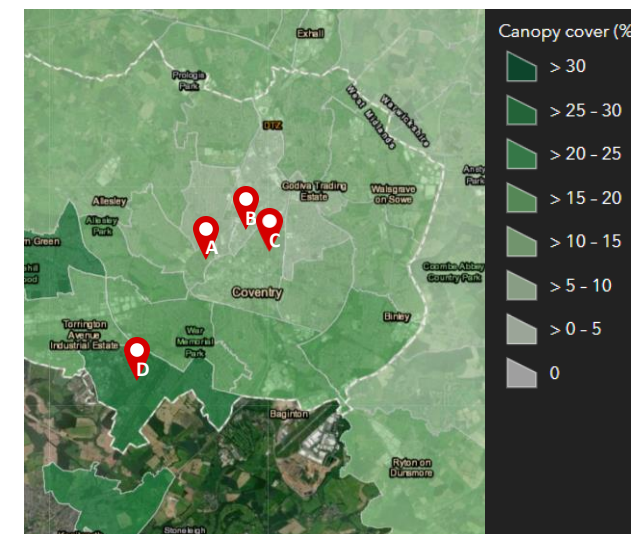
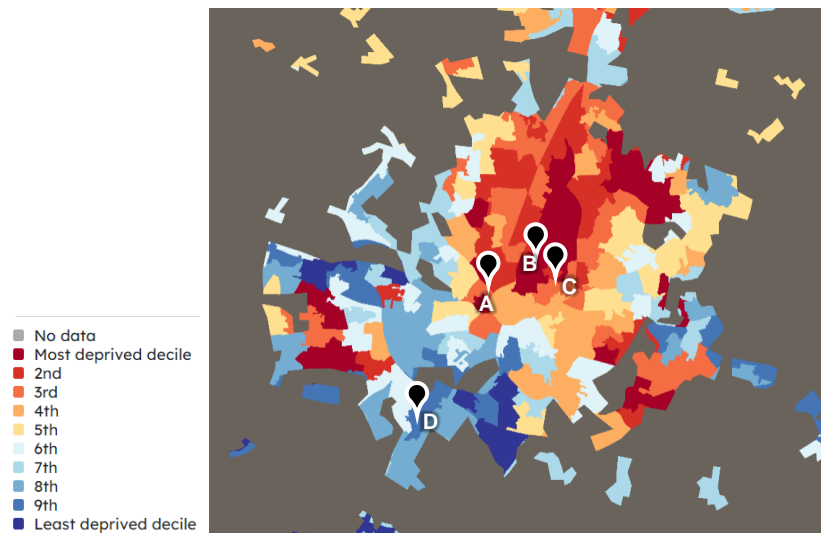
