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## Microclimate development in open urban spaces: the influence of form and materials

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### Abstract

The microclimates of open spaces in cities are highly influenced by urban geometry and construction materials. The present study reports on measurements of microclimate data taken in different open urban spaces such as parks, squares and courtyards featuring various ground surface materials, in particular asphalt, concrete, marble, granite, porous stone, cobble stone, ceramic tiles, gravel, grass and water. The measured data were used to assess the effect of morphologic features and material properties on microclimate development. Measurements were taken in two stages, starting with exploratory readings followed by corrective and complementary measurements. These took place in six different sites in the city of Thessaloniki, in northern Greece. The measurements include surface and ambient temperatures, relative humidity and wind velocity readings. Spot measurements of direct and reflected solar radiation were also taken for an indicative calculation of surface albedo. The second round of measurements included globe temperatures in order to estimate the effect of the radiant environment on pedestrian thermal comfort. The results show differences between and within open spaces and their surfaces, thus

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