Matthew L. Allen, PhD

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CURRENT POSITION

National Science Foundation Postdoctoral Fellow (EAR-PF) 2024–2026
University of Michigan, Ann Arbor, MI

EXPERTISE

Stable Isotope Geochemistry; Paleoclimatology; Paleontology; Stratigraphy

ACADEMIC BACKGROUND

Ph.D. Geology, University of Kansas, Lawrence, KS 2024
Advisor: Marina B. Suarez
Dissertation: *Geochemical Approaches to Paleoecology and Paleoclimatology of the Cretaceous Cloverly Formation*

M.Sc. Geology, University of Texas at San Antonio, TX 2016
Advisor: Lance L. Lambert
Thesis: *New Permian Ammonoid Localities at Sibley's Last Chance Ranch, Delaware Mountains, Culberson County, TX*

B.S. Geology, University of Alabama, Tuscaloosa, AL 2013

GRANTS AND FELLOWSHIPS

NSF-EAR Postdoctoral Fellowship (EAR-PF), National Science Foundation 2024–2026
Project: Applying triple oxygen isotopes across the Paleocene–Eocene Thermal Maximum in the Bighorn Basin, Wyoming.

Student Research Grant, SEPM Foundation 2024
Project: Evaluation of a possible major unconformity in fluvial deposits of the Early Cretaceous Cloverly Formation, Wyoming.

RESEARCH EXPERIENCE

NSF-EAR Postdoctoral Fellow, University of Michigan, Ann Arbor, MI 2024–Present
Conduct independent research on hydroclimate change across the Paleocene-Eocene Thermal Maximum using triple oxygen isotopes from mammal fossils and pedogenic carbonates in the Bighorn Basin. Operate and maintain stable isotope mass spectrometers and supervise data quality in high-precision isotope analyses. Mentor undergraduate and graduate students in laboratory methods and research design.

Graduate Research Assistant, University of Kansas, Lawrence, KS 2022–2024
Investigated paleoclimate and paleoecology of the Cretaceous Cloverly Formation primarily using stable isotope geochemistry and related methods. Developed datasets that contributed to peer-reviewed manuscripts on isotope paleoecology, chemostratigraphy, and mid-Cretaceous climate variability. Supervised undergraduate researchers in sampling, lab preparation, and data analysis.

Undergraduate Research Assistant, University of Alabama, Tuscaloosa, AL 2011–2012
Contributed to stable isotope analyses of vertebrate bioapatite through microsampling and thin section preparation. Gained early experience in geochemical approaches to paleoecology, laying the foundation for graduate research.

TEACHING EXPERIENCE

Graduate Teaching Assistant 2020–2021
University of Kansas, Lawrence, KS
Lead instructor for introductory geology; taught paleontology lab; administered intro geology labs.

Graduate Teaching Assistant 2013–2015
University of Texas at San Antonio, TX
Taught sedimentology/stratigraphy and paleontology labs; assisted with intro geology labs.

INDUSTRY EXPERIENCE

Senior Geologist 2019–2020
Zachry Exploration LLC., San Antonio, TX
Developed exploration campaigns using logs, production data, and 3D seismic; oversaw wireline well-logging at drill sites.

Geologist 2015–2019
Zachry Exploration LLC., San Antonio, TX
Characterized basin- and reservoir-scale geology; evaluated prospect proposals; supervised wireline logging.

PUBLICATIONS

Peer-Reviewed Articles

Allen, M.L., Suarez, M.B., Adams, T.L., and Suarez, C.A., 2025. Ecohydrology and paleoenvironment of the Cretaceous (Albian) Cloverly Formation: insights from multi-taxon oxygen isotope analysis of vertebrate phosphates. *Frontiers in Earth Science* **13**:1497416. doi:10.3389/feart.2025.1497416

Manuscripts in Preparation (selected)

Allen, M.L., Suarez, M.B., Kalu, Q., Suarez, C., and Hyland, E. (in preparation). Multiproxy paleoclimate reconstruction of the mid-Cretaceous Cloverly Formation. Target journal: *GSA Special Publication*.

