

TIMOTHY MICHAEL SHANAHAN
Curriculum Vitae February 2020

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)

ADVISING

Postdoctoral fellows

Name	Period	Current position
Michael Toomey	2014-2016	USGS research scientist
Shannon Loomis	2014-2016	Nimble storage

PhD students (advisor)

Name	Started	Passed candidacy	Graduation
Erin Kennan-Early	Fall 2017	Fall 2018	In progress
Chijun Sun	Fall 2016	Fall 2018	In progress
Natallia Piatrunia	Fall 2015	Spring 2018	In progress
Annie Miller Hanna	Fall 2012		graduated

MS students (advisor)

Name	Started	Graduation
Travis Wicks	Fall 2011	2013
Curtis Bixler	Fall 2010	2012
Vera Stoyanova	Fall 2010	2012

BS students, undergraduate Honors supervisor

Name	Started	Completion
Kyra Kim	2010	2013

BS students, undergraduate research assistant supervisor

Name	Year
Geoffery Britt	2014
Stuart Whitfield	2014
Phoebe Li	2014
Angela Wu Li	2014
Kellan Umbarger	2012
Bridget Petitt	2012

BS students, served as Research Experience for Undergrads or Teachers supervisor:

Name	Institution	Year
Carly Pelletier	Mt. Holyoke College	2014
Jordan Jimmie	University of Arizona	2013
Ijeamaka Okechukwu	University of Maryland	2013
Damaris Valero Diaz	University of Puerto Rico	2012
Jody Wycech	Grand Valley State	2012

Roth Akintoye	University of Maryland	2012
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Visiting student supervision

Name	Year	Institution	Supervisor
Matthew King	Summer, 2015	University of Arizona	Overpeck
Cody Routson	2014	University of Arizona	Overpeck
Maria Jesus Rubio	2014	IES Juame Almera	Giralt
Charlotte Miller	2013	Open University	Gosling
Xuewei Zhang	2012	Syracuse University	Scholz

Doctoral students, dissertation committee member

Name	Department	Defense date	Supervisor
Natasha Sekhon	Geological Sciences	Pending	Jay Banner
Lily Serach	Geological Sciences	Pending	Dan Breecker
Lily Jackson	Geological Sciences		Brian Horton
Junweng Peng	Geological Sciences		Xavier Jansen
Kaustubh Thirumalai	Geological Sciences	Spring 2016	Terry Quinn
Lucy Tingwei Ko	Geological Sciences	Spring 2017	Robert Loucks
Veronica Anderson	Geological Sciences		Brian Horton
Bonny Waring	Ecology	Spring 2013	Christine Hawkes
Kelly Hereid	Geological Sciences	Spring 2013	Terry Quinn
Kimberly Meyers	Geological Sciences		Philip Bennett
Peter Carlson	Geological Sciences		Dan Breecker
Christopher Maupin	Geological Sciences	Spring 2014	Terry Quinn
Eugenio Santillan	Geological Sciences	Spring 2014	Philip Bennett

Doctoral students "wild card" candidacy exam committee

Name	Department	Exam date	Supervisor
Estefania Salgado Jauregui	Geological Sciences	Spring 2020	Martindale
Meagan Gorman	Geological Sciences		Terry Quinn
Brandon Shuck	Geological Sciences	Spring 2018	Harm van Avendonk
Alissa Kotowski	Geological Sciences		Whitney Behr
Emily Cooperdock	Geological Sciences		Daniel Stockli
Kuldeep Chaudhary	Geological Sciences	Fall 2010	Bayani Cardenas
Wendy Robertson	Geological Sciences	Spring 2011	Jack Sharp

PROFESSIONAL AND PUBLIC SERVICE

Internal (University of Texas at Austin)

University

2019- Member, Faculty Council at-large

2020- Chair, Faculty Council University Academic Calendar committee

2020- Member, Faculty Council Ethics flag committee

2020- Co-chair, Ad-hoc committee on revision of the academic calendar

College

2019- Chair, Geology EVS program

2021- Member, Ad-hoc committee on revision of the EVS major

2019- Member, Jackson School Equipment and Maintenance Committee

Department

2020- Member, Department Awards committee member (Martindale chair)

2019- Member, Undergraduate curriculum committee (Rempe chair)

2019- Member, Austin Community Foundation Scholarship review

External Service

International committee service:

2017-present PAGES ISO-2k (Isotope-data comparison) working group

Manuscript review: Scientific Reports, Nature Geoscience, Geophysical Research Letters, Quaternary Science Reviews, Earth and Planetary Science Letters, Climate of the Past,

Proposal Review: Sedimentary Geology and Geochemistry; Paleo Perspectives on Climate Change

Society membership:

2009-present American Geophysical Union

2009-present PAGES (Past Global Changes)

FUNDING AND SUPPORT

External grants

(13) NSF EAR

P2C2: Orbital to millennial-scale variability of the Southern Hemisphere Westerlies over the last glacial cycle

09/01/2020-08/31/2023 \$402,158

(12) NSF (ATM)

P2C2: Tropical Response to Hemispheric Forcing--Testing Mechanisms Using Paleoclimate Data and Climate Models

Co-PI with Pedro DiNezio (UTIG)

09/01/2020-08/31/2023 \$360,104

(11) Planet Texas 2050

PaleoTexas: Synthesizing data for reconstructing impacts of climate change on past ecosystems and human societies of central Texas

Co-PI with Daniel Breecker (UT Austin Geo)

09/01/2019 to 08/31/2020 \$59,963.50

(10) DOE (Office of Bio & Env Research)

Exploring halophyte hydrodynamics and the role of vegetation traits on ecosystem response to disturbance at the terrestrial-aquatic interface

Co-PI with Ashley Matheny (UT-Austin Geology)

09/01/2019 to 08/31/2020 \$882,483

(9) NSF (ATM)

The flavors of Southwest hydroclimate extremes.

Co-PI with Overpeck (University of Arizona)

07/01/17-06/30/20 \$360,595 (UT portion)

(8) UT System CONACYT Collaborative research grants

Climate, vegetation and landscape disturbance on centennial to millennial timescales in NE Mexico and Texas

Co-PI with Roy (UNAM)

01/18-12/20 \$74,498

(7) Pacific Rubiales (Industry)

Structural and Hydrologic Evaluation of the Topoyaco Block, Putumayo Basin, Colombia

Co-PI with B. Wolaver, BEG, B. Horton, UT and others

07/15/13 - 07/14/14 \$45,485

(6) NSF (Marine Geology) OCE-0961697

Organic geochemical and isotopic reconstructions of North Pacific climate and sea ice variability

Principal Investigator with K. Hughen, WHOI

06/15/2010 - 05/31/2014 \$276,072,

(5) NSF (Sedimentary Geology) EAR-1226984.

High-resolution, multi-proxy Miocene-Pleistocene climate and environmental record from the high-elevation Zhada basin, SW Tibetan Plateau
Principal Investigator with J. Saylor, U Houston
10/01/12 – 09/30/14 \$198,964

(4) ICP Ecopetrol (Industry)
Initial assessment of the Miocene-Pliocene paleoclimatic and paleoelevation history of the northern Andes
Principal Investigator with B. Horton, UT
7/2011-3/2012 \$180,831

(3) ICP Ecopetrol (Industry)
Vegetation and climate evolution of the eastern foothills of Colombia in association with Cenozoic uplift of the eastern cordillera
5/2013-12/2013 \$105,025

(2) National Science Foundation (Tectonics) Grant EAR 1019857
Collaborative Research: Evaluating along-strike variations in surface uplift of the Andes: Constraints from molecular paleoaltimetry in the Eastern Cordillera of Colombia
Principal Investigator with B. Horton, UT
9/2010-8/2012 \$246,578

(1) National Science Foundation (Instrumentation and Facilities) Grant
Acquisition of Instrumentation for Organic Molecular Geochemistry Research and Training at the University of Texas-Austin
Principal Investigator with P. Bennett UT, C. Hawkes, Biology
1/2010-12/2010 \$98,576

Internal grants

(3) Jackson School of Geosciences Seed Grant
Stable Isotope Records of Indian Monsoon Variability from the Western Ghats, India
2/16-1/17 \$20,050

(2) Jackson School of Geosciences Seed Grant
Developing multi-proxy paleoaltimetry and testing rapid plateau uplift for the central Andes of northern Chile
1/13-1/14 \$7,500

(1) University of Texas at Austin Faculty Summer Research Assignment
Acquisition and preliminary analysis of alpine lacustrine sediments for annually-resolved paleoclimate reconstructions in the eastern Sierra Nevada, California

7/2010- 8/2010 salary

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 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). CO₂ 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 CO₂-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 δD 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. Kalindekafé, 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). Marsielle, 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 3rd 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, IP₂₅ 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
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