Donald M. (Matt) Reeves Curriculum Vitae

Presidential Innovation Professor and Associate Professor
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## Education

**Ph.D. Hydrogeology** **University of Nevada, Reno** **2006**
Dissertation: Ensemble Transport of Conservative Solutes and the Correspondence to Operator-Stable Limit Distributions. Advisor: Dr. David A. Benson.

**M.S. Geology/Hydrogeology** **University of Montana, Missoula** **2001**
Thesis: Hydrologic Controls on the Survival of Water Howellia (*Howellia aquatilis*) and Implications of Land management, Swan Valley, Montana. Advisor: Dr. William W. Woessner.

**B.S. Soils and Environmental Science** **Montana State University, Bozeman** **1998**

## Professional Experience

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|---|---|
| October 2020 – Present | Presidential Innovation Professor (4-yr term, $15k-yr stipend), **Western Michigan University** |
| July 2016 – Present | Associate Professor and Hydrogeology Field Course Director, Department of Geological and Environmental Sciences, **Western Michigan University** |
| July 2014 – June 2016 | Associate Professor, Department of Geological Sciences, **University of Alaska, Anchorage** |
| July 2011 – June 2014 | Associate Research Professor, Division of Hydrologic Sciences, **Desert Research Institute** |
| July 2007 – June 2011 | Assistant Research Professor, Division of Hydrologic Sciences, **Desert Research Institute** |
| January, 2006 – July 2007 | Post-Doctoral Research Associate, Division of Hydrologic Sciences, **Desert Research Institute** |

## Research Areas

Hydrogeology · Contaminant Fate and Transport · Per- and Polyfluorinated Alkyl Substances (PFAS) · Fractured Rock · Climate Change · Groundwater – Surface Water Interaction · Geomechanics

## Publications

(*student author)

Journal Articles and Book Chapters (40 published; 1 in review)

*Saeeda, T., S. Albalawi, A. Abuhagr, H. Hassanain, S.A. Althobaiti, D.M. Reeves, M. Abdullah, and S. Ekkehard, Two-electron Transfer Photoreduction of Methyl Viologen and Perfluorooctanoic Acid Mediated by Flavin Mononucleotide at Colloidal Titanium Dioxide Interfaces, *New Journal of Chemistry*, original submission 9/12/2023, revised submission 10/24/23.

Zhang, Y., G.E. Fogg, H.-G. Sun, D.M. Reeves, R.M. Neupauer, and W. Wei, Adjoint subordination to calculate backward travel time probability of pollutants in water with various velocity resolutions, *Hydrology and Earth System Sciences* (IF=6.6), in press, https://doi.org/10.5194/hess-2023-131

*Link, G.W., D.M. Reeves, D.P. Cassidy, and *E.S. Coffin (2024), Per- and Polyfluoroalkyl Substances (PFAS) in final treated solids (biosolids) from 190 Michigan wastewater treatment plants, *Journal of Hazardous Materials* (IF=13.6), 463, 132734, https://doi.org/10.1016/j.jhazmat.2023.132734

*Vitale, D.S., D.M. Reeves, *E.S. Coffin, *G.W. Link, D.P. Cassidy, and S.M. Rochow (2023), Long-duration monitoring and mass balance of PFAS at a wastewater treatment plant following the release of aqueous-film forming foam, *Water Research* (IF=12.8), 242, 1202868, https://doi.org/10.1016/j.watres.2023.120268

*Fan, X., and D.M. Reeves (2023), A framework for assessing the 4th rank dispersivity tensor under anisotropic axial symmetries, *Hydrogeology Journal* (IF=2.8), 31, 465-484, https://doi.org/10.1007/s10040-022-02584-4

*Coffin, E.S., D.M. Reeves, and D.P. Cassidy (2023), Per- and Polyfluorinated Substances (PFAS) in Municipal Solid Waste Landfills: Sources, Transformations, Leachate Trends, and Challenges, *Current Opinion in Environmental Science & Health* (IF=8.4), 31, 100418, https://doi/10.1016/j.coesh.2022.100418

Reeves, D.M., H.V. Pham, R. Parashar, and N.L. Sund (2023), Fracture connectivity and flow path tortuosity elucidated from advective transport to a pumping well in complex 3D networks, *Engineering Geology* (IF=7.4), 313, 106960, https://doi.org/10.1016/j.enggeo.2022.106960

*Akara, M.E.M., D.M. Reeves, M.D.T. Gnazou, and G. Boguido (2022), Assessing future climate trends and their impact on different fractured rock aquifers in Northern Togo, *Journal of Water and Climate Change* (IF=2.8), 13(11), https://doi:10.2166/wcc.2022.264

*Helmer, R.W., D.M. Reeves, and D.P. Cassidy (2022), Per- and Polyfluorinated Alkyl Substances (PFAS) cycling within Michigan: Contaminated sites, landfills and wastewater treatment plants, *Water Research* (IF=12.8), 210, 117983, https://doi:10.1016/j.watres.2021.117983

*Akara, M.E.M., D.M. Reeves, and R. Parashar (2021), Impact of horizontal spatial clustering in two-dimensional fracture networks on solute transport, *Journal of Hydrology* (IF=6.4), 603, 127055, https://doi:10.1016/j.jhydrol.2021.127055

*Buszka, T.T. and D.M. Reeves (2021), Pathways and timescales associated with nitrogen transport from septic systems in coastal aquifers intersected by canals, *Hydrogeology Journal* (IF=2.8), 29, 1953–1964, https://doi:10.1007/s10040-021-02362-8

*Cascarano, R.N., D.M. Reeves, M.H. Henry (2020), A dye tracer approach for quantifying fluid and solute flux across the sediment-water interface, *Groundwater* (IF=2.6), 59(3), https://doi:10.1111/gwat.13060

Li, Xicheng, Y. Zhang, D.M. Reeves, Zheng, C. (2020), Fractional derivative models for non-Fickian transport in a single fracture and its extension, *Journal of Hydrology* (IF=6.4), 590, 125396, https://doi:10.1016/j.jhydrol.2020.125396

*Akara, M.E.M., D.M. Reeves, and R. Parashar (2020), Enhancing fracture-network characterization and discrete-fracture-network simulation with high-resolution surveys using unmanned aerial vehicles, *Hydrogeology Journal* (IF=2.8), 28, 2285-2302, https://doi:10.1007/s10040-020-02178-y

Reeves, D.M., *T.T. Buszka, *M.E. Wayt and D. Greene (2020), Pneumatic slug manifold design and practical considerations, *Groundwater* (IF=2.6), 58(3), 416-418, https://doi.org/10.1111/gwat.12971

Lu, B., Y. Zhang, D.M. Reeves, H.-G. Sun, and C. Zheng (2018), Application of tempered-stable time fractional-derivative model to upscale subdiffusion for pollutant transport in field-scale discrete fracture networks, *Mathematics* (IF=2.4), 6(5), https://doi:10.3390/math6010005

Koch, J.C., R. Toohey, and D.M. Reeves (2017), Tracer-based evidence of heterogeneity in subsurface flow and storage within a boreal hillslope, *Hydrological Processes* (IF=3.2), 31, 2453-2463, https://doi:10.1002/hyp.11205

Parashar, R. and D.M. Reeves (2017), Groundwater Sustainability in Fractured Rock Aquifers, Chapter 17 In: *Sustainable Water Resources Management*, Eds. C.S.P. Ojha, S. Rao, A. Bardossy, T.C. Zhang, and C.M. Kao, American Society of Civil Engineers (ASCE), Reston, VA, ISBN 9780784414767, pp. 439-464, https://ascelibrary.org/doi/book/10.1061/9780784414767

