

URBAN HEAT ISLAND OBSERVATION IN CHIANG MAI CITY

Bandid SINGHACHANTRA^{a,} and Puttipol DUMRONGCHAI^b*

*^aGraduate Student , Department of Civil Engineering, Faculty of Engineering,
Chiang Mai University 50200, Thailand; E-mail: singhachantra-b@hotmail.com*

*^bAssistant Professor, Department of Civil Engineering, Faculty of Engineering,
Chiang Mai University 50200, Thailand; Tel: +6653-944146-9, Fax: +6653-892376;
E-mail: puttipol.d@cmu.ac.th*

KEY WORDS: Climate change, Global warming, Urban heat island, Chiang Mai

Abstract: This paper presents the characteristics of the canopy-layer urban heat island (UHI) at different times of days in Chiang Mai city, the largest and most economically and culturally significant city in northern Thailand. The mobile traverse method with a precision digital thermometer was used to measure air temperature in daytime and nighttime under calm and clear conditions in the municipal area, beginning in March until April, 2012. The results show that UHI magnitude slowly warms in daytime and rapidly grows after 4 PM. The average intensity of UHI effect is maximized at 3.7°C around 8pm, with the rates of about +0.1°C/hr, +0.2°C/hr, and -0.2°C/hr over the periods of [8am – 4pm], [4pm – 8pm], and [8pm – 0am], respectively. Increases in heat appear in most areas of intensified urban buildings and traffic congestion. Further analysis indicates that high heat conductivity of urban building materials is a significant factor that prevents the UHI effect from rapid cooling and rapid warming in the city.