjoyable year living on the shores of (very high!) Lake Superior north of the border. As explained in last year's note, a major task this summer was to construct a geologically correct garden wall from local rocks collected near our home. The photos below shows the result. The foundation of the wall has been constructed of Archean (~2.6 Ga) granite and greenstone. Resting on an Archean basement are Paleoproterozoic (1.85 Ga) Biwabik Iron Formation, which is overlain by the Rove slate formation. The uppermost unit is Mesoproterozoic (~1.4 Ga) Sibley Group sandstone. Finally, amethyst veins and a diabase dike (both ~1.1 Ga) cut the older units. Our patio and walkway is made of Silurian (450 Ma) dolostone slabs that rest unconformably on the granite-greenstone. Hooty the Owl is for scale. Louise has started some initial planting of perennials with more to come. Tours of the wall are free to the public.



Penny & Ron Morton

It is the first day of November. Hard to believe, but the gray weather reminds us that winter is coming and tomorrow we go off daylight savings time. I have had a pretty busy year in my first full year of retirement. I took up duplicate bridge and play from 8 to 12 hours a week, not counting on line. It is very addictive but it keeps the mind active. In May, I went with a group of women on a rafting trip down the Grand Canyon. That was amazing. It was new moon and the stars were SO SO bright. I have never seen the Milky Way that large and luminous. I guess when I was in northern Canada, when I was younger, I never took the time to appreciate the stars. One of the women with us was a UMD alum, Lynnette Carney, who did her master's some time ago. The rocks and the rapids were pretty cool as well.

Ron and I took a hiking trip to Tuscany in September with our hiking friends. All was good: walking, eating, and drinking Classico Chianti. The vineyards and olive trees were amazing as well as some of the hills we walked. We also took a cooking class—interesting, and did a lot of tourist stops in Pisa and Florence. Ron's favorite place was the Galileo Museum in Florence—he went back there several times. Mine was the baptistery in Pisa. The acoustics were marvelous. One singer performed and you would have thought there was a whole choir.

Much to my surprise there has been a lot of interest in my PhD thesis and I have had requests for samples, thin sections and polished sections. It is amazing after all these years that someone else will use more advanced technology on those same samples and probably make different discoveries.

Ron and I are still very active with our grandchildren, now 8, 5, 4, and 2. We took them all (no parents included) to ride the pumpkin rain. All had a good time.

Dick Ojakangas

Hello, all ye grads of "yesteryear"! You may recall that I do like to talk, and I am still doing it via PowerPoint presentations. The following is a list of "what & where".

"Earth's Energy Resources and Global Warming"
1. First Lutheran Church
2. Bluestone Flats (Where we now live.)

"Roadside Geology of Minnesota"
3. Duluth Lions Club (Also informed them that their Lester River plaque about Lake Superior is a bit misleading, in that the last glacier DID NOT recede 600 million years ago!)

"Turbidites That I Have Known, Loved, and Lost"
5. Mesabi Range Geological Society

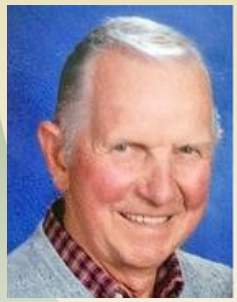
"THE BIG PICTURE: Continental Drift & Plate Tectonics"
4. Bluestone Flats

"The Contributions of Dr. Ralph W. Marsden to the Iron Mining Industry"
6. Marsden family & colleagues

"FINLAND'S THREE WARS TO STAY INDEPENDENT, 1939-1945: Winter War & Continuation War vs. USSR, Lapland War vs. Germany"
7. New York Mills, Minnesota
8. Finland, Minnesota

I'm still trying to finish research projects from as far back as 1972! Peaches keeps saying, "You are RETIRED! Why don't you quit all that computer stuff and enjoy life?" My answer; "This is what I enjoy doing!"

