



Interactions between bars, sediment transport and river bifurcation: a case study of the Taipingkou waterway in Middle Yangtze River, China

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Common in bifurcated channels is shift of the dominating branch due to bed erosion/deposition. Based on field data analyses and numerical investigations, this paper presents a case study of the 2012-shift of the dominating branch from north to south side of the Sanba central bar of the Taipingkou waterway, at the middle reach of the Yangtze River, which worsened the navigational conditions of this waterway. The Key features of morphological evolutions, which led to such shift of the dominating branch, are identified from the field data and numerically reproduced by a shallow water hydro-sediment-morphodynamic model. Such key features include 1) the downstream-right translating movement of the Yanglinji side bar, which is located upstream of the north branch; 2) the intense erosion in the upper-left part of the Lalingzhou side bar; and 3) the intense deposition in its tail part. Prior to these typical morphological changes, the south branch had a larger flow partition during high water but a smaller flow partition during low water. Afterward, the south branch has larger flow partitions during both high water and low water.