Alumni Support
Alumni support is essential to having a strong, vibrant department. And there’s a new donation matching opportunity if you give to any of our scholarship funds on November 29 (Giving Tuesday). See: <www.geology.nmsu.edu> to find out how you can help NMSU Geological Sciences today.

Hall of Fame 2016
Tinka Hyde (MS’ 84) is our new inductee in the Geology Alumni Hall of Fame. See inside for more details.

Look inside to see what the faculty and students have been doing in the classroom, in the field, and in the lab this year.

Students on Mineralogy field trip, Red House Mountains, north of Hatch, New Mexico

Tinka Hyde at Aguirre Springs, during the 2016 Alumni Homecoming Field Trip.

Graduate students Steve Levesque, Jake Buettner, Jenna Lente, Ryan Creitz, Vanessa Swenton, and Cody Stopka at the post-meeting party at the NMGS Spring Conference.

Newsletter Editor: Jeff Amato
(send comments and updates: amato@nmsu.edu)
Congratulations to Tinka Hyde (MS '84). Welcome to the NMSU Geology Hall of Fame!

Tinka started work at the EPA in 1985 in the Water Division of Region 5 (Great Lakes Region), and is now the Director of that Division. She gave a great talk on the complex challenges of maintaining the health of the Lakes and talked with many current students about working for the EPA and in the environmental field in general.
Homecoming Alumni Field Trip 2016
Aguirre Springs Campground
Led by Jeff Amato, Reed Burgette, and Emily Johnson

Mike and Judy Johnson

Glen Brown holds forth to grad students

Emily Johnson and Rowan Burgette

Paul Morgan, Jim Witcher, and Shari Kelley

Rock Room Reunion 2016: Jim Witcher, Ray Irwin, Rick Kelley, Tom Carroll, Steve Harder, and Paul Morgan

Tinka Hyde and Bob Newcomer

Reed Burgette and Jeff Amato, Jim Witcher in background

Rick Kelley

Ray Irwin and Frank Ramos

Zuhl Director Tiffany Santos with Tommy and Anna

Catered lunch, thanks to Warwick Energy and Echo Energy!
The Department's undergraduate research program, URGE, provides research experiences for geology majors. We had ten students with active research project in 2015-2016. Projects are funded by grants from the New Mexico Geological Society, the College of Arts and Sciences Discovery Scholars program, the NMSU Alliance for Minority Participation program, faculty grants, and the Stoll Endowed Fund for Undergraduate Research.

**2015-2016 projects**

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Brent Jackson (left) and Shoshauna Farnsworth-Pinkerton (right in turquoise sweater) present their results at the 2016 Geological Society of America conference.
Steve Henry and Krystina hosted the annual Geological Sciences Holiday party. Here we have Steve, Cody, and Jenna all sporting festive holiday attire.

Below, Vanessa Swenton and Jenna Lente at the Welcoing Event in August hosted by Keith and Eileen Davis. Thanks to our alumni and friends for hosting these parties!

Emeritus Professor Tom Giordano said farewell before moving back to Pennsylvania.
Alumni Support Opportunities

Thanks so much for the amazing outpouring of support last year! Our alumni donated enough, along with Foundation matching funds, to fully endow the new Tim Lawton and Greg Mack Scholarships; these will provide much-needed scholarship money to our students for years to come.

Here's a list of our Scholarships, all of which could use more donations!

- Greg Mack Endowed Scholarship: (All gifts up to $10,000 in 2017 will be matched by Glen Brown*)
- Tom Giordano Endowed Scholarship: (All gifts up to $10,000 in 2017 will be matched by Glen Brown*)
- Timothy F. Lawton Endowed Scholarship
- William R. Seager Endowed Scholarship
- Wemlinger Geology Endowment
- Dora B. Gile Memorial Scholarship
- Eugene Wemlinger Endowed Scholarship

We also have three non-endowed general funds that allow us to use gifts to meet our most pressing needs:

- Graduate Student Research Grant Fund
- Geology Field Teaching and Research Fund
- Geology Lab Teaching and Research Fund

As always your support is greatly appreciated. Please contact Jeff Amato (Chair of the Alumni Relations Committee) by email (amato@nmsu.edu) or phone (575-646-3017) if you have questions.

All donations are tax-deductible and can be made in two ways:
1) Online donations can be made via the NMSU Foundation at https://advancing.nmsu.edu/givenow. Click on “Search for a Fund” and enter a specific fund, or “Geology”

2) Checks can be made out to “NMSU Foundation” and include the Department and fund number in the memo line or in an accompanying letter.

