

Peer Reviewed
Journal Publications and Book Chapters
Related to FEHM

- 1) Arnold, B. A., S. P. Kuzio, and, B. A. Robinson. Radionuclide Transport Simulation and Uncertainty Analyses with the Saturated-Zone Site-Scale Model at Yucca Mountain, Nevada, *J. Contam. Hydrol.*, 62-63, 401-419. (2003).
- 2) Auer, L.A., N.D. Rosenberg, K.H. Birdsell, and E.M. Whitney. The Effects of Barometric Pumping on Contaminant Transport, *J. Contam. Hydrol.* 24:145-166. (1996).
- 3) Bach, W., S. E. Humphris, and A. T. Fisher, Fluid flow and fluid-rock interaction within oceanic crust: reconciling geochemical, geological and geophysical observations, in **Subseafloor Biosphere at Mid-ocean Ridges**, edited by C. Cary, et al., pp. 99-117, American Geophysical Union, Washington, D.C. (2004).
- 4) Bower, K.M., Gable, C.W., Zyvoloski G.A., Grid resolution study of ground water flow and transport, **Ground Water**, 43(1), 122-132. (2005).
- 5) Birdsell KH, Newman BD, Broxton DE, Robinson BA. Conceptual models of vadose zone flow and transport beneath the Pajarito Plateau, Los Alamos, NM, **Vadose Zone J** ;4:620–36. (2005).
- 6) Birdsell, K.H., A.V. Wolfsberg, D. Hollis, T.A. Cherry, and K.M. Bower. Groundwater Flow and Radionuclide Transport Calculations for a Performance Assessment of a Low- Level Waste Site. **J. Contam. Hydrol.** 46:99-129. (2000).
- 7) Bower KM, Gable C, Zyvoloski G. Grid resolution study of groundwater flow and transport. **Ground Water**;43(1):122–32. (2005).
- 8) Chaudhuri, A, Rajaram, H, Viswanathan, H., Fracture alteration by precipitation resulting from thermal gradients: upscaled mean aperture-effective transmissivity relationship, **Water Resources Research**, 48(1), DOI: 10.1029/2011WR010983 (2012).
- 9) Chaudhuri, A., H. Rajaram, and H. Viswanathan, Alteration of fractures by precipitation and dissolution in gradient reaction environments: Computational results and stochastic analysis, **Water Resour. Res.**, 44, W10410, doi:10.1029/2008WR006982. (2008)
- 10) Chaudhuri, A., H. Rajaram, H.S Viswanathan , G.A. Zyvoloski, and Stauffer, P.H., [Buoyant convection resulting from dissolution and](#)

- [permeability growth in vertical limestone fractures](#). **Geophysical Research Letters**, 36, L03401, doi:10.1029/2008GL036533, (2009)
- 11) Chen, M., Z. Lu, G.A. Zyvoloski. [Conditional simulations of water-oil flow in heterogeneous porous media](#), **Stochastic Environmental Research and Risk Assessment** 22(4):587-596. (2008)
 - 12) Chen, M., A. A., Keller, D. Zhang, Z. Lu, and G. A. Zyvoloski, [A stochastic analysis of transient two-phase flow in heterogeneous porous media](#), **Water Resources Research**, 42, W03425, doi:10.1029/2005WR004257, (2006).
 - 13) Dai, Z A Wolfsberg, P Reimus, H Deng, E Kwicklis, M Ding, D Ware, M Ye [Identification of sorption processes and parameters for radionuclide transport in fractured rock](#), **Journal of Hydrology** 414, 220-230.(2012)
 - 14) Dai, Z., E. Keating, C.W. Gable, D. Levitt, J. Heikoop, A. Simmons, Stepwise inversion of a groundwater flow model with multi-scale observation data, **Hydrogeology Journal**, DOI 10.1007/s10040-009-0543-y, 18: 607-624, (2010).
 - 15) Dai, Z., A. Wolfsberg, Z. Lu, and P. Reimus, Upscaling matrix diffusion coefficients for heterogeneous fractured rocks, **Geophysical Research Letters**, 34, L07408, doi:10.1029/2007GL029332, (2007).
 - 16) Dempsey, D.,S.F. Simmons, R. Archer, J. Rowland, Delineation of catchment zones of geothermal systems in large scale rifted settings, **J. Geophysical Research**, doi:10.1029/2012JB009515 (2012).
 - 17) Dempsey, D., R. Archer, S. Ellis, J. Rowland, Hydrological effects of dip-slip fault rupture on a hydrothermal plume, **J. Geophysical Research**, doi:10.1029/2012JB009395 (2012).
 - 18) Dempsey, D., J. Rowland, G.A. Zyvoloski, R. Archer. Modeling the effects of silica deposition and fault rupture on natural geothermal systems, **J. Geophysical Research**, DOI: 10.1029/2012JB009218 (2012).
 - 19) Deng, H., P.H. Stauffer, Z. Dai, Zunsheng Jaio, R.S. Surdam, Simulation of Industrial-Scale CO₂ Storage: Multi-Scale Heterogeneity and its Impacts on Storage Capacity, Injectivity and Leakage, **Int. J. Greenhouse Gas Control**, Volume 10, September 2012, Pages 397–418 .
<http://dx.doi.org/10.1016/j.ijggc.2012.07.003>.
 - 20) Deng, H., [Z. Dai](#) • [A. V. Wolfsberg](#) • [M. Ye](#) • [P.H. Stauffer](#) • [Z. Lu](#), [E. Kwicklis](#) Upscaling Retardation Factor in Hierarchical Porous Media with Multimodal Reactive Mineral Facies. **Chemosphere**.
10.1016/j.chemosphere.2012.10.105. (2012).

