

# PHOTOGRAMMETRIC TECHNIQUE IN EARTH SCIENCES, APPLICATION FROM VARDZIA ROCK-CUT CITY COMPLEX STUDY

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**References:** 16th International Multidisciplinary Scientific GeoConference SGEM 2016, [www.sgem.org](http://www.sgem.org), SGEM2016 Conference Proceedings, ISBN 978-619-7105-59-9 / ISSN 1314-2704, June 28 - July 6, 2016, Book2 Vol. 2, 1059-1066 pp

## ABSTRACT

Presented work is a part of “Vardzia Rock Cut City Complex Survey and Monitoring Project” Started in 2014, by the Research Center of Cultural Heritage and Environment of Ilia State University in cooperation with Experts from ISPRA, supported by the State Agency of Cultural Heritage. The project involves multidisciplinary studies aiming diagnostics of the complex Cultural Monument and elaboration of effective restoration and preservation approaches, identification of major threats and problems and monitoring of ongoing natural processes. [2]

Method of close-range photogrammetry was applied to create a base 3D model for modeling natural processes affecting Vardzia such as rain water flow, but also mapping the geological and geomorphological information gathered both on the almost vertical cliff of Vardzia and on the mount slope capping it from above. Two approaches for photogrammetric data collection were applied: Aerial Photo Shooting from quadcopter and Land Based Photo collection.

Based on the photogrammetric image of Vardzia Rock-cut Complex, we have drawn digital geological and geomorphological maps of the Vardzia cliff (Scale 1:1000). Conducted field research and the results of laboratory analysis of gathered samples were incorporated in digital maps. Obtained Digital models were used for modeling Natural Processes, such as rain water run off.

**Keywords:** Photogrammetry, modelling, mapping, cultural heritage.