

## Conservation of natural and cultural heritage – integrated use of earth observation satellite and in-situ data

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In a global world of rapid changes and development, the question of Natural and Cultural Heritage preservation is more topical than ever. Remote sensing and GIS technologies can be successfully put in work in environmental studies, archaeological surveys and in conservation of natural landmarks, archaeological sites and structures. The nature and cultural sites' preservation underlie in a number of European directives and conventions, such as Cultural landscapes and biodiversity heritage published by EEA, UNESCO's Convention concerning the protection of the world cultural and natural heritage. ESA and UNESCO have been collaborating to use remote sensing to preserve heritage, biodiversity and resources worldwide. Since 2003, ESA has been contributing to the protection of 812 listed sites under UNESCO's Convention. The idea for preservation is one of the tasks of the Global Monitoring for Environment and Security (GMES) initiative, which aims to coordinate Earth observation from space for the protection of the environment.

The paper aims to present the integrated use of satellite and in-situ data for studying the natural and cultural heritage sites and their conservation. The research is conducted for parts of two Bulgarian aerospace test sites – Shoumen and Novi Iskur. It is also supported by the Society for Conservation GIS and SPOT Planet Action. The site of the medieval town of Pliska is orientated to application of satellite data and ground-based information for archaeological study, whereas Novi Iskur region serves as a test site for environmental research and assessment of the cultural heritage.

The application of remote sensing data and geoinformation technologies for Pliska is innovative to archaeological research on a national scale. The research is a serious scientific contribution to the local archaeological community and a strong impetus to the development of conservation activities and non-destructive exploration of unique Bulgarian archaeological sites.

The conservation aspect of the environmental research carried out in the Novi Iskur region is focused on the *Kutina Pyramids* natural landmark, announced in 1962. It is the only natural landmark of the type of rock formations on the territory of the Sofia Municipality. Nowadays, they are experiencing accelerated destruction as a result of the anthropogenic activity carried out in its immediate vicinity. Special attention is being paid to clarify the reasons for its destruction by the integrated use of satellite and ground-based data for the period from 1940 to 2010 and to apply efforts for its conservation. Another aspect of the conservation studies of Novi Iskur region are related to mapping the cultural heritage site and environmental problems in the area.

Earth observation satellite and in-situ data are useful for conservation and preservation of the archaeological area, whose cultural importance has been already acknowledged by giving it the official status of a reserve area. Environmental research based on integrated use of remote sensing, geoinformation technologies and conventional methods provides a wealth of information, which allows adequate conservation measures and activities to be undertaken.