

Geosciences



Newsletter- Special Issue on Student Internship

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DEPARTMENT OF
PHYSICS AND
GEOSCIENCES

Program News

TAMUK offered Instructors Training of GIS for Local High Schools and Community Colleges



Dr. Yu and the Geosciences program at TAMUK offered instructors GIS training for local high schools and community colleges. During a 2 week period, from July 21st to August 2nd, 8 instructors have taken intensive GIS and GPS training as a preparation for teaching the introductory GIS courses at their location. As a part of training, the team of instructors were provided lecture notes, hands-on exercises, detail lectures of the contents, and the resources for the course they will offer including software and text books. This approach enhances awareness of Geospatial Technology in various education levels as well as boosts the institutional collaborations between TAMUK and local education sectors.



Instructors Training Participants and TAMUK Faculty

(Back line from the left: Mr. Lawrence Lollar (Beeville ISD), Mr. Robert J. Robert (Coastal Bend College), Mr. Danny Burns (Coastal Bend College), Mr. Donald Wilson (Brooks County ISD), Mr. Mike Malloy (John Paul High School), Dr. Thomas McGehee (TAMUK)).

(Front line from the left: Mr. Trey Mendez (Kingsville ISD), Ms. Marian McKim (Calallen ISD), Mr. James Haley (Santa Gertrudis ISD), and Dr. Jaehyung Yu (TAMUK)).

Internship Reports

The TAMUK family wishes to thank alumnus and friends of the Department for locating jobs for our majors this summer. Internships provide students with opportunities to acquire practical work experience relating to future employment in their career choice. They identify interests, skills, and talents they have that can be useful in their career. Internships help students develop their professionalism and experience. Students need internships to learn and improve specific skills such as communication, problem solving, team work and leadership. Internships will increase the students marketability and value to future employers.

Government Internships (Military)



Ruben Cano (senior) worked 12 weeks with Mr. Bob Magee (geologist and Program Manager) at the EFDLANT Navy Facility in Norfolk Virginia. Ruben worked as a Physical Science Technician. Ruben imported Geographic Information System (GIS) site data into the Groundwater Modeling System and helped develop geology solid models for two sites. Ruben also used GMS to develop a video showing

the downward trends of TCE concentrations for a site that was then shown to people involved at a meeting discussing a particular site. He also visited several sites including ones he was working on and attended meeting where remediation measures were being discussed.

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"This was a great opportunity and a very good experience. I was able to see how GIS is used in real work environments and show what a useful tool it is to have. I learned a lot about processes that are involved with environmental restoration and had fun while on site visits. They have many internship opportunities and even expressed interest in rehiring me"

Government Internships (Forest and Park Services)



Sam Cantu (senior) worked as a cartographic technician with the US Forest Service's Intermountain Region Office in Ogden, UT. At the office, he mainly geo-referenced old scanned maps that contained flight paths and photo centers of aerial photography. Sam also selected candidate locations for GCPs based on topographic maps, existing aerial photography, and Digital Elevation Models (DEMs). In the field, he helped lay out targets at or near the candidate locations which looked like an X placed on the ground. Then he surveyed the center of that target with a survey-grade GPS. These field areas were photographed so that they could orthorectify the image to have true geographic

coordinates and dimensions. He also spent 5 days at the Boise National Forest. In that week he was taught how to operate a survey-grade GPS. They collected 10 GCPs during that week. He also spent two weeks at the Payette National Forest. During these two weeks, their team collected 30-39 GCPs. The data from the GPS data logger was transferred to a computer to be differentially corrected using different base stations. Sam had the opportunity to visit the Humboldt National Forest in Ely, NV. In this trip, he was able to watch geologists seal an old abandoned mine. The geologist took Sam to several other abandoned mines and explained how and why they sealed the abandoned mine the way they did.

"It was great to be able to keep my existing GIS skills sharp. Learning to use a survey-grade GPS was very exciting. I know about how mines work while they are in operation, but I never knew how they were sealed. That was very interesting. In addition to the skills that I learned, it was great to be able to be in the national forests. The scenery was very beautiful, and I was able to camp out most nights. Since I love nature and the outdoors, getting paid to hike and camp in the forests was a dream job."



