



# Use of electromagnetic exploration methods to identify high-salinity groundwater zones

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## 【Abstract】

Three different electromagnetic methods were used in combination to identify high-salinity groundwater zones in the Kujukuri coastal plain. Zones of high conductivity due to the presence of high-salinity groundwater were revealed at three scales.

## 【Description of study】

The three electromagnetic methods employed were the AMT (audio-frequency magnetotellurics) method, for large-scale exploration; the TEM (transient EM) method, for exploration of medium-sized areas; and the electromagnetic profiling method, for shallow depths. The AMT, TEM, and electromagnetic profiling data were used to estimate the distributions of conductive zones due to deep fossil sea water, present sea water invasion, and high-salinity salt marsh deposits. Studies involving combined application of AMT, TEM, and electromagnetic profiling to the same area are rare, and our results prove that our procedure is effective in verifying the existence of conductive zones and identifying their origins.

## Reference

Mitsuata, Y., et al. (2005) An investigation of saline water distribution in a coastal plain by various electromagnetic methods. Poster presentation at Near Surface 2005, European Geophysical Exploration Meeting.

## 【Application】

Combined application of AMT, TEM, and electromagnetic profiling could be used in efforts to preserve the groundwater environment in coastal plains and in investigations of the groundwater environment near geological disposal sites.

