



TEXAS TECH UNIVERSITY  
Department of Geosciences™

# Caprock Connections

Fall 2017



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## From The Chair

Jeff Lee

Professor & Department Chair

Hi Folks. Our newest faculty member is Dr. Karin Ardon-Dryer. She is introduced on page 4 of this newsletter. We'll be busy this winter interviewing candidates for three open faculty positions. One is in sedimentology/stratigraphy, another in boundary layer meteorology, and the third in weather forecasting. Once again, we are bringing more research money to TTU than any other department in the College of Arts and Sciences. Texas Tech recently joined the best research universities in the country in the "Tier One" designation of the Carnegie Foundation. And, with Hispanics comprising more than 25% of our student population, we soon will be a "Hispanic Serving Institution." That designation will give us access to several funding sources, especially for educational programs and student research projects.

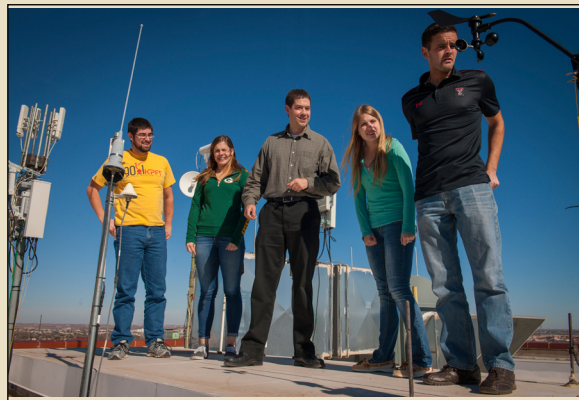
Two of our alumni passed away recently. Richard Cavazos was a geology-major (B.S. 1951) here and then joined the Army. He led troops in both Korea and Vietnam and was the first Hispanic to become a four-star general. Cat Massengale, who runs our administrative office, tells me that her father was honored to serve under General Cavazos. Vestal "Pappy" Yeats (M.S. 1960) was Assistant Professor of Geology in the Department. Through the 1960s-80s, he ran the geology labs, taught the freshmen classes, mineralogy, common rocks and minerals, gemology, and field camp and was Sigma Gamma Epsilon sponsor. Thanks and keep in touch, Jeff Lee



## SCAMS Student Chapter

by Cameron J. Nixon, SCAMS Chapter President

The Student Chapter of the American Meteorological Society (SCAMS) at Texas Tech University is a local chapter whose purpose is to promote the education and awareness of severe weather safety. With only small membership dues, anyone can join! Run by an executive board of Texas Tech Atmospheric Sciences graduate students, members of our chapter include Atmospheric Sciences Master's and Doctorate students, as well as undergraduates pursuing an Atmospheric Sciences minor or who simply enjoy weather!



Already this Fall, our local chapter has taken to community outreach, participating in the South Plains Food Drive to help end hunger in the surrounding area and beyond. We have also succeeded in fundraising, with the help of our nearby Chipotle, enough to send all interested undergraduate students to the upcoming 2018 American Meteorological Society Annual Meeting for an entire week of learning and networking!

Last Spring, we volunteered to help clean up after five home baseball games. Community outreach is a great way to represent our chapter to the University. One of our events we take most pride in is the Severe Weather Awareness Day (SWAD), held every mid-Spring at the Science Spectrum in Lubbock, TX. Last Spring was the 11th annual event, which is student-run and aims to provide the public with the severe weather preparedness skills essential for bracing for the upcoming severe weather season.

This spring, SWAD is set to return! A one-day event, we may attract over 1500 people with experiments, raffle prizes and information booths from local weather companies. In addition, we're planning to bring another knowledgeable and influential speaker to campus, name not yet disclosed!

SCAMS is always looking for more members! Even if weather is just a hobby, the years of knowledge and experience brought about by our many members, speakers and networking opportunities is irreplaceable. We set out to ensure Lubbock is weather-aware, one step at a time.

## Geoscience Society (GSS)

by Rachel Owen, Geoscience Society President

This Fall semester was a fun and eventful time for the Geoscience Society! We began our semester celebrating our school spirit by tailgating. This has always been a great time for undergraduates, graduates, faculty, and alumni to get together and celebrate our fellow Red Raiders. In October, GSS members volunteered for the second year in a row at Tech or Treat here on the Texas Tech campus. The children enjoyed picking out and decorating a rock at our pet rock booth (see photo at right). Additionally, Geoscience Society hosted a Halloween party in order to encourage graduate-undergraduate interaction. GSS also took part in two book sales at a local fundraising event called Friends of the Library. This event directly funds the public libraries around Lubbock. GSS will be volunteering at a holiday event at the Texas Tech Museum this December, ending Fall of 2017 on a strong note.



