

The Relationship between Heat Island Intensity and Rural Land Coverage in Obuse, Nagano

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Abstract

Automobile traverses were used 153 times to gather air temperature data in Obuse, Nagano, which is surrounded by a large number of paddy fields and orchards in order to make clear the feature of urban heat island. Using the horizontal pattern of air temperature and the monthly average and the monthly maximum of heat island intensity, the roles of rural land coverage such as paddy fields, orchards and mixed-use lands in the appearance of heat islands were investigated. In the nighttime, paddy fields had the lowest air temperature area in the snowy season, but orchards had the lowest air temperature from May to July and from October to December. The effect which snow coverage on rural and urban areas and irrigation of paddy fields have on seasonal variation of heat island intensities was not seen. The daytime heat island intensities are almost similar to those in the nighttime in summer. The maximum heat island intensity of 5.4°C in settlements whose population is at least twelve thousand, was significantly larger than that of the same-sized cities in Japan shown by Fukuoka (1983) and Park (1987), and nearly equal to that of North American settlements pointed out by Oke (1973).

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