Allen, M.L., Suarez, M.B., Kalu, Q., and Suarez, C. (in preparation). Carbon isotope stratigraphy and zircon U–Pb geochronology of the Cloverly Formation, Wyoming. Target journal: *Geosciences*.

CONFERENCE ABSTRACTS & PRESENTATIONS

Lead / Presenting Author

Allen, M.L., and Suarez, M.B., 2022. Niche partitioning and paleohydrology: multi-taxa oxygen isotopic analysis of vertebrate phosphates, Cretaceous Cloverly

Formation, Montana, USA. *GSA Abstracts with Programs* **54**(5). doi:10.1130/abs/2022AM-382377.

Allen, M.L., Coombs, N.J., Makovicky, P.J., and Suarez, M.B., 2022. Faunal comparison of Aptian–Albian continental vertebrates, North American WIB: biostratigraphic and biogeographic context. *GSA Abstracts with Programs* **54**(5). doi:10.1130/abs/2022AM-383041.

Allen, M.L., and Lambert, L.L., 2019. New morphometric methods to quantify complex ammonoid sutures. *GSA Abstracts with Programs* **51**(5). doi:10.1130/abs/2019AM-337565.

Allen, M.L., and Lambert, L.L., 2017. The continuing significance of Sibley Ranch localities (Culberson County, Texas) to Guadalupian (Middle Permian Series) ammonoid research. *GSA Abstracts with Programs* **49**(6). doi:10.1130/abs/2017AM-308319.

Allen, M.L., and Lambert, L.L., 2014. Sequence stratigraphic and biostratigraphic correlation of the North American Atokan/Desmoinesian boundary to the Donets Basin, Ukraine. *Proceedings, College of Science Research Conference*, University of Texas at San Antonio, p. 109.

Co-author

Wolf, A., Cole, J.E., Allen, M.L., Geng, J., Langston, J., Passey, B.H., Patterson, E.W., Baker, J.L., Johnson, K.R., McGee, D., and Griffiths, M., 2025. Quantifying cave-internal alterations in speleothems using triple oxygen isotopes. *GSA Abstracts with Programs*, Session: Caves and Karst Through Space and Time.

Lambert, L. L., Vote, J. J., Allen, M. L. and Lewis, D., 2018, Old localities and new specimens—Family Cyclolobidae (Middle and Late Permian) are more complex and diverse than thought. In: A. El Hassani, R. T. Becker, S. Hartenfels, and F. Luddecke (eds.), *10th International Symposium "Cephalopods – Present and Past", Program and Abstracts*, Munstersche Forschungen zur Geologie und Palaontologie, 110:70.

PROFESSIONAL SERVICE

Manuscript reviewer for *Journal of Paleontology* (2025)

Manuscript reviewer for *Geological Society of America Bulletin* (2025)

Co-founder, Board Member, KU Geology Graduate Student Organization (2022–2023)

Vice President, South Texas Geological Society (2019–2020)

PROFESSIONAL MEMBERSHIPS

Geological Society of America (GSA) 2016–present

American Geophysical Union (AGU) 2024–present

American Association of Petroleum Geologists (AAPG) 2014–2019

COMMUNITY OUTREACH

Science Communication Fellow, University of Michigan 2024–2025
Completed NSF-supported Portal to the Public program. Participated in five professional development workshops on public engagement, developed inquiry-based activities, and presented research at two community outreach events.

Vice President, Boerne Chapter, Native Plant Society of Texas 2019–2020

Area Chief Volunteer, Texas Parks and Wildlife 2016–2019

Texas State Coordinator, Fishing's Future 2016–2019

Chairman, Boerne Chapter, Ducks Unlimited 2016–2018

Founder, President, University of Alabama Fly Fishing Club 2012–2013