We hope to have a successful Spring semester by filling it with more volunteer, fundraising, and social events. We will begin fundraising and volunteering by participating in TTU Baseball Stadium cleanup events. We will also hold a fundraising event at the Local bar in order to raise enough funds for next year's social activities. GSS will continue our participation in Texas Tech's Arbor Day events alongside many other campus organizations. The Geoscience Society will be planting trees and flowers in a designated section of campus in order to add to our school's beauty. GSS will also be catering lunch for the Annual Student Research Day in the Geoscience Department as the semester comes to an end. We will be keeping our members updated on the semester events via email, flyers, and our Facebook Group. Texas Tech Geoscience Students and Alumni are always welcome to participate in GSS activities! We look forward to sharing another wonderful semester with you!

# Science Report

by Branimir Segvic, Assistant Professor (Clay Mineralogy)

## Clays – An Insight into the Origin of Midcontinent Unconventionals.

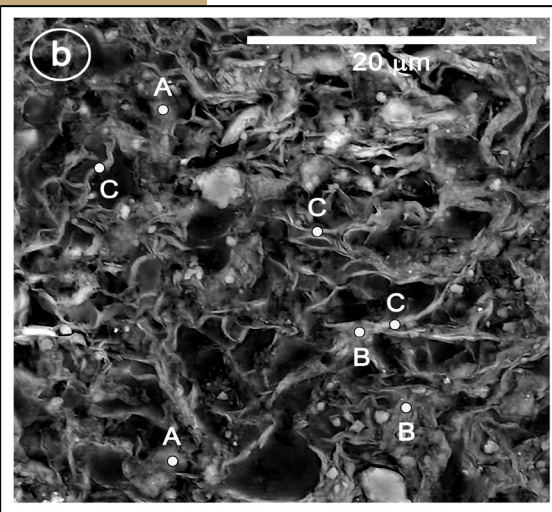
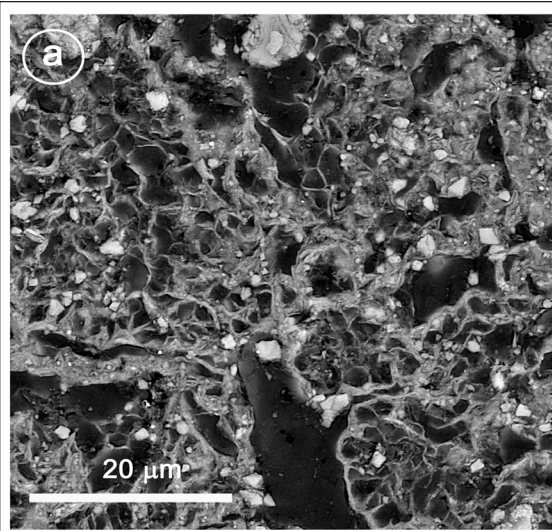
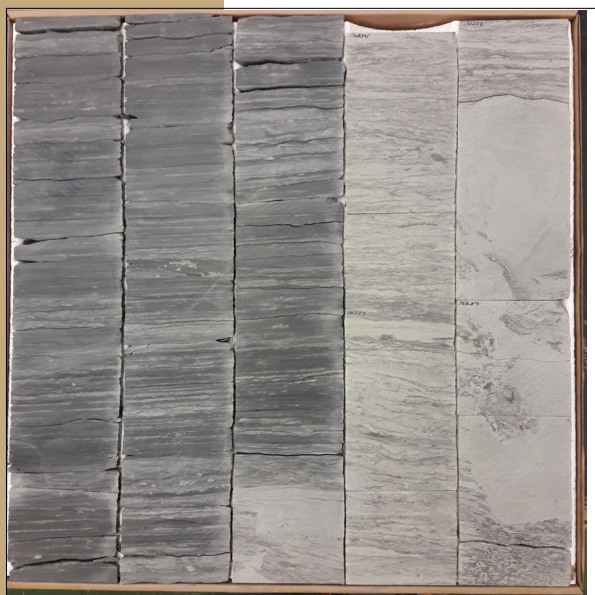
Rapid developments in hydrocarbon production in the last decade show that unconventional reservoirs, in particular shale-oil and shale-gas, are the future of the petroleum industry. And yet, until recently shales were the least studied sedimentary rocks even though they make about two-thirds of the global stratigraphic column. Understanding the relationship between clay mineralogy of shales and their physical parameters, such as permeability and fracability, is essential in developing shale plays. Shale sequences of Anadarko Basin in Oklahoma present an excellent natural laboratory to investigate clay mineral dynamics in fine-grained sediments. Thanks to an extensive drilling activity in the area, large amounts of material became available, offering an insight into mudrocks of different Paleozoic ages.

