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Identification of spatial variation in road network and its driving patterns: economy and population

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ABSTRACT: China is a globally important ecosystem that is undergoing rapid development and land use/cover change (LUCC). The role of road networks in the LUCC is becoming increasingly important. Much of the upgrading in road networks is propelled by economy and population growth. However, the relationships between the road networks and the social-economic factors are poorly understood by using the ordinary least squares (OLS) regression, which assumes that the estimated beta value holds the same everywhere within a given study area. To determine whether there is spatial variation in the relationship between the road networks and the social-economic drivers in a given region, we employed a local model, geographically weighted regression (GWR), that provides a regression coefficient (beta) for each sample location within the study area. Taking Fujian Province, one of the most developed regions in China, as a case, this paper firstly employed an Exploratory Spatial Data Analysis (ESDA) to identify the spatial patterns of the road networks at the different sizes of sampling units. We found that the spatial distribution of road networks had an obvious tendency toward the geographical dependency, with High-High clusters seated in the eastern coastal areas and Low-Low clusters distributed dispersedly in the study area. The spatial

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