In memory of Glenn L. Evavold, MS in Geology, 1992 (former adjunct faculty member)



Glenn Evavold, former adjunct faculty member, graduate student, and long-time friend of the Department, passed away in May of 2019. Glenn received a BS in Civil Engineering from the University of Minnesota Twin Cities. As a consulting engineer and founding partner of RREM Engineering, Inc. in Duluth (he is the "E" in RREM), he realized the importance of geological investigations in environmental assessment. He began working on his M.S. degree in Geology 1988 under the direction of Charlie Matsch. At that time, there was rapidly increasing demand for geologists with training in hydrogeology and contaminant transport. The Geology Department recognized the potential for employment in environmental consulting, and enlisted Glenn's help in crafting a formal Hydrogeology/Environmental Geology Option within the Geology curriculum. Glenn played a key role in the development of the program, and over the next several years developed and taught courses in Applied Hydrogeology, Contaminant Hydrogeology, and Geology of Waste Management. Glenn completed his MS in 1992 and taught courses and helped advise graduate students through the 1990s.

Evavold, Glenn L., 1992, M.S. Thesis, (Advisor: C.L. Matsch) 101 p. "GROUNDWATER FLOW AND SOLUTE TRANSPORT MODELING AT A STATE SUPPORTED SITE, NORTHEASTERN ST. LOUIS COUNTY, MINNESOTA"

SWENSON COLLEGE OF SCIENCE & ENGINEERING ACADEMY INDUCTEE

It is an honor to announce that Tamara Diedrich is this year's inductee into the Swenson College Academy of Science and Engineering. The Academy was established in 2001 to recognize alumni and special friends of Swenson College who have distinguished themselves through commitment and leadership in their chosen profession.

Dr. Tamara Diedrich received a Bachelor of Science degree in geology from UMD in 1999. Her interest in mineralogy and geochemistry was kindled by an undergraduate research project on carbonate mineralogy of the Biwabik Iron Formation, which she completed with the advisement of Dr. Penny Morton.

After UMD, she went on to study high pressure experimental mineralogy and geochemistry at Arizona State University. In 2007, Tami received a PhD and returned to Duluth to take a position as Group Leader of the Mineral and Particle Characterization Group at the Natural Resources Research Institute.

At NRRI, Tami worked on developing protocols for taconite particulate characterization and conducted applied research on beneficial reuse of taconite byproducts. In 2010, she left Duluth with her family for an NSF International Research Postdoctoral Fellowship at Paul Sabatier University in Toulouse, France. At the completion of the fellowship, she returned to Minnesota to a position with Barr Engineering Company, where she worked to develop a mining geochemistry practice within that firm.

In 2016, Tami founded MineraLogic LLC, a specialty geochemistry consultancy, based out of Duluth. As Principal Geochemist, she helps mining companies predict and limit their environmental impact by developing technical programs to understand the potential geochemical interactions between minerals, water, and atmosphere on their projects.

Andrew Dennison - MS 2017

Gary Truman - BA 1970

Graduates

BA / BS
Geological Sciences

Dominic Alfonso
Madelyn David
Jay Halverson
Jacob Heitzman
Andrew Henke
Andrew Holstrom
Jeremy Hurley
Michael Kalwasinski
Tate Lange
Hannah Schwartz
Matthew Stewart
Jennifer Swartz

MS
Geological Sciences

Todd Kremmin
Andrew Regula
Zachary Wagner

MS
Water Resources Science

Carolyn Shull
Kinzey Stoll

BS
Environmental Science

Luke Anderson
Ruth Axtell-Adams
Croix Bopray
Peter Bouchard
Bethany Chaplin
Tyler Dahm
Eric Donner
Lucas Fossum
Kory Hill
Mitchell Hinnenkamp
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Adam Toninato
Lauren Votava
Justin Zunker

Student Scholarships, Awards and other Notable Mentions

Outstanding Graduate Teaching Assistant Award (Randy Seeling): Serenity Mahoney

Outstanding Graduate Student (Ralph & Ellen Marsden & Randy Seeling): Kathryn Vall

Outstanding Senior Award-Geology (Ralph & Ellen Marsden): Nevada Lasher

Outstanding Senior Award-Environmental Science (Barr Engineering): Kimberly Hanson