Supported by AAPG grants, two graduate students, Giovanni Zandoni and Jordan Coe, are currently working on detailed mineralogical and geochemical characterizations of the Anadarko Basin shaley material. Their work aims to report on the nature and origin of multiple illite-smectite generations in shales in light of a critical examination of different existing theories currently proposed in the literature (fundamental particles vs. MacEwan crystallites). Obtained results will also be used to describe a range of physicochemical properties (particle size and surface, ion exchange, porosity, swelling and dispersion) which all may affect various reservoir parameters and their spatial distribution.

It is important to mention that we are very fortunate to have an opportunity to collaborate with leading international experts in clay science who will permit our students to do part of their research work at their respective institutions (Spain - University of Zaragoza, TEM study; Switzerland - University of Geneva, QEMSCAN study; Germany - Technical University of Darmstadt, organic matter investigation). Our clay group at Texas Tech University has been established less than a year ago. In the future, we plan to extend our research on other sedimentary basins of the Midcontinent region in anticipation to find out more on the regional burial-thermal histories and prevailing paleo-climatic conditions.

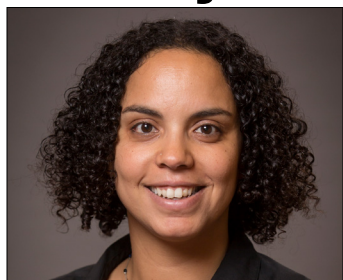
**Figures:** Top photo at left is the section of the Mockinbird core (10228-10238 ft) from the Anadarko Basin in Oklahoma (Caddo County) showing a transition from the carbonaceous sandy shale to bioturbated to massive sandstone. The width of each core is 9.5 cm.

The middle (a) and lower (b) photos at left are backscattered electron images taken with a scanning electron microscope of samples from the South Gabon Basin, Equatorial Africa. They show the synsedimentary to early diagenetic clay assemblage of verdine facies (chlorite-smectite-A; odinite-chlorite-B; and odinite-C; labelled in the lower image), which is typical of shallow deltaic depositional conditions.





# Meet Our New Faculty



**Dr. Karin Ardon-Dryer**

## Assistant Professor

Karin Ardon-Dryer is a new Assistant Professor in the Atmospheric Science Group. She received her PhD in Atmospheric Science from the Department of Geophysics, Atmospheric and Planetary Science and the Porter School of Environmental Studies at Tel Aviv University in Israel. Before joining TTU she was a Postdoctoral Associate in the Department of Earth, Atmosphere and Planetary Sciences (EAPS) at the Massachusetts Institute of Technology (MIT); and later a Postdoctoral Fellow in the Department of System Biology at Harvard Medical School at Harvard University. Dr. Ardon-Dryer studies aerosol-cloud interactions and the effect that aerosols have on climate, the environment and our health. In particular, she takes an interdisciplinary approach and combines field and laboratory work to investigate the interaction between human and climate; exploring the human effects on climate with an emphasis on cloud formation and precipitation processes, and vice versa, namely, how climate may affect our lives (e.g. health) in the short and long terms.

## Student Scholarship Awards - 2017/2018

### Undergraduate Students (BA, BS) – Geology/Geophysics

**Ann and Dennis Bell Geology Scholarship** – Zachary Hueseth

**Frank M. Hall Scholarship** – John Dunlap, Bryce Lewis

**Michael Louis Kincer Memorial Scholarship** – Michael Swearingen

**Lubbock Gem and Mineral Society Scholarship** – Jarrod Bridges, Tiffany Wiley King

**Dr. Grover E. Murray Endowment** – Melody Zuniga, Christopher Sims, Shehzad Budhwani, Spencer Fuston, Jacob Sullivan, Zach Byers, Aziza Omari

