

# CONCEPT OF COMPLEX ENVIRONMENTAL MONITORING NETWORK - VARDZIA ROCK CUT CITY CASE STUDY

G. BASILAIA, M.ELASVHILI, N.VACHEISHVILI, D. CHKHAIDZE, D. KVAVADZE  
Tuesday 6 September 2016 by [Libadmin2016](#)

**References:** 16th International Multidisciplinary Scientific GeoConference SGEM 2016, [www.sgem.org](http://www.sgem.org), SGEM2016 Conference Proceedings, ISBN 978-619-7105-57-5 / ISSN 1314-2704, June 28 - July 6, 2016, Book1 Vol. 3, 427-434 pp

## ABSTRACT

Vardzia represents a unique cultural heritage monument - rock cut city, which unites architectural monument and Natural-Geological complex. Such monuments are particularly vulnerable and their restoration and conservation requires complex approach.

This monument, as many similar monuments worldwide, is subjected to slow but permanent process of destruction, expressed in following factors: surface weathering of rock, active tectonics interaction between different rock layers, existence of major cracks and associated complex block structure, surface rainwater runoff and infiltrated ground water, temperature variations, etc. During its lifetime, Vardzia was heavily damaged by Historical Earthquake of 1283 and only partly restored afterwards.

Research Center of Cultural Heritage and Environment of Ilia State University in cooperation with ISPRA, with the funding from the State agency of Cultural Heritage, has developed a concept of Vardzia complex monitoring network.

Concept includes usage of several measurements: monitoring of local meteorological conditions, micro climate in caves monitoring of micro tremors and ambient seismic noise in Vardzia, monitoring displacement and deformation of Vardzia cliff by means of Ground-based SAR (GBSAR) interferometry, continuous photo fixation of ongoing destruction.

Paper will present the solution that is suitable for Vardzia rock cut city monitoring, but this solution can be used for any kind of similar complex.

**Keywords:** Cultural heritage monitoring, Vardzia rock cut city, Environmental Monitoring, Monitoring network concept