

## **Estimating soil erosion and sediment yield with GIS, RUSLE and SEDD: A case study in Ireland**

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Soil erosion by water and sediment transportation has been observed in Ireland but not well documented. This study evaluates soil erosion in Ireland using the widely accepted empirical model of the Revised Universal Soil Loss Equation (RUSLE). In addition we estimate the sediment yield using the empirical model, Sediment Distribution Delivery (SEDD). Risk assessment is also performed based on different soil erosion risk scenarios concerning the changes of climate and land use. Geographical Information System (GIS) techniques have been applied to harmonize the available datasets for input to the two models. Key components of the models include: the rainfall runoff erosivity (R) factor; the soil erodibility (K) factor, and the land cover management (C) factor in the RUSLE Model and the surface roughness coefficient ( $k_i$ ) in the SEDD Model. These parameters were derived from existing precipitation data, soil associations of Ireland and Coordination of Information on the Environment (CORINE) land cover data. Results from the two models showed that the overall soil erosion and sediment transportation in Ireland is low due to a pasture-dominated land cover and mild slopes despite relatively high precipitation across the country. This was also supported by results employing predicted climate changes from Community Climate Change Consortium for Ireland (C4I) and land cover change scenarios. The integrated approach allows for relatively easy, fast, and cost-effective estimation of spatially distributed soil erosion and sediment delivery, and provides a framework to perform similar analyses elsewhere.