

Daniel Lavery

525 Bullock Ave, Socorro, NM, 87801
daniel.lavery@nmt.edu | (281) 771-2350

I. Educational Background

B.S. Geosciences with Geology Concentration, Texas Tech University, Lubbock, TX

Graduation: May 2021

M.S. Earth and Planetary Sciences, University of New Mexico, Albuquerque, NM

Graduation: Fall 2023

II. Research Experience

Undergraduate Research: Studied mineralogical controls on fracturing in Woodford Shale

Advisor: Dr. Branimir Segvic

- Prepared shale samples for whole rock clay analysis
- Interpreted X-ray diffractograms for common shale minerals

Undergraduate Research: Studied jarosite dissolution to determine K_{sp} for K-jarosite

Advisor: Dr. Moira Ridley

- Speciation modelling in Geochemist's Workbench

M.S. Thesis: Environmental Fate of Sulfur in Sulphur Creek, Valles Caldera, NM:
Implications for metal transport and water quality

Advisor: Dr. Laura Crossey

- Field hydrologic monitoring and water sample collection
- Bicarbonate alkalinity pH titration
- IC, ICP-OES sample preparation and major ion interpretation
- ICP-MS sample preparation for radioisotope analyses
- Stable isotope preparation and interpretation

III. Relevant Work Experience

Crew Member, Philmont Scout Ranch Conservation Department, Cimarron, NM

- Conservation work crew experience
 - June-August 2018**: Assisted in forest thinning for fire suppression after the Ute Park Fire burned on ranch property
 - June-August 2021**: Trained in construction of erosion control structures for stream restoration. Partnered with Cimarron Watershed Alliance and Vermejo Park Ranch.

Work crew successfully installed over 40 rock structures over a heavily incised 4-mile stretch of the North Ponil Creek on the property of Philmont Scout Ranch

Research Assistant, Earth and Planetary Sciences Department, University of New Mexico, Albuquerque, NM

- Perform research under Dr. Laura Crossey (PI) in UNM Earth & Planetary Science
- Regularly meet with PI to discuss research project
- Aided staff hydrologist at Valles Caldera National Preserve with specific tasks related to RA funding: calibration of SONDE monitoring array at VCNP; installation of communication array for water depth gauge in Hidden Valley, VCNP; winterization of backcountry weather stations; collection of SONDE monitoring equipment at season's end

Research Assistant, August-December 2021

Research Assistant, August-December 2022

Research Assistant, January-May 2023

Teaching Assistant, Earth & Planetary Sciences Department, University of New Mexico, Albuquerque, NM

- Teach lab sections for primary lecturer
- Grade lab assignments in a timely manner for return to students
- Hold bi-weekly office hours to meet with students or assist with missed labs

Teaching Assistant, ENVS 102L, The Blue Planet, January-May 2022

Teaching Assistant, ENVS 102L, The Blue Planet, August-December 2022

Teaching Assistant, ENVS 102L, The Blue Planet, January-May 2023

Hydrogeologist, New Mexico Bureau of Geology and Mineral Resources, New Mexico Tech University, Socorro, NM

3D Geologic Modelling – Aquifer Mapping Program, Geologic Mapping Program

- Development of 3D models of major NM basins/aquifers
- Testing with different interpolation techniques
- Modification/creation of model scripts to automate modelling workflow
- *Delaware Basin Basement-to-Surface 3D Model (ongoing, due Mar. 2024)*
- *Central High Plains 3D Model (ongoing, due Mar. 2025)*

Miscellaneous Water Projects

- Water quality, feasibility scoring models, or projects outside realm of 3D modelling
- Modification/creation of model scripts to develop products for project stakeholders
- Field sampling, data analysis for geochemical projects
- *Modified Middle Rio Grande Aquifer Banking Index (ongoing, due Feb. 2024)*
- *Rio Arriba County Water Quality Assessment (ongoing)*

IV. Publications and Presentations

Publications

Lavery, D.J., 2023, Environmental Fate of Sulfur in Sulphur Creek, Valles Caldera, NM: Implications for metal transport and water quality [M.S. thesis]: University of New Mexico, 45 p.

Abstracts

Lavery, D.J., Crossey, L.J., and Ali, A., 2022, *Environmental Fate of Sulfur and Metals in Sulphur Creek, Valles Caldera, NM: Implications for Metal Transport and Water Quality*: New Mexico Water Conference, Las Cruces, NM

Lavery, D.J., Crossey, L.J., and Ali, A., 2022, *Environmental Fate of Sulfur and Metals in Sulphur Creek, Valles Caldera, NM: Implications for Metal Transport and Water Quality*: AGU Fall Meeting, Chicago, IL

Lavery, D.J., Crossey, L.J., and Ali, A., 2023, *Environmental Fate of Sulfur and Metals in Sulphur Creek, Valles Caldera, NM: Implications for Metal Transport and Water Quality*: New Mexico Geological Society Spring Meeting, Socorro, NM

Presentations

AGU 2022 Fall Meeting (iPoster presentation)

2022 New Mexico Water Resource Research Institute Conference

V. Software and Applications

Microsoft Office Suite

ESRI ArcGIS Pro

ESRI ArcMap

PHREEQC

The Geochemist's Workbench

R

- tidyverse

- ggplot

- regex

Python

- pandas

- sklearn

- matplotlib

- geopandas

- arcpy

- re

MATLAB (minimal)

Adobe Illustrator

VI. Technical Skills and Trainings

Field water quality sampling

Lab safety

Sample preparation/lab analysis:

- IC

- ICP-OES

- ICP-MS

- stable isotopes

- HCO₃⁻ alkalinity pH-titration

Geochemical data analysis

Defensive Driving (UNM, NMT)

Leave No Trace Wilderness Ethics

Stream restoration techniques

Python scripting
3D interpolation techniques

Machine learning modelling (working
knowledge)

VII. Awards and Scholarships

Eagle Scout, 2017

Texas Tech University Presidents Top 25% Scholarship, 2017-2021

TTU Department of Geosciences Anderson Endowed Scholarship, 2018-2019

TTU Chancellor's Council Honors College Scholarship, 2020-2021

New Mexico Geological Society Pipkin Award, 2022-2023 (\$1,850)

Geological Society of America Graduate Student Research Grant, 2022-2023 (\$1994)

New Mexico Water Resources Research Institute Student Water Research Grant Award,
2022-2023 (\$7005)

University of New Mexico Earth and Planetary Sciences Alumni Scholarship, 2022 (\$2000)

VIII. Relevant Coursework

Mineralogy

Introduction to Field Mapping

Structural Geology

Igneous & Metamorphic Petrology

Introduction to Geochemistry

Advanced Field Methods

Inorganic Geochemistry

Geographic Information Systems

Hydrogeology

Radiogenic Isotope Geochemistry

Geochemistry of Natural Waters

Thermodynamics and Physical
Chemistry

Climate Dynamics

Environmental Engineering Chemistry

Stable Isotope Geochemistry

Quantitative Methods in Hydrogeology

IX. Outreach

UNM Center for Water and the Environment Outreach Event (April 2022)

Reverse Osmosis demonstration for high school science fair participants

Santa Rosa BioBlitz (July 2022)

Aided the Springs Stewardship Institute in assessment and classification of springs and
cienegas in Santa Rosa, NM for the purpose of documentation/preservation