Melissa Hidalgo (senior) worked as an intern at Goliad State Park and Historic Site for the Texas Parks and Wildlife Department. This was Melissa's first assignment for what she hopes will be her future career as a Park Ranger in the Texas Parks and Wildlife Department. Goliad State Park, located on the San Antonio River, contains a refurbished replica of Mission Nuestra Señora del Espíritu Santo de Zuniga, reconstructed by the Civilian Conservation Corps (CCC) in the 1930s. The mission was originally established in 1722 near Matagorda Bay and moved to its present site in 1749.

This mission was the first large cattle ranch in Texas, supplying its own needs and those of Spanish colonial settlements as far away as Louisiana. The park also contains General Ignacio Zaragoza's Birthplace, Plaza, and Amphitheater, which are located near Presidio La Bahia. General Zaragoza assumed command of the rag-tag Mexican Army and welded it into a staunch fighting force, which met and defeated the French on May 5, 1862, in the Battle of Puebla, which led to Mexico's independence from France. Park property also contains the ruins of Mission Nuestra Señora del Rosario, established in 1754, located four miles west of Goliad on US Highway 59.

"Not only did this internship allow me to study a bit about the geology of this area, but it also allowed me to learn more about the history and the cultural aspects as well (since this area is the 2nd most historically rich location in Texas). My position there was to interpret the areas history, (i.e. tour guide), amongst other tasks such as the preservation of archeological artifacts. I also participated in giving a public service announcement and helping with a week long summer camp for children ages 8-12. I learned a lot during this internship. The most beneficial skill I learned during the internship was communicating with an audience and how to capture the attention of individuals for a longer period of time."



Petroleum Industry (Geophysics)

Kathryn Pratka (junior) worked for Global Geophysical Services in Sonora and Buffalo, Texas learning about the seismic refraction method. Global is a seismic company that acquires data by reflecting sound from underground strata and defining the sub-surface geology of an area. They can acquire this data one of two ways--by using vibraseismic trucks or explosives as energy sources. On the first crew (Crew 445), she worked in Sonora Texas, where they used the vibraseismic trucks as an energy source. On the second crew (Crew 449), she worked in Buffalo Texas, where they used explosives as the energy source. Over the summer, she rode in a helicopter, drove and rode one of the vibraseismic trucks, worked on a variety of jobs with the surveyors, line crew and the drilling crew. She also worked around explosives and helped to detonate the explosives.



"I have returned home with tons of hands-on-experience and a better understanding of what seismic exploration is all about-- not to mention all of my new friends in the industry. I can safely say this is one summer I will not soon forget."

Thomas Schuenemann (junior) worked for Global Geophysical Services in Buffalo, Texas with crew 449 learning about the seismic refraction method. During a five-week period with them he worked with surveyors, drilling crew and recording crew.

On one job he worked with the seismic surveyors to prepare maps for the seismic crew. This involved survey field work and computer work using MapArt to create new maps for the next day. Thomas field-truthed the created maps by field-checking the lines on the mapped areas. He spent two days hacking through the brush fighting the heat and marking recording line points. He also learned how to use a GPS in the field.

Thomas spent one week with the drilling crew. He learned about loading, unloading and shoveling as well as how to assemble the dynamite with the blasting cap. After watching for a few holes he was able to work with this crew. Throughout the rest of the week he worked directly with the drilling crew. Thomas also got a chance to work with the mechanics on the drilling machine to learn how the machines work.

Thomas also worked with the recording crew. For the first couple of days he worked with the trouble shooters changing cut wires and faulty geophones. He walked miles and miles of line and rolled up and unrolled geophone cables. The next couple of days he spent with the line crew laying out and picking up lines and setting up geophone stations.

