



# THE SPECTRUM OF RESIDENTIAL COOLING DEMAND – MODELED DEMAND VERSUS REAL-LIFE NEEDS

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# Who Defines the Cooling Demand – Buildings or Residents?

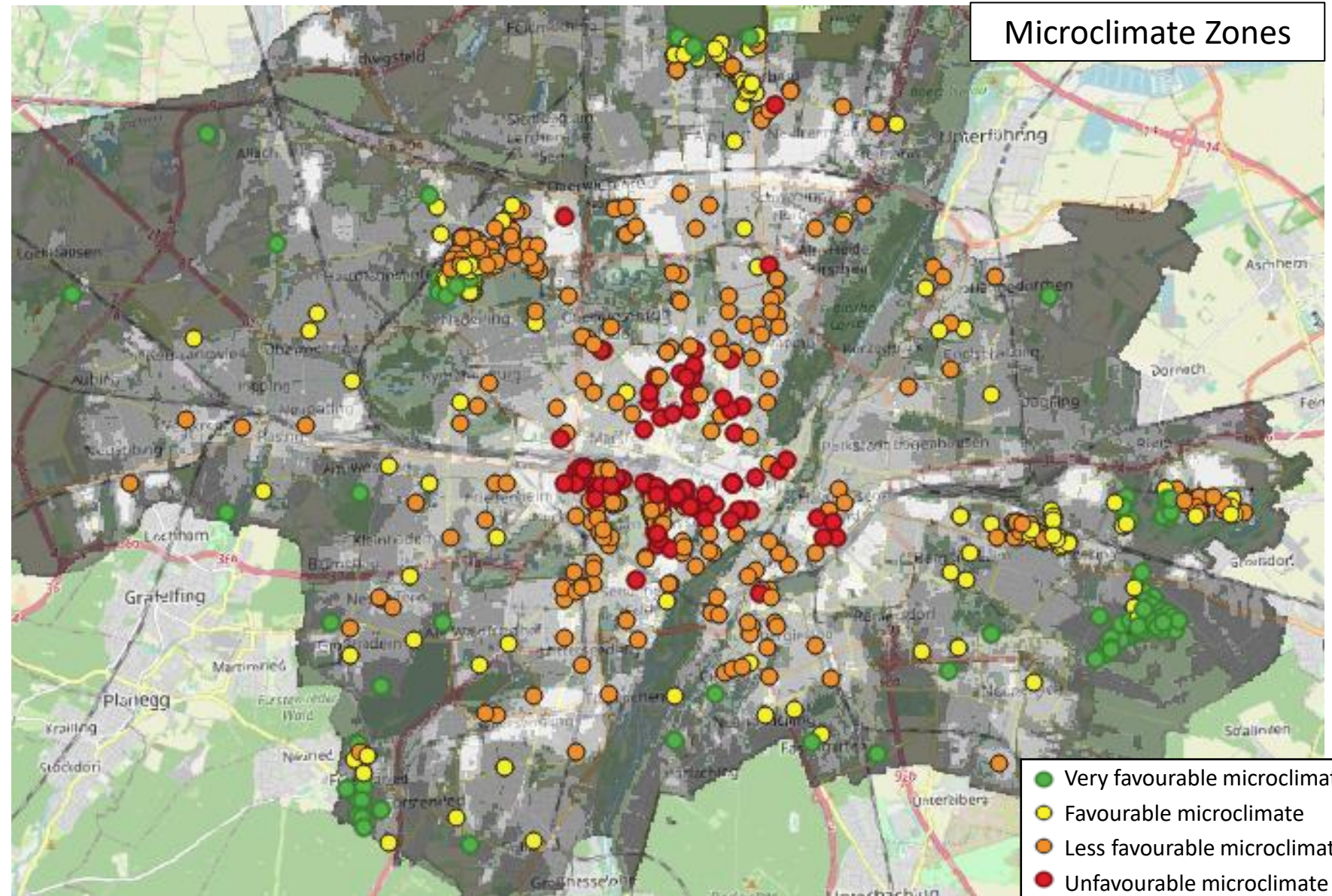


# The Mixed-Methods Study

## Diversity of

- building structures
- social structures
- microclimates

Household survey  
in summer 2020 (n=731)  
→ SPSS analysis, geocoding



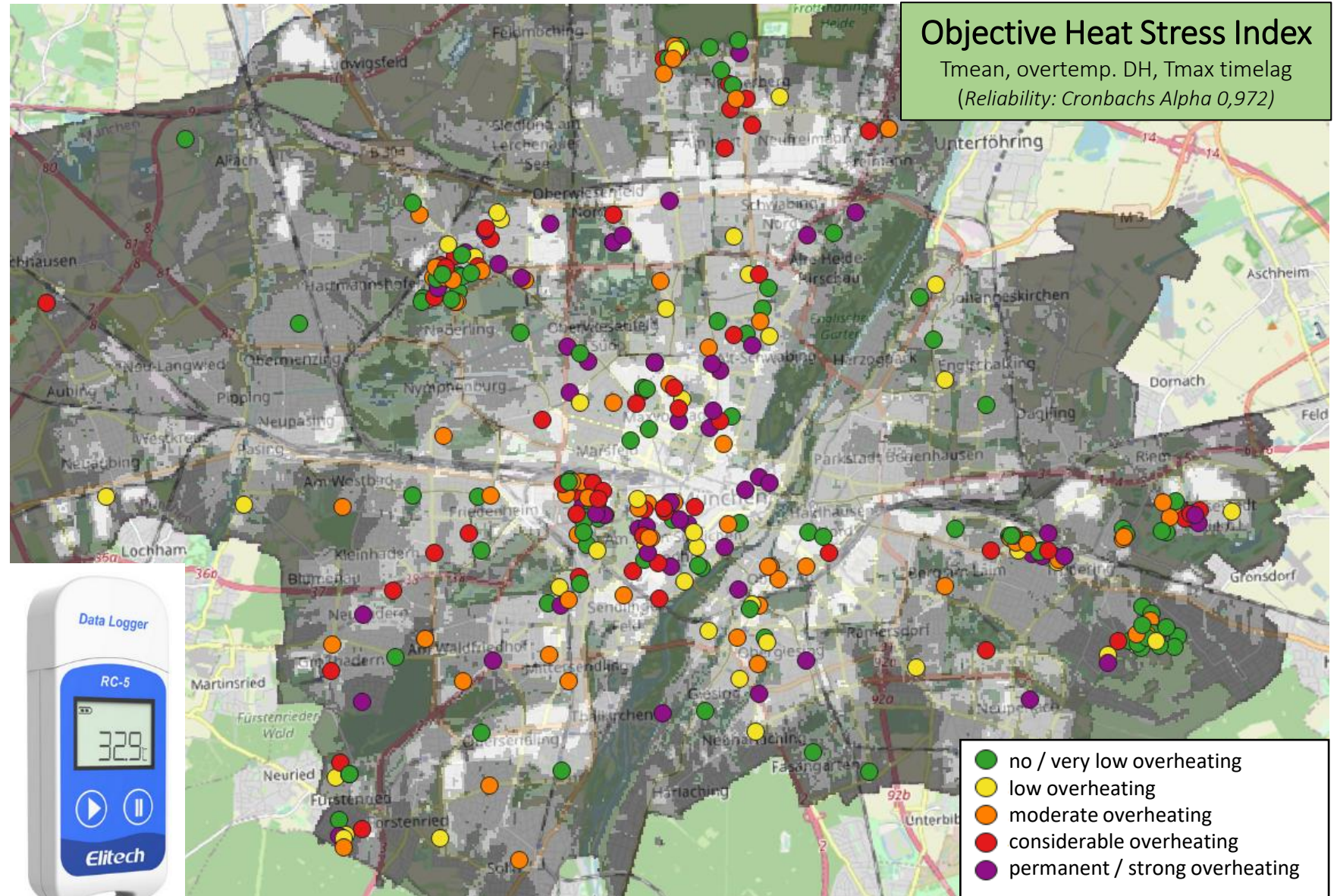
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in August 2020 (n=342)  
→ overheating analysis  
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in August 2020 (n=342)  
→ overheating analysis  
→ matched with survey data  
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Computer simulation (n=40)  
→ overheating analysis  
→ cooling demand model



