

## Curriculum Vitae - Jay L. Banner

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### Education

Ph.D. in Earth Sciences, State University of New York at Stony Brook, August 1986.  
M.S. in Earth Sciences, State University of New York at Stony Brook, May 1981.  
B.A. in Geology, University of Pennsylvania, June 1978.

### Professional Experience

Professor, University of Texas at Austin. 2001 - present.  
Director, Environmental Science Institute, University of Texas at Austin. 2000 – present.  
Associate Professor: University of Texas at Austin. 1996 - 2001.  
Assistant Professor: University of Texas at Austin. 1990 - 1995.  
Member, Theme Organizing Committee of Planet Texas 2050, the first Bridging Barriers initiative at the University of Texas at Austin. 2017- present.  
Post-doctoral Research Associate: Joint appointment with: California Institute of Technology and Louisiana State University, 1986-1989.

### Research interests

My research interests center on Earth-surface processes, including the chemical evolution of groundwater, surface water, and ocean water on geologic and human timescales. An area of particular interest is determining the extent to which hydrologic processes are governed by changes in climate. The methods used to examine these processes include the textures of ancient marine and groundwater sedimentary deposits, isotope geochemistry, trace element geochemistry, and high-precision age determinations of rocks and minerals. Research interests also include K-12 education, sustainability education, and community engagement in STEM.

### Professional society memberships and honors

Fellow, Geological Society of America, 1999 – present.  
Named as 2015 Kappe Lecturer by American Academy of Environmental Engineers and Scientists. Banner is the first scientist named to this national engineering lectureship.  
First person to receive Certification by Eminence to be a Board Certified Environmental Scientist, by the American Association of Environmental Engineers and Scientists, 2012

### Honors and Awards

President's Associates Teaching Excellence Award, 2016-17  
Appointed as Fred M. Bullard Professor, Jackson School of Geosciences, 2014 - present  
Tower Award to ESI's GK-12 Program, 2014  
Research Award for Groundwater Stewardship, Barton Springs Edwards Aquifer Conservation District, for publication in *Groundwater* by Wong et al., 2013,  
University of Texas System Regents Outstanding Teaching Award, 2013  
Appointed as Faculty Fellow, Division of Diversity and Community Engagement, UT-Austin, 2013 - present  
UT Athletics Professor of Excellence, 2012  
Texas Exes Teaching Award, 2012

Friar Centennial Teaching Fellowship Award, Friar's Society of the University of Texas, 2011  
Inducted into the University of Texas at Austin Academy of Distinguished Teachers, 2011  
Outstanding Educator Award, Jackson School of Geosciences, 2010  
Excellence in Teaching Award, UT Division of Instructional Innovation and Assessment, 2007  
Evelyn and Moses E. Knebel Distinguished Teaching Award, Department of Geological Sciences, 1996, 2006, 2007  
Houston Oil and Minerals Corporation Faculty Excellence Award, 1998, 2000  
Outreach Innovation Award, College of Natural Sciences, 2000  
Appointed as Chevron Centennial Teaching Fellow, 2002 - 2014  
Appointed as Carlton Centennial Teaching Fellow, 1990 - 2002

## PEER-REVIEWED PUBLICATIONS

h-index: 45

h-index since 2016: 31 (Google Scholar, accessed March 2021)

Total citations: 8,255

Researcher ID: C-8676-2011

\*Graduate-student advisee, \*\*Undergraduate-student advisee, + Postdoctoral advisee

## PUBLICATIONS

Hu, J., S. Dee, C. Wong, C. J. Harman, J. L. Banner, \*K. E. Bunnell, 2021, Assessing proxy system models of cave dripwater  $\delta^{18}\text{O}$  variability, *Quaternary Science Reviews* 254, <https://doi.org/10.1016/j.quascirev.2021.106799>

Nielsen-Gammon, J., Banner, J.L., Cook, B.I., Tremaine, D.M., Wong, C.I., Mace, R.E, Gao, H., Yang, Z.-L., Gonzalez, M.F., Hoffpauir, R., Gooch, T., and Kloesel, K., 2020, Unprecedented drought challenges for Texas water resources in a changing climate: What do researchers and stakeholders need to know? *Earth's Future*, <https://doi.org/10.1002/essoar.10503372.1>.

\*Carlson, P.E., +Noronha, A.L., Banner, J.L., Jenson, J.W., Moore, M.W., Partin, J.W., Deininger, M., Breecker, D.O., Bautusta, K.K., 2020, Constraining speleothem oxygen isotope disequilibrium driven by rapid  $\text{CO}_2$  deassing and calcite precipitation: Insights from monitoring and modeling. *Geochimica et Cosmochimica Acta* 284, 222-238. <https://doi.org/10.1016/j.gca.2020.06.012>

Gulley, J., Breecker, D.O., Covington, M, Cooperdock, S., Banner, J., Moore, P.J., +Noronha, A., Breithupt, C., Martin, J.B., Jenson, J., 2020, Tidal pumping and biogeochemical processes: dissolution within the tidal capillary fringe of eogenetic coastal carbonates. *Earth Surface Processes and Landforms* 45, 2675-2688, <https://doi.org/10.1002/esp.4922>.

Loewy, S., Valdes, J., Wang, H., Ingram, B., Miller, N.R., de la Cruz Medina, K., Roberts, A., Yanny, S., Banner, J., Feseha, M., Todd, L. and Kappelman, J., 2020, Improved accuracy of U-series and radiocarbon dating of ostrich eggshell using a sample 1 preparation method based on microstructure and geochemistry: A study from the Middle Stone Age of Northwestern Ethiopia. *Quaternary Science Reviews* 247, 106525, <https://doi.org/10.1016/j.quascirev.2020.106525>.

- \*Beal, L., \*Senison, J., Banner, J.L., Musgrove, M., \*\*Yazbek, L., Bendik, N. Herrington, C., and \*\*Reyes, D., 2020, Stream and spring water evolution in a rapidly urbanizing watershed, Austin, TX. *Water Resources Research* 56, e2019WR025623.  
<https://doi.org/10.1029/2019WR025623>.
- Baker, A., Hartmann, A., Duan, W., Hankin, S., Comas-Bru, Laia, Cuthbert, M.O., Treble, P.C., Banner, J.L., Genty, D., Baldini, L., Bartolomé, M., Moreno, A., Pérez-Mejías, C. and Werner, M., 2019, Global analysis reveals climatic controls on the oxygen isotope composition of cave drip water. *Nature Communications* 984,  
<https://doi.org/10.1038/s41467-019-110>.
- Bixler, R.P.; Atshan, S.; Banner, J.L.; Tremaine, D.; Mace, R., 2019, Assessing integrated sustainability research: Use of social network analysis to evaluate scientific integration and transdisciplinarity in research networks. *Curr. Opin. Environ. Sustain.* 39, 103-113.
- Gingerich, S.B., Johnson, A.G., Rosa, S.N., Marineau, M.D., Wright, S.A., Hay, L.E., Widlansky, M.J., Jenson, J.W., Wong, C.I., Banner, J.L., Keener, V.W., and Finucane, M.L., 2019, Water resources on Guam—Potential impacts of and adaptive response to climate change: U.S. Geological Survey Scientific Investigations Report 2019–5095, 55 p.  
<https://doi.org/10.3133/sir20195095>.
- \*Carlson, P.E., Banner, J.L., Johnson, K.R., \*Casteel, R.C., and Breecker, D.O., 2019, Carbon Cycling of Subsurface Organic Matter Recorded in Speleothem <sup>14</sup>C Records: Maximizing Bomb-Peak Model Fidelity. *Geochimica et Cosmochimica Acta* 246, 436-449
- Mickler, P.J., \*Carlson, P.E., Banner, J.L., Breecker, D.O., Stern, L. and \*Guilfoyle, A., 2019, Quantifying carbon isotope disequilibrium during in-cave evolution of drip water along discreet flow paths. *Geochimica et Cosmochimica Acta* 244, 182-196.
- Kloesel, K., B. Bartush, J. Banner, D. Brown, K. Hayhoe, J. Lemory, X. Lin, G. McManus, E. Mullens, J. Nielsen-Gammon, M. Shafer, C. Sorenson, S. Sperry, D. Wildcat, and J. Ziolkowska, 2018, Southern Great Plains. In *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II* [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC. doi: 10.7930/NCA4.2018.CH23.
- \*Carlson, P.E., Miller, N.R., Banner, J.L., Breecker, D.O. and \*Casteel, R.C., 2018, The potential of near-entrance stalagmites as high-resolution terrestrial paleoclimate proxies: Application of isotope and trace-element geochemistry to seasonally-resolved chronology. *Geochimica et Cosmochimica Acta* 235, 55–75.  
DOI.org/10.1016/j.gca.2018.04.036
- Marshall, J.A., Banner, J.L., and You, H.S., 2018, Assessing the effectiveness of sustainability learning. *Journal of College Science Teaching* 47, 57-67.
- \*Beal, L., Wong, C.I, Bautista, K., Jenson, J.W., Banner, J.L., Lander, M.A., Gingerich, S.B., Partin, J.W., Hardt, B. and van Oort, N.H., 2018, Isotopic and geochemical assessment of the sensitivity of groundwater resources of Guam, Mariana Islands, to intra- and inter-annual variations in hydroclimate. *Journal of Hydrology* 568, 174-183
- \*\*Bergel, S., \*Carlson, P.E., Larson, T.E., Wood, C.T., Johnson, K.R., Banner, J.L., Breecker, D.O., 2017, Constraining the subsoil carbon source to cave-air CO<sub>2</sub> and speleothem calcite in central Texas. *Geochimica et Cosmochimica Acta* 217, 112-127.  
DOI.org/10.1016/j.gca.2017.08.017

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- James, E.W., Banner, J.L., and <sup>+</sup>Hardt, B., 2015. A global model for cave ventilation and seasonal bias in speleothem paleoclimate records. *Geochemistry, Geophysics, Geosystems* 16, 1044-1051. DOI: 10.1002/2014GC005658  
[*EOS Research Spotlight*: Calderone, J. (2015), Cave “breathing” affects mineral growth and climate clues, *Eos*, 96, DOI:10.1029/2015EO036169. 30 September 2015]
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- <sup>+</sup>Feng, W., <sup>+</sup>Hardt, B.F., Banner, J.L., \*\*Meyer, K.J., James, E.W., Musgrove, M., Edwards, R.L., Cheng, H., and Min, A., 2014, Changing amounts and sources of moisture in the U.S. southwest since the Last Glacial Maximum in response to global climate change: *Earth and Planetary Science Letters*, v. 401, p. 47–56, doi: 10.1016/j.epsl.2014.05.046.
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*[This article received the 2013 Research Award for Groundwater Stewardship from the Barton Springs Edwards Aquifer Conservation District.]*
- \*Cowan, B., \*\*Osborne, M., and Banner, J.L., 2013, Temporal variability of cave-air CO<sub>2</sub> in central Texas. *Journal of Cave and Karst Studies* 75, p. 38-50. doi:10.4311/2011ES0246.
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- \*Christian, L.N., Banner, J.L., and Mack, L.E., 2011, Sr isotopes as tracers of anthropogenic influences on stream water in the Austin, Texas, area, *Chemical Geology* 282, 84–97.
- Oster, J. L., Montanez, I. P., Guilderson, T. P., Sharp, W. D., and Banner, J. L., 2010, Understanding Speleothem  $\delta^{13}\text{C}$  Variability Using  $^{14}\text{C}$  and  $^{87}\text{Sr}/^{86}\text{Sr}$  at Moaning Cave, California, *Geochimica Cosmochimica Acta* 74, 5228-5242.
- \*Wong, C. and Banner, J.L., 2010, Response of cave-air CO<sub>2</sub> and drip water to brush clearing in central Texas: Implications for recharge and soil CO<sub>2</sub> dynamics. *Journal of Geophysical Research – Biogeosciences*, 115, G04018, doi: 10.1029/2010JG001301.

