DEPARTMENT OF PHYSICS AND GEOSCIENCES

Geosciences Newsletter

VOLUME 6, ISSUE 4 DEC2012

Inside This Issue:

Program News

Earth Sciences Week October 15-19

October 15th -19th, our department was proud to participate in Earth Science Week, an international event sponsored by organizations such as the American Geosciences Institute, the U.S. Geological Survey and the AAPG Foundation. Throughout the week our department organized events to promote the Geosciences in our community, including: hosting Kingsville Mayor Sam Fugate for an Official Proclamation of Earth Sciences Week; geosciences activities with 3rd graders at Harrell Elementary school; hosting a presentation by Phil Dellinger, Chief EPA Region 6, Groundwater Division; and a Geosciences Open House displaying our collection of rocks, minerals, fossils, maps and GIS expertise. We followed the following schedule and produced a great Brochure to publicize our programs. **Lisa McLaughlin and the Geosciences Club were the major reasons why this program was so well attended. Great job guys!**

Presentation at Harrell Elementary

Monday, October 15	Pavillion Outside Sub
1:30 to 3:00 PM	Displays of rocks, minerals, fossils, and maps
2:00 PM	Mayor Sam Fugate: Official Proclamation of Earth Sciences Week
Tuesday	
5:30 PM	Phil Dellinger, Chief, EPA Region 6, Groundwater Division, Speaker
Wednesday	
10:30 to 11:30AM	Presentation at Harrell Elementary
6:00 to 8:00PM	Geosciences Open House
Thursday	
8:00 to 10:00 PM	Astronomy Open House

We Participated in GIS Day

Geosciences professors, Drs. Hedquist and Su, as well as student volunteers represented Texas A&M University-Kingsville at the annual GIS Day of the Coastal Bend event at Del Mar College in Corpus Christi on November 15th. The event was a great success, with over 1,000 attendees, principally from local High Schools and Middle Schools. The event was part of National Geographic's Geography Awareness Week, with the theme "Discovering the World through GIS," and helped showcase GIS and other geospatial technologies and their use in industry. Students and their teachers enjoyed several activities ranging from individual hands-on activities using GPS, to visiting demonstrations at booths and presentations on GIS and surveying from GIS professionals working in industry, education, and the government.

CCGS Supported our Majors with Scholarships and Cameras

The CCGS scholarship committee awarded 8 scholarships to TAMUK geology majors. Many of these students will be going to field camp this year. Thanks for supporting our majors!

The CCGS educational committee awarded 10 cameras to support lab exercises in Petrology Sedimentology, and Mineralogy. These resources were pressed into service immediately to help students document their optical mineralogy exercises. Thanks for these much-needed resources!

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TEXAS A&M UNIVERSITY KINGSVILLE JAVELINAS

Our Students Presented at Pathways to the Doctorate TAMU-Commerce and Javelina Symposium – TAMUK

Michael Hill completed his second year study on the "Effects of Wind on South Texas Regional Coastal Geomorphology" and presented at both the Javelina Symposium and the Pathways to the Doctorate Research Symposium. Michael Hill won the **top poster award** at the Javelina Symposium. Abstract: This study of the South Texas Aeolian Sand Sheet is based on the monitoring of movement of a dune system located on the Kennedy Ranch over a period of one year. This dune field was monitored by height and positional markers placed in Key positions in the dunes. This data are correlated with wind speed and direction monitored during the research time. The major conclusions from this study: the sediment supply for the dune field is from the barrier island; the wind direction is the dominant process that moves sediment from the barrier island; Dune sand grains are too large to be carried as suspended load, the deflated mudflat areas shows onshore migration of dune sand; discovery of saturated sands in the dune indicates there are limiting factors in sand erosion; A minimum age of dune development was determined to be the Pleistiocene.