- 21) Eddebbarh, A. A., G. A. Zyvoloski, B. A. Robinson, E. M. Kwicklis, P. W. Reimus, B. W. Arnold, T. Corbet, S. P. Kuzio, and C. Faunt. The Saturated Zone at Yucca Mountain: An Overview of the Characterization and Assessment of the Saturated Zone as a Barrier to Potential Radionuclide Migration, *J. Contam. Hydrol.*, 62-63, 477-493. (2003).
- 22) Fessenden, J.E., Stauffer, P.H., and H.S Viswanathan, [Natural Analogs of Geologic CO₂ Sequestration: Some General Implications for Engineered Sequestration.](#) In **Geophysical Monograph Series** 138 (2009).
- 23) Fisher, A. T., E. E. Davis, and K. Becker, Borehole-to- borehole hydrologic response across 2.4 km in the upper oceanic crust: implications for crustal-scale properties, *J. Geophys. Res.*, 113, doi:10.1029/2007JB005447. (2008)
- 24) Fisher, A. T., and R. Von Herzen, Models of hydrothermal circulation within 106 Ma seafloor: constraints on the vigor of fluid circulation and crustal properties below the Madeira Abyssal Plain, **Geochemistry Geophysics Geosystems** (G3), 6(11), 10.1029/2005GC001013. (2005)
- 25) Fisher, A. T., Marine hydrogeology: Future prospects for major advances, **Hydro. J.**, 13, 69-97, DOI: 10.1007/s10040-10004-10400-y. (2005)
- 26) Fisher, A. T., Rates and patterns of fluid circulation, in *Hydrogeology of the Oceanic Lithosphere*, edited by E. E. Davis and H. Elderfield, pp. 339-377, Cambridge University Press, Cambridge, UK. (2004)
- 27) Fisher, A. T., C. A. Stein, R. N. Harris, K. Wang, E. A. Silver, M. Pfender, M. Hutnak, A. Cherkaoui, R. Bodzin, and H. Villinger, Abrupt thermal transition reveals hydrothermal boundary and role of seamounts within the Cocos Plate, **Geophys. Res. Lett.**, 30(11), 1550, doi:1510.1029/2002GL016766. (2003)
- 28) Fisher, A. T., Permeability within basaltic oceanic crust, **Rev. Geophys.**, 36(2), 143-182. (1998).
- 29) Harp, D.R. and V.V. Vesselinov (2011), Analysis of hydrogeological structure uncertainty by estimation of hydrogeological acceptance probability of geostatistical models, **Advances in Water Resources**, doi:10.1016/j.advwatres.2011.06.007.
- 30) Harp, D.R. and V.V. Vesselinov (2010), Stochastic inverse method for estimation of geostatistical representation of hydrogeologic stratigraphy using borehole logs and pressure observations, **Stochastic Environmental Research and Risk Assessment**, 24(7), doi:10.1007/s00477-010-0403-2, 1023-1042.
- 31) Harp D. R., Z. Dai, A. V. Wolfsberg, J. A. Vrugt, B. A. Robinson, V. V. Vesselinov, Aquifer structure identification using stochastic inversion,

- Geophysical Research Letters**, 35, L08404, doi:10.1029/2008GL033585, (2008).
- 32) Harris, R. N., A. T. Fisher, and D. Chapman, Fluid flow through seamounts and implications for global mass fluxes, **Geology**, 32 (8), 725-728, doi:10.1130/G20387.20381. (2004)
- 33) Holger, C., Ebigbo, A., Rainer, H., Dahle, H., Nordbotten, J. M., Celia, M. A., Audigane, P., Darcis, M., Ennis-King, J., Fan, Y., Flemisch, B., Gasda, S., Jin, M., Krug, S., Labregere, D., Naderi, A., Pawar, R. J., Sbai, A., Thomas, S. G., and Trenty, L., A benchmark-study on problems related to CO₂ storage in geologic formations, **Computational Geoscience**, DOI 10.1007/s10596-009-9146-x, 2009.
- 34) Hutnak, M; Fisher, AT; Zuhlsdorff, L; Spiess, V; Stauffer, PH; Gable, CW, [Hydrothermal recharge and discharge guided by basement outcrops on 0.7-3.6 Ma seafloor east of the Juan de Fuca Ridge: Observations and numerical models](#), **Geochemistry Geophysics Geosystems** (G3), 7, doi:10.1029/2006GC001242. (2006).
- 35) Kaszuba, J.P., Viswanathan, H.S., Carey, J.W., On the reactivity of dawsonite: Importance of aluminum solubility and speciation to geologic carbon sequestration, **Geophysical Research Letters**, Vol 38, 2011
- 36) Keating, E.H., Newell DL, Viswanathan H, Carey JW, Zyvoloski G, and Pawar R. 2012. CO₂/Brine Transport into Shallow Aquifers along Fault Zones. *Environ Sci Technol*. 2012 Jul 30. <http://dx.doi.org/10.1021/es301495x>
- 37) Keating, E.H., Hakala, J.A., Viswanathan, H., Carey, J.W., Pawar R, Guthrie, G.D. 2012. CO₂ leakage impacts on shallow groundwater: Field-scale reactive-transport simulations informed by observations at a natural analog site. *Applied Geochemistry*. 23 Aug <http://dx.doi.org/10.1016/j.apgeochem.2012.08.007>
- 38) Keating, E. H., et al. The impact of CO₂ on shallow groundwater chemistry: observations at a natural analog site and implications for carbon sequestration. **Environmental Earth Science**. DOI 10.1007/s12665-009-0192-4 (2010)
- 39) Keating, E. H., J. Doherty, J. A. Vrugt, and Q. Kang, 2010, Optimization and uncertainty assessment of strongly nonlinear groundwater models with high parameter dimensionality, **Water Resour. Res.**, 46, W10517, doi:10.1029/2009WR008584
- 40) Keating, E.H., G.A. Zyvoloski, 2009. A stable and efficient numerical algorithm for unconfined aquifer analysis. **Ground Water** 47(4):569-579.

