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Adjustment mechanism of the sand bars in the jingjiang reach after the impounding the three gorges

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After the application of the large reservoirs, the conditions of discharge and sediment are changed. Based on a large number of measured hydrological and topographic data, this paper studies the deformation characteristics of sandbars micro-geomorphology in sandy reach of jingjiang river after the impounding of the three gorges reservoir(TGD), and discusses the adjustment mechanism of sandbars. The result shows that the sandy bars showed the head scoured and the shrink of area, and the sandbars in the reach with revetment project was relatively stable. The evolution of the sandbars was mainly influenced by riverbed composition, discharge and sediment process and revetment project. The composition of the riverbed determined the scour resistance of the sandbars, while the change of flow process determined the location and property of scour and silting, and the amount of incoming sediment determined the extent of scour and silting, the implementation of revetment project was beneficial to sandbars stability. After the TGD operation, the erosion of the bars in the Jingjiang reach ranked the strongest when the discharges fall in 15000 m³/s~25000 m³/s. The duration of this flow range increased after the TGD operation in 2003, and the bars presented an erosion state. Due to the impacts of river bed armoring and the significantly reduced sediment, there existed certain interactive relationships between the adjustment in the erosion and deposition of bars and the changes in the percentage of the grain size belonging to 0.125<d<0.25mm. The reduction of the fine sand had a negative impact on the sedimentation of bars after erosion. The layout of the revetment project had a certain control effect on the sandy reach, but the unguarded sandy bars presented scour and deposition with the fluctuation of discharge and sediment process between years.