



## **Modelling global anthropogenic sediment fluxes in the Holocene**

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A large fraction of natural vegetation has been cleared to provide agricultural cropland, which accelerates erosion by one to two orders of magnitude. Quantification of the accelerated erosion flux is important in order to understand the role of human activities in ecosystem evolution given that soil erosion not only causes on site effects on soil degradation and soil organic carbon (SOC) cycling but also off site effects on the water quality. In this study, we first evaluated and constrained existing ALCC scenarios by comparing observed cumulative sediment fluxes with our model simulations. We further applied a spatially distributed erosion model under the optimized land use scenario at the global scale. Simulation shows that conversion from natural vegetation to cropland has caused a global cumulative agricultural sediment flux of 28000 Pg for the period of agriculture. This results in an average cumulative sediment mobilization of 1890 kg m<sup>-2</sup> on the croplands, i.e. a soil truncation of ca. 1.3 m. Regions of early civilization and high cropland fractions such as South Asia, Southeast Asia and Central America have higher area-averaged anthropogenic erosion than other regions.