- 41) Keating, E. H., B. A. Robinson, and V. V. Vesselinov. Development and application of numerical models to estimate fluxes through the regional aquifer beneath the Pajarito Plateau, *Vadose Zone J.*, 4, 3, 653-671. (2005).
- 42) Keating, E.H., Vesselinov, V.V., Kwicklis, E., Lu, Z., Coupling large- and local-scale inverse models of the Española basin, *Ground Water*, 41(2), pp. 200-211, 2003.
- 43) Keating, G, R.S. Middleton, P.H. Stauffer, H.S. Viswanathan, B.C. Letellier, P Pasqualini, R. Pawar, A.W. Wolfsberg, Meso-scale carbon sequestration site screening and CCS infrastructure analysis, *Environ. Sci. Technol.*, (JAN 1 2011) Vol.45, iss.1, p.215-222 (2011).
- 44) **Kelkar S.**, P. Tucci, G. Srinivasan, R. Roback, B. Robinson, C. Duke, and K. Rehfeldt, 2013. Breakthrough of Radioactive Plumes in Saturated Volcanic Rock: Implications from the Yucca Mountain Site, *Geofluids*.
- 45) **Kelkar S**, Zyvoloski G, Rapaka S, Lewis K, Karra S, Mishra PK, Viswanathan H, Chu S, Coblenz D, Pawar R, 2013, Modeling coupled thermo-hydro-mechanical processes in subsurface geological media using the simulator FEHM. Submitted to *International Journal of Rock Mechanics and Mining Sciences*.
- 46) Kelkar S, Mei Ding, Shaoping Chu, Bruce Robinson, Bill Arnold, and Arend Meijer, 2010. Modeling Solute Transport through Saturated Zone Ground Water at 10km Scale: Example from the Yucca Mountain License Application, *Journal of Contaminant Hydrology*.
[doi:10.1016/j.jconhyd.2010.05.003](https://doi.org/10.1016/j.jconhyd.2010.05.003)
- 47) Kwicklis, E.M., A.V. Wolfsberg, P.H. Stauffer, M.A. Walvroord, and M.J. Sully, [Multiphase Multicomponent Parameter Estimation for Liquid and Vapor Fluxes in Deep Arid Systems Using Hydrologic Data and Natural Environmental Traces](#), *Vadose Zone Journal*, 2006 5:934-950. (2006).
- 48) Kuriyagawa, M.; G. Zyvoloski, S. Kelkar, I. Matsunaga and T. Yamaguchi: Dimension of Radial Fracture Created by Hydraulic Fracturing, *J. of the Mining and Materials Processing Institute of Japan*, **104**(1988), 431-436
- 49) Kuriyagawa, M.; G. Zyvoloski, S. Kelkar, I. Matsunaga and T. Yamaguchi: Extension of Two Fractures with Different Characteristics by Hydraulic Fracturing, *J. of the Mining and Materials Processing Institute of Japan*, **105**(1989), 221-226
- 50) Li, W., Z. Lu, and D. Zhang, [Stochastic analysis of unsaturated flow with probabilistic collocation method](#), *Water Resour. Res.*, 45, W08425, [doi:10.1029/2008WR007530](https://doi.org/10.1029/2008WR007530), 2009.

- 51) Lichtner, P.C.; Kelkar, S.; and Robinson, B. "New Form of Dispersion Tensor for Axisymmetric Porous Media with Implementation in Particle Tracking. **Water Resources Research**, 38, (8), (2002)
- 52) Lu, Z., and Stauffer, P.H., On estimating functional average breakthrough curve using Time-Warping technique and perturbation approach. **Water Resources Research**, doi:10.1029/2011WR011506 (2012).
- 53) Lu, Z., and Edward M. Kwicklis, [Numerical evaluation of effective unsaturated hydraulic properties of fractured rocks using a stochastic continuum approach](#), **Vadose Zone Journal**, doi:10.2136/vzj2011.0164, 2012.
- 54) Lu, Z., A. Wolfsberg, Z. Dai, and C. Zheng [Characteristics and controlling factors of dispersion in bounded, randomly heterogeneous porous media](#), **Water Resources Research**, 46, W12508, doi:10.1029/2009WR008392, 2010.
- 55) Lu, Z. and D. Zhang, [Analytical solutions of statistical moments for transient flow in two-dimensional bounded, randomly heterogeneous media](#), **Water Resources Research**, 41, W01016, doi:10.1029/2004WR3389, (2005).
- 56) Lu, Z. , and D. Zhang, [A comparative study on quantifying uncertainty of flow in heterogeneous media using Monte Carlo simulations, the conventional and the KL-based moment-equation approaches](#), **SIAM J. on Scientific Computing**, 26(2), 558-577, (2004).
- 57) Lu, Z. and D. Zhang, [Conditional simulations of flow in randomly heterogeneous porous media using a KL-based moment-equation approach](#), **Advances in Water Resources**, 27(9), 859-874, (2004).
- 58) Lu, Z. , and D. Zhang, [Stochastic studies of well capture zones in bounded heterogeneous media](#), **Water Resour. Res.**, 39(4), 1100, doi:10.1029/2002WR001633, (2003).
- 59) Lu, Z. , and D. Zhang, [Stochastic analysis of transient flow in heterogeneous variably saturated porous media: the van Genuchten-Mualem constitutive model](#), **Vadose Zone Journal**, 1, 137-149. (2002).
- 60) Lu, Z. , and D. Zhang, [On stochastic modeling of flow in multimodal heterogeneous formations](#) , **Water Resour. Res.**, 38(10), 1190, doi:10.1029/2001WR001026. (2002).
- 61) Middleton R.S., G. Keating, P.H. Stauffer, A. Jordan, H. Viswanathan, Q. Kang, B. Carey, M. Mulkey, J. Sullivan, S.P. Chu, and R. Esposito, The multiscale science of CO2 capture and storage: From the pore scale to the regional scale. **Energy and Environmental Science**, 5, 7328 | doi:10.1039/C2EE03227A (2012).