**Dr. F. Alton Wade Geology Scholarship** – Markicia Horton, Lara Fly

**Vestal and Ouida Yeats Scholarship** – Chelsi Miller, Aline Blasizzo

**Geosciences Sigma Gamma Epsilon Scholarship** – Andrew Crabtree

**Heather S. Anderson Arts & Sciences Scholarship** – Isaac Moody

**Matt and Ginger Williams Endowment** – Michael Langan

**QEP Scholarship** – Moira Plantier, Justin Roeder

### Undergraduates – Geography

**Gary Elbow Scholarship** – Courtney Latham, Austin Preiss

**Otis & Josephine Templer Geography Scholarship** – Jaime McLaurin, Lauren Goff

### Graduate Students (MS, PhD) – Geology/Geophysics

**Alonzo D. Jacka Scholarship** – Elyas Ainiwaer, Matthew Garnett

**E A McCullough Fund and Lewis G Weeks Fund** – Ethan L. Backus, Danielle Keathley

**Portnoy Liquidus Scholarship and Lewis G. Weeks Fund** – Changji Liu

**John P Brand Fund** – Rui Liu

**Hess Leadership and Excellence Scholarship** – Mahmoud Mahrous

**QEP Leadership and Excellence Scholarship** – Amanda Rivera

**Geosciences Excellence Fund Recruitment Scholarship** – Ross Braue

**Hess Leadership and Excellence Fund Recruitment Scholarship** – Katie Pevehouse

**QEP Leadership and Excellence Fund Recruitment Scholarship** – Christopher Reudelhuber

### Graduate Students – Geography

**Gary Elbow Scholarship** – Amal Aljaddani, Ruba Al Zubi, Fernando Angel, Aaron Flores, Ryan Jost, Tarek Kandakji, Ying Liu, Ankush Saha, Cameron Shoemaker, Prudence Venner

### Graduate Students (MS) – Atmospheric Sciences

**Jurica Scholarship** – Jessica McDonald

**We thank our alumni, friends and corporate sponsors for their generous contributions that are so critical to student education in the Geosciences!**

## GLOW by Melody Morales Zuniga, Student Chapter President

Geoscience Leadership Organization for Women (GLOW) took a step back this Fall to let other geoscience societies shine. We wanted our members to be able to participate in the amazing traditions that normally occur in the Fall here at Tech. But that does not mean we weren't active! GLOW members and officers hosted a luncheon for Weiss Postdoctoral Research Fellow Dr. Cailey Condit of Rice University. Dr. Condit visited with members, discussing her experiences in geoscience as a woman, how things have changed for the better, and how we can change things further.



(Left to right) Melody Morales Zuniga, Dr. Melanie Barnes, Dr. Cailey Condit

GLOW members and officers also had the option of attending the WE Connect Mentor Dinner in November, to network with influential women of Texas Tech and the Lubbock community. GLOW is gearing up for the Spring semester and will give our members plenty of opportunities to gather for fellowship and to volunteer. We will host a potluck dinner in January to welcome members back to school and dive head first back into studies. GLOW will also play a major role in hosting Tech Savvy in February. Join our Facebook Group—Geoscience Leadership Organization for Women (GLOW): TTU chapter to keep up with events as they happen. Alumni are always welcome!

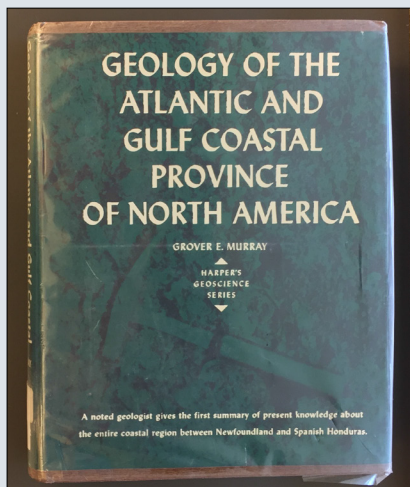
# A Look Back at Dr. Grover Murray – the Geologist President of Texas Tech

Grover E. Murray (1916–2003) was a successful petroleum geologist, professor and administrator. From his own humble beginnings, he was keenly aware of the financial obstacles that students face while pursuing a degree. His career began much like that of many graduating geology students today – as an exploration geologist in the oil patch, in his case with Magnolia Petroleum Company in Mississippi from 1941–1948. Once steadily employed and continuing throughout his lifetime, he responded to many opportunities that provided assistance to students, never forgetting the needs of early career scientists. Fulfillment of his vision continues today through his Endowment Fund in Tech's Geosciences Department.

