

Dr. Kaustubh Thirumalai

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EDUCATION

- 2012–2016 Ph.D., Geological Sciences, The University of Texas at Austin, Austin, TX
2010–2012 M.S., Geological Sciences, The University of Texas at Austin, Austin, TX
2006–2010 B. Tech, Chemical Engineering, National Institute of Technology Karnataka (NITK), Surathkal, India

EMPLOYMENT

- 2019–present Assistant Professor, Dept. of Geosciences, University of Arizona, Tucson, AZ
2017–2019 Postdoctoral Research Associate, Dept. Earth, Environmental, and Planetary Sciences, Brown University, Providence, RI
2016–2017 Postdoctoral Fellow, Institute for Geophysics (U. Texas), Austin, TX

HONORS AND AWARDS

- 2022 AGU Nanne Weber Early Career Award
2022 University of Arizona Geosciences Outstanding Faculty Award
2021 AGU Outstanding Reviewer for 2020, *Geophysical Research Letters*
2020 VAIBHAV Summit Panelist, Prime Minister's Office of India
2017 Brown University Presidential Postdoctoral Fellowship
2016 NSF Mitchell-Hamline Expert Witness Training Academy Fellow
2016 UTIG Institutional Postdoctoral Fellowship Award
2015 University of Texas Brundrett Endowed Scholarship
2015 University of Texas Institute for Geophysics Ewing-Worzel Fellowship
2014 University of Texas Institute for Geophysics Gale White Fellowship
2014 Jackson School Lagoe Micropaleontology Fund
2013 Geological Society of America Student Research Grant
2012 European Center for Excellence Summer Fellowship
2009 Indian Academy of Sciences Research Fellowship
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SERVICE / OUTREACH

Local/State Outreach

- Co-Director “Clouds To Core” (C2C) NSF REU Program for Tribal/ Community College students at U. Arizona Dept. Geosciences 2022–present
Science Mentor and Advisor, Southern Arizona Research, Science, and Engineering Foundation (SARSEF) 2019–present

National/International Outreach

Science Advisor, <i>EOS (Science News by AGU)</i>	2021–present
Associate Editor, <i>Paleoceanography and Paleoclimatology</i>	2020–present

Journal Referee (n=79): *Nature; Nature Geoscience; Nature Communications; Science Advances; Proceedings of the National Academy of Sciences; Paleoceanography & Paleoclimatology; Geophysical Research Letters; Earth & Planetary Science Letters; Quaternary Science Reviews; Geochimica et Cosmochimica Acta; Marine Micropaleontology; Global and Planetary Change; Journal of Foraminiferal Research; Journal of Geophysical Research; Rapid Communications in Mass Spectrometry; Communications in Earth and Environment; Quaternary International; Quaternary Research; Scientific Reports; Atmosphere; Environmental Science and Technology Letters; International Journal of Climatology; Climate; Earth's Future, Water Resources Research.*

Referee of Proposals (n=20): National Science Foundation (USA), American Chemical Society, Ministry of Earth Sciences (India), Future Leaders Fellowship (UKRI), Swiss National Science Foundation (Switzerland), Discovery Grants Program (Canada).

Departmental Committees

Joint HAS-GEOS <i>Climate Systems Science</i> Major Committee	2023–present
UA GEOS Seminar Committee and Co-Organizer	2020–present
GEOS Department Head Search Committee Co-Chair	2023
Tectonics Faculty Search Committee	2022–2023
Department Head Advisory Committee	2020–2022
Academic Program Review Committee	2020–2022
Head Judge, GeoDaze 2022	2022
Judge, GeoDaze 2021	2021
Head Judge, GeoDaze 2020	2020
Peer Evaluation Committee	2020
Diversity, Equity, Inclusion Committee	2019–2023
Diversity, Equity, Inclusion Committee Co-Chair	2019–2021
UA Geoscience Recreation Organizer	2019–2021
Petrochronology Faculty Search Committee	2019–2020

College Committees

College of Science Diversity, Equity, and Inclusion Committee	2020–2021
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University Committees

Faculty mentor for <i>Diana Liverman Scholars Program</i>	2021–present
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Other Committees

- Convener, “*Advanced Understanding of Tropical-Subtropical Hydroclimate Changes During the Pleistocene, Holocene, and Anthropocene*”, American Geophysical Union Fall Meeting, Washington D.C. Dec. 2024
- Convener, “*PP005: Advances in Understanding Past Asian Monsoon Evolution and Impacts by Combining Models and Data*”, American Geophysical Union Fall Meeting, San Francisco Dec. 2023
- Committee Member, AGU Sullivan Award Committee, American Geophysical Union Apr. 2023
- NASEM Workshop Planning Committee Member “*Identifying New Community-Driven Science Themes for NSF’s Support of Paleo Perspectives on Climate Change*” (1 of 6 U.S. scientists) Jan.–June, 2021
- Chair, “*PP026: Advances in Hydroclimate and Paleooceanography During the Holocene and Pleistocene*”, American Geophysical Union Fall Meeting Dec. 2020
- Convener, “*PP11C: Indian Ocean Dynamics Past and Present: Significance for Ocean Circulation and Terrestrial Climate*”, American Geophysical Union Fall Meeting, Washington D.C. Dec. 2018
- Chair, “*PP22C: Understanding the Indian-Asian-Australian Monsoon*”, American Geophysical Union Fall Meeting, Washington D.C. Dec. 2018
- Convener, “*Asian paleomonsoon and low-latitude paleoclimate*”, Goldschmidt Conference, Boston, MA Aug. 2018
- Primary organizer of IODP Expedition 353 (“*iMonsoon*”) Post-Cruise Symposium in Bengaluru, India Nov. 2017

TEACHING / MENTORING

Courses Taught at the University of Arizona

- *GEOS212: Introduction to Oceanography (Undergraduate Gen. Ed.)*
- *GEOS308: Paleontology (Undergraduate)*
- *GEOS342: Earth’s Climate History (Undergraduate)*
- *GEOS482/582: Paleooceanography and Paleoclimatology (Graduate+Undergraduate)*
- *GEOS466/566: Stable Isotope Geochemistry (Graduate+Undergraduate)*
- *GEOS496/596: Trace Elements in Biogenic Calcite (Graduate+Undergraduate)*
- *GEOS596a: Rock-Climate Interactions in Early Earth and Planets (Graduate)*

Guest Lectures

- Coconino Community College, AZ (C2C Visit) November 2023

South Mountain Community College, AZ (C2C Visit)	November 2023
Scottsdale Community College, AZ (C2C Visit)	November 2023
Northland Pioneer College, AZ (C2C Visit)	November 2023
San Juan College, NM (C2C Visit)	October 2023
Pima Community College, AZ (C2C Visit)	October 2023
Diné College, Navajo Nation, AZ (C2C Visit)	October 2023
Coconino Community College, AZ (C2C Visit)	December 2022
San Juan College, NM (C2C Visit)	October 2022
Northland Pioneer College, AZ (C2C Visit)	October 2022
Chandler-Gilbert Community College, AZ (C2C Visit)	October 2022
Pima Community College, AZ (C2C Visit)	September 2022
Diné College, Navajo Nation, AZ (Virtual)	March 2021
University of Vigo, Spain (Virtual)	March 2021