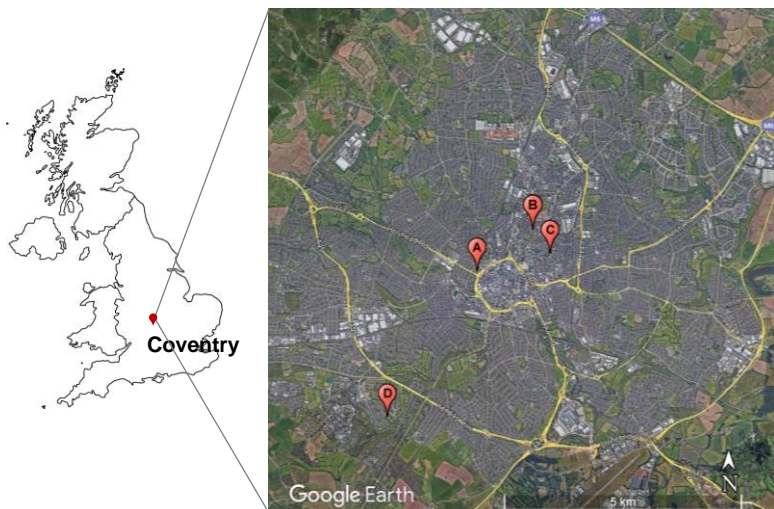
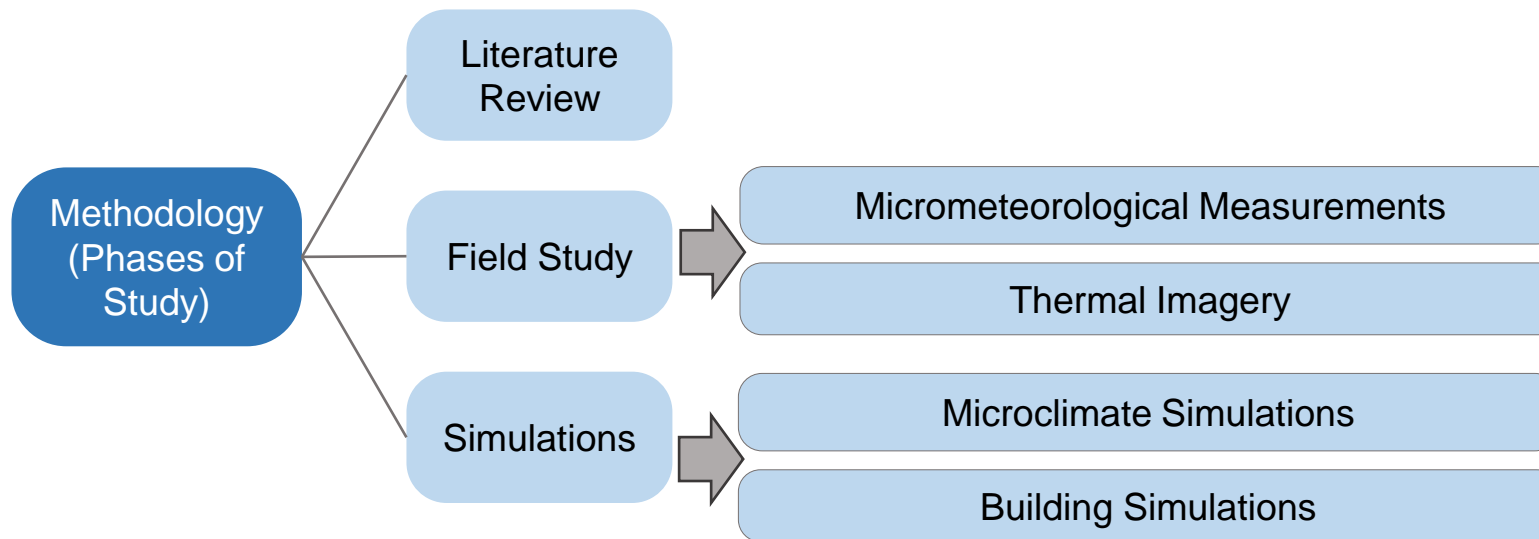