Some of today's Tech students and others new to the university may not be aware of the pivotal role that Grover Murray played in the development of Texas Tech itself, and, more broadly, the profession of geology in the United States. He served as Tech President from 1966 to 1976, one of three geoscientists to do so (the others being Atmospheric Scientist Donald Haragan, 1996–2000, and Geographer M. Duane Nellis, 2013–2016). His presidential term was not only the longest to date, but also one of the most consequential. During his tenure, the university received approval to establish the Law School, the Medical School in Lubbock with branches in Amarillo, El Paso and Midland-Odessa, and Schools of Allied Health Services, Nursing, Pharmacy and Veterinary Medicine. He developed the International Center for Arid and Semi-arid Land Studies, the Ranching Heritage Center, and the Center at Junction. He successfully managed the then-contentious change of the university's name from the original, Texas Technological College, reflecting its transition from a modest, regional institution to large, national university, under his stewardship.



This exceptional man enjoyed a very productive career as a research geologist both before and after his tenure as Texas Tech President. His early academic career was associated with Louisiana State University (LSU): appointed as Professor of Stratigraphy in 1948, Director of Research for the State Geology Survey and Geology Department Chair from 1950–1955, and Boyd Professor, LSU's highest academic rank, in 1955. Over his career, he supervised for over fifty students receiving masters and/or doctoral degrees, representing his proudest accomplishment in geology, and published over 150 articles and books. His most lasting scholarly contribution is his 1961 reference book, *Geology of the Atlantic and Gulf Coastal Province of North America*, which, remarkably, is still available from Amazon and other booksellers today. Murray Basin in the Gulf of Mexico is named after Dr. Murray in recognition of his contributions to understanding the geology of the Gulf.



In addition to research and teaching, Dr. Murray also made numerous contributions to geologic societies, academic journals and professional institutions, most notably as President of each of the American Association of Petroleum Geologists, Geological Society of America, American Geological Institute, American Institute of Professional Geologists, and Society of Economic Paleontologists and Mineralogists. Between 1968 and 1980, he served on 21 committees of the National Science Board (NSB), the advisory body for the National Science Foundation (NSF). He made several trips to Antarctica, as a NSB representative, to evaluate the field work of scientists holding NSF grants there. The NSB recognized his service to Antarctic research by naming Murray Foreland, an ice covered peninsula that projects into the Amundsen Sea, in his honor.

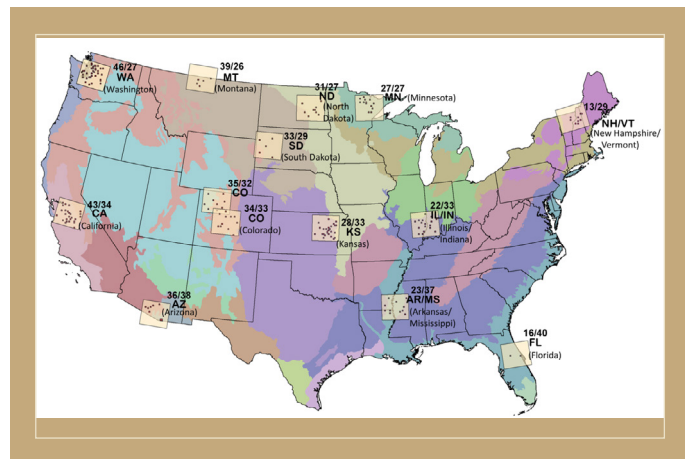


# Science Report

by Zhe Zhu, Assistant Professor (Geography)

Monitoring land change continuously for the entire United States from 1985 to 2017.

Humans, as the most dominant species on Earth, have been changing the Earth's surface throughout its existence, particularly in the recent decades, which has greatly threatened the sustainability, biodiversity, and ecosystems of our planet. Satellite remote sensing has been widely used to assess Earth's surface because of repeated synoptic collection of consistent measurements. For a long time, land change has been mapped based on satellite images that are a few years or even decades apart, which makes it less management relevant and may miss many ephemeral changes. Now, our group at Texas Tech University is working on a new approach called CCDC (Continuous Change Detection and Classification) to monitor land change for the entire United States from 1985 to 2017, in which all available Landsat data are used to monitor land surface change, and all changes are detected continuously at 30-meter resolution and updated at weekly time scales. Funded by U.S. Geological Survey (USGS), we have been busy improving our change detection algorithm for a total of 14 prototype sites, and working closely with USGS scientists within the Land Change Monitoring, Assessment, and Projection (LCMAP) program (<https://eros.usgs.gov/science/lcmap>). Our team is also international, including graduate students and visitors from Saudi Arabia and China. In the coming years, the results generated in the Texas Tech Geosciences Department are expected to change our understanding of how United States land cover has evolved over the most recent 30+ years.



**Figure:** The 14 prototype locations (yellow rectangles). The black dots are Land Cover Trends samples that are used to train the land cover classifier.

## Stay Connected!

We Want To Hear From You!