- <sup>†</sup>Musgrove, M., Stern, L.A, and Banner, J.L., 2010, Springwater geochemistry at Honey Creek State Natural Area, central Texas: Implications for surface water and groundwater interaction in a karst aquifer. *Journal of Hydrology* 388, 144-156.
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- \*\*Pape, J., Banner, J.L., and Mack, L.E., 2010, Controls on oxygen isotope variability in precipitation and cave drip-waters, central Texas, U.S.A., *Journal of Hydrology* 385, 203–215.
- \*Wong, C. and Banner, J.L., 2009, Investigating controls on non-linear drip rate and drip-water composition in central Texas karst, USA, *Proceedings of the 15<sup>th</sup> International Congress on Speleology*, p. 1071-1077.
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- <sup>†</sup>Partin, J., Banner, J.L., Jenson, J.W., Taylor, F.W., Quinn, T. and Cardenas, M.B., 2009, Reconstructing paleo-rainfall in the western tropical Pacific: developing speleothem proxies, *Proceedings of the 15<sup>th</sup> International Congress on Speleology*, p. 1047-1049.
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#### **Non-refereed articles, op-ed pieces, and field-trip guidebooks**

- Starbird, M. and Banner, J.L., 2017, Scientists must do better at educating the public about their work. *Dallas Morning News*, 10/2/17. Also published in the *Austin-American Statesman*.
- Banner, J.L., and Hersh, E.S., 2015, Water in twenty-first century Texas. *Texas CEO Magazine*, June 27, 2015.
- Banner, J.L., Jackson, C., Yang, L., Hayhoe, K., and North, G., 2010, Get ready for a drier Texas. *Houston Chronicle*, Jan. 16, 2010. Also published in *Austin American Statesman*, Dec.30, 2009.
- Partin, J. W., Cobb, K. M. and Banner, J. L., 2008, Climate variability recorded in tropical and sub-tropical speleothems, *PAGES News*, Vol. 16, No. 3, p. 9-10.
- Cooke, M. J., Stern, L. A., Banner, J. L. and Mack, L. E., 2005, The origin of relict, thick soils in central Texas, *Austin Geological Society Bulletin*, v. 1, 33-38.
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- Kirkland, B.L., Banner, J.L., Moore, C.H., Hoffman, C., Pursell, B. and Vasquez, R., 1996, Cretaceous cyclic platform carbonates of central Texas: South-Central Section Meeting of the Geol. Soc. America, *Field Trip Guidebook #3*, 36 p.
- Kerans, C. Goldhammer, R.K., and Banner, J. L., 1996, Carbonates. *Geotimes* 41, 52-53.
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Oetting, G.C., Banner, J.L., and Sharp, J.M. Jr., 1994, Regional geochemical and isotopic variations in badwaters of the Edwards aquifer. In, Edwards aquifer: The Barton and San Marcos Springs area - A field trip guide book, American Institute of Hydrology 1994 Annual Conference, Austin, TX, p. 1-13.

A list of conference presentations and abstracts available on request.

## **GRANT FUNDING**

### **Pending**

National Science Foundation, NRT: Convergent, Inclusive Student Training in Rapidly Urbanizing Climate-sensitive Terrains (Co-InSTRUCT), \$2,997,185, J. Banner, PI; R. Duke, K. Faust, S. Jha, E. McDaniel, co-PI's.

National Science Foundation, Advancing Informal Science Learning Program: Innovations in Development: Connecting via Community Informal STEM Engagement (CONCISE), \$2,990,269. J. Banner, PI; L. Atkinson, L. Contreras, R. Duke, L. Eberlin, co-PI's.

National Science Foundation, Research Experience for Undergraduates Program: InSTRUCT: Inclusive Student Training in Rapidly Urbanizing Climate-sensitive Terrains, \$498,796. J. Banner, PI; D. Niyogi, co-PI.

National Science Foundation, Hydrologic Sciences Program: Collaborative Research: Urban Watershed Evolution - Novel Temporal Perspectives on the Hydrologic Impacts and Positive Unintended Consequences of Failing Municipal Infrastructure, \$618,616. J. Banner, PI; K. Faust, D. Tremaine, B. Black (Univ. Arizona), co-PI's.

National Science Foundation, Coastlines and People Program: Large-scale CoPe Hub for Resilient, Equitable, and Sustainable Coastal/Urban Environments (RESCUE), \$14,996,404. J. Gonzalez, PI (CUNY), J. Banner, E. Bou-Zeid (Princeton Univ.), S. Cutter (Univ. S. Carolina), R. A. Rodriguez (Univ. Puerto Rico, Mayaguez), co-PI's.

National Science Foundation, Sustainable Regional Systems Research Network: Challenges to and Opportunities for Societal Drought Resilience in a Rapidly Developing, Semiarid Urban Corridor through Texas and Oklahoma, \$149,698. J. Banner, PI; K. Olofsson, K. Hayhoe, J. Benavides, J. Nielsen-Gammon, co-PI's.

National Science Foundation, SCC-PG: Planning for Project REACH Austin: Resilience by an Equitable Approach to Combat Heat, \$137,888. K. Lanza PI, P. Bixler, J. Felkner, D. Niyogi, J. Banner, co-PI's.

Impact Austin: Building a community-university network for advancing Informal STEM Engagement Experiences ("I SEE") in Austin's Latinx community, \$78,500. J. Banner, PI; R. Duke, L. Atkinson, co-PI's.

Cynthia and George Mitchell Foundation, The Texas Water Research Network, \$30,000, 2021-2022. J. Banner, PI.

### **Current**

National Science Foundation, Coupled Natural and Human Systems Program: Urban Water Resiliency in a Climatic and Demographic Hot Spot, \$499,745. 2015-2021. J. Banner, PI; S. Pierce, L. Potter, K. Wagner, and U. Venki, co-PI's.

Cynthia and George Mitchell Foundation, Sustainability in Higher Education. \$124,000, 2021-2022. J. Banner, PI. Michael Webber, co-PI.

Planet Texas 2050, UT Austin: Urban Watershed Evolution, \$90,000, 2019-2021. J. Banner, PI. K. Faust, S. Jha, A. Matheny, M. Kiritsis, co-PI's.

Planet Texas 2050, UT Austin: PaleoTexas, \$60,000, 2019-2021. D. Breecker, PI, J. Banner, Melissa Kemp, T. Shanahan, A. Rabinowitz, J. Jarvis, co-PIs.

National Science Foundation, Paleoclimate Perspectives on Climate Change: Reconstructing Northeast Mexico hydroclimate Since the Last Interglacial Period, 2019-2021. K. Johnson, PI (UC Irvine), \$15,650 subaward to UT.

### **Previous**

National Science Foundation, CBET - Environmental Sustainability Program: Challenges to and Opportunities for Resilience in Rapidly Developing Urban Corridors. \$49,925, 2019. J. Banner, PI: K. Faust, A. R. Ganguly (Boston Univ.), S. Gray (Michigan State Univ.), and A. Stillwell (Univ. Illinois), co-PI's.

Cynthia and George Mitchell Foundation, Sustainability in Higher Education. \$130,000, 2019-2020. J. Banner, PI.

Cynthia and George Mitchell Foundation, The Texas Water Research Network. \$45,000, 2019-2020. J. Banner, PI.

National Science Foundation, Major Research Instrumentation Program: Acquisition of a Multicollector Inductively Coupled Plasma Mass Spectrometer for Earth Science Research at the University of Texas at Austin, \$609,431, 2015-2018. J. Banner, PI; J. Lassiter, A. Kolescar, B. Walther and D. Stockli, co-PI's.

National Science Foundation, Geobiology and Low Temperature Geochemistry Program: What hydrogeochemical processes control weathering in the deep critical zone of unburied karst landscapes? \$239,965, 2015-2018. J. Gulley, PI; J. Banner, D. Breecker, and J. Jenson, co-PI's.

National Science Foundation, Research Experience for Undergraduates, Climate Impacts in Semi-Arid Regions, \$376,836, 2015-2020. L. Katz, PI; J. Banner, co-PI.

Texas Commission on Environmental Quality, Undergraduate student intern program, \$444,571, (series of one-year grants over period of 2010-2019).

SERDP (DOD, DOE, EPA), Water Resources on Guam: Potential impacts and adaptive response to climate change for Department of Defense installations, \$294,416 to UT-Austin. 2013-2018. S. Gingerich, PI, J. Jenson, M. Lander, J. Banner and others, co-PI's.

Cynthia and George Mitchell Foundation, Sustainability in Higher Education. \$150,000, 2018-2019. J. Banner, PI.

Cynthia and George Mitchell Foundation, The Texas Water Research Network. \$45,000, 2017-2018. J. Banner, PI.

KDK-Harman Foundation, Ciencias Calientes: Engaging Hispanic K-12 Students and Community in STEM, \$35,000, 2016-2017.

National Science Foundation, EVS Scholars: Promoting excellence in environmental science, \$580,260, 2012-2017. J. Banner, PI; N. Fowler and R. Torres, co-PI's.

Jackson School of Geosciences Seed Grant Program, Two new applications of U isotopes, \$19,727, 2015-2017. R. Martindale, PI; J. Banner and S. Loewy, co-PI's.

Department of the Interior, Pacific Islands Climate Science Center, \$148,000, 2013-2017. K. Hamilton, PI, J. Jenson, M. Lander, J. Banner and others, co-PI's.

National Science Foundation, Geoscience Education Program, Research Experience for Undergraduates Site: The science of global change and sustainability, \$330,657, 2012-2015. J. Banner, PI.