# Modelled Cooling Demand

Overheating Hours



## Input data:

- weather data
- building geometries
- materials, windows
- air exchange rate
- shading by buildings
- treshhold 26°C

Cooling Demand



# Comparing Heat Exposures: Filling the Gaps

Presumed Heat Exposure

modeled / potential  
cooling demand



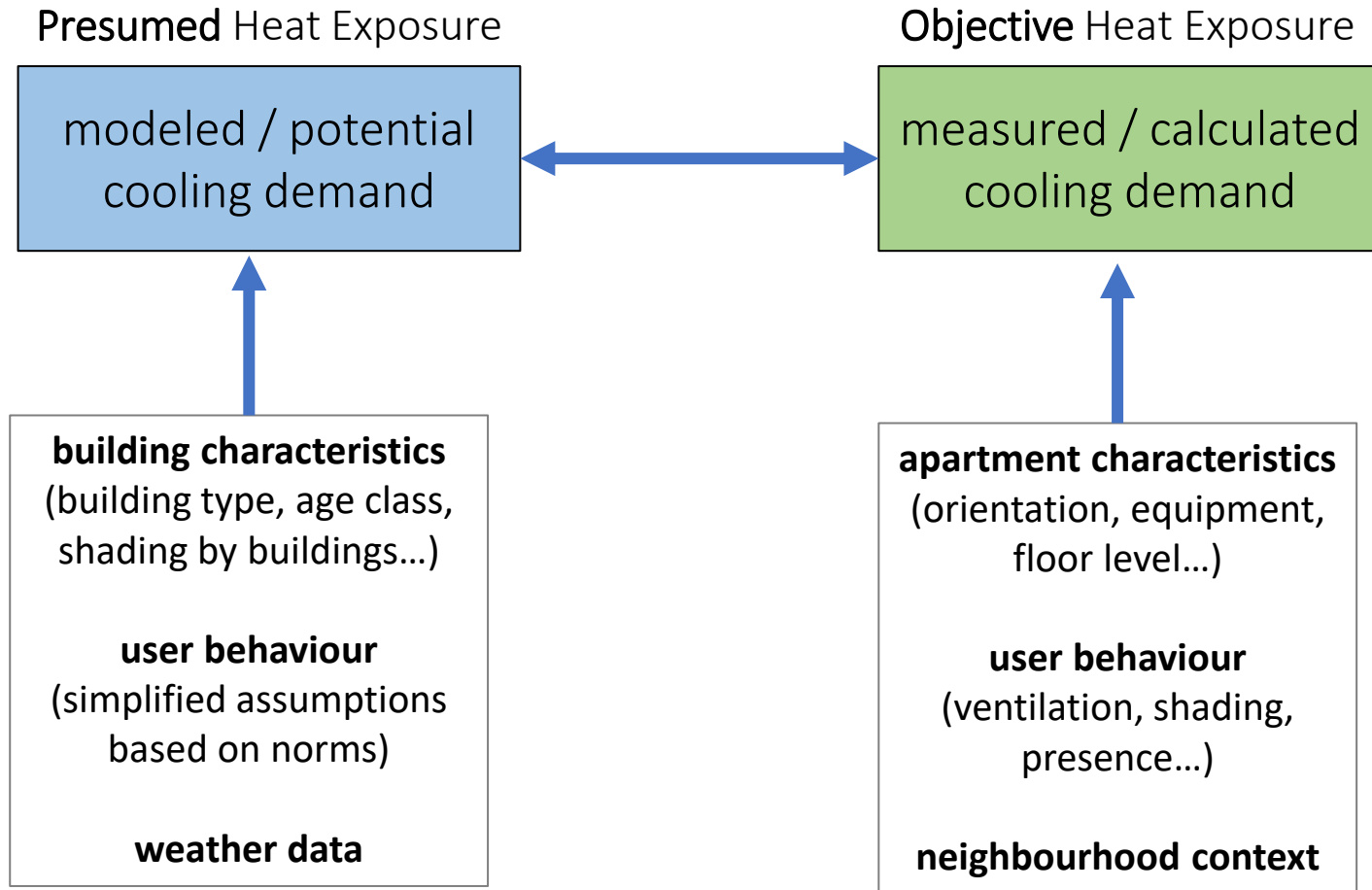
**building characteristics**  
(building type, age class,  
shading by buildings...)