Zhang, Y., B. Baeumer, L. Chen, D.M. Reeves, and H.-G. Sun (2017), A fully subordinated linear flow model for hillslope subsurface stormflow, *Water Resources Research* (IF=5.4), 53, 3491-3504, https://doi:0.1002/2016WR20192

Zhang, Y., L. Chen, D.M. Reeves, and H.-G. Sun (2014), A fractional-order tempered-stable continuity model to capture surface water runoff, *Journal of Vibration and Control* (IF=2.8), https://doi:10.1177/1077546314557554

Reeves, D.M., R. Parashar, K. Pohlmann, C. Russell, and J. Chapman (2014), Development and calibration of dual-permeability models with discontinuous fault networks, *Vadose Zone Journal* (IF=2.8), 13(8), https://doi:10.2136/vzj2013.10.0183

Sun, H.-G., Y. Zhang, W. Chen, and D.M. Reeves (2014), Use of a variable-index fractional-derivative model to capture transient dispersion in heterogeneous media, *Journal of Contaminant Hydrology* (IF=3.6), 157, 47-58, https://doi:10.1016/j.jconhyd.2013.11.002

Zhang, Y., E.M. LaBolle, D.M. Reeves, and C. Russell (2013), A direct numerical simulation of matrix diffusion across the fracture/matrix interface, *Water Science and Engineering*, 2(2), 1-10, https://doi:10.3882/j.issn.1674-2370.2012.02.001

Reeves, D.M., R. Parashar, G. Pohll, R. Carroll, T. Badger, K. Willoughby (2013), Practical guidelines for horizontal hillslope drainage networks in fractured rock, *Engineering Geology* (IF=7.4), 163, 132-143, https://doi:10.1016/j.enggeo.2013.05.001

Zhang, Y., D.M. Reeves, K. Pohlmann, J.B. Chapman, and C.E. Russell (2013), Fractional dynamics of tracer transport in fractured media from local to regional scales, *Central European Journal of Physics* (discontinued), 11(6), 634-645, https://doi:10.2478/s11534-013-0200-x

Schultz, R.A., *C. Klimczak, H. Fossen, J.E. Olsen, U. Exner, D.M. Reeves, and R. Soliva (2013), Statistical tests of scaling relations for geologic structures, *Journal of Structural Geology* (IF=3.1), 48, 85-94, https://doi:j.jsg2012.12.005

*Shope, C.L., J.E. Constantz, C.A. Cooper, D.M. Reeves, G. Pohll, and W.A. McKay (2012), Influence of a large fluvial island, streambed, and streambank on surface water-groundwater fluxes and water table dynamics, *Water Resources Research* (IF=5.4), 48, 6, https://doi:10.1029/2011WR011564

Parashar, R. and D.M. Reeves (2012), On iterative techniques for solving flow in large two-dimensional discrete fracture networks, *Journal of Computational and Applied Mathematics* (IF=2.4), 236, 18, 4712-4724, https://doi:10.1016/j.cam.2012.02.038

Reeves, D.M., R. Parashar, and Y. Zhang (2012), Hydrogeologic characterization of fractured rock masses intended for disposal of radioactive waste, In: *Radioactive Waste*, Ed. R.A. Rahman, InTech Publishing, ISBN 978-953-51-0551-0, doi:10.5772/33168, https://www.intechopen.com/chapters/36032

Zhang, Y., B. Baeumer, and D.M. Reeves (2010), A tempered multiscaling stable model to simulate transport in regional-scale fractured media, *Geophysical Research Letters* (IF=5.2)*, 37*, L11405, https://doi:10.1029/2010GL043609

Reeves, D.M., K. Pohlmann, G. Pohll, M. Ye, and J. Chapman (2010), Incorporation of conceptual and parametric uncertainty into radionuclide flux estimates from a fractured granite rock mass, *Stochastic Environmental Research and Risk Assessment* (IF=4.2), https://doi:10.1007/s00477-010-0385-0

*Klimczak, C., R.A. Schultz, R. Parashar, and D.M. Reeves (2010), Cubic law with correlated aperture to length and implications for network scale fluid flow, *Hydrogeology Journal* (IF=2.8), https://doi:10.1017/s10040-009-0572-6

*Harman, C.J., D.M. Reeves, B. Baeumer, and M. Sivapalan (2010), Subordinated kinematic subsurface flow in hillslopes, *Journal of Geophysical Research - Earth Surface* (IF=3.9)*, 115*, F00A08, https://doi:10.1029/2009JF001273

Ye, M., K. Pohlmann, J. Chapman, G. Pohll, and D.M. Reeves (2009), A model-averaging method for assessing groundwater conceptual model uncertainty, *Groundwater* (IF=2.6), https://doi:10.1111/j.1745-6584.2009.00633.x

Zhang, Y., D.A. Benson, and D.M. Reeves (2009), Time and space nonlocalities underlying fractional derivative models: Distinction and literature review of field-scale applications, *Advances in Water Resources* (IF=4.7), 32, 561-581, https://doi:10.1016/j.advwatres.2009.01.008

Schultz, R.A., R. Soliva, H. Fossen, C. Okubo, and D.M. Reeves (2008), Dependence of displacement-length scaling relations for fractures and deformation bands on the volumetric changes across them, *Journal of Structural Geology* (IF=3.1), 30, 1405-1411, https://doi:10.1016/j.jsg.2008.08.001

Botros, F., A.E. Hassan, D.M. Reeves, and G. Pohll (2008), On mapping fracture networks onto continuum, *Water Resources Research* (IF=5.4)*, 44*, WO8435, https://doi:10.1029/2007WR006092

Reeves, D.M., D.A. Benson, and M.M. Meerschaert (2008), Influence of fracture statistics on advective transport and implications for geologic repositories, *Water Resources Research* (IF=5.4)*, 44*, W08405, https://doi:10.1029/2007WR006179

Reeves, D.M., D.A. Benson, M.M. Meerschaert, and H.-P. Scheffler (2008), Transport of conservative solutes in simulated fracture networks: 2. Ensemble solute transport and the correspondence to operator-stable limit distributions, *Water Resources Research* (IF=5.4)*, 44*, W05410, https://doi:10.1029/2008WR006858

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Reeves, D.M. and W.W. Woessner (2004), Hydrologic controls on the survival of Water Howellia *(Howellia aquatilis)* and implications of land management, *Journal of Hydrology* (IF=6.4)*, 287*(1-4), 1-18, https://doi:10.1016/j.jhydrol.2003.09.010

Conference Proceedings Papers (16)

*Akara, M.E.M., D.M. Reeves, and R. Parashar (2021), Spatial clustering in natural fracture networks and implications for solute transport, *3rd International Discrete Fracture Network Engineering Conference*, ARMA-DFNE-21-2332, June 21, Virtual, https://onepetro.org/ARMADFNE/proceedings-abstract/DFNE21/All-DFNE21/ARMA-DFNE-21-2332/468214

Lu, B., Y. Zhang, Y. Xia, D.M. Reeves, H.-G. Sun, D. Zhou, and C. Zheng (2018), Identifying non-Darcian flow and non-Fickian pressure propagation in field-scale discrete fracture networks, *Journal of Geoscience and Environmental Protection*, 6(5), 59-69, https://doi:10.4236/gep.2018.65005

Parashar, R. and D.M. Reeves (2017), Generalized responses of fractured rock aquifers to pumping and episodic recharge, *MODFLOW and MORE 2017: Modeling for Sustainability and Adaptation*, May 21-24, Golden, CO.

