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Landscape pattern dynamics of water body in Kaifeng city in the 20th century

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Landscape spatial pattern mainly refers to the distribution of patches, which are different in size and shape in space owing to the interaction of various ecological activities. In landscape ecology study, landscape pattern has been one of the key study areas. Water body landscape plays an important role in the development history of a city, but at present city water body landscape in many cities has been destroyed, hence protecting water body in the city is becoming more and more important. In order to protect city water body landscape reasonably, the precondition is to probe the dynamics of water body landscape. Based on historical data and remote sensing data, six indexes including patch number, patch area, landscape dominance index, fractal dimension, patch density and connectivity index etc. were used to analyze landscape pattern dynamics of water body in Kaifeng city since the end of the Qing Dynasty (in the 20th century). The results showed: (1) Since the end of the Qing Dynasty, landscape area of water body in Kaifeng city increased first and then decreased from 1898 to 2002AD; the landscape dominant degree had the same changing tendency with the area. (2) Patch number of water body landscape in Kaifeng city had an increase from 1898 to 2002, but maximum area of patch, minimum area of patch and average area of patch decreased, which resulted in an increase in landscape fragment degree. (3) Connectivity index decreased and fractal dimension increased from 1898 to 2002. The reasons for these changes were the repeated overflows and flooding of the Yellow River and the influence of human activities.

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关键词: Landscape pattern; water body; dynamics; Kaifeng city; the early 20th century