Advising & Student Committees

<i>Graduate Students</i>	Alexandra O’Keefe (MS; Primary Advisor)	2023–present
	Aniket Dhar (PhD; Primary Advisor)	2022–present
	Ammoose Jayan, Central University of Kerala (PhD; Co-Advisor)	2022–present
	Natalia Biezobas, U. Vigo (PhD; Co-Advisor)	2021–present
	Priscilla Martinez (PhD; Committee Member)	2022–present
	Carlie Mentzner (PhD Committee Member)	2021–present
	Mudith Weerabaddana (PhD Committee Member)	2021–present
	Brandon Levenstein (PhD Committee Member)	2019–present
	Maya Prabhakar (MS; Primary Advisor)	2020–2022
	Valerie Rubalcava (MS; Primary Advisor)	2020–2022
	Grace Windler (PhD Committee Member)	2019–2021
	Emma Reed (PhD Committee Member)	2019–2021
	Melli Rosenblatt (MS Committee Member)	2019–2021
	<i>Undergraduates</i>	Oliff Doiron (Geosciences)
Hayley McKenley (Geosciences)		2022–present

	Samantha Wallace (Geosciences)	2024
	Daniel Conley (Environmental Studies)	2022–2024
	Tyler Byland (Geosciences)	2022–2024
	Matthew Singer (Geosciences)	2022–2023
	Emily Havard (Geosciences)	2020–2022
	Serena Conde (Environmental Science)	2019–2022
	Dustin Taylor (Geosciences)	2019–2022
	Deanna Mireles (Geosciences)	2020–2021
<i>High School Students</i>	Sahasrakshi Dasika (BASIS Tucson North)	2022–2023
<i>(Via SARSEF)</i>	Ellis Selznick (University High School)	2020–2021
	Gabriel Declercq (Catalina Foothills)	2020–2021
	Mia Franks (University High School)	2019–2021

PEER-REVIEWED PUBLICATIONS

† – student mentored

- 2024
(*n* = 2)
- [64] †Prabhakar, M., **K. Thirumalai**, T. M. Cronin, L. Gomery, E. K. Thomas, P. Rafter, *Morphotypical, and geochemical variations of planktic foraminiferal Species in Siberian and central Arctic Ocean core tops*, Journal of Foraminiferal Research, 54 (1), 1-19
- [63] Wang, N., S. Dee, J. Hu, N. Steiger, **K. Thirumalai** (2024). *PDO and AMO modulation of the ENSO–Asian summer monsoon teleconnection during the Last Millennium*, Journal of Geophysical Research: Atmospheres, 129, e2023JD039638. doi:10.1029/2023JD039638
- 2023
(*n* = 8)
- [62] Du, X., S. Dee, J. Hu, **K. Thirumalai** (2023), *Solar irradiance modulates the Asian summer monsoon—ENSO relationship over the last millennium*, Geophysical Research Letters, 50(23), e2023GL105708.
- [61] Hu, J., S. Dee, G. Parajuli, **K. Thirumalai** (2023), *Tropical Pacific Modulation of the Asian Summer Monsoon over the Last Millennium in Paleoclimate Data Assimilation Reconstructions*, Journal of Geophysical Research: Atmospheres, 128, e2023JD039207. doi:10.1029/2023JD039207
- [60] **Thirumalai, K.**, C. R. Maupin (2023), *Chasing interannual marine variability*, Paleoceanography & Paleoclimatology, 38, e2023PA004723.
- [59] **Thirumalai, K.**, A. C. Cohen, †D. Taylor (2023), *Hydrologic controls on individual ostracode stable isotopes in a desert lake: A modern baseline for Lake Turkana*, Geochemistry, Geophysics, Geosystems, 24, e2022GC010790. doi:10.1029/2022GC010790

2022
(n = 7)

- [58] **Thirumalai, K.** (2023), *Salty seas sway global glacial cycles*, *Nature*, 617(7960), 258-259. doi:10.1038/d41586-023-01489-w
- [57] Clemens, S. C., **K. Thirumalai**, D. Oppo (2023), *Indian margin methane hydrate dissociation recorded in the carbon isotopes of benthic (*Miliolida*) foraminifera*, *Earth and Planetary Science Letters*, 609 (2023): 118101. doi:10.1016/j.epsl.2023.118101
- [56] Brierley, C., **K. Thirumalai**, E. Grindrod, J. Barnsley (2023), *Indian Ocean variability changes in the Paleoclimate Modelling Intercomparison Project*, *Climate of the Past*, 19, 681–701. doi:10.5194/cp-19-681-2023
- [55] McClymont, E. L., et al. (2023), *Climate Evolution through the onset and intensification of Northern Hemisphere Glaciation*, *Reviews of Geophysics*, e2022RG000793. doi:10.1029/2022RG000793
- [54] Judd, E., J. et al. (2022), *The PhanSST global database of Phanerozoic sea surface temperature proxy data*, *Scientific Data* 9 (1), 753. doi:10.1038/s41597-022-01826-0
- [53] Midhun, M., P. R. Lekshmy, **K. Thirumalai**, R. Ramesh (2022), *Coherent Indian Summer Monsoon and Sahel Rainfall Variability Revealed by Ethiopian Rainfall $\delta^{18}O$* , *Journal of Geophysical Research: Atmospheres* 127 (22), e2022JD037160; doi:10.1029/2022JD037160
- [52] Yanay, N., Z. Wang, D. L. Dettman, J. Quade, K. W. Huntington, A. J. Schauer, D. D. Nelson, J. B. McManus, **K. Thirumalai**, S. Sakai, A. R. Morillo, A. Mallik (2022), *Rapid & precise measurement of carbonate clumped isotopes using laser spectroscopy*, *Science Advances* 8 (43), eabq0611. doi:10.1126/sciadv.abq0611
- [51] Zorzi, C., S. Desprat, C. Clément, **K. Thirumalai**, D. Oliviera, K. Anupama, S. Prasad, P. Martinez (2022), *When eastern India oscillated between desert versus savannah-dominated vegetation*, *Geophysical Research Letters*, e2022GL099417. doi:10.1029/2022GL099417
- [50] Band, S. T., M. G. Yadava, N. Kaushal, M. Midhun, **K. Thirumalai**, T. Francis, A. Laskar, R. Ramesh, G. M. Henderson, A. C. Narayana (2022), *Southern hemisphere forced millennial scale Indian summer monsoon variability during the late Pleistocene*, *Scientific Reports* 12 (1), 1-8. doi:10.1038/s41598-022-14010-6
- [49] Lawman, A. E., P. N. DiNezio, J. W. Partin, S. G. Dee, **K. Thirumalai**, T. M. Quinn (2022), *Unraveling forced responses of extreme El Niño variability over the Holocene*, *Science Advances* 8 (9), eabm4313. doi:10.1126/sciadv.abm4313
- [48] Warner, J. P., K. L. DeLong, D. Chicoine, **K. Thirumalai**, C., F., T., Andrus (2022), *Investigating the influence of temperature and seawater $\delta^{18}O$ on *Donax obesulus* (Reeve, 1854) shell $\delta^{18}O$* , *Chemical Geology*, 588, 12063. doi:10.1016/j.chemgeo.2021.120638

