

Deformation Studies of the Dam of Mornos Artificial Lake via Analysis of Geodetic Data

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SUMMARY

Internal soil erosion, hydraulic gradients and stability problems resulting from high pore pressures are common causes of failure of embankment dams. However, the self-weight of a dam and variations in water pressure (resulting from the annual variation in water volume) may be a source of extensive deformation of its embankment and foundation that, potentially, may lead to a loss of stability of the structure. The Global Positioning System (GPS) provides a valuable tool for monitoring geospatial deformations, and thereby aids in understanding the complex structural and tectonic mechanisms related to the interaction of the water reservoir and the body of the dam.

The artificial lake of Mornos is located some 25 km north of the seismically active area of the Gulf of Corinth in central Greece. This lake serves as the main storage reservoir for the water supply of Athens. In the recent years, in order to study the structural deformation of Mornos dam four survey campaigns from 2002 – 2004 were carried out. This paper presents the results of the analysis of the GPS and precise leveling data collected spanning the entire period of observations.