DEPARTMENT OF PHYSICS AND GEOSCIENCES

Geosciences Newsletter

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Program News

Fall Geosciences Field Trip was successful

Drs. John Buckley, Jae Yu and Tom McGehee led the Fall Fieldtrip to Central Texas to study the Edwards Aquifer and Cave formations, Precambrian geology of the region, and climb Enchanted Rock.

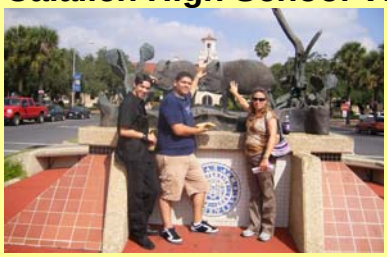
Program Receives New Equipment

In December the Geosciences Program will be receiving a thin-section preparation machine from Army Corps of Engineers to be added to the rock room equipment. Also, Dr. James Carter (Economic Geologist, retired from UTD) will be donating materials to the Geosciences Program to teach a graduate course in economic geology.

Geospatial Technology in Local High Schools and Community Colleges

Five High School Principles at Calallen, H.M. King, Falfurias, Alice and Beeville have submitted letters of commitment to develop Geographic Information Systems at their High School. In addition, Coastal Bend College in Beeville and Alice are introducing GIS into their curriculum. With the help of Sam Cantu (Administrative Assistant) Drs. McGehee and Yu will develop the seven classes to be offered by Fall, 2008.

Calallen High School Visited our Program



Bruce Jonasen, Linda Hajek and five Earth and Space Science students from Calallen High School visited the campus to complete a GIS field exercise with Noe Saenz and Sam Cantu which was imported into a GIS. During their visit Jacob Hundl and members of the geology club conducted a laboratory review of rocks and minerals.

Dr. Norwine Will Sign His Latest Book

Dr. Jim Norwine will be doing a book signing of his latest book, *The Changing Climate of South Texas 1900-2100*, in the Texas A&M University-Kingsville Barnes and Noble bookstore the afternoon of Wednesday January 23, 2008. He is presently working on the draft of his TAMUK "Annual Faculty Lecture" scheduled to be held in the Ben Bailey Art Galley the evening of April 17, 2008. Although his title is a mouthfull (“Dueling Weltanschauungen? A Critical/Conservative Reading of Fugitive Values:What Being-In-The-World-Is-Truly-Like for Contemporary Undergraduates”) he promises to make it lively. His next project will be writing a paper to be delivered at the Congress of the International Geographical Union in Tunis next August.

Program News

Geosciences Student Won Second Place in Undergraduate Research Competition in TAMU Pathway

Four Texas A&M University-Kingsville Geosciences students presented their team members research at the Pathways to the Doctorate Symposium on Nov 2-3, 2007 at Tarleton State University. Noe Saenz won second place award in the undergraduate division of environmental sciences. We are including their abstracts followed by a copy of their poster.

Student News

Four Student Research Teams Presented Their Papers in Research Competition

Artificial Intelligence Tools for Spotting Anomalies on the Battlefield

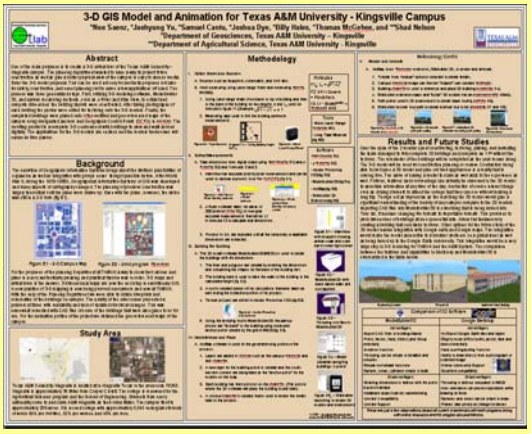
Billy Hales and Marshall Saenz

An Artificial Intelligence (AI) tool was developed for the Army Corps of Engineers to construct conceptual geological models of the Basin and Range Province for numerical modelling purposes. Alluvial and Aeolian sedimentation processes in these arid areas produce alluvial fan and playa type sedimentary lithofacies. The lithofacies were identified as geometries for the AI tool. Representative lithofacies were defined as 20m x 20m x 2m volumes to develop AI test meshes. Remote sensing and ground-truthed data collected on vegetation, soil temperature and soil moisture will be added to the mesh, computed by numerical methods, and analyzed for anomalies on the battlefield.

