

Event-based, Water-induced Soil Erosion Modeling for Medium Watersheds in Yen Bai province, Vietnam Using the KINEROS2 Model

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Key words: Water-induced soil erosion; KINEROS2; Sediment yield, flow; Discharge; Yen Bai

SUMMARY

The problem of water, soil erosion has become an important issue in the North of Vietnam. Modeling its processes might help better understanding and quantifying the development of erosion. Based on data availability, climate condition and scale (medium watershed and event-based rain) we decided to use the KINEROS2 model for this research. The changing in land use practices has significant impact on reduction of saturated hydraulic conductivity (K_s), thus, increases the Horton overland flow (HOF) and eventually exaggerates soil erosion. On the model simulation stage, we found that the boundary conditions and the parameter sensitive tests were crucial for estimation of model outputs, these converged to measured data. Interestingly, the use of finer temporal resolution (5 minutes) of radar rainfall (accumulative 144 mm) produced much lower sediment yield (SeY) rates comparing to satellite precipitation (30 minutes, accumulative 138 mm). Although each tested variable had different effects on model outputs, the K_s presented a most sensitive parameter to SeY in both channels and on planes, following by soil saturation index (S) and hillslope roughness (R). The geomorphological resolutions based on critical source area (CSA) defining modeling resolutions were founded remarkable for estimation soil loss and must be determined with care. Finally, changing in land uses resulted in soil erosion was mapped with significant rises in SeY for whole Man Kim and in some areas in Nam Khat watershed.