



Geosciences at UTSA

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Graduate and Certificate Programs

Master of Science degree in Geology. This degree offers the opportunity for advanced study and research in the geological sciences. Current Topics in the Geosciences is the only required course so the program offers great flexibility to custom build coursework for the degree.

Master of Science degree in Environmental Science. This option may appeal to geoscientists who want to broaden their expertise into environmental restoration, environmental ecology, management, protection, regulation, or use of natural resources technology. Required courses include Survey of Environmental Science, Environmental Statistics, Environmental Policy and Law, Graduate Seminar in Environmental Science and Engineering, and Environmental Science Colloquium. Faculty in geological sciences teach courses and supervise students in this program that is administered by the Department of Biology.

Doctoral degree in Environmental Science and Engineering. A range of geoscience-related research topics may be pursued within the doctoral program, which is a joint program supported by faculty in engineering, environmental science, and geological sciences. Some areas of research emphasis include water resources, spatial analysis, remote sensing, and natural hazards. Required core courses include Global Change, Analyses of Environmental Problems, and a quantitative analysis course, such as Experimental Design and Analysis, plus the Graduate Seminar in Environmental Science and Engineering.

Certification of Professional Development in Geographic Information Science. This program builds competent users of GIS and related tools of Global Positioning System and Remote Sensing through courses in Geographic Information Science, Advanced GIS, Internet Served GIS, Remote Sensing, and GPS Mapping. It may be completed in conjunction with other graduate degrees.

Research facilities

State-of-the-art research facilities include laboratories for biogeochemistry, hydrogeology, engineering geology, isotope geochemistry, micropaleontology and stratigraphy, remote sensing and spatial analysis, and x-ray diffraction. A geomorphology laboratory that will include a flume is under development.

Center for Water Research

The Center emphasizes a multi-disciplinary approach to solving practical problems related to water as a resource. Projects define challenging education and research opportunities to provide hydrological, environmental, and other basic data for water resource planning and management in terms of both costs and results. The Center's research and development reflects an increasing concern for the preservation of quality water resources for all facets of water usage.

Financial support

Teaching assistantships are available on a competitive basis to qualified students. To be considered, applications for both admission (www.graduateschool.utsa.edu/) and assistantship (<http://www.utsa.edu/geosci/masters.html> at bottom of page) must be received by February 1. The Center for Water Research supports students through competitive scholarships that include a stipend plus tuition support for a maximum of two years (www.utsa.edu/water/scholar_advertisement.cfm). The application deadline for admitted students is typically around March 1.

Faculty Research Interests

Stephen F. Ackley (Stephen.Ackley@utsa.edu): Polar Sciences

Ackley, S.F., M.J. Lewis, C.H. Fritsen, and H. Xie, 2008, Internal melting in Antarctic sea ice: development of "Gap Layers". *Geophysical Research Letters*, doi:10.1029/2008GL033644.

Ainley, D., G. Ballard, S.F. Ackley, et al, 2007, Paradigm Lost or is top-down forcing no longer significant in the Antarctic marine ecosystem? *Antarctic Science*, 19: 283-290.

Stuart Birnbaum (Stuart.Birnbaum@utsa.edu): Sedimentary, Stratigraphy, Geochemistry, Geoscience Education

Birnbaum, S.J., 2004, Overcoming the limitations of an urban setting through field-based Earth systems inquiry. *Journal of Geoscience Education*, 52:407-410.

Yang, L., S. Birnbaum, and G.A. Cragolino, 2004, Microbially influenced corrosion studies of engineered barrier system materials. Report No. CNWRA 2005-01, 77 pp.

Alan Dutton (Alan.Dutton@utsa.edu): Hydrogeology, Aqueous Geochemistry

Dutton, A.R., J.P. Nicot, and K.S. Kier, 2006, Hydrodynamic convergence of hydropressured and geopressured zones, Central Texas, Gulf of Mexico Basin, USA. *Hydrogeology Journal*:14, 859-867.

Dutton, A.R. 1995, Groundwater isotopic evidence for paleocharge in U.S. high-plains aquifers. *Quaternary Research*, 43:221-231.

Weldon Hammond Jr. (Weldon.Hammond@utsa.edu): Hydrogeology

Murray, K.E., D.R. Straud*, and W.W. Hammond, 2007, Characterizing groundwater flow in a faulted karst system using optical brighteners from septic systems as tracers. *Environmental Geology*, 53:769-776.

