

## **A study of the Microclimatology of the Green Roof at Toronto**

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This research addresses the characteristics of urban microclimates that is affected by the urban heat island phenomenon which superimposes on the background climate change and creates additional warming in urban areas compared to the surrounding rural areas. The mitigation of this urban warming by building green structures such as green roofs became an integral process to create comfortable open spaces in urban areas. In green roofs, stored moistures within the vegetation evaporate either directly from the roof-surface or are released from plants by transpiration and thus generate the evaporative cooling. An experiment is designed to compare the temperature distribution and humidity of a dense urban station, Toronto City with that from a Green Roof station located near the city, for four seasons to study the micro-climatology of the green roof. The results from the analysis of both daily and hourly data suggest that out of the four seasons, spring, winter and fall seasons are mainly benefited by the cooling effect of the green roof mostly at nighttime. For some hours during the day, the green roof is found to be warmer, which can be accounted for by localized ozone emission during the rush hours from a highway in the vicinity that amplified the temperature of the green roof.