3M Foundation, Graduate STEM Fellows in K-12 Education Program (GK-12 Program), \$5,000, 2016-2017. J. Banner, PI.

Cynthia and George Mitchell Foundation, The Texas Water Research Network. \$54,000, 2016-2017. J. Banner, PI.

3M Foundation, Graduate STEM Fellows in K-12 Education Program (GK-12 Program), \$5,000, 2014-2015. J. Banner, PI.

KDK Harman Foundation, Ciencias Calientes: Engaging Hispanic K-12 Students and Community in STEM, \$30,000, 2014-2015. J. Banner, PI.

Office of the Provost, UT-Austin, Measuring the effectiveness of interdisciplinary courses, \$10,000, 2015-2016. J. Marshall, PI, J. Banner, co-PI.

Office of the Provost, UT-Austin, Sustainability education at UT-Austin and beyond, \$50,000, 2014-2015. D. Allen, co-PI.

Jackson School of Geosciences Seed Grant Program, Chronology of hydrologic change across the SW US during abrupt global change, \$15,976, 2014. J. Banner, PI; N. Miller and D. Breecker, co-PI's.

National Science Foundation, Geobiology and Low Temperature Geochemistry Program: Carbon in karst: Investigating sources, transport mechanisms and isotopic fractionation to advance the interpretation of speleothem climate record, \$223,903, 2012-2015. D. Breecker, PI; J. Banner, co-PI.

National Science Foundation, Paleoclimate Perspectives on Climate Change competition: Collaborative Research: Holocene hydrologic variability across the Western Pacific Warm Pool, \$504,622, 2010-2013. J. Partin, PI; J. Banner, B. Cardenas, and F. Taylor, co-PI's.

National Science Foundation, Geoscience Education Program, Research Experience for Undergraduates Site: Global change and its impacts, \$323,456, 2008-2013. J. Banner, PI.

Motorola Foundation, Environmental Science Institute Satellites, \$25,000, 2010-2012. J. Banner, PI.

Texas Commission on Environmental Quality, Student Internships for the TCEQ Water Quality and Air Permits Divisions, \$120,000, 2009-2011.

University of Guam Water and Environment Research Institute. Paleoclimate of the West Pacific Warm Pool. \$46,100. 2010-2011.

National Science Foundation, Hydrologic Sciences Program, A novel method for assessing impacts of urbanization on watershed processes, \$39,848, 2007-2011.

National Science Foundation, Paleoclimate Perspectives on Climate Change competition: Mechanisms of regional climate change and impacts on water availability in Texas from the Last Glacial Maximum to present-day, \$410,000, L. Yang, co-PI, 2008-2011.

National Science Foundation, GK-12 Program: From Aquifers to Estuaries - Tracing a drop of water via an interactive program linking UT scientists with K-12 students and teachers, \$1,797,059. Co-principal investigator with K. Dunton, C. Bell, M. Marder, and J. Marshall, 2007-2011.

Guadalupe-Blanco River Authority, Reconstructing Past Climatic Conditions in Central and South Texas Using Tree Rings, \$24,727, 2009-2010.

Texas State Energy Conservation Office, The UT Environmental Science Institute and Alliance to Save Energy, Energy Conservation Projects, \$140,000, 2008-2010.

U.S. Geological Survey, Student Internship Program, \$48,868, 2006-2009.

University of Guam Water and Environment Research Institute. Paleoclimate of the West Pacific Warm Pool. \$41,349. 2009-2010.

National Science Foundation, Instrumentation and Facilities, Acquisition of a thermal ionization mass spectrometer with positive and negative ion capability for geologic research, 2007-2008, \$308,712. Co-Principal Investigator with J. Lassiter, T. Housh, and J. Connelly.

U.S. Department of Education, Towards environmental responsibility: An interdisciplinary approach to undergraduate and graduate education for environmental study in Brazil (in collaboration with Pace University) \$207,828, 2002-2007. Co-Principal Investigator with N. Shumway.

National Science Foundation, Division of Undergraduate Education, Design, construction, and evaluation of a multi-author interactive tutorial for carbonate petrology, 2005-2007, \$149,634, Co-Principal Investigator with K. Milliken and C. Kerans.

National Science Foundation, GK-12 Program, An interactive program linking graduate fellows in environmental science with K-12 students and teachers, \$1.52 M, 2002-2006. Co-Principal Investigator with K. Dunton, I. Dalziel, K. Ellins, and J. Barufaldi.

National Science Foundation, GK-12 Program, Social science and Research Experience for Teachers supplement, \$174,610, 2003-2006. Co-Principal Investigator with K. Dunton, I. Dalziel, K. Ellins, and J. Barufaldi.

National Science Foundation, Geoscience Education Program, Research Experience for Undergraduates Site: Integrated watersheds from urban centers to estuaries, 2006-2009, \$213,534.

National Science Foundation, Water Cycle Initiative, Ecohydrology of semiarid woodlands: Role of woody plants in the water cycle (in collaboration with the Rangeland Ecology Program, Texas A&M University), \$166,335, 2003-2006. Co-Principal Investigator with L. Stern.

Mercyhurst College & Department of Defense, Reconnaissance paleoenvironmental assessment at Fort Hood, Texas using travertine deposits, \$25,000, 2004.

UTOPIA (Digital Knowledge Gateway), UT Research as a Window to the Edwards Aquifer, \$19,466, 2004-2006.

UTOPIA (Digital Knowledge Gateway), Developing Digital Video Profiles of the Outreach Lecture Series Scientists, \$19,562, 2004.

National Science Foundation, Geology and Paleontology Program, A new approach to understanding the timing, rates, and causes of Quaternary soil denudation, \$120,759, 2000-2002. Co-Principal Investigator with L. Stern and C. Bell.

University of Texas Interdisciplinary Research Initiative, A multidisciplinary investigation of environmental signals encoded in marine and freshwater otoliths, \$98,600, 2000-2002. Co-Principal Investigator with J. Brandes, L. Fuiman, and D. Hendrickson.

Department of Energy, Basic Energy Sciences Program, High-resolution temporal variations in groundwater chemistry: Tracing the links between climate, hydrology, and element mobility in the vadose zone, \$488,100, 1997-2001.

National Science Foundation, Hydrologic Sciences Program, Temporal evolution of groundwater in a limestone aquifer: The Pleistocene of Barbados, \$105,200, 1996-2000.

National Science Foundation, Geology and Paleontology Program, Collaborative Research: Interbasinal applications of newly resolved Middle to Late Cambrian Sr isotope stratigraphy: North American Cordilleran margin, \$89,000, 1996-2000.

National Science Foundation, Major Research Instrumentation Program, Acquisition of a high-resolution magnetic-sector inductively coupled plasma mass spectrometer for the University of Texas at Austin, \$229,100, 1998-2000. Co-Principal Investigator with P. Bennett, J. Connelly, and T. Housh

National Science Foundation, Directorate for Education and Human Resources, Graduate Research Traineeships in Hydrology: Role of the hydrological cycle in the coupled Earth system, Co-Principal Investigator with J. Famiglietti, P. Bennett, and J. Sharp, \$537,500, 1994-2000.

National Geographic Society, Paleohydrology of seawater within ancient reefs. Co-Principal Investigator with W. Ward, \$20,000, 1993-1995.

National Science Foundation, Instrumentation and Facilities Program, Upgrading of multicollector, thermal ionization mass spectrometer to ion counting detection. Co-Principal Investigator with N. Walker; \$31,875, 1993-1995.

National Science Foundation, Instrumentation and Facilities Program, Technician support: Multicollector, thermal ionization mass spectrometer laboratory. Co-Principal Investigator with N. Walker, L. Land, F. McDowell, and L. Long, \$81,960, 1991-1995.

National Science Foundation, Geology and Paleontology Program, Collaborative Research: Sequence stratigraphy, third-order accommodation events, and related diagenetic history of the Middle Cambrian Bonanza King Formation, southern Great Basin, \$31,644. 1994-1995.

National Science Foundation, Geology and Paleontology Program, Origin of 'badwater' in carbonate aquifers: Edwards aquifer, Texas. Co-Principal Investigator with J. Sharp, \$94,095, 1992-1994.

American Chemical Society, Petroleum Research Fund, Marine burial diagenesis of carbonate platforms and secular variations in Late Devonian seawater, \$40,000, 1992-1994.

American Chemical Society, Petroleum Research Fund, Undergraduate Research Supplement to above ACS grant, \$3,000, 1992-1994.

National Science Foundation, Geology and Paleontology Program, Origin, evolution and mixing of saline and dilute groundwaters in a regional flow system, Kansas and Missouri, \$107,345, 1991-1993.

## TEACHING

### Undergraduate classes

Current (past five years): Large-enrollment Signature Course, Sustaining a Planet (UGS303), all lectures are webcast and archived through Canvas; Field Seminar in Environmental Science and Sustainability (EVS311), which integrates field exercises across geoscience, biological sciences, marine science, architecture, and engineering; Professional Development in Environmental Science (EVS141); Research Communication (EVS151).

Previous: Environmental Isotope Geochemistry (GEO376E), Sedimentary Rocks (GEO416M), Introduction to Physical and Chemical Hydrogeology (GEO346C), Earth, Wind, and Fire (GEO302E); Bridging Disciplines Forum Seminar in Environmental Change (BDP101), Living with a Planet (GEO302P), Field Methods (GEO660);

### Graduate classes

Current (past five years): Planet Texas 2050 (new Spring 2018), Graduate Seminar in Science Communication (GEO191)

Previous: Environmental Isotope Geochemistry (GEO388H/cross listed with undergraduate GEO376E); Biogenic & Evaporite Depositional Systems (GEO383N), Sedimentary Geochemistry (GEO391), Geologic Records of Environmental Change (GEO391).

### Signature course

Co-developed and co-teach with D. Allen the university's first signature course, Sustaining a Planet, as part of major curriculum reform resulting from Commission of 125 Report. Five field trips are conducted as part of this course.

### Courses developed for new Environmental Science (EVS) degree curriculum

1. Field Seminar in Environmental Science and Sustainability (EVS311). This course integrates the fields of geology, hydrology, ecology, marine science, and sustainable development through weekly field exercises. It is required for the EVS major.
2. Environmental Science Professionalism (EVS141). This course prepares Environmental Science majors for seeking employment in this field and for applying to graduate programs. It is required for the EVS major.

Participant in Plan II Honors *Perspectives* seminar course (TC 125K), Spring, 2010.

### *Curriculum Innovation Grant Project:*

Through a grant from the Provost's Office, I transformed parts of two courses, UGS303 and EVS311, via the development of on-line materials and flipped classroom approaches. 2014-2016.