**user behaviour**  
(simplified assumptions  
based on norms)

**weather data**

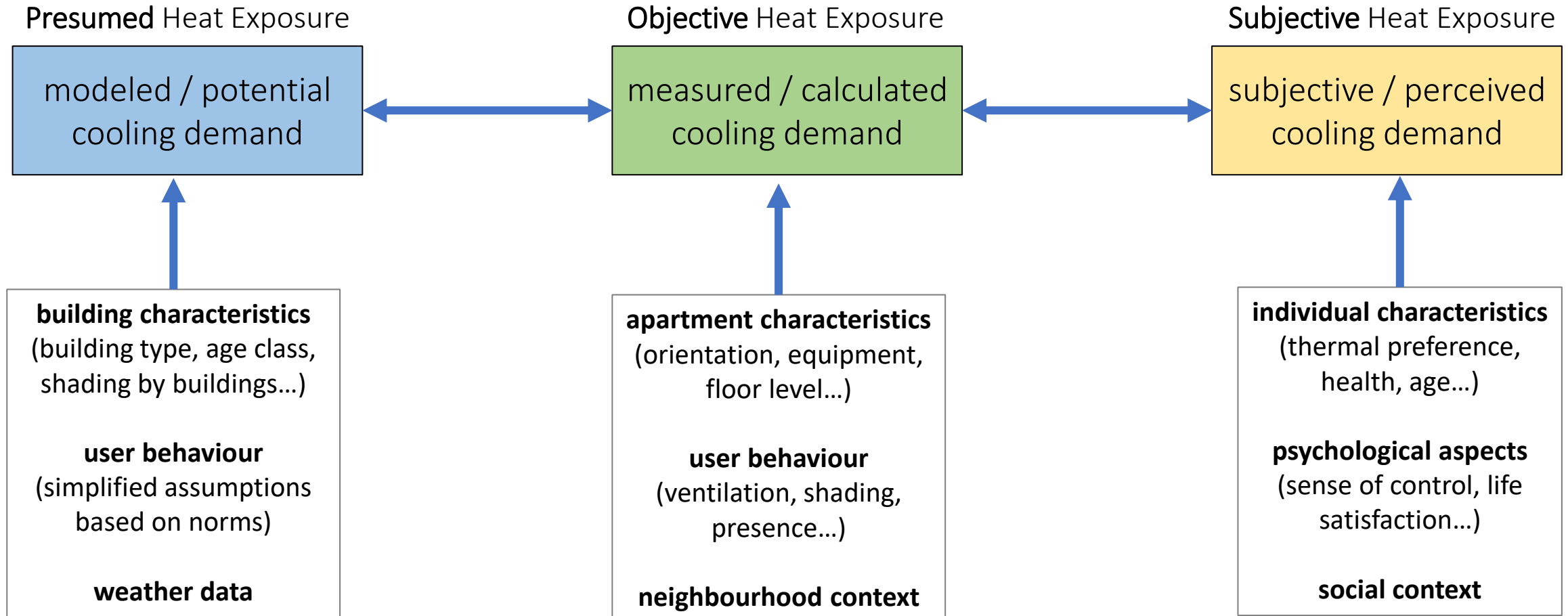


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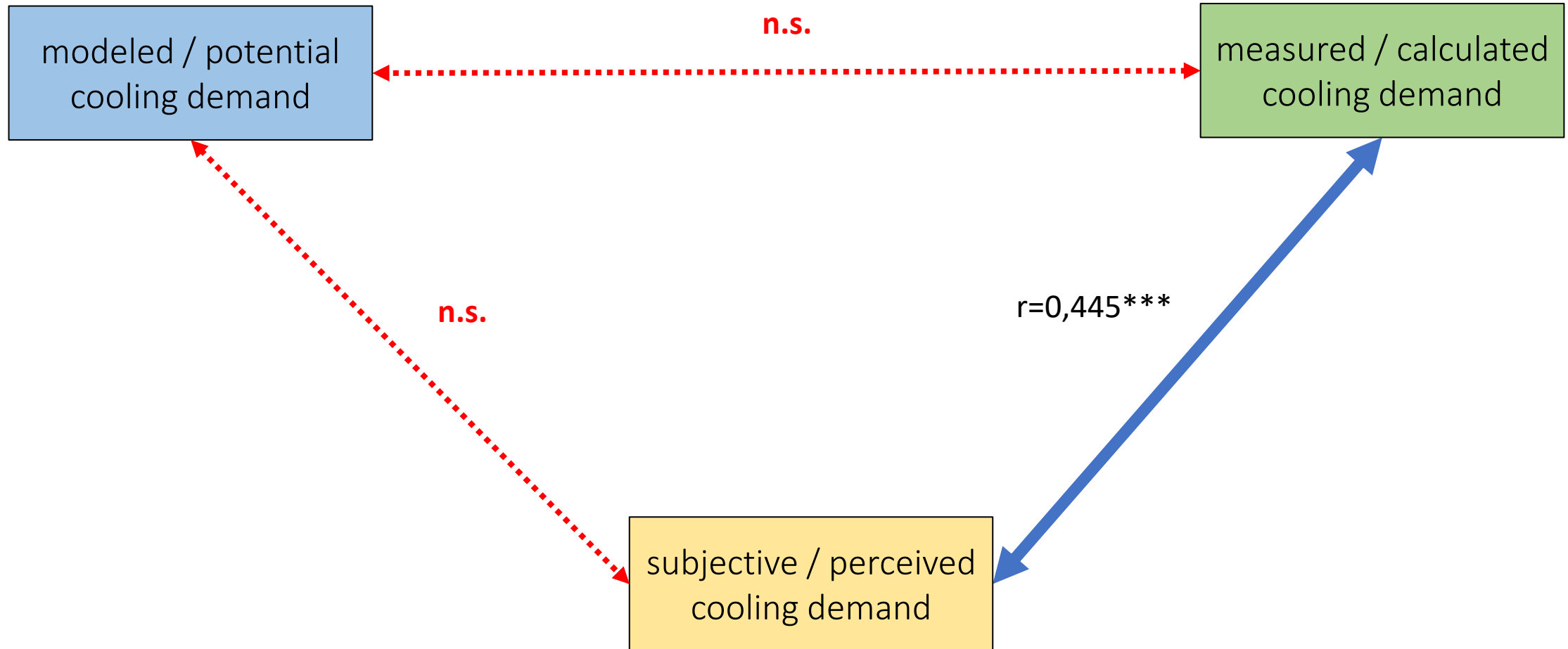




