

Using Remote Sensing to Analyze the Relation of Fractional Vegetation Cover to Thermal Temperature and Electricity Consumption in Taipei City

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Abstract: Development strategies of Eco-city are used to increase fractional vegetation cover(FVC) to decrease urban air temperature. Thermal temperature increase of urban environment will increase the electricity consumption of household. Meanwhile, that lack of assessment of green coverage impact to thermal temperature and electricity consumption, so that it could not clearly quantify the environmental contribution of green covers. In Taipei City, for example, by Aster satellite remote sensing images to analyze. Using actual hourly electric power consumption data, we calculated the sensitivity of electric power consumption using multiple regression analysis. The result shows that when the fractional vegetation cover is low, the air temperature is high. The average of FVC is 27.5%. In summer night the highest heat island effect(UHI) in Taipei is 0.71°C. The sensitivities to electric power consumption during summer are approximately 10–15 (W/floor-m²) on an average. This study hopes can be the reference materials for the future metropolis plan and to inhibit the spread of urban thermal environment.

Keywords: Remote Sensing, Fractional Vegetation Cover (FVC), Thermal Temperature, Aster Ssatellites Images, Electricity Consumption.