

2011 Calendar Year Annual Report for Department of Geology

To be submitted by Steven G. Driese, Chair
June 1, 2012 to College of Arts and Sciences

Scholarship: Refereed Articles Published in 2011 (underline = GEO faculty, * = GEO graduate student)

- 1) Allen, P.M., Harmel, R.D., Dunbar, J.A., and Arnold, J.G., 2011, Upland contribution of sediment and runoff during extreme drought: A study of the 1947-1956 drought in the Blackland Prairie, Texas: *Journal of Hydrology*, v. 1. p. 1-11.
- 2) Deonaraine A., Lau B.L.T., Aiken G.R., Ryan J.N. and Hsu-Kim H, 2011, Effects of humic substances on precipitation and aggregation of zinc sulfide nanoparticles: *Environmental Science and Technology*, v. 45 (8), p. 3217-3223.
- 3) Driese, S.G., Jirsa, M.A., Ren, M., Brantley, S.L., Sheldon, N.D., Parker, D., and Schmitz, M., 2011, Neoproterozoic paleoweathering of tonalite and metabasalt: implications for reconstructions of 2.69 Ga early terrestrial ecosystems and paleoatmospheric chemistry: *Precambrian Research*, v. 189, p. 1-17.
- 4) Driese, S.G., Schultz, B.S., and McKay, L.D., 2011, Genesis of clay-rich soils from carbonate bedrock on upland surfaces in the Valley and Ridge Province, eastern Tennessee, USA: *Southeastern Geology*, v. 48, p. 1-22.
- 5) Dyar, M.D., Carosino, M.L., Tucker, J.M. Brown, E.A., Clegg, S.M., Wiens, R.C., Barefield, J.E., Delaney, J.S., Ashley, G.M., and Driese, S.G., 2012, Remote laser-induced breakdown spectroscopy analysis of East African Rift sedimentary samples under Mars conditions: *Chemical Geology*, v. 294-295, p. 135-151.
- 6) Faith, J.T., Choiniere, J.N., Tryon, C.A., Pepper, D.J., Fox, D.L., 2011, On the taxonomic status and paleoecology of *Rusingoryx atopocranium* (Mammalia, Artiodactyla), an extinct Pleistocene bovid from Rusinga Island, Kenya: *Quaternary Research*, v. 75, p. 697-707.
- 7) Gallagher, M.E., Hockaday, W.C., Masiello, C.A., Snapp, S., McSweeney, C.P., and Baldock, J.A., 2011, Biochemical Suitability of crop residues for cellulosic ethanol: Disincentives to nitrogen fertilization in corn agriculture: *Environmental Science & Technology*, v. 45, p. 2013 – 2020.
- 8) *Jennings, D.S., Lovelace, D.M., and Driese, S.G., 2011, Differentiating paleowetland subenvironments using a multi-disciplinary approach: an example from the Morrison Formation, south central Wyoming, USA: *Sedimentary Geology*, v. 238, p. 23-47.
- 9) Lau B.L.T., 2011, Revisiting concerns about Lead: *Journal of the American Water Works Association*, v. 103 (1), p. 7-8.

- 10) Lau, B.L.T., 2011, Understanding how nanoparticles behave in natural and engineered waters: *Journal of the American Water Works Association*, v. 103 (11), p. 2-5.
- 11) Lehmann, J., Rillig, M., Thies, J., Masiello, C.A., and Hockaday, W.C., 2011, Biochar effects on soil biota – a review: *Soil Biology and Biochemistry*, v. 43, p. 1812-1836.
- 12) Li, D., Hockaday, W.C., Masiello, C.A., and Alvarez, P.M., 2011, Earthworm avoidance of biochar can be mitigated by wetting: *Soil Biology and Biochemistry*, v. 43, p. 1732-1737.
- 13) Li, Z.-H., Labbé, N., Driese, S.G. and Grissino-Mayer, H.D., 2011, Micro-scale analysis of tree-ring $\delta^{13}\text{C}$ and $\delta^{18}\text{O}$ on α -cellulose spline reveals high-resolution intra-annual climate variability and tropical cyclone activity: *Chemical Geology*, v. 284, p. 138-147.
- 14) *Mintz, J.S., Driese, S.G., Ludvigson, G.A., and Breecker, D.O., 2011, Seasonal influence of changing hydrology on pedogenic calcite precipitation in Vertisols, Dance Bayou, Brazoria County, TX: Implications for estimating paleoatmospheric pCO_2 : *Journal of Sedimentary Research*, v. 81, p. 394-400.
- 15) Nordt, L.C., Dworkin, S.I., and Atchley, S.C., 2011, Ecosystem response to soil biogeochemical behavior during the Late Cretaceous and early Paleocene within the western interior of North America: *Geological Society of America Bulletin*, v. 123, 1745-1762.
- 16) Nordt, L.C., Collins, M.E., Monger, H.C., and Fanning, D.S., 2011, Entisols: Chapter 33.4 in *Handbook of Soil Science, 2nd Edition*, Huang, P.M., Li, Y, and Sumner, M.E. (eds.): CRC Press, Boca Raton, Florida, p. 33-49 to 33-63.
- 17) Peppe, D.J., Johnson, K.R., and Evans, D.A., 2011, Magnetostratigraphy of the Lebo and Tongue River Members of the Fort Union Formation (Paleocene) in the northeastern Powder River Basin, Montana: *American Journal of Science*, v. 311, p. 813-850.
- 18) Peppe, D.J., Royer, D.L., Cariglino, B., Oliver, S.Y., Newman, S., Leight, E., Enikolopov, G., Fernandez-Burgos, M., Herrera, F., Adams, J.M., Correa, E., Currano, E.D., Erickson, J.M., Hinojosa, L.F., Hoganson, J.W., Iglesias, A., Jaramillo, C.A., Johnson, K.R., Jordan, G., Kraft, N.J.B., Lovelock, E.C., Lusk, C.H., Niinemets, Ü., Peñuelas, J. Rapson, G., Wing, S.L., and Wright, I.J., 2011, Sensitivity of leaf size and shape to climate: global patterns and paleoclimatic applications: *New Phytologist*, v. 190, p. 724-739.
- 19) Ramezani, J., Hoke, G.D., Fastovsky, D.E., Bowring, S.A., Therien, F., Dworkin, S.I., Atchley, S.C., and Nordt, L.C., 2011, High-precision U-Pb geochronology of the Late Triassic Chinle Formation, Petrified Forest National Park (Arizona, USA): Temporal constraints on the early evolution of dinosaurs: *Geological Society of America Bulletin*, v. 123; no. 11/12; p. 2142–2159.
- 20) Southard, R.J., Driese, S.G., and Nordt, L.C., 2011, Vertisols: Chapter 33.7, in *Handbook of Soil Science, 2nd Edition*, Huang, P.M., Li, Y, and Sumner, M.E. (eds.): CRC Press, Boca Raton, Florida, p. 33-82 to 33-97.

- 21) *Stinchcomb, G.E., Messner, T.C., Driese, S.G., Nordt, L.C., and Stewart, R.M., 2011, Pre-colonial (A.D. 1,100-1,600) sedimentation related to prehistoric maize agriculture and climate change in eastern North America: *Geology*, v. 39, p. 363-366.
- 22) Vulava, V.M., McKay, L.D., Broholm, M.M., McCarthy, J.F., Driese, S.G., and Sayler, G.S., 2012, Dissolution and transport of coal tar compounds in fractured clay-rich residuum: *Journal of Hazardous Materials*, v. 203-204, p. 283-289.
- 23) Waters, M.R., Forman, S.L., Jennings, T.A., Nordt, L.C., Driese, S.G., Feinberg, J.M., Keene, J.L., Halligan, J., Lindquist, A., Pierson, J., Hallmark, C.T., Collins, M.B., and Wiederhold, J.E., 2011, The Debra L. Friedkin Site, Texas and the origins of Clovis: *Science*, v. 331, p. 1599-1603.
- 24) *Wegert, D., and Parker, D.F., 2011, Petrogenesis of the McDermitt Formation trachyandesite, San Juan basin, Colorado and New Mexico: *Rocky Mountain Geology*, v. 46, p. 139-152.
- 25) Zeng, F.-W., Masiello, C.A. and Hockaday, W.C., 2011, Controls on the cycling of dissolved inorganic carbon in the Brazos River, Texas: *Biogeochemistry*, v. 104, p. 279-291.

