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Loose sediments distribution and its relationship with aeolian desertification in the Tibetan Plateau

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The study of the spatial pattern of loose sediments is of great theoretical and practical significance for the prevention and control of desertification. The problem of land desertification in the Tibetan Plateau is prominent, but there are few studies on the spatial distribution characteristics of loose sediments which are the material basis of aeolian desertification. In this study, remote sensing data and field survey data were used to obtain the spatial distribution of surface material type of Tibetan Plateau by visual interpretation of human-computer interaction. The spatial characteristics of loose sediments and their regional heterogeneity were analyzed, and the relationship between the spatial pattern of different types of sediments and their potential influencing factors was evaluated. Finally, the relationship between the spatial pattern of loose sediments and land desertification is discussed. We report that: (1) Loose sediment accounts for 37.4% of the total area of the Tibetan Plateau, sediment types mainly include eluvium-deluvium, proluvium, outwash deposits, lacustrine deposits and fluvial sediments, which are accounting for 17.0%, 12.0%, 3.2%, 2.1% and 1.6% of the total area, respectively. Characteristic combinations of sediment types in the different areas are different, which shows wide regional differences. (2) The spatial distribution of loose sediments in the Tibetan Plateau is mainly controlled by the geomorphological pattern of the plateau. Geomorphological type, Terrain relief and slope have a good effect on the spatial distribution of loose sediments. (3) The loose sediment types in the Tibetan Plateau determines the type of aeolian desertified land. Sandy desertification, gravel desertification, and wind-eroded badland are closely related to proluvium and fluvial sediments, proluvium-outwash deposits and eluvium-deluvium, and lacustrine deposits, respectively