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Presidential Scholar Karen Gutierrez Receives PRF Support

The Petroleum Research Fund of the American Chemical Society recently awarded a summer supplementary grant to support undergraduate Presidential Scholar Karen Gutierrez, a 3rd year geology major from Albuquerque. Her study expands upon the ISEM sponsored project, "Geology and Paleontology of Coastal Angola," funded by the Petroleum Research Fund and the National Geographic Society. Karen will examine and analyze drill cores from the Congo Basin held in the Africa Museum at Tervuren, Belgium, and correlate her results with those obtained from Angola. In the laboratory, her focus will be on clay minerals and stable isotopes that will yield clues about the geological and climatic evolution of Africa as it separated from South America in the breakup of Gondwana. In addition, she will extract fossils from rocks at the Museu da Lorinhã, Portugal, and participate in field studies there.



Class Project leads to Global Outreach, New Lab, and Renewal of "Computers in Geology" Course



When graduate student Jack Rogers began his class project he could not have guessed how it would pick up steam. He chose to focus on a 15 million-year-old lizard head preserved in Dominican amber in order to learn about it, how it was preserved, how it got to the island of Hispaniola, and to gain an understanding of the tectonics and ocean currents of the Caribbean region. The project grew and expanded. The golden piece of amber, no larger than a penny and enclosing a lizard head

smaller than the bas-relief of Abraham Lincoln was taken to the High Resolution X-Ray CT Laboratory at the University of Texas where it was cat-scanned. Analysis of the data was undertaken by Mike Polcyn, Vice-President for Research and Development at InterVoice, a telecommunications company headquartered in Richardson. His creative drive is witnessed by two dozen or so technology-related patents.

To fully utilize the illustrative capabilities of the CT data, a technical study was published in the on-line scientific journal *Palaeontological Electronica*, but that was not good enough. Polcyn turned the surface image into a 3-D anaglyph that can be viewed wearing glasses with one red lens and one blue lens. The image was placed on the ISEM web site. To reach out to school groups, the ISEM supplies inexpensive red-blue

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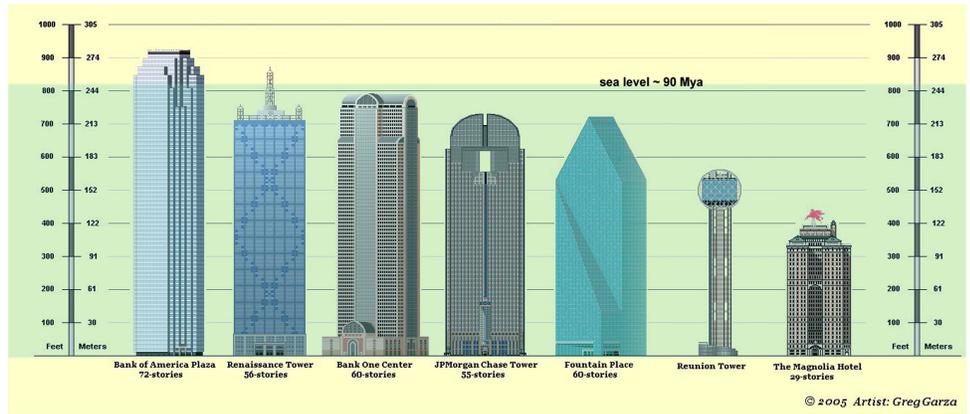


NTEC 2007 Symposium

For the 19th year in a row, the ISEM is co-sponsoring the North Texas Energy Council Symposium. The theme for this year's conference is **Global Energy: Today & Tomorrow**, and features **Dr. Maduabebe Daukoru**, Oil Minister of Nigeria and Chairman of OPEC, as the keynote speaker. Special thanks are due the ISEM's Diana Vineyard who has arranged the logistics for the symposium for each of the past three years, in which the Symposium has been held at the Hughes-Trigg Student Center on the SMU campus. This year the Institute is pleased to have offered free registration to the NTEC Symposium for all SMU student members of the American Association of Petroleum Geologists.

