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Mapping the changing risk of land degradation, ephemerality and water quality across Europe

B. Irvine (1), M. Kirkby (1) and P. Chapman (1)
(1) School of Geography, University of Leeds, UK (b.j.irvine@leeds.ac.uk)

Ephemeral and seasonally flowing streams carry a large fraction of the runoff, sediment and nutrients removed from agricultural land, and in urban storm and wastewater. Climate, geology and land management are all significant factors in the occurrence of ephemeral or intermittent streams in semi-arid areas. As well as the pressures from changing climate, continuing increases in agricultural and urban loading are exacerbating the extent and impact of ephemerality on downstream water quality. Sparse vegetation cover and high soil water fluctuations ensure that semi-arid areas are always prone to high levels of erosion and secondary salinisation, and these risks are likely to increase with greater climatic and agricultural pressure.

The coarse scale PESCAS model estimates current land (and water) degradation risk and how this is likely to evolve with future climate and water demand. This provides regional maps for the changing extent of ephemeral and intermittent streams and the inferred risk to water quality, making use of available data and scenario based forecasts for agricultural, urban and climate loading. The model provides a simplified and physically based tool to explore changing mosaics of land and water quality risk across Europe taking proper account of both small and large catchments.