

분절화된 서울의 도시 열섬 현상

Fragmented Urban Heat Islands in Seoul, Korea

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A fragmented urban heat island is observed over the Seoul metropolitan area. Long-term (1996-2003) hourly temperature, wind speed and direction, and precipitation data observed at 26 (51) automatic weather stations (AWS) in Seoul (Gyeonggi province) makes it possible to reveal more dynamic spatial and temporal patterns of the urban heat island in this area than previously revealed. Annual and seasonal isotherms are not quite concentric around the city core in Seoul due to a diversity of land use change reflecting the history of fast economic developments during recent several decades. Warmer isotherms are fragmented, concentrating on the three major central business districts (CBD) in Seoul; Jongro, Yeondeongpo, and Kangnam. These hot spots have little natural land cover, with many large buildings retaining and producing heat. Irregularly distributed cooler features such as Nam Mountain, Han River, and small ecosystems in urban parks reduce the intensity of urban heat island by changing the energy mode from sensible to latent heat through evapotranspiration (cool islands). As noted in other urban research, the daily (seasonal) intensity of the urban heat island weakens during the daytime (summer) compared with the nighttime (winter) spatial pattern, particularly on windy or rainy days. As seen with most urban heat islands, the Seoul hot spots are most pronounced when nighttime winds are calm and skies are clear. The development of bioclimate criteria to mitigate anthropogenically intensifying heat islands as well as the proper management of cool islands should be the key topic in future studies concerning urban heat islands.

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