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In western Europe, soil erosion rates are relatively low from a global perspective. The major impact of soil erosion in western Europe is off-farm: damage to properties, roads and watercourses. But often, fields which are identified – by observation or modelling – as being at high risk of erosion are not the sites which contribute to the off-site damage. Instead, the fields responsible for most of the off-site damage are those that are either adjacent to, or well connected with, the sites of damage; such fields may be assessed as having a low risk of erosion. The issue is connectivity, not simply high erosion rates.
Here we show that strongly-connected within-catchment flows of runoff and sediment may travel via topographic concentration lines (dry valleys) and anthropogenic features such as tracks, roads, ditches, culverts and field drains. These anthropogenic features may not be recorded on digital or paper maps. Even if they are recorded, essential attributes such as the state of maintenance of a ditch (i.e. whether blocked or clean) are not recorded. Without proper consideration of these elements, field/catchment-scale erosion models cannot be expected to adequately represent within-catchment flow routing, and hence cannot adequately determine the ‘hotspot’ fields which make the greatest contribution to these flows. Field observation, aided by remote sensing, is essential to properly quantify the role of these elements in connected agricultural systems. A soil erosion control policy solely based on predicted erosion rates on fields, taking no account of each field’s contribution of off-site damage, can be very misleading. Administrations/policymakers must take this into account when implementing new agricultural soil erosion regulations.