Outstanding Junior Award-Geology (Hugh Roberts Scholarship): Emily Wojtowicz

Outstanding Junior Award-Environmental Science (Barr Engineering): Sam Nesheim

Tools-of-the-Trade Award (UMD New Millennium): Elizabeth Boor, Logan Carpenter, Heidi Krauss

UMD Crain Family Scholarship: Emily Wojtowicz

Nancy Elizabeth Koski Scholarship: Brenna Roth

Jill & Terry Swor Scholarship: Elizabeth Boor, Logan Carpenter, Morena Hammer, Sam Nesheim

Estwing Geology Field Methods Award: Elizabeth Boor

Kenneth E. Differt Scholarship: Micaela Buda

UMD Peterson Memorial Scholarship: Emily Wojtowicz

Frantes Graduate Fellowship: Hannah Behar, Nicholas Budde, Emma Burgeson, Paul Burley, Samuel Duncanson, Alejandro Fernandez, Shelby Hammerschmidt, Mitchell Ihlang, Serenity Mahoney, Collin Murphy, Julia Petreshen, Ann Marie Prue (Spring 2020), Emilie Richard, Ali Wiemer

Roderick Syck Outstanding Field Camp Performance Award: Kendall Johnson

Barr Engineering Scholarship: Marcie Peeters

FIELD CAMP SCHOLARSHIPS:

Robert L. Heller Field Camp Scholarship: Travis Boser

"Rip" Rapp Field Camp Scholarship: Hannah Schwartz

Charlie Matsch Field Camp Scholarship: Evan Brinkman, Hannah Dryke, Andrew Holstrom, Kendall Johnson, Michael Kalwasinski, Nevada Lasher

Steven & Karen Brand Geological Sciences Field Camp Scholarship: Elizabeth Boor

Lempi M. & John Pagnucco Scholarship: Loren Naland

Faculty Emeriti Scholarship: Cooper Ling, Craig Steiskal

R.C. Bright Scholarship: Hannah Schwartz

Ralph & Ellen Marsden Scholarship: Ryan Peterson

New Millennium Scholarship: Mitchell Ihlang, Casey Reeves

2019 UMD Earth & Environmental Sciences

Graduate Student Presenters & Contributors

Geological Society of America South Central North-Central Rocky Mountain Joint Section 2019

Manhattan, Kansas

Fernandez, Alejandro, Steinman, Byron A., Stansell, Nathan D., Abbott, Mark B., "Hydrologic and Isotope Mass-Balance Modeling of Small Lake Systems and Implications for Reconstructing Holocene Hydroclimate Using Lacustrine Sediment Oxygen Isotope Records"

Wiemer, Ali, Steinman, Byron A., Abbott, Mark B., Wagner, Zachary C., Shae, Christopher J., Woods, Arielle; "Holocene Climate Variability of the Southern Alberta Rocky Mountains Reconstructed Using Oxygen Isotope Analysis of Closed-Basin Lake Sediment"

Awards

Jackie Drazan was recipient of the "Joe Mancuso Student Research Award" at ILSG 2019.

Jackie Drazan, Matthew Matko, Margaret Upton received "Eisenbrey Student Travel Grants" at ILSG 2019.

Samuel Duncanson and Collin Murphy were recipients of the Continental Scientific Drilling Division Student Research Grant and GSA's Graduate Student Research Award.

Ali Wiemer was recipient of the "Best Graduate Poster Award" at North-Central Rocky Mountain Joint Section Meeting 2019.

University of Minnesota Twin Cities

Department of Earth Sciences
Graduate Student Symposium 2019

Burley, Paul, "Long Barrow and Cursus Location and Orientation in the Cranborne Chase Neolithic Landscape"

The Institute on Lake Superior Geology 2019

Terrace Bay, Ontario

Drazan, Jackie, Brengman, L., Hudak, G., Mooers, H., "Morphology, Mineralogy, Texture, and Genesis of Peperite, Fivemile Lake, Vermilion District, Minnesota; Comparison with Pleistocene Peperite, Iceland."

