On the estimation of the sediment transport and sediment budget in a long reach: application on the Middle Loire River, France (Camenen et al. 2016) [1]

Sediment load and budgets are a fundamental component of the process-based hydromorphological framework developed by the REFORM project, and are needed to accurately assess the current condition of a river, its sensitivity to change, and its likely future evolutionary trajectory. This paper presents an evaluation of three different methods for estimating both bedload sediment transport and bed-material budget within river channels, using the Middle Loire River as a case study.

The first method is based on the stream power concept and does not need any hydraulic calculations. It yields estimates of the sediment transport in the same order of magnitude as measurements but poor results for the bed-material budget in terms of magnitude and tendency. For the second method, hydraulic parameters are computed using the Manning–Strickler equation (or a 1D hydraulic model for steady flow). It provides useful indicators for understanding river dynamics but does not yield significant improvements compared to the first method. The third method uses 1D numerical software for water flow and river bed evolution. It yields the most accurate results for both sediment transport and bed evolution but requires more data and overall more work to construct the model. Guidance is provided on the amount of data required, the competence needed to build the models, and the predictive capability of each of the methods.

Keywords: Sediment transport, Sediment budget, Bed material, 1D modelling

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http://dx.doi.org/10.1007/s00027-015-0442-3 [2]

Links
[1] https://reformrivers.eu/estimation-sediment-transport-and-sediment-budget-long-reach-application-middle-loire-river-france
[2] http://dx.doi.org/10.1007/s00027-015-0442-3

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