

WSV-Lab – an expert and management system for dredged material quality assessment in German Federal Waterways

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Introduction: Waterways play a key role in ensuring Germany's attractiveness as a business location. Every year, approximately 46 Mio. m³ of sediments from coastal waters, rivers, canals and ports are dredged and have to be managed in a cost-effective and environmentally-safe way [1]. For the most part the waterways are managed by 46 regional offices of the Federal Waterways Administration (WSV) (<http://www.wsv.de/>). Qualitative restrictions due to pollution and environmental hazard are often crucial for the decision of how to deal with the dredged material. Approximately 200 projects per year have to be accomplished in the whole 'WSV' where a suspicion of contamination exists. As in the 'WSV' a deepened expertise in such special fields like chemistry, ecotoxicology, and biology does not exist, the assessments are usually carried out by external laboratories and/or consultants. The German Federal Institute of Hydrology (*BfG*) provides general guidance, e.g. with guidelines, and is directly involved in individual cases.

Methods: The legal framework for dredged material management has changed fundamentally in recent years. The implementation of the EU Water Framework Directive has led to a stronger focusing on sustainable management of sediments at river basin scale. Furthermore, requirements from adjacent regulated areas (e.g. waste disposal, soil protection) have made dredged material assessment a more and more complex task. This development takes place and will continue in a situation when the Waterways Administration suffers from a permanent staff reduction. Therefore, to put the dredged material assessment on an effective and consistent basis and to assure the compliance with quality criteria it was decided to concentrate the management of the dredged material assessment in one hand.

Results: On the one hand, a precondition for the intended concentration was the development and implementation of the expert system 'WSV-Lab' which provides data and project management as well as classification functions. On the other hand, it was necessary to conclude a framework agreement for the commissioning of selected, verified laboratories and consultants. Subjects of the agreement are sampling, chemical and ecotoxicological analyses, and the compilation of assessment reports. A quality

assurance system is run by the *BfG* to ensure the compliance with required standards.

The combined management and classification system WSV-Lab consists of the modules (1) project management, (2) classification and reporting, and (3) data management.

(1) The individual projects are being processed from the planning phase until their completion in one system. After the project goals have been identified, tailor made programs are provided by composing investigation packages in terms of chemistry, ecotoxicology, and biology. Individual packages or elements of them have to be selected from a web-based catalogue. The technical realisation was performed by using the form management system FormsForWeb[®].

(2) The classification of the results according to the valid guidelines is carried out using the classification and reporting module. This module of WSV-Lab interacts with the Sediment information system 'Sedimentkataster' [2] which provides amongst others the required reference data and automatic classification schemes. The assessment results are automatically transferred into standard reports, which have to be accomplished by the project operator. Access to the classification and reporting system is available via the Hydrological Geographical Information and Analyzing System 'GGInA' (<http://geoport.bafg.de/>). Standard functions like Web Mapping Services are used for the reports.

(3) Several databases are integrated into the system, thus forming the module data management. Historical as well as reference and recent project data from all Federal Waterways are stored and on request automatically provided for specific project purposes.

Discussion: From November 2007 to February 2008, the management system has been tested in an initial pilot phase. First experience of the operation phase and of the recent pilot phase will be presented at the conference.

References: [1] BMVBW (2004) <http://www.dredging-in-germany.de/downloads/bro-english.pdf>; [2] Pelzer et al. (2006) *12. Magdeburger Gewässerschutzseminar, 10.-13.10.2006, Český Krumlov*: 108-110.