### *Collaborative Teaching Grant Project:*

Through a grant from the Provost's Office, we assessed the effectiveness of interdisciplinary courses. Marshall et al. (2018) presents the outcomes from this study. 2015-2017.

*Development of New Graduate Training Program.* Led development of a plan for a new interdisciplinary graduate training program on Sustainable Urban Systems, with faculty from seven departments (Geological Sciences, Civil, Architectural and Environmental Engineering, Mechanical Engineering, Geography and the Environment, Architecture, Integrative Biology, and Government). Proposal submitted to NSF Research Traineeship (NRT) Program, February 2021.

## **Students, research associates and other mentoring**

Research Experience for Undergraduates, National Science Foundation and Mitchell Foundation, Principal Investigator or co-PI, 2006-present, Faculty mentor, 2003- present.

*Mentor to the following REU students:* Sarah Pierson, University of Texas, 2003; Elizabeth Copeland, Haverford College, 2004; Brian Cowan, State University of West Georgia, 2005; Vijay Lemaye, 2006, University of California, Berkeley, Ashley Francis, 2007, Baylor University, Elyse Greenburg, 2008, University of Houston, Esther Mandelbaum, 2008, University of Texas, Mark Hagemann, Carelton College, 2009, Selene Castillo, Baylor University, 2009, Diana Zamora, UT El Paso, 2009, Carolyn Ball, University of Florida, 2010, Alyssa Anderson, Middlebury College, 2010, Lisa Duran, St. Mary's University, 2010, Sierra Anseeuw, Beloit College, 2011, Maxwell Cunningham, College of William and Mary, 2011, Ayla Heinze-Frye, University of Massachusetts Amherst, 2011, Jenna Kromann, Texas A&M University, 2011, Barbara Wortham, UT Austin, 2012, Abigail Thayer, Northern Ohio University, 2013; Maxwell Silver, Pacific Lutheran University, 2014; Collin Roland, UT-Austin, 2014; Lindsey Yazbek, Trinity University, 2016; Maya Gilchrist, Northeastern University, 2017; Rosemary Burkhalter-Castro, Eckerd College, 2018; Alessandro Mauceri, Macalester College, 2019; Anna Lowell, Middlebury College, 2019; Hannah Wolf, Trinity University, 2020; Jevon Harding, UT RGV, 2020.

*Program Participants:* This program has involved over 30 faculty mentors from 6 academic units and 107 undergraduate students from 38 universities across the U.S. The program has emphasized participation (40%) by students from underrepresented groups.

### Undergraduate honors theses\* and EVS Capstone research\*\* supervised

- \*\* Rachel Wright, Chronology of Texas speleothems, graduated 5/18.
- \*\* Kara Posso, Geochemistry of drip waters in central Texas caves, graduated 12/17.
- Nathan van Oort, Controls on calcite growth in seasonally-ventilated caves. Graduated 5/13.
- \*\* Barbara Wortham, Improved geochronology for Texas speleothems, Graduated 12/13.
- \*\* Mark Moore, Speleothem calcite growth in Jinapsen Cave, Guam, Graduated 5/14.
- \* Daniel Reyes, Impact of urbanization on spring water. Graduated 5/12.
- \* Kevin Meyer, Speleothems as paleoclimate indicators in central Texas. Graduated 5/12.
- \* Ashley Quinn-Payne, Carbon isotope tracing of ventilation of central Texas caves. Graduated 5/10.
- \* James Pape, Oxygen isotope variations in the hydrologic cycle of the Edwards aquifer. Graduated 12/08.
- \* Lauren Greene, Paleoclimate of the Bahamas region: Implications from speleothem studies. Graduated 5/08.

### Other geoscience and environmental science undergraduate students supervised and supported

Jubal Grubb, Michelle Town, Karen Jarocky, Alka Tripathy, Molly Pierce, Mike Jaffe, Katherine Markovich, Nathan van Oort, Shelby Manford, Hank Star, Taylor Culpepper, Brandon Wallace, Collin Roland, Kiera Brown, Emma Heitmann, Mitchell Pham, Nayoung Hur, Ariana Nehrass, Emily Mihm, Savannah Atchley, Frances Stum, and Lauren McCosky.



Advisor to undergraduate students Connecting Experience for the Bridging Disciplines Program in the Environment

Kristin Goddard, Research on geochemistry of Honey Creek, Fall 2004

James Pape, Research on oxygen isotope ratios in cave groundwater, Spring 2007

Jacob Bintliff, UT Campus Environmental Center Internship, Spring 2007; Environmental Action Coordinator for GEO 302P Internship, Fall 2007

Erika Baylor, Potts and Reilly, L.L.P. Internship, Summer 2007

Bijal Mehta, Division of Housing and Food Services - Sustainable Food Internship, Spring 2009

Liz McConnell, W&M Environmental Group, Inc. Internship, Summer 2009

Rachel Aitkens, UT Campus Environmental Center Director Internship, Spring 2011

Brandon Wallace, Hot Science – Cool Talks, Spring 2012

Mentor for Research Experience for Teachers, National Science Foundation

Christine Mihealsick, Science teacher, Crockett High School, Austin, TX, 2004.

Theresa Rocha, Science teacher, Harmony Science Academy, Austin, TX, 2009.

Greg Wenderski, Trinity Episcopal School, Austin, TX, 2011.

Faculty Advisor to student group, the Geological Energy and Environmental Leadership Organization), 2012-2013.

Master's students supervised

Lillian Beaman, Temporal evolution of infrastructure failure impacts on stream water quality, graduation expected 5/22.

Hunter Manlove, Geochemical evolution of streamwater in urbanized watersheds, graduated 12/20.

Kendra Bunnell, Assessment of speleothems as records of extreme climate events, graduated 5/19.

Lakin Beal, Impacts of urbanization on stream water quality, graduated 8/19.

Christina James, Texas paleoclimate during the deglacial period, graduated 8/17.

Timothy Charlton, graduated 8/16, Deglacial climate change in Texas reconstructed from speleothem proxies. Co-supervised with D. Breecker.

Michelle Hulewicz, graduated 8/15, Geochemistry of drip water in central Texas karst.

Rosemary Hatch, graduated 12/14, Trace element partitioning in modern karst hydrologic systems.

Jeffrey Senison, graduated 8/14, Impacts of urbanization on the Bull Creek watershed, Austin, TX.

Jonathan Sntatic, graduated 5/13, Tracing urbanization impacts in north Austin watersheds. Co-supervised with J. Sharp, Jr.

Kyle Meyer, graduated 8/12, Isotope fractionation in karst systems. Co-supervised with D. Breecker.

Richard Casteel, graduated 8/11, High resolution analysis of environmental change recorded in speleothems of the Edwards aquifer.

Brian Cowan graduated 5/10, Mechanisms of cave ventilation: Insights from central Texas karst.

Corinne Wong, graduated 12/08, Physical and chemical responses of vadose zone dripwater to environmental change.

Laura DeMott, graduated 8/07, Evaluating travertine deposits as records of urbanization.

Amber Guilfoyle, graduated 8/06. Evaluating stable isotopes as environmental proxies in Quaternary speleothems via calibration studies in modern environments

Brad Garner, graduated 12/05. Geochemical evolution of groundwater in the Barton Springs segment of the Edwards aquifer.

Meredith Guhl, graduated 5/04. Origin of evaporites of the Jurassic Todilto Formation, New Mexico (co-advised with G. Kocurek).

Benjamin Pursell, graduated 12/97. Petrographic and geochemical investigation of cyclic marine platform carbonates, Triassic Latemar Fm.

Milton H. Kwong, graduated 12/95. Fluid inclusion salinities in marine calcite cements from Devonian reef complexes, Western Australia: Implications for paleohydrology of seawater in ancient reefs.

Gregg C. Oetting, graduated 8/95, Evolution of fresh and saline groundwaters in the Edwards aquifer, central Texas: Geochemical and isotopic constraints on processes of fluid-rock interaction and fluid mixing.

MaryLynn Musgrove, graduated 5/93, Origin, evolution, and mixing of saline groundwaters in three regional flow systems, midcontinent, USA.

Ph.D. students supervised

Natasha Sekhon, Speleothem proxy system models, graduation expected 8/21, co-supervised with D. Breecker.

Peter Carlson, Carbon transport and sources in karst, graduated 8/18, co-supervised with D. Breecker. Carlson is a Geospatial Engineer with the Climate Corporation.

Corinne Wong, Tracing groundwater in the Barton Springs segment of the Edwards aquifer, graduated 8/13. Wong was a Univ. of California Presidential Postdoctoral Fellow and joined the faculty of Boston College in January 2015.

Seay Nance, Regional groundwater geochemistry of the western part of the Edwards aquifer, graduated 8/10. Co-supervised with J. Sharp, Jr. Nance was a Research Associate at the Bureau of Economic Geology at UT-Austin (now deceased).

Rosario Vasquez-Scheerhorn, Origin and evolution of groundwater in large-scale flow systems, midcontinent, USA, graduated 8/05. Vasquez-Scheerhorn is a petroleum geologist with Chevron, Inc.

Patrick Mickler, Geochronology and geochemistry of speleothems from the Pleistocene limestone aquifer of Barbados: Implications for climate change in the tropics, graduated 5/04. (Co-advised with L. Stern). Mickler is a Research Associate at the Bureau of Economic Geology at UT-Austin.

MaryLynn Musgrove, Groundwater evolution and climate change in central Texas aquifers: Constraints from speleothem studies, graduated 5/01. Musgrove was a postdoctoral fellow at Harvard University from 2001-2004, and is now a physical scientist with the U.S. Geological Survey.

Ian C. Jones, Geochemical and physical modeling of the Pleistocene limestone aquifer of Barbados, W.I., graduated 5/03. Jones is a hydrologist with the Texas Water Development Board.

Mary Jennifer Cooke, Evolution of soils on the Edwards Plateau, graduated 12/05. (Co-advised with L. Stern). Cooke has been a Lecturer at the University of Texas at Austin and Austin Community College.

#### Post-doctoral Fellows and Research Scientist Associates

Dr. Darrel Tremaine, 2019 – present; Dr. Alexandra Noronha, 2014-present; Dr. Benjamin Hardt, 2010-2012; Dr. Zhaoping Yang, Manager, MC-ICP-MS laboratory, 2010-2012; Dr. Allison Koleszar, Manager, MC-ICP-MS laboratory, 2013-present; Dr. Weimin Feng, 2008 – 2011; Dr. Judson Partin, 2008 – 2010; Dr. Eric James, 1998 - present; Dr. Lawrence Mack, 1996 - 2010; Dr. W. Bruce Ward, 1993-1996; Dr. MaryLynn Musgrove, 2004 – 2005; Dr. Daniel Sinclair, 2005 - 2007.

