Tyler Huth

Curriculum Vitae

SCIENTIFIC EXPERTISE

Modern and ancient water and carbon cycle; biogeochemistry of caves, lakes, soils, and precipitation; environmental sampling, monitoring, and analysis, development and application of novel methods for quantifying water resources and ecosystem composition

EDUCATION

2018	Ph.D.	Geochemistry	University of Utah, with Thure Cerling
2012	M.S.	Geosciences	University of Arizona, with Jay Quade
2010	B.A.	Science of Earth Systems	Cornell University

PROFESSIONAL APPOINTMENTS

2025–present Chemist, Maine Health and Environmental Testing Laboratory

2021–2025 Postdoctoral Research Associate, Washington University in St. Louis, Climate and Paleoclimate Laboratory
Supervisor: Bronwen Konecky

2018–2021 Postdoctoral Research Fellow, University of Michigan, Isotopologue Paleosciences Laboratory (IPL)
Supervisors: Benjamin Passey and Naomi Levin

PUBLICATIONS

16. **Huth T. E.**, Cerling T. E., Marchetti D. W., Ellwein A. L., Mahan, S., Bowling D. R., Passey B. H., Asmerom Y., and Polyak V. J. (*in press, Geochemistry, Geophysics, Geosystems*). Springtime formation of laminated soil carbonate rinds and orbital scale change in fluvial terrace soils of Rio Mesa, Utah, USA.

15. Winkelstern I., Passey B., **Huth T.**, McGee D., and Quade J. (*in press, Geology*). Triple Oxygen Isotope Constraints on the Hydroclimate that Sustained Paleolake Bonneville.

14. Marchetti D. W., Ellwein A. L., **Huth T. E.**, Cerling T. E., Anderson L. S., Passey B. H., and Hynek S. A. (2025). Ages of boulder armored benches document varying Fremont River tributary incision rates, Teasdale-Torrey lowlands, Utah, USA. *Geosphere*, **21**(5), 941–961.

13. **Huth T. E.**, Konecky B. L., Hutchings J. A., Deuerling K. M., Kneeshaw T. A., Peschman J., Wilke T L., Winkelstern I. Z., and Xu S. (2025). Constraints on evaporation and

associated kinetic isotope fractionation from Lake Michigan, USA using dual hydrogen and triple oxygen isotopes. *Journal of Hydrology*, 134002.

12. Liang Y., Zhao K., Wang Y, Chen S., **Huth T. E.**, Zhao B., Wang Q., Zhang Z., Shao Q., Cheng H., and Edwards R. L. (2025). Asian monsoon variability across Termination II and implications for ice age terminations. *Nature Communications*, **16**(1), 5025.

11. Kelson R. J., **Huth T. E.**, Andrews K., Bartleson M. N., Cerling T. E., Jin L., Salinas M. P., and Levin N. E. (2024). Pedogenic carbonate as a transient soil component in a humid, temperate forest (Michigan, USA). *Quaternary Research,* **34**(2), 1–16.

10. Kelson J., **Huth T. E.**, Passey B. H., Levin N. E., Petersen S. V., Ballato P., Beverly E. J., Breecker D. O., Hoke G. D., Hudson A. M., Ji H., Licht A., Oerter E. J., and Quade J. (2023). Triple oxygen isotope compositions of globally distributed soil carbonates record widespread evaporation of soil waters. *Geochimica et Cosmochimica Acta*, **355**, 138–160.

9. Lehmann S. B., Levin N. E., Passey B. H., Hu H., Cerling T. E., Miller J. H., Arppe L., Beverly E. J., Hoppe K. A., **Huth T. E.**, Kelson J. R., Luyt J., and Sealy J. (2022). Triple oxygen isotope distribution in modern mammal teeth and potential geologic applications. *Geochimica et Cosmochimica Acta*, **331**, 105–122.

8. **Huth T. E.**, Passey B. H., Cole J. E., Lachniet M. S., McGee D., Denniston R., Truebe S., and Levin N. E. (2022). A framework for triple oxygen isotopes in speleothem paleoclimatology. *Geochimica et Cosmochimica Acta*, **319**, 191–219.

