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Contact us:

Geosciences Program
Texas A&M – Kingsville
MSC 175, University Blvd
Kingsville TX, 78363

Phone: 361-593-3110

Fax: 361-593-2183

URL:

http://www.tamuk.edu/arts/ci/physics_geosci/geosci

Editors:

Dr. Thomas McGehee
(kftlm00@tamuk.edu)

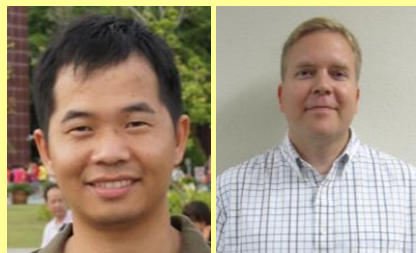
Dr. Haibin Su
(haibin.su@tamuk.edu)

Dr. Mark Ford
(mark.ford@tamuk.edu)



Program News

Geosciences Won a NGA Grant and Money for 40 Internships



Drs. Haibin Su and Brent Hedquist won a grant award of \$373,093.00 from the National Geospatial Intelligence Agency (NGA) for five years on February 1, 2015. The title of the proposal is "Developing Pathways to Geospatial Intelligence (GEOINT) for Underrepresented South Texas Students." This project aims to build the pathways to train, educate and produce a workforce, particularly from underrepresented Hispanic graduates, with necessary geospatial knowledge, skills and expertise in South Texas through research and the development

of relevant curriculum and the establishment of GEOINT academic programs. A two-week long intensive GIS training workshop will be offered each year for 5 years to instructors from local high schools and community colleges to help them launch GIS classes at their campuses. Each school will be provided with course material, lab equipment, GIS software licenses and teaching support. We will also provide \$80,000 in assistantships (\$2000.00 assistantships to ten students each year for four years) to TAMUK students that have a commitment to earning a Minor in GIS. We believe that the assistantship will help us to increase on-campus student interest in geospatial technologies and attract more highly-qualified students to enroll in the GIS certificate/minor program. This will also establish the name of our near future Bachelor Degree in Geography.

Six Geology Majors Graduated in December



Robert (Bobby) Schoen, Katelyn Wallace, Veronica Nieto, Jake Ewing, David Wood, and Adrian Dancer, graduated during the Fall Commencement Ceremonies. **Robert Schoen** was nominated by our Department for the College of Arts and Sciences Distinguished Scholar award. Mr. Schoen graduated with an overall 3.5 GPA. Bobby Schoen received his GIS Certification in May 2014. **Katelyn Wallace** brings high energy, enthusiasm, preparation, and patience to everything she attempts as demonstrated by her dedication in her coursework. She was

one of our best lab teaching assistants that taught Central Texas Field Camp, Sedimentology, and Physical Geology. **Veronica Nieto** was our field teaching assistant for the Summer Field Camp at Big Bend. She was also the president of the Geosciences Club in her senior year. **Jake Ewing**, David Wood, Matt Dabney and Dr. Mark Ford completed their study on the geochemistry of the Eagle Ford Shale in the Fall semester and submitted their abstract for publication in the Gulf Coast Association of Geological Societies (GCAGS) Transactions Journal. **David Wood** also received his GIS Certification in December 2014. **Adrian Dancer** coordinated many of the Geosciences Program activities as a member of the Geosciences Club. We are very proud of these students and all of their accomplishments (Not pictured: Adrian Dancer and Katelyn Wallace).

Daniella Herrera Won Peacock Mathematics and Science Scholarship



We received the latest College of Arts and Sciences Newsletter for Spring 2015. The following acknowledgement and congratulatory message included a 1 year scholarship for Daniella Herrera. Congratulations Daniella!

"The College of Arts & Sciences realizes how hard students have worked to achieve and maintain academic success. Because of their achievements, ten deserving students were awarded with scholarships. Congratulations to the recipients and best wishes for continued success. Daniella Herrera, (Geology), Stephanie Cazares, Agatha Diaz, Ashleigh Popek, and Kyle Wilson were awarded the Peacock Mathematics and Science Scholarship."



Geosciences Has 8 New Geology Majors This Spring

Melisa Balderas (Freshman), Allen Hibler (Sophomore), Tristin Shaw (Sophomore), and Roberto Zamora (Sophomore) are new majors in the geology program. Crystal Stubbs (Junior), Jim Quisenberry (Junior), Sarah Dillon (Junior), and Monica Estrada (Junior) are Del Mar College transfer students.

Melisa Balderas is from Houston, Texas.

Allen Hibler is a transfer student from Lamar University

Tristin Shaw is a transfer student from Coastal Bend College.

Roberto Zamora is a transfer student from Laredo Community College.

Crystal Stubbs is a transfer student from Del Mar College.

Jim Quisenberry is a transfer student from Del Mar College.