Manz, L.R. and W.W. Hammond., 2007, The challenge for water resources in Honduras. *Bulletin of the South Texas Geological Society*, 47:4-10.

Judith K. Haschenburger (Judy.Haschenburger@utsa.edu): Sediment Transport in Gravel-bed Rivers, Channel-Floodplain Interactions, Methodology

Haschenburger, J.K. and M. Cowie[^], 2009, Floodplain stages in the braided Ngaruroro River. *Geomorphology*, 103, doi:10.1016/j.geomorph.2008.07.016.

Haschenburger, J.K. and P. Roest*, 2009, Substrate indices as indicators of interstitial space in gravel-bed channels, *River Research and Applications*, 25:98-105.

Lance L. Lambert (Lance.Lambert@utsa.edu): Paleontology, Stratigraphy

Lambert, L.L., G.L. Bell, Jr., J.A. Fronimos[^], B.R. Wardlaw, and M.O. Yisa*, 2010, Conodont biostratigraphy of a more complete Reef Trail Member section near the type section, latest Guadalupian Series type region. *Micropaleontology*, 56:233-253

Harrell, J.E.* and L.L. Lambert, 2007, Revision of Carboniferous stratigraphy in the Sierra Diablo, outcrop analog for the Delaware and other Texas basins. In: C.E. Bowden and M.A. Raines (eds.), *Structure and stratigraphy of the Permian Basin-Understanding the fundamentals of conventional and unconventional plays*. West Texas Geological Society Digital Publication No. 07-119, Vol. 2-Technical Papers and Extended Abstracts, p.15-27.

Kyle E. Murray (Kyle.Murray@utsa.edu): Hydrogeology, GIS, Renewable Energy

Geza, M., K.E. Murray, and J.E. McCray, 2010, Watershed scale impacts of nitrogen from onsite wastewater systems: Parameter sensitivity and model calibration: *Journal of Environmental Engineering*, 136:926-938

Murray, K.E., S.M. Thomas*, and A.A. Bodour, 2010, Prioritizing research for trace pollutants and emerging contaminants in the freshwater environment. *Environmental Pollution*, doi:10.1016/j.envpol.2010.08.009.

Marina B. Suarez (msuarez5@jhu.edu): Stable Isotope Geochemistry, Clumped Isotope Paleothermometry, Paleoclimatology, Terrestrial Depositional Environments, Paleosols

Suarez, M.B., L.A. González, and G.A. Ludvigson, 2010, Estimating the isotopic composition of equatorial precipitation during the mid-Cretaceous, *Journal of Sedimentary Research*, 80:480-491.

Suarez, M.B., L.A. González, G.A. Ludvigson, F.J. Vera, and J. Alvarado-Ortega, 2009, Isotopic composition of low-latitude paleo-precipitation during the Early Cretaceous. *Geological Society of America Bulletin*, 121:1584-1595.

Eric Swanson (Eric.Swanson@utsa.edu): Earth Science History, Geoscience Writing, Volcanic Stratigraphy

Swanson, E.R., K. Kempter, F. McDowell, and W.C. McIntosh, 2006, Major ignimbrites and volcanic centers of the Copper Canyon area: a view into the core of Mexico's Sierra Madre Occidental. *GeoSphere*, 2, 125-141.

Swanson, E.R., 1995, *Geo-Texas: a guide to the earth sciences*. Texas A&M University Press, College Station, Texas, (in 4th printing), 208 p.

Hongjie Xie (Hongjie.Xie@utsa.edu): Remote Sensing, GIS, Geoinformatics

Wang, X.*, H. Xie, and T. Liang, 2008, Evaluation of MODIS snow cover and cloud mask and its applications in northern Xingjiang, China. *Remote Sensing of the environment*, doi:10.1016/j.rse.2007.05.016.

Xie, H., X. Zhou, E. Vivoni, J. Hendrick, and E. Small, 2005, GIS based NEXRAD precipitation database: automated approaches for data processing and visualization. *Computers and Geosciences*, 31, 65-76.

David J. Young (David.Young@utsa.edu): Structural Analysis, Metamorphic Petrology, Geochronology, Tectonics

Young, D.J., B.R. Hacker, T.B. Andersen, and F. Corfu, 2007, Prograde amphibolite facies to ultrahigh-pressure transition along Nordfjord, western Norway: Implications for exhumation tectonics. *Tectonics*, 26:TC1007, doi:10.1029/2004TC001781.

[^] Undergraduate student; * Graduate student