DIPARTIMENTO DI SCIENZE DELL'AMBIENTE E DELLA TERRA

UNIVERSITA' MILANO - BICOCCA

PROGETTO DIPARTIMENTI DI ECCELLENZA

Electric and Electromagnetic methods for mapping of groundwater resources and of permeability

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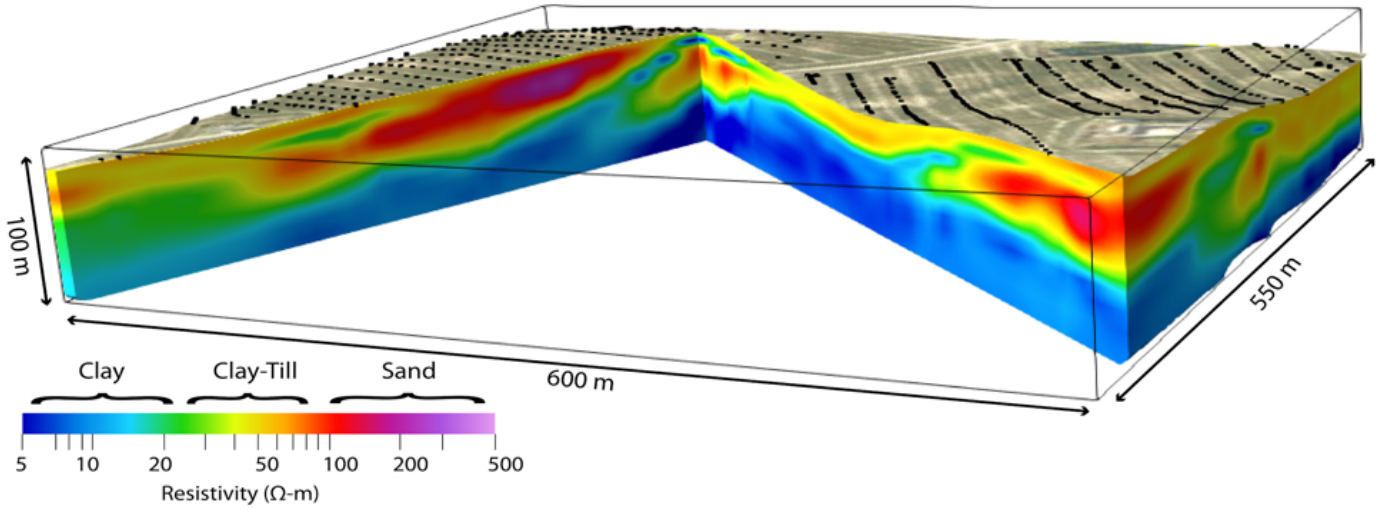
Lunedì 19 novembre ore 11:30 - U1 Aula Marchetti



Geophysical image of a complex (but common) geological setting in sedimentary areas. Blue colors represent clays, while red colors are sandy tills and outwash sand; black dots represent EM sounding positions. Any prediction of water flow obtained disregarding the geology complexity would be very unreliable.

Water is a prerequisite for all life on Earth. On a global scale, clean water for human consumption and crop irrigation ranks amongst the greatest societal challenges. Water management requires addressing the challenges of (amongst others) developing reliable and cost-efficient methods for mapping water resources and for predicting the spatio-temporal dynamics of hydrogeochemical processes. These challenges are exacerbated by the changing climate that will result in, among other things, increases in drought periods and sudden floods. Hydrogeophysics and hydrology are the key methods for addressing these challenges thanks to their ability to map and monitor the subsurface and to measure, model and predict groundwater flow. Within hydrogeophysics, the electric (E) and electromagnetic (EM) methods are among the most successful geophysical methods for mapping groundwater resources and get insights on the groundwater flow, thanks to the link between electrical properties, rock texture and permeability, i.e. the ability of a porous medium to allow fluids to pass through it.

This seminar focuses on recent advancements in E&EM methods for detailed, high-resolution mapping of geology and water resources and for (successful) geophysical estimation of permeability. Cost-effective estimation of permeability by geophysical measurements is indeed the holy grail of hydrogeophysics, but it had eluded attempts of resolution so far.