7. Aron P. G., Levin N. E., Beverly E. J., **Huth T. E.**, Passey B. H., Pelletier E. M., Poulsen C. J., Winkelstern I. Z., and Yarian D. A. (2021). Triple oxygen isotopes in the water cycle. *Chemical Geology*, **565**, 120026.

6. **Huth T. E.**, Cerling T. E., Marchetti D. W., Bowling D. R., Ellwein A. L., Passey B. H., Fernandez D., Valley J., and Orland I. (2020). Laminated soil carbonate rinds as a paleoclimate archive: a case study from the Colorado Plateau. *Geochimica et Cosmochimica Acta*, **292**, 227–244.

5. **Huth T. E.**, Cerling T. E., Marchetti D. W., Bowling D. R., Ellwein A. L., and Passey B. H. (2019). Seasonal bias in soil carbonate formation and its implications for interpreting high-resolution paleoarchives: evidence from southern Utah. *JGR Biogeosciences* **124**, 618–632.

4. Marchetti D. W., Anderson L., Donovan J. J., Harris M. S., and **Huth T.** (2018). Fish Lake limnology and Watershed aqueous geochemistry, Fish Lake Plateau, Utah. In Emerman, S. H., Bowen, B., Schamel, S., and Simmons, S. (Eds.), *Geofluids of Utah: Utah Geological Association Publication 47*, 55–74.

3. Hudson A. M., Olsen J. W., Quade J., Guoliang L., **Huth T. E.**, and Hucai Z. (2016). A regional record of elevated Holocene water tables and human occupation from paleowetland deposits of the Yarlung Tsangpo valley, southern Tibetan Plateau. *Quaternary Research* **6**(1), 13–33.

2. **Huth T.**, Hudson A. M., Quade J., Guoliang L., and Hucai Z. (2015). Constraints on paleoclimate from 11.5 to 5.0 ka from shoreline dating and hydrologic budget modeling of Baqan Tso, southwestern Tibetan Plateau. *Quaternary Research* **83**(1), 80–93.

1. Hudson A. M., Quade J., **Huth T.**, Guoliang L., Olsen J. W., and Hucai Z. (2015). Lake-level reconstruction for 2.3–12.8 ka for the Ngangla Ring Tso closed-basin lake system, southwest Tibetan Plateau. *Quaternary Research* **83**(1), 66–79.

Manuscripts in review or preparation

Huth T. E., Cerling T. E., Marchetti D. W., Ellwein A. L., Mahan S., Passey B. H., Blum T., Bard E., Rostek F., Tuna T., Polyak V. J., and Asmerom Y. (*in* prep). Divergent critical zone response to Late Quaternary climate change as a function of elevation.

Huth T. E., Konecky B. L., Hutchings J. A., Diem J., Palace M., Salerno J., Bailey K., Namusisi S., and Hartter J. (*in prep*). Separation of moisture source and terrestrial contributions to Ugandan precipitation isotope composition

Huth, T. E., Konecky, B. L., and Hutchings, J. A. (*in prep*). Continental-scale patterns in cave water triple oxygen isotope composition in the USA.

GRANTS AND FELLOWSHIPS

2021	NSF Grants EAR-2051587, EAR-2051585, and EAR-2051548 (grant dates 7/2021–7/2023), $472,479 "COLLABORATIVE RESEARCH: Laminated soil carbonate rinds as a tool for investigating late Quaternary climate-vegetation links", T.E. Cerling, B.H. Passey, D.W. Marchetti, and A.L. Ellwein, with **Huth** (co-author; I led the conceptual design, writing, and revision of this proposal)
2018, 2015, and 2014	Student Research Funds grants, University of Utah, Department of Geology and Geophysics ($2k)
2018, 2017, and 2015	Chapman Fund grants, University of Utah ($2.5k)
2017	Graduate Research Fellowship, University of Utah ($18k), "Soil carbonate rinds as a new terrestrial paleoarchive: testing interpretations of isotopic chemistry"
2016 and 2015	NSF Participant Grants for the SPATIAL and IsoCamp short courses, University of Utah ($5k)
2016 and 2015	Rio Mesa Young Scholar Grants, University of Utah ($5k)
2016 and 2014	Research-in-Residence grants, Inter-university Training for Continental-scale Ecology program, University of Utah ($12k)
2016	Travel Grant to the Fall 2016 AGU Meeting, Global Change and Sustainability Center, University of Utah ($500)
2015 and 2012	Graduate Student Grants, Geological Society of America ($3.5k)
2015	Graduate Research Grant, Global Change and Sustainability Center, University of Utah ($3k)
2014	Graduate Student Travel Assistance Award, University of Utah ($750)

