The Dependency of Anomalous Transport Behavior on Flow Path Orientation

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Purpose of study

A new method for subsurface description has recently been developed at the University of New Mexico that incorporates ground penetrating radar (GPR) and geostatistical description to create a more realistic virtual representation of subsurface conditions along a portion of an active sand bar of the Rio Grande near Albuquerque. The models constructed with this new method will be used to model groundwater flow and transport to assess the influence of sedimentary structures and their orientation on flow and transport paths.

Study Underway

Using the ground penetrating radar images, the three orientations of parallel to flow, perpendicular to flow, and oblique to flow will generate five models from four methods in each orientation. It is expected that both Fickian and non-Fickian transport behavior will be observed, and will give insight into the fundamental behavior of transport paths.

Benefits

The new model will give insight into transport behavior of groundwater and could provide drastic improvement in the reliability and accuracy of contaminant transport models.

Nick is shown hauling lots of the equipment used for GPR surveys. He is an Albuquerque native and is working on a master's degree at UNM with an emphasis in hydrogeology. He plans to pursue a Ph.D. in the hydrologic sciences. Nick has worked at the USGS office in Albuquerque for the past four years and has prepared an article for publication on a heterogeneity model that he worked on while at the USGS and which is related to this student grant project.

Nick is extracting a core from the study site.