Pathways to the Doctorate Presentations

Michael Parker, Jonathan Sulaica, and Lisa McLaughlin completed their research and presented the poster "Quantifying Material Removed as a Result of 2002 Flood at Canyon Lake: a GIS Analysis" Abstract: On July 4th, 2002, the Canyon Lake reservoir breached its spillway after the watershed received 34 inches of rain in a matter of days. In roughly 24 hours, a gorge was carved from the hillside, spanning a distance of more than one mile, with depths up to 50 feet. The Guadalupe River valley is the most flash flood prone river system in North America, so any information known about this system will help save people from disasters, as seen in 2002. As part of this research, it was hypothesized that remote sensing techniques could be employed to quantify the volume of material removed by this catastrophic flood event. Analysis was performed using Digital Elevation Models (DEM) with 30m accuracy, 2010 LiDAR data with 0.45m accuracy, and ArcGIS software. Due to the high resolution of available post-flood LiDAR data, and the low resolution pre-flood DEM data, results are deemed accurate within a considerable margin of error, and are still considered preliminary. The results of this analysis rendered a total 3,035,417.079 m^3 of material removed from this single flood event.

Lisa McLaughlin completed a second research project for her Honors College commitment entitled "Standing Water: A Coastal Bend Surface Water Quality Assessment." Abstract: Texas Stream Team Certified Water Quality and Bacteria Monitors are volunteers that complete a monitoring plan and go through three phases of training using a test kit that measures physical and chemical parameters in water, in addition to monitoring for E.Coli Bacteria. Two sites were chosen for monthly monitoring: Escondido Creek at Dick Kleberg Park, in Kingsville, and the Nueces River at Hazel Bazemore Park, in Calallen. These two sites were monitored for just over a year and data were submitted to the Texas Stream Team for entry in a database to maintain a record of stream conditions. Participation in this program has been instrumental in learning techniques for collecting quality assured data, and providing standard professional water quality data, and facilitating environmental stewardship to enhance community awareness of water quality issues.

Sarah Roos and Stephanie Resendez completed a GIS project entitled "Restoring Flinn Farm Cemetery." Abstract: In the first half of the 20th century agriculture was the economic engine for much of South Texas and many of the region's farms and ranches made use of Hispanic migrant workers. One such farm, Flinn Farm, played a major role in the development of the area around Petronila, Texas. One legacy of this era is a cemetery on Flinn Farm property containing the graves of nearly 30 Hispanic workers, and their children. Today, many of the graves have been overgrown by vegetation, damaged by flooding or storms, and have deteriorated from a general lack of upkeep to the point of being effectively unmarked. This project used a combination of GIS, Aerial Photographs, and Remote Sensing techniques in order to determine the boundaries of the cemetery and properly identify and mark the graves contained therein. By locating and mapping these gravesites, archaeologists, historians, and volunteers can better preserve the site and the families of the individuals interred in Flinn Farm Cemetery will again be able to visit their relatives. This research increases representations of Hispanic heritage in the local history of the region. We would like to thank the Flinn Family and Flinn Farm and the Nueces County Historical Commission. This project emerged out of a Texas A&M-Kingsville Advanced GIS class in Spring 2012 under the direction of Dr. Yu and Dr. Alcala. We are also grateful to the Department of Geosciences for the use of equipment and technical support.

Field camp III – A Progress report

We are gearing up for the third leg of the Field Camp with our Winter Intersession. Vernon Kramer, a retired geological engineer and Professor at Del Mar, will join Dan Jackson and Dr. Tom McGehee in the organization and pedagogical training of our students. On December 15 Mike Maxson (Mestena) will present Uranium 101 – A short course on the Uranium Mining Industry. On day two we will have an analysis phase of the field camp where our majors analyze field data from the uranium mining industry. The third day will be shadowing geologists (Lily Alfaro and Jon Pollock) in the field at the UEC facility at Palangana. Dennis Moore will be leading the presentations for Well-Log Analysis on December 18. We will be visiting a Log Library in Corpus Christi to learn how you gather data in the first stage of developing a petroleum prospect. We will be traveling to Victoria, Texas to learn how to be a mudlogger with the Gisler Brothers.