2013 Graduate Fellow, Think Globally, Learn Locally, University of Utah (1-yr tuition and stipend)

AWARDS AND HONORS

2024 Gladys W. Cole award, Geological Society of America; "Constraining the evolution of dryland soils through a novel timeline of calcite horizon development" ($9k)

2018 Outstanding PhD Student, University of Utah

2012 Best Presentation-Paleoclimate and Climate Dynamics, GeoDaze conference, University of Arizona

2007 (FA), 2008 (SP), and 2009 (SP) Dean's list, Cornell University

RESEARCH EXPERIENCE

2021–2025 **Postdoctoral Research Associate,** Climate and Paleoclimate Laboratory, Washington University in St. Louis. Investigating drivers of precipitation, evaporation, and groundwater using a novel tool, triple oxygen isotopes ($\Delta'^{17}O$): study sites in Uganda and the USA (quantifying Lake Michigan evaporation rate, geostatistical patterns in meteoric waters across the USA)

2018–2021 **Postdoctoral Research Fellow**, Isotopologue Paleosciences Laboratory, University of Michigan. Developing the triple oxygen isotope and dual clumped isotope (Δ_{47}–Δ_{48}) methods for reconstructing ancient water cycle processes.

2013–2018 **Ph.D. student**, University of Utah. Combined modern environmental monitoring, radiocarbon, stable isotope, cosmogenic isotope, and geologic mapping data to investigate the carbon cycle and water cycle in modern and ancient dryland soils.

2014–2018 **Laboratory manager**, Cerling Stable Isotope Facility, University of Utah. Maintained a mass spectrometer and its inlet systems (elemental analyzer, laser ablation system, common acid bath), a CO_2 extraction line, and a water extraction line; Taught and assisted visitors in running their samples.

2013 **Intern**, Barrick Cortez, Nevada. Assisted in the prefeasibility study for the Goldrush property, a multimillion-ounce Carlin type gold deposit.

2010–2012 **Master's student**, Quade Laboratory, University of Arizona. Reconstructed ancient watery cycle of Tibet through mapping, soil descriptions, radiocarbon dating of lake carbonates, and hydrologic modeling.

2010–2012 **Research assistant**, Quade Laboratory, University of Arizona. Prepared and processed organic matter and lake carbonate samples on gas extraction and graphitization lines for radiocarbon dating.

2012 **Field assistant**, University of Arizona. Collected lake and cave deposits in the Bonneville Basin, UT, and Lehman Cave, NV, for reconstructing ancient water cycle.

2012 **Field assistant,** University of Arizona**.** Assisted in collecting modern cave water and calcite from Cave of the Bells (AZ) for study of cave geochemistry.

2008–2009 **Volunteer**, Hawaiian Volcano Observatory, Hawaii. Identified and categorized deformation processes occurring at Kilauea Volcano.

2008–2010 **Undergraduate research assistant**, Cornell University. Assisted in basic maintenance of a mass spectrometer, acid-cleaned labware.

2008 **Participant**, Cornell University Earth and Environmental Systems Field Program. Studied and applied biogeochemical concepts in a field-based semester-long program in the Hawaiian Islands.

