

Electrical Resistivity Imaging

Electrical resistivity imaging (ERI) provides a means of obtaining a two-dimensional (2D) cross-section of electrical resistivity, which is a function of soil and rock type, porosity, its permeability as well as the composition of fluids that fill the pore spaces. If a sufficient resistivity contrast exists, the data can be used to identify stratigraphic layers and anomalous zones. For example, clay layers typically have a significantly lower electrical resistivity than sand and gravel.

Electrical resistivity measurements are made by placing a series of electrodes in contact with the soil or rock. A current is injected between one pair of electrodes while the voltage across the other pair of electrodes is measured. Multiple measurements made by different combinations of electrode spacings provide a dense dataset from which a 2D resistivity model can be developed. ERI measurements may be made on land or in water-covered areas.



- Non-invasively map stratigraphy and anomalous conditions
- Applications include mapping karst features, characterizing relative clay content, mapping groundwater resources, assessing landfill boundaries, and mapping groundwater contaminants
- Measurements made along survey lines or within a survey grid to map lateral trends and guide confirmatory borings
- Measurements can be made over water-covered areas using a towed array of electrodes
- Survey procedures outlined in ASTM D6431-99

