

The response of ecological security to land use change in east and west subtropical China

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Abstract

Regional land use change and ecological security have received considerable attention in recent years. The rapid economic development of Kunming and Fuzhou has resulted in environmental damage. It is important to conduct a comparative analysis of the ecological security response to land use/land cover change (LUCC) in different natural zones. With the support of Google Earth Engine (GEE) platform, the random forest and support vector machine methods were used to classify land cover types in the study area, then the ArcGIS platform was used to analyze LUCC. The driving force-pressure-state-impact-response (DPSIR) model and entropy weight method was used to construct an ecological security evaluation system, and gray correlation was used to compare the ecological security responses to LUCC in Kunming and Fuzhou. The findings revealed that: (1) The average dynamic degrees of comprehensive land use in Kunming and Fuzhou from 1995 to 2020 were 1.05% and 0.55%, respectively; (2) From 1995 to 2020, the ecological security index values for Kunming and Fuzhou increased from 0.42 to 0.52 and from 0.36 to 0.68, respectively, indicating that Fuzhou's index is rising more quickly; and (3) The response of ecological security to LUCC varies across regions; increases in the woodland area had a positive effect on the ecological security of Kunming and Fuzhou, whereas the expansion of construction land significantly impeded the improvement of ecological security in Fuzhou, and the status of water resources had a significant impact on the ecological security of Kunming.

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