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Study of anthropogenic and natural impacts on archaeological sites of the Volga Bulgaria period (Republic of Tatarstan) using remote sensing data

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Abstract

© 2016 SPIE.In this paper we consider the possibility of using remote sensing data for determining various negative factors affecting archaeological objects condition on the territory of the Republic of Tatarstan. Fortified settlements, with the system of defensive fortifications, were selected as the objects of study, as they are easily identified by remote sensing data. In our view, the analysis of medieval Volga Bulgars (X-XIII centuries A.D.), the most common in the territory of the Republic of Tatarstan, has the highest priority. The first task by using remote sensing was to obtain actual data on the current condition of archaeological monuments located on the Kuibyshev reservoir shore, where the threat of destruction is maximized. Due to the fact, that most of the Volga-Bulgaria settlements, is located on the small rivers banks, the second task was geomorphological description of monuments placement in order to assess the risk of their destruction by natural processes. Third objective was to evaluate the role of the human factor in archaeological sites destruction. Ancient settlements under different types of negative impact were selected for the study. Deciphering of multitemporal remote sensing data allowed to assess the objects condition and to predict the risk of further damage. Additionally, it made able to correct the form of the Bulgars hillforts in comparison with existing plans, as well their size and location in the landscape, to restore the original appearance of destroyed fortified settlements, to determine precise coordinates for the further use of these data in the archaeological geographic information systems.

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Keywords

Aerial image, Anthropogenic factor, Archaeology, Cultural heritage management, Exogenous factor, GIS, Medieval hillfort, Remote sensing