TEACHING AND MENTORSHIP

Washington University in St. Louis

2021–present **Mentor**, 8 undergraduate and graduate students; led a Weekly Writing group to provide formal writing advice; aided students in senior thesis project development, presentations (AGU Fall 2023 Meeting, 2023 MidWest Geobiology Symposium), and writing

2023 **Grader**, First-Year Seminar: Unearthing the Science of Climate Change

University of Michigan

2021 **Participant**, Postdoctoral Short Course on College Teaching in Science and Engineering

2019–2021 **Mentor** for graduate students at University of Michigan (Levin and Passey lab); edited manuscripts, proposals, and conference abstracts for lab members as part of the Weekly Writing Group, trained in laboratory and data reduction procedures

University of Utah

2018 (FA) **Instructor of record**, Geochemistry (GEO 5660/6660; upper level undergraduate/graduate)

2013–2018 **Mentor** for undergraduate students at the University of Utah; trained five undergraduate students in multi-week field and laboratory techniques. Mentored student Max Jin in developing and executing a project that he presented at the GSA Fall Meeting 2018: “Trace elements in laminated soil carbonates: first steps towards understanding the signal”

2017, 2019 **Instructor**, IsoCamp short course in stable isotope ecology

2015 (FA) **Teaching Assistant**, Biophysical Ecology

2014 (FA) **Teaching Assistant**, Geochemistry

2013–2014 **Scientist-in-Residence** at Clayton Middle School (Salt Lake City, Utah); designed and led lessons (20 hr/wk) for 7th grade classroom as part of NSF-funded

Think Globally, Learn Locally (TGLL) program, University of Utah

University of Arizona

2010 (FA), 2012 (SP), 2023 (FA) **Teaching Assistant**, Introductory Geology for Non-Majors

2011 (FA) **Teaching Assistant**, Introductory Geology for Majors

OUTREACH, SERVICE, AND DEI ACTIVITIES

2024 **Presenter**, for collaborating citizen scientists: "Continental-scale patterns in meteoric water isotope composition in the USA"

2021–2024 **Co-lead**, DIRTS (Developing Investigators Researching Trends in Soils) pre-college outreach program to teach geoscience through environmental monitoring (NSF grants EAR-2051587, EAR-2051585, and EAR-2051548); acquired funding, developed lessons, facilitated and co-led remote lessons

2021 **Member,** Michigan Earth Diversity, Equity, and Inclusion (DEI) Pod for the NSF- and WHOI-funded Unlearning Racism in Geoscience (URGE)

2020–2021 **Co-lead**, "Michigan Shakes!", a seismology-based outreach event for pre-college students done in partnership with the University of Michigan Wolverine Pathways program

2016–2018 **Scientist-in Residence** at City Academy (Salt Lake City, Utah); advised 7th-12th grade Science Olympiad club

2017–2018 **Volunteer** for the Annual Open House, Department of Geology and Geophysics, University of Utah

2017 **Invited Lecturer** for the Entrada Institute (Torrey, Utah); led a public field trip and lecture: "Torrey's black and white boulders: what can chemistry tell us about water and ecology in the West?"

2016 **Presenter**, Rio Mesa Field Station (University of Utah) open house; gave a lecture and ran a short lesson for pre-college students

2015–2016 **Scientist-in-Residence and Science Fair Judge** at Clayton Middle School (Salt Lake City, Utah)

2010–2011 **Co-organizer and presenter** at the Saturday Science Academy, University of Arizona

INVITED KEYNOTES AND LECTURES

2025 "Novel perspectives on the water cycle and critical zone from the late Quaternary through the present." Department of Earth and Environmental Sciences, University of Iowa (2/7/2025).

2024 "Constraining lake evaporation and associated kinetic isotope fractionation via water vapor and vapor isotope mass balance." Isotopologue Network for Early

Career Researchers (10/23/2024).

2024 "Novel perspectives on the water cycle and critical zone from the late Quaternary through the present." California Institute of Technology, Division of Geological and Planetary Sciences, Division Seminar (5/20/2024).

2024 "Novel perspectives on the water cycle and critical zone from the late Quaternary through the present." Center for Applied Isotope Studies, University of Georgia, Athens, Georgia, USA (3/5/2024).

2023 Huth T., Marchetti D., Passey B., Cerling T., Ellwein A., Mahan S., Bard E., Rostek F., Tuna T., Blum T., and Holder R. "Sub-millennial scale reconstruction of late Quaternary critical zones in Utah, USA using laminated soil carbonate rinds." Keynote, XXI International Union for Quaternary Research (INQUA) Congress, Rome, Italy (7/15/2023).