AGU FALL MEETING

San Francisco, California

Wiemer, Ali, Steinman, Byron, Abbott, Mark, Wagner, Zach, Shea Christopher, Woods, Arielle, "Lake Sediment Oxygen Isotope Records of Holocene Climate Variability in the Southern Canadian Rocky Mountains"

Geological Society of America

Phoenix, Arizona

Budde, Nicholas, "Characterization of the Hydrologic and Landscape Factors Controlling Calcareous Fen Occurrence Along Glacial Lake Agassiz Beach Ridges, Northwestern Minnesota"

Duncanson, Samuel, Brengman, Latisha, Fournelle, John, Moy, Aurelien, "Deciphering Primary and Diagenetic Controls on Mineralogy in the ~1.9 GA Biwabik Iron Formation, MN Using Paired Textural and Geochemical Analyses"

Brengman, Latisha, **Duncanson, Samuel,** Hanson, Stephen, Wetzel, Anthony, "Crossing The Redoxcline: An Investigation Into Geochemical Changes That Directly Link To Textural Transitions In The ~1.9 GA Biwabik Iron Formation, MN"

Fernandez, Alejandro, Steinman, Byron A., Stansell, Nathan D., Abbott, Mark B., "Hydrologic and Isotope Mass-Balance Modeling of Small Lake Systems and Implications for Reconstructing Holocene Hydroclimate Using Lacustrine Sediment Oxygen Isotope Records"

Murphy, Collin, Steinman, Byron A., Pompeani, David P., Schreiner, Kathryn, Depasqual, Seth, "Reconstruction of Archaic Copper Mining and Holocene Environmental Conditions on Isle Royale, Michigan, Using Lake Sediment Biogeochemistry"

Richard, Emilie, Dahly, Derek T., Gran, Karen B., Breckenridge, Andy J., Delong Stephen B., Delong, Whitney M., Engle, Zachary, Jennings, Carrie, Wickert, Andrew D., "Landslides in Northeast Minnesota; Inventory Mapping and Susceptibility Assessment"

Sockness, Brian, Gran, Karen B., Cullen, Cecilia, Anders, Alison, McDanel Joshua J., Miller, Bradley A. and Moore, Peter L., "An Experimental Study of River Network Development By Overland and Subsurface Flow in Low-Gradient Landscapes"

Anders, Alison, Cullen, Cecilia, McDanel, Joshua J., **Sockness, Brian**, Lai, Jingtao, Miller, Bradley A., Moore ,Peter L., and Gran Karen B., "How Do Fluvial Networks Become Re-Established Following a Glaciation"

McDaniel, Joshua., Miller, Bradley A., Moore, Peter L., Gran, Karen B., **Sockness, Brian**, Anders, Alison, Cullen, Cecilia, "Using Noncontributing Area To Assess Landform Development in the Central Lowlands of North America"

Undergraduate Student Presenters & Contributors

UMD UROP Showcase - Spring 2019

University of Minnesota Duluth

Boor, Elizabeth, "Water Source and Budget for Beaver Dam Stream Site 2B in the Knife River Watershed"

Bouchard, Peter, "How Wind Changes Snowpack"

Leapaldt, Hanna, "A Lithological Assessment of Core Transects from Marl Lake, Wisconsin"

Peichel, Alex, "Spatial and Temporal Variation in Isotopic Values in Snowpacks"

The Institute on Lake Superior Geology 2019

Terrace Bay, Ontario

David, Mady, Schardt, C., "High-Technology Metals in Ore-forming Environments and Their Signature in Volcanic Hosted Sulfide Mineralization in Northern Minnesota and Wisconsin"

Geological Society of America

Phoenix, Arizona

Hanson, Stephen, Duncanson, Samuel, Brengman, Latisha, Wetzel, Anthony, "Crossing The Redoxcline: An Investigation Into Geochemical Changes That Directly Link To Textural Transitions In The ~1.9 GA Biwabik Iron Formation, MN"

Wetzel, Anthony, Hanson, Stephen, Duncanson, Samuel, Brengman, Latisha, "Crossing The Redoxcline: An Investigation Into Geochemical Changes That Directly Link To Textural Transitions In The ~1.9 GA Biwabik Iron Formation, MN"

