

Urban vegetation effects on different urban forms to mitigate heat stress, thermal comfort and vulnerability: case of Paraisópolis-Morumbi, São Paulo

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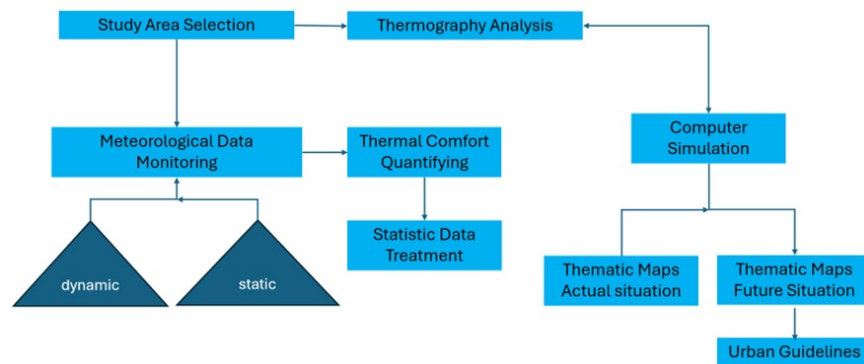
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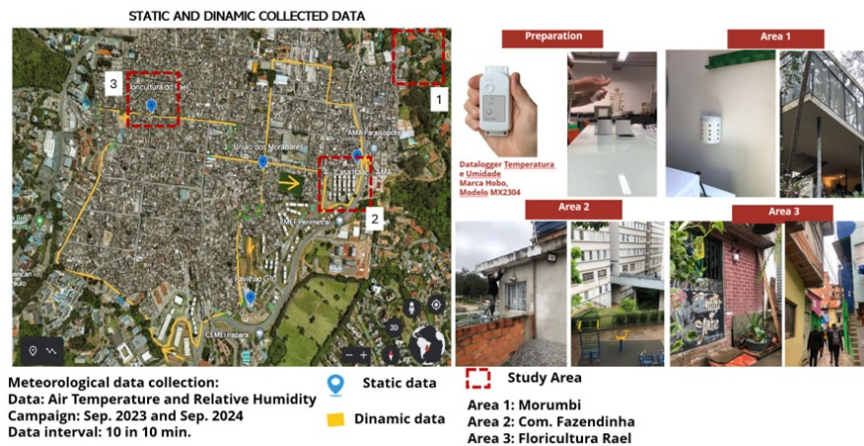
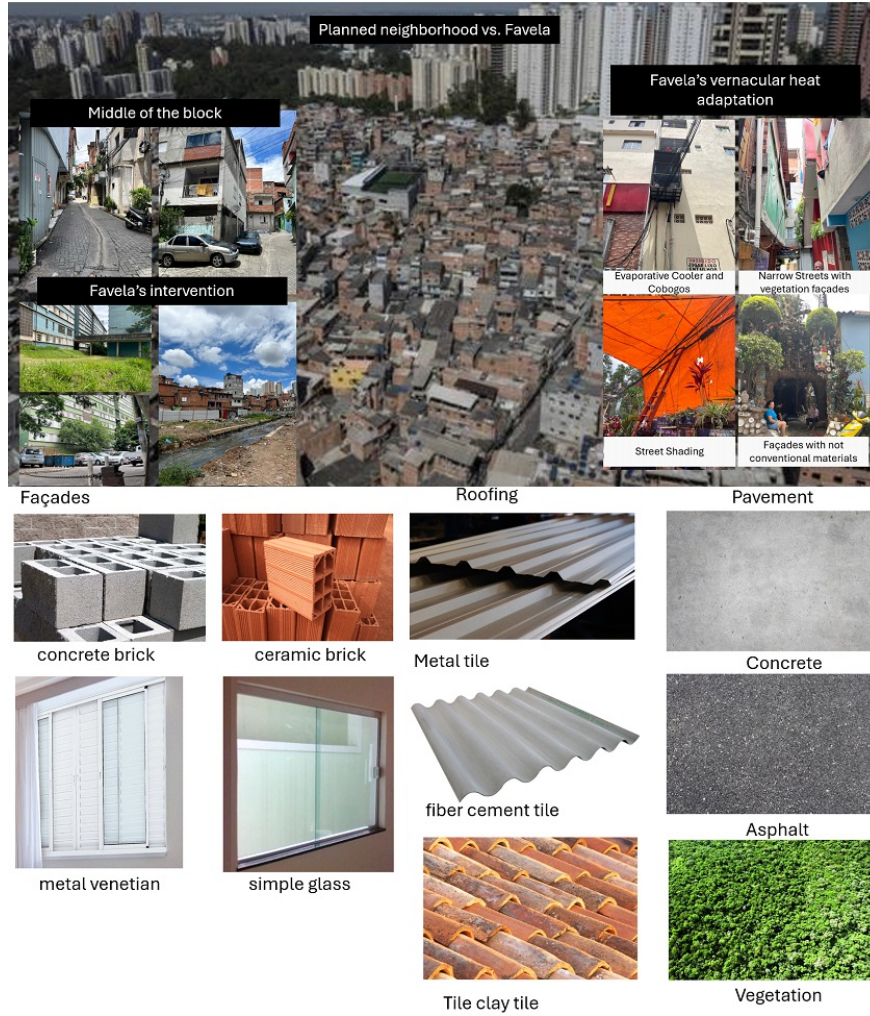
²Affiliation not available

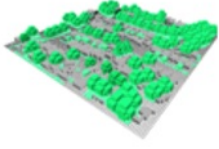
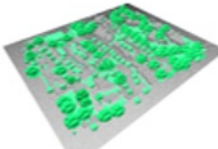
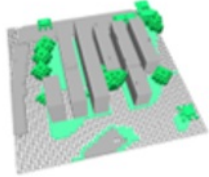
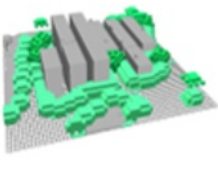
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Abstract

Satellite surface temperatures of São Paulo show heat islands and coolness islands due to urban form. Some planned neighborhoods have street trees, green areas, appropriate urban drainage to prevent flooding in floodplain areas, and adequate thermal comfort and ventilation conditions for urban health and human well-being. Others neighborhoods that originated irregularly within the urban grid or on the city's outskirts suffer from extreme weather problems, such as urban heat islands and localized rainfall that cause flooding and landslides. This work investigates urban heat at the pedestrian scale in different urban forms in Paraisópolis-Morumbi region. Methods: a) Study area selection; c) Field climate data (air temperature and humidity), every 10 min (08/25/2024 to 09/14/2024); d) Quantify heat and thermal comfort by the PET (Physiological Equivalent Temperature) and UTCI (Universal Thermal Climate Index); e) Analysis of current and future scenarios. The maximum air temperature difference between Morumbi (area 1) and Paraisópolis (area 3) was 7.8^o C in 2023 and 11,77 ^oC in 2024. The difference between Favela is 12.5^oC in PET and 10^oC in UTCI. The maximum relative humidity values showed similar values, around 79%, but the minimum values differed by 14.4%. Although data collection was conducted in the winter, heat conditions can worsen during the rainy season, when temperatures in PET and UTCI can exceed 45 ^oC in conditions of extreme thermal stress. The computer simulations presented the current and future scenarios in which temperatures can be cooled with the implementation of a park in the Antonico Valley (area 3).





local	ACTUAL	FUTURE
PORTO SEGURO (P1)		
COMUNIDADE FAZENDINHA (P2)		
CÓRREGO DO ANTONICO (P3)	