

Accepted Manuscript

Title: The Influence of the Spatial Characteristics of Urban Green Space on the Urban Heat Island Effect in Suzhou Industrial Park

Authors: Xiang Dong Xiao, Li Dong, Hainan Yan, Nan Yang, Yimei Xiong



PII: S2210-6707(17)30357-8
DOI: <https://doi.org/10.1016/j.scs.2018.04.002>
Reference: SCS 1042

To appear in:

Received date: 12-4-2017
Revised date: 1-4-2018
Accepted date: 1-4-2018

Please cite this article as: Xiao, Xiang Dong., Dong, Li., Yan, Hainan., Yang, Nan., & Xiong, Yimei., The Influence of the Spatial Characteristics of Urban Green Space on the Urban Heat Island Effect in Suzhou Industrial Park. *Sustainable Cities and Society* <https://doi.org/10.1016/j.scs.2018.04.002>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

The Influence of the Spatial Characteristics of Urban Green Space on the Urban Heat Island Effect in Suzhou Industrial Park

Xiang Dong Xiao^{1,2}, Li Dong¹, Hainan Yan², Nan Yang³, Yimei Xiong³

¹College of Landscape Architecture, Beijing Forestry University, Beijing 100083, China

²School of Architecture, Soochow University, Suzhou, Jiangsu, 215123, China

³Xi'an Jiaotong-Liverpool University, Suzhou, Jiangsu, 215123, China

Abstract: Urban green spaces can mitigate urban warming problems to some extent. However, the cooling effect of plants differs spatially and temporally, and with plant features. To understand how plants affect urban surface and air temperature, 15 urban green spaces in Suzhou Industrial Park were selected to study the diurnal variation of summer air temperature. At the same time, the mitigation effect of different types of green spaces on the urban heat island (UHI) effect was investigated and further research was undertaken on the effect of green space area, perimeter area ratio, green space average canopy density, average leaf area index (LAI), and other factors influencing the cooling effect. Based on these studies, three representative parks were selected as samples to investigate the cooling effect of urban green space in terms of the water and wind environment. It was found that in the summer, large green spaces had a stable cooling and humidifying effect, while small green spaces had the opposite effect. The cooling and humidifying effect of large green spaces was more obvious and stable, and the cooling effect of small green spaces was more variable, with a heat preservation phenomenon occurring in some cases. The cooling effect of each green area was positively correlated with the green area, the average LAI of green space, and the average canopy density of green space. The cooling effect of each green area was significantly negatively correlated with the green area perimeter. Water bodies within green spaces did not contribute to cooling; however, the cooling effect was related to the wind environment. From the perspective of the planning and construction of city green spaces it is important to increase the green area and the reasonable planning green perimeter area ratio; however, suitable tree species should be selected in the greening process. The effect of urban greening in improving the urban ecological environment has been established. It was concluded that the cooling effects of such green areas are largely determined by plant type, canopy density, and park shapes. Therefore, it is suggested that a stronger emphasis is placed on the selection of plant species and the design of park shapes to achieve environmental cooling effects.

Keywords: Urban green spaces, Cooling effect, Perimeter area ratio, Leaf area index, Canopy closure

Download English Version:

<https://daneshyari.com/en/article/6775200>

Download Persian Version:

<https://daneshyari.com/article/6775200>

[Daneshyari.com](https://daneshyari.com)