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Program News

Congratulations to Noe Saenz for his wedding and listed in who's who



Noe Saenz was married to Noelia Chacon on Saturday September the 12 of 2009. The ceremony was held at Our Lady of Good Counsel followed by the reception at the KC Hall down 14th street in Kingsville.

Noe was selected as a Who's Who recipient and received the award at a ceremony along with the other recipients Sunday October the 8th of 2009. Noe says "I feel very fortunate to have received such a special award. All this and I got to get married as a bonus. This Rocks my perthite!"

Melissa Hidalgo participates in the HACU conference in Orlando, FL

Melissa Hidalgo traveled to Orlando, Florida to attend the Student Track portion of the HACU Annual Conference October 31-November 2. She discussed geosciences opportunities with representatives from the Department of the Interior (DOI), and United States Geological Survey (USGS). Melissa learned a lot from the HACU Conference. She will be a graduate from our program in December.



Dr. McGehee receives Army Corps of Engineers Grant from ERDC



Dr. Thomas McGehee received a \$50,000 research award from ERDC this summer to develop synthetic hydrogeologic models of coastal environments. McGehee has conducted on-campus research for ERDC with geosciences students for the past 4 years. Dr. McGehee is proud of his students accomplishments on these projects. These projects fund up to 4 undergraduate student engagements each year.

Dr. Yu presented his research outputs at NARP 2009 symposium in Washington DC



Dr. Jaehyng Yu was invited and presented his research titled "Vertical Integration of Geospatial Intelligence for South Texas" at NARP 2009 symposium sponsored by National Geospatial Intelligence Agency from September 29 to October 1, 2009. Moreover, his research project is selected as one of the best performance researches, and he presented his success story during special session. Attending the symposium, the research team finishes the 2 year project.

Billy Hales wins the best poster award at SWAAG 2009

Mr. Billy Hales, a MS student at TAMU and class of 2009 TAMUK, won the best poster award at the Southwestern Division of the Association of American Geographers (SWAAG) conference in North Little Rock, Arkansas. Hales took first place poster honors for his poster titled "Shoreline Extraction and Analysis of Lacustrine and Fluvial Systems: A Case Study." Hale's advisors are Dr. Doug Sherman and Dr. Hongxing Liu.



Program News

Geosciences had a great QEP fieldtrip to Central Texas

Our students and faculty enjoyed the most productive fieldtrip in the past several decades October 15-17. Frank Roberts an engineer with "Austin City Limits" and an avid mineral collector in the Austin area led the TAMUK group to the famous Badu Hill and Petrick Mine pegmatites. Mr. Roberts has found many of the REE enriched minerals found in the pegmatites. We were fortunate that he made his spare time available that weekend.



Dan Jackson, Tom McGehee, and Wayne Kinnison (Physics Program) prepared a talk on "Pegmatites, Rare Earth Elements, and Radioactive Mineral Safety Issues" and presented on October 15 to 50 students, faculty, and Geosciences Club members as part of our Quality Enhancement Program (QEP). Jaehyung Yu, Thomas McGehee, Dan Jackson, and John Buckley traveled to the Johnson City area on Friday morning. During the travel and at Dr. John Buckley's ranch we gathered data and interpreted key geomorphologic features.

On Saturday we devoted the day to studying field relationships and mineral assemblages at two Pegmatite deposits. We congratulate our students and Frank Roberts for their performance on this fieldtrip. The major goals of this fieldtrip were accomplished by their efforts. We now have maps and a mineral collection of the Petrick Mine and Badu Hill pegmatite deposits that will be studied by future geology majors. Students gained valuable field knowledge that will be useful through their professional careers. Mr. Scott Van Winkle (senior, geology major), Dr. McGehee, Dan Jackson, and Frank Roberts will be continuing these fieldtrip activities at other pegmatite deposits in the area to understand the origin and field relationships in this mineralized area.

Meet our Fall, 2009 Research Team

Alexandra Breeding, Dan Jackson, and Dr. McGehee are working on 2 research projects this past year. She prepared thin-sections of 40 carbonate rock specimens collected on a fieldtrip last spring and identified the sedimentary environment using hand-specimen and petrographic microscopy techniques.

Noe Saenz is presenting a GIS Crime Analysis in Alice, TX. The project was conducted in hopes of showing the city of Alice the potential of GIS applications to help reduce crime by assisting with patrolling decisions and crime predictions. Noe Saenz will be a graduate from this program in December.

Rebecca Roscoe is preparing ore petrology course materials for our mineralogy and petrology classes. Rebecca Roscoe will be a graduate from this program in December.

Ruben Cano and Dr. McGehee continued his work on the geologic characterization of subsurface fluvial deposits. Ruben Cano will be a graduate from this program in December.

Sam Cantu, **David Smith** and **Joe Martinez** will be a graduate from this program in December.