Reeves, D.M., R. Parashar, G. Pohll, and R. Carroll (2014), The use of DFN concepts in understanding hillslope drainage in fractured rock, *International Discrete Fracture Network Engineering Conference*, DFNE 2014-277, October 19-22, Vancouver, Canada.

Reeves, D.M., R. Parashar, K. Pohlmann, E.M. LaBolle, Y. Zhang, C. Russell, and J. Chapman (2014), Radionuclide containment properties of fractured and faulted volcanic tuff units at the T-tunnel complex, Rainier Mesa, Nevada National Security Site, *Proceedings of 2014 Waste Management Symposia*, March 2-6, Phoenix, AZ.

Huntington, J., R. Niswonger, S. Rajagopal, Y. Zhang, *M. Gardner, C.G. Morton, D.M. Reeves, D. McGraw, and G. Pohll (2013), Integrated hydrologic modeling of Lake Tahoe and Martis Valley mountain block and alluvial

systems, Nevada and California, *Proceedings of MODFLOW and MORE 2013: Translating Science into Practice*, June 8-11, Golden, CO.

Reeves, D.M., R. Parashar, K. Pohlmann, J. Chapman, and C. Russell (2013), Development and calibration of dual-permeability models in complex hydrogeologic settings: An example from the T-Tunnel Complex, Rainier Mesa, Nevada National Security Site, *Proceedings of MODFLOW and MORE 2013: Translating Science into Practice*, June 8-11, Golden, CO.

*Benato, S., D.M., Reeves, R. Parashar, N. Davatzes, S. Hickman, D. Elsworth, P. Spielman, and J. Taron (2013), Computational investigation of hydro-mechanical effects on transmissivity evolution during the initial injection phase at Ormat Desert Peak EGS Project, NV, *Thirty-Eight Workshop on Geothermal Engineering*, Stanford University, Stanford, California, SGP-TR-198, https://pangea.stanford.edu/ERE/pdf/IGAstandard/SGW/2013/Benato.pdf

Reeves, D.M., G. Pohll, B. Lyles, J. Faulds, J. Louie, B. Ehni, C. Kratt, C. Cooper, R. Parashar, S. Pullammanappallil, and D. Noel (2012), Geothermal resource characterization and evaluation at Astor Pass, Nevada, *Geothermal Resources Council Transactions†*, 36, 1371-1376, https://www.osti.gov/servlets/purl/1110503

Cooper, C.A., J.M. Thomas, B.F. Lyles, D.M. Reeves, G.M. Pohll, and R. Parashar (2012), A preliminary geochemical description of the geothermal reservoir at Astor Pass, Northern Pyramid Lake, Nevada, *Geothermal Resources Council Transactions†*, 36, 37-40, https://www.geothermal-library.org/index.php?mode=pubs&action=view&record=1030207

Reeves, D.M. and R. Parashar (2011), A numerical investigation of soil-bedrock interface flow impedance, *Proceedings of MODFLOW and MORE 2011: Integrated Hydrology Modeling*, June 5-8, Golden, CO.

Parashar, R. and D.M. Reeves (2011), Computation of flow and transport in fracture networks on a continuum grid, *Proceedings of MODFLOW and MORE 2011: Integrated Hydrology Modeling*, June 5-8, Golden, CO.

Carroll, R., G. Pohll, and D.M. Reeves (2011), Design guidelines for horizontal drains used for slope stabilization, *Proceedings of MODFLOW and MORE 2011: Integrated Hydrology Modeling*, June 5-8, Golden, CO.

Zhang, Y., D.A. Benson, E.M. LaBolle, and D.M. Reeves, (2008), Fractional RWHet: An enhanced solver for solute transport with both spatiotemporal memory and conditioning on local aquifer properties, *Proceedings of MODFLOW and MORE 2008: Ground Water and Public Policy*, May 19-21, Golden, CO, 62-66.

Reeves, D.M., Y. Zhang, G. Pohll, and D. Benson, (2008), FRACK: A freeware flow and transport suite for fractured media, *Proceedings of MODFLOW and MORE 2008: Ground Water and Public Policy*, May 19-21, Golden, CO, 67-71.

Ye, M., K.F. Pohlmann, J.B. Chapman, G.M. Pohll, and D.M. Reeves, (2008), Assessing recharge and hydrostratigraphic model uncertainty in the Climax Mine area of the Nevada Test Site, *Proceedings of MODFLOW and MORE 2008: Ground Water and Public Policy*, May 19-21, Golden, CO, 310-314.

† GRC Proceedings are peer-reviewed and serve as industry standard for geothermal publications

Reports and Theses (12)

Parashar, R., H.V. Pham and D.M. Reeves, Investigation of Primary Flow Paths in Western Pahute Mesa Using Models Accounting for the Influence of Regional Stress on Fault Permeability, DOE/NV/0000003590-24, *DRI Letter Report*, October, 2018.

Reeves, D.M., K.D. Smith, R. Parashar, C. Collins, and K.M. Heintz, Investigating the Influence of Regional Stress on Fault and Fracture Permeability at Pahute Mesa, Nevada National Security Site, DOE/NV/0000939-41, *DRI Report No. 45275*, May, 2017, https://www.osti.gov/biblio/1358216

Reeves, D.M., K. Smith, R. Parashar, and C.G. Morton, Stress Field Inversions of Earthquake Focal Mechanisms and Influences of Regional Stress on Fault Permeability at Pahute Mesa, Nevada National Security Site, DOE/NV/0000939-28, *DRI Letter Report*, February, 2016.

Pohll, G., J. Chapman, K. Pohlmann, R. Plume, R. Parashar, *S. Rybarski, R.L. Hershey, W. Faraday, D.M. Reeves, and J.M. Thomas (2015), Hydraulic Fracturing in the Upper Humboldt River Basin, Aquifer Quality Assessment Program, Interim Final Report, *DRI Report No. 41263*, September, 2015, https://minerals.nv.gov/uploadedFiles/mineralsnvgov/content/Programs/OG/DRI%20pub%2041263_AQUA%20Final%20Report%20Oct%202015.pdf

Rajagopal, S., J.L. Huntington, R. Niswonger, G. Pohll, M. Gardner, C. Morton, Y. Zhang, and D.M. Reeves (2015), Integrated Surface Water and Ground Water Modeling of Martis Valley, California for Assessment of Potential Climate Change Impacts on Basin-Scale Water Resources, *DRI Report No. 41261*, April, 2015.

Pohll, G.M., R.W.H. Carroll, D.M. Reeves, R. Parashar, B. Muhunthan, S. Thiyagarjah, T. Badger, S. Lowell, and K. Willoughby (2013), Design Guidelines for Horizontal Drains Used for Slope Stabilization, *Washington State Department of Transportation Report, WA-RD 787.1*, http://www.wsdot.wa.gov/research/reports/fullreports/787.1.pdf.

Rajagopal, S., D.M. Reeves, J. Huntington, and G. Pohll, Estimates of Ground Water Recharge in the Martis Valley Ground Water Basin, *DRI Technical Memo*, September, 2012.

Zhang, Y., E.M. LaBolle, D.M. Reeves, and C. Russell (2012), Development of RWHet to Simulate Contaminant Transport in Fractured Porous Media, *DOE/NV/0000939-01, DRI Report No. 45244*, July, 2012, https://www.osti.gov/biblio/1091944

Pohlmann, K., M. Ye, D. Reeves, M. Zavarin, D. Decker, and J. Chapman (2007), Modeling of Groundwater Flow and Radionuclide Transport at the Climax Mine sub-CAU, Nevada Test Site, *DOE/NB/26383-05, DRI Report No. 45226*, September, 2007, https://www.osti.gov/biblio/922626

Reeves, D.M. (2006), Ensemble Transport of Conservative Solutes and the Correspondence to Operator-Stable Limit Distributions, *Ph.D. Thesis*, University of Nevada, Reno.

