



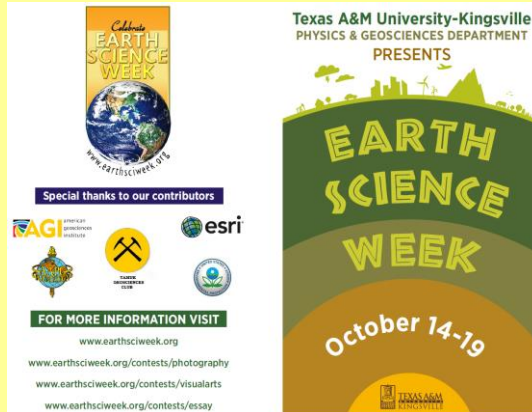
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### Program News

#### Earth Science Week, October 14th-19<sup>th</sup>



From October 14<sup>th</sup>-19<sup>th</sup> our Geosciences Program was proud to participate in Earth Science Week, an international event sponsored by organizations such as the American Geosciences Institute (AGI), the U.S. Geological Survey (USGS) and the American Association of Petroleum Geologists (AAPG). Throughout the week, our program organized events to promote the geosciences in our community, including: hosting Kingsville Mayor Sam Fugate for an official proclamation of Earth Science Week; geosciences activities with 3<sup>rd</sup> graders at Harrell Elementary School; hosting a presentation with Randy Bissell (Senior Geologist at Headington Oil Company

LLC), and a Geosciences Open House displaying our collection of rocks, minerals, fossils, maps, and GIS expertise. Dr. Hedquist, along with students and faculty, planted twenty mesquite trees along 6th St near the gateway to the city of Kingsville, south of Sage road. We made five hundred and forty from the charoite-mineral raffle. The winner is Ralph Perri from Financial Aid. Please congratulate him the next time you see Ralph. The money for this raffle will be used to support a rock garden for the campus. Thanks for supporting our raffle!

#### SCHEDULE

**Monday, October 14**  
1:30 to 3:00 p.m.  
2:00 p.m.  
**Tuesday, October 15**  
6:00 to 8:00 p.m.  
**Wednesday, October 16**  
5:30 to 6:45 p.m.  
**Thursday, October 17**  
Harrell Elementary  
7:00 to 9:00 p.m.  
**Saturday, October 19**  
9:00 a.m. to noon

Courtyard Outside Sub  
Display of Rocks, Minerals, and Fossils  
Mayor Sam Fugate: Official Proclamation of Earth Science Week  
Manning, Hill, and Kleberg Halls  
Geosciences Open House  
Hill Hall Room 119  
Randy Bissell Presentation  
  
Earth Sciences Activities  
Geosciences Movie Night "How the Earth was Made"  
  
Kingsville Volunteer Tree Planting Activity

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#### More Chances to Mitigate Heat Effects in Kingsville Next Summer



Dr. Hedquist and majors took to the field on November 9th to plant two oak trees, oleanders and crepe myrtles on the south and east side of the U.S. Post Office in Kingsville to increase shade in the area. Further volunteer tree planting events in Kingsville will take place in March and April 2014, with a focus on downtown, to help lower heat island effects, provide shading for pedestrians, and beautify the city.

#### Corpus Christi Geological Society Supported our Majors with Scholarships

The CCGS Scholarship Committee awarded seven scholarships to TAMUK geology majors. Many of these students will be going to field camp this year. Thanks for supporting our majors!

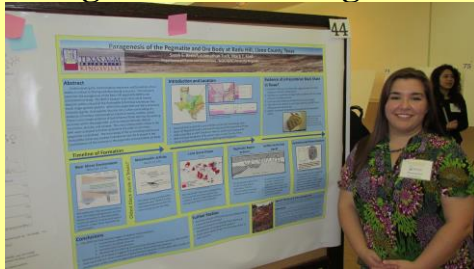




## Our Students Presented at Pathways to the Doctorate Symposium TAMU-Kingsville

**Sarah Beers** and **Jonathan Tuck** (Honors College students) presented posters this month at the Pathways to the Doctorate Symposium, a state-wide conference that took place on our campus. Sarah's presentation was titled, "Paragenesis of the Pegmatite and Ore Body at Badu Hill, Llano County, Texas" and she discovered evidence for a previously undocumented 1.3 billion year old black shale in Texas. Jonathan's presentation was titled, "Badu Hill: A Potential Rare Earth Element Resource in Central Texas?" and he investigated the economic viability of mining rare earth elements at Badu Hill. Both presentations were culminations of semester-long projects that included an earlier oral presentation that was attended by over 50 students and faculty along with field work at Badu Hill with the Mineralogy class (GEOL 3409).

