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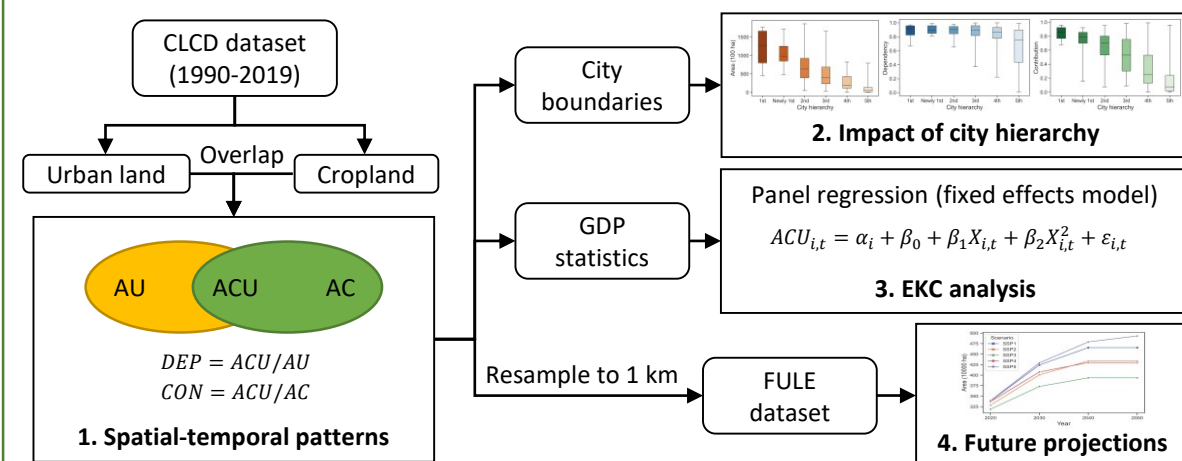
Background

The dramatic expansion of urban lands has caused widespread cropland losses in China. However, the extent to how much newly constructed urban lands have encroached croplands as well as its spatial-temporal variance and future trends remain underexplored.

Research objectives

1. What are the spatial-temporal patterns of urban expansion and cropland loss in China during the past three decades?
2. Does city hierarchy influence the extent of urban encroachment on cropland?
3. Can the nexus between urban expansion and cropland loss be coupled with economic growth and what is the future trend?
4. Which regions are likely to suffer the most severe cropland loss induced by urban expansion in the upcoming years?

Materials & Methods



Findings & Discussion

- Urban expansion had directly led to a loss of 12 Mha croplands during 1990-2019.
- Nearly 84% of newly urban lands occurred on croplands.
- The most severe cropland-urban land nexuses were found in the 1st and newly 1st tier cities.
- There existed an inverted-U shape curve between land conversion factors and per capita GDP at the provincial level.
- Urban expansion-driven cropland loss had decoupled from economic growth since 2013.
- Urban expansion is expected to occupy 3.7-4.3 Mha and 3.9-4.9 Mha existing croplands by 2030 and 2050.
- Improvement in land-use efficiency, adaptive planning strategies and regional coordination emerge as key measures to mitigating the negative impacts of urban expansion on croplands as well as securing food productions in China.

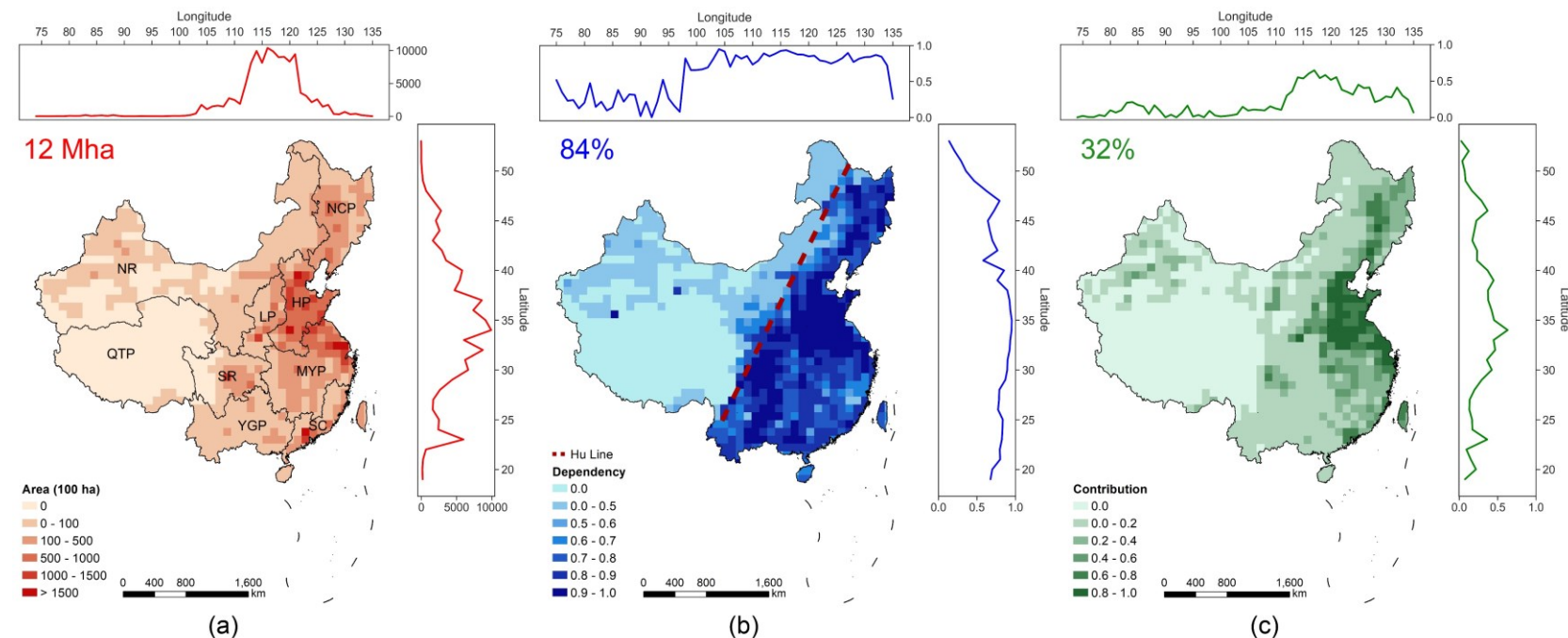


Figure 1. Spatial patterns of the nexus between urban expansion and cropland loss in China for the period 1990-2019: (a) ACU, (b) DEP, and (c) CON. HP: Huang-Huai-Hai Plain. LP: Loess Plateau. MYP: Middle-lower Yangtze Plain. NCP: Northeast China Plain. NR: Northern arid and semiarid region. QTP: Qinghai Tibet Plateau. SC: Southern China. SR: Sichuan Basin and surrounding regions. YGP: Yunnan-Guizhou Plateau.