

Using source-sink landscape theory to investigate factors influencing ecological processes in Kaiyang County, China

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Abstract

How landscapes affect ecological processes is an important area of research that needs to be developed. To reveal the mechanisms of ecological processes, a study was carried out in Kaiyang County, China. Source-sink landscapes and the mechanisms influencing ecological processes were identified using correlation analysis and regression analysis. The results showed that: urbanization led to more land being used for construction and less cultivated land, forest land, and grassland. Some types of land use as source landscapes contributed to the thermal process, while others did the opposite. This was true at both the city scale and the county scale. Source and sink landscape changes were investigated as factors potentially influencing ecological processes: a relationship model between source-sink landscapes and thermal process provided significant correlation. The source-sink landscapes area ratio at the city scale versus the county scale was 1.6, changing the ecological landscape from a low scale to high scale did not affect the mechanisms influencing ecological processes. Temperature is the limiting factor for NPP and precipitation was a further consideration based on the temperature state. The study provides an effective reference for exploring the mechanisms influencing ecological processes and understanding the mechanism of ecosystem-scale transformation, and could be used as a basis for the regulation of ecosystem functions.

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