**Description of the data and code files**

The excel file “change in bankfull area” includes the data of the average change in bankfull area at the 32 sub-reaches of the Yichang-Chenglingji reach during 2002-2020. The adjustment classes are also indicated by different colors in the file.

The excel file “water discharge and sediment load” shows the annual water discharge and sediment load at Qingxichang, Yichang, Zhicheng, Shashi and Jianli stations during 1991-2020, respectively.

The excel file “bed substrate in cases” shows the grainsize distributions in Cases A, B, C, D and S of numerical modeling.

The MATLAB code file “CaseA\_modeling” represents the numerical model used to simulate the case A in the paper. For simulation in other cases, the user only needs to change the grainsize distributions of the bed substrate (see the excel file “bed substrate in cases”).