



# UTSA Geological Sciences

And

## Institute of Water Research, Sustainability and Policy (IWRSP)

*Seminar Presentation*

*By*

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*On*

*Friday, April 2, 2021*

*4:00 P.M.*

*“Hydrologic and geochemical influences on dissolved organic carbon (DOC) composition in mineralized, mountainous watersheds in Central Colorado”*

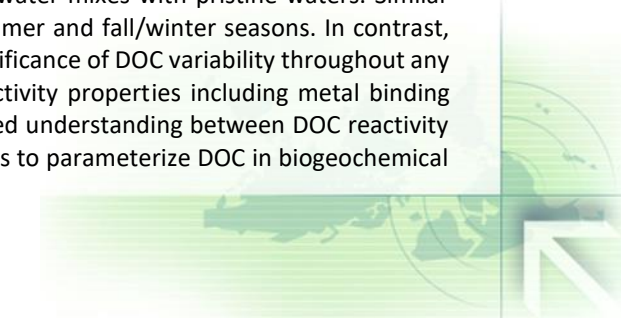
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### **Abstract**

Mountainous watersheds present highly transient, snow-melt driven hydrology that also factor into solute composition and concentration that also includes stream DOC. In this study we examined the relative importance of source and geochemical fractionation on stream DOC characteristics found within mountainous watersheds that have been impacted by historic mining activities. Streams and groundwater from mountainous watersheds impacted by historic mining were sampled during the spring, summer, and fall/winter seasons. We used mass balance and optical spectroscopy (SUVA<sub>254</sub> and fluorescence index) to assess if DOC molecular differences and reactivity are associated with source, season, and aqueous fractionation mechanisms. Our SUVA<sub>254</sub> and FI results suggest that the observed DOC variability throughout the watersheds is a result from a shift in sources due to seasonal changes and fractionation mechanisms when mine impacted water mixes with pristine waters. Similar effects were also observed in DOC concentrations from the spring/summer and fall/winter seasons. In contrast, groundwater DOC composition was less variable. Understanding the significance of DOC variability throughout any given watershed will provides a better understanding of potential reactivity properties including metal binding affinity and biogeochemical cycling of carbon. Additionally, the continued understanding between DOC reactivity and spectroscopic measurements will aid in the continued improvements to parameterize DOC in biogeochemical modeling programs.





Dr. Kato Tsosie Dee is currently an Assistant Professor in the School of Geosciences at the University of Oklahoma in Norman, OK. He obtained his B.S. and M.S. in Geology from the University of Kansas and Ph.D. in Geochemistry from the Colorado School of Mines. His primary research interests are in the areas of hydrogeochemistry as related to organic matter-trace metal interactions and trace metal aquatic toxicology. Prior to his current position at the University of Oklahoma he was the Program Director/Faculty of the Natural Resource Management program for 13 ½ years at Colorado Mountain College (CMC) in Leadville, CO where he taught numerous courses in geological and environmental sciences and assisted in the development of experiential real-world remediation and reclamation projects addressing AML impacts for students to work on.