- 2021
(n = 8)
- [47] Prabhakaran, R., S. P. Kavil, I. Tayasu, C. Yoshimizu, **K. Thirumalai**, K. Sajeev, and R. Sukumar (2021), *Paleovegetation dynamics in an alternative stable states landscape in the montane Western Ghats, India*, *The Holocene*, 2022;32(4):297-307. doi:10.1177/09596836211066592
- [46] **Thirumalai, K.**, J. N. Richey, T. M. Quinn (2021), *Holocene evolution of sea-surface temperature and salinity in the Gulf of Mexico*, *Paleoceanography and Paleoclimatology*, 36, e2021PA004221. doi:10.1029/2021PA004221
- [45] Clemens, S. C., M. Yamamoto, **K. Thirumalai**, L. Giosan, J. N Richey, K. Nilsson-Kerr, Y. Rosenthal, P. Anand, S. M. McGrath (2021), *Remote and local drivers of Pleistocene South Asian summer monsoon precipitation: A test for future predictions*, *Science Advances*, 7 (23), eabg3848. doi:10.1126/sciadv.abg3848
- [44] Maupin, C. R., E B. Roark, **K. Thirumalai**, C.-C. Shen, C. Schumacher, S. Van Kampen-Lewis, A. L. Housson, C. L. McChesney, O. Baykara, T. -L. Yu, K. White, J. W. Partin (2021), *Abrupt Southern Great Plains thunderstorm shifts linked to glacial climate variability*, *Nature Geoscience* 14 (6), 396-401. doi:10.1038/s41561-021-00729-w
- [43] Mehta, S., A. Singh, **K. Thirumalai** (2021), *Uncertainty in palaeosalinity estimates from foraminiferal geochemical records in the northern Indian Ocean*, *Palaeogeography, Palaeoclimatology, Palaeoecology*, 569 (110326). doi:10.1016/j.palaeo.2021.110326
- [42] Mishra, V., **K. Thirumalai**, S. Jain, S. Aadhar (2021), *Unprecedented drought in South India and recent water scarcity*, *Environmental Research Letters* 16 (5), 054007. doi:10.1088/1748-9326/abf289
- [41] †Glaubke, R.H., **K. Thirumalai**, M. W. Schmidt, J. E. Hertzberg (2021), *Discerning Changes in High-Frequency Climate Variability using Geochemical Populations of Individual Foraminifera*, *Paleoceanography and Paleoclimatology*, e2020PA004065. doi:10.1029/2020PA004065
- [40] Tharammal, T., G. Bala, A. Paul, D. Noone, A. Contreras-Rosales, **K. Thirumalai** (2021), *Orbitally driven evolution of Asian monsoon and stable water isotope ratios during the Holocene: Isotope-enabled climate model simulations and proxy data comparisons*, *Quaternary Science Reviews*, 252, 106743. doi:10.1016/j.quascirev.2020.106743.
- 2020
(n = 10)
- [39] **Thirumalai, K.**, S. C. Clemens, J. W. Partin (2020), *Methane, Monsoons, and Millennial-scale Climate*, *Geophysical Research Letters*, 47, e2020GL087613. doi:10.1029/2020GL087613
- [38] **Thirumalai, K.** and S. C. Clemens (2020), *Monsoon reconstructions using bulk and individual foraminiferal analyses in marine sediments offshore India*, *Current Science*, 119.2, 328-334.

- [37] Bali, H., A. K. Gupta, K. Mohan, **K. Thirumalai**, S. K. Tiwari, M. K. Panigrahi (2020), *Evolution of the oligotrophic West Pacific Warm Pool during the Pliocene–Pleistocene boundary*, *Paleoceanography and Paleoclimatology*, e2020PA003875. doi:10.1029/2020PA003875
- [36] Tierney, J. E., C. J. Poulsen, I. P. Montañez et al., (2020), *Past climates inform our future*, *Science*, 370(6517). doi:10.1126/science.aay3701
- [35] McClymont, E. L., H. L. Ford, S. L. Ho, et al. (2020), *Lessons from a high- CO_2 world: an ocean view from ~3 million years ago*, *Climate of the Past*, 16(4), 1599-615. doi:10.5194/cp-16-1599-2020
- [34] Abram, N. J., J. A. Hargreaves, N. M. Wright, **K. Thirumalai**, C. C. Ummenhofer, M. H. England (2020), *Palaeoclimate perspectives on the Indian Ocean Dipole*, *Quaternary Science Reviews*, 237, Volume 237, 106302; doi:10.1016/j.quascirev.2020.106302
- [33] DiNezio, P. N., M. Puy, **K. Thirumalai**, F-F. Jin, J. E. Tierney (2020), *Emergence of an equatorial mode of climate variability in the Indian Ocean*, *Science Advances*, 6, no. 19, eaay7684. doi:10.1126/sciadv.aay7684
- [32] Mishra V., **K. Thirumalai**, D. Singh, S. Aadhar (2020), *Future exacerbation of hot and dry summer monsoon extremes in India*, *npj Climate & Atmospheric Science*, 3, 10. doi:10.1038/s41612-020-0113-5
- [31] Gebregiorgis, D., S. Clemens, E. Hathorne, L. Giosan, **K. Thirumalai**, and M. Frank (2020), *A Brief Commentary on the Interpretation of Chinese Speleothem $\delta^{18}O$ Records as Summer Monsoon Intensity Tracers*, *Quaternary*, 3(1). doi:10.3390/quat3010007
- [30] Lawman, A. L., T. M. Quinn, J. W. Partin, **K. Thirumalai**, F. W. Taylor, C. -C. Wu, T. -L. Yu, M. Gorman, C. -C. Shen (2020), *A century of reduced ENSO variability during the Medieval Climate Anomaly*, *Paleoceanography & Paleoclimatology*, 35, e2019PA003742. doi:10.1029/2019PA003742
- [29] Tierney, J. E., S. Malevich, W. Gray, L. Vetter, **K. Thirumalai** (2019), *Bayesian calibration of the Mg/Ca paleothermometer in planktic foraminifera*, *Paleoceanography & Paleoclimatology*, 34(12), 2005-2030; doi:10.1029/2019pa003744
- (2019
(n = 7)
- [28] Khider, D., et al. (2019), *PaCTS v1.0: A Crowdsourced Reporting Standard for Paleoclimate Data*, *Paleoceanography & Paleoclimatology*, 34, 1570-1596 doi:10.1029/2019PA003632
- [27] **Thirumalai, K.**, P. N. DiNezio, J. E. Tierney, M. Puy, M. Mohtadi (2019), *An El Niño Mode in the Glacial Indian Ocean?*, *Paleoceanography & Paleoclimatology*, 34, 1316- 1327. doi:10.1029/2019PA003669
- [26] Greene, C. A., **K. Thirumalai**, K. A. Kearney, J. M. Delgado, W. Schwanghart, N. S. Wolfenbarger, K. M. Thyng, D. E. Gwyther, A. S. Gardner, D. D. Blankenship (2019), *The climate data toolbox for MATLAB*, *Geochemistry, Geophysics, Geosystems*, 20, 3774-3781. doi:10.1029/2019GC008392