#### Visiting Faculty and Scientists

MaryLynn Musgrove, Physical Scientist at US Geological Survey, 2011 - present; Robert Dull, 2012 - present; Isabel P. Montañez, Professor, University of California at Davis, National Science Foundation Visiting Professorship for Women, 1996-1997. Dr. Jing Li, Chinese University of Geosciences, 2015-2016.

## **SERVICE**

### **Planet Texas 2050 Research Initiative**

Member of the Theme Organizing Committee that is directing the development of this research initiative as part of UT Austin's Bridging Barriers program. The [Bridging Barriers research initiative](#) addresses some of the most challenging questions in the natural and human-made world. Planet Texas 2050 is the first research theme selected under this initiative. 2017-present.

### **Environmental Science Institute (ESI) Education, Research and Community Engagement Initiatives**

Founding director of organized research unit that fosters interdisciplinary research, education, and outreach in environmental science. This institute comprises over 140 affiliated faculty from 24 academic and research units, develops new degree and portfolio programs, and STEM outreach initiatives. External grants to ESI total over \$21M. 2000 - present.

<http://www.esi.utexas.edu/>. Through this institute, the following initiatives have been developed.

*BS ES degree program.* Chaired committee that developed UT-Austin's first Environmental Science B.S. degree plan, which received approval from the Texas Higher Education Coordinating Board in October, 2010. This interdisciplinary degree plan is a collaboration between three colleges/schools: Geosciences, Natural Sciences, and Liberal Arts.

<http://www.esi.utexas.edu/education/undergraduate-students/evs-program/>

*Texas Water Research Network.* The Texas Water Research Network provides a forum and encouragement for research about water science, management, and policy. Solutions to

Texas' water challenges will be addressed through new knowledge, innovative approaches, as well as through the synthesis of existing knowledge. The network membership includes researchers from more than ten universities in Texas and in other water-stressed regions. <http://www.esi.utexas.edu/research/texas-water-research-network/>. 2015 – present.

*Co-authored Education Report to Mitchell Foundation*, outlining plans for revision of UT curriculum to incorporate sustainability into undergraduate and graduate teaching. This report led to the development of the B.A. degree program in Sustainability Studies, 2012 – 2015.

*Research Experience for Undergraduates and Teachers Program*. Principal investigator (PI) on National Science Foundation program involving students from institutions across U.S. and local K-12 science teachers. Over 55 undergraduate student participants supported and trained in research approaches to global change and its impacts; PI 2006 – 2014, co-PI, 2014 – present; <http://www.esi.utexas.edu/education/summer-research-experience-for-undergraduates-reu/>. More information on participants is given below.

*GK12/Scientist in Residence Program*: Co-PI on NSF graduate student training grant that partners graduate fellows with K-12 teachers to develop innovative science learning activities. During this project, over 65 graduate students and over 80 K-12 teachers have been supported and trained, 2003- 2020. <http://www.esi.utexas.edu/outreach/scientist-in-residence-program/>

*Graduate Portfolio Plan in Watershed Studies*, Led (2005-2011) and serve on (2011-2018) faculty panel in developing an interdisciplinary approach to water issues by integrating existing resources throughout UT-Austin through a certificate program designed to supplement existing UT degree programs. <http://www.esi.utexas.edu/education/graduate-students/integrated-watershed-studies/>

*Invited participant, UT-Austin DIIA Critical Thinking Project*, funded by Texas Higher Education Coordinating Board. Development of learning modules for signature course faculty to incorporate critical thinking concepts and exercises in to their courses.

*Sustainability and Business Speaker Series*, Established and directed series that featured speakers from Dell, Goldman-Sachs, and Wal-Mart, and the Mayor of Austin. Co-sponsored by the McCombs School of Business and the Environmental Science Institute, 2006-2007.

*Hot Science – Cool Talks Outreach Series*: Co-established and direct the ESI-Jackson School-Natural Science's *Hot Science – Cool Talks* Outreach Series, which brings university research to the public, UT community, and K-12 teachers, in eight Austin-area independent school districts and beyond via live and archived webcasts and other digital educational materials. 1999 - present. 123 events have been produced to date. Approximately 2,500 people attend these events each year. [www.esi.utexas.edu/k-12-a-the-community/hot-science-cool-talks](http://www.esi.utexas.edu/k-12-a-the-community/hot-science-cool-talks). New initiatives have developed from this series, including *Hot Science – At Home*, a livestream event series created in 2020 to accommodate COVID-19 restrictions, and *Hot Science*, a developing TV series with S. Rice, a filmmaker from the Moody College of Communications (2019-present).

### **State, National, and International Service**

Convener, NSF Sustainable Urban Systems Workshop: Challenges to and Opportunities for Developing Resilience in Rapidly Growing Urban Corridors in Semi-Arid Regions. Led

national workshop and follow up reports and publications with 45 participants from 15 academic institutions and stakeholders from 12 non-profit and governmental organizations. Austin, TX, August 22-24, 2019.

Invited participant, Fourth National Climate Assessment, South Great Plains Region, U.S. Global Change Research Program, 2016 – 2018.

Co-convenor and Planning Committee, The Karst Record - 8 Conference, hosted by the Jackson School of Geosciences, May 20-25, 2017. International conference, held for the first time in the US, convening approximately 150 scientists from 20 countries.

Texas Water Research Network. Organize and lead over 40 researchers and stakeholders from 15 institutions (Texas, Oklahoma, Arizona, New York and California) to address water sustainability in Texas. 2015 – present.

Session coordinator on The Karst Record in Water-Limited Environments, American Geophysical Union Annual Meeting, 2015.

Theme team member for organizing sessions for 2014 V. M. Goldschmidt Conference, 2013.

Review panel: National Science Foundation Paleoclimate Perspectives on Climate Change Program, 2013-14.

Member of board to prepare first examination for Board Certified Environmental Scientists, American Association of Environmental Scientists and Engineers, 2012.

Review panel: National Science Foundation Carbon and Water in the Earth System Initiative, 2006.

Review panel: National Science Foundation GK-12 program, 2004.

Review panel: Department of Energy, Environmental Management Program, 1996.

Session leader and lead author, Future Directions in Karst Research workshop, Karst Waters Institute, 2007.

Organizing Technical Committee member, Climate Change - The Karst Record, June 27-30, 2011; Birmingham, UK.

Abstracts Committee member, 11<sup>th</sup> Bathurst Meeting on Carbonates, Cambridge, UK, 1999.

Invited participant, National Science Foundation Workshops on Terrestrial Earth System History (1996) and Low Temperature Geochemistry (1999).

Technical Committee member, Society for Sedimentary Geology (SEPM) Research Conference on Fluid Flow in Carbonates, 1998.

Earth and Sky (National Radio Program) Science Advisors, 2000 – present.

Symposia and field trips organized at conferences:

Field trip for 2008 GSA Annual Meeting, Geomorphic and Hydrochemical History of the Edwards Aquifer at Inner Space Cavern

Assessment of speleothem paleoenvironment proxies using studies in modern karst systems, GSA Annual Meeting, Houston, TX, 2008.

Speleothems as indicators of hydrologic, climatic, and biological processes, 11<sup>th</sup> Bathurst Meeting on Carbonates, 1999.

Geochemical record of hydrologic response to climate change, Geochemical Society Symposium, Annual meeting of Geological Society of America, 1997.

Field trip for 1996 GSA South-Central Section: Cretaceous cyclic platform carbonates of central Texas.

Application of trace element and isotopic composition of modern pore fluids to studies of carbonate diagenesis, Amer. Assoc. Petroleum Geologists Annual Meeting, 1993.

*Reviewer of grant proposals:*

National Science Foundation Programs: Paleoclimate Perspectives on Climate Change; Geoinformatics Program; Sedimentary Geology and Paleobiology; Geology and Paleontology; Climate Dynamics; Tectonics; Petrology and Geochemistry; Academic Research Infrastructure; Hydrologic Sciences; Instrumentation and Facilities; Marine Geology & Geophysics; Polar Programs, Chemical Oceanography.

Department of Energy; American Chemical Society; NSERC (Canada); Israel National Science Foundation; Louisiana Board of Regents; Research Council for Earth and Life Sciences in the Netherlands

*Reviewer of journal articles:*

Nature, Science, Geophysical Research Letters, Earth and Planetary Science Letters, Geology, Geochimica et Cosmochimica Acta, Journal of Sedimentary Research, Geological Society of America Bulletin, Chemical Geology, Environmental Earth Sciences, G-Cubed, Geofluids, Proceedings of the National Academy of Sciences.

*External promotion and tenure review:* For numerous universities.

**University Service**

Academy of Distinguished Teachers Steering Committee, 2013 – 2018.

Undergraduate Studies Faculty Advisory Committee, 2014 – 2019.

Council for Racial and Ethnic Equity and Diversity, 2016 – 2017.

<https://provost.utexas.edu/faculty-affairs/council-racial-and-ethnic-equity-and-diversity>

Faculty Search Committee, Department of Civil, Architectural & Environmental Engineering, 2015-2016 and 2016-2017 (two searches).

Faculty Search Committee, Department of Geological Sciences and Planet Texas 2050, 2018-2019.

Faculty Advisory Committee on Budgets, 2013- 2015.

University Green Fee Committee. This committee formed in December 2010 to develop, implement and administer the use of the funds from this new student fee for campus sustainability projects; solicits, reviews and awards \$500,00/year for campus sustainability projects. Appointed by Provost as the faculty representative to this committee. 2010 - 2017.

New Faculty Symposium. Led workshop on engagement in teaching for new UT Austin faculty, 2015

UT Austin presidential search, member, faculty sub-committee, 2014-2015.

School of Undergraduate Studies Dean Search Consultative Committee, This committee is consultative to Provost and President for selecting new dean for this school, 2012-2013.

Bridging Disciplines Program in The Environment Faculty Panel, This program supports students in developing skills to collaborate across disciplines and cultures. *The Environment* is one of eight concentration areas in this program. The Faculty Panel built the curriculum, reviews applications to the program, and reviews student progress. 2004-present.

Texas Interdisciplinary Program Faculty Panel. This faculty panel is advisory to the Texas IP program, which was created for Liberal Arts and Natural Science students. It is a six-course interdisciplinary plan rooted in a critical thinking, writing, and a capstone project. 2006-2013.

Texas Regional Collaboratives (TRC) Advisory Board, 2012-2017.

Division of Instructional Innovation and Assessment, Faculty Advisory Council, 2008 - 2010.  
International Undergraduate Degree Working Group, This group is advisory to the Office of the Executive Vice President and Provost's Initiative for International Studies. 2007.

