

**TIMOTHY MICHAEL SHANAHAN**  
Curriculum Vitae February 2021

Associate Professor

Dept. Geological Sciences, Jackson School of Geosciences, The University of Texas at Austin  
Phone: (512)232-7051, Email:tshanahan@jsg.utexas.edu

**EDUCATION**

---

- Ph.D., 2007 Department of Geosciences, University of Arizona, Tucson, AZ  
Advisor: Jonathan T. Overpeck
- M.S. 2001 Dept. Hydrology and Water Resources, University of Arizona, Tucson, AZ  
Advisor: Marek Zreda
- B.S. 1994 Department of Geology, Brown University  
Advisor: Bruno Giletti

**RESEARCH INTERESTS**

---

Paleoclimate, stable isotope geochemistry, molecular biomarkers, climate-ecosystem interactions

**PROFESSIONAL APPOINTMENTS**

---

- 2016-present, Associate Professor, The University of Texas at Austin
- 2009-2016, Assistant Professor, The University of Texas at Austin
- 2007-2009, NOAA/ WHOI postdoctoral Scholar, Woods Hole Oceanographic Institution
- 2001-2006, GRA, Dept. Geosciences, University of Arizona
- 1997-2001, GRA, Dept. Hydrology and Water Resources, University of Arizona
- 1994-1995, Staff Geologist, Water Resources Division, United States Geological Survey
- 1995-1996, Staff Hydrogeologist, Environmental Division, Fluor Daniel-GTI
- 1991-1994, Undergraduate research assistant, Geological Sciences, Brown University

**HONORS AND RECOGNITION**

---

- Kavli National Academy of Scientists Fellow (2013)
- NOAA Climate & Global Change Postdoctoral Fellowship (2006)
- Woods Hole Oceanographic Institution Postdoctoral Fellowship (2006)
- NSF-IGERT research traineeship in Anthropology, U. Arizona (2003)
- WAIME fellowship, U. Arizona (2003,2004)
- McGinnies Fellowship for Arid Lands Studies, U. Arizona (2002)
- NSF research traineeship, Dept. Hydrology, U. Arizona (1997)
- Outstanding Graduating Senior, Dept. of Geosciences, Brown University (1994)
- NAGT Field Geology Award, (1994)
- Sigma Xi, Dept. of Geosciences, Brown University (1994)

## COMPLETE PUBLICATIONS RECORD

---

**Researcher ID:** <http://www.researcherid.com/rid/B-1298-2012>

**Google Scholar:** <https://scholar.google.com/citations?user=UEOzEgEAAAAJ&hl=en&oi=sra>

### Peer reviewed papers in review/submitted:

[49] Raposeiro, P.M., A. Hernandez, S. Pla-Rabes, V. Goncalves, R. Bao, A. Saez, N. Aguiar, T. M. Shanahan, M. Benavente, E. DeBoer, H. Marques, M. Matias, C. Pimentel, C. Pereira, N. Richter, C. Ritter, M.J. Rubio, M. Salcedo, P. Sousa, M. Souto, D. Vazquez-Loureiro, V. Vilagut, O. Margalef, L. Amaral-Zettler, A. C. Costa, Y. Huang, J. van Leeuwen, P. Masqu, R. Prego, A., C. Ruiz-Fernandez, J-A. Saachez-Cebza, R. Trigo, S. Giralt, Climate facilitated early colonization of the Azores Archipelago during Medieval times, *Proceedings of the National Academy of Sciences*.

[48] Sun, C., L. Tian, T.M. Shanahan, J. Partin, Y. Gao, N. Piatrunia, J. Banner., (submitted) Controls on the isotopic evolution of precipitation during tropical cyclones - implications for paleotempestology, *Nature Communications*.

[47] Sun, C., T.M. Shanahan, P.N. DiNezio, N.P. McKay, P. Roy, (in review) Reconstructed and future changes in Great Plains storminess driven by springtime land surface warming, *Nature Geoscience*.