Reeves, D.M. (2004), Acid Mine Drainage Treatment Technologies, *In: Restoration of Abandoned Mine Sites (RAMS) Technological Database*, http://www.unr.edu/mines/ramstech

Reeves, D.M. (2001), Hydrologic Controls on the Survival of Water Howellia (Howellia aquatilis) and Implications of Land management, Swan Valley, Montana, *M.S. Thesis*, University of Montana.

Conference Abstracts – please refer to end of CV for complete list.

## Submitted Grants and Contracts

- *Principal Investigator*, Harbor Island Environmental Services, City of Grand Haven PFAS and CCR Project, Reeves subcontract to HDR, Sponsor: HDR Inc./City of Grand Haven, Phase III, $14,901, submitted.
- *Co-Principal Investigator*, NSF Convergence Accelerator (Track K): WATERGUARD: Building Resilient and Equitable Water Systems through Advanced Technologies and Inclusive Strategies, $747,275, submitted.
- *Co-Principal Investigator*, A Versatile Strategy of Constructing Synthetic Materials for High Efficiency PFAS Removal, Sponsor: National Science Foundation, $576,815, submitted.
- *Co-Principal Investigator*, Transformation and Sorption of PFAS Precursor in the Subsurface Under Semi-Arid and Humid Climate Conditions, Sponsor: Desert Research Institute/U.S. Geological Survey WRRI, $66,873, submitted.

## Funded Grants and Contracts

(listed in chronological order)

- *Principal Investigator*, Kalamazoo Water Reclamation Plant Plastics/Microplastics Characterization, Sponsor: City of Kalamazoo, DRI budget $67,475, WMU budget $5,431, *approved by sponsor*.
- *Principal Investigator*, Asylum Lake Stormwater Chloride Treatment: Laboratory Testing, Sponsor: State of Michigan/WMU Asylum Lake Preserve, 1/1/2023 – 12/31/2024, $92,000.
- *Principal Investigator*, Charlotte County Data Analysis and Proposal Revision, Sponsor: Charlotte County, FL, 5/15/2022 – 7/1/2024, $4,999.

- *Principal Investigator*, Harbor Island Environmental Services, City of Grand Haven PFAS and CCR Project, Reeves subcontract to HDR, Sponsor: HDR Inc./City of Grand Haven, 2/1/2022 – 7/1/2024, $10,000 (Phase I), $12,000 (Phase II).
- *Principal Investigator*, Expert Support for Gardnerville Ranchos Area Aquifer Testing, Sponsor: Desert Research Institute (subcontract), 9/15/2021 – 3/31/2022, $13,365.
- *Principal Investigator*, Ackerman Subdivision Grant Application Support, Sponsor: Charlotte County, FL, 12/31/2020 – 7/30/2021, $16,118.
- *Co-Principal Investigator*, Collaborative Research – Characterizing the Role of Spatial Thinking in Learning Hydrogeology: A Classroom, Field, and Expert-Novice Study, Sponsor: National Science Foundation, 2043620, 5/1/2021 – 4/30/2024, $150,567.
- *Principal Investigator*, Hydrogeological and Geochemical Evolution of the Spring Valley Watershed, Sponsor: City of Kalamazoo, Department of Public Services, MI, 1/1/2020 – 12/31/2021, $108,677.
- *Principal Investigator*, Investigation of Septic Seepage into Charlotte Harbor, Florida, Sponsor: Charlotte County, FL, 4/1/2018 – 5/31/2020, $61,652.
- *Principal Investigator*, Increasing Diversity in Geosciences: Hydrogeology Field Course, Sponsor: Michigan Association of Environmental Professionals, 4/1/2018-8/31/2018, $2,400.
- *Co-Investigator*, Coupling Stress-Permeability Relations to DFN Models to Compute Flow Patterns and Identify Main Flow Paths and Controlling Features at Western Pahute Mesa, Sponsor: U.S. Department of Energy, Underground Test Area Program, 2016-2018, DE-NA0000939, $77,029 (DRI subcontract $17,324).
- *Principal Investigator*, Use of Conservative Tracers to Characterize Transport of Septic Effluent in Southwest Florida, Sponsor: WMU-Enterprise Charlotte Economic Council (ECEC) – WMU, 3/1/2017-6/30/2018, $25,230 ($6,308 external to WMU).
- *Co-Investigator*, Petroleum Geology at UAA: Geophysics Faculty and ConocoPhillips Subsurface Laboratory Support, Sponsor: UAA Conoco-Phillips Arctic Science and Engineering Endowment, $100,000.
- *Co-Investigator*, Hydrogeology and Geochemistry of Groundwater in the Sand Lake Area, Anchorage, Alaska, Sponsor: State of Alaska, $275,000.
- *Senior Personnel*, Collaborative Research: Water Sustainability in Snow-Fed Arid Land River System, Sponsor: Joint U.S. Department of Agriculture – National Science Foundation/DRI Subcontract, 8/1/2016-07/31/2018, $71,595.
- *Principal Investigator* through June 2014, Pahute Mesa Discrete Fracture Network Code Evaluation, Sponsor: U.S. Department of Energy, Underground Test Area Program, 2014-2019, DE-NA0000939, ~$1,300,000.
- *Co-Investigator*, Assessment of Contaminant Migration Potential from Hydraulic Fracturing in the Upper Humboldt River Basin, Nevada, Sponsor: Noble Energy, 2013-2017, $954,000.
- *Principal Investigator*, Current and Future Water Supply Assessment for the Truckee River Basin Project, Sponsor: MWH/U.S. Bureau of Remediation, 10/10/12 – 04/30/14, S10501497-98606-OF, $113,480.
- *Co-Investigator*, Parallelization of an existing discrete fracture network model, Sponsor: DRI/DHS Internal Research and Development, $30,000.
- *Co-Investigator*, Quantifying of surface runoff and water infiltration in arid and semi-arid areas, Sponsor: U.G. Geological Survey WRRI, $114,000.
- *Principal Investigator*, Utilization of Thermal-Hydrologic-Mechanical-Chemical Coupled Modeling to Investigate Fracture Network Permeability Evolution during Enhanced Geothermal System Stimulation at Desert Peak, Nevada, Sponsor: Sponsor, U.S. Department of Energy, Geothermal Technologies Program through a faculty seed grant from the Great Basin Center for Geothermal Energy, 08/1/12 – 12/31/15, DRI 646.3700/UNR 13-28, $55,106.
- *Principal Investigator*, Pahute Mesa Regional Stress-Fault Permeability Analysis, Sponsor: U.S. Department of Energy, Underground Test Area Program, 2014-2017, DE-NA0000939, $75,139.
- *Co-Investigator*, Design Guidelines for Horizontal Drains used for Slope Stabilization, Sponsor: Washington Department of Transportation, 2011-2013, GCA6381, $220,000.
- *Principal Investigator*, Pahrump Valley Water Resources: An Integrated Modeling Assessment, Sponsor: DRI Maxey Endowment, 2013-2014, $115,000.

