

The influence of the nature over the urban climate. The Tsuchiura City case of study.

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The natural environment has a capital role of mitigation in the urban heat island phenomena. Nevertheless, with the rapid development of build-up areas the importance of green zones is often neglected. To keep a balance between the build-up areas and the natural zones it becomes necessary to include green areas inside the urban ones.

The objective of this study is to verify the influence that the green spaces have inside a city, by considering the temperature as main factor of the analysis.



Fig.1 - Example of temperature data collection results (Satellite image source: Google Earth)

The case of study chosen is the area around the Kijo Park in Tsuchiura City. This zone contains evergreen and deciduous plants, an artificial reservoir and

build-up areas. The fieldwork was done in winter period to clearly distinguish between the two type of vegetations. Five point were taken as representative of the four types of land use (evergreen vegetation, deciduous vegetation, water, build-up area at 50m and 150m from the park). The data were collected every hour (from 10.00 to 17.00) assuming that for 20 minutes the temperature is not changing.

Maps were produced as in the Fig.1 each hour to understand if it exists some difference of temperature during the day according the type of land use. Focusing on the data, there is not apparent difference between the evergreen and deciduous vegetation. In fact, observing the Graph.1 the two lines (in red and blue) are almost completely overlapping each others. The water has an atypical behaviour, when the sunshine is 100% the temperature around this area has a similar reaction such as the green zones. However in case of clouds appearing the temperature immediately decrease. This phenomena can be observed in the Graph. 1 at 13.00 and 14.00. Moreover, due to the urban heat island (UHI) effect, the build-up areas, appear to be in average 2C° warmer than the green areas.

In conclusion, this study highlights the importance of green areas inside the cities as cooling zones to reduce the UHI effect, especially in high density districts where this phenomena is stronger.

Graph.1 - Temperatures data from 10.00 to 17.00