- [25] Naidu, P. D., N. Niitsuma, **K. Thirumalai**, and S. S. Naik (2019), *Significant seasonal contrast in the Arabian Sea during deglaciation: Evidence from oxygen isotopic analyses of individual planktic foraminifera*, *Quaternary International*, 503, 163-169. doi:10.1016/j.quaint.2018.08.005
- [24] Richey, J. N., **K. Thirumalai**, D. Khider, C. Reynolds, J. W. Partin, T. M. Quinn (2019), *Considerations for Globigerinoides ruber (white and pink) paleoceanography: comprehensive insights from a long-running sediment trap*, *Paleoceanography and Paleoclimatology*, 34: 353-373. doi:10.1029/2018PA003417
- [23] Schmitt A., M. Elliot, **K. Thirumalai**, C. La, F. Bassinot, J. Petersen, A. Movellan, S. Jorry, J. Borgomano (2019), *Single foraminifera Mg/Ca of two morphotypes of planktonic species G. ruber by LA-ICPMS: New insights into past seasonality and inter-annual variability of water column temperatures*, *Chemical Geology*, 511, 510-520. doi:10.1016/j.chemgeo.2018.11.007
- [22] Giosan, L., W. D. Orsi, M. Coolen, C. Wuchter, A. G. Dunlea, **K. Thirumalai**, S. E. Munoz, P. D. Clift, J. P. Donnelly, V. Galy, D. Q. Fuller (2018), *Neoglacial Climate Anomalies and the Harappan Metamorphosis*, *Climate of the Past*, 14(11), 1669-1686. doi:10.5194/cp-14-1669-2018
- [21] **Thirumalai, K.**, (2018), *A fresh take on ancient climate change in the North Pacific*, *Nature*, 559(7713), 185-186; doi:10.1038/d41586-018-05614-y
- [20] **Thirumalai, K.**, T. M. Quinn, Y. Okumura, J. N. Richey, J. W. Partin, R. Z. Poore, E. Moreno-Chamarro (2018), *Pronounced centennial-scale Atlantic Ocean climate variability correlated with Western Hemisphere hydroclimate*, *Nature Communications*, 1- 11. doi:10.1038/s41467-018-02846-4
- [19] Ghosh, P., R. Rangarajan, **K. Thirumalai**, F. Naggs (2017), *Extreme monsoon rainfall signatures preserved in the invasive terrestrial gastropod Lissachatina fulica*, *Geochemistry, Geophysics, Geosystems*, 18; doi:10.1002/2017GC007041
- [18] Tindall, J., A. M. Haywood, **K. Thirumalai** (2017), *Modelling the Stable Water Isotope expression of El Niño in the Pliocene: Implications for the interpretation of proxy data*, *Paleoceanography*, 32, 881-902; doi:10.1002/2016PA003059
- [17] **Thirumalai, K.**, P. N. DiNezio, Y. Okumura, C. Deser (2017), *Extreme temperatures in Southeast Asia caused by El Niño and worsened by global warming*, *Nature Communications*, 8:15531, 1-8; doi:10.1038/ncomms15531
- [16] Emile-Geay, J., and the **PAGES2K Consortium** (2017), *A global multiproxy database for temperature reconstructions of the Common Era*, *Scientific Data*, 4, 170088. doi:10.1038/sdata.2017.88

2016 and
prior

- [15] Flannery, J. A., J. N. Richey, **K. Thirumalai**, R. Z. Poore, K. L. DeLong (2017), *Multi-species Coral Sr/Ca Based Sea-Surface Temperature Reconstruction Using Orbicella faveolata and Siderastrea siderea from Dry Tortugas National Park, FL*, Palaeogeography, Palaeoclimatology, Palaeoecology, 466, 100-109. doi:10.1016/j.palaeo.2016.10.022
- [14] **Thirumalai, K.**, T. M. Quinn, G. Marino (2016), *Probabilistic constraints on past seawater- $\delta^{18}O$ & temperature reconstructions developed from foraminiferal geochemistry*, Paleoceanography, 31, 1409-1422; doi:10.1002/2016PA002970
- [13] **Thirumalai, K.** and J. N. Richey (2016), *Potential for paleosalinity reconstructions to provide information about AMOC variability*, US CLIVAR Variations, 14, 3, 8-11
- [12] Abram, N.J., H. V. McGregor, J. E. Tierney, M. N. Evans, N. P. McKay, D. S. Kaufman, **K. Thirumalai**, & the PAGES 2k Consortium (2016), *Early onset of industrial-era warming across the oceans and continents*, Nature, 536, 411-418; doi:10.1038/nature19082
- [11] Weil-Accardo, J., N. Feuillet, E. Jacques, P. Deschamps, J-M. Saurel, **K. Thirumalai**, S. Demeza, D. Anglade (2016), *Relative sea-level changes during the last century recorded by coral microatolls in Belloc, Haiti*, Global and Planetary Change, 139, 1-14. doi:10.1016/j.gloplacha.2015.12.019
- [10] Goff, J. A., L., Lugin, L., S. P. S., Gulick, **K. Thirumalai**, Y. Okumura (2015), *Oyster Reef Die-Offs in Stratigraphic Record of Corpus Christi Bay, Texas Possibly Caused by Drought-Driven Extreme Salinity Changes*, The Holocene, 26(4) 511-519. doi:10.1177/0959683615612587
- [9] McGregor, H. V., M. N. Evans, H. Goosse, G. Leduc, B. Martrat, J. A. Addison, P. G. Mortyn, D. W. Oppo, M-S. Seidenkrantz, M-A. Sicre, S. J. Phipps, K. Selvaraj, **K. Thirumalai**, H. L. Filipsson, V. Ersek (2015), *Robust global ocean cooling trend for the pre-industrial Common Era*, Nature Geoscience, 8, 671-677 doi:10.1038/ngeo2510
- [8] **Thirumalai, K.**, F. W. Taylor, C.-C. Shen, L. L. Lavier, C. Frohlich, L. M. Wallace, C.- C. Wu, H. Sun, A. K. Papabatu (2015), *Variable Holocene deformation above a shallow subduction zone extremely close to the trench*, Nature Communications, 8607, 1-6 doi:10.1038/ncomms8607
- [7] Clemens, S. C., W. Kuhnt, L. J. LeVay, and the Expedition 353 Scientists (2015), *Indian monsoon rainfall*, International Ocean Discovery Program Preliminary Report, 353. doi:10.14379/iodp.pr.353.2015
- [6] Wicks, T. Z., **K. Thirumalai**, T. M. Shanahan, C. J. Bell (2015), *The use of $\delta^{13}C$ values of leporid teeth as indicators of past vegetation*, Palaeogeography, Palaeoclimatology, Palaeoecology, 418 (C), 245-260; doi:10.1016/j.palaeo.2014.11.017

- [5] **Thirumalai, K.**, J. N. Richey, T. M. Quinn, R. Z. Poore (2014), *Globigerinoides ruber morphotypes in the Gulf of Mexico: A test of null hypothesis*, Scientific Reports, 4, 6018 doi:10.1038/srep06018
- [4] Maupin, C. R., J. W. Partin, C.-C. Shen, T. M. Quinn, K. Lin, F. W. Taylor, J. L. Banner, **K. Thirumalai**, D. J. Sinclair (2014), *Persistent decadal-scale rainfall variability in the tropical South Pacific Convergence Zone through the past six centuries*, Climate of the Past, 10, 1319-1332. doi:10.5194/cp-10-1319-2014
- [3] Laskar, A., N. Gandhi, **K. Thirumalai**, M. G. Yadava, R. Ramesh, R. R. Mahajan, D. Kumar (2014), *Stable carbon isotopes in dissolved inorganic carbon: extraction and implications for quantifying the contributions from silicate and carbonate weathering in the Krishna River system during peak discharge*, Isotopes in Environmental and Health Studies, 50 (2), 1-13. doi:10.1080/10256016.2014.878715
- [2] **Thirumalai, K.**, J. W. Partin, C. S. Jackson, T. M. Quinn (2013), *Statistical constraints on El Niño Southern Oscillation reconstructions using individual foraminifera: A sensitivity analysis*, Paleoceanography, 28, 401-412; doi:10.1002/palo.20037
- [1] **Thirumalai K.**, A. Singh, R. Ramesh (2011), *A MATLAB™ code to perform weighted linear regression with (correlated or uncorrelated) errors in bivariate data*, Journal Of The Geological Society Of India, 77 (4), 377-380. doi:10.1007/s12594-011-0044-1

