



Seasonal variations of soil erosion in UK under climate change: simulations with the use of high-resolution regional climatic models

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Climate change is expected to have a significant impact on the hydrological cycle, twenty-first century climate change simulations for Great Britain forecast an increase of surface runoff and flooding frequency.

Once quality and resolution of the simulated rainfall deeply influence the results, we adopted rainfall simulations issued of a high-resolution climate model recently carried out for extended periods (13 years for present-day and future periods ~2100) at 1.5 km grid scale over the south of the United Kingdom (simulations, which for the future period use the Intergovernmental Panel on Climate Change RCP 8.5 scenario, Kendon et al., 2014).

We simulated soil erosion with 3D soil erosion model Schmidt (1990) on two catchments of Great Britain: the Rother catchment (350 km²) in West Sussex, England, because it has reported some of the most erosive events observed during the last 50 years in the UK, and the Conwy catchment (628 Km²) in North Wales, which is extremely resilient to soil erosion because of the abundant natural vegetation. Estimation of changes in soil moisture, saturation deficit as well as vegetation cover at daily time step have been done with the Joint UK Land Environment Simulator (JULES) (Best et al, 2011).

Our results confirm the Rother catchment is the most erosive, while the Conwy catchment is the more resilient to soil erosion. Sediment production is perceived increase in both cases for the end of the century (27% and 50%, respectively). Seasonal disaggregation of the results reveals that, while the most part of soil erosion is produced in winter months (DJF), the higher soil erosion variability for future periods is observed in summer (JJA). This behaviour is supported by the rainfall simulation analyse which highlighted this dual behaviour in precipitations.