Scholarship: Refereed Publications: Accepted, in Press, or Published in 2012 (underline = GEO faculty, * = GEO student)

- 1) *Ahr, S.W., Nordt, L.C., and Driese, S.G., 2012, Assessing lithologic discontinuities and parent material uniformity within the Texas sandy mantle: Implications for archeological burial and preservation potential in upland settings: *Quaternary Research*. doi:10.1016/j.yqres.2012.03.013.
- 2) Ashley, G.R., Deocampo, D.M., *Kahmann-Robinson, J.A., and Driese, S.G., in press, Groundwater-fed wetland sediments and paleosols: It's all about water table: In *New Frontiers in Paleopedology and Terrestrial Paleoclimatology* (S.G. Driese and L.C. Nordt, eds.): SEPM Special Publication Volume.
- 3) Atchley, S.C., Nordt, L.C., Dworkin, S.I., *Cleveland, D.M., *Mintz, J.S., and *Harlow, H., in press, Alluvial stacking pattern analysis and sequence stratigraphy: concepts and case studies, In *New Frontiers in Paleopedology and Terrestrial Paleoclimatology* (S.G. Driese and L.C. Nordt, eds.): SEPM Special Publication Volume.
- 4) Bennett, S.J., Dunbar, J.A., Rhoton, F.E., Allen, P.M., Bigham, J.M., Davidson, G.R., and Wren, D.G., in press, Assessing sedimentation within aging of flood control reservoirs, In *The Challenges of Dam Removals and River Restorations*, (J.V. DeGraff and J.E. Evans, eds.): *Reviews in Engineering Geology*.
- 5) Breecker, D.O., Yoon, J., *Michel, L.A., Dinka, T.M., Driese, S.G., *Mintz, J.S., Nordt, L.C., Romanak, K.D., and Morgan, C.L.S., in press, CO₂ concentrations in Vertisols: seasonal variability and shrink-swell: In *New Frontiers in Paleopedology and Terrestrial Paleoclimatology* (S.G. Driese and L.C. Nordt, eds.): SEPM Special Publication Volume.

- 6) Cusak, D.F., Chadwick, O.A., Hockaday, W.C., Vistousek, P.M., in press, Mineralogical controls on soil black carbon preservation: ***Global Biogeochemical Cycles***.
- 7) Danley, P., Husemann, M., Ding, B., *DiPietro, L., *Beverly, E., Pepper, D.J., in press, The impact of the geologic history and paleoclimate on the diversification of East African cichlids: ***International Journal of Evolutionary Biology***.
- 8) Driese, S.G., and Nordt, L.C., in press, New frontiers in paleopedology and terrestrial paleoclimatology: paleosols and soil surface analog systems: ***In New Frontiers in Paleopedology and Terrestrial Paleoclimatology*** (S.G. Driese and L.C. Nordt, eds.): SEPM Special Publication Volume.
- 9) Driese, S.G., Nordt, L.C., Waters, M.R., and Keene, J.L., accepted, Analysis of site formation history and potential disturbance of stratigraphic context at the Debra L. Friedkin archaeological site in central Texas, USA: ***Geoarchaeology***.
- 10) Dunbar, J.A., Allen, P.M., and Bennett, S.J., in press, Acoustic sub-bottom profiling surveys of flood control reservoirs: ***Environmental & Engineering Geosciences***.
- 11) Gondikas A.P., Masion A., Auffan M., Lau B.L.T., and Hsu-Kim H., in press, Early-stage precipitation kinetics of zinc sulfide nanoclusters forming in the presence of cysteine: ***Chemical Geology***.
- 12) Kinney, T., Masiello, C.A., Dugan, B., Hockaday, W.C., Dean, M.R., Zygourakis, K., and Barnes, R.T., 2012, Hydrologic properties of biochars produced at different temperatures: ***Biomass and Bioenergy***, v. 41, p. 34-43.
- 13) Ludvigson, G.A., González, L.A., Fowle, D.A., Roberts, J.A., Driese, S.G., Villarreal, M.A., Smith, J.J., and Suarez, M.B., in press, Paleoclimatic implications and modern process studies of pedogenic siderite: ***In New Frontiers in Paleopedology and Terrestrial Paleoclimatology*** (S.G. Driese and L.C. Nordt, eds.): SEPM Special Publication Volume.
- 14) Nordt, L.C., (in press), Late Quaternary fluvial landscape evolution of the Rio Casas Grandes and San Pedro: Implications for the archaeological record. ***In Late Archaic Cerros de Trincheras Sites of Chihuahua, Mexico***, R. Hard and R. Roney (eds.): University of Utah Press.
- 15) Nordt, L.C., Hallmark, C.T., Driese, S.G., Dworkin, S.I., and Atchley, S.C., 2012, Biogeochemistry of an ancient Critical Zone: ***Geochimica et Cosmochimica Acta***, v. 87, p. 267-282.
- 16) Nordt, L.C., Hallmark, C.T., Driese, S.G., Dworkin, S.I., and Atchley, S.C., in press, Multi-analytical pedosystem approach to characterizing and interpreting the fossil record of soils: ***In New Frontiers in Paleopedology and Terrestrial Paleoclimatology*** (S.G. Driese and L.C. Nordt, eds.): SEPM Special Publication Volume.
- 17) Parker, D.F., Ren, M., *Adams, D.T., and Long, L.E., in press, Mid-Tertiary magmatism in western Big Bend National Park, Texas, U.S.A.: Evolution of basaltic source regions and generation of peralkaline rhyolite: ***Lithos***.

- 18) Royer, D. L., Peppe, D. J., Wheeler, E. A., and Niinemets, U., 2012, Roles of climate and functional traits in controlling toothed vs. untoothed leaf margins: *American Journal of Botany*, v. 99, no. 5, p. 915-922.
- 19) *Stinchcomb, G.E., Driese, S.G., Nordt, L.C., and Allen, P.A., 2012, A mid to late Holocene history of floodplain and terrace reworking along the middle Delaware River valley, USA: *Geomorphology*: doi:10.1016/j.geomorph.2012.04.018.
- 20) *Trendell, A.M., Atchley, S.C., and Nordt, L.C., 2012, Depositional and diagenetic controls on reservoir attributes within a fluvial outcrop analog: Upper Triassic Sonsela Member of the Chinle Formation, Petrified Forest National Park, Arizona: *American Association of Petroleum Geologists Bulletin*, v. 96, p. 679-707.
- 21) Tryon, C.A., Peppe, D.J., Faith, J.T., *Van Plantinga, A., Nightingale, S., Ogondo, J., and Fox, D.L., 2012, Late Pleistocene artefacts and associated fauna from Rusinga and Mfangano islands, Lake Victoria, Kenya, Azania: *Archaeological Research in East Africa.*, v. 47, p. 14-38.

Appointments, Awards, and Fellowships for 2011 (underline = GEO faculty)

B.L.T. Lau was awarded a 3-year Marie Curie International Incoming Fellowship at the University of Copenhagen in Denmark.

L.C. Nordt was an invited panelist, (chaired by J.T. Parrish, with J.T., Erwin, D.H., Kidwell, S., Lawton, T.F., Mohrig, D., Schmitz, M.D., and Walton, A.W.), 2011, Workshop to Identify Major Research Initiatives in Sedimentary Geology and Paleontology, Washington, D.C., March 16-17, 2011.

D.J. Peppe received the George Gaylord Simpson Prize for a paper on evolution and the fossil record, Yale Peabody Museum, spring of 2011.

Professional Presentations for 2011 (underline = GEO faculty, * = GEO graduate student; @ = undergraduate student)

- 1) Atchley, S.C., *Barclay, C., and *Jones, K., 2011, Regional exploration assessment of the Late Devonian Jean Marie and Kakisa Formations within the Bivouac/Ekwan field areas, northern British Columbia: Project review provided to management of Husky Energy, Calgary, Alberta in July, 2011.
- 2) @Barrington, T., and Pulliam, J., 2011, Seismic anisotropy of the Rio Grande Rift and surrounding regions: presented at *Texas Undergraduate Research Day at the Capitol: Transforming Texas Through Undergraduate Research*, Austin, TX, 14 February 2011
- 3) @Barrington, T., and Pulliam, J., 2011, Seismic Anisotropy, Edge-Driven Convection, and the Rio Grande Rift, Baylor Undergraduate Research and Scholarly Activity (URSA) Scholar's Week, Baylor University, April 6-7, 2011.