Pre-Graduate School Intellectual Entrepreneurship Internship, Faculty Advisory panel. 2006-2007.

Campus sustainability committee. This is a campus-wide committee comprised of faculty, students and staff to explore and recommend ways to make UT's campus more sustainable. 2004-2007.

President's Sustainability Task Force and Steering Committee. This task force was appointed by UT-Austin's president to explore and recommend ways to promote sustainability in education, research, and campus operations. 2007-2019.

Moderator, Panel on Climate Change, McCombs School - Net Impact Summit on Sustainable Business

Texas Teaching Excellence Awards Selection Committee, Texas-Exes Association, 2003-2004.

University Recreational Sports Committee, 1996- 1998; Admissions and Registration Committee, 1998-1999.

Elected to University Council (1995) and Faculty Council (1995, 1997), University of Texas.  
Service Learning Committee, 2004 - 2005.

Chair, Colleges of Natural Sciences and Liberal Arts Environmental Studies Institute Task Force, 1998-99.

Chair, Faculty Search Committee, 1998.

University Recreational Sports Committee, 1996- 1998; Admissions and Registration Committee, 1998-1999.

Junior Honors Colloquium, 1996, 2002, 2003, 2004, 2005. Present lecture to top high school juniors in Texas during two day recruiting visit to UT.

College of Natural Sciences Honors Committee, 1995 - 1996.

Texas Teaching Excellence Awards Committee, Texas-Exes Association, 2003-2004.

### **Departmental and School Service**

Peer teaching observation and assessment for a number of faculty members, 2010 – present.

Mass spectrometry facilities. Co-direct (with J. Lassiter) two instrument laboratories and associated clean laboratories - thermal ionization MS, *Nu-Plasma 3D* ICP-MS (second of its kind built, acquired through an NSF IF grant, and installed in 2018). These facilities provide standard and new isotopic analytical capabilities. Since 2019, these facilities have served UT students (13) and faculty/researchers (12) and external students (4) and faculty/researchers (10).

EVS Faculty Committee, Oversee curriculum, student petitions etc. for B.S. in Environmental Science (EVS) degrees, 2011 – present.

EVS Admissions Committee, Oversee admissions into EVS degree program, 2011 – present.  
Jackson School Diversity and Inclusion Committee, 2016 – 2017.  
Faculty Search Committee, 2014-2015 and 2016-2017 (two searches).  
Chair, EVS Scholars Committee, oversee application, review and awarding of NSF scholarships for EVS students with financial need, 2012 – 2018.  
Jackson School Equipment Committee: 2005 – 2012.  
Chair, Technical Sessions and Departmental Visiting Lectureship Committee, 1991-1994.  
Jackson School Strategic Planning Council: 2006 – 2010.  
Jackson School Education and Outreach Committee: 2005 – 2009.  
Other departmental committees served on since 1996: Numerous Promotion and Tenure and post-tenure review subcommittees, Equipment Committee, Faculty Search Committee (chair), Strategic Planning Committee, Strategic Planning Implementation Committee, New Directions Task Force (chair), Research Scientist Review Committee, ICP-MS Search Committee (chair), Thermal Ionization MS Search Committee, Faculty Climate Theme Search Committee.

*University and departmental symposia organized or co-organized:*

Coupled interactions between the atmosphere ocean and land systems: Past, present and future, 1997.  
Integrated life and Earth science approaches to understanding global and environmental change, 1999.  
The Edwards Aquifer, 2001.  
Water for the Mexico-Texas Borderlands: Challenges for Future Research, 2002.  
Integrated Watershed Sciences, 2003.  
Abrupt Climate Change, 2005.  
Climate Change Studies at UT-Austin, 2010.

**State and Local Community Service (in addition to outreach activities described above)**

State legislative testimony. Testified on bills on a Climate Adaptation Plan for Texas, 2009, 2011, 2015, and 2017.  
Consultation with Texas State Representatives and staff, regarding interfacing scientific expertise with legislative initiatives, 2019-present.  
Participant in Austin Climate Protection Program, Community Climate Action Planning Workshop/Charrette, March 2010.  
Leader of Panel on Regional Climate Change Projections and Impacts, at Climate Resilience and Adaptation Strategies: A Capital Area Symposium, October 4, 2013.  
Co-leader, field trips for Texas Section of the Association of Engineering Geologists, and OnRamps Geoscience teachers, 2017.

**MEDIA COVERAGE**

Bull Creek fed in part by Austin-area wastewater pipes, UT report finds, May 29, 2020.  
[CBS-TV story](#), [KXAN-TV story](#).  
Cover story, Austin American Statesman: A Warmer Austin: The Future is Here, February 21, 2020 ([Article](#))



Austin American Statesman cover story, February 23, 2019

<https://stories.usatodaynetwork.com/2020-vision-austin/a-warmer-austin-the-future-is-here/site/statesman.com/>

Interview for Spectrum News on Amazon rain forest fires. August 23, 2019

<https://spectrumlocalnews.com/tx/austin/news/2019/08/24/ut-austin-professor-talks-impact-of-amazon-rainforest-fires#>

Interview for KLRU (PBS) TV episode of *Decibel* on “Austin’s Water Pressures”, aired April 26, 2019.

<https://video.klru.tv/video/decibel-austins-water-pressures-afj8hg/>

New York Times stories on Fourth National Climate Assessment, November 2018.

<https://www.nytimes.com/2018/11/23/climate/us-climate-report.html>

<https://www.nytimes.com/2018/11/25/climate/trump-climate-report.html?searchResultPosition=5>

Interview for Spectrum News on National Climate Assessment, November 26, 2018.

<http://spectrumlocalnews.com/tx/austin/news/2018/11/27/new-climate-report-predicts-directions-for-texas->

NPR-affiliate KUT radio show *Eklektikos*, numerous segments on *Hot Science – Cool Talks*, 2015-2019.

KEYE TV, Segment on *Hot Science – Cool Talks*, October 6, 2014.

Austin-American Statesman article on new Ciencias Caliente STEM outreach program,

[http://www.mystatesman.com/news/news/local-education/ut-researchers-hit-classrooms-to-promote-sciences-/nf62L/?icmp=statesman\\_internallink\\_invitationbox\\_apr2013\\_statesmanstbtomystatesmanpremium#8f89d506.3512575.735379](http://www.mystatesman.com/news/news/local-education/ut-researchers-hit-classrooms-to-promote-sciences-/nf62L/?icmp=statesman_internallink_invitationbox_apr2013_statesmanstbtomystatesmanpremium#8f89d506.3512575.735379), May 24, 2014.

National Public Radio feature on Banner group cave research, “For Clues to Texas’ Climate Future, Scientists Look Deep Underground”

<https://stateimpact.npr.org/texas/2014/02/06/scientists-look-deep-underground-for-clues-to-texas-climate-future/>. February 6, 2014.

Interviewed for PBS Series "Thirst", air date 1/30/14, on KLRU-TV.

Cover story, [Environmental Engineer and Scientist](#), “Less is more: Jay Banner finds balance in teaching and research”, v. 49, no. 4, 2013.

“Day Job” on the GAC TV Network. Appearance as guest expert on caves. Season 2, Episode 1.

Austin Culture Map, 2013, “Hot Science - Cool Talks series sparks interest for the whole family”, November 20, 2013. <http://austin.culturemap.com/news/innovation/11-20-13-spark-your-curiosity-at-uts-hot-science-cool-talks-lecture-series/#slide=0>

Lead article in Austin American Statesman, “When the water runs dry”, features Cleveland et al. (2011) publication in discussing record of past droughts in Texas, October 6, 2013.

Telemundo interview on climate change and drought in Texas, March 2013,

KTBC Fox 7 - Good Day Austin. Segment on *Hot Science – Cool Talks*, January, 2012.

Longhorn Network vignette on EVS311 course,

<https://video.search.yahoo.com/yhs/search?fr=yhs-Lkry-newtab&hsimp=yhs->

[newtab&hspart=Lkry&p=Longhorn+Network+vignette+jay+banner#id=1&vid=cf3543c2251fe0d034e49190df290053&action=click](http://www.kutv.com/story/news/local/2011/11/01/day-job-on-the-gac-tv-network-1.1000000)

KTBC Fox 7 - Good Day Austin. Segment on Texas drought, November, 2011. "Day Job" on the GAC TV Network. Appearance as guest expert on caves. Season 2, Episode 1.

Article in Austin American Statesman, "Green Shift", January 30, 2011.

Article in Cosmopolitan magazine on how to live green, April, 2010.

Article in Austin American Statesman, "A&M scientist to talk about global warming in Austin", December 11, 2009.

Article in Austin-American Statesman, "Federal stimulus program a windfall for Texas higher education", August 23, 2009.

Interview on KUT, "Tracking Texas Droughts"

Interview by Pocono Business Journal: "Pace yourself, you need Earth's resources to do business", Pocono Business Journal, April 2009, p. 18.

Article in Austin-American Statesman, "UT prof unearths clues about climate in caves", July 8, 2008, p. B1.

Interview for EarthSky film on Sustainability and Corporations "Why Corporations Should Go Green", 2008.

Interview on global warming on ABC affiliate KVUE-TV, 2005.

Feature story on Banner group research on paleoclimate, on NBC affiliate KXAN-TV, 2003.

### **INVITED LECTURES AND PANEL PRESENTATIONS**

Climate Change Impacts on Water Resources: Science and Policy, Current Issues in the Practice of Geoscience, National Continuing Education webinar, February 26, 2021.

How has Texas climate changed in the past and what will happen in the future? Texas Climate Youth Corps, sponsored by Representative G. Hinojosa, February 10, 2021.

Climate change impacts on water resources: An example from Texas, American Association of Environmental Engineers and Scientists, January 27, 2021.

Unprecedented drought challenges for Texas water resources in a changing climate. UT Osher Lifelong Learning Institute, January 19, 2021.

Past, present, and future droughts: What are the impacts? Dell Medical School Health Sciences Summer Camp, August 6, 2020.

Past, present, and future climate change impacts on Texas: Science and policy, UT Hemispheres seminar, June 12, 2020.

Past, present, and future climate change impacts on Texas: Science and policy. Staff of Representative G. Hinojosa, State Capitol, March 2, 2020.

Past, present, and future climate change impacts on Texas water: Science and policy. Invited presentation to the Global Citizenship & Human Rights Faculty Learning Community, Austin Community College, February 21, 2020.

Past, present, and future climate change impacts on Texas water: Science and policy. Physics Colloquium, UT Austin, February 12, 2020.

Planet Texas 2050. Town Hall presentation to Dow Chemical, Lake Jackson, TX, November 21, 2019.

Planet Texas 2050 – Past, present, and future climate change impacts on Texas water. The Sierra Club, Austin, TX, October 8, 2019.

