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Hillslope hydrological response using catena pedology

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Hydrological responses of hillslopes have been observed in a number of small research catchments (1-2sq.km) throughout South Africa. Hydrometric observations, geophysical techniques and isotope sampling have been combined to define and quantify a range of hillslope responses in these catchments. These hillslope responses have been grouped into typical pedohydrology catena behaviours and applied to the observed runoff responses using a transfer function model. The simulation model includes land segment units linked together to make up a catena response. Each land segment comprises four subsurface layers which are linked to layers in downslope land segments according to the pedohydrological response type. In applying the model to a large scale catchment (137sq.km), standard soil surveys maps are used to develop the hydropedological reponse types. The paper demonstrates the techiques of pedotransfer function development and application in research catchments on differing geologies and in the large scale catchment.