Sarah Dillon is a transfer student from Del Mar College.

Monica Estrada is a transfer student from Del Mar College.



Melisa

Allen

Tristin

Roberto

Crystal

Jim

Sarah

Monica

Summer Field Camp at Big Bend and Central Texas

We have a number of students eligible for summer field camp this year including Damon Crutcher, Mark Alanis, Jacob Byerly, Payton Campbell, Dakota Kubiak, Justin Kelley and Emilio Martinez (and maybe more!) We will also be accepting outside students and can accommodate 16 to 18 students in total. For more information, visit our Field Camp website at:

http://www.tamuk.edu/artsci/physics_geosci/geosci/Fieldexperiences/fieldcamp/Summer2015.html. Applications with letters of reference are due by April 6th (see the website for an application.)

We Scheduled 3 Fieldtrips (With Our Colleagues in Central Texas) for Spring

The Pedernales Creek area mapping project (Field Geology, Field Mapping Cartography, and Geomorphology three-day field trip exercise on March 26-28) is a team contest to determine the level of our students' field skills. Their skills in pace and compass, rock descriptions, field book note taking, and reading a topographic map will be tested. The overarching goals of this fieldtrip are to determine our students' field readiness for the coming field camps and to start correcting weaknesses.

The Precambrian Geology of Central Texas (April 9-11 three-day fieldtrip exercise) covers the rudiments of measuring and preparing cross-sections through a Precambrian sequence that has been interpreted to be an incomplete ophiolite. Also, we will be examining igneous plutons and dikes to understand the intrusive history of Central Texas. The overarching goals of this project are for our majors to interpret metamorphic protoliths and to identify spatial tectonic elements.

Hydrogeology of Central Texas (April 16-18 three-day fieldtrip exercise) covers recharge enhancement, multiport well monitoring, geophysics, and springflow at the Barton Springs segment of the Edwards Aquifer, Central Texas. Ron Fieseler will perform a geophysical well logging exercise with their logging truck.

Four Geology Majors Have Published Abstracts for the GCAGS 2015 (Houston) Conference

Four of our majors have had abstracts accepted for the Gulf Coast Association of Geological Societies (GCAGS) conference which will be held, along with the AAPG/SEG Student Expo in Houston in September. Way to go students!

Using pXRF to Identify Pay Zones in Hydrocarbon-Rich Shales: A Lithochemical Analysis of The Eagle Ford Shale John M. Dabney, Mark T. Ford, David J. Wood and Jake D. Ewing

Finding the pay zones of potential hydrocarbon-rich shales is vital to the success of the oil company and investors. In this work, we identify key zones in the Eagle Ford shale (south Texas) by using geochemical data obtained with a pXRF (portable X-ray fluorescence) spectrometer.

Lithochemistry is important in interpreting where pay zones are because slight changes in lithology chemistry can indicate changes in hydrocarbon potential. Our goal in this research is to use a pXRF spectrometer to quantify certain elements in the shale samples that were provided by Pioneer Drilling. Shales trap hydrocarbons along with certain elements such as molybdenum, vanadium and chromium, allowing us to correlate the two. We received three wells worth of powdered drill cuttings (approximately



3,000 feet total) at increments of 5 to 15 feet through the Eagle Ford formation to scan with the pXRF and quantify the elemental data. Using this data we constructed a detailed log of each element of interest. We focused on some major elements (e.g. calcium, aluminum) to identify lithology and trace elements (e.g. molybdenum, chromium) to identify emplacement oxidation-reduction (paleoredox) facies and the proper lithology for hydrocarbon production. Our hypothesis is that key elements that correlate to hydrocarbon potential in the Eagle Ford may apply to finding pay zones in other shale plays. Unconventional wells and hydraulic fracturing are expensive, so why not pinpoint where you would like to produce from and reduce the cost of completing the well? With this research we show that there are several elements such as molybdenum and vanadium that have a high correlation with hydrocarbon potential. With rapid expansion in shale plays both here in Texas and around the globe, the implications for this technique are becoming more important, and a simple, reliable method to identify pay zones is needed.

Evidence of Precambrian Organic-rich Shales in a Granitic Pegmatite, Llano County, Texas

Sarah E. Beers and Mark T. Ford

Badu Hill Pegmatite (BHP), found in Llano County, Texas, is an NYF (Niobium, Yttrium, and Fluorine) pegmatite that has been mined in the past for its high-grade feldspar crystals and investigated for its REE potential. Understanding the petrogenesis of pegmatites and associated ore bodies is critical to finding and developing resources. This research examines multiple lines of evidence for the assimilation of Precambrian-aged black shale to help produce the suite of minerals found at the BHP. By examining the surrounding country rock types, determining chemistries of the suite of minerals found at BHP, and examining the composition and source of the associated granite batholiths, multiple lines of evidence were found suggesting previously unknown Precambrian black shales in this area.

