

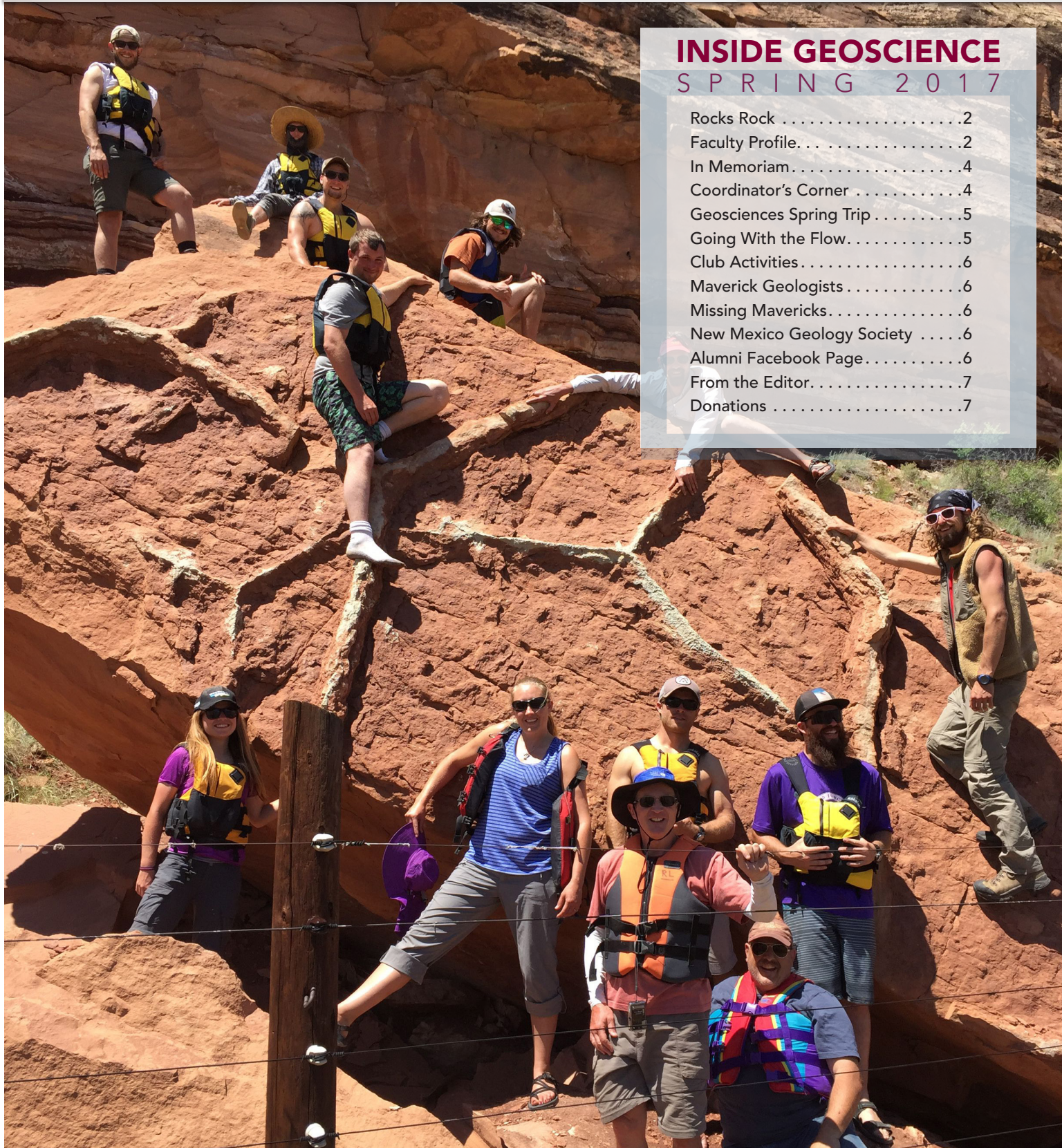
Geosciences Program Newsletter

For alumni and friends of the geosciences program
Spring, 2017


COLORADO MESA
UNIVERSITY
DEPARTMENT OF PHYSICAL AND
ENVIRONMENTAL SCIENCES

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Field Camp, 2016. Massive mudcracks on the Wingate – Chinle contact along the Colorado River in Ruby Canyon.

