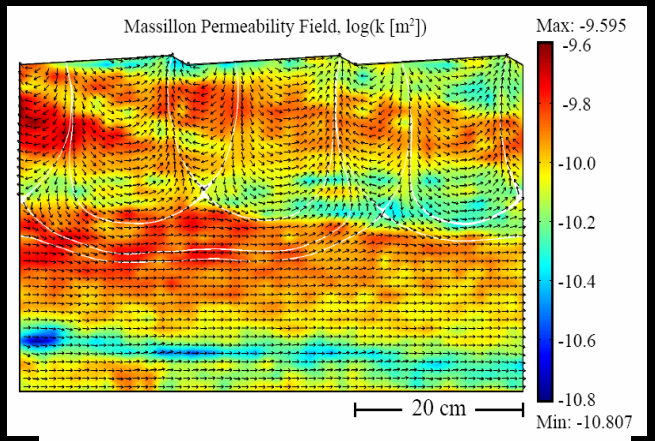
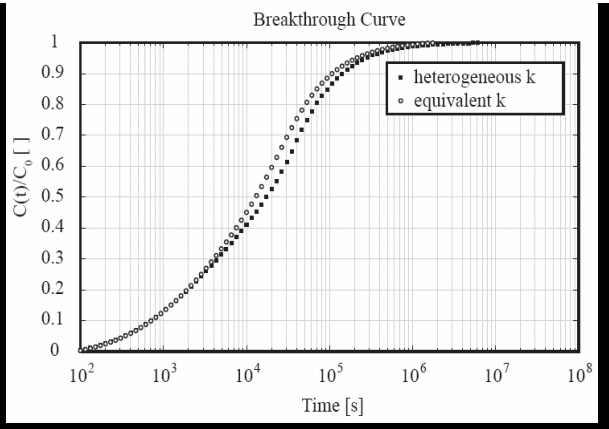
Current-topography driven exchange processes between water columns and heterogeneous permeable sediments

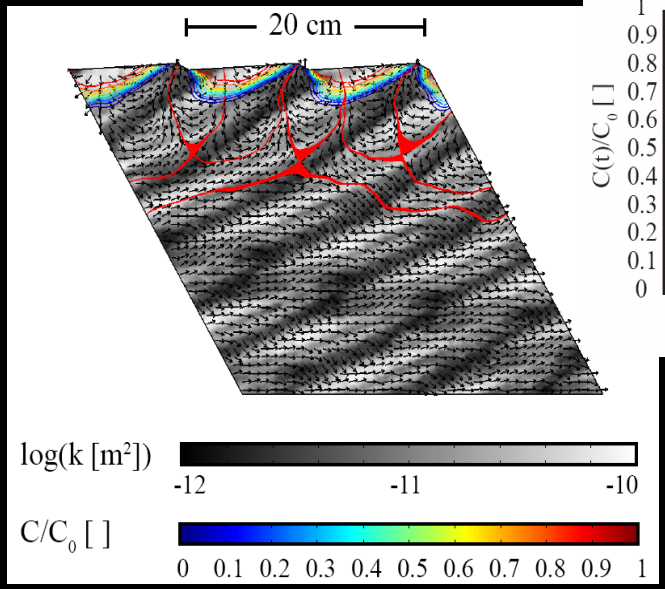
M. Bayani Cardenas, Department of Geological Sciences, University of Texas at Austin

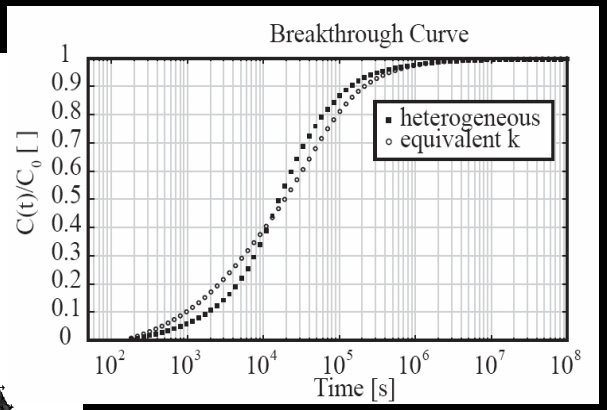
We are investigating the effects of sediment permeability (*k*) architecture on solute and heat exchange across the sediment-water interface in riverbeds using computational modeling and lab experiments.

We have modeled fluid flow and solute transport through two heterogeneous permeability fields- one developed from the Massillon Sandstone and other from modern sediment of the Brazos River in Central Texas. We use the return time or breakthrough of solutes back into the river to characterize any effects of heterogeneity by comparing to equivalent homogeneous cases.









The permeability field in the Massillon Sandstone leads to deviation from its equivalent homogeneous case at late times while heterogeneity has an effect in the Brazos River sediment at both early and late times.