



Soil erosion under climate change in Great Britain: long-term simulations using high-resolution regional models

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Twenty-first century climate change simulations for Great Britain reveal an increase in heavy precipitation that may lead to widespread soil loss and reduced soil carbon stores by increasing the likelihood of surface runoff. We find the quality and resolution of the simulated rainfall used to drive soil loss variation can widely influence the results. Hourly high definition rainfall simulations from a 1.5km resolution regional climate model are used to examine the soil erosion response in two UK catchments.

The catchments have different sensitivity to soil erosion. “Rother” in West Sussex, England, reports some of the most erosive events that have been observed during the last 50 years in the UK. “Conwy” in North Wales, is resilient to soil erosion because of the abundant natural vegetation cover and very limited agricultural practises.

We modelled with Erosion3D to check variations in soil erosion as influenced by climate variations for the periods 1996-2009 and 2086-2099.

Our results indicate the Rother catchment is the most erosive, while the Conwy catchment is confirmed as the more resilient to soil erosion. The values of the reference-base period are consistent with the values of those locally observed in the previous decades. A soil erosion comparison for the two periods shows an increasing of sediment production (off-site erosion) for the end of the century at about 27% in the Rother catchment and about 50% for the Conwy catchment. The results, thanks to high-definition rainfall predictions, throw some light on the effect of climatic change effects in Great Britain.