Geophysical Research Abstracts
Vol. 21, EGU2019-12946, 2019
EGU General Assembly 2019

Modifying BQART Model for Sediment Discharge in Subtropical Montane Rivers in Taiwan

Ying-Tong Lin and Jr-Chuan Huang
National Taiwan University, Department of Geography, Taipei, Taiwan (r06228004@gmail.com)

Sediment discharge linking the terrestrial to marine ecosystem is controlled by the climatic, tectonic, and anthropogenic forces. The BQART model which incorporated the four forces explicitly (geomorphic and tectonic influences, geography, geology, and human activities) was widely used to estimate the sediment discharge of catchments with the drainage area ranging from 102 to 107 km2. Recently, the sediment discharge in small mountainous rivers (SMRs), drainage area < 10,000 km2, have received great attention due to its disproportionate export compared with the large rivers, highlighting the necessity of a downscaling modification. Here, we focused on the lithology factor (L) and the human-influenced soil erosion factor (Eh) in BQART. For lithology factor, the soil pore water pressure was introduced to represent the landslide susceptibility which is the main source of sediment. Also, the forest cover fraction and population density were the surrogate for Eh. The model was applied to 114 catchments in Taiwan with the sediment discharge collected from 1971-2000.The Nash–Sutcliffe efficiency coefficient (NSE) of the original model is merely 0.17, while considering pore water pressure, NSE can increase about 0.29. On the other hand, if the forest area proportion is added into the model, NSE would rise 0.45, indicating the improvement of our modification. However, some significant overestimation and underestimation could be found in fluvial fans and the mud stone area, respectively. It suggested that the landscape and lithology still have some intrinsic control in sediment discharge, which need to be represented explicitly for the understanding of the sediment discharge in SMRs.