Geosciences Alumni, Keep Up Your Connections With Us! We would like to hear from you! If you would like us to include a profile of your career or some recent news in a future newsletter, or just update your contact information, please drop us an email or letter or visit the 'Texas Tech Geosciences Alumni' page on Facebook.

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Left to right: Prof. Sylvester with Geosciences alumni Ron Frederick, Dennis Robbins, Melanie Barnes at the 2017 West Texas Geological Society Symposium in Midland TX.

# AAPG Student Chapter

by Jordan Coe, AAPG Student Chapter President

The Texas Tech student chapter of the American Association of Petroleum Geologists (AAPG) has enjoyed continuing the success that has been instilled throughout previous years. Before returning to kick off the academic year, our chapter was able to sponsor an exciting 3-day field trip to Big Bend National Park. Several of our members were able to attend, and the trip was graciously led by Big Bend expert and Texas Tech Geosciences' own, Dr. Tom Lehman.



Due to the horrible events impacting the coastal region of Texas this September, our chapter was unable to send students to the Houston Student Expo. Instead, we decided to take initiative to assist the victims of this devastating hurricane season in the form of a campus blood drive. The AAPG Student Chapter partnered with United Blood Services, and the results were incredible! Dozens of our members showed up in support of this great cause as well as several nonaffiliated Texas Tech students with big hearts and a willingness to help.

This semester we were privileged to host our first guest lecturer, Dr. Robert Nail, Senior Geologist at Apache Corporation, and Geosciences alumnus. His presentation on "Unconventional and conventional horizontal benches of the west Delaware Basin" not only drew students from Geology and Geophysics, but Petroleum Engineering as well. We look forward to hosting more industry-related lectures this Spring. Thank you, Dr. Nail.

The Annual Chili Cookoff was a huge success! We would like to thank all the students, alumni, and faculty who came out in support. Special thanks to Riley Geological Consultants, Neuralog, and the TTU student chapter of SPWLA for helping and contributing to this event.

During the spring semester, we will sponsor and train a highly competitive AAPG Imperial Barrel Award team. Our teams have progressively placed higher in this prestigious competition over the past three years, with our 2017 team taking home 2nd place in the SWS regional event. This is a new and rapidly advancing program at Texas Tech, and we look forward to continuing our progress!

Our chapter remains active in our community by continuing our commitment to the Adopt-A-Highway program. We are planning to further contribute to our Lubbock and Texas Tech community by hosting baseball stadium cleanups after the home games this Spring.

The officers would like to thank everyone for their continued support of our department and the commitment to furthering the education of our future petroleum geologists. Wreck 'em!



2017 – 2018 TTU  
AAPG Officers

Jordan Coe  
President

Miles Rand  
Vice President

Katie Pevehouse  
Treasurer

Saheed Obitayo  
Secretary





# YouthMappers

YouthMappers celebrated two years of work during GeoWeek this November. This university consortium now includes 90 campuses in 27 countries around the world. YouthMappers was co-founded by TTU faculty member, **Dr. Patricia Solís**, Co-Director, Center for Geospatial Technology, Research Associate Professor of Geography, Department of Geosciences, and Adjunct Associate Professor, Climate Science Center, along with colleagues at The George Washington University, West Virginia University and the US Agency for International Development's GeoCenter.

YouthMappers chapters have been volunteering to map for humanitarian and development needs in locations where geospatial data is scarce or nonexistent. This Fall has brought a host of major disasters around the world that required the time of YouthMappers everywhere, including three hurricanes in the Gulf and Caribbean, mudslides in Sierra Leone, earthquakes in Mexico, and monsoons in Bangladesh.

The Texas Tech chapter of YouthMappers contributed in a major way to the effort to support the Red Cross relief efforts in Puerto Rico after Hurricane Maria. An estimated 70 mappers came to a mapathon held in the lab suites in Holden Hall. Together, 28,153 map changes were made to OpenStreetMap in just a few short hours! The whole task itself was completed and validated, and is now in use by the humanitarian community, as well as available to the public. See photos at right.

Winners of our competition for the night were:

- Andrew Skipton - Most Edits Overall (nearly 5,000!)
- Jake Webb - Most Productive Validator
- Ivan Dario Arrange Iturregui and Betzaida Rivera - Best Beginner Mappers (number of map changes and quality) who appropriately, hail from Puerto Rico.