- *Co-Investigator*, Comprehensive Evaluation of the Geothermal Resource Potential with the Pyramid Lake Paiute Reservation, Sponsor: U.S. Department of Energy, ARRA Geothermal Technologies Program (Geothermal Modeling Lead), 7/30/10 – 1/31/12, ~$4,850,000 total/~$1,100,000 DRI.
- *Principal Investigator*, How Do Length-Aperture Correlations Influence Flow and Transport Characteristics of Fractured Rock Masses?, Sponsor: DRI/DHS Internal Research and Development, 2009-2010, $16,000.
- *Principal Investigator*, Use of FRACK to Quantify Flow through Fractured Rock at Folsom Dam, California, Sponsor: U.S. Bureau of Reclamation, 07/1/09 – 12/31/10, DRI 09PG-850965, $12,009.
- *Principal Investigator*, Development of a Validated Groundwater Model of Pahrump Valley, Sponsor: Nye County Nevada/Thomas S. Buqo Consulting, 05/01/08 – 7/31/09, DRI 08-01/DE-FG52-06NA27205, $149,980.
- *Principal Investigator*, Rainier Mesa sub-CAU Modeling of T-Tunnel Complex and Ponds, Sponsor: U.S. Department of Energy, Underground Test Area Program, 2008-2013, DE-NA0000939, ~$900,000.

## Teaching

**Western Michigan University – Department of Geological and Environmental Sciences**

- *GEOS 5010 – Geologic Communications and Presentations* (2020)
- *GEOS 5090 – Surface Water Hydrology* (Fall 2023)
- *GEOS 5120 – Principles of Hydrogeology* (2017 – current)
- *GEOS 5240 – Remediation Design and Implementation* (2017 – 2022)
- *GEOS 5260 – Principles and Practices of Aquifer Testing* (2017 – current)
- *GEOS 6120 – Advanced Hydrogeology* (2022 – current)
- *GEOS 6500 – Mechanics of Contaminant Transport* (2018)

**University of Alaska, Anchorage – Department of Geological Sciences**

- *GEOL 115 – Environmental Geology* (2015–2016)
- *GEOL 440/640 – Hydrogeology* (2014)
- *GEOL 445/645 – Geothermal Energy* (2014)
- *GEOL 490/690 – Environmental Methods* (2015)

**University of Nevada, Reno – Program of Hydrologic Sciences**

- *GEOL 701/702S – Fortran Programming for Scientists and Engineers* (2006–2014)
- *GEOL 786 – Contaminant Transport in Ground Water Flow Systems* (2008–2013)

**Professional Short Courses**

Contaminant Fate and Transport in Fractured Bedrock, *Midwest Geosciences Short Course*, West Chester University, West Chester, PA, Sept. 13-14, 2021; 2022; New York, April 2024 (tentative).

FRACK Overview: Simulation of fluid flow through stochastic fracture networks and grid-based upscaling techniques, *Short course taught to the U.S. Bureau of Reclamation,* Denver, CO, 2011.

## Graduate and Undergraduate Student Advising and Awards

Kristen Hasbrouck, (Ph.D. Geosciences), Thesis topic: PFAS Storage and Transport Behavior in the Capillary Fringe

Rami Waheeb Ahmad Mansouri (Ph.D. Geosciences), Thesis topic: Artificial Recharge Feasibility in Fractured Basaltic and Unconsolidated Aquifers in Saudi Arabia

Donovan Vitale (M.S. Geosciences), Thesis topic: PFAS Foams in Michigan Surface Waters

Kathryn Strohauer (M.S. Geosciences), Thesis topic: Trends and Distributions in Water Chemistry and Trace Metal Elements in Michigan

Justin Honer (Ph.D. Geosciences), Thesis topic: Fluid and Gas Flow and Solute Transport Behavior in Columnar Patterns within the Environment

Ethan Coffin (Ph.D. Geosciences), Thesis topic: PFAS Composition and Transformation within Wastewater Treatment Plants and Foams. **2023 AJ Birkbeck Scholarship for PFAS Research ($3k), 2023 Michigan Water Environment Association Scholarship ($5k)**

Kai Trobisch (M.S. Geosciences), Thesis topic: PFAS Fate and Transport in Wastewater Effluent Applied to Rapid Infiltration Basins

Jacelyne Myrthil (B.B.A./B.S. Business/Public Health and Communication, minor in Environmental Sustainability), Michigan Sea Grant Environmental Internship Program/Ann Arbor Department of Drinking Water, Summer 2023, Topic: Environmental and Human Health Concerns of PFAS.

Garrett Link (M.S. Geosciences, 2023), Thesis title: Per- and Polyfluoroalkyl Substances (PFAS) in Final Treated Solids (Biosolids) from 190 Michigan Wastewater Treatment Plants.

Donovan Vitale (B.S., Geophysics, 2023), Lee Honors College Thesis Title: "Wastewater Treatment Plant Scale PFOS Mass Balance from Aqueous-Film Forming Foam Concentrate Release at the Kalamazoo/Battle Creek International Airport". **AIPG 2022 Undergraduate Student Poster Award (1st place), WMU 2022-2023 Presidential Scholar**

Xiang Fan (Ph.D. Geosciences, 2022), Thesis title: A framework for assessing the 4th rank dispersivity tensor under anisotropic axial symmetries.

Ross Helmer (M.S. Geosciences, 2021), Thesis title: Observed PFAS Transport Phenomena: A Review of Known Contaminated Sites in Michigan. **Geological and Environmental Sciences Advisory Board Best Poster Award 2020, MI AIPG 2020 Graduate Student Poster Award (2nd place), WMU Department-Level Masters Research and Creative Award 2021-2022**

Austen York (M.S. Geosciences, 2021), Thesis title: Hydrogeological and Geochemical Evaluation of the Spring Valley Watershed. **WMU All University Masters Research and Creative Award 2020-2021**

Mabossani Akara (Ph.D. Geosciences, 2021), Thesis title: Characterization of Regional-Scale Fractured Rock Aquifers in Togo, Africa and Influence of Climate Change on Water Resources. **Department-Level Doctoral Graduate Teaching Effectiveness Award 2019-2020**

Madison Wayt (M.S. Geosciences, 2020), Thesis title: "An Analysis of Maximum Pneumatic Slug Tests for the Characterization of Aquifer Parameters – Guidelines for an Alternative Field Procedure."

Tanten Buszka (M.S. Geosciences, 2020), Thesis title: "Field and Numerical Evaluation of Nitrogen Transport from Septic Systems in Surficial Aquifer Systems to Charlotte Harbor, Florida." **WMU All University Masters Research and Creative Award 2019-2020**

Clayton Joupperi (M.S. Geosciences, 2018), Thesis title: "Reservoir Characterization and Fracture Network Modeling of the Highly Fractured Dolomitized A-2 Carbonate (Silurian) Gas Storage Reservoirs in the Michigan Basin"

Ryan Cascarano (M.S. Geosciences, 2018), Thesis title: "Use of Fluorescein Dye for Characterizing Fluxes across the Groundwater-Surface Water Interface"

Larry Shores (B.S. Geology, 2016), UAA Undergraduate Research: Radon isotope sampling for delineation of ground water discharge in fluvial systems.

Luke Pickman (M.S. Hydrogeology, 2015) Thesis title: "Development of a Continuous Time Random Walk Model for Fractured Media – Site Characterization and Comparison with Discrete Fracture Network Method" (co-advisor)

Lise Comartin (M.S., Hydrogeology, 2010) Thesis title: "Development of a Groundwater Flow Model of Pahrump Valley, Nye County, Nevada and Inyo County, California for Basin-Scale Water Resource Management"

Steven Humphrey (M.S., Hydrogeology, 2008) Thesis title: "A Stochastic Approach to a Groundwater Flow Model of the Southern Honey Lake Valley in Lassen County, California and Washoe County, Nevada"

## Post-Doctoral Fellows

Rishi Parashar (Ph.D., Purdue), currently Research Professor at the Desert Research Institute.

