Lecture Title: **Influence of spatially variable soil permeability on backward erosion piping**

Abstract: Backward erosion piping (BEP) is a failure mechanism of serious concern for both dams and levees. Finite element models have been developed for analysis of BEP; however, these models often assume foundation soils are entirely homogenous. Recent laboratory investigations have demonstrated that spatial variability in soil substantially affects the BEP process, typically resulting in increased resistance to BEP. This lecture presents a numerical investigation of the influence of spatial variation in permeability on BEP. A two-dimensional finite element model was developed for conducting plan view analyses of BEP in random permeability fields. Analyses results indicate that the probability of erosion progression is related to both the variance and correlation length of the permeability random field. BEP progression becomes less likely as the variance in permeability increases and the correlation length in the direction of flow decreases.