Geophysical Research Abstracts
Vol. 21, EGU2019-4235, 2019
EGU General Assembly 2019

Evaluation of Sustainable Development and Scenario Analysis Based on the Three-Dimensional Ecological Footprint Model in Jing-Jin-Ji Urban Agglomeration, China

Wenyu Hou
Peking University, Beijing, China (houwy@pku.edu.cn)

Jing-Jin-Ji urban agglomeration is one of the three major urban agglomerations in China. The sustainable and coordinated development of Jing-Jin-Ji urban agglomeration has been a hot topic in urban, environmental and regional development research. In this study, a multi-dimensional sustainable development evaluation system based on three-dimensional ecological footprint was established to evaluate the sustainable development state of 13 cities in Jing-Jin-Ji urban agglomeration in 2005 and 2015. Further, we set different scenarios of demographics, carbon emissions and land use to predict the sustainable development state of this urban agglomeration in the future and make trade-offs. The results show that compared with 2005, the natural capital mobility of cities in the Jing-Jin-Ji urban agglomeration was decreased, the sustainability was weakened, and the ecological utilization efficiency was improved. The distribution of natural capital flow per capita was relatively balanced, but the degree of unfairness increased; according to the current trend, the natural capital mobility of cities in the Jing-Jin-Ji urban agglomeration will be further reduced in 2025, and eight cities will consume more natural capital stocks. The urban ecological utilization efficiency will be greatly improved, and the difference in the consumption of natural capital stocks will increase in different cities; Energy-conservation and emission-reduction scenario will increase the sustainability and ecological utilization efficiency of all cities. Population regulation scenarios will significantly improve the sustainability and ecological utilization efficiency of Beijing, and make natural capital flows more equitable, but at the cost of reducing the sustainability and ecological utilization efficiency of other cities in Jing-Jin-Ji urban agglomeration. The study results can provide scientific support for the sustainable development strategy of Jing-Jin-Ji urban agglomeration.