Juan Cavazos is a new transfer student with good computer skills that will be working with Paul Laraway and Alexandra Breeding to develop coastal models for our ERDC project.

Melissa Hidalgo and Dr. John Buckley have been preparing and reconstructing a partial skeleton of *Polyptychodon hudsoni*. She will graduate this December.

Richard Hodges, **Michael Schneider** and a team of undergraduate students "dissected" an outcrop of the Edwards Reef Formation on a QEP fieldtrip last spring.

Paul Laraway is our lead research student to prepare new strategies for modeling subsurface coastal deposits for ERDC.

Jarret Pawlik is a new member of our team to prepare new strategies for modeling subsurface coastal deposits for ERDC.

Scott Van Winkle, Dr. McGehee, Dan Jackson, and Frank Roberts will be continuing these fieldtrip activities at other pegmatite deposits in the area to understand the origin and field relationships in this mineralized area.



Geosciences' Quality in Research Proved - 7 Papers at 2009 Pathways Program

Geosciences program proved that they are the major players in undergraduate research by presenting seven research papers at TAMUS Pathways to Doctorate program. Number of papers presented by Geosciences program account for 13 % of total presentations made by TAMUK, and it is more impressive because they made the quality presentations without graduate program. Moreover, Mr. Noe Saenz, senior Geology major, won the first place in environmental science division. During last three years of Pathways competition, the Geosciences program has won three awards (two first places and one second place) and the success history goes on. We proudly present the award certificate and seven papers made by our students.



GIS Based Crime Occurrence Analysis for City of Alice, TX

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 **Department of Agronomy and Resources Sciences, Texas A&M University - Kingsville

Abstract
 Public safety is a critical factor to provide a better living environment for the community. Crime is a major cause of significant degradation of the quality of life. South Texas is known as having some of the least safe cities in Texas. Especially, the crime rate for the city of Alice can be ranked as high as the 3rd highest among the 180 Texas cities with populations of 10,000 or more in 1999. Geographic Information Systems provides the science of crime mapping to police officers, crime analysts, and other people to visualize crime data through the medium of maps. The robust capabilities of crime mapping and analysis have been proven; about 13% of law enforcement agencies are using GIS regularly to analyze their crime problems. However, none of the cities in South Texas have yet to be introduced to this powerful method, and no cities in the region have the crime analysis system based on GIS. This poster analyzes the crime data in the GIS environment, and identifies the locations of crime hot spots, and their distribution over time for a specific type of crimes. Eventually, this poster presents details of crime distribution and the optimal routes for police patrol.

Methodology
 Geo-Statistical Modeling
 Data
 Land Use Land Cover
 Crime Data
 US census data

Results and Discussion
 Violent Crimes
 Drug Crimes
 Conclusion

This study employed various geostatistical models to identify crime centers, clustering, and hot spot for four different types of crimes: property crime, violent crime, drug crime, and traffic events. The spatial and temporal characteristics of four different types of crimes are investigated for the first time in the study area. Moreover, the physical environment, and socio-economic data is related to the spatial and temporal variations of each crime type. As a result the vulnerable attributes and spatial characteristics of each crime type over the time are classified. The spatial-temporal characteristics of each crime type can be concluded as following:
 -Property crimes show strong clustering at all time periods of day. Commercial areas are considered as the hot spots of property crimes from morning to midnight. From midnight to morning, the residential areas with below median house income and high Hispanic population are most likely vulnerable against property crimes.
 -The frequency of violent crimes does not show much variation with time periods. However, the clustering is relatively weaker during the dormant time period although the general clustering for this type is strong. Commercial areas are the main hot spot of violent crimes from morning to midnight whereas the residential area below-average life style is more exposed during dormant time.
 -The drug crimes occur in residential areas in below-average income areas mainly during the night time. The commercial areas are mostly used for drug crimes during daytime. The spatial pattern of drug crimes shows strong clustering for all time periods.
 -Traffic accidents and events are highly concentrated in commercial areas at all times showing strong clustering. But, some of the residential areas are included as hot spots for traffic events from midnight to morning with very weak clustering, and it does not show



Spatial Analysis of the Edwards Reef in North Central Texas

*Michael Schneider, *Alan Hodges, *Alexandra Breeding, *Dr. Thomas McGehee, *Prof. Dan Jackson
 *Department of Geosciences Texas A&M Kingsville - Kingsville

Abstract
 The Edwards Reef is a prominent geological feature in the Edwards Plateau region of North Central Texas. This study aims to analyze the spatial distribution and characteristics of the reef using GIS and remote sensing techniques. The study area covers approximately 10,000 square kilometers and includes major cities such as Austin, San Antonio, and El Paso. The reef is characterized by its unique topography and geology, which have shaped the region's landscape and ecosystems. This research provides a comprehensive overview of the reef's spatial characteristics and their implications for the surrounding environment and communities.

