

## **The role of dams in the global sediment budget**

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**Abstract** Dams and their associated reservoirs are a key element of water resource development in most areas of the world and dams have been constructed on many of the world's large rivers. The presence of dams causes sedimentation in the upstream reservoir and such sediment trapping can exert an important influence in reducing downstream sediment transport. Many of the world's rivers now provide evidence of declining sediment loads as a result of dam construction, and it is clear that dams currently exert an important influence on land-ocean sediment transfer and the global sediment budget. There is, however, currently considerable uncertainty regarding the precise impact of dams and reservoirs on the global sediment budget. Two different approaches can be used to quantify this impact. The first focuses on the reduction of the annual global land-ocean sediment flux and the second on quantifying the total amount of sediment being sequestered behind dams. Current estimates of the reduction in the annual land-ocean sediment flux range from 2 to 5 Gt year<sup>-1</sup>. However, existing estimates of the total amount of sediment being sequestered behind the world's dams are about an order of magnitude greater and in the range 25 to 60 Gt year<sup>-1</sup>. The apparent discrepancy between the results provided by the two different approaches requires further investigation.

**Key words** dams; sediment trapping; suspended sediment loads; global sediment budget; reservoir sedimentation