- 62) Miller, T.A., V. V. Vessilinov, P.H. Stauffer, K. H. Birdsell, and C. W. Gable, [INTEGRATION OF GEOLOGIC FRAMEWORKS IN MESHING AND SETUP OF COMPUTATIONAL HYDROGEOLOGIC MODELS, PAJARITO PLATEAU, NEW MEXICO](#), *New Mexico Geological Society Guide Book, 58th Field Conference*, Geology of the Jemez Mountains Region III (2007).
- 63) Neeper, DA; and Stauffer, P, Transport by oscillatory flow in soils with kinetic mass transfer I. Theory", *Vadose Zone Journal*, doi:10.2136/vzj2011.0093. (2012)
- 64) Neeper, DA; and Stauffer, P, Transport by oscillatory flow in soils with kinetic mass transfer II. Field Experiment", *Vadose Zone Journal*, doi:10.2136/vzj2011.0094 (2012).
- 65) Neeper, DA; and Stauffer, P, [Unidirectional gas flow in soil porosity resulting from barometric pressure cycles](#), *Journal of Contaminant Hydrology*; v.78, no.4, p.281-289. (2005).
- 66) Robinson B. A., Z. Lu, and D. Pasqualini, [Simulating solute transport in porous media using model reduction techniques](#), *Applied Mathematics*, 3, 1161-1169, doi:10.4236/am.2012.310170 (2012)
- 67) Robinson, B.A. and S. Chu, 2013, A Residence-Time-Based Transport Approach for the Groundwater Pathway in Performance Assessment Models. *Computers and Geosciences*, 52 (2013), pp. 155-163, DOI: 10.1016/j.cageo.2012.09.001 (2013)
- 68) Robinson, B.A., S. Chu and Z. Lu, 2012, Simulation of Radionuclide Transport through Unsaturated, Fractured Rock: Application to Yucca Mountain, Nevada. *Vadose Zone Journal*, v.11, doi:10.2136/vzj2011.0142. (2012)
- 69) Robinson, B.A., J.E. Houseworth and S. Chu, 2012, Radionuclide Transport in the Unsaturated Zone at Yucca Mountain, Nevada. *Vadose Zone Journal*, v.11, doi:10.2136/vzj2011.0133.(2012)
- 70) Robinson, BA ; Wolfsberg, AV ; Viswanathan, HS ; Reimus, PW . A colloid-facilitated transport model with variable colloid transport properties. *Geophysical Research Letters*, Vol.34, iss.9 (2007).
- 71) Robinson, BA; Cole, G; Carey, JW; Witkowski, M; Gable, CW; Lu, ZM; Gray, R, A vadose zone flow and transport model for Los Alamos Canyon, Los Alamos, New Mexico. *Vadose Zone Journal*; v.4, no.3, p.729-743. (2005).

- 72) Robinson, BA ; Cole, G ; Carey, JW ; Witkowski, M ; Gable, CW ; et al. A vadose zone flow and transport model for Los Alamos Canyon, Los Alamos, New Mexico. *Vadose Zone Journal* Vol.4, iss.3, p.729-743. (2005).
- 73) Robinson, BA ; Broxton, DE ; Vaniman, DT. Observations and modeling of deep perched water beneath the Pajarito Plateau. *Vadose Zone Journal* Vol.4, iss.3, p.637-652. (2005).
- 74) Robinson, BA ; McLin, SG ; Viswanathan, HS. Hydrologic behavior of unsaturated, fractured tuff: Interpretation and modeling of a wellbore injection test. *Vadose Zone Journal* Vol.4, iss.3, p.694-707. (2005).
- 75) Robinson, B.A., and H.S. Viswanathan. Application of the theory of micromixing to groundwater reactive transport models. *Water Resour. Res.* 39(11):1313, doi:10.1029/2003WR002368. (2003).
- 76) Robinson, B. A., C. Li, and C. K. Ho. Performance Assessment Model Development and Analysis of Radionuclide Transport in the Unsaturated Zone, Yucca Mountain, Nevada, *J. Contam. Hydrol.*, 62-63, 249-268. (2003).
- 77) Robinson, BA ; Viswanathan, HS ; Valocchi, AJ. Efficient numerical techniques for modeling multicomponent ground-water transport based upon simultaneous solution of strongly coupled subsets of chemical components. *Advances in Water Resources*, Vol.23, iss.4, p.307-324. (2000).
- 78) Robinson, B.A., and G.Y. Bussod, 2000. "Radionuclide Transport in the Unsaturated Zone at Yucca Mountain: Numerical Model and Preliminary Field Observations," in Dynamics of Fluids in Fractured Rock, Geophysical Monograph 122, second edition, B. Faybishenko, P.A. Witherspoon, and S.M. Benson (Eds.), American Geophysical Union, Washington, D.C., pp. 323-336. (2000).
- 79) Robinson, B. A., H. S. Viswanathan, and A. J. Valocchi. Efficient Numerical Techniques for Modeling Multicomponent Ground-Water Transport Based Upon Simultaneous Solution of Strongly Coupled Subsets of Chemical Components, *Adv. In Water Resour.*, 23, 307-324.(2000).
- 80) Robinson, B. A. A Strategy for Validating a Conceptual Model for Radionuclide Migration in the Saturated Zone Beneath Yucca Mountain, *Rad. Waste Manag. and Environ. Restor.*,19, 73-96. (1994).
- 81) Rosenberg, N., A. T. Fisher, and J. Stein. Large-scale lateral heat and fluid transport in the seafloor: revisiting the well-mixed aquifer model, *Earth Planet. Sci. Lett.*, 182, 93-101. (2000).
- 82) Sakamoto, Y., T. Komai, T. Kawamura, H. Minagawa, and N. Tenma et al. Modification of permeability model and history matching of laboratory-scale

