

Investigating the Spatial Heterogeneity of the Impact of Urbanization on Carbon Emissions in China



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0 | Background & Importance

Research Question:

This study explores the spatial heterogeneity of the impact of urbanization on carbon emissions in China——how the level of urbanization development in different regions affects carbon emissions and the spatial variation and correlation of these influencing factors.

Strengths

China's Role as a Major CO₂ Emitter

Weaknesses

High Data Requirements of GWR Model
Difficulty in Selecting Impact Factors



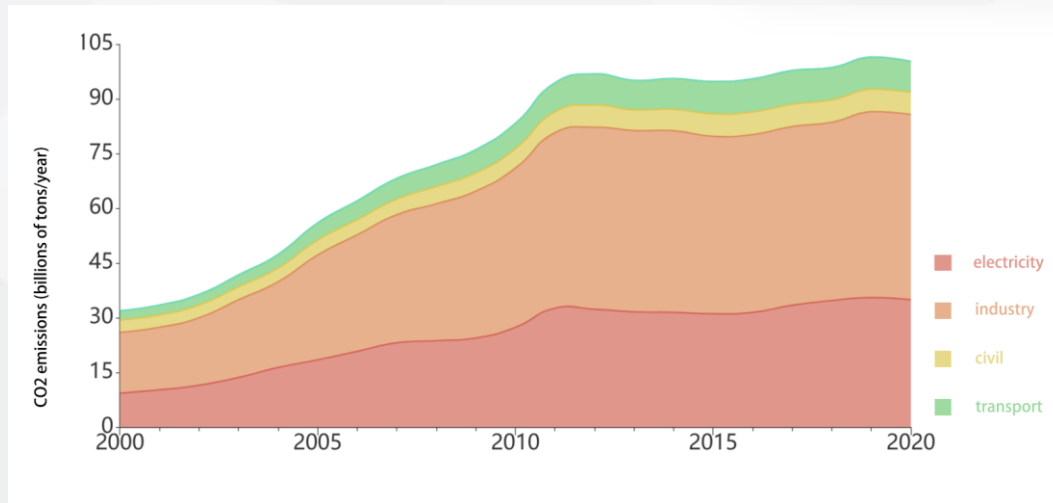
Opportunities

Global Environmental Issues

