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ABSTRACT BOOK

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GEOSCIENCES FOR
A SUSTAINABLE FUTURE

UNIVERSITÀ DI TORINO

COVER IMAGE:

Aerial cityscape image of Turin during sunset.

S9.

Ground deformation measurements and Geosciences: applications and outlooks

Giuseppe Pezzo (INGV Roma)

Silvia Bianchini (University of Firenze)

Federico Di Traglia (OGS Trieste)

Claudia Meisina (University of Pavia)

Risk evaluation in critical sites of the metropolitan area of Rome: geophysical-geotechnical characterization of deformation phenomena

Rotella G.*[1], De Ritis R.[2], Argentieri A.[1], Calderoni G.[2], Fabiani M.[1], Marra F.[2], Stefanelli P.[2], Tolomei C.[2], Vitali P.[1], Chiappini M.[2] & Doglioni C.[2]

[1] Città metropolitana di Roma Capitale - Dipartimento IV Servizio 2 "Geologico, difesa del suolo - Rischio idraulico e territoriale", Roma. [2] INGV, Roma.

Corresponding author e-mail: g.rotella@cittametropolitanaroma.it

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The present work concerns the geophysical-geotechnical characterization of deformation phenomena occurring in the metropolitan territory of Rome (Italy). Two sites affected by sinkholes and landslides were investigated within a collaboration agreement between "Città metropolitana Roma Capitale" (CMRC) and "Istituto Nazionale di Geofisica e Vulcanologia" of Rome (INGV). The first, the "Lago Puzzo", is a sinkhole-lake located near Capena (a village placed 30 km North of Rome). In October 2020 a shallow hypocentre and low intensity earthquake occurred in this area. The second site, San Vito Romano (a village placed 50 km East of Rome) shows widespread slow-moving slope movements affecting both the urbanized area and its crossing provincial roads. The two sites are located close to important infrastructures, such as a high-speed railway line, a large overhead power line, and intensely urbanized areas. The investigation, based on an interdisciplinary approach, is aimed to evaluate the two sites geo-structural model and to decipher the evolutionary stages of the respective ongoing phenomena. The remote-detected data (InSAR) have allowed to localize the phenomena and quantify their movements. The seismological spectral analysis techniques have characterized the recent seismic event occurring in the Capena area and the geophysical investigations (e.g., ERT, magnetic and gravimetric surveying) have illuminated the crustal sector of the two sites. The results are relevant for the understanding the deformation mechanisms, for the predicting future evolutions scenarios and, possibly, for the conceptualization of specific time-lapse monitoring systems. Thus, we developed the first fundamental steps towards the definition of the risk mitigation paradigm, that are: detection, mapping and modelling.