Land Use/Cover Change in the Upper Reaches of Minjiang River and Its Response to Hydrological Characteristics

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Scientists have aimed at exploring land use and land cover change (LUCC) and modelling hydrological response in order to improve our understanding of the consequences of these phenomena. We studied on upper reaches of Minjiang river, based on ArcGIS spatial analysis tools and four land use/cover change (LUCC) during the period from 1980 to 2010, the land-use transition matrix were generated and land use/cover change (LUCC) were assessed using landscape index(Shannon's diversity index, area-weighted mean shape index), then we used SWAT（Soil and Water Assessment Tool）, Model calibration was conducted using runoff data from 1980 to 1985, runoff data from 1986 to 1990 were used for model validation. Established different landuse change scenarios, to evaluate the impact of land use change on hydrological characteristics such as runoff evaporation and rainfall. The result shows that The area of cropland continued to decrease, and the two-way transformation was dominated by woodland and grassland, which was influenced by human activities. The parameters of the SWAT were consistent with the accuracy requirements of the simulation. In different scenarios, the reduction of forest vegetation area had a significant effect on runoff, and there was a negative correlation between runoff and evapotranspiration. The results provide important reference and recommendations for water resources management and rational planning of land use in the upper reaches of Minjiang River.