



Spatially distributed modelling of hill-slope sediment delivery to river channels in the Murrumbidgee catchment, Australia.

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Sediment yield data derived from long-term sedimentation rates in 26 small farm dams in SE Australia, were used to calibrate WATEM/SEDEM, a spatially distributed soil erosion and sediment delivery model. For three different land use categories (poor, moderate and good vegetative cover) a sediment transport capacity coefficient was calibrated. All other parameters being equal, it was found that sediment transport capacity for cropland is 2 times higher than for degraded pasture and 20 times higher than native forest and good pasture. Model efficiencies for the prediction of specific and total sediment yield are 0.56 and 0.89, respectively. Several of the catchments that were used for the calibration have very high sediment yield rates, which is attributed to the presence of gullies. The good performance of WATEM/SEDEM to all catchments, suggests that gully erosion is taken into account using the 2D calculation of the LS-factor. Next, the calibrated WATEM/SEDEM was applied to the Murrumbidgee river basin (30.000 km²). A mean annual sediment input into the river channels from the hillslopes of 685.000 t was predicted. The spatial pattern of suspended sediment delivery in the Murrumbidgee indicates that most of the sediment originates from a few tributaries downstream of Burrinjuck Reservoir. Given the fact that high-resolution datasets (including digital elevation models) are becoming available at reasonable cost, WATEM/SEDEM provides a powerful tool to predict sediment yield under different environments including the spatial patterns of hillslope generated sediment fluxes.