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Towards a Reproducible Pan-European Soil Erosion Risk Assessment - RUSLE

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Soil is a valuable, non-renewable natural resource that offers a multitude of ecosystems goods and services. Given the increasing threat of soil erosion in Europe and the implications this has on future food security and water quality, it is important that land managers and decision makers are provided with accurate and appropriate information on the areas more prone to erosion phenomena.

The present study shows an attempt to locate, at regional scale, the most sensitive areas and to highlight any changes of soil erosion trends with climate change. The choice of the input datasets is crucial as they have to offer the most homogeneous and complete covering at the pan-European level and to allow the produced information to be harmonized and easily validated. The model is based on available datasets (HWSD, SGDBE, SRTM, CLC and E-OBS) and The Revised Universal Soil Loss Equation (RUSLE) is used because of its flexibility and least data demanding.

A significant effort has been made to select the better simplified equations to be used when a strict application of the RUSLE model was not possible. In particular for the computation of the Rainfall Erosivity factor a validation based on measured precipitation time series (having a temporal resolution of 10-15 minutes) has been implemented to be easily reproducible. The validation computational framework is available as free software.

Designing the computational modeling architecture with the aim to ease as much as possible the future reuse of the model in analyzing climate change scenarios has also been a challenging goal of the research.