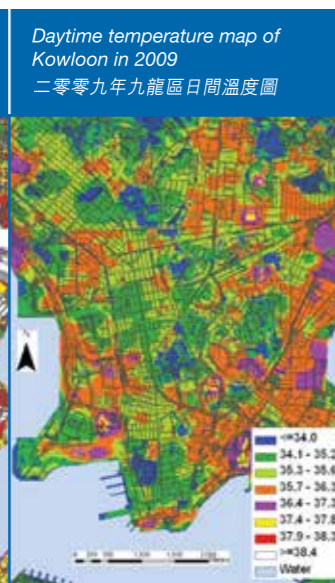


The Environment 環境

Hong Kong's average temperature on the rise

香港平均氣溫持續上升

Map 1
圖一Map 2
圖二Map 3
圖三Map 4
圖四

The average temperature of Hong Kong's inner urban areas is predicted to rise by 2 to 3°C in 30 years' time, according to a study carried out by researchers in PolyU's Department of Land Surveying and Geo-Informatics.

理大土地測量及地理資訊學系研究人員的研究指出，香港三十年後的市區平均溫度將上升攝氏二至三度。

Prof. Janet Nichol
李真教授

With funding from a Research Grants Council Public Policy Research Grant, PolyU Prof. Janet Nichol and research student Mr To Pui-hang have partnered with Chinese University of Hong Kong Prof. Edward Ng Yan-yung to map Hong Kong's day- and night-time temperature distribution at decadal intervals up to 2039.

Their projections show that by 2039, most urban areas of Hong Kong will see a 2-3°C increase in daytime air temperatures over current temperatures, as can be seen in Maps 1 and 2 in which the areas that were dark green in 2009 change to yellow in 2039. The result will be an average summer daytime temperature of just under 38°C in urban districts, compared with an average of 35°C today.

In predicting this coming temperature rise, the researchers made use of remote sensing technology, satellite images for baseline air temperature mapping, global climate models for the projection of greenhouse-induced warming and a plot ratio to reflect the degree of urbanization—i.e. the Urban Heat Island (UHI) effect.

According to a study carried out by the Hong Kong Observatory in 2007, the city's annual mean temperature will rise by 3-6 °C by 2100, assuming that no further urbanization takes place. If a constant urbanization rate is assumed, however, the mean temperature will rise by 3.7 to 6.8°C over the same period. The UHI magnitude is estimated to be 0.08°C per decade.

"Urbanization is an additional factor causing temperature rises, and if current trends are continued, temperatures could increase much faster in the future", Prof. Nichol said.

Hong Kong, a densely populated urban area, is a typical example of areas in which the UHI effect, which refers to urban areas being significantly warmer than their rural surroundings, can be found. The temperature difference is usually larger at night and in winter. The causes of the UHI effect include the existence of high-rise buildings that block thermal radiation at night, the extensive use of materials with thermal bulk properties such as asphalt and concrete, and a lack of vegetation in urban areas.

Prof. Nichol urged city planners to consider the wind speed requirements for residential buildings in urban areas, which would help to achieve sustainable urbanization and a more favourable living environment for city dwellers.

土地測量及地理資訊學系李真教授與她的研究生杜沛恒先生，聯同香港中文大學吳恩融教授，合力繪製出直至二零三九年本港每十年的日夜氣溫分佈圖。該研究計劃得到研究資助局公共政策研究基金資助。

研究發現，在二零三九年，香港市區大部分地方的日間氣溫，將上升攝氏二至三度，由原來在二零零九年以深綠色標示的地區變為二零三九年的黃色（比較圖一及圖二），顯示香港市區在炎夏的氣溫將由現時的平均攝氏三十五度，上升至二零三九年的平均攝氏近三十八度。

在預測未來的氣溫上升時，研究人員不但採用了遙感技術，更以熱衛星圖像繪製基線氣溫圖。他們亦利用全球氣候模式來預測溫室效應引起的暖化，與及以地積比率反映城市化的程度（或稱為「熱島效應」）。

根據香港天文台在二零零七年進行的研究，假若本港沒有進一步城市化，直至二一零零年，本港每年的平均氣溫將上升攝氏三至六度。然而，若在這期間本港維持原有的城市化速度，每年的平均氣溫預計將上升攝氏三點七至六點八度。熱島效應的強度，預計為每十年上升攝氏零點零八度。

李真教授表示：「城市化是造成溫度上升的另一原因，如果目前的趨勢持續，未來的氣溫將上升得更快」。

人口密集的香港市區，正是熱島效應的典型例子，即市區氣溫明顯高於鄰近的郊區，尤以夜晚及冬季的溫差較為顯著。熱島效應的成因，包括市區的高樓大廈於晚上阻礙散熱、大量使用如瀝青及混凝土等吸收熱能的物料，以及市區內缺乏植被。

李真教授促請城市規劃部門，考慮在市區建造住宅時，加入風速規定，這除可達致「可持續城市化」外，更可為市區居民提供更舒適的居住環境。