

First results of energy and carbon fluxes over a tropical city

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The urban atmosphere of tropical cities is much less researched and understood compared to that of mid-latitude urban areas. This is despite the fact that many tropical cities experience above average growth and many of these people will be added to cities whose infrastructure is often already at or beyond its limit which will lead to an inevitable decline in the quality of life and the climate of the urban environment. Cities are also major contributors of carbon dioxide, a greenhouse gas which is thought to be responsible for global warming. The objective of the present study is to measure and analyze the energy fluxes and turbulence structure in a tropical city environment and for the first time assess the carbon fluxes. Long-term observations are currently in progress. The results presented here are from a 2-week long pilot study carried out over an industrial neighborhood in the West of Singapore. Flux equipment was operated intermittently from the top of a manlift crane at a height of 25 m above a surface covered by 8 m tall industrial buildings and dense trees along the roads. The results show the expected energy portioning into primarily sensible heat during daytime. The carbon fluxes are positive at all times of the day indicating a net release of carbon by the industrial neighborhood.