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Abstract: Covering a large area and population, urban agglomeration (UA) is an advanced and competitive form of urbanization but brings serious unbalanced economic growth and uncoordinated sustainability. In this paper, we design an evaluation framework to assess the comprehensive carrying capacity of the UA (UCC) in the Yangtze River Economic Belt (YREB), involving its river-basin specificities. A series of spatial analyses are conducted to reveal the spatial differentiation of sustainable development. The results show that the comprehensive UCC has a fluctuating downward trend, and the UCC compositions of four sub-systems contribute differently. There is a large gap in UCC value among the five sub-UAs in the YREB, which indicates that the unbalanced and diverse sustainable development in UAs cannot be neglected. From a dynamic perspective, the spatial differentiation is increasingly noticeable, and the pattern of spatial clustering transforms into discrete small areas. This transformation implies that many hot spot cities have preferred coordinated cooperation within a small region rather than the whole UA in recent years. Some policy suggestions should be further provided. Our study makes contributions to UA's sustainable development research, and some findings could be used as the reference for future decision-making.

Keywords: Urban Comprehensive Carrying Capacity; Spatial Autocorrelation; Spatial Differentiation Study; Hot Spots Analysis; Sustainable Development.