- 4) *Beverly, E.J., Ashley, G.M., and Driese, S.G., 2011, High-resolution paleoenvironmental and paleoclimatic reconstruction of a Pleistocene catena using paleopedology and geochemistry of lake margin paleo-Vertisols, Olduvai Gorge, Tanzania: GSA Annual Meeting in Minneapolis, MN, October 2011. (GSA Abstracts with Programs Vol. 43, No. 5).
- 5) Breecker, D.O., *Michel, L.A., Yoon, J., *Mintz, J.S., Driese, S.G., and Nordt, L.C., 2011, Toward calibrating the paleosols carbonate CO₂ barometer for paleoVertisols: talk presented in August of 2011 at the International Goldschmidt Conference in Prague, Czech Republic: Mineralogical Magazine, v. 75 (3), p. 577.
- 6) Browning, S., Dunbar, J.A., and Cronin, V.S., 2011, The use of physical models to demonstrate seismic wave propagation and seismic hazards -- application to elementary school students: Poster, AGU Fall Meeting 2011, San Francisco, Ca, 5-9 December, 2011.
- 7) Cronin, V.S., 2011, Using earthquake focal mechanism solutions to find the surface trace of seismogenic faults: Medellin, Colombia, Sociedad Colombiana de Geologia, XIV Congreso Latinoamericano de Geologia, Memorias, p. 169.
- 8) Cronin, V.S., 2011, EarthScope resources and the multi-disciplinary search for seismogenic faults: Presented at the EarthScope national meeting; May 17-20, 2011, Austin, Texas; available online at http://www.earthscope.org/es_doc/meetings/2011_national/esnm_2011_abstracts_all.pdf
- 9) Cronin, V.S., 2011, Some thoughts about the challenges of E&O for COCONet: Presented at COCONet Workshop – community science, station siting and capacity building; February 3-4, 2011, San Juan, Puerto Rico; available online at http://www.unavco.org/community/meetings-events/2011/coconet/abstracts/cronin_abstract.pdf
- 10) Cronin, V.S., and *Lindsay, R.D., 2011, Using focal mechanism solutions to correlate earthquakes with faults in the Lake Tahoe-Truckee area, California and Nevada, and to help design LiDAR surveys for active-fault reconnaissance: Abstract S21A-2157, EOS Transactions, American Geophysical Union, v. 90.
- 11) *Dhillon, R.S., *Mintz, J.S., and Atchley, S.C., 2011, Influence of climate and the expansion of C4 grasses on sequence-scale cyclicality and landscape development during the Late Miocene to Pleistocene of west Texas: GSA Annual Meeting in Minneapolis, MN, October 2011. (GSA Abstracts with Programs Vol. 43, No. 5).
- 12) *DiPietro, L., 2011, Stratigraphic integrity of geoarchaeological site at Owl Ridge, Alaska: Evaluating the influences of Gelisol processes: (talk presented at 48th Annual Soil Survey and Land Resource Workshop in College Station, TX, on February 3, 2011).
- 13) Driese, S.G., 2011, “New research opportunities in “deep-time” paleopedology”: (talk presented at 48th Annual Soil Survey and Land Resource Workshop in College Station, TX, on February 3, 2011).
- 14) Driese, S.G., 2011, “New research opportunities in studies of “deep-time” using paleosols and proposed interface with NSF Critical Zone studies”: (talk presented to NSF Earth

Sciences, Earth Surface Processes Directorate in Arlington, VA, by Dr. Steven G. Driese and Dr. Gail M. Ashley on March 31, 2011.)

- 15) Driese, S.G., 2011, "Investigations of Evidence for the Earliest Humans in the Americas at the Debra L. Friedkin Site near Salado, TX": (talk presented to Waco Gem and Mineral Society on November 7, 2011).
- 16) Driese, S.G., Nordt, L.C., *Mintz, J.S., Robinson, A.E., and Miller, W.F., 2011, The overlooked soil-forming factors: Distinguishing influences of soil age and hydrology from climate influences on Vertisols, and application to paleosols: GSA Annual Meeting in Minneapolis, MN, October 2011. (GSA Abstracts with Programs Vol. 43, No. 5).
- 17) Driese, S.G., Nordt, L.C., *Stinchcomb, G.E., Graf, K.E., Goebel, T., and Waters, M.R., 2011, Applications of soil micromorphology, pedology and geochemistry to interpreting potential for disturbance of stratigraphic context at geoarchaeological sites: Texas Vertisols and Alaskan Gelisols: Developing International Geoarchaeology (DIG) Conference meeting, Knoxville, TN; Abstracts p. 21-22, September 23, 2011.
- 18) Dunbar, J., Cronin, V.S., Allen, P.M., and White, J.D., 2011, Recent fault movement in Lake McDonald, Montana: Evidence from acoustic sub-bottom profiling: Poster, AGU Fall Meeting 2011, San Francisco, Ca, 5-9 December, 2011.
- 19) Dworkin, S.I., Nordt, L., and Atchley, S., 2011, Carbon isotope ratios in bulk organic matter from paleosols of the Late Triassic Chinle Formation, Petrified Forest National Park, Arizona, USA: GSA Annual Meeting in Minneapolis, MN, October 2011. (GSA Abstracts with Programs Vol. 43, No. 5).
- 20) Dyar, M.D., Carosino, M.L., Tucker, J.M., Speicher, E.A., Brown, E.A., Clegg, S.M., Wiens, R.C., Barefield, J.E., Delaney, J.S., Ashley, G.M., and Driese, S.G., 2011, Error analysis for remote laser-induced breakdown spectroscopy analysis using combinations of igneous, sedimentary and phyllosilicate samples: talk presented at 42nd Lunar and Planetary Science Conference, Houston, TX, March, 2011.
- 21) *Felda, G.R., 2011, Development of a 3-dimensional sequence stratigraphic model for the Late Triassic (Norian) Owl Rock Member located at Petrified Forest National Park, Arizona: A reconstruction of paleodepositional environments and paleoclimatic conditions: GSA Annual Meeting in Minneapolis, MN, October 2011. (GSA Abstracts with Programs Vol. 43, No. 5).
- 22) Furman, O., Usenko, S., and Lau, B.L.T., 2011, Aggregation and adsorption of silver nanoparticles: Effects of surface modification by humic substances: ACS Fall Meeting, Denver, 2011.
- 23) Furman, O., Lau, B.L.T., and Usenko, S., 2011, Spatial and temporal mercury fluxes in remote lake sediment cores from western U.S. national parks: ACS Fall Meeting, Denver, 2011.
- 24) Gallagher, M.E., Masiello, C.A., Hockaday, W.C., Snapp, S., McSwiney, C.P., and Baldock, J.A., 2011, Estimating oxidative ratio in U.S. agricultural ecosystems: Ecological Society of America, Austin, TX, August, 10, 2011.