Threats

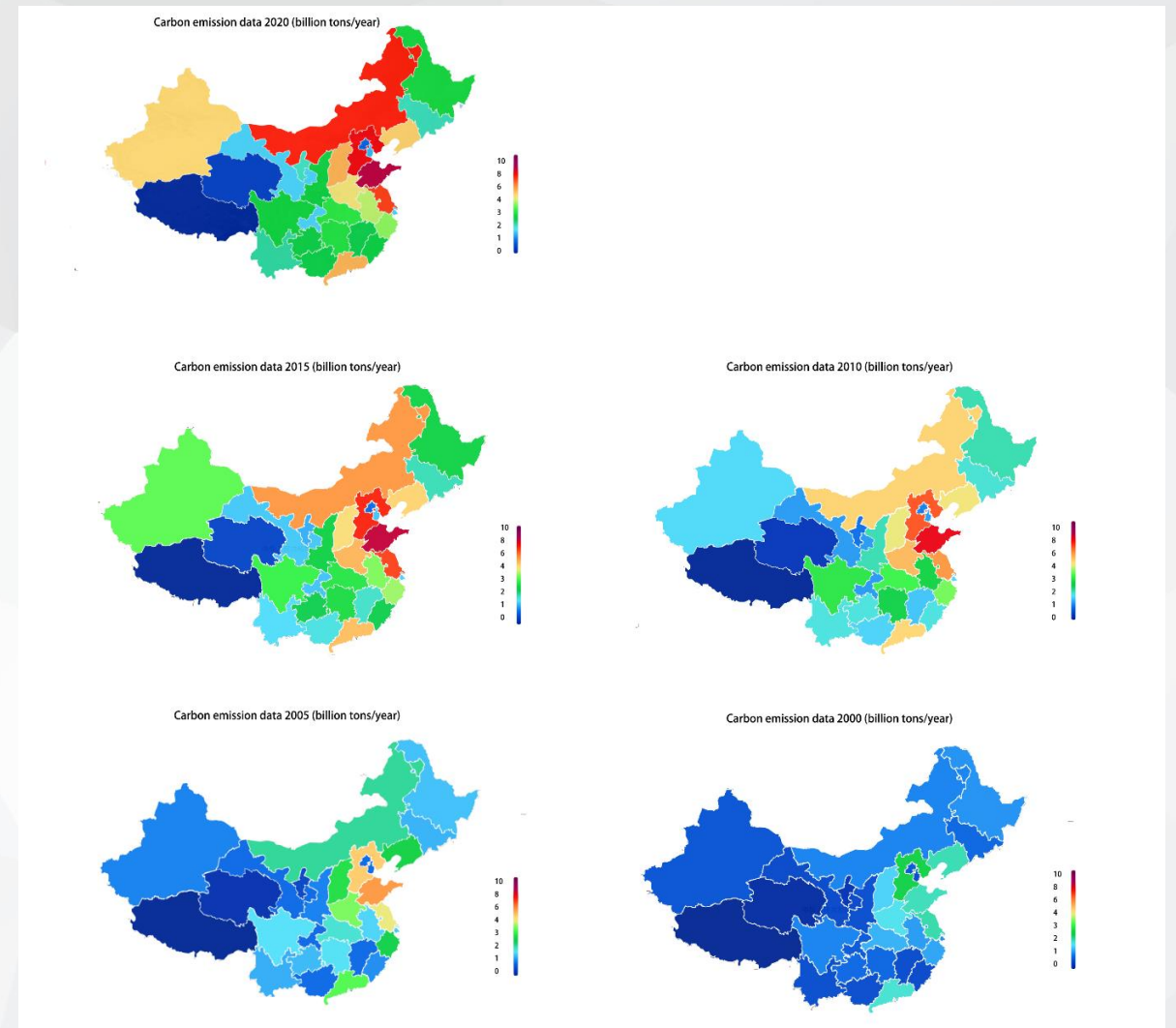
Urbanization Challenges in China

02 Literature Review



CO2 emissions from China's sub sectors

(data source: <http://meicmodel.org.cn/>)



China's annual emission of carbon dioxide

(data source: <http://meicmodel.org.cn/>)

03 Materials and methods

Data Sources

IPCC Guidelines

China Statistical Yearbook

China Science and Technology Statistical Yearbook

China Environmental Statistical Yearbook

Wind Database

National Bureau of Statistics

Regional Statistical Yearbooks

Methods

1. Ordinary Least Square (OLS) Model:

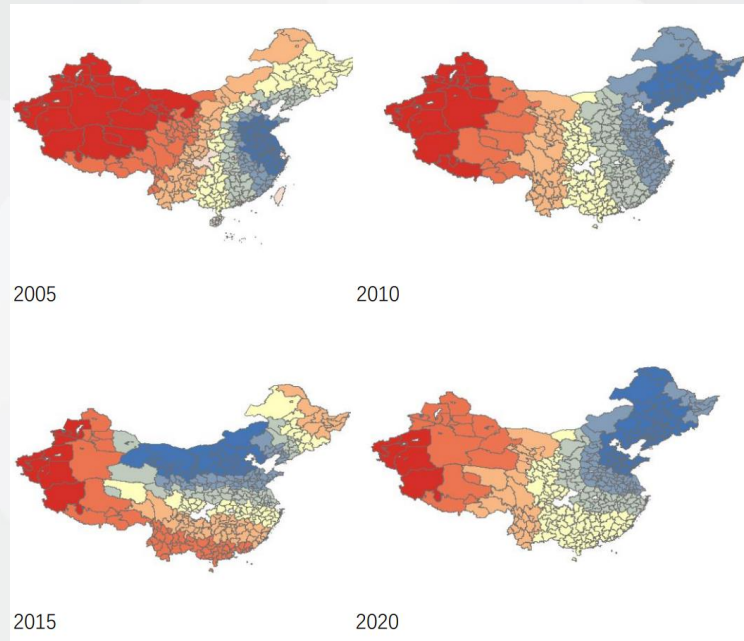
Analysis of Urbanization Indicators and CO₂ Emissions

