Aquifer Characterization Studies

We are using geophysical methods to characterize hydrogeologic aquifers throughout the region at a variety of scales. Our results are used to identify and develop geothermal resources, to identify permeable zones for locating new water wells, and to understand regional groundwater flow for remediation of contamination. Traditional geophysical methods, with modifications in acquisition and analysis, can be used to safely and successfully operate from meter to kilometer scales in diverse conditions such as urban centers.

For example, in the Boise Valley we are analyzing seismic reflection data at three distinct scales to better define hydrostratigraphic models for regional groundwater studies. On the basin scale, we examine existing industry seismic data to identify the structural and stratigraphic framework of the entire western Snake River Plain. On the aquifer scale, we can image across water wells to map specific hydrostratigraphic boundaries of importance to groundwater modeling. Finally, on the meter scale, we are analyzing surface, borehole and crosswell seismic data from a highly characterized wellfield to better understand the nature of the reflectors. The BHRS is a field site in Boise, in-part, designed to identify methods to map meter-scale permeability with geophysical methods. We find seismic boundaries can directly correspond to changes in porosity on all scales. Seismic reflection data from different scales help identify and map hydrostratigraphy to enable a better understanding of groundwater problems throughout the region.

Selected References