- 25) Gallagher, M.E., Hockaday, W.C., and Masiello, C.A., 2011, Using ^{13}C nuclear magnetic resonance spectroscopy to estimate biochemical stocks and biofuel feedstock quality: USDA bioenergy project directors meeting, Washington, D.C., Oct. 23-25, 2011.
- 26) Gurrola, H., Pratt, K., and Pulliam, J., 2011, Processing innovations necessary to maximize resolution of models of the northern Gulf Coast Plain using data from the “GUMBO” seismic study: GSA South-Central Section annual meeting, New Orleans, LA, 27-29 March 2011.
- 27) Gurrola, H., Pratt, K., Pulliam, J., and Dunbar, J., 2011, Processing innovations necessary to maximize resolution of models of the northern Gulf Coast Plain using broadband data from the “GUMBO” broadband seismic study: 2011 EarthScope National Meeting, Austin, TX, 18-20 May 2011.
- 28) Hockaday, W.C., Gallagher, M.E., Masiello, C.A., Polley, W., Pyle, L., and Baldock, J., 2011, Biochemical inventory as a means to assay ecosystem carbon cycling: Ecological Society of America, Austin, TX, August, 9, 2011.
- 29) Hockaday, W.C., 2011, Biochar carbon sequestration: City of Austin Public Works, Carbon management workshop, June 11-12, 2011. *Invited*
- 30) Hockaday, W.C., 2011, Studying the effects of atmospheric CO_2 concentration on the carbon cycle using ecosystem biochemical inventories: Texas A&M University, Mar. 22, 2011. *Invited*
- 31) Hockaday, W.C., Gallagher, M.E., Masiello, C.A., Pyle, L., Polley, W., and Baldock, J., 2011, The responses of soil carbon and biochemical stocks to changing atmospheric CO_2 concentration are soil-type-dependent, Texas Soil Survey and Land Resources Workshop, College Station, TX, Feb. 3, 2011
- 32) *Huang R.X., and Lau, B.L.T., 2011, Surface-directed mineralization of calcium phosphate: Effects of solution composition and surface properties: MRS Fall Meeting, Boston, 2011.
- 33) @Kuijper, K., 2011, Testing the universal paleoprecipitation equation (CIA-K) using the newly constructed NRCS/Baylor soil geochemical database: (talk presented at 48th Annual Soil Survey and Land Resource Workshop in College Station, TX, on February 3, 2011).
- 34) Lau, B.L.T., 2011, Nanoparticles from cradle to grave: The importance of understanding how nanoparticles behave in natural and engineered waters: Presented at the Swiss Federal Institute of Aquatic Science and Technology (Eawag), Zurich, 2011. (Invited)
- 35) @LeBlanc, S., Dworkin, S.I., Atchley, S.C., and Nordt, L.C., 2011, Reconstructing Late Triassic environmental conditions using paleosol mineral assemblages from the Chinle Formation, Arizona, USA: GSA Annual Meeting in Minneapolis, MN, October 2011. (GSA Abstracts with Programs Vol. 43, No. 5).
- 36) *Lemons, C.R., Peppe, D.J., Royer, D.L., Wright, I.J., and Lusk, C.B., 2011, Are modern fern leaf economics coherent enough to use as a proxy for fossil interpretations?: GSA Annual Meeting in Minneapolis, MN, October 2011. (GSA, Abstract with Programs, 43(5): 615.)

- 37) *Lemons, C.R., Peppe, D.J., Royer, D.L., Wright, I.J., and Lusk, C.B., 2011, Linking ecologies past and present: fern leaf economics quantified: Ecological Society of America Annual Meeting, Austin, TX, August, 9, 2011.
- 38) Maxbauer, D.P., Peppe, D.J., Bamford, M, McNulty, K., Dunsworth, H., Harcourt-Smith, W.E.H., and Davis, L.E., 2011, New paleoenvironmental and paleoclimatic interpretations from fossil leaves for the Early Miocene faunas of Rusinga Island (Lake Victoria, Kenya): PaleoAnthropology 2011.
- 39) *Meier, H., Driese, S.G., Nordt, L.C., Dworkin, S.I., and Forman, S., 2011, Interpretation of dynamic Late Quaternary climate and landscape variability based upon paleosol macro- and micromorphology and stable isotopes of soil organic matter, Owl Creek, central Texas, USA: GSA Annual Meeting in Minneapolis, MN, October 2011. (GSA Abstracts with Programs Vol. 43, No. 5).
- 40) Meltzer, A., Cabello, O., Beck, S., Barrientos, S., Fischer, K., Sandvol, E., Turkelli, N., Barstow, N., Lerner-Lam, A., Willemann, R., Nyblade, A., Simpson, D., Pulliam, J., and Pennington, W., 2011, Geophysical infrastructure, seismological research, and earthquake hazard assessment: Bridging the gap: European Geophysical Union General Assembly 2011, Vienna, Austria, 3–8 April 2011.
- 41) *Michel, L.A., 2011, Stable carbon isotope geochemistry of Vertisols formed on marine carbonates and implications for deep-time paleoenvironmental reconstructions: (talk presented at 48th Annual Soil Survey and Land Resource Workshop in College Station, TX, on February 3, 2011).
- 42) *Michel, L.A., Peppe, D.J., Driese, S.G., McNulty, K.P., Lehmann, T., Dunsworth, H.M., and Harcourt-Smith, W.E.H., 2011, Paleoenvironmental reconstruction of early Miocene catarrhine localities using fossil forest paleosols from Rusinga Island, Lake Victoria, Kenya: GSA Annual Meeting in Minneapolis, MN, October 2011. (GSA Abstracts with Programs Vol. 43, No. 5).
- 43) *Mintz, H., and Pulliam, J., 2011, Seismic anisotropy beneath the NE Caribbean: Implications for the subducting North American lithosphere, 27th Annual Caribbean Geology Symposium “Earthquake and Tsunamis in the Northeastern Caribbean”, University of Puerto Rico, Mayagüez, 12-14 October 2011.
- 44) *Mintz, J.S., Driese, S.G., *Harlow, R.H., *Wright, T.C., and Atchley, S.C., 2011, Middle Devonian landscapes, climates and the correlation of continental strata in the northern Appalachian basin: talk presented at the Northeastern Section GSA Meeting in Pittsburg, PA, in March, 2011.
- 45) *Mintz, J.S., Driese, S.G., *Harlow, R.H., *Wright, T.C., and Atchley, S.C., 2011, Sequence stratigraphic analysis of Middle Devonian fluvial deposits and correlation with marine accommodation trends in the Appalachian basin, New York, USA: talk presented at the Annual Meeting of the American Association of Petroleum Geologists in Houston, TX, April 2011.

- 46) *Morgan, R.F., 2011, Paleogeographic and paleoecologic associations among Mississippian bryozoans: GSA Annual Meeting in Minneapolis, MN, October 2011. (GSA Abstracts with Programs Vol. 43, No. 5).
- 47) Nordt, L.C., Driese, S.G., and Dworkin, S.I., 2011, Terrestrial paleoclimate futures: Gambling on investments in modern analogs: GSA Annual Meeting in Minneapolis, MN, October 2011. (GSA Abstracts with Programs Vol. 43, No. 5).
- 48) Peppe, D.J., Deino, A.L., Lehmann, T., Dunsworth, H.M., Harcourt-Smith, W.E.H., and McNulty, K.P., 2011, New age constraints for the early Miocene faunas of Rusinga and Mfangano Islands (Lake Victoria, Kenya): Society of Vertebrate Paleontology Annual Meeting.
- 49) Peppe, D.J., Faith, J.T., Tryon, C.A., Fox, D.L., Garrett, N., *Van Plantinga, A., Keegan, W., Nightingale, S., Ogondo, J., and Zaarur, S., 2011, Terrestrial evidence for late Quaternary lake level changes from the Lake Victoria Basin, Equatorial Africa: GSA Annual Meeting in Minneapolis, MN, October 2011. GSA, Abstract with Programs, 43(5): 335.
- 50) Peppe, D.J., *Lemons, C., and Royer, D.L., 2011, Fern leaf economic quantified: Midcontinent Paleobotany Colloquium.
- 51) Peppe, D.J., Deino A.L., McNulty, K.P., Lehmann, T., Harcourt-Smith, W.E.H., Dunsworth, H.M., and Fox, D.L., 2011, New age constraints on the early Miocene faunas from Rusinga and Mfangano Islands (Lake Victoria, Kenya): American Journal of Physical Anthropology, 144(S52): 237.
- 52) Peppe, D.J., 2011, Late Pleistocene lake level change and the expansion of arid grasslands: evidence from the Lake Victoria region, Equatorial Africa: Texas A&M (invited talk).
- 53) Peppe, D.J., 2011, Using the size and shape of leaves to interpret ancient climates: University of Texas at Arlington (invited talk).
- 54) *Phrampus, B., and Pulliam, J., 2011, Analysis of Broadband Seismic Station Coverage for a Seismic Survey Across the Texas Gulf Coast: poster presented at Baylor Undergraduate Research and Scholarly Activity (URSA) Scholar's Week, Baylor University, April 6-7, 2011.
- 55) Pulliam, J., 2011, Lithospheric erosion at Laurentia's southwestern edge: talk presented at GSA South-Central Section annual meeting, New Orleans, LA, 27-29 March 2011.
- 56) Pulliam, J., 2011, Seismic swarms and complex subduction in the Northeast Caribbean: 27th Annual Caribbean Geology Symposium "Earthquake and Tsunamis in the Northeastern Caribbean", University of Puerto Rico, Mayagüez, 12-14 October 2011.
- 57) Pulliam, J., 2011, A seismic microzonation survey for Santo Domingo, Dominican Republic: 6th Caribbean Conference on Comprehensive Disaster Management, Global Earthquake Model (GEM) Session, Port of Spain, Trinidad, 5 December 2011.

