

Kamryn Webster, The University of Texas at Austin, Austin, Texas, USA for their project: *Critical Mineral Distribution Across Oil, Produced Water, and Reservoir Rock in the Permian Basin*.

Kamryn Webster is pursuing an M.S. in Geological Sciences at The University of Texas at Austin and serves as a Graduate Research Assistant at the Bureau of Economic Geology under the supervision of Dr. Brent Elliott. She earned her B.S. in Geology from the University of Arkansas in 2025. Her research focuses on the distribution and resource potential of critical minerals within petroleum systems.



Kamryn's master's research evaluates how critical minerals are distributed among produced water, crude oil, and reservoir rock in the Permian Basin, with emphasis on the Wolfcamp, Bone Spring, and Delaware Mountain Group formations. Preliminary work includes 93 paired oil and produced-water samples from the same wells and producing intervals. Results indicate strongly phase-dependent elemental distributions, with many elements enriched in produced water and others showing greater relative enrichment in crude oil. Reservoir rock analyses will complete the three-phase assessment and help determine whether produced-water chemistry alone adequately represents critical mineral occurrence within petroleum systems. Ultimately, this research will identify formations and systems that may warrant further evaluation as unconventional domestic critical mineral resources and improve understanding of critical mineral behavior in oil-bearing formations.

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