[46] Gosling, W.D., C.S. Miller, T.M. Shanahan, J.T. Overpeck, F. van Lagevelde (in review) Long-term changes in moisture, not CO<sub>2</sub>, are the main driver of woody cover change in the tropics. *Science*.

### Peer reviewed papers accepted:

[45] Saadeh, C.M., Saylor, J.E., Nie, J., Shanahan, T.M. 2020. Orbital Forcing of Late Miocene-Early Pleistocene Environmental Change in the Zhada Basin, SW Tibetan Plateau, *Paleoceanography and Paleoclimatology*. 35, 8 e2019PA003781. <https://doi.org/10.1029/2019PA003781>

[44] Phelps, L.N., Chevalier, M., Shanahan, T.M., Aleman, J.C., Courtney-Mustaphi, C., Kiahtripes, C.A., Marchant, R., Broennimann, O., Quick, L.I., Shekeine, J., Davis, B.A.S., Guisan, A., Manning, K. 2020. Asymmetric response of Forest and Grassy biomes to climate variability across the African Humid Period: influenced by anthropogenic disturbance? *Ethography*. 43, 8. <https://doi.org/10.1111/ecog.04990>

- [43] Dallmeyer, A., Claussen, M., Lorenz, S. and Shanahan, T., 2020. The end of the African humid period as seen by transient comprehensive Earth system model simulation of the last 8000 years. *Climate of the Past* 16, 1: 117-140. <https://doi.org/10.5194/cp-16-117-2020>, 2020.
- [42] Phelps, L.N., Broennimann, O., Manning, K., Timpson A., Mariethoz, G., Davis, B., Jousse, H., Guisan, A., Shanahan, T.M. 2019. Reconstructing the climatic niche breadth of land use for animal production during the African Holocene . *Global Ecology and Biogeography*, 29 (1): 127-147.
- [41] Roy, P.D., Vera-Vera, G., Sánchez-Zavala, J.L., Shanahan, T.M., Quiroz-Jiménez, J.D., Curtis, J.H., Girón-García, P., Lemus-Neri, V.H. and Muthusankar, G., 2020. Depositional histories of vegetation and rainfall intensity in Sierra Madre Oriental Mountains (northeast Mexico) since the late Last Glacial. *Global and Planetary Change*, p.103136.
- [40] \*Sun, C., Shanahan, T.M., Partin, J. (2019) Controls on the stable isotopic composition of precipitation over the southcentral United States. *Journal of Geophysical Research. Atmospheres* 124 (14), 8320-8335
- [39] \*Hanna, A.J.M., Shanahan, T.M., Allison, M.A., Bianchi, T.S., Schreiner, K.M. (2018) A multi-proxy investigation of late-Holocene temperature change and climate-driven fluctuations in sediment sourcing: Simpson Lagoon, Alaska. *The Holocene*. 1-14
- [38] Shanahan, T.M. (2018) Quaternary Climate Variability in West Africa. *Oxford Research Encyclopedia of Climate Science*.
- [37] Jardine, P.E., Fraser, W.T., Lomax, B.H., Sephton, M.A., Shanahan, T.M., Miller, C.S., Gosling, W.D., (2016). Pollen and spores as biological recorders of past ultraviolet irradiance. *Scientific Reports* 6.
- [36] Kar, N., Garzzone, C.N., Jaramillo, C., Shanahan, T., Carlotto, V., Pullen, A., Moreno, F., Anderson, V., Moreno, E., Eiler, J., (2016). Rapid regional surface uplift of the northern Altiplano plateau revealed by multiproxy paleoclimate reconstruction. *Earth and Planetary Science Letters* 447, 33-47.
- [35] \*Hanna, A.J.M., Shanahan, T.M., Allison, M.A., (2016). Distribution of branched GDGTs in surface sediments from the Colville River, Alaska: Implications for the MBT/CBT paleothermometer in Arctic marine sediments. *Journal of Geophysical Research-Biogeosciences* 121, 1762-1780.
- [34] Nash, D.J., De Cort, G., Chase, B.M., Verschuren, D., Nicholson, S.E., Shanahan, T.M., Asrat, A., Lezine, A.M., Grab, S.W., (2016). African hydroclimatic variability during the last 2000 years. *Quaternary Science Reviews* 154, 1-22.
- [33] Saylor, J.E., Casturi, L., Shanahan, T.M., Nie, J.S., Saadeh, C.M., (2016). Tectonic and climate controls on Neogene environmental change in the Zhada Basin, southwestern Tibetan Plateau. *Geology* 44, 919-922.

