

EGU21-3819

<https://doi.org/10.5194/egusphere-egu21-3819>

EGU General Assembly 2021

© Author(s) 2022. This work is distributed under the Creative Commons Attribution 4.0 License.



Morphological effects of a hydraulic lifting dam on the middle Fenhe River, China

Yufang Ni¹, Zhixian Cao¹, Wenjun Qi², Xiangbin Chai², and Aili Zhao²

¹Wuhan University, School of Water Resources and Hydropower Engineering, Department of Harbor, Waterway and Coastal Engineering, Wuhan, China (yufangni@whu.edu.cn)

²Authority of Fenhe River Basin of Shanxi Province, Taiyuan, China

Hydraulic lifting dams become increasingly popular in China for water storage, river landscaping and environmental restoration. Inevitably, dams influence riverine morphology. Unfortunately, current understanding of this topic has remained rather limited. Here, the morphological effects of a hydraulic lifting dam on the middle Fenhe River, China are investigated. This reach features a compound channel and floodplains, and the riverbed is mainly composed of silt that can be easily eroded, indicating potential significant bed deformation. A computationally efficient depth-averaged two-dimensional shallow water hydro-sediment-morphodynamic model is employed. Unstructured meshes are refined around dam structures to accurately present topography. The numerical predictions show discrepancies of morphological responses of the main channel and floodplains to different operation schemes of the hydraulic lifting dam. This work helps to support decisions on the management of hydraulic lifting dams on the middle Fenhe River and reveals a general pattern for the morphological impact of hydraulic lifting dam.