Geophysical Research Abstracts
Vol. 14, EGU2012-7051, 2012
EGU General Assembly 2012

Climate change impact on river wetted perimeter

JL Chiang (1) and HC Yang (2)

(1) Pingtung University of Science & Technology, Dept. of Soil and Water Conservation, Pingtung, Taiwan (jlchiang@mail.npust.edu.tw, 886-8-7740140), (2) Shu-Te University, Dept. of Leisure, Recreation and Tourism Management

Taiwan is situated in a subtropical region with frequent typhoons and earthquakes. Because of the non-uniform spatial and temporal distribution of rainfall, the steep terrain, and rapid rivers, the variation of river discharge is large and considerably affects habitats and the ecosystem. In particular, the ecosystem experiences more stress under the threat of climate change.

Wetted perimeter is one of the main parameters of habitat evaluation. A strong correlation exists between river discharge and wetted perimeter.

Frequency analysis was used to determine the wetted perimeter of various river discharges of various return periods in the Kaoping River. The variation of wetted perimeter along the river and variation caused by various discharges were also investigated. The wetted perimeters of various cross-sections along the river increased from 38 km close to the river mouth.

We discuss the potential impact of climate change on wetted perimeter by using HEC-RAS Model for simulation, in which the input river discharge was based on the results of GWLF simulation using rainfall and temperature data from various GCMs under A2 and B2 climate change scenarios.

The results indicate that the river discharge in the wet season increased considerably, whereas the discharge in the dry season decreased. This variation considerably affects the river habitats.Under climate change, the change of wetted perimeter was not considerable in wet season. The results indicated that the decrease of the wetted perimeter in the dry season in March was the most substantial for the long term. In the A2 scenario, the decrease of the wetted perimeter was in the range of 17% to 36%. In the B2 scenario, it was in the range of 16% to 31%. This result can assist in assessing the ecological river discharge requirements.