

Letter from the Editor

Welcome to *Vadose Zone Journal* (VZJ). This must be an extremely exciting time for all those who strive for more coherence and direction in vadose zone research. Initiation of this journal is motivated by the recognition that the vadose zone is fundamental to many scientific and engineering disciplines. Unfortunately, vadose zone research historically has been carried out mostly from disciplinary perspectives, with often limited knowledge of related work in other fields. The result is that our understanding of the vadose zone remains fragmentary and incomplete. VZJ is intended to be an interdisciplinary forum from which a more complete and coherent understanding of the vadose zone may emerge.

The vadose zone, especially the plant root zone, has long been a focus for soil scientists and others concerned with soil water flow and the fate and transport of nutrients and agricultural contaminants. Interest in the vadose zone has broadened considerably in recent years. For example, many industrial, municipal, and engineering activities are known to impact the vadose zone. Since many subsurface pollution problems stem from activities at or near the soil surface, effective management of the vadose zone offers the best opportunities for preventing, limiting, or remediating soil and groundwater pollution. Once groundwater is polluted, control and management of contaminants becomes much more difficult and costly.

Advances in vadose zone research have been truly astonishing during the past several decades. The vadose zone is now the active domain of scientists and professionals in a broad range of disciplines, including soil physics, geophysics, hydrogeology, geochemistry, soil chemistry, microbiology, terrestrial ecology, atmospheric sciences, environmental engineering, agricultural engineering, and engineering associated with construction, petroleum and chemical technologies. However, while tremendous advances have been made, they generally have proceeded along separate disciplinary lines, with limited interaction and without a feeling of community among the different groups involved. Research results up to this day are being published mostly in separate journals supported by different professional societies, or in more narrowly focused journals run by commercial publishers. Unfortunately, or perhaps fortunately, disciplines can no longer exist and thrive in isolation. The scientific community needs a home for research that covers all of the physical, chemical, and biological aspects of the vadose zone, especially multidisciplinary research. For this reason, we hope that this journal will help to break down some of the barriers between the different disciplines and societies, while also narrowing the increasingly severe gap between the state-of-the-science and the state-of-the-practice.

Vadose Zone Journal will report fundamental and applied research on a wide range of topics, including experimental and modeling studies of variably saturated fluid flow; heat, solute and vapor transport in granular and fractured media, flow processes in the capillary fringe, shallow water table management, land-surface hydrology, regional and global climate change impacts on the vadose zone, design and performance of waste disposal facilities, long-term stewardship of contaminated sites, biogeochemical transformation processes, microbial processes in shallow and deep formations, bioremediation, carbon sequestration, and the fate and transport of inorganic and organic chemicals, nonaqueous phase liquids, colloids, viruses, microorganisms, and radionuclides. Inherent to most of these topics are the problems of subsurface heterogeneity, the effective representation of processes and properties across multiple spatial and temporal scales, advances in monitoring systems, and measuring and reducing uncertainty.

In this first issue you will find an interesting set of topics, including reviews by Glassley and colleagues on the impacts of climate change on the chemical composition of deep vadose zone waters, Tuller and Or on the unsaturated hydraulic conductivity of structured media, Hassanizadeh

and colleagues on dynamic effects in the capillary pressure-saturation relationship and their impacts on unsaturated flow, and Katul and Siqueira on modeling heat and water vapor transport inside plant canopies using turbulent transport theories. The latter paper is predicated by the vadose zone being an important part of land-surface parameterization schemes that determine the exchange of energy, mass, and momentum between the atmosphere and the land surface. Technical papers cover a range of topics, including solute transport in the Hanford vadose zone, effluent drainage from mining heaps, solute transport in fractured rock, virus and colloid transport, and root-water uptake. Please note that in addition to reviews and technical papers, VZJ will also publish short communications, technical notes, comments, letters to the editor, and book reviews.

Our new direction in focusing on multidisciplinary vadose zone research is accompanied by a new direction in publishing. VZJ is entirely electronic, from manuscript submission and peer review via the Manuscript Tracker system (<http://www.manuscripttracker.com/vzj/>), to electronic proofs, to online publication by HighWire Press. Electronic review and proofing quicken the publication process and facilitate the participation of authors and editors from any part of the globe. The journal features full text searches, linked references, subject collections, and complete searchable archives. Each paper is both an HTML file and a printable PDF file that closely resembles a printed journal page, including volume and page numbers for ease of citation. Electronic publication has many advantages over traditional print media, such as publication of color graphics at no special charge, inclusion of multimedia information, and links to external material. It is of course impossible to envision the full potential of electronic publishing in the future. For this reason we encourage our authors to stretch the capabilities of VZJ, and explore alternative ways of presenting data and results.

Launching this journal would have been impossible without the vision and support of many individuals inside SSSA and its sister organizations. I want to thank especially Don Nielsen, Glendon Gee and Bob Luxmoore for articulating the need for this journal within SSSA and guiding VZJ through its approval process, Rhonda Zamora for taking charge as Editorial Assistant in Riverside, CA, and Lisa Al-Amoodi for serving as Managing Editor in Madison, WI. Special thanks also to those willing to serve as Associate Editor and, most importantly, the authors. Ultimately the authors will determine the success of this journal, the quality and type of papers being published in VZJ, and the direction in which this journal will grow. As Editor, my primary function is to attract a wide diversity of quality papers on vadose zone issues, and to implement a fair and expedient review process. As such, I am ecstatic that this first issue could appear just barely one year after the first paper was submitted.

Again, welcome to *Vadose Zone Journal*. I am looking forward to receiving your contributions.

Rien van Genuchten
Editor