**HOLISTIC Dredging and sediment management on the waterway Danube**

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**TOpics: 2. Dredging**

 **2.1 Effective Planning and Execution of Dredging
 Projects**

**Abstract**

Recent research on traffic development and transport economics in the Danube corridor revealed the importance of improved navigation conditions on the waterway Danube. The developed Waterway Asset Management System (WAMS) of viadonau allows a real-time calculation of fairway availability, planning of dredging measures, sediment management and budget estimations for various target conditions. The paper provides an overview on the dredging management in this software tool reproducing the entire dredging process, starting from an automated analysis of critical sections, planning of dredging measures per drag and drop, automated cost estimations based on economy-of-scale cost functions and an overview on the status of all measures. Prior to the developed solution estimations of dredging volumes had been based on single-beam surveys and the profile method or a more accurate "manual" assessment of multi-beam data in ArcGIS. With these new capabilities an analysis based on accurate multi-beam riverbed surveys is feasible accounting for deviations in billing of conducted dredging measures. Further functionalities include an analysis of dredging impact duration based on sedimentation and erosion rates, enabling an assessment of the efficiency of a dredging measure in comparison to other possible solutions (e.g. fairway alignment, construction of groynes). Thus, a much faster and efficient planning, implementation and controlling of dredging measures in order to achieve higher fairway availability has been realized. Based on the concept for a systematic sediment management the paper also gives insight into the key elements, findings and functionalities of an advanced sediment management taking into account both economic and ecologic factors. By facilitating an analysis of sedimentation and erosion rates on short sections for a fixed time frame as well as the development over time including dredging and dumping measures the developed WAMS provides an overview on all conducted dredging measures and related dumping sites for a given time frame as well as a total balance on all erosion and sedimentation volumes for any given time frame and river stretch (sediment balance). Instead of lengthy analyses and studies the Sediment Management allows viadonau to constantly assess and adapt their approaches by optimizing both the selection and the timing of appropriate measures. In summary, the developed functionalities enable an efficient balancing of both the interests of environmental protection and inland navigation at the same time. The comprehensive analysis and documentation system is constantly being updated based on previous results, thus becoming more accurate with every year.

**Key words:**

Inland waterway Danube, dredging management, sedimentation and erosion, balancing

**PRESENTATION:**

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**RELEVANCE STATEMENT:**

The presentation will provide attendees with information on the latest developments in Waterway Asset Management with a developed Software Tool with focus on efficient dredging and sediment management. The main aspects will be

 - Overview on dredging strategy, volumes and expenditures

 - Impact duration and stability of dredging and dumping sites

 - Optimizing timing and dredging volumes for optimal availability

 - Holistic sediment management approaches

 - Stabilizing critical sections with sedimentation or erosion