3-D GIS Model and Animation for Texas A&M University-Kingsville Campus

Noe Saenz, Samuel Cantu, Joshua Dye, and Billy Hales

One of the main purposes is to create a 3-D virtual tour of the Texas A&M University –Kingsville campus. The planning department wanted to have a way to project future construction as well as give a better physical view of the campus in easy to access media. Enter the 3-D model proposal. This can be used not only for aesthetic purposes but also for safety, construction, and event planning just to name a



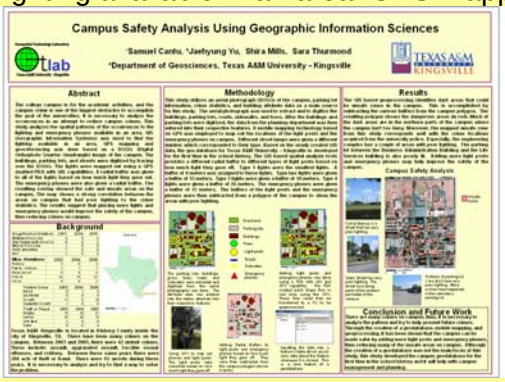
few applications off hand. The process was three generalized steps. First, utilizing 3-D modeling software, Modelbuilder 3D, and various measuring methods, such as J-Ruler and Irfan View, to extract and compute dimensions the building layouts were constructed. After taking photographs of each building the photos were edited for texturing onto the 3-D models. Finally, the completed buildings were placed onto ortho-rectified and geo-referenced maps of the campus using designated anchors and Geographic Control Points in Arcmap. The resulting product is a complete 3-D environment with buildings to view and walk around digitally. The applications for the 3-D models are endless and the models themselves will evolve as time passes.

Student News

Campus Safety Analysis Using Geographic Information Sciences

Samuel Cantu, Shira Mills, and Sara Thurmond

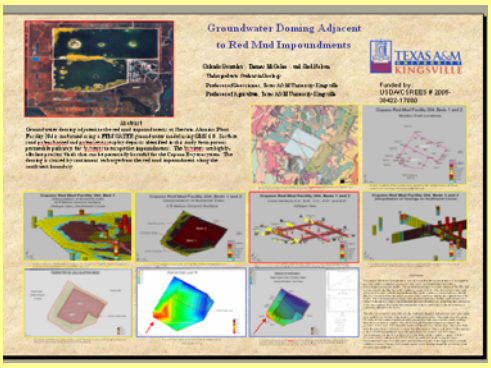
The college campus is for the academic activities, and the campus crime is one of the biggest obstacles to accomplish the goal of the universities. It is necessary to analyze the occurrences in an attempt to reduce campus crimes. This study analyzes the spatial patterns of the occurrences to the lighting and emergency phones available in an area. GIS (Geographic Information Systems) was used to find the lighting available in an area. GPS mapping and georeferencing was done based on a DOQQ (Digital Orthophoto Quarter Quadrangle) image of the campus. The buildings, parking lots, and streets were digitized by tracing over the DOQQ. The lights were mapped out using a GPS enabled PDA with GIS capabilities. A radial buffer was given to all of the lights based on how much light they gave out. The emergency phones were also given a radial buffer. The resulting overlay showed the safe and unsafe areas on the campus. The map shows a strong correlation between the areas on campus that had poor lighting to the crime statistics. The results suggest that placing more lights and emergency phones would improve the safety of the campus, thus reducing crimes on campus.



Groundwater Doming adjacent to Red Mud Impoundments

Orlando Gonzalez

Groundwater doming adjacent to the red mud impoundments at Sherwin Alumina Plant Facility 204 is confirmed using a FEMWATER groundwater model using GMS 6.0. Surface sand paleochannel and paleocrevasse splay deposits identified in this study form porous permeable pathways for lixivients to escape the impoundments. The lixivients are highly-alkaline process fluids that can be potentially harmful for the Copano Bay ecosystem. The doming is caused by continuous recharge from the red mud impoundment along the southwest boundary.