Planet Texas 2050 – Past, present, and future climate change impacts on Texas water. Osher Lifelong Learning Institute, September 30, 2019.

Climate change & urbanization impacts on central Texas karst water resources, Keynote address to Barton Springs University 2019, September 17, 2019.

The Ultimate Classified Ad. *Testify* (a monthly storytelling show at the Spider House Ballroom, Austin, TX), August 29, 2019.

Addressing the challenges to the resilience of 20th-century Texas: Planet Texas 2050. Texas Exes Past Presidents Luncheon, Houston, TX, June 19, 2019.

Planet Texas 2050 – Past, present, and future climate change impacts on Texas water. U.S. State Department Media Tour, July 18, 2019.

Climate change and urbanization impacts on Texas water. 14th Annual Environmental and Water Resources Institute Continuing Education Workshop, June 5, 2019

Planet Texas 2050: Addressing the challenges to Texas’ 21<sup>st</sup> century resilience. McCombs Undergraduate Business Council, April 29, 2019.

Planet Texas 2050. EarthX, Dallas, TX, April 28, 2019.

From Hot Science – Cool Talks to Hot Science TV. EarthX, Dallas, TX, April 27, 2019.

Past, Present, and Future Climate Change Impacts on Texas Water: Science and Policy. School of the Earth, Ocean and Environment, University of South Carolina, March 29, 2019.

Texas climate change and resilience. AIR Worldwide - Envision 2019 (Conference of catastrophe modeling industry), Austin, TX, April 10, 2019.

Past, Present, and Future Climate Change Impacts on Texas Water: Implications for Barton Springs. Save Barton Creek Association, March 10, 2019.

Planet Texas 2050 – ExxonMobil, Houston, TX, November, 2018.

Past, Present, and Future Climate Change Impacts on Texas’ Resiliency. St. Stephens School Sustainability Summit, October, 2018.

Past, Present, and Future Climate Change Impacts on Texas’ Resiliency. National Academy of Sciences Workshop at the Austin Film Festival, October, 2018.

Climate Change, The Edwards Aquifer, and Barton Springs. Barton Springs University, October, 2018.

Past, Present, and Future Climate Change Impacts on Texas Water: Science and Policy. UT Tower Fellows Program, October, 2018.

Planet Texas 2050: Impacts of Urbanization on Water Resources. Energy Journalism Workshop, September, 2018.

Climate Change Impacts on Texas Water: Science, Policy, and Clues from Inner Space Cavern. Senior University, Georgetown, TX, September, 2018.

Climate Change Impacts on Texas Water: Science and Policy. Mensa Lonestar Regional Conference, September, 2018.

Teaching Climate Change. Difficult Dialogues/Planet Texas 2050 Teaching Workshop, August, 2018.

Fear and Loathing and Loving Chemistry. *Testify* (a monthly storytelling show at the Spider House Ballroom, Austin, TX), August, 2018.

Weather, Climate and Texas: Science and Policy. Central Texas Ballooning Association, August, 2018.

Climate Change Impacts on Texas Water: Science and Policy. Austin Life Member Chapter of the Central Texas Section of the Institute of Electrical and Electronic Engineers, June, 2018.

STEM education initiatives in UT's Environmental Science Institute. STEM Education Research at UT Symposium, April, 2018.

Planet Texas 2050. UT Energy Symposium, April, 2018.

Past, Present, and Future Climate Change Impacts on Water in a Semi-Arid Region: Science and Policy. University of Texas Rio Grande Valley, April, 2018.

Past, Present, and Future Climate Change Impacts on Water in a Semi-Arid Region: Science and Policy. Texas A&M University Kingsville, April, 2018.

Past, Present, and Future Climate Change Impacts on Water in a Semi-Arid Region: Science and Policy. Austin Branch of the American Association of University Women, April, 2018.

Past, Present, and Future Climate Change Impacts on Water in a Semi-Arid Region: Science and Policy. 3rd Annual South Texas Water and Waste Water Managers/Directors Regional Conference, Eagle Pass, TX, February, 2018.

Past, Present, and Future Climate Change Impacts on Water in a Semi-Arid Region: Science and Policy. University of Texas at San Antonio, September, 2017.

Climate and Water. Energy Journalism Workshop, September 2017.

Climate change impacts on Texas water: Science and policy, University of Texas at Arlington, June, 2017.

Climate change impacts on Texas water: Science and policy, Texas Section American Water Works Association, June, 2017.

Austin Diplomacy Forum, Climate change: Challenges, certainties, reasons for optimism, and reasons for pessimism. Austin Diplomacy Forum, January 2017.

Why are Hot Science – Cool Talkers Cool, Delta Kappa Gamma International Women educators group. Founded in 1929 by women UT professors. October 2016.

Climate and Water, Energy Journalism Workshop, January 2016.

Global change impacts on karst aquifers. Evolution Education Symposium, Evolution 2016: Joint conference of the American Society of Naturalists, the Society for the Study of Evolution, and the Society of Systematic Biologists, June 17, 2016.

Carbon dioxide: Facts, myths, reasons for optimism, and reasons for pessimism. Air and Waste Management Association, Central Texas Chapter, May, 2016.

Past, present and future climate change in Texas and environmental education. St. Stephens School, April, 2016.

Inner Space Cavern: Its discovery and the study of its environmental and biological archives, Austin Geological Society, March, 2016.

Climate change and water in a semi-arid environment, Sierra Club, Central Texas Chapter, February, 2016.

Past, Present, and Future Climate Change Impacts on Water in a Semi-Arid Region: Science and Policy. UT Energy Journalism Workshop, January 2016.

First Unitarian Universalist Church of Austin, Past, Present, and Future Climate Change Impacts on Water in Texas: Science and Policy, November, 2015

Arizona State University, The AAEEES 2015 Kappe Lecture, Past, Present, and Future Climate Change Impacts on Water in a Semi-Arid Region: Science and Policy, November, 2015.

Clemson University. The AAEEES 2015 Kappe Lecture, Past, Present, and Future  
Climate Change Impacts on Water in a Semi-Arid Region: Science and Policy, October,  
2015.

Washington University. The AAEEES 2015 Kappe Lecture, Past, Present, and Future  
Climate Change Impacts on Water in a Semi-Arid Region: Science and Policy, October,  
2015.

University of Arkansas. The AAEEES 2015 Kappe Lecture, Past, Present, and Future  
Climate Change Impacts on Water in a Semi-Arid Region: Science and Policy, October,  
2015.

Barton Springs University: 21<sup>st</sup> Century challenges for Barton Springs & the Edwards aquifer,  
September, 2015.

Center for Inquiry Austin, Past, Present, and Future Texas Climate Change: Science and Policy,  
June, 2015.

Williamson County Master Naturalists, Past, Present, and Future Texas Climate Change: Science  
and Policy, August, 2015.

Austin Faith Energy Action Team, Past, Present, and Future Texas Climate Change: Science and  
Policy, March, 2015.

UT Energy Symposium, Past, Present, and Future Texas Climate Change: Science and Policy,  
March, 2015.

Osher Lifelong Learning Institute – SAGE, Past, Present, and Future Texas Climate Change:  
Science and Policy, February, 2015.

Austin Forum on Diplomacy and Statecraft, Climate Change and Security, January, 2015.

Engineers Without Borders - Greater Austin Chapter, Texas Climate Change: Past, Present and  
Future, September 2014.

Retired Faculty-Staff Association, Texas Climate Change, May, 2014.

University United Methodist Church, Austin, Climate Change: Science and Policy, April 2014.

Commencement speaker, Jackson School of Geosciences Graduation, Austin, December, 2013.

Air and Waste Management Association Central Texas Chapter, Past, Present, and Future Climate  
Change in Texas: Science, Impacts, and Policy, Austin, November, 2013.

Keynote address at *High Resolution Climate Proxy Workshop*, Speleothems as high resolution  
climate proxies – Prospects from monitoring, imaging and geochemistry, Madison,  
Wisconsin, June, 2013.

Georgia Institute of Technology, Climate Change: Science and Policy, June, 2013.

University of California, Davis, Climate Change Impacts on Texas Water: Past, Present and  
Future, May, 2013.

University of Wisconsin, Madison, Climate Change Impacts on Texas Water: Past, Present and  
Future, March, 2013

University of California, Irvine, Texas Climate Change: Science and Policy, February, 2013

Invited Panelist, “Local Leaders: Climate, Energy and Policy in Austin and Beyond”, American  
Meteorological Society Annual Meeting, Austin, TX, January 8, 2013.

Querencia learning program, January 3, 2013

Austin Rotary Club, December, 2012

UT GEELO, October 24, 2012

UT LAMP, Osher Lifelong Learning Institute, October 4, 2012

UT Odyssey Continuing Education, September 19, 2012

South Austin Rotary Club, September 5, 2012

EarthLabs Teacher Workshop, UT Institute for Geophysics, June 13, 2012

National Park Service Climate Friendly Parks workshop, San Antonio, TX, April 17, 2012.  
Climate and paleoclimate change and impacts on Texas.

University of Texas at Arlington, March 1, 2012. Climate Change Impacts on Texas Water: Past, Present and Future, Arlington, Texas.

First Texas Water Forum, University of Texas, Austin TX, February 13, 2012. The potential for reconstruction of past climate of Texas,

Drought Preparedness Council, Department of Public Safety, Austin, TX, February 9, 2012.  
Climate and paleoclimate change, water change, and policy in Texas.

American Astronomical Society Annual Meeting, Austin, TX January 11, 2012. Teaching climate change.

Climate and paleoclimate change, water change, and policy in Texas. Sam Houston State University, November 10, 2011, Huntsville.

Southwestern University, November 7, 2011. Climate change and water change in Texas: Science and policy, Georgetown, Texas.

Climate change, water change, and policy in Texas. National Consortium of Specialized Secondary Schools in Mathematics, Science, and Technology, Keynote lecture, October 28, 2011, Austin, Texas.

Climate change impacts on Texas water: Past, present and future. Climate Change Law course, UT-Austin School of Law, July 27, 2011.

Climate Change and its Impact on Texas Water: Reconstructing the Past and Planning for the Future. Farmers and Lake Interests Conference, Lakeway, TX, April 25, 2011.

Testimony to Texas Legislature, House Committee on State Affairs, April 20, 2011.

Invited testimony to Texas Legislature on House Bill 977, April 19, 2011.

University of Texas American Chemical Society for Students, April 13, 2011. Texas climate change.

Undergraduate Geology Students Club, University of Texas, April 6, 2011. Paleoclimate records and forecasts of Texas climate,

University of Texas Climate Forum, April 4, 2011. Climate change impacts on Texas water: Texas Drought – Past and Future.