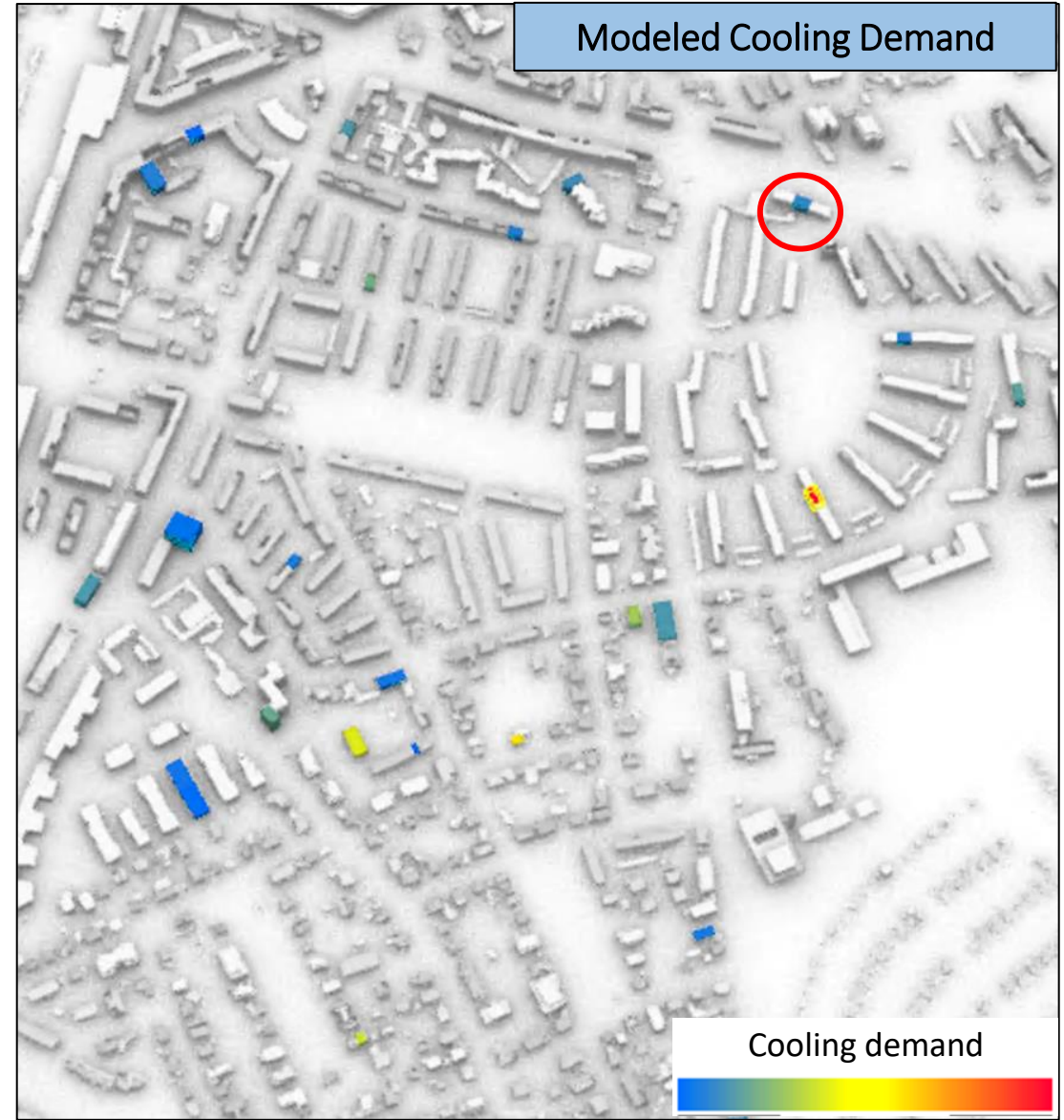
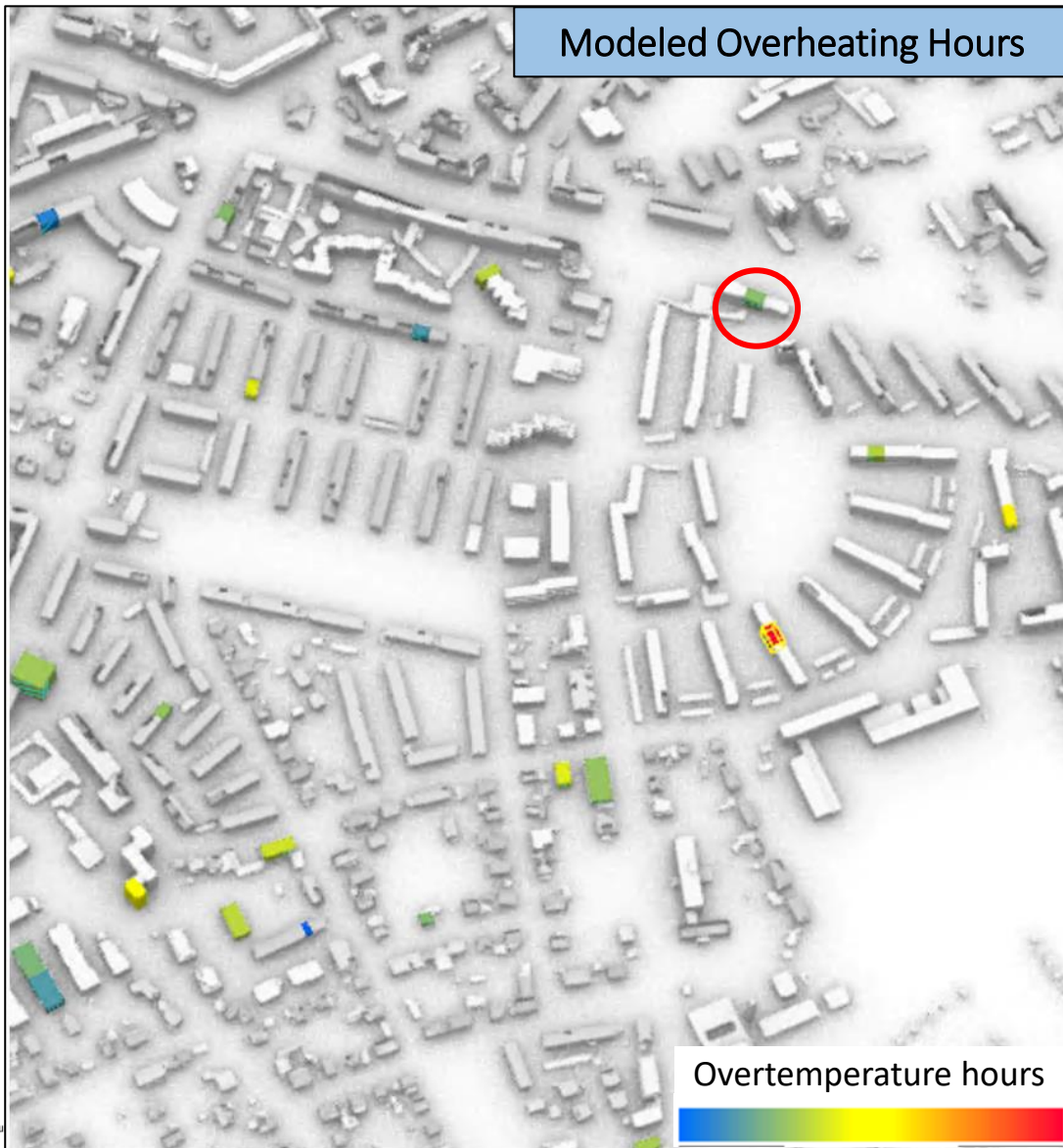