Introducing Our Undergraduate Research Team Members

Drs. Jaehyung Yu and Thomas McGehee have been assembling an undergraduate team of GIS and Hydrogeology students to work on research projects in Geospatial Analysis. The geospatial research team includes:

Samuel Cantu is a senior geology major with a geography minor that is approximately 1.8 years away from graduation. He came directly to Texas A&M University-Kingsville directly after graduating from Falfurias High School. He has been a research assistant for Dr. Jaehyung Yu since the spring of 2006. Major projects include: flood analysis, socio-economic and land use effects of NAFTA on the south Texas border region, campus safety analysis, and being an administrative assistant for a GIS grant.

Joshua Dye is a senior-status geology major that is one and a half years from graduation. He is a transfer student and is certified in GIS from Del Mar College, Corpus Christi. He is working at Uranium Exploration Corporation as a GIS Project Specialist. He worked on the team to develop the 3-D GIS Model and Animation for Texas A&M University-Kingsville Campus.

Octavio Flores is a freshman graduate from Flour Bluff High School. Mr. Flores is a recipient of the Geospatial Intelligence Scholarship. He is working with our team on the 3-D GIS Model and Animation for Texas A&M University-Kingsville Campus.

Billy Hales is a senior-status geology major that is one year from graduation. He is a transfer student from Coastal Bend Community College, Alice Campus. Mr. Hales has been a research assistant for Dr. McGehee and Dr. Yu for the past 2.5 years. He brings strong computer, quantitative, and geology knowledge to each research project he pursues. Major projects include: Developed the geologic characterization of Yuma Proving Grounds, developed a protocol to go about using the CALINE4 CO dispersion model in GIS, and 3D, and helped with 3-D GIS Model and Animation for Texas A&M University-Kingsville Campus.

Orlando Gonzales is a junior-status geology major. He is a transfer student from Coastal Bend Community College, Alice Campus. He was selected by our Department to receive this funded research from the USDA/CSREES Project # 2006-38422-17080.

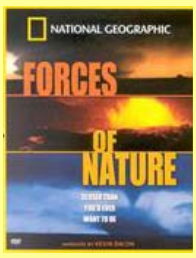
Noe Saenz is a senior-status geology major with a double major in computer sciences. Mr. Saenz has unique skills in research and is one of the most persistent in problem solving. He was selected by our Department to receive this funded research from the USDA/CSREES Project # 2006-38422-17080.

Marshall Saenz is a senior-status geology major that is one year from graduation. He is a non traditional student from Rockport, Tx. Mr. Saenz has conducted research for Dr. McGehee and Dr. Yu. He presents strong computer and geology knowledge, along with excellent teamwork and leadership skills.

David Smith is a junior-status geology major. He is currently working on crime analysis of hot spots of crime in Alice, Tx. using GIS under Dr. Yu's advising. Also, this summer he worked with the team on the 3-D GIS Model and Animation for Texas A&M-Kingsville Campus.

Geosciences Club News

Geosciences Movie Night on December 6 at 6:30 PM



Geology Club's Film and Refreshments night will be showing the National Geographic Film "**Forces of Nature**" on December 6 at 6:30 PM. This film shows the awesome power and unimaginable power of explosive volcanoes, ground buckling earthquakes, and deadly tornadoes. Narrated by Kevin Bacon, it's a spectacular film with an up-close look at nature's most destructive forces. All faculty and alumnus welcomed.

Alumnus Report

We would like to keep up with our alumnus during their walk through their professional careers. TAMUK geosciences program has had over 300 graduates with either a Baccalaureate or a Masters Degree. If you send us an email with your current bio-sketch we would like you to come to TAMUK, meet our faculty and students, and present a talk.