"I had fun doing this though it was extremely hot. After I completed my time on the line I spent two days with the shooters blasting the dynamite. That was an exhilarating experience. I had a lot of fun and learned a lot about the seismic exploration process. I tied everything I've done so far together. It has been a great experience and my time here has definitely been enjoyable."

Petroleum Industry (Oil and Gas Production)

Michael Schneider (junior) worked as a geotech intern for Denbury Resources Inc. located in Plano, Texas. Denbury is an oil and gas production company specializing in CO₂ tertiary recovery using naturally occurring CO₂. They are also a leading company studying CO₂ sequestration. CO₂ sequestration is capturing vented CO₂ from process facilities and plants and utilizing this waste gas by injecting this in depleted oil reservoirs. This would not only keep the CO₂ out of the atmosphere but help make the country less dependent on foreign oil by increasing domestic oil production.

Michael began his internship program by working with a geologist in the Barnett Shale area. The Barnett Shale is located in multiple counties around Forth Worth. This is one of the most active drilling basins in the world and is making a significant impact on natural gas production. His first task was to research and review some of the existing open hole logs. He learned how to pick different formation tops from well to well and field to field. This allowed him to get familiar with the unique geologic structures. He also took several trips out to the field where the company had two rigs drilling new wells. During their trips to the field, he was able to witness several production and drilling procedures including, water fracture technology, horizontal drilling tools, drilling fluids, and a micro image logging.



During the next month, Michael spent a lot of time working with a geologist studying large fields in South Texas. Denbury was studying this field for use as a future tertiary oil flood. He learned how to make a net pay map by using open hole log data. He used this data to manually and electronically calculate the net acre-ft and calculate the original oil in place in the field. He also used the logs to make cross sections across the field. Michael finished the internship program by working directly with the Texas Geologic Manager. They worked on an exploration well called a "wildcat" in Louisiana. A wildcat well is a well that is justified by using regional geologic data and or seismic data. Usually there are no wells producing in the immediate vicinity of the proposed wildcat. The proposed wildcat well had a large regional growth fault that cut through the area. It also had several local fractures that made identifying the trap difficult. While he was working with him, we visited Mississippi to view a 3-D seismic shoot, where hundreds of multiple pound dynamite charges are placed in the ground and exploded in order to map the wave reflections against target formation. "Overall the internship was extremely helpful and encouraging. I am very thankful to the employees at Denbury for being both friendly and helpful."

Mining Industry (Uranium Production)



Over the past year, **Jacob Hundl (senior)** and **Jonas Bal (senior)** performed a variety of tasks for Mesteña Uranium, LLC. Jacob and Jonas essentially performed the same duties as a field geologist for the company. Typical duties included assisting geologist in the development and exploration mud-rotary drilling operation, examination and description of drill-cuttings, evaluation of drill-hole electrical logs and drill-hole data, and map/report preparation. Using a Trimble Pathfinder they performed GPS surveys to locate sites for the drilling crew. In the office, they learned valuable skills at

correlating geophysical logs, maintained a drilling log geodatabase in ArcGIS and created cross sections with NeuraSection. Jacob wrote "My internship with Mesteña Uranium has been an invaluable experience in real world geologic skills and practices."

Jarret Pawlik (transfer student, Spring, 2009) worked for Uranium Energy Corporation (UEC) for three months this past summer. Since UEC is primarily in an exploration phase Jarret Pawlik worked with geologist's and crew members in exploration for Uranium around Goliad, Texas. His duties included testing the integrity of the wells drilled. Jarret also learned how the wells were drilled and completed. He learned how to log the geology and fluids in the borehole using wire-line data. The onsite geologist's provided Jarret a good perspective on what he will do in his chosen profession.

"UEC allowed me to be a part of it's exploration crew for the last 3 month's. I worked with knowledgably people who are a part of my chosen profession. UEC and it's employee's offered me an opportunity to get a head-start on my education. I want to thank Harry Anthony and the professionals at UEC for this opportunity."

