

**Capturing Hydrogeologic Uncertainty in Transport Predictions at
the Hanford Site, Washington**

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Limited data on the spatial extent of aquifers and aquitards in the Hanford site hydrogeologic system as well as limited data on their properties and the external and internal driving forces affecting the geohydrologic system leads to uncertainty in the transport predictions used for remediation decisions. We are working to quantitatively incorporate uncertainty related to many of these factors into our transport predictions. Geostatistical methods are being used to develop alternative realizations of model structure at the site, as discussed by Kanevski and others at this conference. An initial transient inverse calibration of the existing three-dimensional Hanford Site model to estimate hydraulic parameters and boundary conditions based on our current interpretation of the aquitards was completed. We are currently using inverse methods to examine uncertainty in communication between the unconfined and confined aquifers at the site. We plan to use inverse methods that allow the inverse model to vary the extent of aquitard units within bounds determined through the geostatistical analysis. The planned inverse analysis will consist of varying the spatial distribution of the mud units, as well as flow parameters and boundary conditions, to achieve the best fit of historical measurements of hydraulic head and contaminant movement.