- 58) Pulliam, J., 2011, Seismic Sequences Associated with Complex Subduction in the Northeast Caribbean: Department Seminar, University of Texas at Arlington, 1 September 2011.
- 59) Pulliam, J., 2011, Possible crustal delamination beneath the Trans-Pecos revealed by seismic imaging: "Igneous Geology of the Southwest", a seminar in honor of Don Parker's retirement from the Baylor Geology Department, 29 April 2011, Baylor University, Waco, TX.
- 60) Pulliam, J., 2011, Seismic swarms, complex tectonics, and subducting slab morphology in the Northeast Caribbean: Invited talk in the session entitled "Seismotectonics and Hazards of Active Margins in the Circum-Caribbean Sea and Eastern Pacific Ocean", annual meeting of the Seismological Society of America, 13-15 April 2011, Memphis, TN.
- 61) Pulliam, J., 2011, Tectonic Hazards of Hispaniola and How to Mitigate the Risks: Seminar on "Improving the Resilience of Municipalities of the Dominican Republic to Disasters and Natural Hazards", Santiago de los Caballeros, Dominican Republic, 17-19 March 2011.
- 62) Pulliam, J., 2011, Geophysical Hazards and Plate Boundary Processes in Central America, Mexico and the Caribbean: Science Opportunities for Seismological Collaboration and Capacity Building with COCONet: (A meeting with our sponsors, NSF/OISE and USAID), Rio Grande, Puerto Rico, 2 & 4 February 2011.
- 63) Pulliam, J., 2011, Slab detachment in the Northeast Caribbean: Consequences for regional tectonics and hazards: Department of Geology, University of Puerto Rico, Mayagüez, 1 February 2011.
- 64) Pulliam, J., Cabello, O., Valdes-Gonzalez, C., Huérfano, V., von Hillebrandt-Andrade, C., Cabello, O., Willemann, R., Mora, M., Protti, M., Schmitz, M., Talavera, E., Robertson, R., Calais, E., Fischer, K., Lerner-Lam, A., and Pennington, W., 2011, *The Alliance for Middle American Seismology/Alianza Mesoamericana de Sismología (ALMAS): A Collaboration to Build Seismological Capacity in Central America, Mexico and the Caribbean*, Workshop to Determine Science Objectives for the Continuously Operating Caribbean GPS Observational Network (COCONet), Rio Grande, Puerto Rico, 3-4 February 2011.
- 65) Pulliam, J., Dunbar, J., and Gurrola, H., 2011, Gulf of Mexico Basin Opening (GUMBO): A Seismic Study of the Texas Gulf Coast, GSA South-Central Section annual meeting, New Orleans, LA, 27-29 March 2011.
- 66) Pulliam, J., *Mintz, H., Lopez Venegas, A., Ten Brink, U., Huérfano, V., and von Hillebrandt-Andrade, C., 2011, Seismic Sequences Associated with Complex Subduction in the Northeast Caribbean, 19th Caribbean Geological Conference, Le Gosier, Guadeloupe, France, 21-24 March 2011.
- 67) Pulliam, J., *Rockett, C., Xia, Y., and Grand, S.P., 2011, Lithospheric erosion at the southern edge of Laurentia?: GSA Annual Meeting in Minneapolis, MN, October 2011. (GSA Abstracts with Programs Vol. 43, No. 5).
- 68) *Rockett, C., Pulliam, J., and Grand, S.P., 2011, Seismic Tomographic Imaging of an Upper Mantle Anomaly beneath the Rio Grande Rift: 2011 EarthScope National Meeting, Austin, TX, 18-20 May 2011.

- 69) Sen, M.K., Pulliam, J., Dutta, U., Ghosh, R., Mellors, R., and Pasyanos, M., 2011, Seismic Velocity Estimation in the Middle East from Multiple Waveform Functionals: P & S Receiver Functions, Waveform Fitting, and Surface Wave Dispersion, 2011 Monitoring Research Review, 10 pp., Tucson, AZ.
- 70) *Speckien, M., Pulliam, J., Dunbar, J., Gurrola, H., and Van Avendonk, H., 2011, Orogeny, deformation, rifting, and sediment burial on the Texas Gulf Coast: An EarthScope target: 2011 EarthScope National Meeting, Austin, TX, 18-20 May 2011.
- 71) *Stinchcomb, G.E., 2011, Construction of a fully searchable soils database integrating soil characterization data and whole-soil geochemical data: (talk presented at 48th Annual Soil Survey and Land Resource Workshop in College Station, TX, on February 3, 2011).
- 72) *Stinchcomb, G.E., Driese, S.G., Messner, T.C., and Nordt, L.C., 2011, Climatic and human controls on Holocene vegetation changes in eastern Pennsylvania based on the isotopic composition of soil organic carbon: Developing International Geoarchaeology (DIG) Conference meeting in Knoxville, TN, September 23-24, 2011, p. 41-42.
- 73) *Stinchcomb, G.E., Driese, S.G., Messner, T.C., and Nordt, L.C., 2011, Climatic and human controls on Holocene vegetation changes in eastern Pennsylvania based on the isotopic composition of soil organic carbon: GSA Annual Meeting in Minneapolis, MN, October 2011. (GSA Abstracts with Programs Vol. 43, No. 5).
- 74) *Stinchcomb, G.E., Peppe, D.J., and Driese, S.G., 2011, Precipitation and time are factors influencing modern and past magnetic susceptibility enhancement within alluvial soils along the Delaware River Valley, USA: Fall American Geophysical Union (AGU) meeting in San Francisco, CA, December 2011.
- 75) Tryon, C.A., Faith, J.T., Peppe, D.J., *Van Plantinga, A., Fox, D.L., Garrett, N., Keegan, W.F., and Ogondo, J., 2011, Middle Stone Age hominin occupation of arid environments in the Lake Victoria basin: New evidence from Rusinga and Mfangano islands, Kenya: PaleoAnthropology 2011
- 76) Villarreal, M.A., Ludvigson, G.A., Fowle, D.A., González, L.A., Roberts, J.A., Smith, J.J., Driese, S.G. and McKay, L.D., 2011, Actualistic calibration of the pedogenic siderite paleoclimate proxy: GSA Annual Meeting in Minneapolis, MN, October 2011. GSA Abstracts with Programs Vol. 43, No. 5.
- 77) Williamson, T.E., Peppe, D.J., Secord, R., Brusatte, S., and Weil, A., 2011, A long-term terrestrial record of Early Paleocene climate and ecosystem change in the San Juan Basin, New Mexico: Society of Vertebrate Paleontology Annual Meeting.
- 78) Xia, Y., Grand, S.P., and Pulliam, J., 2011, Thickened crust observed beneath the eastern edge of the Rio Grande Rift, 2011 EarthScope National Meeting, Austin, TX, 18-20 May 2011.
- 79) Yelderman, J.C., Jr., 2011, Changes in On-site Wastewater Treatment and Evaluation: Influent Equalization: Presentation, 19th Annual Meeting of the Texas On-Site Wastewater Treatment Research Council Conference (TOWA), Mesquite, Texas.

80) Zhang, F., Bruce, E., and Lau, B.L.T., 2011, Understanding the importance of surface adsorption in cellular uptake of silver nanoparticles: 5th International Symposium on Nanotechnology, Occupational and Environmental Health, Boston, 2011.

