## Background

Dr. Nathan Moodie is a Research Assistant Professor with the Carbon Science Initiative (CSI) in the Department of Civil & Environmental Engineering at the University of UT. He is also affiliated with the Energy & Geoscience Institute (EGI). He joined CSI and EGI as a graduate student pursuing his Masters through the Department of Civil & Environmental Engineering in 2011. Throughout his graduate work, he has continued with CSI and EGI, earning both his Masters and Ph.D., and then continuing as a post-doctoral research staff. In 2022 he joined the Department of Civil & Environmental Engineering as a Research Assistant Professor and continues his affiliation with CSI and EGI. His expertise covers many aspects of multi-phase, multi-physics numerical simulations, focusing on geologic carbon storage under multiple scenarios, including permanent geologic storage in deep saline aquifers and enhanced oil recovery operations. He specializes in the application of relative permeability and capillary pressure to numerical models and how uncertainty in the data can impact the modeling results. In conjunction with this, he is currently collaborating on several DOE-sponsored research projects in the western US.

## Education/Funded Projects

Dr. Nathan Moodie received his Ph.D. in civil and environmental engineering in 2017 from the University of Utah. He focused on the impacts that uncertainty in relative permeability and capillary pressure relationships have on multi-phase numerical simulations of enhanced oil recovery and geologic carbon storage predictions. He received a Master of Science in Civil & Environmental Engineering in 2013, also from the University of Utah. As a Research Assistant Professor, he is currently working on the following Department of Energy funded projects:

* Southwest Regional Partnership on Carbon Sequestration Phase III (SWP) project
* Improving Production in Utah’s Emerging Northern Paradox Unconventional Oil Play
* Carbon Utilization and Storage Partnership (CUSP) for the Western USA
* San Juan Basin CarbonSAFE Phase III: Ensuring Safe Subsurface Storage of CO2 in Saline Reservoirs
* Uinta Basin CarbonSAFE II: Storage Complex Feasibility
* Four Corners Carbon Storage Hub: CarbonSAFE Phase III

## Research Experience & Focus

* Multi-phase flow simulations with a focused on geologic carbon storage in deep saline aquifers and under enhanced oil recovery scenarios in the context of Carbon Capture Utilization and Storage (CCUS)
* Numerical modeling of uncertainty in two- and three-phase relative permeability relationships
* Empirical formulas for determining relative permeability and capillary pressure from laboratory data
* Using laboratory-measured fluid-rock interaction data for improving reservoir model resolution

# Bio Short

Dr. Nathan Moodie is a Research Assistant Professor in the Civil & Environmental Engineering Department and affiliated with the Energy & Geoscience Institute (EGI) at the University of Utah. His expertise covers many aspects of multi-phase, multi-physics numerical simulations, with a focus on geologic carbon storage under multiple scenarios. He specializes in the application of relative permeability and capillary pressure to numerical modeling with an emphasis on improving methods for leveraging laboratory data to improve model resolution. In conjunction with this, he is currently collaborating on several DOE-sponsored research projects in the western US.