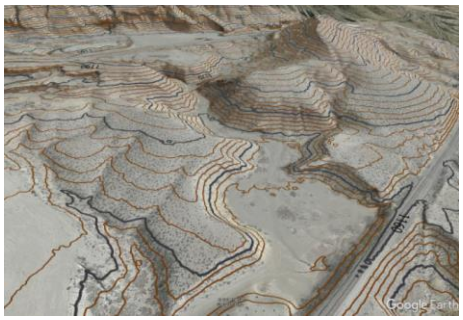
Chair's Newsletter – Spring 2021
https://www.utep.edu/science/geology/
News Flash!

The Texas Higher Education Coordinating Board approved the Department name change from "Geological Sciences" to "Department of Earth, Environmental and Resource Sciences".

Colloquium 2021 will take place on **March 11 and 12, 2021** online via gather.town (an interactive meeting platform). Look for announcements about the schedule and link.

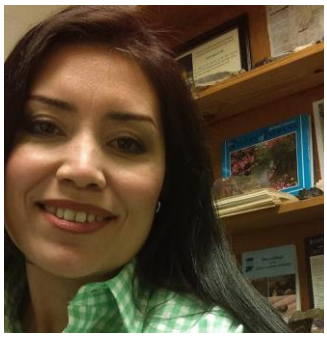


Mount Cristo Rey topographic map overlay served as the students' base map.

The COVID-19 pandemic has done huge damage to the world, our nation and our region. The loss of life, jobs, and social interactions has been an ordeal few of us ever dreamed we would have to endure. The resolve shown by our students, staff and faculty has been impressive. The patience and creativity with which everyone has met this challenge is impressive. Of particular note, **Dr. Jose Hurtado** turned field class into a virtual experience and successfully was able to deliver a course that was able to provide students much of the same experiences and skills development as an in-person course. He presented this innovative instruction methodology at the 2020 Geological Society of America meeting – Simulated Planetary Rover Operations as a Model for Teaching Field Geology with **Jesse Moore Kelsch** and **Aaron Conley**. This methodology can be replicated for other courses and would likely be very useful for physically-impaired students. Congratulations Jose, Jesse and Aaron!

Instructors used portable XRF to collect composition data as requested by students.

Now that vaccinations are becoming available, I hope everyone will be vaccinated when their turn comes up. This is not only for the sake of you and your loved ones, defeating the virus means stopping its replication and inevitable mutation into a new strain. The world depends upon as many as people getting vaccinated as possible so we can eradicate SARS-Cov-2 and end the COVID-19 pandemic as soon as possible. I, for one, certainly do not want to re-live 2020 again in 2021, 2022, 2023 . . .



Departures - **Christine Sanchez**, M.A. our Program Coordinator the past few years left UTEP at the end of 2020 to complete her Ph.D. She will be sorely missed by faculty, students and the Chair. Christine was efficient and friendly, and always willing to go the extra mile to help with outreach and orientations. We wish her the best on her Ph.D. and career that will follow.

New Faculty - We were extremely fortunate to hire **Drs. Laura Alvarez and Hernan Moreno** from the University of Oklahoma this spring. Dr. Alvarez works in the area of sediment transport modeling and builds robots to collect more robust data in the field. We look forward to her strengthening our Geographical Information Systems program and expanding our collaborations with the College of Engineering. Dr. Moreno is also in the Physical Geography/Remote Sensing field with an emphasis on water resources – an obvious need in the El Paso region. He joins our growing team in understanding the hydrology of our region and also connect with water resource faculty in COE. Both have moved into the building and are in the process of setting up workspace in Geology 121 (formerly CyberShare).

Student Success - Student success highlights were:

Jordan Caylor – National Nuclear Security Administration Graduate Fellowship

Jenna Faith – Was accepted to the National Nuclear Security Administration Graduate Fellowship Program (NGFP) with the Nuclear Nonproliferation Research and Development office in Washington DC. This office oversees and manages projects that directly relate to nuclear defense research. The fellowship will last for one year starting in June 2021.

Jenna Faith

Lucia Gonzalez - Arctic Research Consortium of the US (ARCUS) Early Career Conference Funding Award to attend AGU.

Amanda L. Labrado - Society of Independent Professional Earth Scientists (SIPES) Scholarship

Julia Astromovich and **Derek Scott** received Society of Exploration Geophysics scholarships

Aparna Mangadu received a summer internship for 2021 through the University of Utah BUILD program.

