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Modelling soil erosion at European scale: the importance of management practices and the future climate and land use scenarios

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The implementation of RUSLE2015 for modelling soil loss by water erosion at European scale has introduced important aspects related to management practices. The policy measurements such as reduced tillage, crop residues, cover crops, grass margins, stone walls and contouring have been incorporated in the RUSLE2015 modelling platform. The recent policy interventions introduced in Good Agricultural Environmental Conditions of Common Agricultural Policy have reduced the rate of soil loss in the EU by an average of 9.5% overall, and by 20% for arable lands (*NATURE, 526, 195*). However, further economic and political action should rebrand the value of soil as part of ecosystem services, increase the income of rural land owners, involve young farmers and organize regional services for licensing land use changes (*Land Degradation and Development, 27 (6): 1547-1551*).

RUSLE2015 is combining the future policy scenarios and land use changes introduced by predictions of LUISA Territorial Modelling Platform. Latest developments in RUSLE2015 allow also incorporating the climate change scenarios and the forthcoming intensification of rainfall in North and Central Europe contrary to mixed trends in Mediterranean basin. The rainfall erosivity predictions estimate a mean increase by 18% in European Union by 2050. Recently, a module of CENTURY model was coupled with the RUSLE2015 for estimating the effect of erosion in current carbon balance in European agricultural lands (*Global Change Biology, 22(5), 1976-1984; 2016*).

Finally, the monthly erosivity datasets (*Science of the Total Environment, 579: 1298-1315*) introduce a dynamic component in RUSLE2015 and it is a step towards spatio-temporal soil erosion mapping at continental scale. The monthly mapping of rainfall erosivity permits to identify the months and the areas with highest risk of soil loss where conservation measures should apply in different seasons of the year. In the future, the soil erosion-modelling platform will incorporate the land use intra-annual variability, sediment transport and economic assessments of land degradation.

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