Supplementary information

Review

Anthropogenically breaking macro-ecospatial ‘chains’? – case review of HU Line

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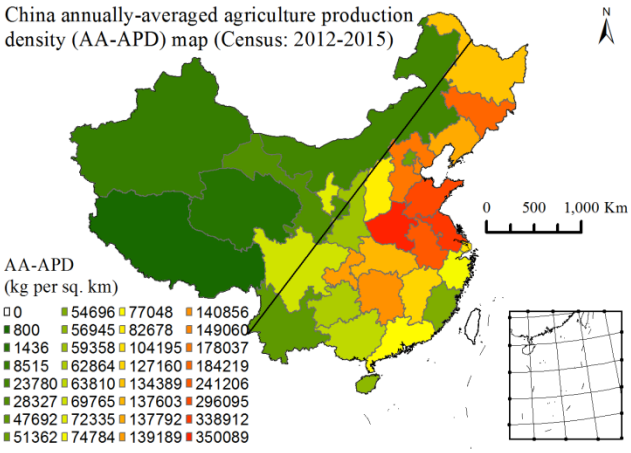
Supplementary Figures

Supplementary Figure S1-S2

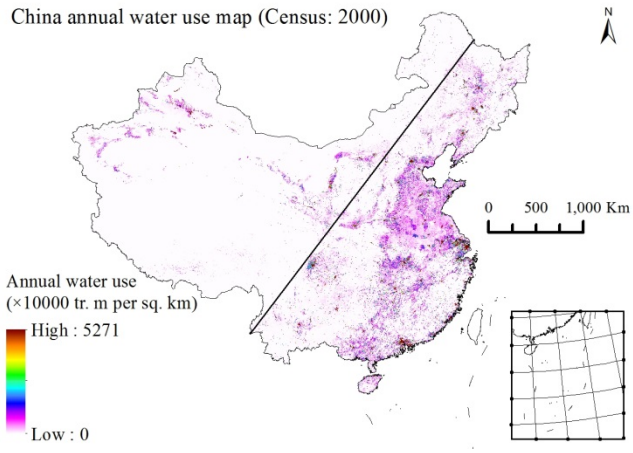
1. Agricultural production



Supplementary Figure S1. China annually-averaged agriculture production density map (Census: 2012-2015) (The authors generated the image based on the data that is published in www.moa.gov.cn).

Agricultural production is the leading anthropogenic factor closely related to population distribution, since agricultural production serves as the living basis for human residence and population increase, which in turn, can enhance agricultural production. This mutual-enhancement effect has already reached a relatively stable status in China, a traditional agricultural country. This is manifested in the map of grain yields at the province scale (www.moa.gov.cn) during 2012–2015, as illustrated in terms of annually averaged agriculture production density (kg per sq. km) (Supplementary Figure S1). The map shows that HU Line is also the geographic demarcation line for agriculture productions across China, as the regional agricultural production in southeast China is obviously larger than the opposite in northwest China. Wang et al. (2005) revealed that for agriculture production the east and north boundary of this demarcation line is in the Da and Xiao Xing'an Mountains–Hetao Plain in the Inner Mongolia–Ningxia–Hexi Corridor of Gansu, and the west of the demarcation line is in the south Gansu–Sichuan Basin. Overall, the integration of these separated demarcation line segments obeys the spatial transition layout marked by HU Line (2015).

2. Resource consumption



Supplementary Figure S2. China annual water use density map (Census: 2000) (The authors generated the image based on the data that is published in Jiang 2000).

Resource consumption is receiving more and more attention by not only economists but also Earth scientists. Dai and Chen (2010) showed the spatial distribution of extended-energy based indicators in 30 provinces of China in 2007 and found that the east part consumed more energy of fossil fuels than the west part. Zhang et al. (2011) examined the spatial distribution of total energy consumptions of the 30 case cities in China in 2005 and found that energy consumption is similar to economic activity in terms of spatial pattern, e.g., with the three representative regions Beijing-Tianjin-Tangshan Area, Yangtze River Delta and Pearl River Delta. Jiang (2000) derived the spatial distributions of China's annual water use density, as illustrated in Figure 3a. All of these endeavors indicated that resource consumption follows the spatial layout marked by HU Line.

References

Wang, Z., Li, H., Kong, X., et al., 2005. Impact of climate warming on agriculture in China. Progress in Natural Science, 15(6), 706-713.

Zhong, Z., Wang, Z., Xia, H., Sun, Y., Yue, Q., 2015. Temporal and spatial variation of the potential agricultural productivity of China under global climate change. Journal of Natural Resources, 30(12), 2018-2032.

Dai, J., Chen, B., 2010. Extended energy-based fossil fuels resource accounting in spatial distribution in 2007, China. Procedia Environmental Sciences, 2, 1799-1807.

Zhang, J., Deng, S., Shen, F., Yang, X., Liu, G., Guo, H., Li, Y., Hong, X., Zhang, Y., Peng, H., Zhang, X., Li, L., Wang, Y., 2011. Modeling the relationship between energy consumption and economy development in China. Energy, 36, 4227-4234.

Jiang, D., 2000. China 1 km grid water resource dataset (2000). National Earth System Science Data Sharing Infrastructure (http://www.geodata.cn/).