Our Department Went on Three Fieldtrips

Hydrogeology (GEOL 4425) and Geomorphology (GEOG 3421) Fieldtrip to Central Texas (Sept 27-29). We were treated to an excellent educational program developed by the Barton Springs/Edwards Aquifer Concervation District (BSEACD). The major speakers were Brian Hunt, Brian Smith and Ronald Fieseler. We started the trip at the BSEACD headquarters with an excellent overview of the activities from the above speakers. Our first stop was at the Westbay Multiport Monitor Well. The second stop was at the Antioch Recharge Enhancement Facility on Onion Creek. We had a discussion of the results from a resistivity and natural potential (NP) geophysical studies alond Onion Creek and the Balcones Faults. We concluded the fieldtrip at Barton Springs to talk about the Barton Springs hydrogeology and the biology there at the Springs. This was the most professionally organized and conducted fieldtrip we have had the pleasure to attend. We are so pleased to have this support from these professionals. Thanks for all your help! Vernon Kramer, Dan Jackson, John Buckley, Paul Tybor, and Tom McGehee provided pedagogical support for our majors.

Mineralogy and Structural Geology Fieldtrip to Badu Hill (Oct 18-20). Tom McGehee, Dan Jackson, Vernon Kramer, John Buckley, and Frank Roberts led this fieldtrip. This 2.5-day field trip exercise (Th-Sat) covered the mapping of one historic pegmatite intrusion and the structural field relationships to the surrounding geology. Mineralogy and structural geology exercises included collecting a reference collection of Badu Hill Minerals, mapping the spatial relationship of the minerals across the site, determining the paragenesis of mineralization, mapping the structural geology in the vicinity, and determining the timing of Badu Hill Pegmatite formation.

Canyon Lake Gorge Fieldtrip (November 17) As a Geology Club/ AAPG Student Chapter Field Trip, our students chose to visit Canyon Lake Gorge, in Canyon Lake, Texas, for a recreational learning experience. In 2002, a catastrophic flood overtopped the Spillway at Canyon Lake, and in a matter of days a gorge was carved into the landscape, exposing a window to the Upper and Lower Glen Rose. Our students were able to view unique and fresh exposures of the Hidden Valley Fault, the hydraulic dynamics of the Trinity Aquifer and Glen Rose Limestone, 110 million year old dinosaur tracks and extensive marine fossil diversity. Then we ate delicious German food in New Braunfels!

Geology Club and AAPG Speakers during the Fall 2012

Randy Bissell presented "**From the Basin Floor to the River System: The Complete Section – A Review of the Carboniferous Ross Formation, Gull Island Formation, and Clare Group, Western Ireland**." This was an excellent example of sequence stratigraphy high-stand, low-stand sedimentation and its application to exploring for offshore hydrocarbons. Mr. Bissell is a dynamic speaker that has presented the most interesting talks to our students. We are always pleased to hear his presentations. Jake Hansen followed his talk with his field camp experiences looking at the same outcrops discussed in Mr. Bissell's talk.

The Geosciences Club and the AAPG Student Chapter hosted four field camp presentations by our students that participated in Field Camps this summer. Jacob Hansen (Geology of Ireland) and Sarah Roos and Lauren Rosson (Geology of Sardinia, Italy), Naomi Pankratz (Texas, New Mexico and Colorado with Sul Ross), and Michael Parker (University of Miami, Ohio) presented a good evaluation of field camps across the United States. As you can see two groups of majors traveled abroad to study classic outcrops in Italy and Ireland.

GSRL Progress Report

The GeoSpatial Research Lab (GSRL) recently hired a graduate assistant to teach GIS mini-courses and work with faculty on research projects. The first GIS workshop was recently held and was well attended, with participants including faculty and students from TAMUK, as well as several from the City of Kingsville.

Special Guest Speaker

We had a special guest speaker Dr. Jaehyung Yu from Korea on October 5 that presented 'Remote Sensing in Geological Applications." It was great to see our friend in good health and high spirits. He is an inspiration to students and faculty.

Dr. Jaehyung Yu and Dr. Thomas McGehee receive their award

Check out the picture from the awards ceremony at the AAG Conference in San Marcos. You can follow this link http://www.aag.org/cs/news_detail?pressrelease.id=1501 to see our picture and the write-up on the award.

Picture Gallery