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## Global water soil erosion risk associated with climate change

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Water-driven soil erosion is the most widespread form of soil degradation worldwide, which threatens to the sustainability of agriculture. Climate change may aggravate the threat of erosion. On the basis of the Revised Universal Soil Loss Equation, combined with Geographic Information Systems (GIS), we assessed spatiotemporal variances in global water erosion risk trends during the period 1992–2015 using the linear regression model. The research objective was to explore the spatial pattern of global water erosion risk change in recent decades and to identify the driving factors. The results show that the global water erosion risk increased over 54% of the surface during 1992–2015, with an average rate of  $0.17 \text{ t}\cdot\text{ha}^{-1}\cdot\text{yr}^{-2}$ . The lands with significant increasing trends ( $p < 0.05$ ) accounted for 12% of global lands, with an average rate of  $0.27 \text{ t}\cdot\text{ha}^{-1}\cdot\text{yr}^{-2}$ . In which, over 75% regions with significant increasing trends were croplands and forest lands in the cold climate zone as the rainfall intensity increased. However, the increasing rates of soil erosion risk on bare lands and croplands were extremely larger than that on lands with natural vegetation, which means that water erosion on natural lands had much lower sensitive to rainfall changes. These results suggest that improving vegetation conditions in the region with sensitive climate change could reduce the erosion threat.