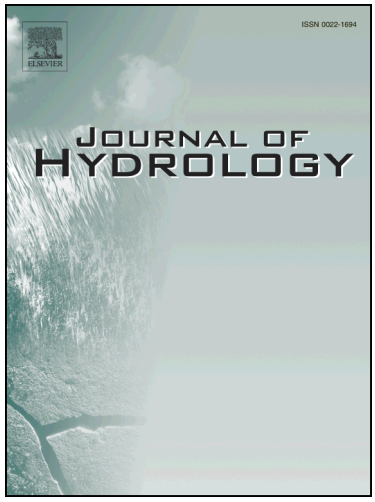

Research papers

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PII: S0022-1694(17)30593-0
DOI: http://dx.doi.org/10.1016/j.jhydrol.2017.08.057
Reference: HYDROL 22220

To appear in: *Journal of Hydrology*

Received Date: 10 March 2017
Revised Date: 30 August 2017
Accepted Date: 31 August 2017

Please cite this article as: Lai, X., Yin, D., Finlayson, B.L., Wei, T., Li, M., Yuan, W., Yang, S., Dai, Z., Gao, S., Chen, Z., Will river erosion below the Three Gorges Dam stop in the middle Yangtze?, *Journal of Hydrology* (2017), doi: http://dx.doi.org/10.1016/j.jhydrol.2017.08.057

Will river erosion below the Three Gorges Dam stop in the middle Yangtze?

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ABSTRACT

The environmental impact of the Three Gorges Dam has been a subject of vigorous academic, political and social debate since its inception. This includes the key issue of post-dam river channel erosion, which was predicted by the feasibility study to extend to the river mouth. In this paper we examine the geomorphic response of the channel of the middle Yangtze for 660 km downstream of the dam. Using data on channel characteristics, bed material and sediment transport, we show that in the decade following the dam closure, pre-dam seasonal erosion has been replaced by year-round erosion, a pattern most marked at the upstream end of the study area. The sediment carrying capacity of the river channel has been largely reduced below the dam. The locus of bed scour has moved progressively downstream, ceasing as the bed material became too coarse to be transported (e.g. D_{50}: 0.29 mm pre-dam coarsened to 20 mm below the dam by 2008). About 400 km below the dam there is a reduction in channel slope that changes the sediment carrying capacity from 0.25 kg m^{-3} to only