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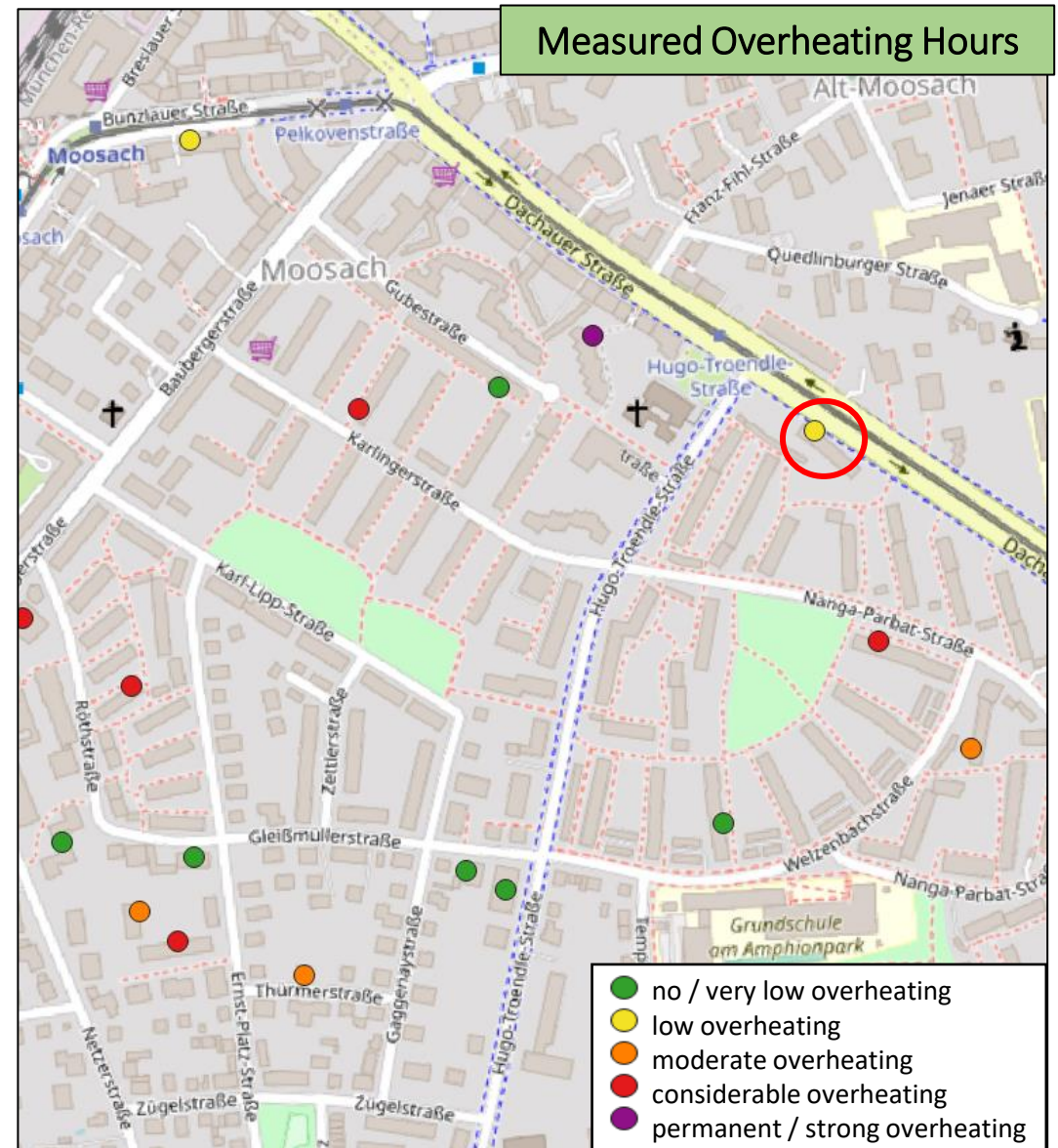