Grant Proposals and Contracts in force for 2011 – including Principal Investigator/ Title/ Funding Source

Allen, P.M., and **Dunbar, J.A.**, 2011, Sediment budget and reservoir sediment evaluation techniques for the SWAT watershed model, Kenya: USDA/ARS; Period: 07/2011-06/2012; Amount: \$13,860.

Allen, P.M., and **Dunbar, J.A.**, 2011, Determining groundwater recharge from irrigation systems for production of biofuels in Hawaii: USDA/ARS, Period: 05/2011- 05/2012; Amount: \$24,000.

Atchley, S.C., 2011, Devonian Jean Marie/Kakisa study, NE BC Canada; Husky Energy; awarded summer 2010; Period: 9/2010-8/2011; Amount: \$127,000

Driese, S.G., 2009, with the University of Tennessee-Knoxville as the lead institution (with Z.-H. Li as PI/PD, and S.P. Horn as co-PIs), Collaborative research: Pleistocene-Holocene climate variability of the southern Appalachian region, southeastern U.S.: NSF EAR 0823131 award from Paleo-Perspectives on Climate Change (P2C2) program, \$390,919 awarded for 3 years (Note: Baylor University share of grant for three years is \$61,057; Period: 10/2009 to 09/2012).

Driese, S.G., and **Nordt, L.C.**, 2009, with the University of Texas-Austin as the lead institution (with D.O. Breecker as PI/PD), Collaborative research: Calibrating the paleosol carbonate CO₂ paleobarometer for vertic paleosols by monitoring soil CO₂ in modern Vertisols: NSF EAR-0921356 award from Geobiology and Low-Temperature Geochemistry program, \$292,200 awarded for 3 years (Note: Baylor University share of grant for three years is \$96,957; Period: 07/2009 to 06/2013: no-cost extension requested).

Driese, S.G., 2010, Joint SEPM-NSF Workshop: Paleosols and Surface Soil Analog Systems: NSF EAR-1047609 award from Sedimentary Geology and Paleobiology program (\$20,000 awarded from 09/2010 to 09/2011).

Funding for Hockaday, W.C.

NAME (PI #1 first)	SUPPORTING AGENCY AND AWARD NUMBER	TOTAL \$ AMOUNT	EFFECTIVE DATES	TITLE OF PROJECT
Active				
C. Masiello T. Perez <u>W. Hockaday</u>	NSF OCE 0928941	\$389,261	8/2009 – 7/2012	Impact of developing-world land-use on riverine organic carbon delivery to the ocean
C. Masiello <u>W. Hockaday</u>	USDA NIFA AFRI Renewable Bioenergy	\$100,811 (Baylor portion)	12/2010 – 12/2013	Effect of Nitrogen Management Strategies on Biofuel Crop Biochemistry & Soil Carbon Stocks

Funding for Lau, B.L.T.

Title: The role of microbial metabolites in Pb-Calcite surface interactions

Sponsor name: European Union's Seventh Framework Programme, Marie Curie International Incoming Fellowship

Date awarded: April 19, 2011

Current project period: September 1, 2011 to August 31, 2013

Award amount: €230,627

Title: Impact of backwash strategies on biofiltration performance

Source of Support: City of Waco

Date awarded: October 2011

Project period: October 1, 2011 to April 30, 2013

Total Award Amount and Period: \$75,000

Title: Particle Analysis for Tarrant Regional Water District Water Supplies

Sponsor name: Tarrant Regional Water District

Date awarded: September 2010 and December 2011

Project period: October 1, 2010 to September 31, 2012

Award amount: \$11,250

Peppe, D.J., *Influence of phylogeny and ecology on leaf size and shape: implications for paleoclimatic interpretation*, Awarded by Baylor University, Vice Provost for Research Young Investigator Development Program, \$24,550, awarded for one year from 6/1/11 – 6/1/12

Peppe, D.J., with New York University as the lead institution (with C.A. Tryon as the PI) and in collaboration with the University of Minnesota (D.L. Fox), *Collaborative research: Quaternary Archaeology and Environments of Rusinga and Mfangano Islands, Kenya*, awarded by the NSF-BCS program, \$180,082 for two years from 09-01-10 to 08-31-12 (Note: Baylor University's share of grant is \$52,722 for two years commencing September 2010).

Peppe, D.J., and *Michel, L., *Paleoclimate reconstructions using soils from Early Miocene Proconsul sites on Rusinga Island, Kenya*: Awarded by the Evolving Earth Foundation, \$3K awarded for 1 year from 06/01/10 to 05/31/11.

Peppe, D.J., with University of Minnesota as the lead institution (K. McNulty as lead PI, and H. Dunsworth as co-PI) and the American Museum of Natural History (W. Hartcourt-Smith and I. Tattersol), *Collaborative research: Paleobiology of Early Miocene primates from Rusinga and Mfangano Islands, Kenya*, Awarded by NSF-BCS, \$219,415 awarded for 3 years from 6/1/09 – 5/31/12 (Note: Although a project director and major contributor to the proposal, Peppe is listed on a sub-contract for this proposal through the University of Minnesota because this proposal was submitted after Peppe was hired by Baylor but prior to beginning his the position. The sub-contract is for \$9933 commencing June 2009).

Pulliam, J.

1) Seismic Velocity Estimation from Multiple Waveform Functionals: P- & S-Wave Receiver Functions, Waveform Fitting, and Surface Wave Dispersion, National Nuclear Security Agency (U.S. Dept. of Energy), 1 Sept 2009 – 31 Aug 2012, \$291,825

2) Collaborative Research: Acquisition of Equipment to Upgrade and Expand the AfricaArray Seismic Network

PI: Andy Nyblade (Penn State) and **Jay Pulliam**, Co-Investigators: Stephen P. Grand, Luc Lavier, Ian Norton (UT Austin), Andy Nyblade (Penn State)

Funded by the National Science Foundation (Earth Sciences Division, Instrumentation and Facilities Program) on 5/20/2008

Total amount funded: \$434,196 (\$99,698 to UT Austin—see note below)

Note: The following two awards funded purchases of equipment to complete the AfricaArray seismic network, a network of broadband, three-component seismographs that spans the continent of Africa. While I was still employed by UT Austin, \$100,000 was awarded by NSF to UT Austin and I wrote a separate proposal to the Jackson School of Geoscience to obtain matching funds in the amount of \$99,698 (below). There is no funding for salaries, students, or research expenses and, as capital equipment, the NSF grant does not provide MTDC to UT Austin. The effort involved constitutes service to both the professional community and to the individual African nations that will benefit from the network's operations. The Geological Survey of South Africa is largely underwriting the ongoing costs of operating the network.

a) Collaborative Research: Acquisition of Equipment to Upgrade and Expand the AfricaArray Seismic Network

PI: **Jay Pulliam**, Co-Investigators: Stephen P. Grand, Luc Lavier, Ian Norton (UT Austin), Andy Nyblade (Penn State)

Funded by the National Science Foundation (Earth Sciences Division, Instrumentation and Facilities Program) on 5/20/2008

Total amount funded: \$434,196 (\$99,698 to UT Austin—see note above)

b) AfricaArray: Infrastructure for Geophysics Research and Education

PI: **Jay Pulliam**, Co-Investigators: Stephen P. Grand, Luc Lavier, Ian Norton (UT Austin)

Funded by the Jackson School of Geoscience, UT Austin, 10/1/2007

Total Amount Funded: \$99,698 in equipment matching funds (no MTDC—see note above)

3) SIEDCAR: Seismic Invigation of Edge Driven Convection Associated with the Rio Grande Rift

PI: **Jay Pulliam**, Co-Investigator: Stephen P. Grand (UT Austin)

Funded by the National Science Foundation (Earth Sciences Division, EarthScope Program), 1 June 2008 – 31 May 2011

Total Amount Funded: \$482,029

4) Crossing the Shoreline: An Onshore-Offshore Seismic Refraction Investigation of the Texas Continent-Ocean Boundary

PI: Ian Norton (UT Austin), Co-Investigators: Harm Van Avendonk, Gail Christeson, and Paul L. Stoffa (all of UT Austin), **Jay Pulliam (Baylor University)**

Funding Agency: ExxonMobil

Date of Submission: 12 October 2009

Period of Performance: 1 January 2010 – 31 December 2011

Total Amount Funded: \$3,267,636 (\$128,942 to Baylor, the great majority of the larger total will be expended as subcontracts for a seismic vessel and equipment rental)

5) Deep seismic investigation of a rifted margin: Gulf of Mexico to the Llano Uplift, Central Texas

PI: **Jay Pulliam (Baylor University)**, Co-Investigators: John Dunbar (Baylor University), Harold Gurrola (Texas Tech University)
Funding Agency: Norman Hackerman Advanced Research Program, Texas Higher Education Coordinating Board
Date of Submission: 15 January 2010
Period of Performance: 1 June 2010 – 31 May 2012
Total Amount Funded: \$148,276 (\$74,138 to Baylor University)

6) Seismic refraction study of a rifted margin: The Texas Gulf Coast

PI: **Jay Pulliam (Baylor University)**
Funding Agency: Undergraduate Research and Scholarly Activities (URSA) Program
Date of Submission: 3 February 2010
Period of Performance: 1 June 2010 – 31 May 2011
Total Amount Funded: \$4,934
This proposal was fully funded.

