REVIEWS AND ANALYSES
Microbial Processes in the Vadose Zone
Patricia A. Holden and Noah Fierer 1–21

ORIGINAL RESEARCH
Infiltration in Unsaturated Layered Fluvial Deposits at Rio Bravo: Macroscopic Anisotropy and Heterogeneous Transport
R.J. Glass, J.R. Brainard, and T.-C. Jim Yeh 22–31

Measurement and Prediction of Deep Drainage from Bare Sediments at a Semiarid Site
G.W. Gee, J.M. Keller, and A.L. Ward 32–40

Spatial Variability and Transport of Nitrate in a Deep Alluvial Vadose Zone
Yuksel S. Onsoy, Thomas Harter, Timothy R. Ginn, and William R. Horwath 41–54

Evaluation of Evapotranspirative Covers for Waste Containment in Arid and Semiarid Regions in the Southwestern USA
Bridget R. Scanlon, Robert C. Reedy, Kelley E. Keese, and Stephen F. Dwyer 55–71

Chloride Mass Balance: Cautions in Predicting Increased Recharge Rates
G.W. Gee, Z.F. Zhang, S.W. Tyler, W.H. Albright, and M.J. Singleton 72–78

Spatial and Temporal Dynamics of Preferential Bromide Movement towards a Tile Drain
J. Maximilian Köhne and Horst H. Gerke 79–88

Development of a Wet Plume Following Liquid Release along a Fault
Rohit Salve, David Hudson, Hui-Hai Liu, and Joseph S.Y. Wang 89–100

Characterization of Field Tracer Transport Using High-Resolution Images
R. Kasteel, M. Burkhardt, S. Giesa, and H. Vereecken 101–111

Quantitative Analysis of Flow Processes in a Sand Using Synchrotron-Based X-ray Microtomography

Dynamic Water-Entry Pressure for Initially Dry Glass Beads and Sea Sand
Takeyuki Annaka and Susumu Hanayama 127–133

Continuum Percolation Theory for Saturation Dependence of Air Permeability
A.G. Hunt 134–138

The Effect of Entrapped Air on the Quasi-Saturated Soil Hydraulic Conductivity and Comparison with the Unsaturated Hydraulic Conductivity
A. Sakaguchi, T. Nishimura, and M. Kato 139–144

Hydraulic Conductivity Limited Equilibration: Effect on Water Retention Characteristics
A.G. Hunt and T.E. Skinner 145–150

Uncertainty of Hydraulic Conductivity under Field Conditions and at Fixed Pressure Heads and Water Contents
A.L.B. Hurtado and Q. de Jong van Lier 151–162

A Comparison of Models Describing Residual NAPL Formation in the Vadose Zone
M. Oostrom, M.D. White, R.J. Lenhard, P.J. Van Geel, and T.W. Wietsma 163–174

Suitability of Fiberglass Wicks to Sample Colloids from Vadose Zone Pore Water
Szabolcs Czigány, Markus Flury, James B. Harsh, Barbara C. Williams, and Jason M. Shira 175–183

Transport and Retention Mechanisms of Colloids in Partially Saturated Porous Media

Validity of the Generalized Richards Equation for the Analysis of Pumping Test Data for a Coarse-Material Aquifer
Aly I. El-Kadi 196–205

A Set of Analytical Benchmarks to Test Numerical Models of Flow and Transport in Soils
J. Vanderborght, R. Kasteel, M. Herbst, M. Javaux, D. Thiéry, M. Vanclooster, C. Mouvet, and H. Vereecken 206–221
ERRATA
The Role of the Unsaturated Zone in Artificial Recharge at San Gorgonio Pass, California
Alan L. Flint and Kevin M. Ellett

THANKS TO OUR REVIEWERS

Cover: Three-dimensional rendering of a partially saturated sand-pack illustrating the nonuniformity in water and air distribution in the pore space following drainage. Gray regions are sand grains, black areas are air-filled pores, and the lighter gray areas are water-filled pores. Images collected for different drainage conditions showed significant variability in both water saturation and distribution for the two types of boundary conditions (slow or fast drainage). The images were obtained with computed X-ray microtomography at the GSECARS beam-line at the Advanced Photon Source. D. Wildenschild, J.W. Hopmans, M.L. Rivers, and A.J.R. Kent present their findings in “Quantitative Analysis of Flow Processes in a Sand Using Synchrotron-Based X-ray Microtomography,” p. 112–126.