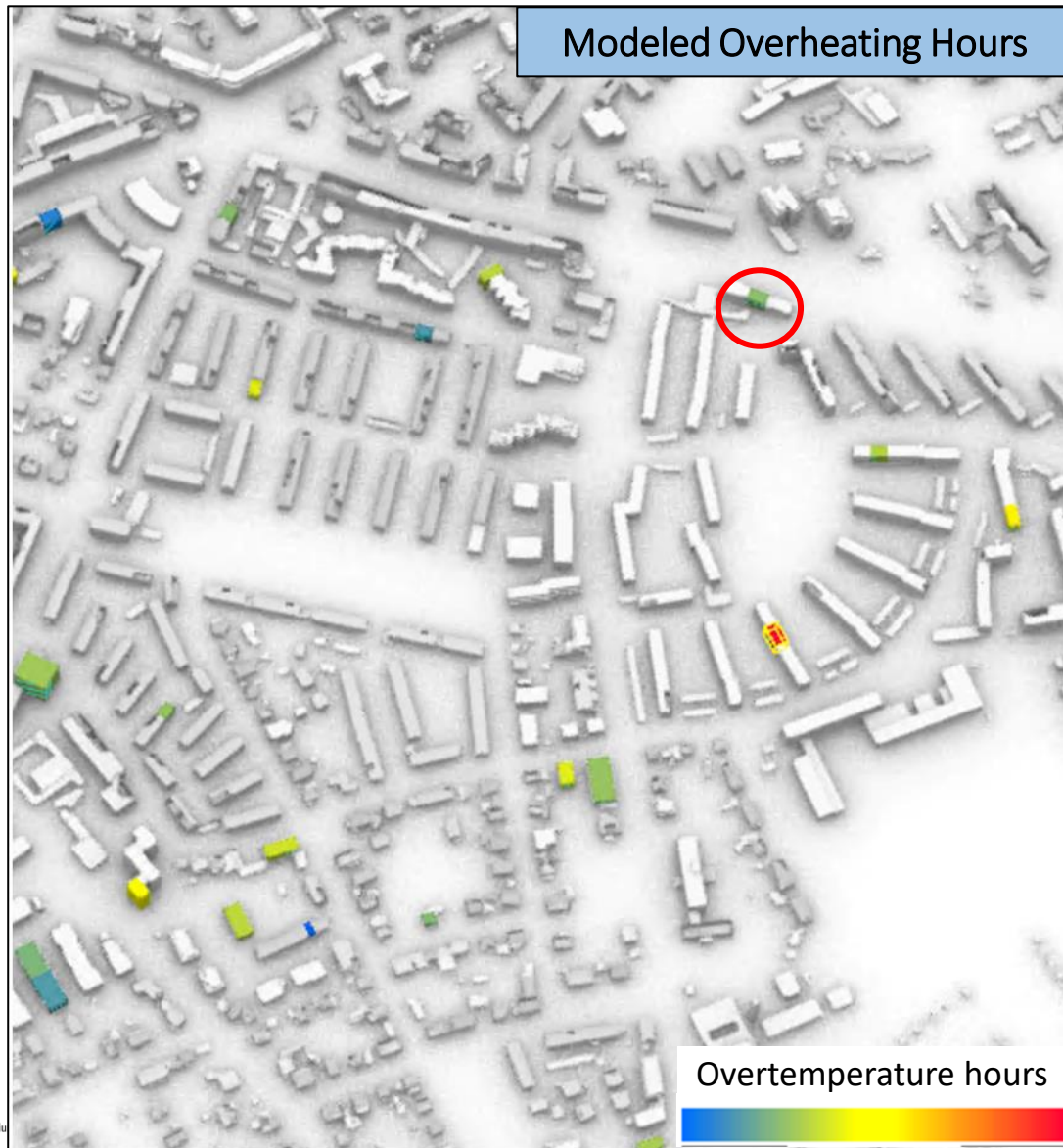
# First results



