

The use of Copernicus data to support archeological research in the Eastern Mediterranean

Diofantos Hadjimitsis¹, Andreas Christofe¹, Athos Agapiou¹, Argyro Nisantzi¹, Marios Tzouvaras¹, Christiana Papoutsas¹, Christodoulos Mettas¹, Evagoras Evagorou¹, Kyriacos Themistocleous¹, Vasiliki Lysandrou¹, Georgia Kouta¹, Rosa Lasaponara², Nicola Masini³ and Gunter Schreier⁴

¹Eratosthenes Research Center, Remote Sensing and Geo-environment Research Lab, Department of Civil Engineering Geomatics, Cyprus University of Technology, Saripolou Str. 2-8,3036 Limassol, Cyprus; andreas.christofe@cut.ac.cy

²National Research Council, Institute of Methodologies for Environmental Analysis, C.da S. Loya, 85050 Tito Scalo, Italy

³National Research Council, Institute of Archaeological Monumental Heritage, C.da S. Loya, 85050 Tito Scalo, Italy

⁴Earth Observation Center (EOC), German Aerospace Center (DLR), Wessling, D-8223 Oberpfaffenhofen, Germany

Correspondence: andreas.christofe@cut.ac.cy; Tel.: +35725245001

Based on satellite and in situ observations, the Copernicus services deliver near-real-time data on a global level which can also be used for local and regional needs. The ongoing Horizon 2020 "ATHENA" Twinning project uses specific Copernicus data to identify several case studies. "ATHENA" project aims to establish a "Remote Sensing Science Center for Cultural Heritage" in Cyprus. The Center foresees to support the current Cultural Heritage (CH) needs through the systematic exploitation of Earth Observation technologies. For the establishment of the center, the existing Remote Sensing and Geo-Environment Research Laboratory of the Eratosthenes Research Center (ERC) based at the Cyprus University of Technology (CUT), is twinned with internationally-leading counterparts from the EU, the National Research Council of Italy and the German Aerospace Centre (DLR). Through this network, the ATHENA twinning project strengthens the remote sensing capacity in cultural heritage at CUT's ERC.

Within "ATHENA" project, training courses, workshops and other activities are carried out, promoting Earth Observation knowledge and best practices. Earth Observation technologies are introduced, systematically employed, and further developed for Cultural Heritage applications. These technologies implement Copernicus data and services for the preservation of Cultural Heritage as they can be usefully adopted for tackling the looting phenomenon. Satellite technologies offer a suitable chance to quantify and analyze this phenomenon, especially in the region of the Eastern Mediterranean, where the onsite surveillance is not much effective or non-practicable due to military or political restrictions. Also, active and passive remote sensing data for archaeology, SAR for change and deformation detection, satellite monitoring for archaeological looting, integration of remote sensing data for protection and preservation of cultural heritage are also further explored. The scientific strengthening and networking achieved in Cyprus through the ATHENA project could be of great benefit for the entire Eastern Mediterranean Region bearing a plethora of archaeological sites and monuments urgently calling for monitoring and safeguarding.

Keywords: Cyprus, Eastern Mediterranean, Cultural Heritage, Copernicus, Remote Sensing