



Msc in Exploration and
Applied Geophysics



Earth Science Department
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Recent developments and challenges in time-lapse ERT monitoring of river levees

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[Link to the webinar](#)



Microsoft Teams

Abstract:

the increasing number of embankment failures in recent decades is highly demanding to develop reliable technologies to monitor the stability of these structures. Geophysical monitoring systems have the advantage of being non-invasive and allowing rapid monitoring of the critical sections of earthen embankments such as river levees, tailings dams, earthen dams, and transportation embankments. Electrical resistivity tomography (ERT) method is one of the most flexible geophysical techniques that has specifically shown to be efficient in monitoring the variations of water saturation and detecting seepage zones through embankments. In order to successfully integrate ERT method with real-time monitoring systems capable of highlighting the internal heterogeneities of the embankments at the time they start to develop and promptly plan mitigation actions, site-specific data processing algorithms must be developed. The most challenging parameters to be considered are the effect of the soil covering the electrodes, temperature variations, seasonal 3D effects, and contact resistance of the electrodes. In this talk, two pilot sites where customized ERT monitoring systems are permanently installed along two river levees in Italy are presented. The talk will focus on the latest findings on how to successfully use ERT method to monitor critical segments of levees and have reliable interpretations.