

Estimating Hydraulic Parameters of Heterogeneous Soil at the Handford Site Using the Parameter-Scaling Concept. (S01-zhang113826-Poster)

Authors:

- Z.F.Zhang* - *Pacific Northwest National Lab, Richland, WA*
- A.L.Ward - *Pacific Northwest National Lab, Richland, WA*
- G.W.Gee - *Pacific Northwest National Lab, Richland, WA*

Abstract:

Determination of the soil hydraulic parameters of heterogeneous soils remains a challenge since inverting for too many parameters can lead to the non-uniqueness of parameter values. In this research, the parameter-scaling method of Zhang et al. (2002) was used to reduce the number of parameters to be estimated at field scale. The heterogeneous soil is classified into different texture units. The scaling factor is defined as the ratio of a parameter of a texture unit to the corresponding parameter of the reference texture. It is assumed that the scaling factor associated with each parameter is invariant over observation scales. Parameter-scaling factors are determined using local-scale parameter values. By assigning scaling factors to the corresponding soil textures in the field, the reference hydraulic parameter values at the field scale can be estimated through inverse modeling of field experiments. The parameter-scaling method was tested by inverting field injection experiments in three-dimensional heterogeneous soil at the Handford site. The results show that simulation errors were significantly reduced after applying parameter scaling and inverse modeling.

Corresponding Author Information:

Fred Zhang
Pacific Northwest National
Laboratory
MSIN K9-33, P.O. Box 999
Richland, WA 99352

phone: 509-372-4866
fax: 509-372-6089
e-mail:
fred.zhang@pnl.gov

Presentation Information:

Presentation Date: Wednesday, November 13, 2002
Presentation Time: 10:00 am-12:00 pm
Poster Board Number: 1328

Keywords:

Parameter-Scaling Concept, Hydraulic Property, Heterogeneous
Soil, Inverse Modeling