

Distributed runoff and sediment yield modelling of the Chabagou watershed in the middle reach of the Yellow River, China

TAO YANG¹, XI CHEN¹, JIEREN CHEN¹, WENYI YAO² & XUEJIAN SHI²

1 State Key Laboratory of Hydrology-Water Resources and Hydraulics Engineering, Hohai Univ., Nanjing 210098, China
enigama2000@hhu.edu.cn

2 Yellow River Institute of Hydraulics Research, Zhengzhou 450003, China

Abstract This paper discusses a distributed watershed runoff and sediment yield model supported with GIS tools, for the middle stream of the Yellow River, China. The Chabagou watershed was selected as a typical test area to study the distributed runoff and sediment yield model. The theories of runoff excess and kinematic wave for describing surface runoff generation and movement on the hillslope and the finite-difference method were adopted in the model development. The calculation formulae for soil erosion were deduced by means of the energy balance principle. The runoff and sediment yield at the watershed outlet can be routed from each cell, respectively, in a Preissmann implicit scheme. On the basis of calibration and validation results of 17 hydrological events from 1970 to 2001, it is shown that the model is able to simulate runoff processes and soil erosion in the hilly loess region.

Key words distributed; finite-difference method; high and coarse sediment; kinematic wave; runoff and sediment yield; Loess Plateau; Yellow River
