

The Application of the Water Erosion Prediction Project (WEPP) Model For The Estimation of Runoff and Sediment on a Monthly Time Resolution

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ABSTRACT

The Water Erosion Prediction Project (WEPP) model is utilized to simulate the sediment and runoff processes. According to previous studies, WEPP model provides impressive results in watersheds of diverse climates and scales. It is also capable of modeling the sediment transportation processes and consequently predicting subsequent deposition sites. In this study, the geo-spatial interface for WEPP (GeoWEPP) was employed as a GIS framework to extract the data required from the ASTER Global Digital Elevation Model (ASTER-GDEM) dataset which was subsequently used as the model input. The case study was based on monthly data consisting of average sediment and runoff estimation from the Emameh subbasin, in northern Iran. The model estimations were validated through field measurements. Two statistical measures of co-efficiency including the Nash–Sutcliffe Efficiency (NSE), and the coefficient of determination (R^2) were considered to evaluate how well the model predictions could explain the variability of observations in the field. The model performed favorably as corroborated by a reasonably high NSE of 0.99 and an R^2 value of 0.92 for sediment. In the case of runoff, the results were slightly inferior, but still acceptable with an NSE of 0.76 and R^2 value of 0.62.

KEYWORDS: ASTER-GDEM; Emameh; Runoff; Sediment; WEPP

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