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Sediment budgeting of German waterways

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Waterways today rarely have a sustainable sediment budget. Supply from upstream and lateral sources is blocked by barrages in many places. The transport capacity is strongly modified by means of planform and cross-section alterations. Many free-flowing river sections are subject to bed degradation, while impoundments tend to aggrade. This has consequences for the usability of navigation facilities, stability of structures (like bridge foundations and dykes) and groundwater levels. Consequently, sediment managements operations are commonplace, being challenging in economic and ecologic terms. A first step towards an improved sediment management is to establish the current sediment budget of a river.

There are different methods to gain information about the sediment budget:
- measurements of bed-load and suspended load transport
- deductions from temporal development of bed-level development
- deductions from temporal development of streamwise water-level measurements
- deductions from temporal development of water-levels at gauges
- bed-load tracer analyses
- numerical modelling

An overview of the methods used in sediment budgeting of German waterways at the Federal Institute of Hydrology will be given. Ongoing research based on the above mentioned methodology will be presented, with a special focus on the possible influence of climate change on sediment budgets.