Mail to: NMSU Foundation, Inc.
Dove Hall, Room 212
1305 N. Horseshoe Dr.
PO Box 3590
Las Cruces, NM 88003-3590

*See p. 7
Announcing a Gift Opportunity

1:1 Match for all Gifts to the

Greg Mack Endowed Scholarship

&

Tom Giordano Endowed Scholarship

Up to $10,000 for each Scholarship

Gifts made in 2017

Generously Challenged by Glen Brown

Online Giving:
https://advancing.nmsu.edu/givenow
Under "Fund", Click on "Search for a fund not listed"
Enter "Mack" or "Giordano" for "Keyword"

Checks may be made out to "NMSU Foundation" with "Mack Scholarship" or "Giordano Scholarship" in the memo line and sent to the Department of Geological Sciences
I am currently advising two graduate students. Vanessa Swenton is working on the Schoolhouse Mountain Caldera, using field mapping, argon dating, and geochemistry to understand the history of this caldera within the Mogollon-Datil volcanic field. Much of her time is spent evaluating the significance of a mega-breccia unit with individual clasts up to 5 meters in diameter.

Colby Howland joins the Amato Research Group from Union College in New York. He will be continuing the work of Chelsea Ottenfeld in the San Andres Mountains, focusing on the origin of the oldest crust in southern New Mexico using U-Pb zircon dating, whole-rock Nd isotopes, and Lu-Hf isotopic composition of the zircons.

I was fortunate to receive an NSF grant to work on the uplift history of the Rio Grande Rift and adjacent Basin and Range province. I will be using the U-Th/He dating technique, which measures the helium concentration in zircon and apatite to determine when the rocks cooled through <200 °C. This is a collaborative project with Jason Ricketts at UTEP, Shari Kelley at the Bureau in Socorro, and Becky Flowers at CU-Boulder.

I had a paper published along with this UTEP collaborator, Terry Pavlis, and Terry’s student, Erik Day, on the age of blueschists in southern Alaska. I also submitted a paper with Greg Mack and Bill Seager on some tuffs and lava flows associated with the Laramide orogeny.

I enjoyed my trip to the GSA conference Denver last month. I gave a presentation on my studies of the Proterozoic geology of southern New Mexico in a special session that I co-chaired. It was great to see old friends and former Amato Research Group student Sean Gaynor, who is pursuing his PhD at UNC-Chapel Hill. I also enjoyed catching up with NMSU Alumnus Kevin Hon (MS ’2001), who joined me in Alaska in 2000.

Sofia is now 8, and Wesley just turned 6. They are enjoying rock climbing at City of Rocks. Stephanie ran the Boston Marathon in April and just finished a 70 mile triathlon in Tempe in October. Even Sofia did a triathlon in Socorro this summer!

I am spending 50% of my time this year serving as the Interim Head of the Department of Criminal Justice at NMSU.

Faculty Profile: Dr. Jeff Amato

Vanessa Swenton and Dr. Emily Johnson looking at a tuff associated with the 35 Ma Schoolhouse Mountain Caldera.

Left, at Avery in Boulder; right, at Fenway Park with Sofia and Wesley.
Faculty Profile: Dr. Reed Burgette

Reed Burgette and the NMSU Neotectonics group have had a busy and enjoyable year. Graduate student Austin Hanson is in the final stages of data analysis and interpretation for his M.S. research on the late Quaternary slip rate of the Sierra Madre fault in southern California. Over the summer, Austin joined Reed and colleagues from the U.S. Geological Survey and Purdue University to sample a suspected middle Pleistocene geomorphic surface for cosmogenic nuclide burial dating in a follow-on project funded by the Southern California Earthquake Center (SCEC). This sampling traverse was facilitated by a return via Lyft- a new urban geology experience for all involved. Hanson and Burgette presented progress on these projects at the American Geophysical Union and SCEC meetings, as well as an international workshop on active tectonics in Crestone, CO. Incoming graduate student Jon Ingram has joined the Neotectonics group from Portland State University, and he is preparing to work on another portion of the Sierra Madre fault.

Reed traveled to the Tien Shan Mountains in Kyrgyzstan in July to conduct fieldwork with M.S. student Jascha Coddington, with funding from the NMSU College of Arts and Sciences. Jascha’s project is focused on understanding how folds grow in this intracontinental orogen, using progressively deformed terraces as structural markers. They spent three weeks camping in the western Jumgal basin, in the interior of the mountain belt. Fieldwork consisted of mapping deformed Neogene and Quaternary stratigraphy, surveying terraces with high precision GPS instruments, and searching for organic material for dating terraces. Jascha has already presented a poster on preliminary analysis of the summer’s data at the September GSA meeting.

Burgette remains active in studying neotectonic deformation over decadal time scales as well. He is involved in a project to study the rate of land level and sea level change along the West Coast, as well as a geodetic analysis focused on rapid contractional deformation in the Western Transverse Ranges of southern California. Reed presented these projects at five U.S. universities over the 2015-16 year as a lecturer for the NSF EarthScope program.

