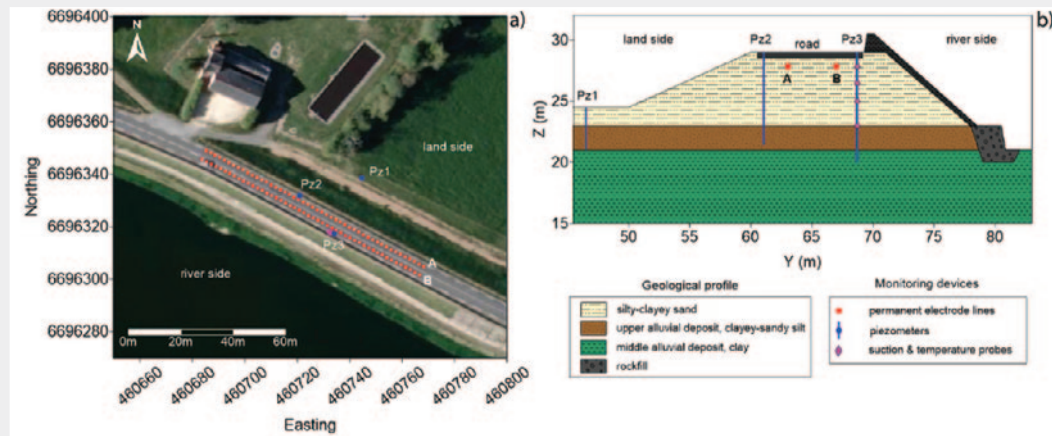


2D ERT monitoring of soil moisture seasonal behaviour in a river levee

Resistivimeter SYSCAL PRO SWITCH 48

Piping induced by abnormal seepage is the main cause that may lead to the failure of flood protection structures such as embankment levees.

CASE STUDY



a) Location of the permanent ERT profiles A and B.

b) Cross-section of the levee perpendicular to the profiles A and B.

The study aims to characterize the seasonal behaviour of soil moisture in an old embankment levee by means of 2D electrical resistivity tomography monitoring based on an embedded electrode installation. The studied portion is 100m long, part of a 50km long flood defence network along the Loire River in the Authion valley between Angers and Saumur in France.

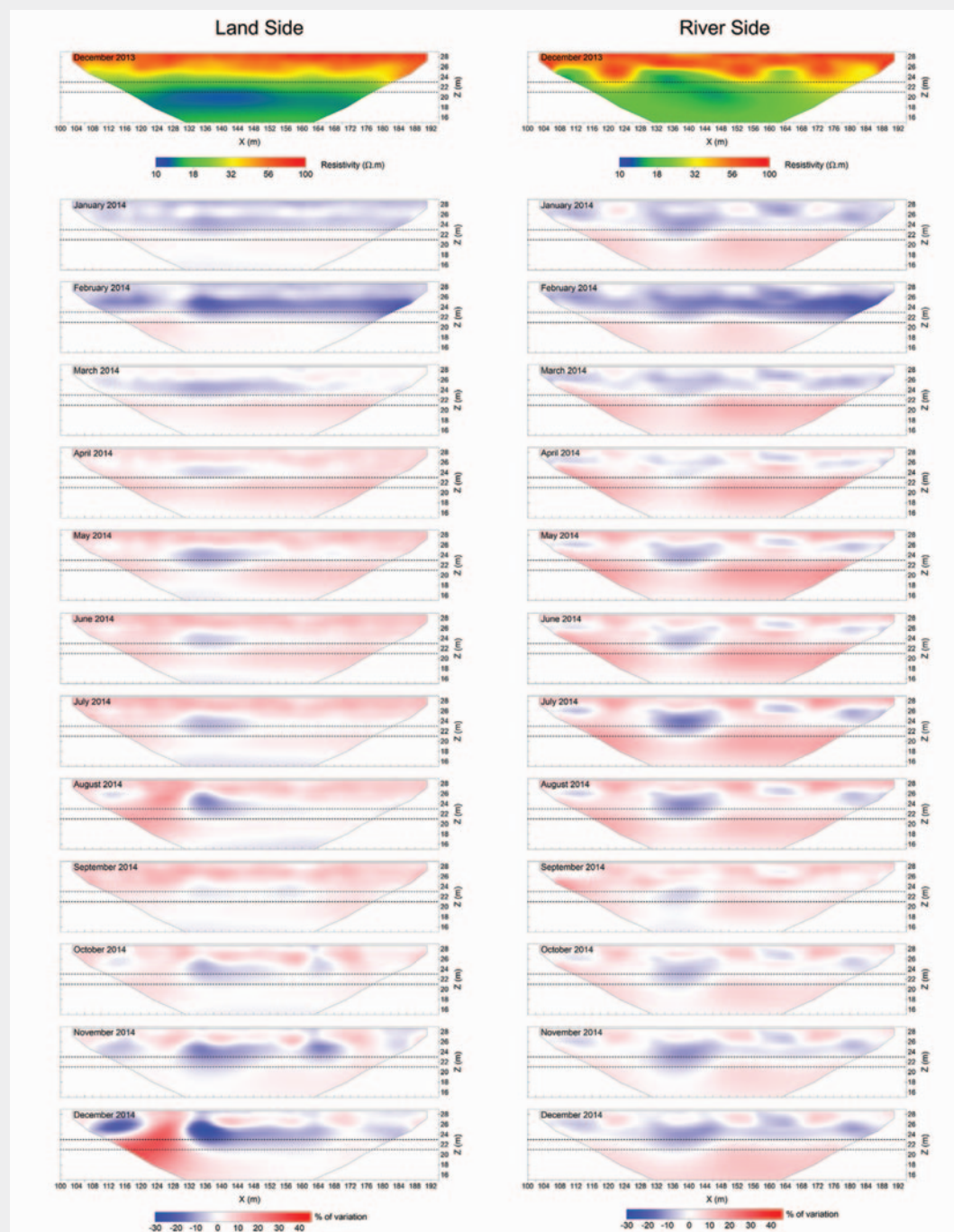
The permanent ERT setup with buried electrodes was used to collect one acquisition per month along 2 parallel profiles and, based on a Wenner-Schlumberger protocol. This sequence allowed to record 997 apparent resistivities on each of the electrode lines.

Seasonal resistivity change models were compensated for temperature effects using a seasonal temperature profile model. Time-lapse sections of percentage resistivity changes show spatial and temporal overall consistency with seasonal variations of soil temperature. Discrepancies are likely due to the pavement layer that is not well considered in the inversion process as well as to time-lapse inversion pitfalls.

C. Jodry et al., 2019, *Journal of Applied Geophysics*, 167, pp. 140-151

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CASE STUDY



2D inverted resistivity tomography corrected of the modelled temperature (up) and percentage resistivity change sections from "cascade" inversions for a) the land side, and b) the river side. The dotted lines represent the top of each alluvial layers estimated according the geotechnical data.