OCEAN DALLAS Rises Again

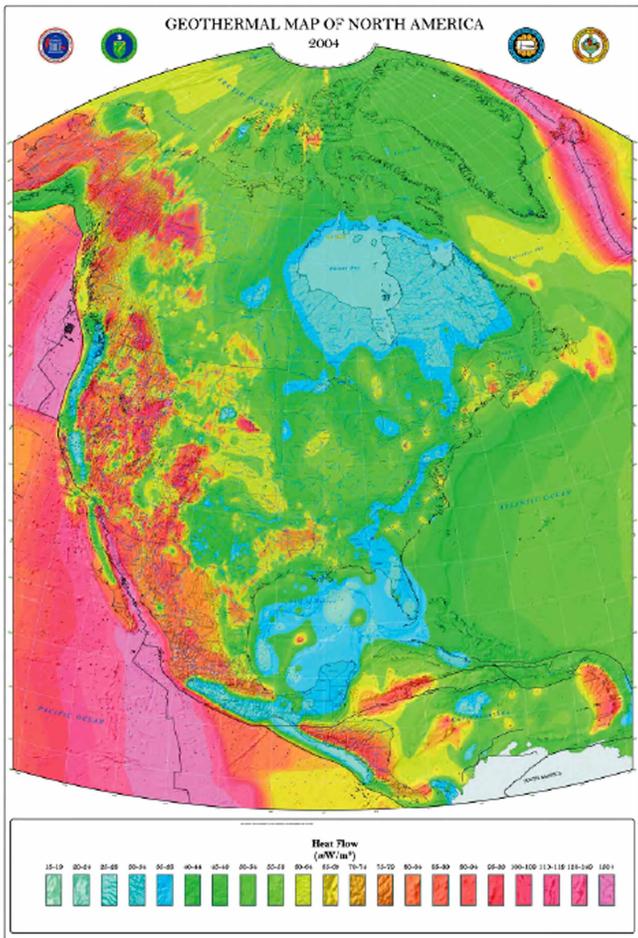
In conjunction with the 2005 National Earth Science Teachers Convention held in Dallas, Richardson Independent School District's Kathy and Norm Poff teamed up with the ISEM to lead a field trip through the Woodbine, Eagle Ford, and Austin Chalk formations. The accompanying field guide, called *Ocean Dallas*, served to instruct and inspire teachers during their hands-on experience with rocks and fossils. Since that time, the *Ocean Dallas* guidebook has resided on the SMU webpage of the Department of Geological Sciences, where it has been utilized in first year Earth history field trips and has been available as a free and easily obtained teacher resource.



Now, thanks to Paul Ballou, Science Facilitator at Mesquite ISD's Russell Planetarium, *Ocean Dallas* is being revised and improved so that it might be used once again in organized teacher training. This comes none too soon as the Texas Department of Education is implementing new policies regarding the teaching of Earth Sciences in public schools. A field trip for Mesquite ISD science teachers was held on March 3. Teachers participating in the *Ocean Dallas* field trip are eligible for the "pay-for-knowledge" program which encourages teacher participation.

You can access the *Ocean Dallas* Field Trip Guide at www.smu.edu/isem/oceandallas.html. If you would like to arrange a special field trip for the teachers of your valued school, please contact Diana Vineyard at 214-768-2425 (vineyard@smu.edu).

ISEM TRAVEL: Hot Rocks to Remember



David Blackwell and Maria Richards (editors)

This year's ISEM travel event for board members, faculty, friends, and supporters is to the Grand Teton - Yellowstone - Cody area in Wyoming. This trip builds on our previous three excursions to Alaska and Iceland to examine the surface expression, economic potential, and the path ahead in the use of Earth's heat as an energy resource for the future of humankind. SMU has long held a position of preeminence in geothermal studies because of the expertise and experience of Hamilton Professor David Blackwell, editor of the Geothermal Map of North America and a member of the blue ribbon MIT committee on geothermal energy.

ISEM excursions are characterized by a high level of technical inquisitiveness, a strong commitment to SMU, and the participation of uniquely qualified experts. For this trip, we will have Dr. Robert Smith, Professor of Geology and Geophysics at the University of Utah and co-author of *Windows into the Earth: The Geologic*



Story of Yellowstone and Grand Teton national Parks, and Dr. Roy Mink, former director of the US Department of Energy Geothermal Program. In addition to touring Grand Teton and Yellowstone National Parks with these two distinguished gentlemen, we will receive a special tour of the Buffalo Bill Museum in Cody with ISEM Board Chairman and museum board member Leighton Steward. The trip will include a visit to an active SMU fossil locality on the Hoodoo Ranch in the Bighorn Basin of Wyoming. For more information, contact Diana Vineyard at 214-768-2425 (vineyard@smu.edu).



“In my opinion, the most creative research at a university is done by the most energetic investigators, by which I mean graduate students. Those are who we can support best.” Dr. Louis L. Jacobs, President

What some of our students say...



The funding offered by the ISEM supports the stable isotopic research that comprises my dissertation work on the analysis of silicate lithics from archaeological sites on the Northern Channel Islands, California. The tools used by Native Americans that are found in Holocene-age sites on the islands were primarily created from cherts, volcanics, and meta-volcanics that are found throughout the islands and on the mainland. By comparing the isotopic “fingerprints” of the lithics found in these sites to stones from quarries they were possibly collected from, models of land use and the extent of trade on and between the island can be produced. Collections of quarry rocks is the essential first step in determining these models. Funding from the ISEM makes this research possible and I greatly appreciate its support. Thank you. **John Robbins**