ESCI undergraduate student **Yeshey Seldon** received a spring 2021 internship with the NASA- Science Systems and Applications, Inc. (SSAI) supporting the DEVELOP National Program BT - Bhutan Special Project

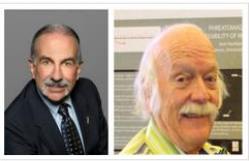
ESCI undergraduate student **Esteban Salazar** received an internship with the local Insights Science museum for spring 2021 to help them develop more ESCI outreach materials for local K-12 schools.

In other news, **Diane Doser** serving on a National Academies of Science, Engineering and Medicine Planning Committee that is running scoping meetings on "Quantitative Skills Framework for Geophysics".

Grants – We have had a banner year! Congratulations to all receiving awards!

A team (Lixin Jin, Vanessa Lougheed, Jennie McLaren, Lin Ma, and Anthony Darrouzet-Nardi, Mark Engle, Thomas Gill, Hugo Gutierrez, Marianne Karplus, Marguerite Mauritz-Tozer, Craig Tweedie, Melissa Warak, and Jie Xu) of interdisciplinary researchers at UTEP was awarded $5.27 million by the NSF to advance critical zone research in drylands. The University is one of nine funded critical zone research projects in the nation. Photo: Courtesy of UTEP Department of Geological Sciences

TEN TARGETS FOR TEXAS: PROSPECTIVE STRATEGIC MINERAL WEALTH ON STATE LANDS



Nicholas Pingitore and Philip Goodell
THE TEXAS GENERAL LAND OFFICE
Nov 16, 2020 through Oct 31, 2022
$225,000
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COLLABORATIVE RESEARCH: PARSING OUT THE CONTROLS OF CLIMATE, GEOLOGY, AND LAND USE ON RIVERINE (234U/238U) RATIOS IN TEXAS RIVER BASINS

Lin Ma and Jason Ricketts
NATIONAL SCIENCE FOUNDATION
Sep 15, 2020 through Aug 31, 2023
$500,952
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STUDENT RESEARCH OPPORTUNITY: CATALOGING ASTRONAUT PHOTOGRAPHY FROM THE INTERNATIONAL SPACE STATION

Jose Hurtado
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION THROUGH JACOBS TECHNOLOGY
Nov 27, 2019 through Apr 30, 2020
$10,000
Read Full Announcement
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DEVELOPMENT OF TECHNIQUES FOR 3D MAPPING AT MACROSCOPIC SCALES

Terry Pavlis, Jason Ricketts, and Laura Serpa
NATIONAL SCIENCE FOUNDATION
Mar 01, 2021 through Feb 28, 2023
$62,789
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PRECONCENTRATION AND QUANTIFICATION OF ECONOMIC TRACE ELEMENTS IN PERMIAN BASIN PRODUCED WATERS

Mark Engle
PIONEER NATURAL RESOURCES CO.
Oct 01, 2020 through Sep 30, 2022
$179,000
Read Full Announcement
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Velasco, A., Gonzalez-Huizar, H., Karplus, M., Insights into the complexities of a seismogenic subduction zone: Analysis of a high-quality aftershock data set from the 2017 Tehuantepec (M8.2) offshore Mexico earthquake, 2 years, $303,000.

Please join us as UTEP Earth, Environmental and Resource Sciences moves forward to learn more about how we are using education and research to help society deal with today's complex geological, environmental, and energy issues. We are happy to include you in our efforts.

James Kubicki
Chair - Earth, Environmental and Resource Sciences

Publications

Bounliyong P, Itaya T, Arribas A, Watanabe Y, Wong H, Echigo T., 2021, K–Ar geochronology of orogenic gold mineralization in the Vangtat gold belt, southeastern Laos: Effect of excess argon in hydrothermal quartz. Resource Geology, p. 1–15. https://doi.org/10.1111/rge.12258

Arribas A., R. Mathur, P. Megaw, I. Arribas, 2020, The isotopic composition of silver in ore deposits, Geochemistry, Geophysics, Geosystems, v. 21 (DOI: 10.1029/2020GC009097)

Baddock, Matthew C., Robert C. Bryant, Miguel Dominguez Acosta, and Thomas E. Gill, 2021. Understanding dust sources through remote sensing: Making a case for CubeSats. *Journal of Arid Environments* 184:104335, doi:10.1016/j.jaridenv.2020.104335

Reade, N.Z., Biddle, J.M., Ricketts, J.W., and Amato, J.M., 2020, Zircon (U-Th)/He thermochronologic constraints on the long-term thermal evolution of southern New Mexico and western Texas: Lithosphere, v. 2020, 8881315.

