THE PROBLEM

Groundwater, as the major contributor to the fresh water resource, has been contaminated by agricultural and industrial activities in recent years. However, it is extremely difficult to obtain data to assess the current pollution situation or to predict contaminants’ movement trend. The problem also renders challenges in education. Civil Engineering Students are easy to get bored when learning the modeling and simulating theories in class. In this project, a scenario was designed where an industrial plant had a 1,2 Dichlorethane (1,2-DCA) spill, caused by the failure of an underground storage tank.

THE PROJECT

The regional groundwater model encompassed an area 2000 feet long, 3000 feet wide and 100 feet deep. Simulating data resulting from Groundwater Vistas software is first visualized and rendered via Paraview and Open Scene Graph, and then rendered on an immersive 3D system via VR Juggler. Navigating by the wand and virtual probe, students can explore the virtual underground world, observe the contamination situation, and swiftly understand related theories and real world outcomes. A menu system is built for students to choose different remedial conditions.

THE OUTCOME

The Groundwater project was used as a virtual lab in 2010 & 2011. Students and faculty have responded positively to using the project for class. Additional functionality has been requested and is in-progress. The new functionality will allow students to compare remedial strategies side-by-side for dealing with groundwater contamination.