2. Geographically Weighted Regression (GWR) Model:

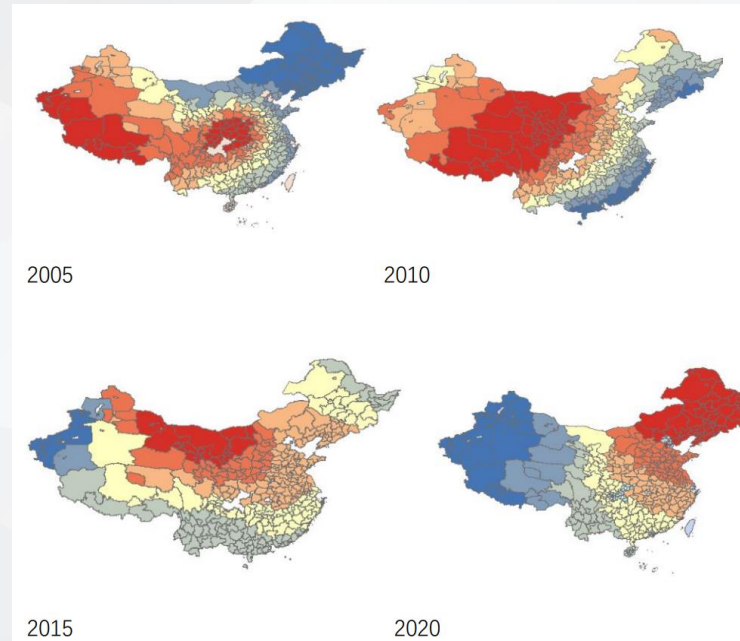
Detailed Spatial Analysis

3. Carbon Emissions Sustainability Theory

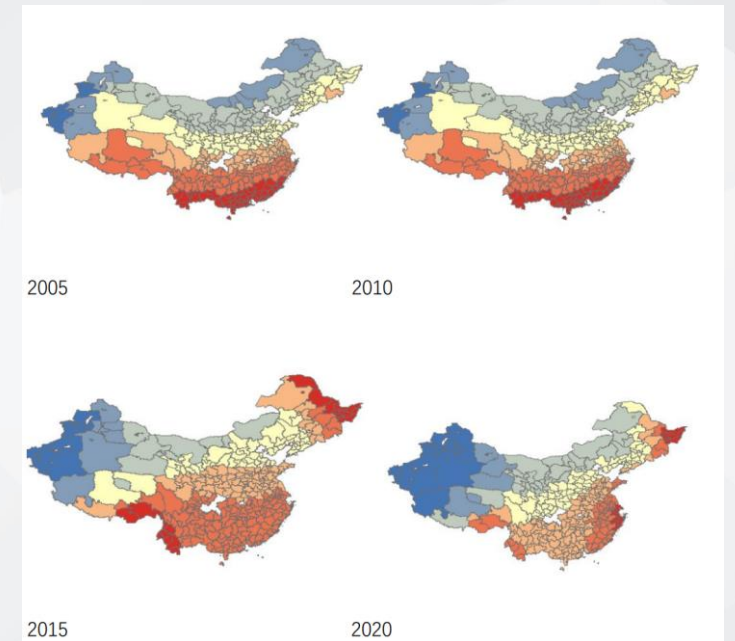
04 Data conclusions——GWR results



Variable: Proportion of primary industry to GDP

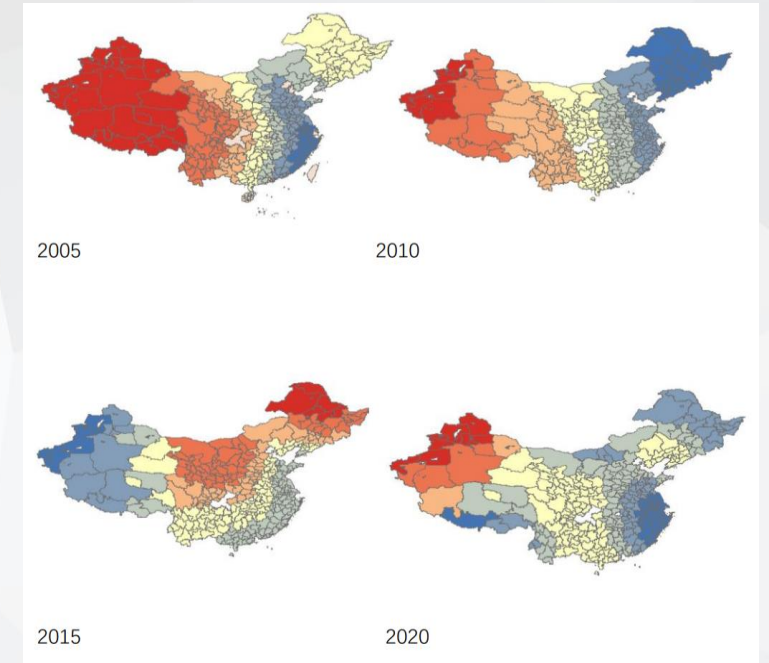
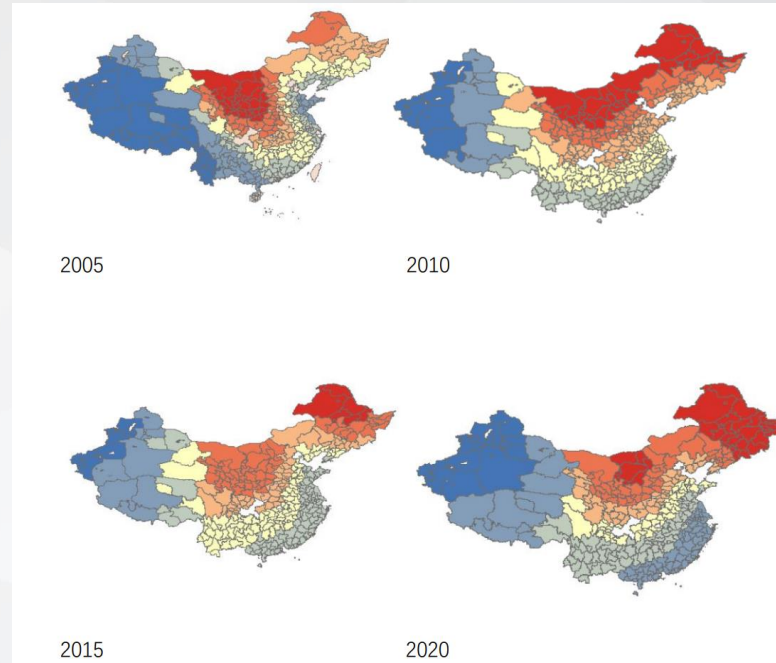
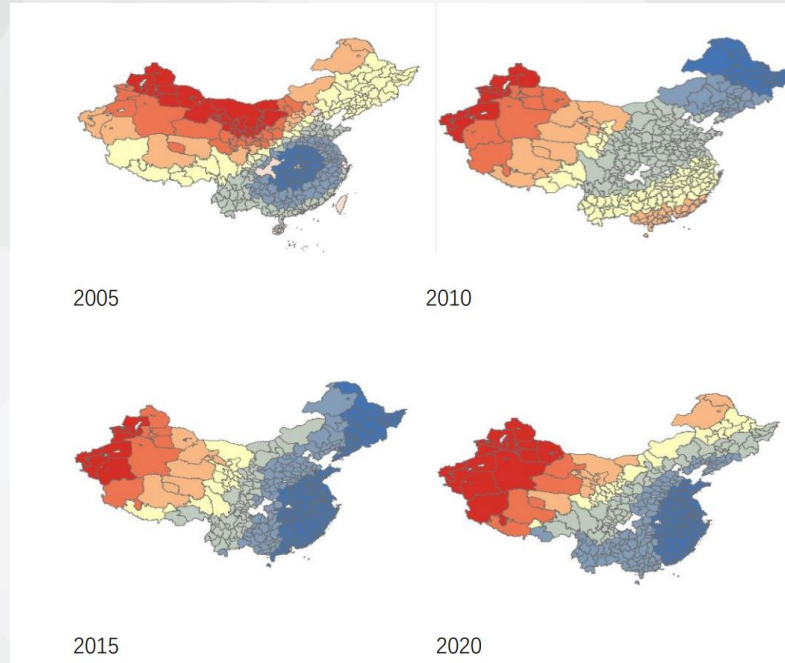


Proportion of secondary industry to GDP



Proportion of tertiary industry to GDP

04 Data conclusions —GWR results



Variable:

Total GDP

Road network density

Population density

- 1. Significantly Impacted Regions:** Northeast, Northwest, and North China (Characteristic: Slow Economic Development)
- 2. Key Influencing Factors:** Carbon-Intensive Industries, Dense Populations, GDP Development
- 3. Southern Region:** Complex Influencing Factors, Shift to Service-Driven Economy, Industrial Modernization

05 Future study & Limitation

Future Study

1. Detailed Regional Analysis
2. Incorporation of More Variables
3. Longitudinal Studies:
4. Comparative Studies
5. Impact of Policies

Limitations

1. Geographical and Socio-Economic Diversity
2. Unquantifiable Factors
3. Data Availability and Reliability
4. Omission of Policy Variables
5. Modeling Constraints



THANKS