- experiment for dissociation process of methane hydrate: Part 2 - Numerical study for estimation of permeability in methane hydrate reservoir, **Int. J. Offshore Polar Eng.** (2007) .
- 83) Severino G., Tartakovsky, G. Srinivasan, D., H. Viswanathan, Transport in Heterogeneous Porous Media with Uncertain Geochemical Parameters, **Proc. R. Soc. Lond. A**, 468(2140), doi: 10.1098/rspa.2011.0375
- 84) Soll, W., and K. Birdsell. The Influence of Coatings and Fills on Flow in Fractured, Unsaturated Tuff Porous Media Systems. **Water Resources Research**, Vol. 34, No. 2, pp. 193-202. (1998).
- 85) Spinelli, G. A., and A. T. Fisher (2004), Hydrothermal circulation within rough basement on the Juan de Fuca Ridge flank, **Geochem., Geophys., Geosystems**, 5(2), Q02001, doi:02010.01029/02003GC000616. (2004).
- 86) Srinivasan, G., Tartakovsky, D.M., Dentz, M., Viswanathan, H.S., Berkowitz, B., Robinson, B., Random walk particle tracking simulations of non-Fickian transport in heterogeneous media, **J. Computational Physics**, 229(11), p 4304-4314, (2010).
- 87) Stauffer, P.H. and Z. Lu, [Quantifying transport uncertainty in unsaturated rock using Monte Carlo sampling of retention curves](#), **Vadose Zone J** , 11, doi:10.2136/vzj2011.0171.(2012).
- 88) Stauffer, P.H., J.A. Vrugt, H.J. Turin, C.W. Gable, and W.E. Soll, [Untangling diffusion from advection in unsaturated porous media: Experimental data, modeling, and parameter uncertainty assessment](#). **Vadose Zone J.**, 8:510-522, doi:10.2136/vzj2008.0055. (2009)
- 89) Stauffer, P.H., H.S Viswanathan, R.J. Pawar, and G.D. Guthrie, [A system model for geologic sequestration of carbon dioxide](#). **Environ. Sci. Technol.**, (2/1/09). DOI: 10.1021/es800403w (2009)
- 90) Stauffer, P.H., K.H. Birdsell, M.S. Witkowski, and J. K. Hopkins, [Vadose Zone Transport of 1,1,1-Trichloroethane: Conceptual Model Validation through Numerical Simulation](#), **Vadose Zone Journal** 2005 4: 760-773. (2005).
- 91) Stauffer, P.H. and W. J. Stone, [Surface Water\Groundwater Connection at the Los Alamos Canyon Weir Site: Part 2. Modeling of Tracer Test Results](#), **Vadose Zone Journal** 2005 4: 718-728. (2005).
- 92) Stauffer P.H., and Rosenberg, N.D., [Vapor phase transport at a hillside landfill](#), **Environmental and Engineering Geoscience**, Vol. VI, No. 1, p. 71-84. (2000).

- 93) Stauffer P.H., Auer, L.H., and Rosenberg, N.D., [Compressible gas in porous media: A finite amplitude analysis of natural convection](#), *Int. J. of Heat and Mass Transfer*, 40 (7), 1585-1589. (1997).
- 94) Stein, J. S., and A. T. Fisher (2001), Multiple scales of hydrothermal circulation in Middle Valley, northern Juan de Fuca Ridge: physical constraints and geologic models, *J. Geophys. Res.*, 106 (B5), 8563-8580.
- 95) Stein, J. S., and A. T. Fisher (2003), Observations and models of lateral hydrothermal circulation on a young ridge flank: numerical evaluation of thermal and chemical constraints, *Geochem., Geophys., Geosystems*, 10.1029/2002GC000415.
- 96) Tenma, N., T. Yamaguchi, and G. Zyvoloski, The Hijiori Hot Dry Rock test site, Japan Evaluation and optimization of heat extraction from a two-layered reservoir, *Geothermics*, 37 p.19-52. (2008)
- 97) Tenma N., T. Yamaguchi, T. Okabe and G. Zyvoloski: Estimation of the Characteristics of the Multi-reservoir System at the Hijiori HDR Test Site during the Long-Term Circulation Test, Term 2 and Term 3 Using FEHM Code, *J. of the Mining and Materials Processing Institute of Japan*, **120**(2004), 355-364
- 98) Tenma N., T. Yamaguchi, T. Kikuchi, K. Tezuka and G. Zyvoloski: Estimation of the Characteristics of the Multi-reservoir System at the Hijiori HDR Test Site during the Long-Term Circulation Test, Term 1 Using FEHM Code, *J. of the Mining and Materials Processing Institute of Japan*, **119**(2003) 625-634
- 99) Tenma N., T. Yamaguchi, Y. Oikawa, K. Tezuka, and G. Zyvoloski, Estimation of the Fluid Flow in the Multi-Reservoir System at the Hijiori HDR Test Site during the Long-Term Circulation Test, *J. of the Geothermal Research Society of Japan*, **23**(2001), 303-315
- 100) Tenma N., Y. Sato, I. Matsunaga, M. Kuriyagawa, T. Yamaguchi, G. Zyvoloski and M. Miyairi : Model Study of the Reservoir Character at Hijiori HDR Test Site, *Geothermal Resources Council Transaction*, **18**(1994), 475-478
- 101) Tseng, PH ; Soll, WE ; Gable, CW ; Turin, HJ ; Bussod, GY ; et al. Modeling unsaturated flow and transport processes at the Busted Butte Field Test Site, Nevada. *J. Contaminant Hydrology*, Vol.62-3, spec. iss.SI, p.303-318. (2003.)
- 102) Tseng, PH ; Bussod, GY. Evaluation of the filter paper technique for in situ sampling of solute transport in unsaturated soils and tuffs. *Water Resources Research*, 37(7), p.1913-1928. (2001).