Reed continues enjoying teaching courses in general geology, tectonics and GIS. The 2015 Neotectonics class involved surveying a fault scarp south of Alamogordo, NM using a camera suspended from a helium balloon. He loves visiting the outstanding geologic history of southern NM through teaching the Tectonics of North America course for upper level undergraduates. Reed has also enjoyed traveling in the western U.S. with his family over the past year to and from fieldwork and for fun. This included the far western U.S. island of Hawaii. Reed and Emily got a few days together to explore the active volcanism. Over the summer, the family also road-tripped to and from Oregon and the Teton area of eastern Idaho, seeing some classic geology of the American cordillera.

Jascha Coddington surveying terraces with help from a Kyrgyz graduate student.

Reed and son Rowan exploring Bryce Canyon
2016 has been a productive year in the Basin Research Lab at NMSU! The group has been hard at work on a range of sed/strat. and basin/tectonic-themed projects in southwestern Alaska, the U.S. Midcontinent, and right here in southern New Mexico. Hampton spent much of the year writing up new provenance findings from upper Paleozoic strata of the Michigan basin as well as Meso-Neoproterozoic strata of the Keweenawan Supergroup in the Midcontinent Rift. Data from these projects were presented in Topical Session 202 Detrital zircons on the North American continental interior that Hampton co-convened at the 2016 GSA Annual Meeting with colleagues from the Universities of Arizona, Iowa, and Kentucky.

Current graduate students Cody Stopka and Ryan Creitz have been making solid research contributions with their MS projects. Cody is in the final writing stages of his project which addresses provenance trends from Upper Cretaceous strata of the Sevier foreland basin in southern New Mexico. Ryan is off and running on the second year of his project which is focused on the age, sedimentology, stratigraphy, and provenance of Middle Eocene volcanogenic/volcaniclastic strata of the Palm Park Formation in southern New Mexico. Over the past year, we have spent many long days in the field and made several visits to the University of Arizona LaserChron Center to collect U-Pb data for these projects. Cody and Ryan presented their new data at the 2016 NMGS Spring Meeting as well as the 2016 GSA Annual Meeting.

The Basin Research Lab welcomed a new graduate student (Alicia Bonar) this past year. Alicia came to NMSU from West Virginia University where she spent time working on an undergraduate research project with Dr. Amy Weislogel (2001 NMSU graduate alumni!). Alicia is getting started on a project that will address the age, provenance, and sediment dispersal trends from the Early Permian (Wolfcampian) nonmarine strata of the Abo Formation which record the latest stage of Ancestral Rocky Mountain uplifts in northern and southern New Mexico.

Finally, CONGRATULATIONS to the research group for award received in 2016! Cody Stopka was recently awarded the 2016 SEPM/GSA Sedimentary Geology Division Best Student Poster Award at the GSA Annual Meeting in September. Ryan Creitz was selected as the 2016 NMGS Frank E. Kotlowski Research Award recipient which is given annually to the top-ranked grant-in-aid application submitted to the New Mexico Geological Society. Cody and Ryan also received 2016 GSA Student Travel Grants to attend the 2016 GSA Annual Meeting. Hampton was honored to receive a 2016 Outstanding Faculty Achievement Award in Teaching from the NMSU College of Arts & Sciences.

On the home front, Michelle and I are continuing to enjoy our time in the Mesilla Valley and trying to get out/about as much as time permits. We’ve managed to kayak some of the upper and lower stretches of the Rio Grande this year and made our annual trek up Wheeler Peak.
Faculty Profile: Dr. Emily Johnson

Emily and her research group have had a busy year. M.S. student Jenna Lente is finishing up her thesis on the Organ caldera ignimbrites; she presented her work at the Fall Meeting of AGU, the NMGS Spring Meeting, and most recently at GSA. Jenna has been investigating the compositions of melts from the first- and last-erupted tuffs from the caldera and constraining melt volatile contents, melt evolution and storage depths.

Emily spent much of her summer in the Pacific Northwest, working on her NSF-funded project investigating the subduction contributions to mafic magmas in the southern Cascade arc. M.S. student Meredith Cole also travelled to Oregon for lab and fieldwork; Meredith has been making great progress on her research on the volatile contents and subduction contributions to cinder cone magmas in northern California and southern Oregon. Meredith worked in the Fourier Transform Infrared (FTIR) lab at the University of Oregon analyzing the volatile contents of olivine-hosted melt inclusions. After lab work was complete, incoming M.S. student Jamie Shaffer met Emily and Meredith in Oregon to begin 10 days of fieldwork. Jamie comes to NMSU from Arizona State, and will also be working on the southern Cascades project. Fieldwork was very successful, although it started off uncomfortably hot; digging pits for carbon material under lava flows in 105 degree weather proved challenging! Thankfully temperatures cooled off and Emily and her students collected many great samples from basaltic cinder cones and enjoyed the stunning vistas in the Oregon Cascades.