MEDIA

- 2023 [There is no JOIDES in Mudville](#) - Eos, American Geophysical Union
- [Twin ocean climate anomalies may trigger heat and drought in 2024](#) - New Scientist
- 2022 [Why is it important to reconstruct methane seepage?](#) - AGU TV
- [Entfesselt - Der Indische Monsun](#) - Energiewende-Magazin (Germany)
- [Study reveals how El Nino responds to external forcing factors](#) - National Public Radio (KJZZ)
- 2021 [Million-year study shows warming will make Indian monsoons will make Indian monsoons more extreme, says geoscientist Kaustubh Thirumalai](#) - The Times of India
- 2017 [Giant Snails' Century-Old Shells Recorded Monsoon Rainfall](#) - Eos, American Geophysical Union
- [Improving Our Understanding of El Niño in a Warm Climate](#) - Eos, American Geophysical Union
- [Trace metals and thrash metal with Kaustubh Thirumalai](#) - Forecast (Podcast); Michael White, Nature

- Climate change causes killer heatwaves* - Climate News Network
- Scientists just linked another record-breaking weather event to climate change* - The Washington Post
- South-east Asia smashes temperature records for its hottest month* - International Business Times
- Scientists Unravel How El Niño and Global Warming Combine to Cause Record-Breaking Heat in Southeast Asia* - University of Texas at Austin
- 2016 *Bat Guano: A Possible New Source for Paleoclimate Reconstructions* - Eos, American Geophysical Union
- Climate scientists trained to be on hot seat* - Minnesota Public Radio
- Climate Change: The Beginning* - Generation Anthropocene (Podcast); Stanford University
- Man-made warming may have started decades earlier* - CBS News
- 2015 *Tapping Coral for Evidence of Earthquakes* - University of Texas at Austin
- Oceans warming 20x faster than they cooled in past millennium* - University of Maryland
- 1.8kyr Cooling Trend Results from a Series of Volcanic Eruptions* - Nature World News
- Coral Reefs and Earthquake History: Tale is There* - Nature World News
- 2014 *Catch a Falling Sediment* - The University of Texas at Austin

CONFERENCES PRESENTATIONS

Invited Conference Presentations (since 2016)

- December 2023 [11] Invited Speaker, American Geophysical Union Fall Meeting (2023), Session: *PP33A: Advanced Understanding of Tropical-Subtropical Hydroclimate Changes During the Pleistocene, Holocene, and Anthropocene*, San Francisco, CA
- December 2023 [10] Invited Poster Presentation, American Geophysical Union Fall Meeting (2023), Session: *PP53D: Not Your Average Monsoon: Developing Proxies and Records for Paleoseasonality*, San Francisco, CA
- October 2022 [9] Invited Speaker, *Geological Society of America Connects 2022* (2022), Session: *T145. Advances and New Voices in Marine and Coastal Geoscience*, Denver, CO
- December 2021 [8] Invited Speaker, *American Geophysical Union Fall Meeting* (2021), Session: *PP026: Tropical Paleoclimate Across Time: Insights from Proxy Data and Climate Models*, San Francisco, CA

- October 2021 [7] Invited Speaker, *Geological Society of America Connects 2021* (2021), Session: T80: Foraminiferal Signals of Major Events in Mesozoic–Cenozoic Earth History, Portland, OR
- June 2021 [6] Invited Speaker, *Japanese Geophysical Union Meeting 2021* (2021), Session: Advanced understanding of Quaternary and Anthropocene hydroclimate changes in East Asia, Japan
- May 2021 [5] Invited Speaker, *The Geological Society*, “Climate change in the geological record: What the geological record tells us about our past and future climate”, London, United Kingdom
- November 2020 [4] Invited Panelist, *The Micropaleontology Society* Annual Conference
- September 2019 [3] Invited Session Speaker, *International Conference on Paleooceanography* (2019), Sydney, Australia
- August 2019 [2] Plenary Lecture, *PaleoENSO Conference* (2019), Belitung, Indonesia
- August 2018 [1] Invited Speaker, *Goldschmidt Conference* (2018), Session: 08c: Applications of High Resolution Geochemical Proxies: Seasonality and Past Climate Variability, Boston, MA

Invited Seminars & Colloquia (since 2016)

- April 2024 *Earth Science Seminar*, George Mason University, VA
- April 2024 *Van Tuyl Lecture*, Colorado School of Mines, CO
- February 2024 *Earth Science Seminar*, Indian Institute of Technology Gandhinagar, India
- February 2024 *Geosciences Division Seminar*, Physical Research Laboratory, India
- October 2023 *Comer Family Foundation*, Wisconsin
- April 2023 *Shell Colloquium Series Seminar*, Geosciences, University of Oklahoma, Norman, OK
- February 2023 *HAS Seminar*, Hydrology & Atmospheric Sciences, University of Arizona, AZ
- February 2023 *Seminar*, Department of Geological & Atmospheric Sciences, Iowa State University, Ames, IA
- January 2023 *Geoscience Seminar*, National Taiwan University, Taipei, Taiwan

December 2022 *Geography Seminar Series*, Durham University, Durham, UK

November 2022 *Divecha Centre for Climate Change Seminar*, Indian Institute of Science, India

June 2022 *Seminar*, Indian Institute of Tropical Meteorology, Pune, India

February 2022 *Seminar*, Yale University, New Haven, CT

February 2022 *Seminar*, University of Wisconsin at Madison, Madison, WI

February 2022 *Colloquium*, Lamont Doherty Earth Observatory, Palisades, NY

December 2021 *Geochemistry Seminar*, Lamont Doherty Earth Observatory, Palisades, NY

November 2021 *Earth and Atmospheric Sciences Seminar*, GeorgiaTech, Atlanta, GA

July 2021 *Chemistry & Geochemistry Seminar*, Woods Hole Oceanographic Institution, Falmouth, MA

May 2021 *Earth and Planetary Sciences Seminar*, Northwestern University, Evanston, IL

April 2021 *Oceanography Seminar*, University of Hawaii, Manoa, HI

March 2021 *Geology & Geophysics Seminar*, Louisiana State University, Baton Rouge, LA

March 2021 *Weeks Seminar*, University of Wisconsin at Madison, Madison, WI

March 2021 *Geosciences Seminar*, University of Nevada at Las Vegas, Las Vegas, NV

March 2021 *School of Earth and Sustainability Seminar*, Northern Arizona University, Flagstaff, AZ

November 2020 *PalaeoPERCS Presentation* (Virtual Platform)

October 2020 *Earth Sciences Colloquium*, University College London, United Kingdom

September 2020 *Earth Sciences Seminar*, University of Southern California, Los Angeles, CA

