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Modeling the spatial relationship between urban ecological resources and the economy

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1 Modeling the Spatial Relationship between Urban Ecological Resources and the Economy

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9 **Abstract**

10 The relationship between a city's economic development and the ecological resource cost of that
11 development is an important area of research, although the results vary between different study areas and with
12 methods of inquiry. Using spatial match degree and econometric methods, urban economic success, as indicated
13 by GDP and ecological resource base as indicated by vegetation cover (NVDI), for cities along the Beijing to
14 Guangdong high-speed railway were compared. Then those samples were divided into four different terrain area
15 groups for a deeper analysis. Finally, a negative correlation between ecological resource and economy was
16 revealed. A few different detailed spatial characteristics of the environmental costs of economic development were
17 found in the different terrain areas. And, most cities consuming more environmental resources than they were
18 expected according to their economic scale, which was thought unsustainable.

19 **Keywords**

20 Ecological resources; NDVI; Urban economy; Modeling; Spatial relationship; Regression

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22 **1. Introduction**

23 Urbanization and economic development are coupled with environmental quality and ecological resources
24 (Peters et al. 2010, Lin et al. 2014). On the one hand, the scale of resource use expands with increases in urban
25 population, economic development, urban expansion and improvements in standard of living, resulting in massive
26 natural resource consumption and the generation of different types of pollution (Cui et al. 2015, Yao et al. 2015).
27 The speed and intensity of human disturbance have exceeded the speed of ecosystem recovery, leading to
28 substantial cumulative and even irreversible environmental damage (MA 2005, Han et al. 2015). Eventually
29 resource depletion and environmental deterioration will hamper economic growth. This decline will cause a
30 vicious cycle of unsustainable urbanization. On the other hand, with increasing economic growth, environmental

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