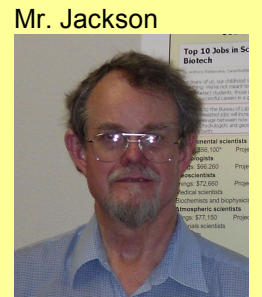
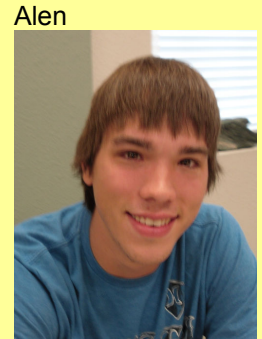
Methodology
 1. Satellite Data
 2. Data Preprocessing
 3. Feature Extraction
 4. Classification
 5. Validation

Aerial Analysis
 This study involves the use of aerial photography and satellite imagery to analyze the spatial characteristics of the Edwards Reef. The data is processed and analyzed using GIS software to identify patterns and trends in the reef's distribution. The results show that the reef is highly concentrated in certain areas, particularly in the central and eastern parts of the study area. This concentration is likely due to the unique geological conditions and topography of these regions.

Petrology
 During field observations of the reef, the rock samples were collected and analyzed in the laboratory. The results show that the reef is composed of various rock types, including limestone, sandstone, and shale. The petrology analysis provides valuable insights into the reef's geological history and the processes that have shaped its formation. The study also identifies the presence of various mineral resources and their potential economic value.

Discussion
 The Edwards Reef has a significant impact on the region's geology and environment. Its unique topography and geology have shaped the landscape and ecosystems of the Edwards Plateau. The study highlights the need for further research and conservation efforts to protect the reef's natural resources and ensure its long-term sustainability. The findings of this study can be used to inform land use planning and resource management decisions in the region.

Conclusions
 This research provides a comprehensive overview of the spatial characteristics and petrology of the Edwards Reef. The study highlights the reef's unique geological features and their implications for the surrounding environment and communities. The findings of this study can be used to inform land use planning and resource management decisions in the region.





2009 Pathways to Doctorate TAMUS Research Symposium Presentations

Preparation and Partial Reconstruction of *Polytychodon hudsoni* Skull

Melissa A Hidalgo, John Buckley, Jaehyung Yu
Department of Geosciences, Texas A&M University-Kingsville

Abstract
The preparation and partial reconstruction of a fossil skull of *Polytychodon hudsoni* is presented. The skull was prepared using a series of techniques including ultrasonic cleaning, sandblasting, and chemical treatments. The partial reconstruction was achieved using a combination of traditional and modern techniques, including the use of a 3D printer to create a model of the skull.

Methodology
The methodology involved the use of ultrasonic cleaning, sandblasting, and chemical treatments to prepare the skull. The partial reconstruction was achieved using a combination of traditional and modern techniques, including the use of a 3D printer to create a model of the skull.

Results
The results of the preparation and partial reconstruction of the skull are presented. The skull was successfully prepared and the partial reconstruction was achieved using a combination of traditional and modern techniques.

Conclusion and Future Work
The preparation and partial reconstruction of the skull was successful. Future work will involve the completion of the skull reconstruction and the study of the skull's morphology and function.

Acknowledgements
The authors would like to thank the following individuals for their assistance in the preparation and partial reconstruction of the skull: [Names]

Bibliography
[Bibliography entries]



Glacial Shrinkage in Mongolia's Altai Mountain Range as a Climate Indicator from 1989 to 2000 using Satellite Remote Sensing

Texas A&M University - Kingsville, Physics/Geosciences Department

Abstract
The purpose of this study is to determine the extent of glacial shrinkage in the Altai Mountain Range in Mongolia from 1989 to 2000 using satellite remote sensing data. The study uses Landsat TM+ data to calculate the Normalized Difference Snow Index (NDSI) and the Normalized Difference Vegetation Index (NDVI) to identify changes in snow cover and vegetation over time.

Methodology
The methodology involves the use of Landsat TM+ data to calculate the NDSI and the NDVI. The NDSI is calculated using the snow band (band 6) and the near-infrared band (band 4). The NDVI is calculated using the near-infrared band (band 4) and the red band (band 3). The data is analyzed to identify changes in snow cover and vegetation over time.

Results
The results of the study show a significant decrease in snow cover and an increase in vegetation in the Altai Mountain Range from 1989 to 2000. This indicates a warming trend in the region.

Conclusion
The study concludes that the glacial shrinkage in the Altai Mountain Range is a clear indicator of climate change. The warming trend in the region is likely due to global climate change.