[32] Shanahan, T.M., Hughen, K.A., McKay, N.P., Overpeck, J.T., Scholz, C.A., Gosling, W.D., Miller, C.S., Peck, J.A., King, J.W., Heil, C.W., (2016). CO<sub>2</sub> and fire influence tropical ecosystem stability in response to climate change. *Scientific Reports* 6.

[31] Wolaver, B.D., Coogan, J.C., Horton, B.K., Bermudez, L.S., Sun, A.Y., Wawrzyniec, T.F., Zhang, T.W., Shanahan, T.M., Dunlap, D.B., Costley, R.A., de la Rocha, L., (2015). Structural and hydrogeologic evolution of the Putumayo basin and adjacent fold-thrust belt, Colombia. *Aapg Bulletin* 99, 1893-1927.

[30] Sánchez, N., A. Mora, M. Parra, D. Garcia, M. Cortes, T.M. Shanahan, R. Ramirez, O. Llamasa, M. Guzman, (2015) Petroleum system modeling in the Eastern Cordillera using geochemistry and timing of thrusting and deformation. *AAPG Bulletin*. v. 99, p. 1537-1556,

[29]\*Santillan, T.M. Shanahan, C.R. Omelon, J.R. Major, P.C. Bennett (2015) Isolation and Characterization of a Novel CO<sub>2</sub>-Tolerant *Lactobacillus* Strain from Crystal Geyser, UT. *Frontiers in Earth Science*: 3:41. doi: 10.3389/feart.2015.00041

[28]\*Anderson, V.J. T.M. Shanahan, J.E. Saylor, B.K. Horton (2015). Paleoelevation records from lipid biomarkers: Application to the tropical Andes, *GSA Bulletin*: B31105-1

[27] Shanahan, T.M., N. McKay, K.A. Hughen, J.T. Overpeck, B. Otto-Bliesner, J.A. Peck, C. Scholz, C.W. Heil, J. King. (2015) The time-transgressive termination of the African Humid Period. *Nature Geoscience* 8: 140-144.

[26] \*Wicks, T.Z., \*K. Thirumalai, T.M. Shanahan, and C.J. Bell. 2015. The use of  $\delta^{13}\text{C}$  values of leporid teeth as indicators of past vegetation. *Palaeogeography, Palaeoclimatology, Palaeoecology*, 418: 245-260.

[25]\*Fornace, K.L., K.A. Hughen, T.M. Shanahan, S.C. Fritz, P.A. Baker, S.P. Sylva (2014) A 60,000 year record of hydrologic variability in the Central Andes from  $\delta\text{D}$  of leaf waxes, *Earth and Planetary Science Letters*.

[24] \*Anderson, V.J. T.M. Shanahan, J.E. Saylor, B.K. Horton, 2013, Sources of local and regional variability in the MBT'/CBT paleotemperature proxy: Insights from a modern elevation transect across the Eastern Cordillera of Colombia. *Organic Geochemistry*, v. 69, pp. 42-51.

[23] Shanahan, T.M., Hughen, K.A., Van Mooy, B.A.S. 2013, Temperature sensitivity of branched and isoprenoid GDGTs in Arctic lakes. *Organic Geochemistry*, v. 64, pp. 119-128.

[22] Shanahan, T.M., K.A. Hughen, L. Ampel, P.E. Sauer. 2013, Environmental controls on the  $\delta^2\text{H}$  values of terrestrial leaf waxes in the Eastern Canadian Arctic. *Geochimica et Cosmochimica*, v. 119, pp. 286-301.

