



## **Complex landscape-hydrological studies of the Upper-Volga section of the Great Volga Route**

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The main goal and tasks of the performed works was to study the Upper-Volga section of the Great Volga route as an integral landscape-historical and navigational facility, conduct historical-scientific, landscape and hydro-chemical research of the water system, identify changes in the natural environment before and after the construction of hydraulic structures, and also their landscape conditionality, and study the impact of water bodies on the surrounding natural environment. An important area of work was the study of the structure and hierarchy of cultural and historical landscapes of waterways, the study of the features of natural, anthropogenic and cultural-historical complexes of these landscapes, the study of the formation of the settlement structure and landscape features of the formation of Old Russian cities inextricably linked to this route. Field studies included the following types of work: clarification of the source base of historical and scientific research; the study of the landscape structure, territory and local landscape complexes in key areas, the study of the hydrologic and hydro-chemical regime of the studied area; clarification of geographical coordinates of water and historical objects, identification and comparison of maps of various historical periods with satellite images and topographic maps. Fixation of the current state of waterways in Russia and the surrounding cultural and historical landscapes was carried out using satellite images, topographic maps and photo and video filming of the terrain. Assessment of the disruption of natural areas consisted of visual interpretation, comparison of old and modern photographic materials and processing of space images. Visual interpretation was carried out on the basis of images from the satellite "Landsat 7" and a 10-verst map of European Russia, compiled by the Corps of military topographers under the direction of F.F. Schubert (mid-XIX century). Matching and comparison of cartographic material with photographs allowed both to assess changes in natural landscapes, and also to visually see the extensive "disruption" of natural territories. Landscape route observations provided rich material on the history of the development of valleys and watersheds. A comparative analysis of landscape, natural component and historical-geographical maps of the area of historical water systems in combination with research in key areas made it possible to establish certain features of nature use, the formation of ancient Russian cities and the formation of a settlement structure, depending on the specific functioning of waterways and the landscape structure of the terrain. The landscape analysis of the spatial location of historical cities showed that at an early stage in the Old Russian period, sites of cities (proto-cities) were usually chosen on the most important sections of the waterway, taking into account their safety, with a relatively simple landscape structure, and low relief elements. Later, they were expanded or even "transferred" to higher sites (high terraces, outwash plains, riverine morainic plains) with a more complex landscape structure and a richer resource base.

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