July 2020 *Marine Geosciences Seminar*, IFREMER, France

July 2020 *Keynote Speaker*, Vellore Institute of Technology, Vellore, TN, India

- March 2019 *Earth Science Colloquium*, Rowan University
- March 2019 *Program in Atmospheres, Oceans, and Climate Colloquium*, Massachusetts Institute of Technology, Cambridge, MA
- January 2019 *Earth and Planetary Sciences Colloquium*, Washington University of St. Louis, St. Louis, MO
- October 2018 *Environmental Geology & Geochemistry Seminar*, Princeton University, Princeton, NJ
- October 2018 *Department of Marine & Coastal Sciences Seminar*, Rutgers University, New Brunswick, NJ
- September 2018 *School of the Earth, Ocean, and Environment Seminar*, University of South Carolina, Columbia, SC
- May 2018 *Marine Geology & Geophysics Seminar*, Woods Hole Oceanographic Institution, Falmouth, MA
- April 2018 *Ocean Sciences Seminar*, University of California at Santa Cruz, Santa Cruz, CA
- April 2018 *Department of Geosciences Colloquium*, University of Arizona, Tucson, AZ
- March 2018 *UTIG Seminar*, University of Texas Institute for Geophysics, Austin, TX
- January 2018 *Department of Earth & Environmental Sciences Seminar*, Syracuse University, Syracuse, NY
- October 2017 *Department of Geoscience Seminar*, University of Rhode Island, Kingston, RI
- July 2017 *USGS Seminar*, University of South Florida Marine Campus, Tampa, FL
- April 2017 *Colloquium*, National Institute for Science Education & Research, Odisha, India
- April 2017 *Department Seminar*, Centre for Atmospheric and Oceanic Sciences, Indian Institute of Science, Bengaluru, India
- February 2017 *Seminar*, College of Earth, Ocean, and Atmospheric Sciences, Oregon State University, Corvallis, OR
- November 2016 *Division of Biology and Paleo Environment Seminar*, Lamont Doherty Earth Observatory, Palisades, NY

Conference Presentations (since 2016)

† - student mentored

- 2023 (n = 12) [60] Abell, J. T., G. Winckler, **K. Thirumalai**, *Investigating the drivers of subarctic North Pacific Ocean export productivity and deep ocean oxygenation across the Pliocene and earliest Pleistocene*, PP31A-05, AGU Fall Meeting 2023 San Francisco, CA, 11–15th December, 2023

- [59] Oppo, D., S. C. Clemens, **K. Thirumalai**, *Indian Margin Methane Hydrate Dissociation Recorded in the Carbon Isotopes of Benthic (Miliolida) Foraminifera*, OS21C-1431, AGU Fall Meeting 2023 San Francisco, CA, 11–15th December, 2023
- [58] Rafter, P. et al., *Characterizing the spatial distribution and chemistry of geologic carbon input to the Eastern Tropical North Pacific before and after the last ice age*, PP33D-1547, AGU Fall Meeting 2023 San Francisco, CA, 11–15th December, 2023
- [57] Vetter, L., **K. Thirumalai**, J. Fehrenbacher, *Investigating the Link between Shell Crusting, Trace Element Ratios, and Ontogeny in Thermocline-Dwelling Menardiiform Planktic Foraminifera*, PP43E-1723, AGU Fall Meeting 2023 San Francisco, CA, 11–15th December, 2023
- [56] Wang, N., S. Dee, J. Hu, N. Steiger, **K. Thirumalai**, *PDO and AMO Modulation of the ENSO–Asian Summer Monsoon Teleconnection during the Last Millennium*, PP52B-03, AGU Fall Meeting 2023 San Francisco, CA, 11–15th December, 2023
- [55] Yu, S. M., R. Keating, **K. Thirumalai**, R. A. Mortlock, K. Miller, J. Wright, *Stratification and Surface Salinity Variations across the Last Two Glacial Cycles with Maldivian Planktonic Foraminifera*, PP53D-1126, AGU Fall Meeting 2023 San Francisco, CA, 11–15th December, 2023
- [54] †Dhar, A., **K. Thirumalai**, J. W. Partin, P. Ghosh, R. Subba, S. C. Clemens, H. -M. Hu, C. -C. Shen, *Speleothem-derived insights into hydroclimate changes in India over the past 500 years*, PP31B-1473, AGU Fall Meeting 2023 San Francisco, CA, 11–15th December, 2023
- [53] Babineaux, G., D. Oppo, **K. Thirumalai**, L. Macelloni, *Isotopic Signatures of Methane Seepage Recorded in Benthic Foraminifera from Woolsey Mound (Gulf of Mexico)*, OS21C-1432, AGU Fall Meeting 2023 San Francisco, CA, 11–15th December, 2023
- [52] **Thirumalai, K.** et al. (invited), *Late Pleistocene Indian Monsoon Variability: A Southern Indian Speleothem Perspective*, PP33A-01, AGU Fall Meeting 2023 San Francisco, CA, 11–15th December, 2023
- [51] **Thirumalai, K.** et al. (invited), *What is your average monsoon? Seasonal links between stratification and Indian summer monsoon outflow*, PP53D-1129, AGU Fall Meeting 2023 San Francisco, CA, 11–15th December, 2023
- [50] Du, X., S. Dee, J. Hu, **K. Thirumalai**, *Solar Irradiance Modulates the Relationship Between the Asian Summer Monsoon and ENSO over the Past Millennium*, PP32B-06, AGU Fall Meeting 2023 San Francisco, CA, 11–15th December, 2023

- [49] Solanki, H., V. Jain, **K. Thirumalai**, V. Sharma, *Hydrological Reconstruction Supports the Impacts of Drought on the Indus Valley Civilization*, PP53F-1140, AGU Fall Meeting 2023 San Francisco, CA, 11–15th December, 2023
- [48] Vetter, L., **K. Thirumalai**, J. Fehrenbacher, *Characterizing Variability in the Tropical Ocean Mixed Layer and Thermocline: Insights from Core-top Multi-species Individual Foraminiferal Analysis (IFA)*, PP35C-0991, AGU Fall Meeting 2022 Chicago, IL, 12-16th December, 2022
- 2022
(n = 7)
- [47] Jana, D., M. Torres, **K. Thirumalai**, U. Jammalamadaka, *Understanding the effects of post-depositional processes on foraminiferal paleotemperature proxies: Insights from X-Ray MicroCT Scanning*, PP35A-03, AGU Fall Meeting 2022 Chicago, IL, 12-16th December, 2022
- [46] †Havard, E., **K. Thirumalai**, J. N. Richey, D. Oppo, *Species Abundance and Individual Foraminiferal Analyses During the Younger Dryas in the Northern Gulf of Mexico*, PP12E-0682, AGU Fall Meeting 2022 Chicago, IL, 12-16th December, 2022
- [45] Hu, J., S. G. Dee, **K. Thirumalai**, *ENSO Modulation of the Asian Summer Monsoon in Last2k Paleoclimate Data Assimilation Reconstructions*, PP11A-03, AGU Fall Meeting 2022 Chicago, IL, 12-16th December, 2022
- [44] Babineaux, G. L., D. Oppo, **K. Thirumalai**, G. Panieri, J. N. Richey, L. Macelloni, *Individual Benthic Foraminifera Analysis and its Use in Reconstructing Methane Seepage: the Case of Woolsey Mound, Gulf of Mexico*, OS42B-1197, AGU Fall Meeting 2022 Chicago, IL, 12-16th December, 2022
- [43] **Thirumalai K.**, *Holocene Paleoceanography Of The Gulf Of Mexico*, 122-8, T145. Advances and New Voices in Marine and Coastal Geoscience, GSA Connects 2022, Denver, CO, 9-12 October, 2022
- [42] †Conde, S. & **Thirumalai, K.**, *Heterogeneous Planktic Foraminiferal Response To Deglacial Indian Monsoon Changes*, 1-3, D18. Recent Advances in Paleoclimatology/Paleoceanography, GSA Connects 2022, Denver, CO, 9-12 October, 2022
- [41] †Prabhakar, M., **K. Thirumalai**, T. M. Cronin, L. Gemery, E. K. Thomas, *Morphotypical variation and geochemistry of planktic foraminifera in the Late Holocene Arctic Ocean*, AGU Fall Meeting 2021 New Orleans, LA, 13-17th December, 2021
- 2021
(n = 14)
- [40] †Rubalcava, V. & **Thirumalai K.**, *Stable Isotopic Analyses of Small Carbonate Samples: Implications for Individual Foraminiferal Analyses & Results From Isotope Dilution Experiments*, AGU Fall Meeting 2021 New Orleans, LA, 13-17th December, 2021