- [21] PAGES 2K Consortium. 2013, Continental-scale temperature variability over the Common Era. *Nature Geoscience*, v. 6, pp. 339-346.
- [20] Nicholson, S.E., D.J. Nash, B.M. Chase, S.W. Grab, D. Verschuren, T.M. Shanahan, A. Asrat, A.-M. Lezine, M. Umer. 2013. Temperature variability over Africa during the last 2000 years, *The Holocene*, v.23, pp. 1085-1094.
- [19] Shanahan, T.M., N. McKay, J.T. Overpeck, J.A. Peck, C. Scholz, C.W. Heil, J. King. 2013. Spatial and temporal variability in sedimentological and geochemical properties of sediments from an anoxic crater lake: implications for paleoenvironmental reconstructions. *Palaeogeography, Palaeoclimatology, Palaeoecology*. v. 374, pp. 96-109.
- [18] Shanahan, T.M., J.A. Peck, N. McKay, C.W. Heil, J. King, S.L. Forman, D.L. Hoffmann, D.A. Richards, J.T. Overpeck, C. Scholz. 2013. Age models for long lacustrine sediment records using multiple dating approaches - an example from Lake Bosumtwi, Ghana. *Quaternary Geochronology*, v. 15, pp. 47-60.
- [17] Shanahan, T.M., J.W. Beck, J.T. Overpeck, N. McKay, J.E. Pigati, J.A. Peck, C. Scholz, J. King. 2012. Late Quaternary sedimentological and climate changes at Lake Bosumtwi Ghana: new constraints from laminae analysis and radiocarbon age modeling: *Palaeogeography, Palaeoclimatology, Palaeoecology*, v. 361, pp. 96-109.
- [16] \*Stoyanova, V., T.M. Shanahan, K.A. Hughen, A. deVernal. 2012 Insights into Circum-Arctic Sea Ice Variability from Molecular Geochemistry. *Quaternary Science Reviews*. v. 79, pp. 63-73.
- [15] Shanahan, T.M., Overpeck, J.T., Anchukaitis, K.J., Beck, J.W., Cole, J.E., Dettman, D.L., Peck, J.A., Scholz, C.A., and King, J.W., 2009, Atlantic Forcing of Persistent Drought in West Africa: *Science*, v. 324, p. 377-380.
- [14] Schouten, S., Hopmans, E.C., van der Meer, J., Mets, A., Bard, E., Bianchi, T.S., Diefendorf, A., Escala, M., Freeman, K.H., Furukawa, Y., Hugué, C., Ingalls, A., Menot-Combes, G., Nederbragt, A.J., Oba, M., Pearson, A., Pearson, E.J., Rosell-Mele, A., Schaeffer, P., Shah, S.R., Shanahan, T.M., Smith, R.W., Smittenberg, R., Talbot, H.M., Uchida, M., Van Mooy, B.A.S., Yamamoto, M., Zhang, Z.H., and Damste, J.S.S., 2009, An interlaboratory study of TEX86 and BIT analysis using high-performance liquid chromatography-mass spectrometry: *Geochemistry Geophysics Geosystems*, v. 10.
- [13] Pigati, J.S., Bright, J.E., Shanahan, T.M., and Mahan, S.A., 2009, Late Pleistocene paleohydrology near the boundary of the Sonoran and Chihuahuan Deserts, southeastern Arizona, USA: *Quaternary Science Reviews*, v. 28, p. 286-300.
- [12] Shanahan, T.M., Overpeck, J.T., Scholz, C.A., Beck, J.W., Peck, J., and King, J.W., 2008, Abrupt changes in the water balance of tropical West Africa during the late Quaternary *Journal of Geophysical Research-Atmospheres*, v. 113, p. D12107.
- [11] Shanahan, T.M., Overpeck, J.T., Hubeny, J.B., King, J., Hu, F.S., Hughen, K., Miller, G., and Black, J., 2008, Scanning micro-X-ray fluorescence elemental mapping: A new tool for the study of laminated sediment records: *Geochemistry Geophysics Geosystems*, v. 9.
- [10] Conroy, J.L., Overpeck, J.T., Cole, J.E., Shanahan, T.M., and Steinitz-Kannan, M., 2008,

Holocene changes in eastern tropical Pacific climate inferred from a Galapagos lake sediment record: *Quaternary Science Reviews*, v. 27, p. 1166-1180.

