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Assessment of the spatial distribution of global soil loss tolerance by using the productivity index method

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The soil loss tolerance (T value) is the ultimate criterion for determining whether a soil has potential erosion risks. While the existing T value criteria are mainly on national scale, and lack of consideration of the differences in soil erosion, soil properties and soil productivity between different types of land use. We calculated the global T value by using the productivity index method. The global T values ranged from 0.84 to 4.99 Mg ha^{-1} yr^{-1}, with an average of 1.49 Mg ha^{-1} yr^{-1}. The distribution of T values in global scale demonstrated significant spatial differences, and the range of T values in most regions of the land (98.23%) was between 1.0 and 2.0 Mg ha^{-1} yr^{-1}. The mean T values varied from c ontinent to continent, with Africa and Oceania having higher mean T values than other continents. The T values between different land use types varied widely, and the T values of five land use types were as follows: cropland (1.67 Mg ha^{-1} yr^{-1}) > shrubland (1.61 Mg ha^{-1} yr^{-1}) > grassland (1.59 Mg ha^{-1} yr^{-1}) > forestland (1.38 Mg ha^{-1} yr^{-1}) > wetland (1.28 Mg ha^{-1} yr^{-1}).