## Graduate Student Committees

Marwan Al Hinaii (WMU, M.S. Geosciences)

Nicole Sanabria (WMU, M.S. Geosciences, 2023)
Moein Izadi (WMU, Ph.D., Geosciences, 2022)
Samuel Nyarko (WMU, Ph.D., Science Education, 2021)
Karem Abdelmohsen (WMU, Ph.D., Geosciences, 2020)
Fahad Alshehri (WMU, Ph.D., Geosciences, 2020)
Sita Karki (WMU, Ph.D., Geosciences, 2019)
Charles Holada (WMU, M.S., Geosciences, 2017)
Danielle Dawson (UAA, M.S., Geochemistry, 2016)
Charles Rust (UAA, M.S., Petroleum Geology, 2016)
Veronica Jones (UAA, M.S., Petroleum Geology, 2016)
Marcy Kolberg (UAA, M.S., Environmental Geology, 2016)
Haley Huff (UAA M.S., Geochemistry, 2016)
Luke Pickman (UNR, M.S. Hydrogeology, 2015)
Vitor De Carli (UAA, M.S. Applied Environmental Science and Technology, 2015)
Gerrad Jones (UNR, Ph.D., Environmental Engineering, 2013)
Bo Tan (UNR, M.S. Atmospheric Science, 2012)
Subhashree Mishra (UNR, Ph.D., Atmospheric Sciences, 2011)
Rishi Pandit (UNR, M.S., Physics, 2011)
Christian Klimczak (UNR, Ph.D., Geological Engineering, 2011)
Annie Kell-Hills (UNR, M.S., Hydrogeology, 2010)
Mehmet Yilmaz (UNR, Ph.D., Physics, 2009)
Breann Westfall (UNR, M.S., Hydrogeology, 2008)

## Press Coverage, Awards, and Service

- Proposal Reviewer, National Science Foundation, NSF SBIR/STTR Phase II Water Treatment Technologies, October, 2023, $1M budget.
- Stacy Gittleman, "PFAS threats to health in all aspects of daily life", Downtown Newsmagazine, September 26, 2023, https://www.downtownpublications.com/single-post/pfas-threats-to-health-in-all-aspects-of-daily-life
- Matt DeYoung, Grand Haven Tribune, "Complexities of Harbor Island Cleanup Discussed", August 26, 2023, https://www.grandhaventribune.com/news/environment/complexities-of-harbor-island-cleanup-discussed/article_cf4380ca-bc46-593d-a246-50b8c4b82d58.html.
- Michigan Water Environment Association (MWEA), Contaminants of Concern Working Group, July 2023 – current.
- Technical Session Chair: T18. Fate and Transport of PFAS in the Engineered and Natural Environment, Geological Society of America, North-Central Section Meeting, May 5, 2023.
- WMU Organizational Representative, Mid-American Conference (MAC) Universities Research Consortium Water group, January 2023 – current.
- Garret Ellison, MLIVE, "An Invasive Weed is Choking Spring Valley Lake in Kalamazoo", June 29, 2022, https://www.mlive.com/public-interest/2022/06/an-invasive-weed-is-choking-spring-valley-lake-in-kalamazoo.html.
- Geological Society of America Hydrogeology Division Webinar, "Navigating the Graduate School Search and Admissions Process", Invited Panelist, April 27, 2022,

https://www.geosociety.org/documents/gsa/webinar/library/20220427-navigating-grad-school-slides.pdf.

- Tracy Samilton, Michigan Radio/NPR, "Research finds more PFAS coming out of wastewater treatment plants than going in", April 12, 2022, https://www.michiganradio.org/environment-climate-change/2022-04-12/research-finds-more-pfas-coming-out-of-wastewater-treatment-plants-than-going-in.
- Keith Matheny, Detroit Free Press, "Study: Water leaving wastewater treatment plants has more detectable PFAS than going in", April 12, 2022, https://www.freep.com/story/news/local/michigan/2022/04/12/water-plants-pfas-michigan/9511745002.
- Michigan Environment, Great Lakes, and Energy (EGLE) PFAS Summit Conference Planning Committee, 2021 – 2023.
- Lynne Peeples, Ensia/The Guardian (co-published), "From Alaska to Florida, Harmful PFAS Compounds Pollute Water at Multiple Sites in Every State", December 16, 2020, https://ensia.com/features/drinking-water-contamination-pfas-health/, https://www.theguardian.com/us-news/2020/dec/22/forever-chemicals-pollute-water-dozens-of-sites-in-every-us-state.
- Geological Society of America, "These 'Forever Chemicals' Are Highly Toxic, Under-Studied, and Largely Unregulated", GSA Press Release No. 20-36, October 29, 2020, https://www.geosociety.org/GSA/News/pr/2020/20-36.aspx.
- WMU Presidential Innovation Professorship, October, 2020 to present (4-yr term expires 9/30/2024).
- Betsy Calvert, Charlotte Sun, "Study predicts quick results from septic-to-sewer conversions in Charlotte", Nov. 19, 2019, https://www.yoursun.com/charlotte/news/study-predicts-quick-results-from-septic-to-sewer-conversions-in/article_2eff7236-0b0a-11ea-a3e1-bba7t431c5cb.html.
- Best In Class: Why More Teachers are Bringing Instrumentation Into the Classroom and Students Into the Field, April 24, 2020, live/on-demand webinar, https://in-situ.com/us/classroom-water-instrumentation-webinar.
- WMU students tour PFAS contaminated site, learn about its complex geology and hydrogeology, Michigan Department of Environmental, Great Lakes, and Energy Press Release, August 21, 2019, https://www.michigan.gov/mienvironment/0,9349,7-385-90161-504964--,00.html.
- In-Situ Success Story: "WMU Field Course Preps Future Hydrogeologists with Hands-On Expertise", June 20, 2019, https://in-situ.com/us/blog/western-michigan-university-hydrogeology-field-course/?___store=us_en&___from_store=global_en.
- City of Kalamazoo Wellhead Protection Committee, June 2019 to present.
- A National PFAS Roadmap: A Western Michigan University White Paper, submitted as congressional testimony to "Legislative Proposals to Protect Americans at Risk of PFAS Contamination & Exposure," Subcommittee on the Environment and Climate Change, May 15, 2019, https://upton.house.gov/news/documentsingle.aspx?DocumentID=401198.
- Michigan PFAS Action Response Team (MPART) Treatment Technologies Roundtable member, May, 2019 to 2021.
- Interstate Technology and Regulatory Council (ITRC), PFAS Team Member, December 2018 to 2020.
- WMU Extended University Programs Community Engagement Award, 2017.
- John Mann Mentor in Applied Hydrogeology, Geological Society of America, 2015.
- U.S. Department of Energy Technical Working Group Numerical Modeling Subcommittee, January 2011 to June 2014.
- U.S. Department of Energy Yucca Flat Preemptive Review Committee, June 2011 to June 2014.
- Wagner Medal of Excellence for DRI scholars in early stages of career development, a competitive award, 2010.
- Outstanding Faculty Award, Graduate Program of Hydrologic Sciences, University of Nevada, Reno, 2007-2008.
- Reviewer: *Advances in Water Resources*, *Chemosphere, Computational Geosciences*, *Current Opinion in Environmental Science & Health*, *Engineering Geology*, *Environmental Science & Technology*, *Frontiers in*

*Environmental Sciences*, *Geoderma*, *Geophysical Research Letters*, *Groundwater*, *Hydrology and Earth System Sciences*, *Journal of Computational Physics*, *Journal of Contaminant Hydrology*, *Journal of Geophysical Research*, *Journal of Hazardous Materials*, *Journal of Hydraulic Engineering*, *Journal of Hydrodynamics Ser. B*, *Journal of Hydrology*, *Journal of Structural Geology*, Michigan Department of Environment, Great Lakes and Energy, National Science Foundation, U.S. Environmental Protection Agency, U.S. Geological Survey, *Vadose Zone Journal*, *Water Research*, and *Water Resources Research*.