[9] Shanahan, T. M., Overpeck, J. T., J.W.Beck, Wheeler, C. W., Peck, J. A., King, J. W., and Scholz, C. A., 2008. The formation of biogeochemical laminations in Lake Bosumtwi, Ghana, and their usefulness as indicators of past environmental changes. *Journal of Paleolimnology* 40(1), p. 339-355.

[8] Shanahan T. M., Overpeck J. T., Sholz C., Sharpe E., and Arko J., 2007 Simulating the response of a closed basin lake to recent climate and land-use changes in tropical West Africa (Lake Bosumtwi, Ghana). *Hydrological Processes* 21 (13) 1678-1691.

[7] Scholz, C.A., T.C. Johnson, A.S. Cohen, J.W. King, J.P., J.T. Overpeck, M.R. Talbot, E.T. Brown, L. Kalindekafe, P.Y.O. Amoako, R.P. Lyons, T.M. Shanahan, I.S. Castaneda, C.W. Heil, S.L. Forman, L.R. McHargue, K.R. Beuning, J.Gomez, and J. Pierson (2007), East African megadroughts between 135-75 kyr ago and implications for early human history. *Proceedings of the National Academy of Sciences*, 10.1073/pnas.0703874104.

[6] Shanahan T. M., Overpeck J. T., Beck J. W., Pigati J., Wheeler C. W., Talbot M. R., Scholz C. A., Peck J., and King J. W., (2006), Paleoclimatic variations in West Africa from a record of late Pleistocene and Holocene lake level stands of Lake Bosumtwi, Ghana. *Palaeoceanography, Palaeoclimatology, Palaeoecology* 242 (3-4), 287-302.

[5] Shanahan, T. M., Pigati, J. S., Dettman, D. L., and Quade, J. (2005), Isotopic variability in the aragonite shells of freshwater gastropods living in springs with nearly constant temperature and isotopic composition. *Geochimica Et Cosmochimica Acta* 69(16), 3949-3966.

[4] Pigati, J.S., Quade, J., Shanahan, T.M., and Haynes, C.V., 2004, Radiocarbon dating of minute gastropods and new constraints on the timing of late Quaternary spring-discharge deposits in southern Arizona, USA: *Palaeogeography Palaeoclimatology Palaeoecology*, v. 204, p. 33-45.

[3] Peck J. A., Green R. R., Shanahan T., King J. W., Overpeck J. T., and Scholz C. A. 004 A magnetic mineral record of Late Quaternary tropical climate variability from Lake Bosumtwi, Ghana. *Palaeogeography Palaeoclimatology Palaeoecology* 215(1-2), 37-57.

[2] Shanahan, T. M., and M. Zreda, 2000 Chronology of Quaternary glaciations in East Africa: *Earth and Planetary Science Letters*, v. 177, p. 23-42.

[1] Giletti, B.J., and Shanahan, T.M. 1997 Alkali diffusion in plagioclase feldspar: *Chemical Geology*, v. 139; 1-4, p. 3-20.

### **Invited lectures:**

[20] Shanahan, T.M., Piatrunia, N. (2019) The Southern Hemisphere Westerlies from New Zealand, Workshop on the Southern Hemisphere Westerlies, University of Pittsburgh, Pittsburgh, PA, (Fall, 2019)