# **The Impact of Green Infrastructure (GI) on Thermal Conditions in Schools during Summer**

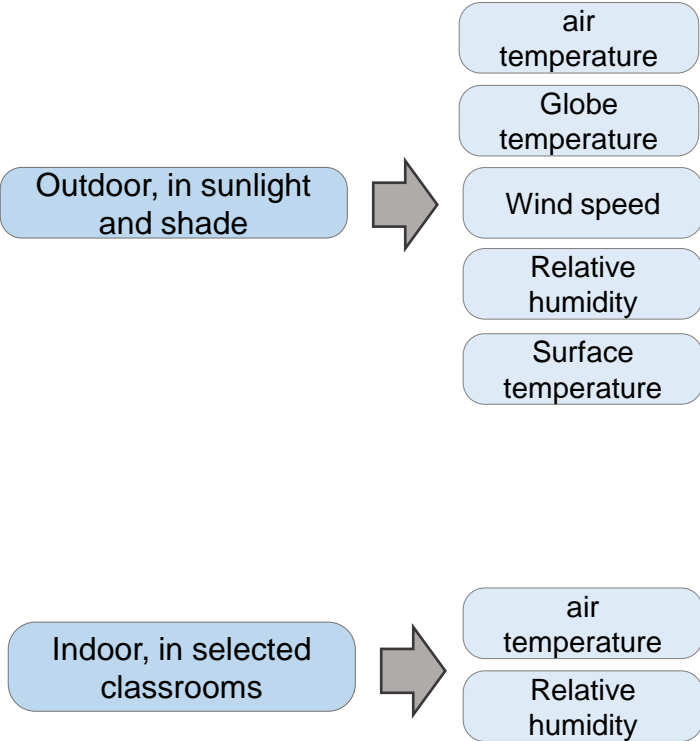
**A PhD project by Yasaman Namazi**

**Supervisory team: Susanne Charlesworth, Azadeh Montazami, Mohammad Taleghani**

# Aim: Exploring the influence of green infrastructure (GI) on indoor and outdoor thermal conditions in schools



# Measurements



# Calculation

Materials  
Surface Areas

Asphalt

Grass

Concrete

Artificial  
grass

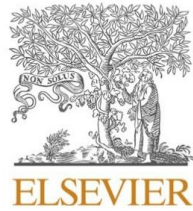
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Urban Greening Factor



# Results

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## Building and Environment

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### The impact of local microclimates and Urban Greening Factor on schools' thermal conditions during summer: A study in Coventry, UK

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#### ARTICLE INFO

##### Keywords:

Thermal comfort  
Schools  
Urban Greening Factor  
Microclimates

#### ABSTRACT

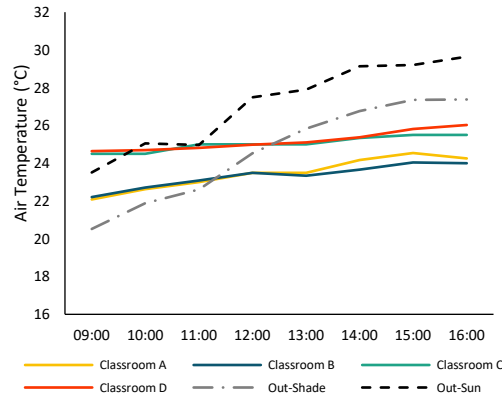
Thermal comfort in schools affects children's wellbeing and educational outcomes. Global warming and frequent heatwaves have worsened the overheating issue in schools, especially in Western European countries, like the UK. While previous studies have mainly focused on residential and commercial buildings, school-related research often emphasised indoor thermal conditions, neglecting the broader influence of microclimates on the overall thermal conditions. Therefore, this research explores the thermal conditions in schools, during the summer of 2023, with a specific focus on the impact of greenery and materials. Urban Greening Factor (UGF) and its relationship with indoor and outdoor air temperatures were explored for the first time.

Field studies were conducted in four primary schools in Coventry, UK, measuring indoor air temperatures and

