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Changes in soil conservation service and its driving factors: case studies in global top five largest basins

Yiming An and Wenwu Zhao
Beijing Normal University, Beijing, China (anyiming2010@163.com)

Soil conservation service is an important regulating ecosystem service. We estimated the soil conservation rate of the top five largest basins in the world from 2000 to 2018, classified the trend of conservation rate for each basin and each location as four types (i.e., significant decrease, decrease, increase and significant increase), and analyzed the relationships between soil conservation rate and driving factors. Results show that the Yangtze River basin produces the highest average soil conservation rate (with the value of 1429.68 t ha^{-1} yr^{-1}). The Yangtze, Mississippi and Yellow River basins show a generally increasing conservation trend. Partial principal component analysis between soil conservation rate and driving factors show that slope gradient has the greatest impact on soil conservation rate, followed by rainfall and NDVI. Vegetation greening (increasing NDVI) could partly offset the effect of increasing rainfall on soil conservation rate in the Mississippi and Yellow River basins. More direct and quantitative variables should be used to represent human activities to analyze the impact on soil conservation change.