Image courtesy: Jonathan Cooley

Rocks Rock:

Current Research in the Unaweep Canyon Area

Verner Johnson and I have been working in the Unaweep Canyon area of the Uncompahgre Plateau with two recent alumni, **Adam Trumbo (B.S. '16)** and **Mike Feil (B. S. '16)**, and several current students. Graduates of the Colorado Mesa University Geosciences program will recognize the areas where we are working: Unaweep Canyon, Cactus Park, Big Dominguez Canyon, and Escalante Canyon. Adam and Mike spent a lot of time combing 'them thar hills' for mineral deposits, and they found incredible stuff! Most of you are probably familiar with the famous purple amethyst crystals found in Nancy Hanks Gulch. In addition to the amethyst, Adam and Mike also found fluorite, malachite, azurite, barite, calcite and others minerals that have not yet been identified. The two alumni also found similar mineral deposits in mine workings along other faults in the Unaweep Canyon area, but their most exciting find was slickenline striations (my favorite) along these faults. As an extra bonus, the Bureau of Land Management donated some excellent mineral samples (see image) to us that were confiscated from an overly enthusiastic collector (no affiliation with CMU) who was illegally in possession of 300 pounds of Unaweep specimens!



These are just a few of the outstanding specimens contributed to CMU Geosciences by the local office of the Bureau of Land Management. The upper left image is a breccia with amethyst, fluorite, malachite, and calcite. The others are purple amethyst specimens.

The goal for our project is to map what we believe to be a series of Laramide-age faults and associated mineral deposits. We think the mineral deposits are found along faults that are related to the mountain building event that formed the Rocky Mountains during the Laramide Orogeny. Our big problem is that there is no direct timing

evidence for the age of faulting except for cross-cutting. The faults are post-Jurassic because they cut rocks of that age. Other similar mineral deposits are present elsewhere on the Uncompahgre Plateau, but not all have been identified and located by the BLM. Part of our work will be to locate (or as the BLM says 'inventory') mine workings that have not yet been mapped.

What I find most amazing about this area is how many faults are present that have gone unnoticed. For example, remember the field trip in structure class where we go into Big Dominguez Canyon to look at the folds in the Proterozoic rocks? At our last stop (the waterfall), down at the base the waterfall is a wide zone of breccia (1-2 m wide), indicating the presence of a major fault. I now suspect that the entire Big Dominguez Canyon is controlled by a fault. The only way to know for certain is to walk the entire 10-mile length of Big Dominguez Canyon. The cool part is that most of the faults are oblique-slip with lots of rockin' slickenlines, and you know how much I like those!

We are in the process of submitting a proposal to the BLM for funding to produce a geologic map of the Dominguez-Escalante National Conservation Area. If all goes according to plan, we will do field work during the summer of 2017, after this year's "Little Ice Age" winter ends, and determine for certain if that fault really does run the length of Big Dominguez. We'll also locate other faults, and map previously unknown mineral deposits and mine workings. And of course, more slicks! •

~Dr. Rick Livaccari

Faculty Profile:

Dr. Gigi Richard, Professor of Geology

Massachusetts Institute of Technology (B.S., Civil Engineering)
Colorado State University (M. S. & Ph. D, Civil Engineering)