7) Broadband Seismic Investigation of a Rifted Margin: The Texas Gulf Coastal Plain

PI: **Jay Pulliam (Baylor University)**
Funding Agency: Gulf Coast Association of Geological Societies (GCAGS)
Date of Submission: 28 February 2010
Period of Performance: 1 June 2010 – 31 May 2012
Total Amount Funded: \$10,000

Note: The following awards all refer to the same “project”: organizing, conducting, and writing the results of a workshop in Costa Rica (described in detail above), yet each required a separate proposal.

8) Geophysical Hazards and Plate Boundary Processes in Central America, Mexico and the Caribbean: A Workshop to Build Seismological Collaboration and Capacity

PI: Ray Willemann (Incorporated Research Institutions for Seismology), Co-Investigators: **Jay Pulliam (Baylor University)** and Karen Fischer (Brown University).

a) Funding Agency: National Science Foundation (Office of International Science and Education)

Date of Submission: 21 November 2009
Period of Performance: 1 July 2010 – 30 June 2011
Total Funding Request: \$60,000
This proposal has been fully funded at the requested level of \$60,000.

b) Funding Agency: U.S. Agency for International Development (USAID)

Date of Submission: 29 January 2010
Period of Performance: 1 July 2010 – 30 June 2011
Total Funding Request: \$100,000
This proposal has been funded at the level of \$80,000.

c) Funding Agency: American Geophysical Union (AGU)

Date of Submission: 25 March 2010

Period of Performance: 1 July 2010 – 30 June 2011

Total Funding Request: \$8,000

This proposal has been fully funded at the level of \$8,000. It supports the attendance of 7 earth scientists from the island of Hispaniola (4 from Haiti and 3 from the Dominican Republic) to attend the workshop in Costa Rica.

Yelderman, J.C., Jr.

Internship with the Southern Trinity Groundwater Conservation District, initial contract Jan 2012 for January-December, 2012, \$20,328.

Changes in On-site Wastewater Treatment and Evaluation: Influent Equalization, TOWTRC-TCEQ, August, 2011 - August, 2012 \$71,157

Total Dollars = \$20,000 – Geology

Total Dollars = \$70,000 - Wastewater Research Program

Undergraduate Program

Dr. Rena M. Bonem, Undergraduate Program Director and Dr. Joe C. Yelderman, Jr. Secondary Advisor

- **Undergraduate research: 5 Undergraduate students presented professional papers and/or posters on their research.**

Geo 43C0 Spring 2012

GEO 43C0-02	Senior Thesis	Dunbar, John	1
GEO 43C0-12	Senior Thesis	Driese, Steven G.	1
GEO 43C0-13	Senior Thesis	Dworkin, Steve	1

Geo 43C1 Colloquium Spring 2012

GEO 43C1-01	Senior Colloquium Capstone	Hockaday, Bill	6
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Geo 4V90

Summer 2011 Geo 4V90-09	Special Problems	Byars, Bruce W.	1
Fall 2011 GEO 4V90-15	Special Problems	Pulliam, Jay	1
Spring 2012 Geo 4V90-03	Special Problems	Bonem, Rena M.	1
Spring 2012 Geo 4V90-12	Special Problems	Driese, Steven G.	1
Spring 2012 Geo 4V90-13	Special Problems	Dworkin, Steve	1

- **General education course for majors**

Summer 2011

GEO 1406-F1	Earth Through Time	Bonem, Rena M.	12
GEO 3344-F2	Sedimentary Fld Studies	Dworkin, Steve	1

GEO 3643-F1	Field Geology	Dworkin, Steve	17

Fall 2011

GEO 1405-01	The Dynamic Earth	Cronin, Vincent S.	71
GEO 1405-02	The Dynamic Earth	Allen, Peter M.	26
GEO 1406-01	Earth Through Time	Atchley, Stacy Conrad	24
GEO 3427-01	Rocks & Rock-Forming Minerals	Wegert, Daniel	10
GEO 3435-01	Invertebrate Paleontology	Bonem, Rena M.	11
GEO 3445-01	Structural Geology	Cronin, Vincent S.	3
GEO 4313-01	Astronomy	Greene, Donald M.	17
GEO 4346-01	Hydrogeology	Yelderman, Joe C	4
Geo 4485-01	Intro Geographic Info Systems	Byars, Bruce W.	10
Geo 4V90-02	Geodynamics	Dunbar, John	2
Geo 4V90-17	Paleobotany	Peppe, Dan	1

Spring 2012

GEO 1405-01	The Dynamic Earth	Allen, Peter M.	23
GEO 1406-01	Earth Through Time	Bonem, Rena M.	48
GEO 3319-01	Intro to Geophysics	Dunbar, John Speckien, Mark Andrew	11
GEO 3342-01	Field Strat-Sediment	Peppe, Dan	15
GEO 3430-01	Petrology	Parker, Don	10
GEO 4341-01	Intro to Hydrology	Allen, Peter M.	6
GEO 4345-01	Water Management	Foss, Laura Kaye Yelderman, Joe C	2
GEO 4373-01	Global Soil Systems	Michel, Lauren Nordt, Lee C.	7
GEO 4386-01	Remote Sensing	White, Joseph D.	3
GEO 4485-01	Intro Geographic Info Systems	Byars, Bruce W.	7
GEO 4487-01	Advanced GIS Analysis	Byars, Bruce W.	1
GEO 4V90-01	Clastic/Carb.Depositional Syst	Atchley, Stacy Conrad	1

GEO 4V90-05	Kinematics of the Lithosphere	Cronin, Vincent S.	2
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Number of Majors in Spring 2012: 57

Number of Majors in Fall 2012: 75

Number of Graduates: 8. (Another 3-5 will graduate in August of 2012.)

We have 7 students listed as majors in our lists who either transferred or were suspended for low grades.

There are also 3 senior theses in the fall. Some of these are currently in progress.

During 2011 Geology had 5 B.S. Senior Theses completed, as below.

Undergraduate research: Senior Theses completed

- 1) Danielson, R., 2011, Temperature in groundwater/surface water interaction: B.S. Thesis. (J.C. Yelderman, Jr., Director)
- 2) DiPietro, L., 2011, Paleoclimate interpretation using clay mineralogy for Early Miocene fossil localities of the Hiwegi Formation on Rusinga Island, Lake Victoria, Kenya: B.S. Thesis. (D.J. Peppe, Director)
- 3) Landers, T.C., 2011, Influence of Late Holocene climate change on floodplain deposition, erosion, and soil formation along Williams Creek, central Texas, USA: B.S. Thesis, 27 p. (S.G. Driese, Director)
- 4) Phrampus, B., 2011, Analysis of broadband seismic station coverage for a seismic survey across the Texas Gulf Coast: B.S. Thesis (J. Pulliam, Director)
- 5) Swain, B., 2011, Development geology of an oil field: B.S. Thesis. (V.C. Cronin, Director)

Graduate Program

Dr. Stephen I. Dworkin, Graduate Program Director

In 2011 Geology had 17 Ph.D. students (+ 1 enrolled off-campus) and 15 M.S. students enrolled in the program. During 2011 Geology had 1 Ph.D. and 6 M.S. students graduated.