- [39] †Conde, S. & **Thirumalai, K.**, *Species-specific Responses of Planktic Foraminifera to the Indian Summer Monsoon: High Resolution Insights Across the Deglaciation*, AGU Fall Meeting 2021 New Orleans, LA, 13-17th December, 2021
- [38] Vetter, L., **K. Thirumalai**, J. S. Fehrenbacher, †S. Conde, H. A. Ren, *Subdecadal Variability in Tropical Paleoclimate: Proxy Insights from Individual Foraminifera Analysis (IFA) in Core Tops and Plankton Tow*, AGU Fall Meeting 2021 New Orleans, LA, 13-17th December, 2021
- [37] **Thirumalai, K.**, S. C. Clemens, Y. Rosenthal, †S. Conde, K. Bu, S. Desprat, L. Zhou, L. Giosan, A. Singh, V. Mishra, *Extreme Indian paleomonsoon states and productivity collapses since the last Ice Age*, AGU Fall Meeting 2021 New Orleans, LA, 13-17th December, 2021
- [36] Richey, J. N. & **Thirumalai K.**, *Holocene Deterioration of the Rio Grande outflow: A multiproxy perspective*, AGU Fall Meeting 2021 New Orleans, LA, 13-17th December, 2021
- [35] Babineaux, G. L., D. Oppo, N. Powers, **K. Thirumalai**, †E. Selznick, G. Panieri, L. Macelloni, *New Analyses Reveal a High Variability of Methane Release Over the Last 50 kys at Woolsey Mound (Gulf of Mexico)*, AGU Fall Meeting 2021 New Orleans, LA, 13-17th December, 2021
- [34] Clement, C., S. Desprat, P. Martinez, **K. Thirumalai**, S. Prasad, K. Anupama, C. Zorzi, D. S. Oliveira, S. C. Clemens, *Indian Vegetation and Summer Monsoon Changes across the Last Two Interglacials: The First Pollen-Based Holocene-Eemian Comparison in the Core Monsoon zone from IODP Site U1446*, AGU Fall Meeting 2021 New Orleans, LA, 13-17th December, 2021
- [33] Zorzi, C., C., S. Desprat, P. Martinez, C. Clement, **K. Thirumalai**, S. Prasad, K. Anupama, S. C. Clemens, *Strong Influence of the Interhemispheric Gradient in Modulating the Indian Vegetation and Monsoon Changes During the Last Glacial Period ~78-20 ka*, AGU Fall Meeting 2021 New Orleans, LA, 13-17th December, 2021
- [32] Domeyko, R. A., J. W. Partin, Y. Okumura, P. N. DiNezio, **K. Thirumalai**, A. E. Lawman, F. W. Taylor, Y. -C. Chung, C., -C., Shen, *Climate Model-Coral Record Comparisons of El Niño-Southern Oscillation Variability During Abrupt Climate Events*, AGU Fall Meeting 2021 New Orleans, LA, 13-17th December, 2021
- [31] Costa, K., **K. Thirumalai**, A. Jacobel, *Sea surface temperature gradients indicate enhanced upwelling in the eastern tropical Atlantic during the Last Glacial Maximum*, AGU Fall Meeting 2021 New Orleans, LA, 13-17th December, 2021
- [30] Bala, P. R., S. P. Kavil, I. Tayasu, C. Yoshimizu, **K. Thirumalai**, K. Sajeev, R. Sukumar, *The role of short-term disturbances in paleovegetation dynamics in a montane forest-grassland vegetation mosaic, Western Ghats, India*, AGU Fall Meeting 2021 New Orleans, LA, 13-17th December, 2021

- [29] Jana, D., M. Torres, K. Evans, U. Jammalamadaka, T. Terlier, **K. Thirumalai**, *Foraminifera as indicators of the effects of bottom-water circulation on marine sedimentary archives*, AGU Fall Meeting 2021 New Orleans, LA, 13-17th December, 2021
- [28] **Thirumalai, K.** et al., *Extreme Indian Monsoon States And Stratification-Induced Paleoproductivity Collapses Since The Last Ice Age (Invited Presentation)*, 368428, T80. Foraminiferal Signals of Major Events in Mesozoic–Cenozoic Earth History, GSA Connects 2021 in Portland, OR, 10-13th October, 2021
- [27] **Thirumalai, K.**, J. W. Partin, M. G. Yadava, C.-C. Shen, S. C. Clemens, M. A. Lone, T. -L. Yu, P. Ghosh, R. Subba, A. C. Narayana, R. Ramesh, *Non-stationary response of South Indian hydroclimate to orbital forcing during Marine Isotope Stage 9*, PP022-0009, AGU Fall Meeting 2020 Online Everywhere, 1-17th December, 2020
- [26] Lawman, A. E., J. W. Partin, P. N. DiNezio, S. Dee, **K. Thirumalai**, T. M. Quinn, *Reconciling simulated and coral-inferred changes in El Niño-Southern Oscillation variability during the Holocene*, OS021-02, AGU Fall Meeting 2020 Online Everywhere, 1-17th December, 2020
- [25] **Thirumalai, K.**, J. W. Partin, M. G. Yadava, C.-C. Shen, S. C. Clemens, M. A. Lone, T. -L. Yu, P. Ghosh, R. Subba, A. C. Narayana, R. Ramesh, *Non-stationary response of South Indian hydroclimate to orbital forcing during Marine Isotope Stage 9*, AGU Fall Meeting 2020 Online Everywhere, 1-17th December, 2020
- [24] Hargreaves, J., N. Abram, N. Wright, **K. Thirumalai**, C. Ummenhofer, M. H. England, *Paleoclimate perspectives on the Indian Ocean Dipole*, AGU Fall Meeting 2020 Online Everywhere, 1-17th December, 2020
- [23] Tharammal, T., G. Bala, A. Paul, D. Noone, A. Contreras-Rosales, **K. Thirumalai**, *Evolution of Asian Monsoon and Stable Water Isotope Ratios During the Holocene*, PP003-0015, AGU Fall Meeting 2020 Online Everywhere, 1-17th December, 2020
- [22] Warner, J., K. L DeLong, D. Chicoine, **K. Thirumalai**, C. Fred T. Andrus, A. D Wanamaker, *Eastern Pacific El Niño-Southern Oscillation variability ~400-200 BCE: perspectives from a dual-archive approach*, OS015-0010, AGU Fall Meeting 2020 Online Everywhere, 1-17th December, 2020
- [21] Warner, J., K. L DeLong, D. Chicoine, C. Fred, T. Andrus, **K. Thirumalai**, A. D Wanamaker, *Detecting Increasing El Niño-Southern Oscillation Intensity in Coastal Peru at ~400 BCE Compared to the mid-Holocene Using Short-lived Bivalves Mesodesma donacium and Donax obesulus*, OS53D-1553, AGU Fall Meeting 2019, San Francisco, CA, 9-13th December, 2019
- [20] **Thirumalai, K.**, S. C. Clemens, J. W. Partin, *Methane, Monsoons, and Modulation of Millennial-scale Climate*, PP51A-04, AGU Fall Meeting 2019, San Francisco, CA, 9-13th December, 2019