Climate change impacts on Texas water: Past, present and future. Texas A&M University, March 1, 2011.

Climate change impacts on Texas water: Past, present and future. 12<sup>th</sup> Annual Changing Face of Water Rights Course 2011, Texas Bar Continuing Legal Education, San Antonio, February 25, 2011.

Texas climate change: Past, present and future. Lakeway Men's breakfast club, Lakeway, TX, August 11, 2010.

A New Degree Program in Environmental Science and Sustainability at UT-Austin. Sustainability on the UT Campus: A Symposium, September 10, 2010.

Climate change impacts on Texas water. Environmental, Natural Resources and Water Law Section of the Austin Bar Association, May 6, 2010

Development of an undergraduate curriculum in Environmental Science and Sustainability at UT-Austin. *After Copenhagen: Collaborative Responses to Climate Change - A Conference on Political Action, Policy, Research and Teaching Opportunities for Climate Change Adaptation and Mitigation*. Co-sponsored by Canadian Consulate General, The University of Lethbridge, Alberta, Canada, UT-Austin, and Hiroshima University. April 9, 2010.

Reconstructing past climate change. 2010 Spring Joint Meeting Texas Section of the American Physical Society and the American Association of Physics Teachers, Austin, TX, March 19, 2010.

Climate change in Texas - A long past and view to the future. Atheist Community of Austin Lecture Series, December 6, 2009.

Texas climate change: Past, present and future. *Meet UT* Event – Recruitment of A-rated admits from Greater Houston and Southeast Texas, January 30, 2010.

*Meeting of the Minds* panel discussion with Walmart CEO Lee Scott, on global sustainability challenges within business and society. October 20, 2009.

Sustaining a Planet, 4th annual L.O.U.D.D. (Leadership, Outreach, Unity, Diversity, and Development) Conference, Leadership and Ethics Institute at UT-Austin. October 6, 2009

Reconstructing paleoclimate: How we know about what ancient climates were like before there were people around to record anything? Center for Inquiry Austin, April 8, 2009, Center for Inquiry Austin.

Moderator for panel on “Austin Energy’s Solar, Wind & Geothermal Future” at *Steps Toward a Sustainable Austin Energy* symposium hosted by The LBJ School of Public Affairs, University of Texas at Austin, March 10, 2009.

Testimony to the Texas Legislature. Invited to testify on House Bill 1553 and Senate Bill 988, March, 2009. Video of proceedings at <http://www.youtube.com/watch?v=MnnBELNniAs>.

Sustainability Initiatives at The University of Texas at Austin, First Annual Meeting of the Texas Regional Alliance for Campus Sustainability, March 27, 2009.

Speleothems as records of paleoenvironmental change in Texas, Underground Texas Grotto, May 6, 2009.

Strontium isotopes in Austin area watersheds, Watershed Protection and Development Review Department, City of Austin, May 14, 2009.

Karst Aquifers and Climate Change: Field-based Research, UT-Austin Geography Society, November 13, 2008.

Climate Change and Texas Water: What Did and What Could Happen?, Conference of the Texas Water Conservation Association, June, 2008, Galveston, TX.

Campus Greenlight Projects, President’s Task Force on Sustainability, University of Texas, April, 2008, Austin, TX.

Jackson School of Geosciences Paleoclimate Research, President’s Advisory Committee on University Relations, University Corporation for Atmospheric Research, University of Texas, April, 2008, Austin, TX.

Texas speleothems as paleoenvironmental proxies: Challenges and prospects, Bureau of Economic Geology, University of Texas, April, 2008, Austin, TX.

Environmental Integrity, Integrity Week Conference, Senate of College Councils, University of Texas, February, 2008, Austin, TX.

Aquifers, Caves and Climate Change: Challenges and Prospects for Reconstructing Paleoclimates, Kealing Middle School, February, 2008, Austin, TX.

Karst Aquifers and Climate Change: Challenges and Prospects for Reconstructing Paleoclimates, Sierra Club, February, 2008, Austin, TX.

Challenges and Prospects for Reconstructing Past Climate Change: Insights from Caves, LAMP (Learning Activities for Mature People), January, 2008, Austin, TX.

Sustainability as part of UT- Austin's curriculum reform, US Green Building Council and North Texas & AIA Dallas Committee on the Environment, Panel on the 2030 Challenge, November, 2007, Dallas, TX.

Texas Water: More precious than oil, College of Natural Sciences Advisory Council, University of Texas, October, 2007, Austin, TX.

Karst & Speleothem Research in Central Texas: Models for Owner-University Partnerships, National Caves Association Annual Convention 2007, October, 2007, San Antonio, TX.

Environmental Change and Communication Challenges, Communication across the Disciplines - GRS 390P class, October, 2007.

Environmental Science and Sustainability: What is UT-Austin Doing? Texas Exes Association, Classes without Quizzes, Austin, TX, June, 2007.

The Tragedy of the Commons and the history of an ancient civilization, World Affairs Council, Houston, June, 2007.

Climate Change, *Study Break* lecture series, UT-Austin, April, 2007.

Reaching teachers across Texas through the *Hot Science – Cool Talks* Outreach Lecture Series, Texas Regional Collaboratives for Excellence in Science and Mathematics Teaching, Science Project Director Meeting, February, 2007.

A Signature Course pilot: Opportunities for Undergraduate Education, Teaching and Learning Colloquium: Teaching That Inspires Learning, University of Texas, January, 2007.

Cave deposits as paleoenvironmental records: Problems and prospects, University of Arkansas at Fayetteville, November, 2006.

Vision and strategies for addressing interdisciplinary communication challenges, UT Office of Graduate Studies graduate seminar in Communication across the Disciplines, November, 2006.

Sustainability research at the University of Texas at Austin, Wal-Mart Corporate Headquarters, Bentonville, AK, October, 2006.

Challenges to achieving environmental sustainability, UT McCombs School of Business Ethics Program, September, 2005.

Hot Science – Cool Talks: A public lecture series connecting science teachers and the University of Texas, August 2005, *Botany 2005*, National conference of the Botanical Society of America, Austin, TX.

Isotope Hydrology, UT Civil Engineering graduate course, April, 2005.

The Edwards Aquifer: Past, present and future, UT School of Architecture graduate seminar in Topics in Sustainable Development, February, 2005.

The Edwards Aquifer: Past, present and future, UT School of Law, Environmental Law and Policy Seminar, February, 2005.

Vision and strategies for addressing interdisciplinary communication challenges, UT Office of Graduate Studies graduate seminar in Communication across the Disciplines, April, 2005.

Applications of cave deposits to environmental change, Northern Illinois University, April, 2004

Integrating environmental science and policy through the Environmental Science Institute, UT School of Law, Environmental Law and Policy Seminar, March, 2004.

Paleoenvironmental analysis from central Texas speleothems, Field Trip Leader, Texas Section of the Association of Engineering Geologists, July 2004.



Natural Bridge Caverns: Unique views through time and space inside an aquifer, Invited Field Trip Leader, Decision-Makers Field Trip, Bureau of Economic Geology, April, 2004.

Global environmental change: A geologic perspective, Junior Honors Colloquium, University of Texas, July, 2004

Tomorrow's environmental science and technology today, Panel Member, Junior Honors Colloquium, University of Texas, July, 2004.

The Environmental Science Institute's community engagement programs, Panel Member, Scholarship at Work Colloquium, UT Humanities Institute, April, 2004.

Integrating environmental science and policy through the Environmental Science Institute, UT School of Law, Environmental Law and Policy Seminar, February, 2003.

Global environmental change: A geologic perspective, UT Dean's Scholars Program, August, 2003.

Applications of cave deposits to environmental change, Society of Ecological Restoration Annual Meeting, November, 2003.

Geologic records of environmental change: Applications to paleoclimate of Texas, Lakeway Men's Breakfast Club, May, 2001.

The Environmental Science Institute at UT-Austin, Marine Science Institute Advisory Council Meeting, May, 2001.

The Outreach Lecture Series, Texas Exes Teaching Excellence Conference, February, 2001.

Geologic records of environmental change, UT Grotto, November, 2001.

Geologic records of environmental change: Applications to paleoclimate of Texas, University of Texas, Dallas, 2000.

Temporal evolution of groundwater, University of New Mexico, September, 1998.

Temporal evolution of groundwater in karst systems, Keynote lecture, 17<sup>th</sup> Symposium on Caribbean Geology, University of Puerto Rico, Mayaguez, February, 1998.

Temporal evolution of groundwater: An isotopic perspective, University of Illinois, Champaign-Urbana, February, 1998.

Temporal evolution of groundwater in the Pleistocene limestone aquifer of Barbados, University of West Indies, Cave Hill Campus, Barbados, April, 1997.

Geochemical evolution of badwater in the Edwards aquifer, San Antonio Water System - U.S. Geological Survey, San Antonio, TX, April, 1997.

Speleothems as terrestrial records of Earth system history, NSF-sponsored workshop on Terrestrial Records of Earth System History, Portland, OR, May, 1996.

Quantitative models for fluid-rock interaction, Exxon Production Research Company, Houston, TX, 1994

Geochemistry of ancient oceans: Implications for climate change, Texas A&M University, Galveston, 1994.

The Pleistocene limestone aquifer of Barbados, W.I., University of Minnesota, 1993

Geochemical evolution of limestones and groundwater in Barbados, Johns Hopkins University, 1993.

Geochemical evolution of limestones and groundwater in Barbados, Carnegie Institution of Washington, 1993.

Speleothems as hydrologic records, University of Maryland, 1993.

Geochemistry of the Pleistocene limestone aquifer of Barbados, University of Puerto Rico, Mayaguez, 1993.

Geochemistry of ancient oceans: Implications for climate change, Texas A&M University, College Station, 1992.

Large-scale flow systems in the Midcontinent, USA, Rice University, 1991

Large-scale flow systems in the Midcontinent, USA, Gordon Research Conference on Regional Ore-Forming Fluids, Andover, NH, July, 1989.

Quantitative models for fluid-rock interaction: Implications for carbonate diagenesis and regional groundwater flow systems, University of Chicago, 1989.

Quantitative models for fluid-rock interaction: Implications for carbonate diagenesis and regional groundwater flow systems, Stanford University, 1989.

Quantitative models for fluid-rock interaction: Implications for carbonate diagenesis and regional groundwater flow systems, Southern Methodist University, 1989.

Origin and evolution of dolomite in the Mississippian Burlington-Keokuk limestone, Texaco, Inc., Houston, TX, 1987

Origin and evolution of dolomite in the Mississippian Burlington-Keokuk limestone, University of California, Riverside, 1987

The role of basinal brines in carbonate diagenesis, Penrose Conference on Deep Basinal Brines, Oxnard, CA, 1986