- 103) Tseng, PH ; Zyvoloski, GA. A reduced degree of freedom method for simulating non-isothermal multi-phase flow in a porous medium. **Advances in Water Resources**, 23(7), p.731-745. (2000).
- 104) Valentine, G. A., D. Zhang, and B. A. Robinson. Modeling Complex, Nonlinear Geological Processes, *Annual Reviews Earth and Planet. Sci.*, 30, 35-64. (2002).
- 105) Vesselinov, V.V., Neuman, S.P., Numerical inverse interpretation of single-hole pneumatic tests in unsaturated fractured tuff, **Ground Water**, 36(5), pp 685-695, 2001.
- 106) Vesselinov, V.V., Neuman, S.P., Illman, W.A., Three-dimensional numerical inversion of pneumatic cross-hole tests in unsaturated fractured tuff: 1. Methodology and borehole effects, **Water Resources Research**, 37(12), pp 3001-3018, 2001.
- 107) Vesselinov, V.V., Neuman, S.P., Illman, W.A., Three-dimensional numerical inversion of pneumatic cross-hole tests in unsaturated fractured tuff: 2. Equivalent parameters, high-resolution stochastic imaging and scale effects, **Water Resources Research**, 37(12), pp 3019-3042, 2001.
- 108) Viswanathan, Z Dai, C Lopano, E Keating, JA Hakala, KG Scheckel, L Zheng. [Developing a robust geochemical and reactive transport model to evaluate possible sources of arsenic at the CO2 sequestration natural analog site in Chimayo, New Mexico](#), **Int. J. Greenhouse Gas Control** 10, 199-214 (2012)
- 109) Viswanathan, H.S., R.J. Pawar, P. H. Stauffer, J.P. Kaszuba, J.W. Carey, S.C. Olsen, G.N. Keating, D. Kavetski, and G.D. Guthrie, [Development of a hybrid process and system model for the assessment of wellbore leakage at a geologic CO2 sequestration site](#), *Environ. Sci. Technol.*, 42, 7280-7286 (2008).
- 110) Viswanathan, HS ; Valocchi, AJ. Comparison of streamtube and three-dimensional models of reactive transport in heterogeneous media. **J. Hydraulic Research**, 42, spec. iss.SI, p.141-145. (2004).
- 111) Viswanathan, HS; Robinson, BA; Gable, CW; Carey, JW, A geostatistical modeling study of the effect of heterogeneity on radionuclide transport in the unsaturated zone, Yucca Mountain, **J. Contaminant Hydrology**; v.62-63, p.319-336. (2003).
- 112) Viswanathan, HS ; Robinson, BA ; Valocchi, AJ ; Triay, IR. A reactive transport model of neptunium migration from the potential repository at Yucca Mountain. **J. of Hydrology**,209(1-4), p.251-280. (1998).

- 113) Vrugt, J.A., P. H. Stauffer, Th. Wöhling, B. A. Robinson, and V. V. Vesselinov, [Inverse Modeling of Subsurface Flow and Transport Properties Using Recent Advances in Global Optimization, Parallel Computing, and Sequential Data Assimilation](#), *Vadose Zone J.*, 7(2), 843-864 (2008) .
- 114) Vrugt, J. A. B. A. Robinson, and V. V. Vesselinov. Improved inverse modeling for flow and transport in subsurface media: Combined parameter and state estimation, *Geophys. Res. Lett.*, 32, 18, L18408. (2005).
- 115) Walvoord, M.A., Plummer, M.A., Phillips, F.M., Wolfsberg, A.V. (2002) Deep arid system hydrodynamics 1. Equilibrium states and response times in thick desert vadose zones, *Water Resour. Res.*, 38, doi:10.1029/2001WR000824. [\[Link\]](#)
- 116) Walvoord, M.A., F.M. Phillips, S.W. Tyler, and P.C. Hartsough, 2002, Deep arid system hydrodynamics 2: Application to paleohydrologic reconstruction using vadose-zone profiles from the northern Mojave Desert, *Water Resources Research*, 38, 1291, doi: 10.1029/ 2001WR000825. [\[Link\]](#)
- 117) T. Yamaguchi, Y. Sato, M. Kuriyagawa, I. Matsunaga, Y. Oikawa, Y. Mitsunaga and G. Zyvoloski: Heat Extraction Tests and Reservoir Modeling for Hot Dry Rock Development, *J. of the Mining and Materials Processing Institute of Japan*, 106(1990), 843-849
- 118) T. Yamaguchi, M. Kuriyagawa, Y. Sato, Y. Oikawa, H. Kobayashi, I. Matsunaga and G. Zyvoloski : Heat Extraction Test from Hot Dry Rock and Reservoir Modeling, *J. of the Geothermal Research Society of Japan*, 13(1991), 73-93
- 119) Yamashita, M.; T. Yamaguchi, M. Kuriyagawa and G. Zyvoloski: Estimation of Fracture Aperture and Shape Created by Massive Hydraulic Fracturing Test, *J. of the Mining and Materials Processing Institute of Japan*, 113(1997), 247-253
- 120) Zhang, D. and Lu, Z. , [An efficient, higher-order perturbation approach for flow in randomly heterogeneous porous media via Karhunen-Loeve decomposition](#) , *Journal of Computational Physics*, 194(2), 773-794, 2004.
- 121) Zhang, D. and Lu, Z. , [Stochastic delineation of well capture zones](#), *Stochastic Envir. Res. and Risk Assessment*, 18(1), 39-46, 2004.
- 122) Zhang Y., Person M., Gable C.W., Representative Hydraulic Conductivity Of Hydrogeologic Units: Insights From An Experimental Stratigraphy. *J. Hydrology*, 339, P65-78, doi:10.1016/j.jhydrol.2007.03.007. (2007).
- 123) Zhang Y., Person M., Gable C.W., Equivalent hydraulic conductivity of an experimental stratigraphy: Implications for basin-scale flow simulations. *Water Resour. Res.*, 42, W05404, doi:10.1029/2005WR004720. (2006).

