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## Identification of Dominant Factors Affecting Soil Erosion and Water Yield within Key Ecological Functional Areas

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Soil conservation and water retention are important metrics for designating key ecological functional areas. However, research on the quantitative identification of dominant environmental factors in different ecological functional areas remains relatively inadequate, which is unfavorable for zone-based management of key ecological functional areas. This paper presents a case study of Beijing's key ecological functional areas. In order to objectively reflect the ecological characteristics of key ecological functional areas in Beijing which is mainly dominated by mountainous areas, the application of remote sensing data about high resolution is important for the improvement of model calculation and spatial heterogeneity. Based on multi-source remote sensing data, meteorological and soil observations, soil erosion and water yield were calculated using the Revised Universal Soil Loss Equation (RUSLE) and Integrated Valuation of Ecosystem Services and Tradeoffs (InVEST) model. Combining the influencing factors, including slope, precipitation, land use type, vegetation coverage, geomorphological type and elevation, a quantitative attribution analysis was performed on soil erosion and water yield in Beijing's key ecological functional areas using the geographical detector. The power of each influencing factor and their interaction factors in explaining the spatial distribution of soil erosion or water yield varied significantly among different key ecological function areas. Vegetation coverage was the dominant factor affecting soil erosion in Beijing's key ecological function areas, explaining greater than 30% of its spatial heterogeneity. Land use type can explain the spatial heterogeneity of water yield more than 60%. In addition, the combination of vegetation coverage and slope was found to significantly enhance the spatial distribution of soil erosion (>55% in various key ecological functional areas). The superposition of land use type and slope explained greater than 70% of the spatial distribution for water yield in key ecological functional areas. The geographical detector results indicated that the high soil erosion risk areas and high water yield areas varied significantly among different ecological functional areas. Thus, in efforts to enhance key ecological functional areas protection, focus should be placed on the spatial heterogeneity of soil erosion and water yield in different ecological functional areas.