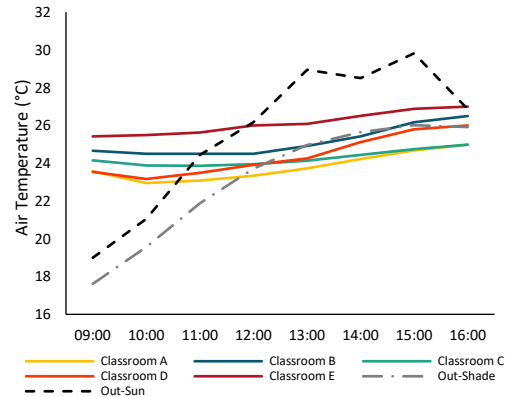
## Classrooms Air Temperature

## Outdoor Air Temperature

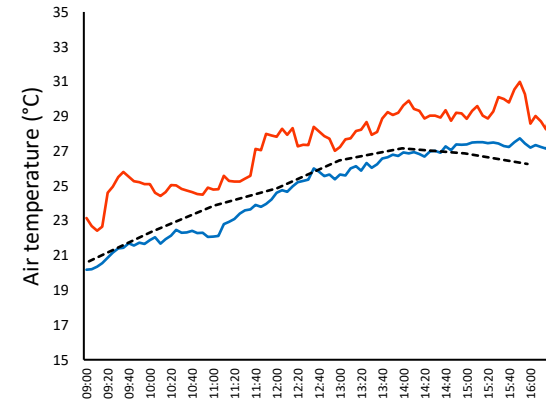
School A-June 13th



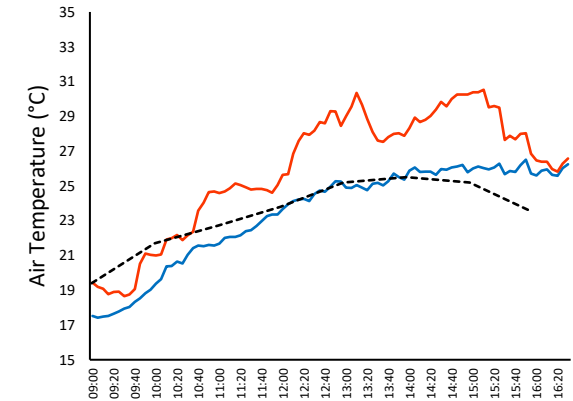
School B-June 14th



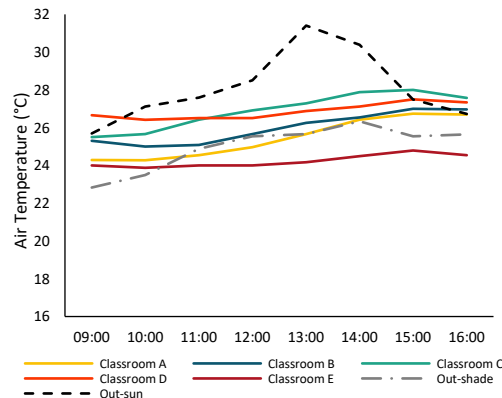
School A- June 13th



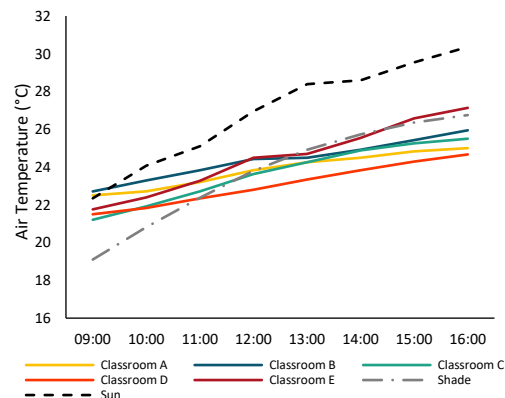
