



Responses of water erosion processes to natural rainfall change in terrestrial ecosystems

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Water erosion is the most destructive erosion type worldwide, causing serious land degradation and environmental deterioration. Rainfall is the most important factor for water erosion generation. Against a background of climate change and accelerated human activities, changes have taken place and will be expected to become more in natural rainfall regimes worldwide. rainfall variables will change and rainfall extremes will experience more frequently. Such long-term shifts may challenge the existing cultivation systems worldwide and eventually alter the spatiotemporal patterns of land use and topography. Meanwhile, specific features of soil crusting/sealing, plant litter and its decomposition, antecedent soil moisture content (ASMC) all will change accompanying rainfall variability. All these changes will increase pressures on soil erosion and hydrological processes, making accurate erosion prediction and control more difficult. An improved knowledge and understanding of this issue, therefore, is essential for dealing with the forthcoming challenges regarding soil and water conservation practices. In this paper, the characteristics of changes in natural rainfall, its role on terrestrial ecosystems, the challenges, and its effect on surface water erosion dynamics are elaborated and discussed. The major priorities for future research are also highlighted, and it is hoped that this will promote a better understanding of water erosion processes and related hydrological issues.