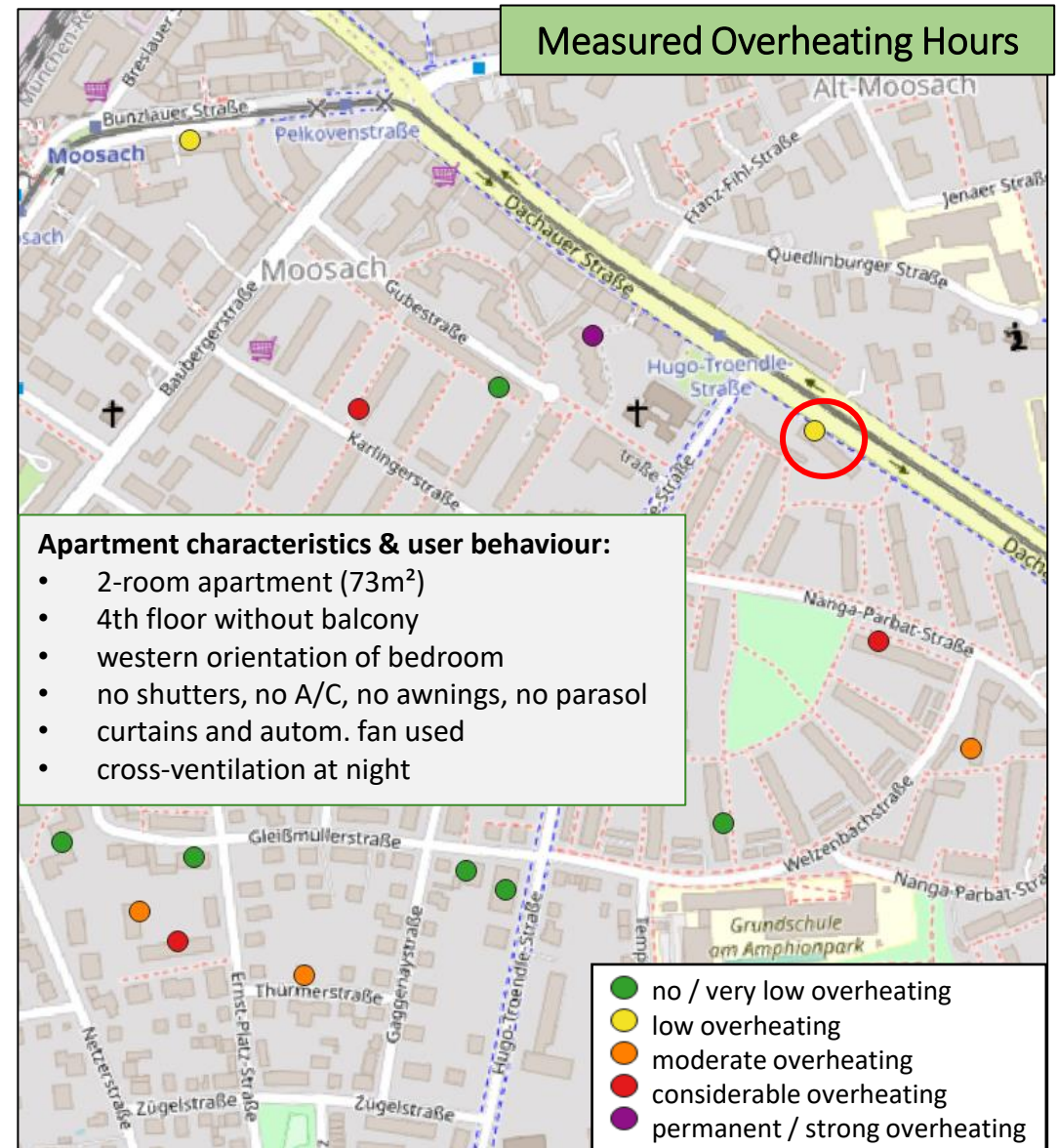
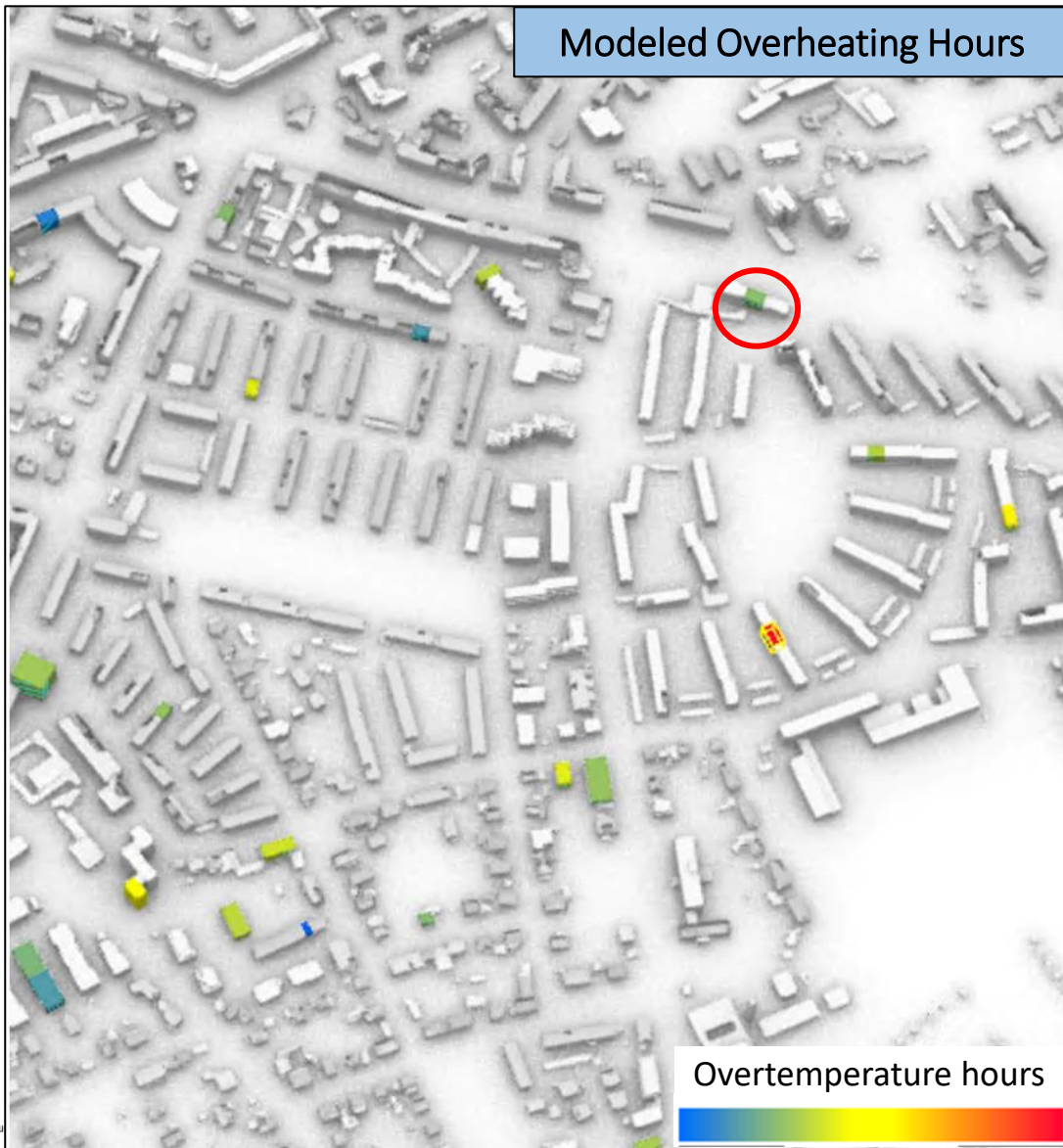
# Filling the Gaps: An Example from the Real World