## Professional Affiliations

- American Geophysical Union
- American Institute of Professional Geologists
- Geological Society of America
- National Ground Water Association

## Seminar and Guest Talks (15)

Per- and Polyfluorinated Alkyl Substances (PFAS) in the Engineered and Natural Environment, Michigan Colleges of Arts and Sciences – Dean's Meeting, *Western Michigan University,* Kalamazoo, MI, May 23, 2022.

The Role of Groundwater and Canals in Nutrient Transport from Septic Systems in Charlotte County, *Charlotte County Water Quality Summit*, Port Charlotte, FL, March 7, 2022 (virtual).

PFAS Cycle in Michigan: Connections between the Engineered and Natural Environment, *Department of Civil and Environmental Engineering and Earth Sciences Seminar Series*, Notre Dame, South Bend, Indiana, February 15, 2022.

WMU Hydrogeology Field Course, *In-Situ Webinar – Best In Class: Why More Teachers are Bringing Instrumentation Into the Classroom and Students Into the Field*, https://in-situ.com/us/academic-webinar, April 24, 2020.

Investigating the Influence of Regional Stress Controls on Fault and Fracture Permeability and Connectivity at Pahute Mesa, Nevada National Security Site, *Geological and Environmental Sciences Seminar Series, Western Michigan University*, Kalamazoo, MI, March 31, 2019.

PFAS Plume Characterization, Monitoring and Transport, *WMU OVPR Innovation Networking Session of PFAS and other Emerging Contaminants*, *Western Michigan University*, Kalamazoo, MI, November 15, 2018.

Probabilistic Approaches to Quantifying Fluid Flow and Contaminant Transport in Fracture Networks, *Statistics Colloquium*, *Western Michigan University,* Kalamazoo, MI, October 25, 2018.

Fracture Networks: The Internal Plumbing of Bedrock, *Grand Valley State University Science Week Seminar*, Allendale, MI, November 9, 2017.

Characterizing Fluid Flow and Contaminant Transport Pathways in Variably-Saturated Fractured Rock Systems, *University of Alaska Fairbanks Geosciences Seminar*, Fairbanks, AK, March 25, 2016.

Assessing Fluid Flow Characteristics and Contaminant Migration Potential in Variably-Saturated, Fractured Rock Systems: An example from the T-Tunnel Complex, Rainier Mesa, NNSS, *Alaska Geological Society*, Anchorage, AK, February 16, 2016.

The Use of DFN concepts in understanding hillslope drainage in fractured rock, *Alaska Society of Professional Engineers*, Anchorage, AK, May 14, 2015.

Hydrogeologic Research Interests, *University of Alaska Anchorage Consortium Library Public Outreach*, Anchorage, AK, December 2, 2014.

Characterization of a Blind Geothermal Resource: Preliminary Analysis through Resource Energy Estimates, *University of Alaska Anchorage Geosciences Seminar*, Anchorage, AK, September 11, 2014.

Solute Transport in Fractured Media: Correspondence to Operator-Stable Limit Distributions and Implications for Geologic Repositories, *Lawrence Livermore National Laboratory*, Livermore, CA, June 9, 2008.

Stochastic Simulation of Fracture Networks for Ground Water Flow and Transport Models, *Department of Mathematics, Probability and Statistics Seminar*, *University of Nevada, Reno*, Reno, NV, November 30, 2007.

## Conference Abstracts (128)

*Vitale, D.S., D.M. Reeves, *E.S. Coffin, *G.W. Link, D.P. Cassidy, and S.M. Rochow, WWTP mass balance of an AFFF concentrate release to a sanitary sewer, *GSA Connects 2023*, Pittsburgh, PA, October 18, 2023.

*Link, G.W., D.M. Reeves, D.P. Cassidy, and *E.S. Coffin, Trends in Per and Polyfluorinated Alkyl Substances (PFAS) in final treated solids (biosolids) from 190 Michigan wastewater treatment plants, *GSA Connects 2023*, Pittsburgh, PA, October 18, 2023.

*Honer, J.A., D.M. Reeves, M.E.M. Akara, and R. Parashar, Influence of network maturity and megablock structure on fluid flow and solute transport properties of volumetric contraction fracture networks, *GSA Connects 2023*, Pittsburgh, PA, October 18, 2023.

*Popoola, T., H. Petcovic, P. McNeal, *P. Gajewska-Schaefer, D.M. Reeves, and J. Moore, How experts and novices express spatial thinking in speech, gesture, and action in completing a hydrogeology task, *GSA Connects 2023*, Pittsburgh, PA, October 17, 2023.

*Hasbrouck, K., D.M. Reeves, and C. Divine, High resolution field data for understanding PFAS transport in the capillary fringe, *GSA Connects 2023*, Pittsburgh, PA, October 17, 2023.

*Vitale, D.S., D.M. Reeves, *E.S. Coffin, *G.W. Link, D.P. Cassidy, and S.M. Rochow, Long-duration monitoring and mass balance at a wastewater treatment plant following an accidental AFFF sewer release, *Michigan Water Environmental Association (MWEA) 2023 PFAS Seminar*, East Lansing, MI, August 24, 2023.

*Coffin, E.S., D.M. Reeves, and M.H. Henry, Cascade-driven foam fractionation in wastewater treatment plants: Foam fractionation, PFAS enrichment, and potential large-scale treatment applications, *Michigan Water Environmental Association (MWEA) 2023 PFAS Seminar*, East Lansing, MI, August 24, 2023.

*Coffin, E.A., D.M. Reeves, D.P. Cassidy, PFAS leaching and transformations in municipal solid waste landfills: from consumer products to leachate, *GSA North-Central Section Meeting*, Grand Rapids, May 5, 2023.

*Honer, J.A., D.M. Reeves, M.E.M. Akara, R. Parashar, Fluid flow and solute transport properties of well-connected fracture networks in columnar basalt, *GSA North-Central Section Meeting*, Grand Rapids, May 4, 2023.

*Link, G.W., D.M. Reeves, D.P. Cassidy, Characterizing Per- and Polyfluroinated Alkyl Substances (PFAS) in Final Treated Solids (Biosolids) from Michigan Wastewater Treatment Plants, *GSA North-Central Section Meeting*, Grand Rapids, May 5, 2023.

*Trobisch, K., D.M. Reeves, D.P. Cassidy, Assessing the fate and transport of PFAS in wastewater treatment plant effluent discharged to rapid infiltration basins, *GSA North-Central Section Meeting*, Grand Rapids, May 5, 2023.

*Vitale, D.S., D.M. Reeves, *E.S. Coffin, and *G.W. Link, High resolution PFAS mass balance in a wastewater treatment plant post aqueous film forming foam spill, *GSA North-Central Section Meeting*, Grand Rapids, May 5, 2023.

Koch, J.C., A. Bergstrom, M. Bogard, M. Carey, B.A. Ebel, J.A. O'Donnell, D.M. Reeves, Y. Sjobergy, P. Sullivan, and R.A. Toohey, Probing permafrost hydrology and thaw across a ground ice content gradient in Alaska, Oral presentation at *AGU Fall Meeting*, Chicago, IL, December 12-16, 2022 (invited).