### Paragenesis of the Pegmatite and Ore Body at Badu Hill, Llano County, Texas



Understanding the mineralization sequence and formation of ore bodies is critical to finding and developing resources. This research examines the paragenesis of the Badu Hill pegmatite (BHP) and associated ore body. The BHP is located near small marble deposits within a band of the Packsaddle Schist that is between two much larger granitic plutons. Within the pegmatite are many accessory minerals (pyrite, chalcopyrite, fluorite, etc.), while surrounding it is evidence of contact metamorphism (skarn minerals, marble, schist). There is also ample evidence of hydrothermal fluids altering the existing minerals within the pegmatite, such as metasomatically altered microcline, jarosite, and anatase. The cross cutting relationships in the BHP were

analyzed to further determine the order in which the pegmatite crystallized. The mineralogy of the surrounding marble and Packsaddle Schist was studied to determine the role it played in the crystallization of the minerals in the pegmatite and associated ore body. **Authors: Sarah E. Beers, J. Jonathan Tuck, Mark T. Ford**

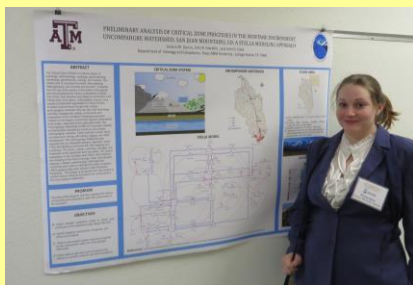
### Badu Hill: A Potential Rare Earth Element Resource in Central Texas?



Rare Earth elements (REEs) (atomic numbers 21, 39, and 57-71) are currently an important mineral resource for American manufacturing. Their applications are as diverse as personal electronics, alternative energy infrastructure, medical instruments, and defense and aerospace technologies. The market value of REEs and their mining tonnage have both significantly increased every year during the last five years. The Badu Hill pegmatite in Llano County, Texas, is a known deposit of many minerals which contain abundant REEs and is associated with a historic mining district. During a field trip to Badu Hill with members of the Texas A&M University Kingsville Department of Geosciences, teams of mineralogy students mapped the mineralogy of

the walls of an abandon mine. We assess the economic viability of a mining operation at the site of the REE deposit based on estimated volumes of minerals, estimated REE concentrations in these minerals and current prices for REEs. **Authors: J. Jonathan Tuck, Sarah E. Beers, Mark T. Ford**

### Jessica Garcia (TAMU) Presented at Pathways to the Doctorate



Jessica Garcia was in Kingsville to present her preliminary information on her PhD study. Jessica (Geosciences Graduate, May 2012) is at Texas A&M University in College Station working on her Doctorate course work and research. Thanks for dropping by the Geosciences Program.

### Geosciences Club and AAPG Student Chapter Activities

The Geosciences Club and AAPG Student Chapter was involved in many of the activities presented in this newsletter. Students supported the day-to-day activities in Earth Science Week, including the tree planting event on Saturday. They planted additional shrubs and trees on November 9. Most of our members attended the fieldtrips. Ten club members prepared jewelry and assembled Geosciences and AAPG booths that were a big hit at the Fall Carnival. They cleared 250 dollars during this event and had a lot of fun doing the event!



## Field Camp III – A Progress Report

Thomas McGehee, Vernon Kramer, and Herman Jackson are scheduling activities that provide insights into the first year of employment into local industries. This includes shadowing uranium geologists during their data collection in the field, learning how to interpret the PFN data to define the uranium role front, learning basic mudlogging techniques, learning how to interpret geophysical logs, learning the basics of 3D Seismic, learning the basics of “fracking,” and a visit to the log library to research a prospect. One of the projects involves travel to a newly constructed oil platform.

## Our Department Went on Three Fieldtrips



Fieldtrip exercises covering aspects of GEOL 3409 Mineralogy, GEOL 3481 Structural Geology and GEOL 4420 Paleontology were conducted from October 10th-12th, 2013. Two Honors College students, assisted by Dr. Mark Ford, prepared and presented “Badu Hill in Central Texas: A Billion Year Old Pegmatite with Potential for the Future (A Presentation By: Sarah E. Beers and Jonathan Tuck).” Thirty-two geology majors and six faculty members conducted field exercises at Badu Hill Pegmatite deposit and examined outcrops in Leander, Texas. Students produced a detailed map of the inner workings of the pit and mapped the perimeter contact zone of the Pegmatite. All participants also toured the Jackson School of Vertebrate Paleontology in Austin, Texas.