School B- June 14th



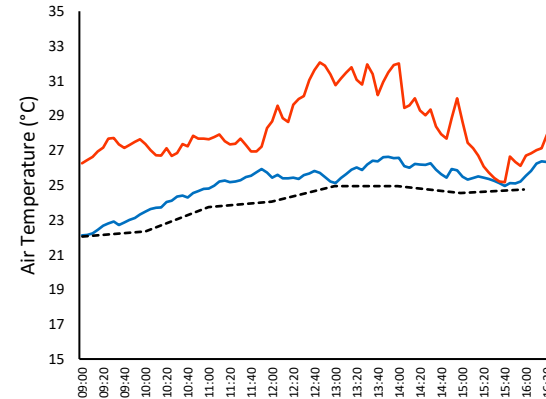
School C-June 16th



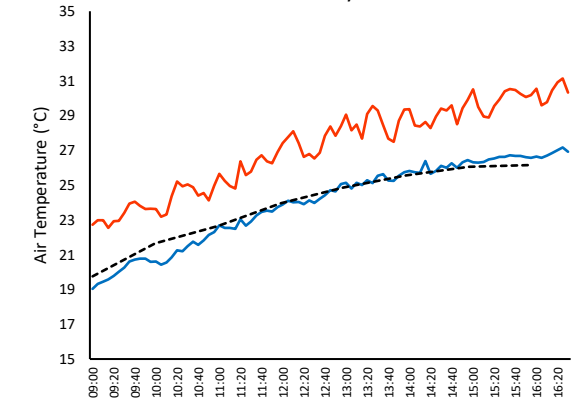
School D-July 7th



School C- June 16th



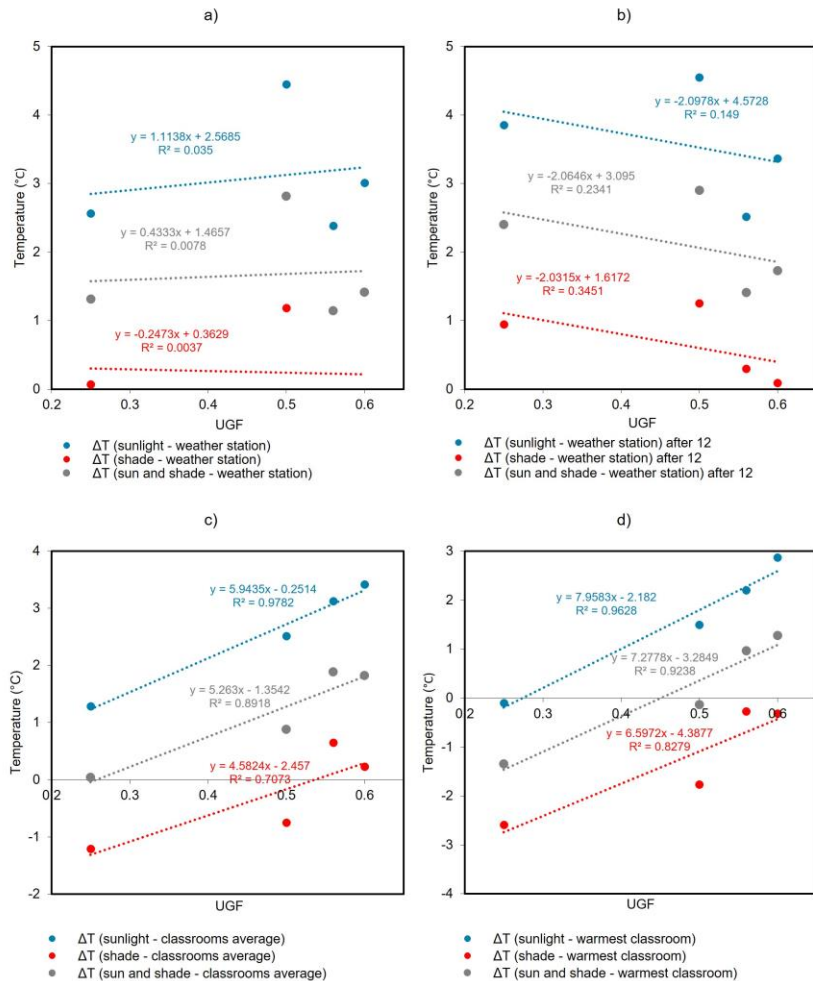
School D- July 7th



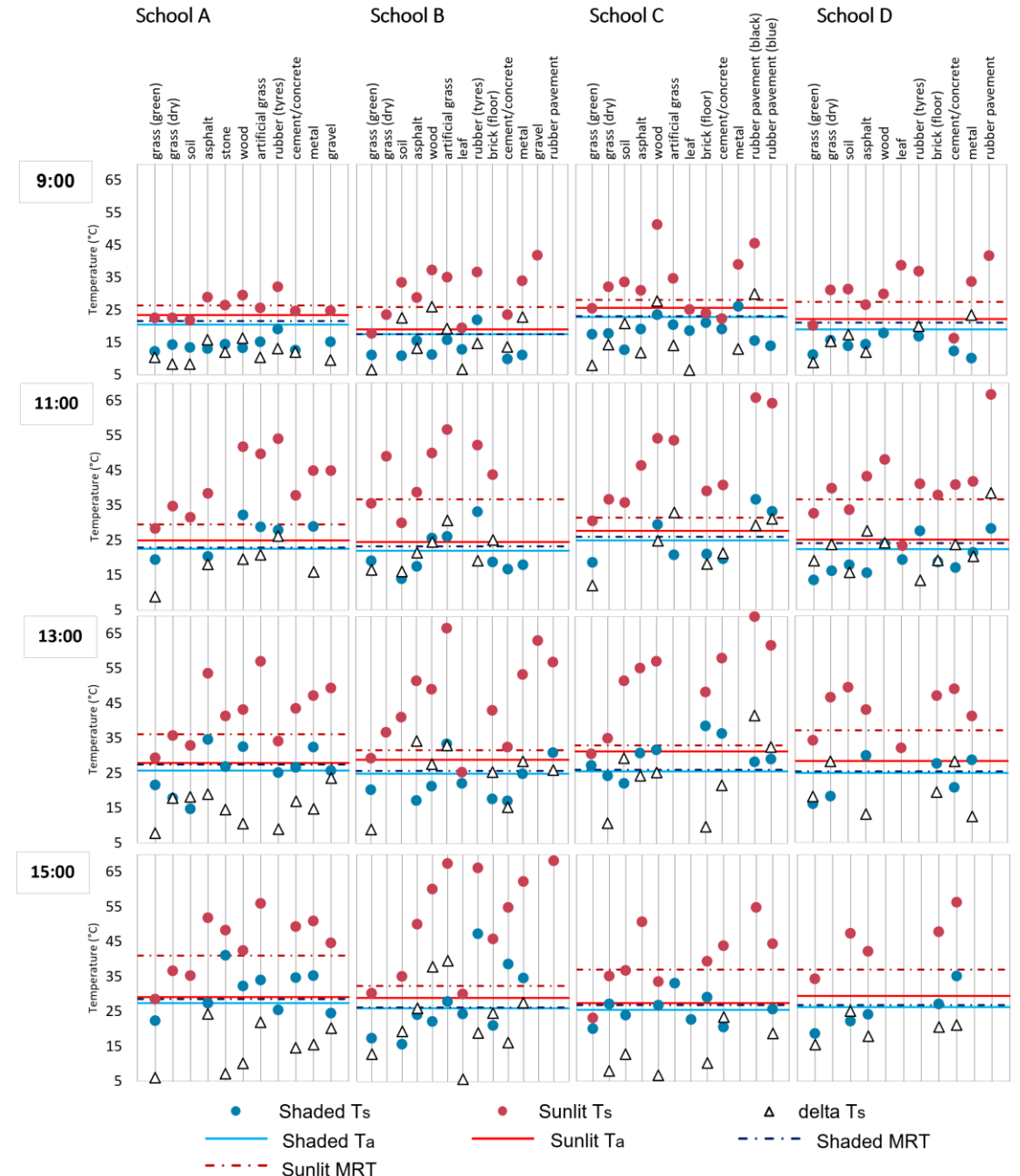
- Warm classrooms were recognised, with potential reasons.
- Substantial cooling effect of tree shade in outdoor areas (up to 6.4°C reduction of air temperature and 22.9°C of MRT)

- Extremely high surface temperature on Artificial Grass (exceeding 67°C).
- UGF had correlations with indoor air temperature. However, outdoor air temperature is more variant and can be different from one point to another.