Using Hydrogeologic Models as a Learning Tool for Sedimentology Students

Ruben Carr, Alan Hodges, Michael Schneider, Thomas McGehee
Texas A&M University - Kingsville, Geosciences Department

Abstract
This study explores the use of hydrogeologic models as a learning tool for sedimentology students. The models are used to simulate the flow of water and sediment in a subsurface environment, allowing students to visualize and understand complex sedimentary processes.

Methodology
The methodology involves the use of hydrogeologic models to simulate the flow of water and sediment in a subsurface environment. The models are used to visualize and understand complex sedimentary processes.

Results
The results of the study show that the use of hydrogeologic models as a learning tool is effective in helping students understand sedimentary processes. The models provide a visual representation of complex sedimentary structures and flow patterns.

Conclusion
The study concludes that the use of hydrogeologic models as a learning tool is an effective way to teach sedimentology. The models provide a visual representation of complex sedimentary structures and flow patterns, which helps students understand the underlying processes.



Development of Methodologies for the Modeling of Fluvial Aquifers using GMSY/FEMWATER

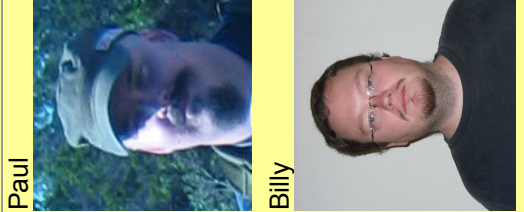
Billy Baker, Thomas Schneider, Paul University - Thomas McGehee
Texas A&M University - Kingsville, Geosciences Department

Abstract
This study focuses on the development of methodologies for the modeling of fluvial aquifers using GMSY/FEMWATER. The methodologies are designed to simulate the flow of water and sediment in a fluvial aquifer, allowing for a better understanding of the complex interactions between the aquifer and the overlying river system.

Methodology
The methodology involves the use of GMSY/FEMWATER to simulate the flow of water and sediment in a fluvial aquifer. The methodologies are designed to simulate the flow of water and sediment in a fluvial aquifer, allowing for a better understanding of the complex interactions between the aquifer and the overlying river system.

Results
The results of the study show that the use of GMSY/FEMWATER as a modeling tool is effective in simulating the flow of water and sediment in a fluvial aquifer. The models provide a detailed representation of the complex interactions between the aquifer and the overlying river system.

Conclusion
The study concludes that the use of GMSY/FEMWATER as a modeling tool is an effective way to study fluvial aquifers. The models provide a detailed representation of the complex interactions between the aquifer and the overlying river system, which helps researchers understand the underlying processes.



Study of Blue Ice Area and Snow Zonation of the Lambert Glacier - Amery Ice Shelf, Antarctica using Landsat ETM+ Data
(Samuel Cantu, Jaehyung Yu)

Blue-ice areas are relatively common features on the Antarctic continent. Blue-ice areas represent zero accumulation and the surface mass loss to the atmosphere by sublimation. Due to its importance in surface accumulation and mass balance of Antarctic ice sheet, it is necessary to quantify the spatial extent of Blue-ice areas and different snow characteristics. The Lambert Glacier-Amery Ice Shelf, located in the East Antarctic Ice Sheet, is one of the largest glacial systems on Earth. Because of its large size and dynamic nature, the Lambert Glacier-Amery Ice Shelf system plays a fundamental role in the study of mass budget of the Antarctic Ice Sheet in response to present and future climate changes. In spite of its importance in mass balance study and snow accumulation, the blue ice area and snow characteristics are not fully mapped for the entire Lambert Glacier-Amery Ice shelf system. This paper utilizes Landsat ETM+ data acquired from 1999 to 2003 to map the extent of Blue-ice area and different snow types. Band ratio technique is effective to differentiate snow and ice features using the spectral differences of snow and ice in the visible green wavelength region (ETM+2) and the MIR region (ETM+5). The mosaics of false color composite and three different types of Band Ratio analyses are constructed. Both supervised (maximum likelihood) and unsupervised (ISODATA) classification methods are carried out to map the zonation of Blue-ice and snow and to cross-validate the results.

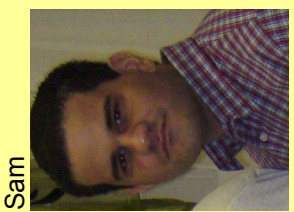
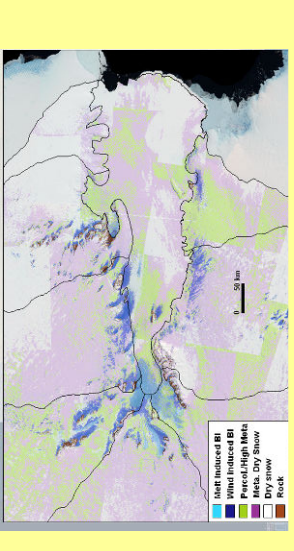




Photo Gallery (GEOSCIENCES Field Trip, October, 2009)



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