Greetings from the odd (wo)man out in the Colorado Mesa University Geosciences Program! As a water engineer and non-geologist, I've certainly had an interesting time since I joined the CMU geology faculty in 2002! I was hired to develop a water-related program in the sciences at CMU, and my interest in sediment bouncing along the bottom of a river channel seemed to be sufficient to earn the title of geology professor. In my nearly 15 years at CMU, we've added courses in hydrology, river dynamics, and introduction to water science, as well as a Watershed Science Minor program. Growing up in New Orleans, Louisiana, my early years were

surrounded by water and very few rocks. But a childhood visit to Yellowstone and skiing in Colorado opened my eyes to the wonders of a world that wasn't a flat, silty, sinking delta. So by the time I headed off to college at Massachusetts Institute of Technology, I was determined to become a geologist, despite dire warnings from my dad's colleagues at Shell that it was a bad career choice (it was 1985, the heart of an oil bust). My randomly-assigned freshman advisor at MIT happened to be in the water resources program in civil engineering, and he somehow lured me away from earth sciences. By the time I took his sediment transport class, I was completely hooked on water and sediment. My undergraduate research projects were still slanted toward the geosciences, though, as I worked on a liquefaction risk map for the city of Boston and on a computer-based geology tutor, which was quite cutting-edge in 1987!

After graduating with my B.S. in civil engineering and water resources, I finally headed west to explore those amazing mountains I had been introduced to as a child. I started on my M.S. at the University of Colorado-Boulder working on water quality modeling in the Colorado River, but the lure of skiing and the agony of Fortran programming led me to take a few years off from graduate school. After a six-year hiatus, during which I skied, led horse-back riding trips, married the mayor of Montezuma, Colorado, skied, built a house, owned a grocery store, skied a bit less, owned a civil engineering consulting firm, skied even less, and had a baby, I returned to graduate school, this time at Colorado State University in Fort Collins.

My graduate work at CSU was in civil engineering and environmental river hydraulics, including an M.S. project on mine waste clean-up in Summit County, Colorado, and a Ph.D. dissertation studying channel change on the Rio Grande in New Mexico following the construction of Cochiti Dam. As I was wrapping up my Ph.D. in 2000, I received a Fulbright Fellowship for a postdoc in New Zealand to study the Waiho River downstream from Franz Josef Glacier. That project involved construction of a model of the river in the lab and not nearly enough field work, but my daughter and I spent a spectacular year in New Zealand!

After New Zealand and another short post-doc at CSU, I was hired by Mesa State College in 2002, where I have immersed myself (so to speak) in better understanding the rivers and water of Colorado's western slope. My current research projects look at channel change in the Colorado River associated with removal of invasive tamarisk and

Russian olive, and at flash flooding in the ephemeral washes draining the Colorado National Monument. In addition, I received funding this year in collaboration with CSU faculty for two new projects, one for CMU students to study runoff generation from snowmelt on the Grand Mesa and the other to analyze crop water use on agricultural land at different elevations in western Colorado.

In 2011, I helped establish what is now called the Ruth Powell Hutchins Water Center at CMU, with a mission to promote education, outreach, research, and dialogue on water issues facing the Upper Colorado River Basin. As the faculty director of this vibrant and productive center, I've worked closely with the Center's coordinator to host an annual Upper Colorado River Basin Water Forum; create an annual Colorado Student Water Field course; develop, edit and publish a Scientific and Technical Report Series; and create a River Studies and Leadership Certificate in collaboration with the River Management Society and five other universities. Check out the Water Center's website for the latest updates: coloradomesa.edu/water-center. It's an exciting time to be working in the world of water in the western US. I reassure my students that studying water provides great job security because we can't live without water (we can grow food without oil, but we can't grow food without water!) and as population grows and our climate warms, water issues just get more interesting! The water future at CMU is bright! •

~Dr. Gigi Richard



Dr. Gigi Richard

In Memoriam:

Dr. Dell Foutz



The late Dr. Dell Foutz admiring a gold nugget on a trip to Siberia

We are sad to report that former Professor of Geology, Dr. Dell Foutz, passed away on February 12, 2017. Dell was a very important faculty member from 1974 to 1995 when CMU was Mesa State College and had its own Geology Department. Formerly employed as a production geologist for Exxon in Texas, Dell came to CMU in 1974 during the transition from a two-year school to a baccalaureate-granting college. He taught numerous sections of Geology of Colorado, Sedimentology and Stratigraphy, Paleontology, Economic Geology, Weather and Climate, and Geology of the Grand Canyon. He published several books, including *Geology of Colorado Illustrated*, which was the textbook for his Geology of Colorado class. He was also admittedly obsessed with gold and especially liked panning for gold along the Colorado River. He even taught geology students how to pan for gold during summer field camp at Radium Hot Springs, Colorado. His favorite course was Geology of the Grand Canyon where he led 15-20 students to the bottom of the Grand Canyon each year during the spring break. He was a great teacher and many students got the "geology bug" from him. His academic credentials included geology degrees from Weber Junior College (A.S.), Brigham Young University (B.S. and M.S.), and Washington State University (Ph.D.). Dell was a pilot and loved flying his homebuilt airplane around Grand Valley. He took many pictures of the beautiful landscapes with a common focus on geology. Dell was active with Grand Junction Geological Society for many years. He was elected society's Vice-President in 1993 and President in 1994.

This brief narrative does not do justice to Dr. Foutz. A more comprehensive description of his amazing career can be found in Spring, 2016, issue of the CMU Geosciences Program Newsletter at coloradomesa.edu/geosciences/documents/cmu_geosciences_newsletter_spring16.pdf. •

Coordinator's Corner:

2016-2017 Updates and Information

Hello again and welcome to the latest edition of the Colorado Mesa University Geosciences Newsletter. Here is a brief summary of past highlights and future events for the program in 2017.

2016-2017 Faculty Update: The past eight months have brought several important changes to the Geosciences faculty. With the retirements of **Donn Lorhammer** and **Skip Hase**, and a year-long sabbatical for Andres Aslan (myself), the program had to find temporary faculty, but unfortunately, some classes were cancelled. Temporary faculty include **Heidi Schoenstein**, **Doug Nichols**, **Jeff Paris**, **Greg Smith** and **Bob Halley**. Thank you all for helping us out! The lone exception to the temporary faculty trend has been the addition of **Dr. Cassandra Fenton**, who began teaching as an Instructor of Geology in the Fall of 2016. Dr. Fenton is a geochemist by trade and is offering an upper-division course in Geochemistry this spring. We are grateful that we can finally offer an upper-division course in Geochemistry at CMU! The Geosciences Program's request for a new tenure-track faculty member to replace retired faculty and to increase the percentage of tenure-track faculty teaching Geology courses was denied this past year, but we are hopeful for a better outcome next hiring cycle. Lastly, **Dr. Bill Hood**, who continues to support the Geology program in numerous ways, was recently awarded \$26K from the CMU Unconventional Energy Center. Funds will be used for student training and geochemical characterization work on the Green River Formation using our XRD and XRF equipment.

2017 CMU Geosciences Spring Field Trip, Sunday, April 23: As a follow-up to our well attended 2016 trip to Canyonlands, the Geosciences Program will offer a tour the geology of Unaweep Canyon and the Uncompahgre Plateau on Sunday, April 23. Stops will include results of new research on the structural geology and mineralization of the region led by former

students Adam Trumbo and Michael Feil along with professors Verner Johnson and Rick Livaccari (see feature article, this issue). The Geosciences Program will provide vans that will leave from campus (details below). We hope that alumni as well as current students will take this opportunity to re-connect with the faculty and the CMU Geosciences Program! For further information, please contact Dr. Rick Livaccari rlivacca@coloradomesa.edu.

2017 CMU Geology Student Presentations at the April Grand Junction Geological Society (GJGS) meeting: Each spring, the April GJGS meeting is set aside to showcase CMU student research. Presentations are a combination of short talks and posters, and this meeting (tentatively scheduled for Wednesday, April 26, at 7:30 pm) is a great way to see what current students are working on at CMU. If you can't make the Spring Field Trip on April 23, this might be a great way to re-connect with the Geosciences Program.

