



## **A new dynamic, hillslope scale rangeland erosion model for Kineros2**

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A soil erosion model for rangelands with simple data requirements and wide range of applicability with well developed parameter database is needed. A new rangeland overland-flow erosion model was developed based on KinEros2 hydrology and a dynamic erosion equation with WEPP (Water Erosion Prediction Project)-like source/sink terms. Model response was tested for steady state conditions so that the output could be compared with that given by WEPP. Then total sediment yield was estimated for rainfall simulation plots from the WEPP field experiments. Also, soil loss dynamics was plotted and compared with experimental results for plots. Lastly, the model was tested on a small watershed in Walnut Gulch, AZ that did not have a well-developed channel network. Predicted and measured total soil losses as well as erosion rate dynamics were compared. The outputs for plot and hillslope scale simulations were in the range of possible natural variability, which implies that the validation was successful. The new model provides information on erosion rates and dynamics, has up-to-date erosion mechanics descriptions, is sensitive to treatment differences on the experimental plots, and has a well-developed parameter database.