Email
Nathan.Moodie@m.cc.utah.edu

Phone
801-272-0916

Research Interests

- Carbon Capture Utilization and Storage (CCUS)
- Permeability relationships between the injected carbon dioxide and the reservoir fluids in place
- Multiphase flow simulation with CO2/Brine
- Impact of relative permeability and capillary pressure functions have on simulation results

EMAIL:
ContactEGI@egi.utah.edu

PHONE: (801) 585-3826

Nathan Moodie, Ph.D.

Post-Doctoral Research Associate

Dr. Nathan Moodie received his Ph.D. in civil and environmental engineering in 2017 from the University of Utah where 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 joined the Energy & Geoscience Institute as a graduate student pursuing his Masters in 2011, and received a Master of Science in Civil & Environmental Engineering in 2013, also from the University of Utah. Continuing with EGI throughout his graduate work, he now is a member of EGI staff as Post-doctoral Research Associate.

Nathan's expertise covers a variety of aspects of multi-phase, multi-physics numeric simulations, with a focus on using carbon dioxide for enhanced oil recovery and geologic carbon storage. He also specializes in the study of relative permeability and capillary pressure, with a focus on the uncertainty that they impart on numerical simulation due to lack of data, uncertainty in the laboratory measurements, and assignment strategies. In conjunction, he is developing a method that uses laboratory-measured fluid-rock interaction data to create relative permeability and capillary pressure relationships for numerical simulations.

He is currently working with the Southwest Regional Partnership on Carbon Sequestration (SWP) and the SubTER Project. He was also part of the CarbonSAFE Rocky Mountain Phase I pre-feasibility study and has been a member of the American Geophysical Union (AGU) since 2014.

Selected Publications

Moodie, N., Ampomah, W., Jia, W., Heath, J., McPherson, B., (2019) Assignment and Calibration of Relative Permeability by Hydrostratigraphic Units for Multiphase Flow Analysis, Case Study: CO2-EOR operations at the Farnsworth Unit, Texas. International Journal of Greenhouse Gas Control. 81: p. 103-114.

Moodie, N., McPherson, B., Lee, S-Y., Mandalaparty, P., (2014) Fundamental Analysis of the Impacts Relative Permeability has on CO2 Saturation, Distribution and Phase Behavior. Transport in Porous Media. 104(2)

Moodie, N., Pan, F., McPherson, B., Jia, W., (2016) Impacts of Relative Permeability Formulation on Forecasts of CO2 Phase Behavior, Phase Distribution, and Trapping Mechanisms in a Geologic Carbon Storage Reservoir. Greenhouse Gases: Science and Technology. 7(2): p. 241-258