*Popoola, O., H. Petcovic, P. McNeal, J. Moore, D.M. Reeves, L. Arthurs, and N. LaDue, Towards the development of a hydrogeology concept inventory: Item development and analysis, *Poster at AGU Fall Meeting*, Chicago, IL, December 12-16, 2022.

Petcovic, H., P. McNeal, J. Moore, D.M. Reeves, *T. Popoola, and *M. Gordon, Scanning, framing and slicing: Key spatial thinking skills for hydrogeology, *Poster at AGU Fall Meeting*, Chicago, IL, December 12-16, 2022.

*Link, G.W., D.M. Reeves, and D.P. Cassidy, Composition, distribution, and occurrence of Per- and Polyfluorinated Alkyl Substances (PFAS) in biosolids from Michigan Wastewater Treatment Plants, AIPG Michigan Section 2022 Annual Meeting, Ann Arbor, MI, December 8-9, 2022.

*Vitale, D., D.M. Reeves, and *E. Coffin, Investigation of PFAS in a WWTP Post-AFFF Spill: A Mass Balance Approach, AIPG Michigan Section 2022 Annual Meeting, Ann Arbor, MI, December 8-9, 2022.

*Gordon. M., P. McNeal, J. Moore, H. Petcovic, D.M. Reeves, and *O. Popoola, How spatial thinking skills affect performance on typical hydrogeology tasks in undergraduate classrooms, *GSA Annual Meeting*, Denver, CO, October 9-12, 2022.

McNeal, P., H.L. Petcovic, J. Moore, D.M. Reeves, and *O. Popoola, Identifying significant spatial thinking skills for learning and practicing hydrogeology, *GSA Annual Meeting*, Denver, CO, October 9-12, 2022.

*Popoola, O., H. Petcovic, P. McNeal, J. Moore, and D.M. Reeves, Development of a hydrogeology concept inventory, *Earth Educators Rendezvous*, Twin Cities, MN, July 15, 2022.

McNeal, P., H.L. Petcovic, J. Moore, D.M. Reeves, and *O. Popoola, What spatial thinking skills are important in hydrogeology?, *Earth Educators Rendezvous*, Twin Cities, MN, July 15, 2022.

Cassidy, D.P., D.M. Reeves, and M. Jury, In Situ stabilization and solidification (S/S) to reduce PFAS leaching from contaminated soils, *Battelle 2022 Chlorinated Conference*, Palm Springs, CA, May 24, 2022.

Cassidy, D.P., D.M. Reeves, and M. Jury, Ex Situ stabilization and solidification (S/S) of PFAS-contaminated waste, *Battelle 2022 Chlorinated Conference*, Palm Springs, CA, May 25, 2022.

*York, A.E., D.M. Reeves, J. Moore, R.V. Krishnamurthy, D.P. Cassidy, J. Enaohwo, J. Talanda, and J.J. Baker, Road Salt Trends in a Kalamazaoo Urban Watershed and Municipal Wellfield Capture Zone, *MI American Water Works Association (AWWA) Regional Meeting*, Kalamazoo, MI, April 6, 2022 (invited).

*Helmer, R.W., D.M. Reeves, *G.W. Link, and D.P. Cassidy, PFAS composition, mass, and transformation in landfill leachate and wastewater treatment plant influent, effluent, and biosolids, *Michigan Water Environmental Association (MWEA) 2022 Biosolids Conference*, Holland, MI, March 23 (invited).

McNeal, P., H.L. Petcovic, J. Moore, and D.M. Reeves, Characterization and training of spatial skills in hydrogeology to improve the preparation of hydrogeologists responding to changing water resources, *GSA Northeastern Meeting*, Lancaster, PA, March 20-22, 2022.

*York, A.E., D.M. Reeves, J. Moore, R.V. Krishnamurthy, D.P. Cassidy, J. Enaohwo, J. Talanda, and J.J. Baker, Spatiotemporal trends in chloride and estimation of surface water capture by municipal pumping wells in an urban watershed impacted by road salt, *MI American Water Works Association (AWWA) Groundwater and Source Water Conference*, East Lansing, MI, February 22, 2022 (invited).

Reeves, D.M., *R.W. Helmer, and D.P. Cassidy, PFAS Composition, transformation, and mass flux from landfills and wastewater treatment plants, *MI EGLE 2021 Great Lakes PFAS Summit*, December 8, 2021, virtual.

Reeves, D.M., *R.W. Helmer, and D.P. Cassidy, PFAS cycling within Michigan: Connections between contaminated sites, landfills, and waste water treatment plants, *NGWA Fate of PFAS: From Groundwater to Tap Water*, June 22-23, 2021, virtual.

Reeves, D.M., T.R. Howe, H.L. Petcovic, D.P. Cassidy, M. Dogan, D.R. Hampton, R.V. Krisnamurthy, and M.I. Sultan, The role of hydrotechnical field courses in complementing hydrogeologic curricula: An example from Western Michgian University, *GSA Joint South Central – North Central Meeting*, April 18-20, 2021, virtual.

*Akara, M.E.M., D.M. Reeves, and R. Parashar, Spatial clustering in natural fracture networks and implications for solute transport, *International Discrete Fracture Network Engineering Conference*, DFNE 2021, June 23-25, 2021, virtual.

*Akara, M.E.M., D.M. Reeves, and R. Parashar, Prevalence of fracture spatial clustering and implications for solute transport, *AGU Virtual Fall Meeting*, December 16, 2020.

*Fan, X. and D.M. Reeves, Investigating spreading properties of the 4th rank Gaussian dispersivity tensor under anisotropic geometrical symmetries, *AGU Virtual Fall Meeting*, December 10, 2020.

Reeves, D.M., X. Li, and Y. Zhang, Fractional-derivative models for non-Fickian transport in a single fracture, parallel fractures, and discrete fracture networks, *AGU Virtual Fall Meeting*, December 9, 2020.

*York, A.E., D.M. Reeves, J. Baker, J. Talanda, and J. Enaohwo, Characterizing groundwater-surface water connections and geochemical fluxes within an urban watershed used for public water supply, *GSA Virtual Annual Meeting*, October 26-30, 2020.

Reeves, D.M., D.P. Cassidy, *R.W. Helmer, D.W. Hyndman, M. Jury, D. Harn, and S. Sliver, Observations and considerations on the fate, transport, and bioaccumulation of PFAS in the environment, *GSA Virtual Annual Meeting*, October 26-30, 2020.

*Helmer, R.W., D.M. Reeves, D. Cassidy, M. Jury, D. Harn, and S. Sliver, Observations and characteristics of PFAS contaminated sites in Michigan, *GSA Virtual Annual Meeting*, October 26-30, 2020.

*Akara, M.E.M., D.M. Reeves, and R. Parashar, Improving fracture network characterization and discrete fracture network flow simulations using unmanned aerial vehicles, *GSA Virtual Annual Meeting*, October 26-30, 2020.

Koch, J., B. Ebel, M. Bogard, K. Wickland, R. Toohey, D.M. Reeves, D. Butman, R. Striegl, and M.A. Walvoord, Preferential flow mechanisms and implications for carbon transport and cycling in permafrost systems, *AGU Fall Meeting*, San Francisco, CA, December 10, 2019.

*Wayt, M.E., D.M. Reeves, D. Greene, *T. Buszka, and *M. Akara, A comparative analysis of large-displacement slug and physical slug tests for hydraulic characterization of aquifer properties, *GSA Annual Meeting*, Phoenix, AZ, September 23, 2019.

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