- [19] DiNezio, P. N., M. Puy, J. W. Partin, **K. Thirumalai**, C. Karamperidou, A. E. Lawman, Y. Okumura, *How past changes in El Niño could inform its future*, PP53A-01, AGU Fall Meeting 2019, San Francisco, CA, 9-13th December, 2019
- [18] Saenger, C., M. N. Evans, A. N. LeGrande, J. C. Tindall, M. Werner, **K. Thirumalai**, *Development and evaluation of Proxy Surrogate Reconstructions as a tool for characterizing Common Era AMOC variability*, PP53D-1477, AGU Fall Meeting 2019, San Francisco, CA, 9-13th December, 2019
- 2018
(n = 7)
- [17] **Thirumalai, K.**, S. C. Clemens, Y. Rosenthal, K. Bu, L. Giosan, *Glacial-to-Holocene evolution of Indian monsoon rainfall*, PP23C-01, AGU Fall Meeting 2018, Washington D.C., 10-14th December, 2018.
- [16] Giosan, L., W. D. Orsi, M. J. L. Coolen, C. Wuchter, A. G. Dunlea, **K. Thirumalai**, S. E. Munoz, P. D. Clift, J. P. Donnelly, C. Galy, D. Q. Fuller, *Neoglacial Climate Anomalies and the Indus Civilization's Metamorphosis*, PP11D-1273, AGU Fall Meeting 2018, Washington D.C., 10-14th December, 2018
- [15] Warner, J., K. L DeLong, D. Chicoine, C. Fred, T. Andrus, **K. Thirumalai**, A. D. Wanamaker, *Local Perspectives on ENSO Variability ~2300 BP and now: Evidence from two Short-Lived Intertidal Bivalves *Mesodesma donacium* and *Donax obesulus**, PP43D-1958, AGU Fall Meeting 2018, Washington D.C., 10-14th December, 2018
- [14] Saenger, C., M. N. Evans, A. N. LeGrande, J. C. Tindall, M. Werner, **K. Thirumalai**, *Development and evaluation of Proxy Surrogate Reconstructions as a tool for characterizing Common Era climate variability*, PP41F-1909, AGU Fall Meeting 2018, Washington D.C., 10-14th December, 2018
- [13] Partin et al., *Continental and Local-Scale Responses of Tropical Rainfall to Precessional Forcing*, PP31A-03, AGU Fall Meeting 2018, Washington D.C., 10-14th December, 2018
- [12] Lawman et al., *Using Data and Models to Quantify Uncertainties in Coral Reconstructions: Implications for Paleo-ENSO Variability*, GC42D-08, AGU Fall Meeting 2018, Washington D.C., 10-14th December, 2018
- [11] **Thirumalai, K.**, P. N. Di Nezio, J. E. Tierney, M. Puy, M. Mohtadi, *Single-Forams and Models Uncover El-Niño-like Variability in the Glacial Indian Ocean*, Presented at 2018 Goldschmidt Conference, Boston, MA, August, 2018
- 2017
(n = 5)
- [10] **Thirumalai, K.**, P. N. Di Nezio, J. E. Tierney, M. Puy, M. Mohtadi, *Intensified Indian Ocean climate variability during the Last Glacial Maximum*, PP31E-05, AGU Fall Meeting 2017, AGU, New Orleans, LA, 11-17th December, 2017
- [9] Leduc, G., L. Vidal, **K. Thirumalai**, *ENSO activity during the last climate cycle using Individual Foraminifera Analysis*, PP23D-06, AGU Fall Meeting 2017, AGU, New Orleans, LA, 11-17th December, 2017

- [8] Puy, M., P. N. DiNezio, **K. Thirumalai**, *Consistent link between Indian Ocean climate variability and mean state across past and future climates*, GC41B-0624, AGU Fall Meeting 2017, AGU, New Orleans, LA, 11-17th December, 2017
- [7] Lawman et al., *Reconstructing Tropical Southwest Pacific Climate Variability and Mean State Changes at Vanuatu during the Medieval Climate Anomaly using Geochemical Proxies from Corals*, PP42A-08, AGU Fall Meeting 2017, AGU, New Orleans, LA, 11-17th December, 2017
- [6] Warner, J., K. L DeLong, D. Chicoine, A. D. Wanamaker, **K. Thirumalai**, *Modern Analogs for Prehistoric El Niño Variability: Evidence from two Short-Lived Bivalve Species, *Donax obesulus* and *Mesodesma donacium**, PP43A-2352, AGU Fall Meeting 2017, AGU, New Orleans, LA, 11-17th December, 2017
- [5] **Thirumalai, K.**, P. N. DiNezio, Y. Okumura, C. Deser, *Extreme April 2016 2016 temperatures in Mainland Southeast Asia caused by El Niño and exacerbated by global warming*, A43C-0238, AGU Fall Meeting 2016, San Francisco, CA, 12-16th December, 2016
($n = 5$)
- [4] Quinn, T. M., **K. Thirumalai**, G. Marino, *Constraining past seawater $\delta^{18}O$ and temperature records developed from foraminiferal geochemistry*, PP51D-2333, AGU Fall Meeting 2016, San Francisco, CA, 12-16th December, 2016
- [3] Lawman, A. E., T. M. Quinn, J. W. Partin, F. W. Taylor, **K. Thirumalai**, C. -C. Wu, C. -C. Shen (2016), *A Coral-based Reconstruction of Interannual Climate Variability at Vanuatu during the Medieval Climate Anomaly (950-1250 CE)*, PP52A-07, AGU Fall Meeting 2016, San Francisco, CA, 12-16th December, 2016
- [2] Taylor, F. W., L. L. Lavier, **K. Thirumalai**, C. Frohlich, C. -C. Shen, B. Cai, E. Dibia, *Coral Microatolls on the Western Solomons Forearc Reveal Multiple Cycles of Small Amounts of Vertical Elastic Strain Accumulation and Aseismic Release Culminating in Coseismic Rupture and a Large Uplift on 1 April 2007*, MR31B-08, AGU Fall Meeting 2016, San Francisco, CA, 12-16th December, 2016
- [1] Partin, J. W., T. M. Quinn, C. -C. Shen, Y. Okumura, M. Bayani Cardenas, F. P. Siringan, M. P. Erb, M. Hori, P. N. DiNezio, **K. Thirumalai**, J. Banner, C. S. Jackson, K. Lin, C. -C. Wu, H. Min, F. W. Taylor, *Western North Pacific Monsoon Variability since the Last Glacial Maximum*, PP23D-08, AGU Fall Meeting 2016, San Francisco, CA, 12-16th December, 2016
-