Edward G. Elizondo

Mr. Edward G. Elizondo transferred from the U.S. Naval Academy and graduated (1982) from Texas A&I University with a BS in Geology and Mathematics. Mr.Elizondo continued his geosciences education in graduate school at the University of South Mississippi studying remote sensing. He has worked for 29 years for the Department of Defense (U.S. Navy) at the Naval Oceanographic Office (NAVOCEANO), Stennis Space Center, Mississippi. His job requires that he acquire and analyze global ocean and littoral data to provide specialized, operationally significant products and services for warfighters and civilian, national and international customers. Utilizing airborne, surface and subsurface platforms deployed worldwide, remote-sensing satellites and seaborne buoys, data are converted into products that are tailored to every warfighter's needs. These products and services support virtually every type of Fleet operation by providing mission essential information to the warfighter 24 hours a day, seven days a week. As a specialist within the Littoral and Riverine Department he provides tactically significant products and services to support Joint expeditionary operations and exercises in the coastal, nearshore, estuarine and riverine environments at the scales, timeframes and communication paths important to the warfighter. As a scientist at NAVOCEANO he develops and maintains partnerships with military customers by participating in Fleet operations and exercise planning. He works closely with Special Operations Command and other agencies such as the Office of Naval Intelligence, National Geospatial-Intelligence Agency, Defense Intelligence Agency and the Marine Corps Intelligence Agency to coordinate geospatial intelligence preparation of the littoral and riverine battlespace. He relies heavily on remotely sensed data and numerical models to characterize this important region. He can be reached at edward.elizondo@navy.mil.

John Seeley

John Seeley, PhD (1985 Bachelors graduate and 1990 Masters graduate) is currently working as an exploration Geologist with Uranium Resources, Inc. in Corpus Christi, Texas. He can be reached at jmseeley@uraniumresources.com or http://www.uraniumresources.com**.**

Mike Russell

Mr. Mike Russell graduated from A & I, Kingsville in 1977 with a Baccalaureate of Sciences in Geology. He is married with five children and resides in Corpus Christi, Texas. He is currently employed by Rio Grande Resources Corporation/General Atomics out of Hobson, Texas as Chief Geologist since 2006. He worked for URI as Chief Geologist from 2004 - 2006. He worked for Heathgate Resources/General Atomics from 1999 - 2004 as Chief Geologist/Geological Superintendent in Australia. He worked for URI from 1977 - 1999 first as Field Geologist, then Chief Geologist and short stint as Engineering Manager.

Meagan J. Kunze

Ms. Meagan J. Kunze, graduated May 2005 with a BS in Geology and a BA in English. She works for the Texas Commission on Environmental Quality (TCEQ) as a Project Manager in the Remediation Division in Austin, Texas. Her personal email address is mjk_geology_rocks@yahoo.com

To be continued on Page4

Joe Cress

Mr. Joe Cress attended Texas A & I University (now Texas A & M at Kingsville) and graduated with honors in 1980, with a Bachelor of Science degree in Geology and a minor in Mathematics. He went to work for the Texas Railroad Commission in 1981 as a Field Inspector, and was later promoted to District Geologist, in the Corpus Christi office. In 1984, he was promoted to Assistant District Director and moved to the Abilene office, Railroad Commission District 7B. In 1991, Joe was promoted to District Director in Abilene and still fills that position. The Railroad Commission is the state agency responsible for regulating the oil and gas industry in Texas. Joe has been married for 31 years, has 2 sons, a granddaughter and enjoys golf, playing guitar, and teaches martial arts (including a Self Defense Lab and class at McMurry University in Abilene).

Robert S. Wilkinson

Mr. Robert S. Wilkinson (2000 Bachelors graduate) is Senior Project Manager with Viva Environmental, Inc in El Paso Texas. He has worked as a Engineering Research Associate with TEES at the South Texas Environmental Institute (TAMUK), the Conrad Blucher Institute (CC), and the Shoreline Environmental Research Facility (CC). He moved to Houston to work with SKA Consulting, Houston, Texas as a Project Geologist. He was a Project Manager for Project Navigator Inc, in Houston, Texas. He can be contacted at Email: rwilkinson@vivaenvironmental.com or www.vivaenvironmental.com.

Photo Gallery

Geosciences Field Trip, Fall, 2007









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