- [19] Saadeh, C.M., J.E. Saylor, J. Nie, T.M. Shanahan (2019) Insolation and tectonics control on late Miocene–Pleistocene climate and environmental variability in the Zhada Basin, southwestern Tibetan Plateau. Geological Society of America Annual Meeting, Phoenix, AZ.
- [18] Shanahan, T.M., Sun, C. (2018) Evolution of the Great Plains Low Level Jet during the last Deglaciation. Geology Department Seminar. UNAM, Mexico
- [17] Shanahan, T.M. 2018. Late Quaternary evolution of the West African monsoon system. AFQUA meeting. Nairobi, Kenya (July, 2018)
- [16] Shanahan, T.M. 2018. Late Quaternary evolution of the West African monsoon – forcing feedbacks and ecosystem response. University of Texas at Arlington departmental seminar. Arlington, TX (March, 2018)
- [15] Shanahan, T.M., 2015. (keynote). Forcings, feedbacks and the evolution of the West African monsoon over the past 21,000yrs. Tropical deserts and lakes through time. Paleohydrology, Isotope geochemistry, Climate & Societies Symposium in memory of Françoise Gasse (1942-2014). Marseille, France (July, 2015).
- [14] Shanahan, T.M. A molecular geochemical perspective on long-term tropical climate variability. Quaternary Tertiary Tropics – Colônia Sediment Archive Drilling Project, Sao Paulo, Brazil (September)
- [13] Shanahan, T.M., Bixler, C., Mora, A., 2014, Temperature and rainfall variability in the northern tropical Andes over the last two millennia. LOTRED-SA 3<sup>rd</sup> International Symposium on climate change and human impact in central and South America over the last 2000 years; observations and models, Medellin (July)
- [12] Shanahan, T.M. 2013 Reexamining nonlinear feedbacks and abrupt changes during the African Humid, Baylor University, Baylor, TX.
- [11] Shanahan, T.M., Hughen, K.A., Overpeck, J.T.O., Peck, J.A., King, J., Heil, C., Scholz, C. 2012, INVITED Asynchronous evolution of the West African monsoon during the Holocene? Insights from the Guinea Coast. AMQUA, Duluth, MN.
- [10] Shanahan, T.M., Stoyanova, V., de Vernal, A. 2012, IP<sub>25</sub> as a proxy for spring sea ice cover – a regional examination First workshop of the PAGES Sea Ice Proxy (SIP) working group. The basis of sea ice proxies, GEOTOP, Montreal
- [9] Shanahan, T.M. 2011, The potential for high-resolution laminated crater lake sediments as paleoclimate archives in southeast Asia, Greater Mekong Delta Meeting, Cambodia.

[8] Shanahan, T. M., Overpeck, J. T., Scholz, C. A., Peck, J., and King, J. W., 2011, Megadroughts and abrupt changes in the West African monsoon: new insights and climate surprises from the Guinea forest zone. Lamont-Doherty Earth Observatory lecture series, Palisades, NY.

[7] Shanahan, T. M., Overpeck, J. T., Scholz, C. A., Peck, J., and King, J. W., 2011, Climate change and human impacts in West Africa on decadal to orbital timescales, Department of Geosciences Seminar Series, University of Rochester, Rochester, NY.

[6] Shanahan, T. M., Overpeck, J. T., Scholz, C. A., Peck, J., and King, J. W., 2011, Climate change and human impacts in West Africa on decadal to orbital timescales, Department of Geosciences Seminar Series, Syracuse University, Syracuse, NY.

[5] Shanahan, T. M., Hughen, K.A., Overpeck, J. T., 2011 West African monsoon variability during the Holocene. Weekly Seminar, Marine Science Institute, University of Texas, Port Aransas, TX

[4] Shanahan, T. M., Hughen, K.A., Overpeck, J. T., 2011 Abrupt changes in the West African monsoon during the Holocene. Department Seminar series, The Open University, Milton Keynes, UK

[3] Shanahan, T. M., Hughen, K.A., 2011. Late Pleistocene changes in the West African monsoon and human migration out of Africa, East African Drilling Workshop, Brown University, Providence, RI

[2] Shanahan, T. M., Late Holocene megadroughts and temperature changes in the tropics: coherent century-scale climate variability across the tropics, 2011, American Geophysical Union Fall meeting, San Francisco, CA

[1] Shanahan, T.M. 2010, Evidence for climate variability in sub-saharan West Africa on century timescales over the last 2 millennia, PAGES 2K-Africa meeting, Ghent, Belgium.