My research focuses on understanding paleoenvironmental and paleoclimatic variability across the Permian-Triassic Boundary (~251 million years ago), which marks arguably the largest mass extinction of the Phanerozoic. Exposures in the Turpan-Hami and Junggar Basins of Xinjiang-Uyghur Autonomous Region contain abundant, well-developed paleosols that show distinct stratigraphic trends in the paleosol morphologies across the boundary. Furthermore, the paleosols preserved contain abundant soil-formed minerals like calcite and goethite, which will be sampled for geochemical analysis. Geochemistry will lead to a quantification of paleoclimate and paleoenvironmental conditions, including precipitation, temperature, and concentrations of atmospheric gases during the Late Permian and Early Triassic. Initial petrographic, mineralogical, and chemical analyses indicate that the rocks within the study area appear to have undergone little diagenetic alteration, which provides a unique opportunity to examine environmental parameters using multiple proxy records. This work will allow a better understanding of the timescales under which changes within the carbon cycle occurred and permit a more mechanisms for Permian-Triassic perturbations of the carbon cycle. The results of this work will be used to compare with and refine global paleoclimate



reconstructions models. Thank you so much for supporting my research. **Stephanie Thomas**



I am investigating Late Pleistocene and trans-Holocene vegetation changes on California’s Northern Channel Islands, including how climate change and human activities influenced the long-term structure and function of terrestrial ecosystems. The Channel Islands contain one of the best-preserved and longest archaeological records from a coastal area in the Americas, with rich macrobotanical samples from sites spanning the last 12,000 calendar years. The analysis of these materials will form the basis of my interdisciplinary dissertation research focused on understanding long-term changes in terrestrial ecosystems, and the role of people and climate change in influencing these developments. The ISEM award has allowed me to spend time training and studying reference collections at the

Cotsen Institute of Archaeology at UCLA. Thank you ISEM for your generous support. **Leslie A. Reeder**

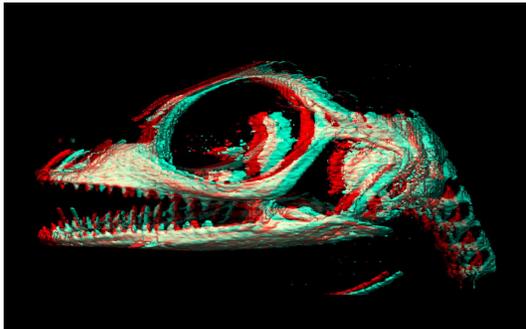
Through this grant I will be able to perform stable isotopic analyses of carbonates and organic matter, as well as perform X-ray diffractions analyses of clay mineral gathered from paleosols. The studied strata within the Lodeve basin of France represent a time span from mid-Pennsylvanian (~320 Million years before present) through Permian (~250 million years before present), which includes the last known icehouse to greenhouse transition of a vegetated world, and therefore is a possible analogue for future climate changes associated with global warming. The paleosols in the Lodeve basin are fossil soils that preserve morphological, mineralogical, and geochemical records that are permit reconstructions of paleoprecipitation, paleoatmospheric carbon dioxide concentrations and paleotemperature. Without the support of the ISEM this work would not be possible. Thank you. **Lauren Michel**



I would like to express my gratitude to the ISEM for its financial support of my mapping work at the Castillo de Huaricanga mound complex on the north-central coast of Peru. The Fortaleza Valley is known for the Prececeramic (3000-1800 BC) mound complexes that have been mapped and dated in the last few years, but little is known about the Initial Period (1800-900 BC) in the valley. The funding from the ISEM will permit me to collect high-resolution geospatial data on surface architecture and artifact distribution. In addition, geospatial data will provide information on the geomorphological impacts on the site. The data collected this summer will structure the future research on this important ceremonial mound complex that will illuminate the socio-political developments in the valley between the Prececeramic and Initial periods. Thank you for your generous financial support. **Martin Aurthier**

glasses to teachers that click a button on the web page. Requests have come continuously for the 7 years the site has been up on the web, with requests coming from 14 countries. Most are from the U.S., of course, but they have also come from Canada, South America, Europe, Asia, Australia, New Zealand, and most recently from Estonia.

Other technical studies on other subjects followed, but equally important, this work led to the establishment of a Visualization Laboratory in room 345 Heroy Hall, stocked with new laser scanners and a point scanner to complement the data that can be obtained through CT studies. Polcyn was tapped to teach the "Computer Methods in Geology" course, which utilizes his expertise and organizational skills



to convey to geology and anthropology students a variety of imaging, surface rendering, analytical, manipulation, and GIS techniques that are relevant at high levels in any field that needs and uses three-dimensional data. This is an important step for SMU and its students.

Most recently, the geology imaging group has teamed up with Dr. Wei Tong, a materials scientist in the School of Engineering at SMU, to submit a National Science Foundation proposal in the amount of nearly \$400,000 to obtain a CT scanner that can image at finer scales than currently possible.



If you would like a free pair of 3-D glasses, visit the ISEM website, www.smu.edu/isem.

Jack Rogers received ISEM financial support as an SMU graduate student and now teaches as a tenured faculty member at Valencia College in Orlando, Florida. Mike Polcyn is an adjunct with the Department of Geological Sciences at SMU, and is a strong supporter of the ISEM.



Our Mission: To benefit the SMU community by promoting and supporting interdisciplinary research at the interface of people, Earth, and the environment.