Comparative analysis of two different methods for determining the environmental flow for a river basin in Central Greece

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The so-called "environmental flow" is referred to the flow magnitude of a river reach that allows the conservation of certain ecological characteristics that may refer to the physical-chemical profile or the biological properties of this reach and their interactions. The Range of Variability Approach (RVA) is a hydrological method that takes into account the natural variability of the daily runoff for a river reach and is based on the assumption that the hydrologic conditions affect in a significant extend the ecological characteristics of the aquatic habitat. The "effective discharge" method, on the other hand, is a coupling of geomorphologic and hydrologic concepts that determine the river discharge which controls the shape of a river section in the long term. The concept of "effective discharge" proposes that there exists a single steady discharge that, theoretically, if constantly maintained in a stream over a long period of time would form and maintain the same basic stable channel dimensions as those produced by the long-term natural hydrograph. The effective discharge concept at this stage incorporates the sediment discharges of the river section under consideration. The research presented here is dealing with the comparative analysis of the environmental flow with these two approaches for Evinos River at Poros Riganiou gauging station in Central Greece with a catchment area of 914 km2. Mean daily discharges have been measured since 1970 and the mean annual runoff is equal to 25.2 m3/s. The suspended sediment discharge rating curve is also constructed using the broken line interpolation method. The magnitude of the environmental flow for these two methods is computed and certain conclusions are presented on the applicability and feasibility

of the computation approach.