- 124) Zhang Y, Person M., Paola C., Gable C.W., Wen X-H., Davis J.M., Geostatistical Analysis of an Experimental Stratigraphy. **Water Resour. Res.**,41,W11416, doi:10.1029/2004WR003756. (2004).
- 125) Zyvoloski, G.A.; Bruce A. Robinson a, Hari S. Viswanathan, Generalized dual porosity: A numerical method for representing spatially variable sub-grid scale processes. **Advances in Water Resources** 31, 535-544 (2008).
- 126) Zyvoloski, G.A., Vesselinov, V.V., An investigation of numerical grid effects in automated calibration, **Ground Water**, (Special issue: Modflow and More 2003: Understanding through Modeling), v.44, no.6, p.814-825, 2006.
- 127) Zyvoloski, G., E. Kwicklis, A. A. Eddebarh, B. Arnold, C. Faunt, and B. A. Robinson. The Site-Scale Saturated Zone Flow Model for Yucca Mountain: Calibration of Different Conceptual Models and Their Impact on Flow Paths, **J. Contam. Hydrol.**, 62-63, 731-750. (2003).

Peer Reviewed Conference Proceedings and Reports **Related to FEHM**

- 128) Dempsey, D., Kelkar S., K. Lewis, S. Hickman, N. Davatzes, D. Moos, E. Zemach, Modeling shear stimulation of the Desert Peak EGS well 27-15 using a coupled thermal-hydrological-mechanical simulator, Rock Mechanics / Geomechanics Symposium held in San Francisco, CA, USA, 23-26 June 2013. ARMA 13-608. (2013)
- 129) Fabryka-Martin, J.T. ; Wolfsberg, A.V. ; Levy, S.S. ; Roach, J.L. ; Winters, S.T. ; et al. Distribution of fast hydrologic paths in the unsaturated zone at Yucca Mountain. High-Level Radioactive Waste Management. Proceedings of the Eighth International Conference p.93-6. (1998).
- 130) Fisher, A. T., Geophysical constraints on hydrothermal circulation: observations and models, in Energy and mass transfer in submarine hydrothermal systems, edited by P. Halbach, et al., pp. 29-52, Dahlem University Press, Berlin, Germany. (2003)
- 131) Hutnak, M., A. T. Fisher, C. A. Stein, R. Harris, K. Wang, E. Silver, G. Spinelli, M. Pfender, H. Villinger, R. MacKnight, P. Costa Pisani, H. DeShon, and C. Diamente, The thermal state of 18-24 Ma upper lithosphere subducting below the Nicoya Peninsula, northern Costa Rica margin, in **MARGINS Theoretical Institute: SIEZE Volume**, edited by T. Dixon, et al., pp. 86-122, Columbia University Press, New York. (2007)

- 132) Jiao Z. (John), Ronald C. Surdam, Lifa Zhou, Philip H. Stauffer, Tingting Luo, [A feasibility study of geological CO₂ sequestration in the Ordos Basin, China](#), *Energy Procedia*, 4, 2011, 5982-5989.(2011).
- 133) Keating, E., Vesselinov, V.V., Kwicklis, E., Lu, Z., Coupling a large-scale basin model with a high resolution local model using a finite-element flow and transport solver (FEHM) and an automated parameter estimator (PEST). ModFlow 2001 and Other Modeling Odysseys (ed. Seo, S., Poeter, E.P., Zheng, C.), International Ground Water Modeling Center, Colorado School of Mines, Golden, CO, v. I, pp. 168-173, 2001.
- 134) Keating, E.H., Vesselinov, V.V., Sources of uncertainty in well capture zone predictions, Modflow and More 2003: Understanding through Modeling, (ed. Poeter, E., Zheng, C., Hill, M., Doherty, J., and Seo, S.) International Ground Water Modeling Center, Colorado School of Mines, Golden, CO, v. I, pp. 538-543, 2003.
- 135) Keating, G.N, R.S. Middleton, H.S. Viswanathan, P.H. Stauffer, R.J. Pawar, [How storage uncertainty will drive CCS infrastructure](#), *Energy Procedia*, 4, 2393-2400.(2011).
- 136) Levine J.S., S. Kelkar, P.H. Stauffer, Hydraulically induced shear failure during CO₂ injection into deep ocean sediments, Rock Mechanics / Geomechanics Symposium held in San Francisco, CA, USA, 23-26 June 2013. ARMA 13-470. (2013).
- 137) Morales-Casique, E., Neuman, S.P., Vesselinov, V.V., Maximum likelihood Bayesian averaging of air flow models in unsaturated fractured tuff, pp.70-75, **IAHS Publication 320**, ISBN 978-1-901502-49-7, 2008.
- 138) Neuman, S.P., Illman, W.A., Vesselinov, V.V., Thompson, D.L, Chen, G., Guzman, A., Lessons learned from field studies at the Apache Leap Research Site in Arizona, in Conceptual Models of Flow and Transport in the Fractured Vadose Zone, **National Research Council**, National Academy Press, Washington, DC, pp. 295-334, 2001.
- 139) Pawar, R.J., G. Brohmal, R. Dilmore, B. Foxall, E.Jones, C. Oldenburg, P.H. Stauffer, S. Unwin, G.Guthrie, Quantification of Risk Profiles and Impacts of Uncertainties as part of the US DOE's National Risk Assessment Partnership (NRAP)., *Energy Procedia*, (2013).
- 140) Pawar, R.J., and G.A. Zyvoloski. 2006. A novel method to couple wellbore flow to reservoir flow p. 1 –8. In P.J. Binning et al. (ed.) **Proc. Int. Conf. on Computational Methods in Water Resour.**, 16th, Copenhagen, Denmark. 19–22 June 2006. Technical Univ. of Denmark, Lyngby. (2006).
- 141) Robinson, B.A. ; Wolfsberg, A.V. ; Gable, C.W. ; Viswanathan, H.S. Radionuclide transport in the unsaturated zone at Yucca Mountain . **High-**

Level Radioactive Waste Management. Proceedings of the Eighth International Conference p.156-8. (1998).