Emily also returned to Blue Lake maar crater in central Oregon to finish up her research project studying the changing eruption styles from this small volcano. Emily successfully completed her isopach map (with help from Meredith and Jamie!) of the eruption deposits, and also spent time on the scanning electron microscope (SEM) at the University of Oregon obtaining images of clasts from this eruption. She will be presenting the results from this research at the AGU Fall Meeting in December.

As always, Rowan accompanied Emily and Reed on their summer adventures; he got a tour of seven national parks and enjoyed some up-close looks at more volcanoes, including Mount St. Helens, Mt. Rainier, and Yellowstone!
Research, teaching, and running the department kept Nancy McMillan busy this year. The biggest departmental project was the completion of our first Academic Program Review, which started with writing 68-page Self-Study Paper, included a visit from three geologists from other institutions, and concluded with their written report and conversations with university administrators about the results. The report is very positive and supportive, and starts with these words:

"The Department of Geological Sciences is a small vibrant program with faculty who are all highly productive researchers and effective teachers. The program thus continues a strong tradition of field- and lab-based instruction and research with a focus on regional tectonics, geochemistry, and sedimentology. Undergraduate and graduate students praise the department chair and faculty for fostering a friendly supportive culture while engaging them in research and fostering their professional development. This program presents a model for success at New Mexico State University and other similar state universities."

It is good to know that we are following in the great tradition of this department and maintaining the values that have led to the successes of our alumni!

In research, Nancy applied Laser-Induced Breakdown Spectroscopy to quite a variety of rock types, including:

- columbite and tantalite, conflict minerals (with alumnus Catherine McManus)
- diamond provenance (with alumnus Catherine McManus)
- correlation of ash flow tuffs (with graduate student Trent Haskell)
- distinguishing biomineralization in caves (with undergraduate Brent Jackson)
- detrital tourmaline as an indicator of sediment source (with undergraduate Shoshauna Farnsworth-Pinkerton; funded by NSF with colleagues Barb Dutrow and Darrell Henry at LSU)
- analysis of engineering properties of highway aggregates (with colleague Warren Chesner of Chesner Engineering)

All of this, plus working with our students in Mineralogy and Optical Mineralogy, keeps a smile on her face!
2015-2016 was another exciting year for the Ramos research group. Nic Slater successfully defended his thesis documenting geochemical and isotopic variations of the alkali-rich, Bandera basalt of the Zuni-Bandera volcanic field located near Grants, New Mexico. He has since landed a job running an ICPMS/MC-ICPMS lab at Princeton University. Not to be outdone, Jacob Buettner was a co-author on a Geology paper published in July (2016) addressing problems associated with dating young trachytes at Changbaishan volcano. Jakes’ radium isotope results were partly used to undermine the validity of 40Ar/39Ar ages of young potassium feldspars, which will have broader implications for the 40Ar/39Ar dating method in general. The paper also welcomed its newest graduate member, Nick Butterfield. Nick will be undertaking research looking at single crystals from young Changbaishan lavas. In addition to graduate research, undergraduate students Tyler Askin and Nathan Roybal are continuing work on Dona Ana Mountains melt inclusions and Cat Hills basalts.

Some previous graduates checked in too. Corey Dimond moved from Chesapeake Energy to Warwick Energy Group (still based in Oklahoma City) and Sean Scott is pushing ahead with his PhD at Wyoming, having just finished getting the first draft of his MS research (on the Endeavour segment of the Juan de Fuca ridge) ready for publication. Work in the Geochemistry, Petrology, and Isotope Geochemistry classes is also targeting feldspar and whole rock isotope signatures of Palm Park dacite and andesite, and Dona Ana Mountains monzonite and caldera-fill rhyolite. Drs. Mack, Hampton, Ramos, and previous distinguished alum Jim Witcher are getting ready for hosting the NMGS Fall Field Trip at the Dona Ana Mountains in fall 2018. Please considering joining us. In addition to research, the New Mass Spectrometry lab is moving forward. We installed the laser sampling system and Ramos is now doing a range of departmental colloquia across campus to advertise the laboratory and what we can do. We also hosted a Gary Michelfelder graduate student (MS/McMillan/2010). We now routinely do Sr, Nd, Pb and U-series isotopes... it is very exciting. Steve can now operate the instrument and Nic is starting to get his hands on it too. Many graduate and undergraduate students in Isotope Geochemistry are also getting experience dissolving and purifying samples in the cleanroom and analyzing samples using the Neptune.

Graduate student Steve Levesque, examining a 60,000 year old basalt flow at Capulin Volcano, in north-central New Mexico, on the 2016 NMGS Fall Field Conference.