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## In situ measurements at the Mont Terri rock laboratory to study argillaceous rocks

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Safe as well as sensible economic uses of the subsurface demand both the comprehensive knowledge of the present state of a system and the understanding of the relevant dynamical processes. In order to facilitate these requirements, adequate characterisation, sufficient monitoring, and conclusive experiments have to be performed. Following this directive, the German Federal Institute for Geosciences and Natural Resources (BGR) has developed, adapted, and successfully employed methods to prospect Opalinus Clay in the Swiss Mont Terri rock laboratory. These methods encompass geoscientific in situ characterisations as well as investigation techniques as part of long-term monitoring programmes from the complementing fields of e.g. micro-seismics, Electrical Resistivity Tomography, micro-structural petrography, geohydrology, and Nuclear Magnetic Resonance. With this expertise, BGR has contributed numerous experiments, which are embedded and coordinated in the long-standing and fruitful cooperation with the partners of the Mont Terri Consortium.

The knowledge gain, based on now almost 25 years of BGR's engagement in the Mont Terri Project, offers comparison and evaluation of different, complementing methods determining present values and their evolution in time of e.g. moisture, saturation, pressure, deformation, the characterisation of parameter variability, and localisation of heterogeneities. It provides information allowing for programme optimisation of in situ measuring methods concerning penetration, resolution, effort, time, or feasibility. Therefore, the research results can be used for decision-making to refine investigation endeavours in regards to specific demands of a certain site or a particular scientific problem not only for Opalinus Clay but also other claystone formations, and in some cases even for non-argillaceous rocks.