

Airborne Laser (LiDAR) Bathymetry for Precision Capture and Survey of River Beds and Belonging Territories

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Key words: Laser scanning; Photogrammetry;

SUMMARY

"... The deep water is useful in many ways, but it is harmful – may to drown in it. But it can be avoided - learn to swim. " Democritus Since antiquity, people mainly inhabit areas around rivers, lakes and other water sources. Water is not only life determinant, but in many cases it dictates the course of human history - for example spills and flow of the Nile River is largely determined the overall life of Egyptian people. Permanent developing and improve methods for measuring and studying watersheds. This report examines an innovative and efficient technology for detailed study and high-precision monitoring of watercourses, lakes and dams, namely air laser (LiDAR) bathymetry. It enables to determine both a depth of shallow systems and topography of them flooded adjacent areas and with unsurpassed level consistency and detail. This technology has the scientific research, economic, political and human aspect, as on the one hand significantly improves the quality and effectiveness of learning complexity and dynamics hydraulic, morphological and environmental processes rivers lakes anddams, on the other hand, it helps to review and reform motivation and business decisions related to the facilities and management of water resources to optimize and refine measures on prevention and protection of the population from flooding and provides virtually unlimited opportunities for reliable monitoring required by the EU, in accordance with Framework Water Directive. After the scientific development of any new technology requires a comprehensive practical examination and assessment of performance and study the accuracy and reliability of outcome data. The report therefore besides examining the theoretical foundations of air laser bathymetry made critical and comparative analysis of the data obtained from the scanning of the river Ogosta two different laser scanners – RIEGL LMS-Q680i and RIEGL VQ-820-G Topo-Hydrographic Airborne Laser Scanner. The report made a number of conclusions and recommendations that discussed the use of technology in practice. Highlighted is the need to achieve closer cooperation and partnership between research units, business and social - managerial field for the full and versatile use of the big potential of this sensor, optimization methods to transform data information systems and improving the use of water resources and reliable protection of the population in case of accidents and disasters. Important for society as a whole - as of scientific research and the socio-economic level is the implementation and reliable connection between the users and contractors - making applications for research water systems and recovery of information on customer needs. Scientific and economic benefits of that discussed the application of technology are significant, both at national and at European and international level. Successful implementation of airborne laser bathymetry case solving such problems as colossal energy and activity of national and international hydroelectric companies monitoring rivers and reservoirs, hydro specialized studies and consultations engineering services.

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FIG Working Week 2015

From the Wisdom of the Ages to the Challenges of the Modern World

Sofia, Bulgaria, 17-21 May 2015