Fieldtrip exercises covering aspects of GEOL 4425 Hydrogeology, GEOL 3481 Structural Geology, and GEOL3431 Stratigraphy and Sedimentology were conducted from October 24th-26th, 2013. Dr. Thomas McGehee and Dan Jackson presented talks on “Geophysical Well Log Analysis” and “Basic Aquifer Testing” to prepare the participants for the field work. Twelve majors and four faculty members developed two stratigraphic columns of Cretaceous lithology across Central Texas. Paul Tybor (General Manager of the Hill Country Underground Water Conservation District) and Ron Fieseler (General Manager of the Pedernales-Blanco Groundwater District) with the services of a water well drilling company pulled the pumping well, measured the geophysical properties of the borehole (well log), and performed a pumping test. Our

students collected the data and are preparing a standard hydrogeology report of *Groundwater Availability from the Trinity Formation in the Buckley Ranch area, Blanco County, Texas*. Special thanks to Paul Tybor, Ron Fieseler, and Jim Chude for helping on the project.

We visited the Houston Museum of Natural Sciences for a tour of their world-class mineral exhibit. While we were in Houston, we went to the Houston Gem and Mineral Show. Both of these exhibits provide aspects of knowledge that is a must for our students in the GEOL 3409 Mineralogy Class.

## TAMUK Geosciences ALUMNUS Presented at the U-2013 Global Uranium Symposium

We recruited Neal Kunkel from Wharton County Junior College (Professors Danny Glenn and Dale Pinson) in Fall 2002. Last month Neal (TAMUK alumnus, 2004) presented “Uranium Disequilibrium in Miocene to Lower Pliocene-aged Goliad Formation Sands at Uranium Energy Corp’s Burke Hollow Project” on October 1st at the U-2013 Global Uranium Symposium. We are very proud that Neal made this presentation. Great job Neal.

## Justin Mauck and Dr. Mark Ford Schedule Research Trip to Big Bend



Over the winter break, Justin Mauck and Dr. Mark Ford are traveling to Big Bend to plan out their research venture that will be continued into the spring. The primary goal of the research is to map out some of the over thirty Tertiary volcanic units (tuffs) present in the park. They will use the department’s new handheld X-ray fluorescence (XRF) spectrometer to determine the geochemistry of various units and correlate them. This is Dr. Ford’s and Justin Mauck’s first visit to Big Bend.

## Minor in Geographic Information Systems

The Geographers submitted a proposal for a minor in GIS that requires five courses to complete the minor. These are Introductory GIS, Advanced GIS, Field Mapping and Cartography, Remote Sensing, and Advanced Remote Sensing. If students take the first four classes with a C or better average they get a GIS Certificate.



### Dr. Brent Hedquist is presenting at Del Mar College

Dr. Brent Hedquist will be presenting “Geospatial techniques and applications in the Geosciences: Case study of the urban heat island effect, microclimates, and heat mitigation in Kingsville, Texas” at 1:00 Friday November 15th at Del Mar College.

In this talk, Dr. Hedquist will give some background on geospatial techniques and applications in the Geosciences. A case study example will then be given on a recent study in Kingsville, Texas, where the urban heat island effect and microclimates were investigated by utilizing geospatial techniques to identify hotspots in the city. This research was presented to the city. Results from this study have led to another project in Kingsville, which involves student volunteer tree planting throughout the city for heat mitigation and beautification. Dr. Hedquist will then conclude with a discussion on the GIS certificate program as well as the newly approved GIS minor, housed within the Department of Physics and Geosciences at TAMUK.

### Drs. Su & Hedquist Present Papers at 2013 SWAAG Meeting

Two Geographers presented research papers at the Annual Meeting of the Southwest Division of the Association of American Geographers (SWAAG) in Nacogdoches, TX. Dr. Haibin Su presented “Combination of regression and spatial interpolation for improving bathymetry mapping with multispectral imagery”. Dr. Brent Hedquist presented “Seasonal variability of temperatures and outdoor human comfort in Phoenix, Arizona”.

### Hydro Fieldtrip Galleries





### Badu Hill Fieldtrip Galleries