Kandakji, Tarek, Thomas E. Gill and Jeffrey A. Lee, 2021. Quantitative Analysis of Drought and Land Cover Impact on Dust Emission in Southwestern United States: Inferring Anthropogenic Effect. *Science of the Total Environment* 755(1):142461, doi:10.1016/j.scitotenv.2020.142461

Van Pelt, Robert S., John Tatarko, Thomas E. Gill, Chunping Chang, Junran Li, Iyasu Eibedingil, and Marcos Mendez, 2020. Dust Emission Source Characterization for Visibility Hazard Assessment on Lordsburg Playa in Southwestern New Mexico, USA. *Geoenvironmental Disasters* 7: 34, doi:10.1186/s40677-020-00171-x

Rea, Patrick, Lin Ma, Thomas E. Gill, Jorge Gardea-Torresdey, Carlos Tamez and Lixin Jin, 2020. Tracing gypsiferous White Sands aerosols in the shallow critical zone in the northern Sacramento Mountains, New Mexico using Sr/Ca and 87Sr/86Sr ratios. *Geoderma* 372:114387.

Kandakji, Tarek, Thomas E. Gill and Jeffrey A. Lee, 2020. Identifying and characterizing dust point sources in the southwestern United States using remote sensing and GIS. *Geomorphology* 353:107019.

Boettger J.D., Kubicki, J.D. (2021) Equilibrium and Kinetic Isotopic Fractionation in the CO_2 Hydration and Hydroxylation Reactions: Analysis of the Role of Hydrogen-bonding via Quantum Mechanical Calculations. *Geochimica Cosmochimica Acta*, 292: 37–63.

Fox A., Boettger J.D., Kubicki J.D., Freeman K.H. (2020) Density Functional Theory Predictions of Non-covalent Hydrogen Isotope Effects During Octane Sorption to a Kaolinite Surface. *ACS Earth and Space Chemistry*, 4, 1756-1764 doi: 10.1021/acsearthspacechem.0c00148.

Kubicki J.D., Ohno T. (2020) Integrating density functional theory modeling with experimental data to understand and predict sorption reactions: Exchange of salicylate for phosphate on goethite. *Soil Systems*, 4 (2), 27.

Fovargue, R., Rezapour S., Rosendahl, D., Wootten, A., Zamanisabzi, H., Moreno H.A., Neeson, T.M., 2021. Spatial planning for water sustainability projects under climate uncertainty: balancing human and environmental water needs. Environmental Research Letters. https://doi.org/10.1088/1748-9326/abdd58.

Moreno, H.A., Gourley, J.J., Pham, T.G., Spade Daniela, 2020. Utility of satellite-derived burn severity to study short- and long-term effects of wildfire on streamflow at the basin scale. Journal of Hydrology 580, 124244.

Ziwu*, F.D., D.I. Doser and S.M. Schinagel*, A geophysical study of the Castle Mountain fault, southcentral Alaska, Tectonophysics 789, https://doi.org/10.1016/j.tecto.2020.228567, 2020. Felix Ziwu and Shane Schinagel were both grad students at UTEP.

Pavlis, T. L., and Trullenque, G., 2021, Evidence for 40-41km of dextral slip on the southern Death Valley Fault: Implications for the eastern California shear zone and extensional tectonics, Geology (in press).

Publications (continued)

Heinlein, S. N., Pavlis, T. L., Bruhn, R. L., McCalpin, J., 2021, Applications of High-Resolution Three-Dimensional Terrain Models: Development of Surface Ruptures by Hanging-wall Extension over a Thrust Ramp along the Ragged Mountain Fault, Katalla, Alaska USA, Geosphere, v. 17, doi: https://doi.org/10.1130/GES02097.1

McCalpin, J.P., Gutierrez, F., Bruhn, R.L., Guerrero, J., Pavlis, T.L., and Lucha, P., 2020, Tectonic geomorphology and late Quaternary deformation on the Ragged Mountain fault, Yakutat microplate, south coastal Alaska, Geomorph9ology, v. 351, doi.org/10.1016/j.geomorph.2019.106875.

Reed, M., Munoz-Saez, C., Hajimirza, S., Wu, S.-M., Barth, A., Girona, T., Rasht-Behesht, M., White, E., Karplus, M., Hurwitz, S., Manga, M. (2021), The 2018 reawakening and eruption dynamics of Steamboat Geyser, the world's tallest active geyser, *Proc. Nat. Acad. Sci.,* 118 (2) e2020943118, doi: 10.1073/pnas.2020943118.

Veitch, S.A., Karplus, M.S., Kaip, G., Gonzalez, L.F., Amundson, J.M., Bartholomaus, T.C. (2021), Active-source seismic imaging of Lemon Creek Glacier in Southeast Alaska, under minor revisions at *Journal of Glaciology*.