Dr. Frances Colon, former Deputy Science and Technology Advisor to the Secretary of State at the US Department of State, a Puerto Rican and colleague of Dr. Solís, said that when she heard of the TTU chapters' efforts: "It makes my heart sing!" The group made this [tribute video](#) of the evening and shared it in solidarity with long-time collaborator and mentor of the YouthMappers chapter at the University of Puerto Rico at Rio Piedras, Dr. Carlos Guilbe, who said: "*Agradecido a la Dra. Patricia Solís y sus estudiantes por su iniciativa bajo YouthMappers en éste momento. Eternamente agradecidos.....Geography Rules!*" He shared photos of their geography students cleaning up their campus - they were hit hard and lost their geomorphology lab among other things. See photos below.

YouthMappers at Texas Tech chapter officers and helpers are Emily Glaser, Evan Conrad, Julia Klein, Sage Laxton, Matt Conant and Nwasi Menkiti.



## Geography Club

by Hannah Webb, President

After several years of being active, The Tech Geography Club is dissolving and encouraging our members to join YouthMappers and to help reactivate the Kappa Chi Chapter of Gamma Theta Upsilon. In its time, The Tech Geography Club was able to participate in many campus traditions like Tailgating, Homecoming, and planting flowers for Arbor Day. Members of The Tech Geography Club were also involved in community outreach. Most notably, many members worked with the City of Lubbock Parks and Recreation Department during the Easter Egg Hunt, Dog Day Howl-O-Ween, and The Pumpkin Trail.

The Club is known for two things: the biannual hiking trip to Palo Duro Canyon, and the biannual Geography Bowl, which is a Jeopardy! style trivia game featuring hand-picked geography questions. The Club hosted its last Geography Bowl on November 30th. The competition was fierce but "Los Muchachos," made up of Fernando Angel, Austin Priess, Valerie Sanchez, and Jessica Balch, came in first to win. This event also served as a taco night pot luck dinner open to everyone, which was a great success and everyone had a blast. It was a phenomenal send off for The Tech Geography Club!





# Geosciences program revamps geology-geophysics undergraduate curriculum

The geology and geophysics undergraduate curriculum has essentially been static for the past decade, but both energy and environmental industry have repeatedly stressed the need for hands-on, rigorous, topical course work where key concepts are presented at numerous times during a student's academic track. Undergraduate curricula in Texas are limited by a 120 credit hour rule set by the state board. The undergraduate geology and geophysics program worked under this limitation for decades, but recently was able to acquire seven credit hours when the College of Arts & Sciences relaxed some general education requirements for BS students. The department has therefore taken the opportunity to utilize those credits by retooling the undergraduate curriculum. These changes will apply to the geology and geophysics BS degrees and the new environmental geology BS concentrations.

The makeover utilizes the previous approach of spiraling curricula topics with numerous opportunities for hands-on practical experiences, but also adds new coursework that allows for more rigor and addressing skills necessary to thrive in a post-academic career. The table below is the proposed path for an incoming freshman Geology major. Geophysics and Environmental concentrations utilize similar changes and we invite you to visit our website to view those changes.

FALL	SPRING
<i>Semester 1</i> : Physical Geology	<i>Semester 2</i> : Historical Geology
<i>Semester 3</i> : <b>Mineralogy (w/ optics)</b> ; Geophysics; <b>Undergraduate Seminar</b>	<i>Semester 4</i> : Geochemistry; <b>Igneous &amp; Metamorphic Petrology w/optics</b>
<i>Semester 5</i> : Structural Geology; <b>Sedimentary Petrology; Geomorphology</b>	<i>Semester 6</i> : Igneous & Metamorphic Processes; Sedimentary Field methods; <b>Depositional Systems &amp; Stratigraphy</b>
<i>Summer</i> : Advanced Field Methods	
<i>Semester 7</i> : <b>Advanced Historical Geology/Tectonics</b>	<i>Semester 8</i> : Two Geoscience Electives
Bold indicates significant change from previous curricula	

## Benefits of the Changes:

- Addition of a second-year seminar course that introduces students to workplace skills necessary for academic and professional success, including time-management, software, resume preparation, library resources, and presentation and writing skills.
- Spreads mineralogy and petrology over a full year with optics in each semester, while maintaining four straight semesters of rock identification and interpretation in hand sample and thin section.
- Splits sedimentation and stratigraphy into two separate courses allowing for more rigor to the soft-rock curricula
- Moves geomorphology from an elective to a required course, thereby allowing this course to have substantial prerequisites and increasing the rigor, as well as requiring each student to graduate with a course in earth-surface processes. Provides better preparation for state licensing exams.
- Provides a capstone course, Advanced Historical Geology/Tectonics, which will require students to integrate information from all of their classes to unravel the geologic history of Western North America.
- Allows motivated students the opportunity to conduct undergraduate research as an elective.