EARTH SCIENCE CLUB NEWS

The Earth Science Club is a club where geology and environmental science major come together to give students the opportunity to share experiences and stories. Our goal is to show the students what each majors is made of; what is fun about them, what they both have to offer, and what there is to learn about both of them. This year our focus will be updating the Heller Hall display cases, a fall break trip to Amnicon State Park, and continuing our annual rock sale in the fall with an environmental science focused fund-raiser in the spring. To start off the year we have taken a nature hike through Chester Park to observe the geologic features and talk about ways to keep our streams free of pollution and litter. Dr. Latisha Brengman is helping the club submit grant proposals to fund renovations of the first floor Heller Hall display cases as well. This year has had a great start with many new faces around our department excited to learn and get involved.

by Heidi Krauss

WASATCH-UINTA FIELD CAMP

This year's Wasatch-Uinta field camp did not disappoint the number of UMD students that attended—Lizzy Boor, Loren Naland, Hannah Schwartz, Ryan Peterson, Evan Brinkman, Andrew Holstrom, Kendall Johnson, Nevada Lasher, Travis Boser, Michael Kalwasinski, and Casey Reeves.

Centered out of the grand Chateau Après Lodge in Park City, Utah, these students absorbed as much information as possible and as quickly as possible to perfect their field mapping technique. The daily schedule—6 a.m. wake up, eat breakfast, hike 10 miles up mountains, eat dinner, attend lectures, complete homework, and by 12 a.m. sleep. Rinse and repeat.

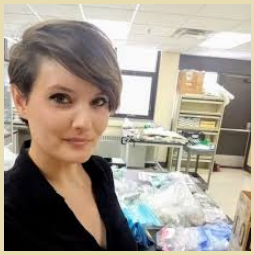
This grueling pace set the course of the summer and was necessary to understand the confusing geology of Chalk Creek, Deer Creek, Bonanza, Jupiter Ridge, and Alta. There were only a few injuries—two sprained ankles, a broken foot, and a concussion by rock hammer. One student did fall off a cliff and tumble down a snow filled valley. He came out...perfectly fine, and with a great story to tell! A resilient bunch.

A few vacations and field trips eased the stress of an overloaded schedule and intense hiking. The students floated in the Great Salt Lake in retreat of biting gnats, climbed to the top of Grand Teton only to come within two feet of a grizzly bear cub, mined for gold in the grueling sun of Nevada, and entertained an exciting Dungeons and Dragons campaign.

Clearly some great memories and friends to last a lifetime as well as a number of skills to apply to our future careers. Thank you to those who make this field camp experience possible, especially those who fund field camp scholarships. They are greatly appreciated and are a great investment in the future of students.

by Elizabeth Boor & Loren Naland

Faculty Awards & Notables



UMD SCSE 2019 Young Teacher Award sponsored by Dr. James P. Riehl

Dr. Latisha Brengman received this award which honors a faculty member of scholarly distinction and teaching excellence who has an established record of directly mentoring undergraduate students in meaningful research projects.

AISES (American Indian Science & Engineering Society)
Professional of the Year Award

Dr. Wendy F. Smythe (K'ah Skaahlauwaa) (Alaska Native Haida) works with Indigenous communities to couple STEM discipline with Traditional Ecological Knowledge (TEK) in K-12 education. Through her work, she seeks to increase the number of Indigenous people represented in STEM disciplines, increase diversity and innovation, and teach the next generation of Indigenous leaders.

A big thank you goes out to Dr. Vicki Hansen for being the inspiration and leader of the floor maps on display in Heller Hall. Dr. Hansen created the images from available datasets and coordinated the printing and installation with the Bell Museum in the Twin Cities. The third and final installation of the Soudan Iron Formation was done this summer.

Congratulations!
Dr. Karen Gran, promoted to full Professor
Dr. Byron Steinman, tenured and promoted to Associate Professor

After 25 years in the department, Claudia Rock is retiring in January. She has kept the department running smoothly for so long, for which we are all immensely grateful. On behalf of all of the faculty, staff, and students that you have helped over the years, thank you so much, Claudia!

We all wish you the best in retirement!

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