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Historical Patterns in Ground Subsidence in Bucharest, Romania

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Bucharest, the capital of Romania , is a city with a large number of buildings located in the alluvial Romanian plain, on the terraces and interfluves between two small rivers – Dambovita and Colentina. The goal of this research is to identify trends in land subsidence as a widespread form of mass movement in the city due to natural and anthropogenic factors.

In this study we compared a digital surface model (DSM) based on ASTER Level 1A data with a digital elevation model (DEM) based on historical maps from 1900, to identify subsidence trends in the metropolitan area of Bucharest focusing on a few patterns within the historical center of the city. Accuracy of the DSM was tested by comparing it with accurate global positioning system (GPS) station locations acquired over the area. Noted changes in topography were correlated with the unique geomorphological features of the city focusing on regions that experienced large changes over time (i.e. developments over former marshes, clay pits, and landfill excavation areas between 1800 and 1950). Field investigations were performed on areas experiencing large elevation differences.

The ongoing research will further explore recent ground deformation (subsidence) patterns identified via radar interferometry (InSAR) correlate with declining groundwater levels (due to groundwater extraction) and construction.