# Alumni Profiles



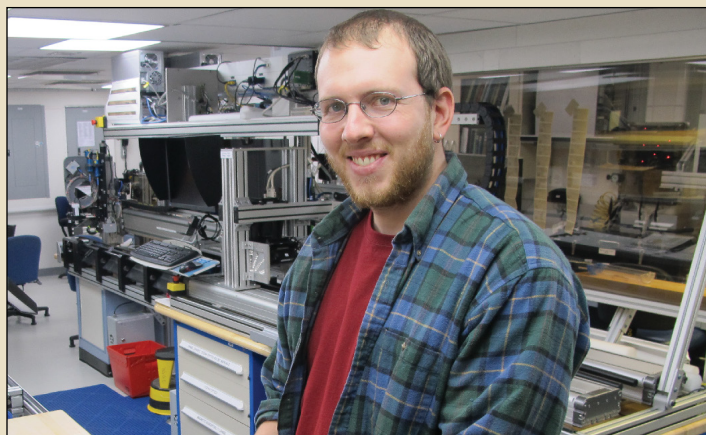
## Nolwenn Coint, Ph.D.

Nolwenn Coint is originally from France, where she received her Bachelor and Masters degrees. She moved to Lubbock to work on her Ph.D. with Dr. Calvin Barnes in 2008 and graduated in 2012. Her research employs mineral chemistry to understand magma reservoir dynamics and the connection between intrusive and volcanic rocks.

After graduation, she worked for one more year, as a post-doctoral researcher at Texas Tech. In 2013, she moved to Trondheim, Norway, for a research geologist position with the Geological Survey of Norway (NGU), where she continues to work today. Dr. Coint is a member of the bedrock geology team, but also interacts with the mineral resources and analytical lab departments. Her job consists of mapping bedrock, including complicated, polymetamorphic gneisses, at both regional (1:50 000 map sheets) and local scales, updating and improving the bedrock database of Norway, and conducting research to understand the geological evolution of Norway. Regional mapping requires the use of various tools such as GIS and geophysics (airborne geophysics, magnetic and radiometric data), which she has learned at the NGU.

Dr. Coint co-supervises Masters and Ph.D. students who are enrolled at NTNU (Norwegian University of Science and Technology). Recently, she joined a collaborative project between NTNU and TTU, and is co-supervising two Masters students from TTU. They both came to Norway to do field work last July. Occasionally, she helps teachers from primary schools in Norway introduce geology to their students, and takes part directly in classroom teaching.

Dr. Coint's spouse is Norwegian geologist, Dr. Trond Slagstad, who received his Ph.D. in Halifax, Nova Scotia in 2003. He also works at the NGU on bedrock mapping, geochronology, regional geology, and in the LA-ICP-MS laboratory.



## Jeremy R. Deans, Ph.D.

Dr. Deans received his M.S. and Ph.D. from Texas Tech in 2010 and 2016, respectively. He worked with Dr. Calvin Barnes for his Masters on trace element variations in granodiorite-granite rocks in Nevada, and with Dr. Aaron Yoshinobu for his Ph.D. on the origin and deformation of the lower oceanic crust. While at Tech, he met his wife and fellow TTU Geosciences alum, Alyson Brink, Ph.D. (2016).

After graduation, Jeremy joined The Department of Geography and Geology at University of Southern Mississippi in Hattiesburg, MS, as a tenure track Assistant Professor. The department has a small but growing number of faculty, and confers both B.S. and M.S. degrees in geology. Jeremy is the main "hard rock" professor, teaching everything from Structural Geology to Optical Mineralogy, Field Mapping, Petrology, and Geochemistry. Dr. Brink is an Adjunct Professor. One Masters student has already completed their degree under Jeremy's direction and another, a Tech alum, Trent Jackson, B.S. (2017), is currently a Masters student studying brittle deformation in the lower oceanic crust.

Dr. Deans is continuing his lower oceanic crust research as part of the Oman Drilling Program, which provides access to several hundred meters of drill core into the Oman ophiolite. He has also begun new research in the southern Appalachians in Alabama and Georgia, and plans to sail for two months next year on an International Ocean Discovery Program (IODP) drilling expedition to an active caldera hydrothermal system along the Brothers Arc, north of New Zealand.

Lastly, Jeremy serves on the Graduate Council, which governs the graduate program at Southern Miss. He has participated in several outreach events such as the Mississippi Science Olympiad and events at the Mississippi Museum of Natural Science in Jackson, MS.