- 142) Stauffer, P.H., Pawar R.J , R.C. Surdam, Z. Jiao, Hailin Deng, B.C. Lettelier,, H.S. Viswanathan, D.L. Sanzo, and G.N. Keating, [Application of the CO₂-PENS risk analysis tool to the Rock Springs Uplift, Wyoming.](#) *Energy Procedia, Energy Procedia, Volume 4, 2011, Pages 4084-4091 (2011).*
- 143) Stauffer, P.H. K.H. Birdsell, and W.J. Rice, 3-D Model Validation in Support of Site Closure, Material Disposal Area L, Los Alamos, NM, **Waste Management 2011**, Phoenix Arizona, March 7-11. (2011)
- 144) Stauffer, P.H., R.C. Surdam, Z. Jiao, T.A. Miller, [Combining geologic data and numerical modeling to improve estimates of the CO₂ sequestration potential of the Rock Springs Uplift, Wyoming.](#) *Energy Procedia*, (2009) Vol.1, iss.1, p.2717-272.
- 145) Stauffer, P.H., J.K., Hopkins, and T. Anderson, “[A Soil Vapor Extraction Pilot Study in a Deep Arid Vadose Zone Part 2: Simulations in Support of Decision Making Processes](#)”, in **Proceedings of the Waste Management Conference**, paper 7185, Tucson AZ, Feb 26-March 1 2007, 19 pages. (2007).
- 146) Stauffer, P.H, H.S. Viswanathan, R.J. Pawar, M.L. Klasky, and G.D. Guthrie M. Klasky. [CO₂-PENS: A CO₂ Sequestration Systems Model Supporting Risk-Based Decisions.](#) in **Proceedings of the XVI International Conference on Comp. Methods in Water Resources**, edited by P. J. Binning P. K. Engesgaard, H.K. Dahle, G. F. Pinder and W.G. Gray. Copenhagen, Denmark. 8 pages (2006).
- 147) Surdam R.C. , Z. Jiao, **Stauffer, P.H.**, T.A. Miller, [The key to commercial-scale geological CO₂ sequestration: Displaced fluid management.](#) *Energy Procedia, Volume 4, 2011, Pages 4246-4251 (2011).*
- 148) Tenma N., T. Yamaguchi, K. Tezuka, K. Kawasaki and G. Zyvoloski : Productivity Changes in the Multi-reservoir System at the Hijiori HDR Test Site during the Long-term circulation test, Geothermal Resources Council Transactions, **26**(2002), 261-266
- 149) Tenma N., T. Yamaguchi, K. Tezuka, H. Karasawa and G. Zyvoloski : Estimation of the Productivity of the Deep Reservoir at the HIJIORI HDR Test Site using FEHM, Geothermal Resources Council Transactions, **24**(2001), 175-179
- 150) Vesselinov, V.V., Uncertainties In Transient Capture-Zone Estimates, Computational Methods in Water Resources XVI, (edited by P. Binning, P. Engesgaard, H. Dahle, G. Pinder & W. Gray), Balkema, Rotterdam, ISBN 90-5809-124-4, pp. 307-314, 2006.

- 151) Vesselinov, V.V., Robinson, B.A., Delineation of capture zones in transient groundwater flow systems, ModelCARE 2005 Calibration and reliability in groundwater modeling: From uncertainty to decision making (edited by M.Bierkens et al.), pp. 246-252, IAHS Publication 304, ISSN 0144-7815, 2006.
- 152) Vesselinov, V.V., Estimation of parameter uncertainty using inverse model sensitivities, Computational Methods in Water Resources XV (CMWR 2004) (ed. Miller, C., Farthing, M.W., Gray, W.G., Pinder, G.), Elsevier, ISBN 0-444-51839-8, pp. 508-514, 2004.
- 153) Vesselinov, V.V., Keating, E.H., Zyvoloski, G.A., Analysis of model sensitivity and predictive uncertainty of capture zones in the Española Basin regional aquifer, Northern New Mexico, ModelCARE 2002 Calibration and reliability in groundwater modelling: A few steps closer to reality (edited by K. Kovar & Z. Hrkal), IAHS Publication 277, ISBN 1-901-502-07-4, pp. 508-514, 2003.
- 154) Vesselinov, V.V., Neuman, S.P., Illman, W.A., Three-dimensional inverse modeling of air injection tests in unsaturated fractured rocks, ModelCARE 99 Calibration and reliability in groundwater modelling: Coping with uncertainty (edited by F. Stauffer, W. Kinzelbach, K. Kovar & E. Hoehn), IAHS Publication no. 265, IAHS Press, Wallingford, Oxfordshire, UK, pp. 263-249, 2000.
- 155) Vesselinov, V.V., Neuman, S.P., Illman, W.A., Zyvoloski, G.A., Three-dimensional inversion of pneumatic tests in fractured rocks, Computational Methods in Water Resources XIII (CMWR 2000) (edited by L. R. Bentley, J. F. Sykes, W. G. Gray, C. A. Brebbia & G. F. Pinder), Balkema, Rotterdam, ISBN 90-5809-124-4, pp. 307-314, 2000.
- 156) Wolfsberg, AV ; Fabryka-Martin, JT ; Levy, SS. Use of chlorine-36 and other geochemical data to test a groundwater flow model for Yucca Mountain, Nevada. RADIOACTIVE WASTE MANAGEMENT p.243-255. (1999).
- 157) Wolfsberg, AV ; Robinson, BA ; FabrykaMartin, JT. Migration of solutes in unsaturated fractured rock at Yucca Mountain: Measurements, mechanisms, and models. MATERIALS RESEARCH SOCIETY SYMPOSIUM PROCEEDINGS Vol.412, p.707-714. (1996).
- 158)