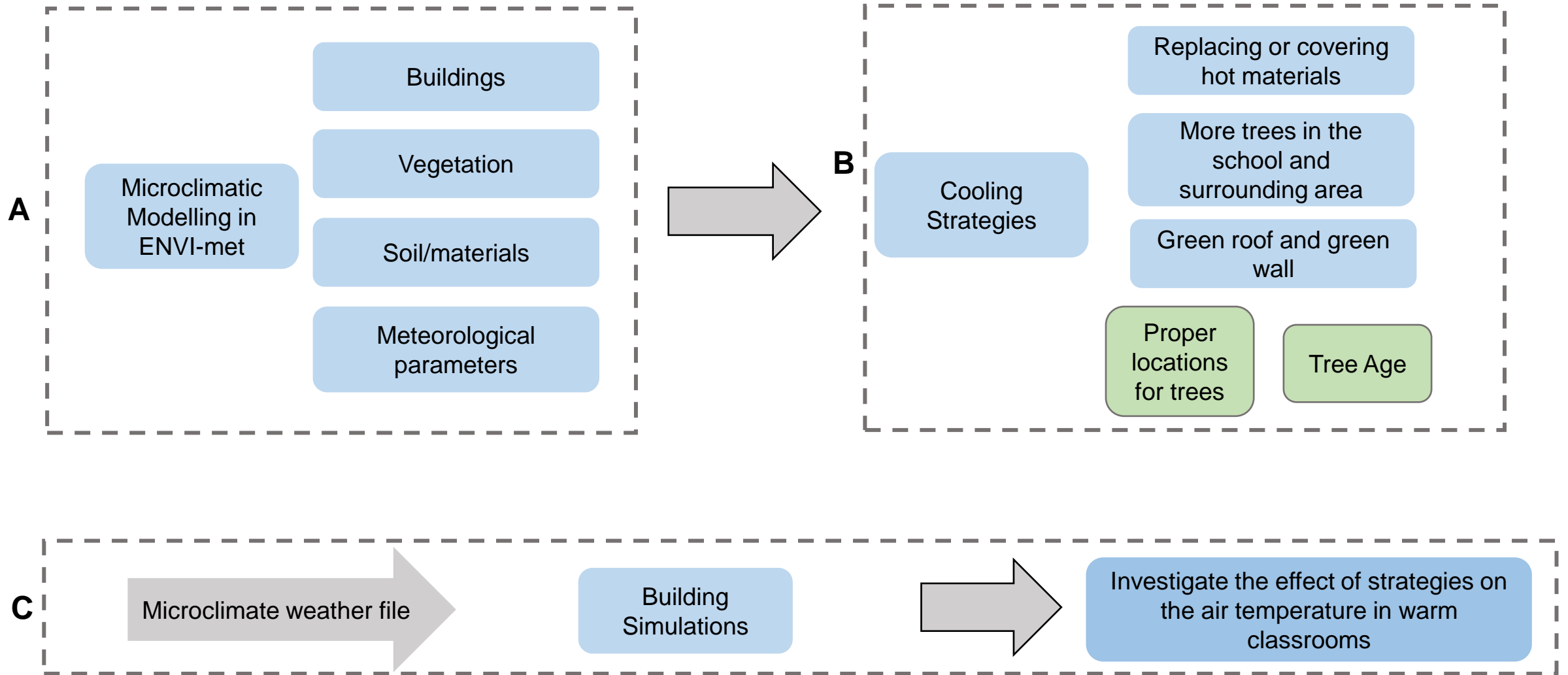
### Comparison of UGF and air temperature