2023 "Novel perspectives on the water cycle and critical zone from the late Quaternary through the present." Department of Geological Sciences, University of Florida, Gainesville, Florida, USA (2/16/2023).

2023 "Novel perspectives on the water cycle and critical zone from the late Quaternary through the present." Indiana University Bloomington, Bloomington, Indiana, USA (2/6/2023).

2022 Huth T., Marchetti D. W., Passey B., Cerling T. E., Ellwein A., Mahan S., Bard E. G., Rostek F., Tuna T. "Board 0441: High-resolution analytical techniques in the development of a novel paleoclimate archive; Laminated soil carbonate rinds as a tool for investigating late Quaternary climate-vegetation links (Invited)" American Geophysical Union Fall Meeting, Chicago, Illinois, USA (12/16/2022).

Other selected presentations

2024 Huth T., Konecky B. L., Hutchings J. A., Deuerling K. M., Kneeshaw T. A., Peschman J., Wilke T. L., Winkelstern I. Z., and Xu S. "3-2 - Constraints on lake evaporation and associated kinetic isotope fractionation via water vapor and vapor isotope mass balance" Geological Society of America Connects 2024, Anaheim, California, USA (9/22/2024).

2023 Huth T., Konecky B. L., Hutchings J., Diem J., Palace M. W., Salerno J., Bailey K., Namusisi S., and Hartter J. "PP43C-05 Seasonal interplay of moisture source and terrestrial processes in western Ugandan precipitation isotope composition" American Geophysical Union Fall Meeting, San Francisco, California, USA (12/13/2023).

2022 Huth T., Konecky B., Hutchings J., Wilke T., Winkelstern I., Kneeshaw T., Deuerling K., Paradis C., Xu Shangping, Peschman J. "Board 0971: A combined dual hydrogen and triple oxygen isotope approach for quantifying moisture recycling applied to Lake Michigan, USA" American Geophysical Union Fall Meeting, Chicago, Illinois, USA (12/14/2022).

2021 Huth T. E., Liang Y., Parmenter D. S., Passe B. H., Edwards R. L., Li X., Zhao K., Wang Y., Kong X. G., Wang X. F., Cruz F. W., Auler A. S. "Board 0917: Triple oxygen isotopes of speleothems in the Amazon and southern China provide

independent support for prior $\delta^{18}O$-based interpretations" American Geophysical Union Fall Meeting, New Orleans, Louisiana, USA (12/13/2021).

2020 Huth T. E., Passey B. H., Cole J. E., Lachniet M. S., and Levin N. E. "PP048-06 - Using triple oxygen isotopes to constrain speleothem paleorecord interpretation in western USA cave systems" American Geophysical Union Fall Meeting, virtual meeting (12/16/2020).

PROFESSIONAL SERVICE

Reviewer for: Chemical Geology; Earth and Planetary Science Letters; Earth and Space Science; Frontiers in Earth Science; Geochemical Perspectives Letters; Geochemistry, Geophysics, Geosystems; Geochimica et Cosmochimica Acta; Geology; Journal of Geophysical Research Biogeosciences, Journal of Geophysical Research Earth Surface; Journal of Hydrology; National Science Foundation (BSF, MRI, P4CLIMATE); Nature Geoscience; Paleoceanography and Paleoclimatology, Proceedings of the National Academy of Sciences, Quaternary Research, Water Resources Research

Panelist for National Science Foundation

Co-lead and presenter for 2024 Rocky Mountain Cell Friends of the Pleistocene Field Trip. "Fish Lake to Blue Gate Badlands: new paleoclimate and geomorphology research along the Fremont River, central Utah," Oct. 4–6, 2024

Convener, Chair, and OSPA Liaison for AGU Fall Meeting 2023 session: "An All-Inclusive Speleothem Science: Toward a Better Paleoclimate and Paleoenvironmental Reconstruction III Poster" (PP13A, PP14A, and PP23A)

AGU Fall Meeting Program Committee Member, Paleoceanography and Paleoclimatology section, 2024-present