Completed M.S. Theses and Ph.D. Dissertations

- 1) Damman, A., 2011, The reef structure and formation of the Edwards Limestone bioherms in central Texas and an investigation of Bermudan reefs as a potential modern analog: (M.S. Thesis). (R.M Bonem, Director)

- 2) Dhillon, R.S., 2011, Influence of climate and the expansion of C4 grasses on sequence-scale cyclicity and landscape development during the late Miocene to Pleistocene of West Texas: M.S. Thesis. (S.C. Atchley, Director)
- 3) Lancaster, D., 2011, Source faults of major earthquakes in AZ MS: M.S. Thesis. (V.S. Cronin, Director)
- 4) Mintz, J.S., 2011, "Rise of the Givetian (385 Ma) Forests, Northern Appalachian Basin, Catskill State Park, New York, U.S.A.: Ph.D. Dissertation, 143 p. (S.G. Driese, Director)
- 5) Rockett, C., 2011, Seismic Tomographic Imaging Reveals Possible Lithospheric Erosion beneath Trans-Pecos Texas and Southeastern New Mexico: M.S. Thesis. (J. Pulliam, Director)
- 6) Secrest, S., 2011, Carbonate fault fabric at Lehigh Quarry, TX: M.S. Thesis. (V.S. Cronin, Director)
- 7) Van Plantinga, A., 2011, Geology of the Late Pleistocene artifact-bearing Wasiriya Beds at the Nyamita Locality, Rusinga Island, Kenya: MS thesis. (D.J. Peppe, Director)

Highlights

- **4 first-authored, journal articles were published by GEO Ph.D. students in 2011.**
- **19 first-authored professional presentations were given by GEO M.S. and Ph.D. students in 2011.**

Faculty Additions & Promotions

The fall semester of 2011 brought the start of two searches for tenure-track Assistant Professors in Applied Geophysics and in Mineralogy-Petrology. The spring semester of 2012 saw two candidates brought to campus for each position, unfortunately both resulted in failed searches and so these searches will hopefully resume again in the fall semester of 2012.

Assistant Professors Drs. Bill Hockaday, Boris Lau, and Dan Peppe continued to advance in their tenure-tracks.

Emeritus Professor Dr. Don Parker continued to be active in the Department, not only conducting research on volcanic rocks, and supervising a Ph.D. student, but also teaching as a temporary lecturer in Geology in 2012-2013. Don taught the Petrology course in the spring of 2012 and is teaching the entire Field Geology course during the summer of 2012 while Dr. Steve Dworkin is on sabbatical.

Departmental Highlights

- The annual late summer Welcome Picnic was held on Friday, August 26th, 2011 at Dr. Lee and Kathy Nordt's River Bend neighborhood facility. An O.T. Hayward Remembrance Dinner, which was organized with great help from Dr. Peter Allen and from Advisory Board members, was held on Thursday, November 3rd, 2011. The Geology Alumni Homecoming Event with food and refreshments was hosted by the Geology Department in the Baylor Sciences Building on Friday, November 4th, 2011.

The annual Christmas Party for faculty and staff was held on December 10th, 2011, for the first time, at the 1424 Bistro in Waco. The Geology Department held its annual “Geology Spaghetti Supper” event at the Ken and Celia Carlile Atrium in the Baylor University Sciences Building on February 18th of 2012 for faculty, staff, graduate and undergraduate students, and their spouses and children; the group was joined by 9 prospective graduate students who were visiting the Department for a 3-day “recruiting” weekend.

- The Geology 5050 Colloquium Series held a regular schedule of talks at 2:30 PM in room E231 on Friday afternoons, with a 2:00 PM reception prior to each lecture in the 4th floor clock tower E401. The Department budget continued to support funding for up to 4 to 5 far-away (airfares) speakers each semester, in an effort to increase Department visibility at a national level and to expose Geology students to researchers from across the country. With the addition of the new OT Hayward Excellence Fund we are able to invite an additional world-class speaker at least once each year.

The GEO 5050 Colloquim in the Fall semester of 2011 was organized by Dr. Steve Dworkin, and guests included Dr. Crayton Yapp (SMU), Dr. Dan Lehrmann (Trinity University), Dr. Corey Lawrence (USGS), Dr. Chandini Revanna (Baylor Chemical Hygiene Officer), Dr. Kitty Milliken (UT-Austin), Dr. Ron Amundson (UC-Berkeley), Dr. Christina Chan-Park (Baylor Science Librarian), Dr. Lindsay Worthington (TAMU), and Dr. David Fastovsky (University of Rhode Island).

The GEO 5050 Colloquim in the Spring semester of 2012 was organized by Dr. Peter Allen and guests included Dr. Scott Burns (Portland State Univ.; AEG Richard Jahns Distinguished Lecture), Dr. Mustafa Saribudak (professional), Dr. Rui Zhang, UT Institute for Geophysics, Austin), Dr. Glen Mattioli (UT-Arlington), Dr. Armando Sena (Stanford University), Dr. Alain Plante (University of Pennsylvania), Dr. Andrew Bishop (Shell Oil Company), Dr. Lindsay Worthington (TAMU), Dr. Tanya Blacic (University of Wyoming), Dr. Lars Ehm (Stony Brook), Dr. Kamini Singha (Penn. State University), Dr. Eric Kelly (UT-Austin), Dr. Chris Poulsen (University of Michigan), and Dr. Oliver Chadwick (UC-Santa Barbara).

- In 2009 Baylor GEO alumnus Connie Hudson, and his wife Virginia, established the O.T. Hayward Excellence Fund, which has been used to support bringing world-class researchers to the Geology Department and Baylor University to give talks on their research and to interact with faculty and students. The 4th OT Hayward Speaker was Dr. Bill Dietrich of the University of California at Berkeley, who presented his talks on February 23-24, 2012.
- The Baylor Geological Society (BGS) and the Baylor Geology American Association of Petroleum Geologists (AAPG) student groups held occasional Wednesday noon “brownbag” talks with guest and local speakers. A BGS field trip, attended by 9 advisory board members, was held on Saturday, April 14th, 2012, and focused on examining the Cretaceous depositional history of central Texas, which was organized and lead by Dr. Stacy Atchley and his graduate stratigraphy course.

Development Activities & Advisory Board

- The Baylor Geology Advisory Board held their business meeting in the afternoon, prior to the Geology Alumni Homecoming Event on Friday, November 4th, 2011. The Board met to talk about ways in which Board members can work with the Department and the Baylor Development Office to identify specific needs and to initiate and conduct special fund-raising projects, including an Endowment to support a graduate research stipend for an M.S. student interested in a career in the Petroleum industry. Josh Talbert became Chair, Ed Jakubowski assumed Vice Chair, and a Victor Carrillo was elected Secretary. Nine Advisory Board members attended the BGS field trip on Saturday, April 14th, 2012 examining Cretaceous rock (mainly carbonates) in central Texas.

Staffing Changes

Ms. Erin Stinchcomb's Administrative Assistant appointment changed from temporary to permanent part-time status, which reflects her continued involvement in the Department Office in Jamie Ruth's absence. Jamie Ruth continued to work part-time on a very limited basis, mainly assisting with assembly of the Annual Newsletter.

Dr. Boris Lau and Dr. Sascha Usenko (ENV) hired a new post-doc, Dr. Kaoru Ikuma after Dr. Olga Furman's departure. Dr. Bill Hockaday and Dr. Sung Kim (CHEM) have hired a new post-doc to start in 2012. Both post-docs are funded by the OVPR.

Changes in Facilities & Equipment

Dr. Steve Driese used the remainder of his startup funds to develop a cathodoluminescence (CL) laboratory for investigation of thin-sections. The Relion CL instrument was delivered in the fall of 2011 and was installed in a renovated closet in the 4th floor D-wing of the BSB.

Fabrication was completed for a New Nuclear Magnetic Resonance (NMR) spectrometer for Dr. Bill Hockaday during the spring semester of 2012 using his Baylor startup and \$100K in gift funds provided by Dr. Ken Carlile. Dr. Hockaday's NMR lab is on the 2nd floor of the BSB in space generously provided by the Chemistry Department. The lab will be dedicated as the Paul Marchand NMR Laboratory sometime during the fall semester of 2012.