University Research

Rebecca Roscoe (senior), **Jacob Hundl (senior)**, and **Orlando Gonzalez (senior)** are working with Dr. McGehee on an ore-petrology research project of a gold mine around Cripple Creek, Colorado. The team is using thin-sections loaned to us from CC&V. The Cripple Creek & Victor Gold Mining Company ("CC&V") operates the current-day Cresson operations, the largest gold mine in Colorado just outside of Victor. CC&V is a joint venture operation between AngloGold (Colorado) Corp. and Golden Cycle Gold Corporation. Rebecca Roscoe has been working for the mining company for one year. She is studying the ore-textures and paragenesis of the sulfide minerals. Jacob Hundl is identifying the mineral complex using reflected light techniques. Orlando Gonzalez is identifying the rock types and alteration of the wall rocks. The team will put their research projects into a poster session for the TAMU's System Pathway's to the Doctorate Program in November.

Noe Saenz (senior) was awarded a position with the Ronald E. McNair scholars program in June (2008), which carries over to the 2009 academic year. The Ronald E. McNair grant focuses on high-performing juniors and senior undergraduate students interested in pursuing scholarly activities throughout the academic year and summer. The principle goal is to have students aspire to a doctoral degree. The 10-week summer research experience provides McNair Scholars exposure to graduate work, faculty mentorship and presentation skills.



Billy Hales (Senior) and Orlando Gonzales (Junior) participated to the multi-institution Hyperspectral project for Mission Aransas National Estuarine Research Reserve to represent Texas A&M University – Kingsville. To acquire very expensive high quality remote sensing image over the area, it is very critical to calibrate the original data with ground-truth data. They have been in the field with Differential GPS and spectrometer to acquire ground-truth data. Through this research activity they are one step closer to be field experts and showed excellence of the work that TAMUK students can provide. They have represented our institution increasing awareness of our excellence in the discipline, and have learned the responsibilities and task managing skills facing real-world problem solving experience collaborating with many experts in this field.

Octavio Flores (sophomore) has been busy this summer constructing 3D GIS buildings of the campus into Google Earth. Octavio has constructed 21 buildings which are stored in Google 3D Warehouse. The list includes Jones Auditorium, Baugh Hall, Seal Hall, Nierman Hall, Earth Science Building, Industrial Arts Building, Engineering Complex, Health-Recreation Building, Conner Museum, Kleberg Hall, Hill Hall, Dotterweich Engineering Hall, May Hall, Bailey Art Building and Speech Building, College Hall, Student Union Building, Fore Hall, McNeil Engineering Building, Music Building, Cousins Hall, and Manning Hall.

Summer Field Camp

On June 2nd, 2008, six students (Billy Hales, Jacob Hundl, Rebecca Roscoe, Ernest Okeke, Alexis Fuentes, and Marshal Saenz) from the Texas A&M University-Kingsville Geosciences Department moved out to west Texas for a four week summer field camp at Sul Ross State University. At camp, these students started detailed mapping of areas that represented many different geologic settings. All students learned many skills in order to create detailed geologic maps of each area. Skills learned and used include: identification of igneous, metamorphic, and sedimentary rocks in the field, identification of various geologic structures in the field, interpretation of aerial/topographic maps, determining and mapping geologic contacts encountered in the field onto a topographic map, interpretation of geologic settings using structural geology, implementing stereonet to describe various structural features encountered in the field, using ternary and quaternary diagrams to determine chemistry of igneous rocks, use of pace-and-brunton techniques, use of a laser theodolite total station, use of global positioning systems (GPS), and the use of Geographic Information Systems.

Geosciences Club News

Jonas Ball, the President of the Geosciences Club, and Joe Martinez began work on the Geosciences Club goals (publicized in the last newsletter) this summer. Hal Ham, the Conner Museum Director, Jonas, and Joe started the cleanup of the Conner Museum lapidary room so that club members and campus students would have a facility to prepare jewelry and art materials during their spare time. Jonas and Joe volunteered time to clean up the facility and organize materials for this purpose. We are hoping that someone in the community will volunteer their time to run the facility. There are also plans to develop workshops for art and jewelry making from faculty volunteers.

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