Thank you to everyone for your continued interest and support of the CMU Geosciences Program. In particular, we are grateful to all of you for donating to the Geology scholarships including the Geology Tuition Scholarship, which has now reached endowment status! We will now be able to begin awarding financial support to one or more deserving Geology students. We hope everyone is well and that we see you soon! •

~Andrew Aslan
Geology Program Coordinator

2017 CMU Geosciences Spring Trip:

Sunday, April 23

The Geosciences Program will offer a tour of the geology of Unaweep Canyon/Uncompahgre Plateau area on Sunday, April 23. The field trip will consist of a drive into Unaweep Canyon and up the Divide Road. We will make about five stops, some of which will involve moderately strenuous hiking:

- Stop 1:** Nancy Hanks Gulch mine and its extension to the south.
- Stop 2:** Hike up the northwest side of Unaweep Canyon to see the Taylor Ranch fault.
- Stop 3:** Look at the Taylor Ranch fault from Divide Road.
- Stops 4 & 5:** Faulting and mineralization along Divide Road.

Current students and alumni are welcome to come. Transportation will be provided by the Geosciences Program. Participants should meet at the parking area at

the corner of 12th Street and Kennedy and be ready to leave at 7:45 am. The trip will be over by about 5 pm. For more information, please contact Dr. Rick Livaccari, rlivacca@coloradomesa.edu or 970.248.1081. •

Going With the Flow:

Water-Related Activities in CMU's Geosciences Program

In addition to its regular education and outreach activities, the Ruth Powell Hutchins Water Center is immersed in the development of an Integrated Water Management Plan for the Upper Colorado River Basin in Colorado funded by the Colorado Water Conservation Board (CWCB). The planning project has been an exciting opportunity for CMU Geographic Information Systems (GIS) students to develop a geospatial database of water data in the upper basin. The initial student-developed database is now being handed over to GIS consultants who will build on it to produce a robust geospatial tool that will be available to the public next year.

The Hutchins Water Center is also involved in a water 'collaboratory' with the University of Colorado Boulder and Metro State University funded by the CWCB to study water use, attitudes, and behaviors on Colorado university campuses. This semester, students, faculty, and staff at the three universities are being surveyed, and building and irrigation water use data are being collected. Future phases of the project will explore innovative strategies to improve water efficiency on university campuses.

This year we also rolled out our new Scientific and Technical Report Series. The third and most recent report on *Conservation Planning on the Colorado River in Utah* was published in December 2016. The series provides an opportunity for peer-reviewed papers related to water issues in the Upper Colorado River basin to be published in a format longer than a journal article. Our next report will be the synopsis of a research study funded by the Water Center exploring the restoration potential of high-altitude fens ecosystems on the Grand Mesa.

This spring, we are co-sponsoring the Colorado Foundation for Water Education's Water Fluency course on the western slope. This course is an opportunity for people to dive into a deeper exploration of water science, policy, and issues, and will involve classes and field trips from Grand Junction to Glenwood Springs between May and July. Please visit the Water Center's website to sign up for our newsletter and explore the new report series: coloradomesa.edu/water-center. •

~Dr. Gigi Richard
Faculty Director
Hutchins Water Center at CMU

Club Activities:

The American Association of Petroleum Geologists

The American Association of Petroleum Geologists (AAPG) Student Chapter at Colorado Mesa University has had a busy year. Last summer, students organized a river trip through Cataract Canyon, where incision of the Colorado River has created exposures of Paleozoic rock which can only be observed and studied along this stretch. Students organized this field trip in order to see and learn about this remote stratigraphic section and are already planning a field trip for spring semester. Last fall, many of our members attended and presented at the 2016 Geological Society of America Conference in Denver. In addition to all our outings, we're keeping busy with monthly meetings. An election was held at the end of fall semester to replace several seniors who graduated in December. Congratulations to our new officers: Kathleen Dykstra, Rachael Lohse, Nicholas Cholas, Ian Shafer, Anthony Seuga-Duncan! The fall semester also saw a change of the faculty sponsor. Larry Jones stepped down at the beginning of August after three years as sponsor and has been replaced by our new faculty member, Cassie Fenton. The Chapter is interested in hosting speakers, particularly those who would like to talk about local geology or who can provide job-finding guidance to geology graduates. The Chapter would also be interested in hearing from geologists who would like to guide students on local field trips. Interested individuals should contact AAPG Student Chapter president Kathleen Dykstra kadykstra@mavs.coloradomesa.edu. •