### Surface temperature of materials in sunlight and shade, measured by thermal camera



# Simulations

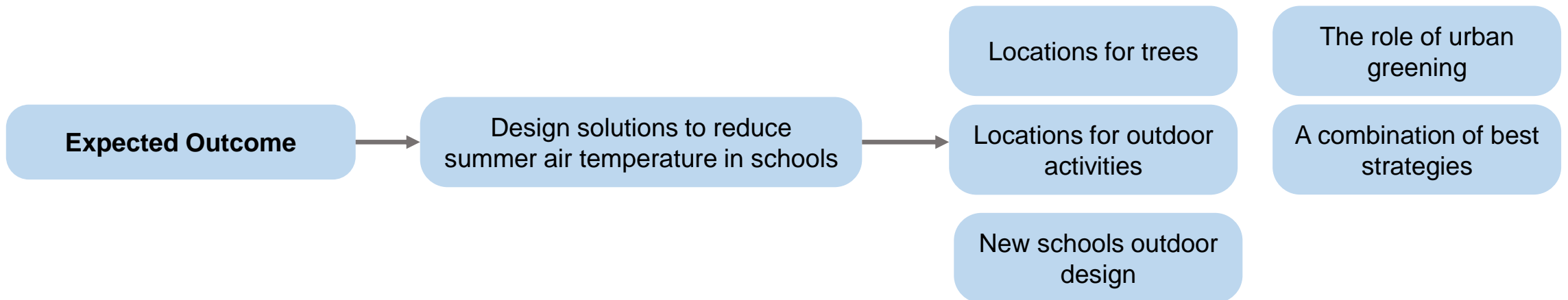
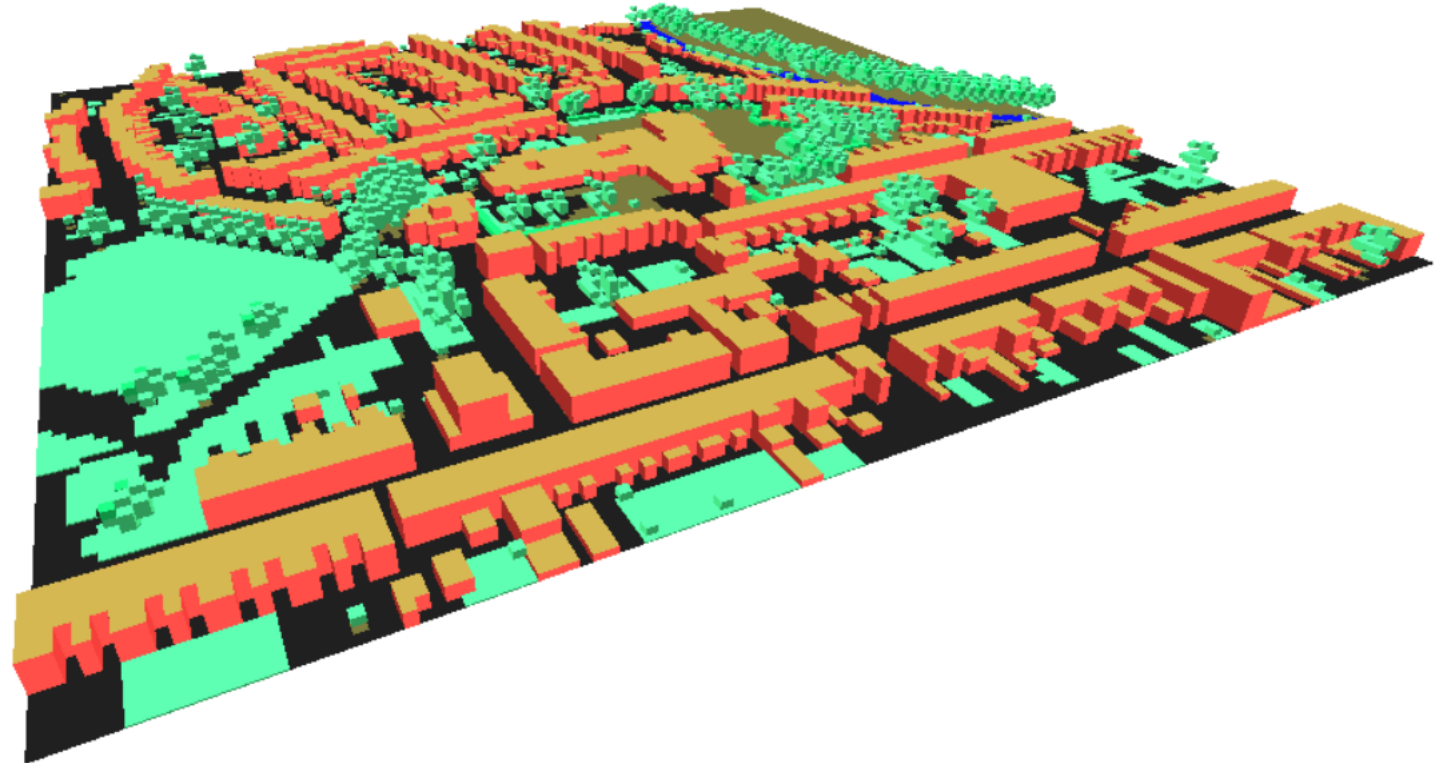




Map of school and surrounding area



Model in ENVI-met



THANK YOU  
FOR YOUR ATTENTION