Geophysical Research Abstracts
Vol. 18, EGU2016-16729-1, 2016
EGU General Assembly 2016

Monitoring of suspended sediments, sediment conditions and aquatic biota during the functional check of bottom outlets

Stefan Haun (1), Lydia Seitz (1), Wolfram Stockinger (2), Martin Riedl (3), and Martin Schletterer (3)

(1) University of Stuttgart, Institute for Modelling Hydraulic and Environmental Systems, Department of Hydraulic Engineering and Water Resources Management, Stuttgart, Germany (stefan.haun@iws.uni-stuttgart.de), (2) DWS Hydro-Ökologie GmbH, Vienna, Austria, (3) TIWAG – Tiroler Wasserkraft AG, Hydropower planning department, Innsbruck, Austria

Reservoirs are used to store water for multiple purposes and are therefore of great importance for our society. Regularly inspections of the dam structure and the bottom outlets are necessary to ensure a safe operation of these structures. The release of water from the reservoirs for this procedure often results in high suspended sediment concentrations downstream by the remobilization of deposited sediments, which may result further in negative effects on the downstream located habitats. Due to a careful elaborated monitoring concept, e.g. regarding the opening procedure of the bottom outlets, it is possible to change the management strategy and to avoid or to minimize ecological impacts. Within this study a monitoring concept is developed and implemented to observe occurring suspended sediment concentrations during the opening of the bottom outlets of a small reservoir in the alpine region. The measurement concept includes suspended sediment concentration and discharge measurements at the two upstream located tributaries as well as suspended sediment concentration measurements downstream. Two stations are selected downstream with a distance of 750 m and 2,000 m from the dam. To ensure a complete series of concentrations over time bottom samples, Imhoff-cones as well as turbidity meters are implemented. Whereas the turbidity meters ensure a permanent observation of the conditions (will be calibrated with laboratory results from the bottle samples), the Imhoff-cones make it possible to intervene right away into the process of releasing water. A second focus lies on the downstream located river bed, which is monitored before and after the opening of the bottom outlets in order to assess morphodynamical changes such as river bed clogging occurs. Therefore sediment samples with the so called freeze-panel technique are collected before and after the opening of the bottom outlets to quantify possible changes of the bed material. The results show that downstream habitats are affected right after the flushing, however it is shown that the biota (zoobenthos) recovered within a short time period. With the knowledge of this study new management strategies can be developed, e.g. a clear water release in the post-flushing phase can be recommended.