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基于1 km网格的天津市二氧化碳排放研究 CO₂ emissions of Tianjin based on 1 km grid dataset

关键词: [城市CO₂排放](#) [1 km网格](#) [空间特征](#)

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摘要: 中国城市建制及地理边界特征使得国际城市CO₂排放的关键问题在中国难以深入研究.例如,城市排放占比,城市与周边区域排放差异等.本文基于天津市CO₂排放的1 km网格,分析天津市CO₂排放的空间特征,探讨天津市不同城市范围的CO₂排放水平,并与纽约市进行对比分析.结果显示,2007年天津市市域内CO₂排放总量为12599万吨,人均排放11.30 t.天津市市域CO₂排放的空间格局是从中心6个城区向外单位网格排放量逐渐降低.CO₂排在空间上具有显著的正空间自相关性,中心6个城区、滨海新区及郊区县中心镇的CO₂排放对其周边区域CO₂排放影响显著,天津市狭义城市人均CO₂排放量为4.71 t,低于纽约市的6.33 t;狭义城市范围1排放占总排放的比例为69.26%,略高于纽约市的59.70%.以狭义城市为城市范围时,天津城市及周边区域人均CO₂排放的空间特征与发达国家城市的排放特征研究结论一致,都是从城区-郊区-周边区域,人均排放水平逐渐升高;在此范围内,天津城市CO₂排放仅占全市域的14.00%.

Abstract: The administrative and geographical boundary of cities in China make it difficult to conduct in-depth study of the key issues related to CO₂ emissions, such as contribution of urban CO₂ emissions to the regional or national CO₂ emission, the spatial differences of CO₂ emission between urban area and its peripheral areas, etc. Based on the 1 km grid dataset developed in this study, the spatial distribution of CO₂ emissions in Tianjin was analyzed; the CO₂ emission levels of three identified urban boundaries of Tianjin municipality were assessed and compared with New York City. The total CO₂ emissions from territories of Tianjin in 2007 were 125.99 Mt, corresponding to 11.30 tons per capita. The CO₂ emissions were gradually decreasing from the central six districts outward. There were clear positive spatial autocorrelation in CO₂ emissions in Tianjin. The CO₂ emissions of six central districts, Binhai New District, and central towns of suburban counties have substantial impact on their surrounding areas. The per capita CO₂ emissions of city proper of Tianjin were 4.71 t, lower than that of New York City. The CO₂ emissions in SCOPE 1 accounted for 69.26% of the total emission in the city proper, which was higher than 59.70% of New York City. If the city proper was defined as the boundary of Tianjin, the spatial characteristics of the per capita CO₂ emissions of Tianjin city were similar to that of cities in developed countries, which showed a gradual increase of per capita CO₂ emissions from city proper to suburb and to the whole region. In this condition, the emissions share of Tianjin city was only 14.00% in the total emissions of the jurisdiction of Tianjin municipality.

Key words: [urban CO₂ emissions](#) [1 km grid](#) [spatial distribution characteristics](#)

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