

Assessing the applicability of the Revised Universal Soil Loss Equation (RUSLE) to Irish Catchments

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Abstract Elevated suspended sediment concentrations in fluvial environments have important implications for system ecology and even small concentrations may have serious consequences for sensitive ecosystems or organisms, such as freshwater pearl mussels (*Margaritifera margaritifera*). Informed decision making is therefore required for land managers to understand and control soil erosion and sediment delivery to the river network. However, given that monitoring of sediment fluxes requires financial and human resources which are often limited at a national scale, sediment mobilisation and delivery models are commonly used for sediment yield estimation and management. The Revised Universal Soil Loss Equation (RUSLE) is the most widely used model for overland flow erosion and can, when combined with a sediment delivery ratio (SDR), provide reasonable sediment load estimations for a catchment. This paper presents RUSLE factors established from extant GIS and rainfall datasets that are incorporated into a flexible catchment modelling approach. We believe that this is the first time that results from a RUSLE application at a national scale are tested against measured sediment yield values available from Ireland. An initial assessment of RUSLE applied to Irish conditions indicates an overestimation of modelled sediment yield values for most of the selected catchments. Improved methods for model and SDR factors estimation are needed to account for Irish conditions and catchment characteristics. Nonetheless, validation and testing of the model in this study using observed values is an important step towards more effective sediment yield modelling tools for nationwide applications.

Key words Ireland; soil loss modelling; RUSLE; sediment yield; validation