Maverick Geologists:

Alumni News

Keegan DePriest ('16) sent an update on his first six months after graduating from CMU. Keegan has enjoyed working for Field Geoservices doing mudlogging, geosteering, mass spectrometry, and XRD work. Keegan has spent a lot of time behind a microscope looking at drill cuttings and interpreting gamma ray logs. He is particularly interested in geosteering and is currently doing that on a rig in West Texas. Keegan plans to apply to graduate school for Fall of 2017. Congratulations on a good start to what we expect will be a great career, Keegan! We always like to hear from our former students. If you can, please drop by or send an email and let us know what you are doing! Photos, current or past, are always welcome. •

Missing Mavericks:

Alumni News

We would like to send the newsletter by email and regular mail to all CMU geology alumni. Unfortunately, we have lost contact with a few. We hope they are happily employed, or retired and sipping Mai Tais on a tropical island. Regardless, if you know where any of the following alumni are (email or postal address) please let us know by emailing lajones@coloradomesa.edu, or ask them to contact us:

Missing Mavs:

- Donnelly, Lyall G. ('80)
- Dougless, Thomas C. ('82)
- Indivero, Gregory D. ('12)
- Knapp, Cheryl D. ('77)
- Kreid, Douglas S. ('77)
- McBride, Michael G. ('84)
- McCulley, Lynette E. ('83)
- Nair, Marilyn K. ('77)
- Simmering, Michael G. ('81)
- Smuin, David ('75?)
- Stermitz, Matthew J. ('84)
- Triplett, Gloria A. ('81)
- Velky, G. A. ('97)
- Vining, Brian T. ('02)
- Wilson, Cynthia J. ('78) •

New Mexico Geological Society:

Fall 2017 Field Conference

The New Mexico Geological Society annual fall field conference is scheduled for September 27-30, 2017. The conference theme is "Geology of the Ouray-Silverton Area." Activities will include geologic hikes in the San Juans at the peak of the autumn aspen colors. More information is available online at nmgs.nmt.edu/ffc/home.html. •

Alumni Facebook Page:

Colorado Mesa University Geology Alumni

Colorado Mesa University Geology Alumni have a Facebook page. You can access it by logging in to Facebook and searching "Colorado Mesa University Geology Alumni" or by going to facebook.com/CMUgeology. •

From the Editor:

Welcome!



Newsletter editor Larry Jones on the outcrop with students Rachael Lohse and Mike Getz

Welcome to the sixth issue of the Colorado Mesa University Geosciences Newsletter. Dr. Rick Livaccari's article shows that the Unaweep Canyon area has its faults. Plan to attend the spring field trip and learn more! Dr. Gigi Richard's faculty profile documents one woman's voyage from the Mississippi Delta all the way upstream to Colorado Mesa University. Dr. Andres Aslan is on sabbatical this year, but still took time to send along the Coordinator's Corner. This issue also contains other regular features.

I note with sadness the passing of former CMU geology professor Dr. Dell Foutz. I first met Dell just about a year ago and spent several hours at his house interviewing him for the article that appeared in the Spring 2016 issue of this newsletter. He was still sharp and had an obvious sense of humor that I'm sure his former students appreciated. He gave me a copy of his most recent book that I read and enjoyed. Rest in peace, Dell.

I'm STILL not getting as much information from alumni as I'd like! I would especially like photographs! Current pics, or from the past, but please send some images related to your time here or your present career. I also would like to know what you're up to. Please send your name, year of graduation, and any details directly to me at lajones@coloradomesa.edu. •

Keep on Rockin'!

~Larry Jones
Newsletter Editor

Thanks for all the Generous Donations!

The Geosciences Program and students greatly appreciate the strong financial support provided by the following alumni and friends of the program:

Geosciences Tuition Scholarship

Chevron North America • Helen and Michael Brownlee • Patricia Powell

Richard D. Dayvault Endowed Memorial Scholarship

K. D. Ashbrook • Richard and Cathy Barkley