There is abundant sulfide mineralization at BHP, including pyrite and chalcopyrite, and documented high concentrations of uranium, some of which is associated with zircons and other accessory minerals. Assimilation – Fractional Crystallization (AFC) modeling of uranium and other elements showed that without the addition of a higher uranium component, like organic-rich black shale, it would have been implausible to get the high concentrations of uranium seen in the BHP. An investigation into black shales revealed their propensity to retain sulfur and uranium that has precipitated from the surrounding marine water. The country rock surrounding BHP is the Honey Formation of the Packsaddle Schist. The Honey Formation is characterized by interfingered marble and graphite bands that may have organic-rich shales as a protolith. The associated granite, Town Mountain Granite of the Llano Uplift, is typically classified as an A-Type granite, but BHP is classified as metaluminous. There has been no indication of Precambrian black shales in Texas until now, but at the Badu Hill Pegmatite in Llano County, there is ample evidence to support the hypothesis that one did exist.

Three Geosciences Students Receive Honors at Honor's Reception Program



Noelia Arredondo (Honor Roll), **Emily Hager-Hahn** (Dean's List), and **Joshua Krnavek** (Honor Roll) received plaques and recognition at our first Honor's Reception Program on March 3, 2015.

AAPG Student Chapter and Geosciences Club Go on Spring Break Fieldtrip



We left TAMUK on Saturday morning (March 14th) and stopped in San Antonio at the River Walk on our way to our campsite at Andy's On the River in Concan, TX. After setting up camp and a bonfire, we got ready for the coming days. On Sunday, we went to Garner State Park and hiked to the Crystal Cave. Later in the day, we relaxed at the riverside back at camp and discussed fluvial geology. Lost Maples State Natural Area was the destination on Monday. While there we hiked and later sat along the river to enjoy the rest of the day. Finally on Tuesday we had planned to go Enchanted Rock State Park but the rain convinced us to explore urban geology in Fredericksburg. A good time was had by all! (Submitted by Spring Break Trip Coordinator **Sydney Kirk**)



Geosciences Has Seven Majors Working as Lab Assistants for Our Courses

Sarah Dillon, Matt Dabney, Crystal Stubbs, Antonio Hernandez, Blanca Garza, Sarah Beers, and Daniella Herrera are lab teaching assistants this semester. Mukti Subedi (graduate student in Biology) is managing the day to day activities of the University Geospatial Research and Training Lab.



Sarah Dillon

Matt

Crystal

Antonio

Blanca

Sarah Beers

Daniella

Geosciences Students Participate in Latest Kingsville Volunteer Tree Planting Event



We had a great turnout at the latest volunteer tree planting event in Kingsville, with eight of our student majors participating and over ten other students attending the event at Corral Park on March 3rd. The event was led by Dr. Brent Hedquist with assistance by the City of Kingsville as part of a University-awarded Service Learning grant. Additional trees will be planted by student volunteers at Corral Park to shade playground equipment and benches as part of Earth Day activities on April 22nd.

Dr. Jon Baskin's Fossil Collection Now at the Jackson School of Geology



Matt Dabney, Antonio Hernandez and Holden Butler helped the staff from the Laboratory of Vertebrate Paleontology at The Jackson School of Geology at UT Austin load the last of the Dr. Jon Baskin teaching and research fossil collection for transport to the lab at UT Austin. Part of the load out consisted of a partial mammoth skull on a pallet. Their effort are greatly appreciated by the lab. The status of the collection had been in limbo for a while until the necessary agreements between UT Austin and TAMUK could be finalized.

SME Professional Meeting on TAMUK Campus

Mike Maxson presented his career activities at the campus Society of Mining Metallurgy and Exploration SME February 26 from 5-7 PM in room 136 of the Engineering Complex. Pizza and refreshments were provided by the SME. Approximately 20 geoscience majors and three faculty members as well as some students and professors from engineering attended.

TAMUK Seismograph



Dr. John Buckley assisted by Dr. Mark Ford assisted the USGS Seismic Hazards Laboratory Albuquerque in troubleshooting power issues with the KVTX seismograph. They were able to locate the problems and have procured the new batteries to replace the ones on site.

Dr. Ford Presents Our Program During the CCGS Monthly Meeting

Dr. Mark Ford gave a presentation of our program at the CCGS professional monthly meeting on February 18, 2015. The meeting theme entitled "CCGS Collegiate Month" provided Universities and colleges a forum to share their program activities with the professional geological society. Dr. Ford's talk was well attended by faculty and student representatives from Del Mar College, TAMUCC, and TAMUK. If you would like a pdf copy of the talk, Email Dr. Ford at Mark.Ford@TAMUK.edu.



Spring Break Field Trip Galleries