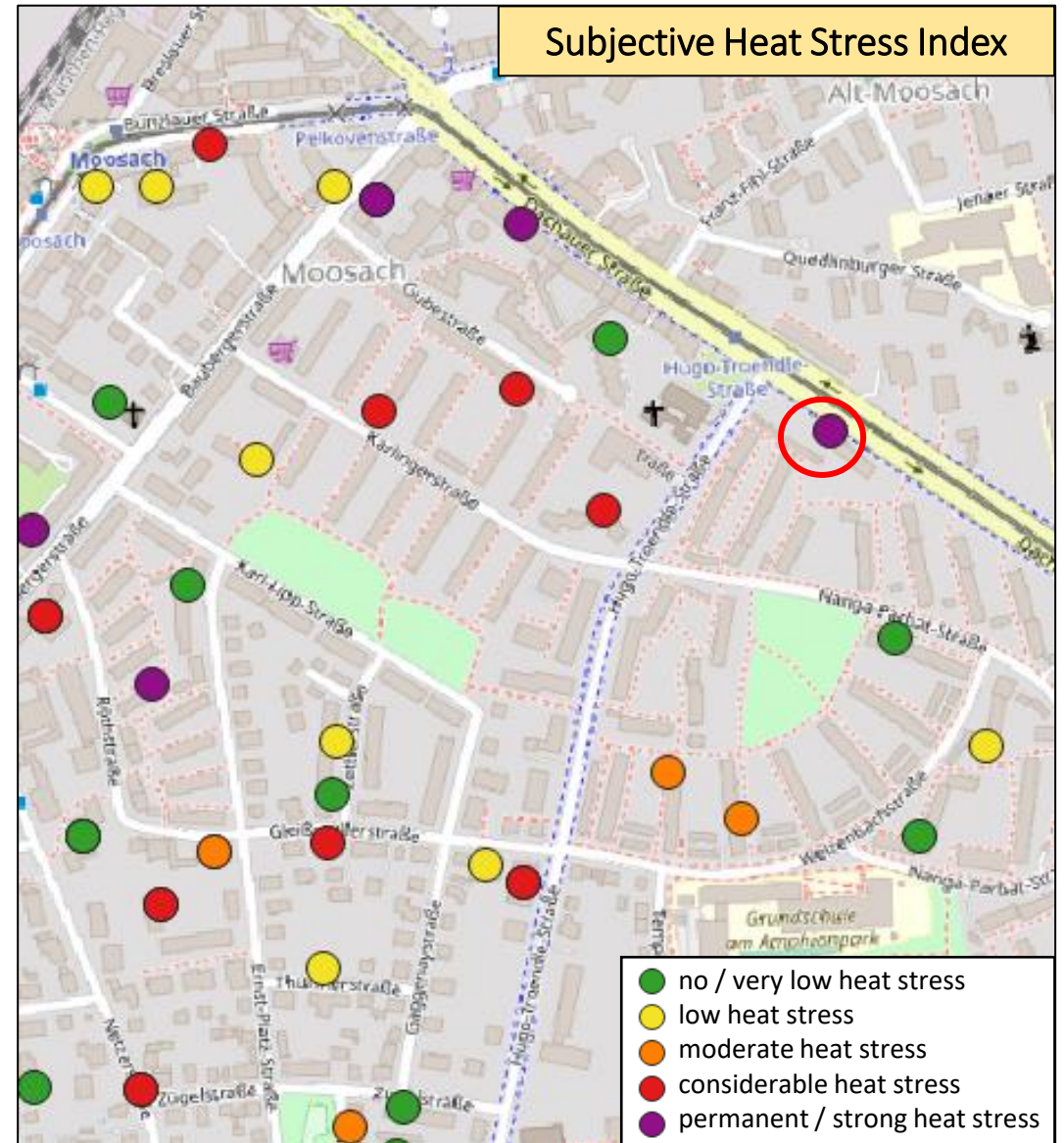
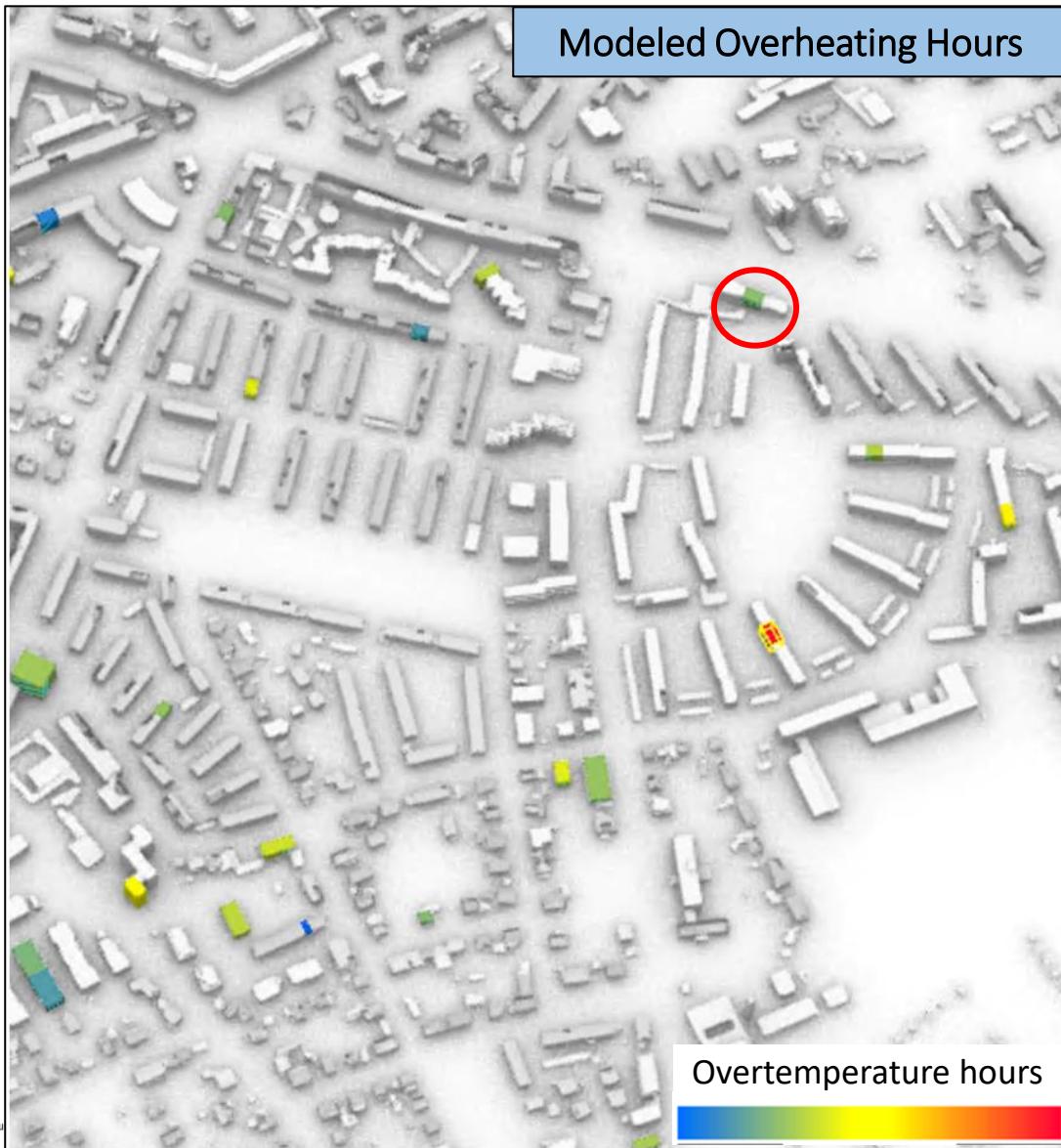
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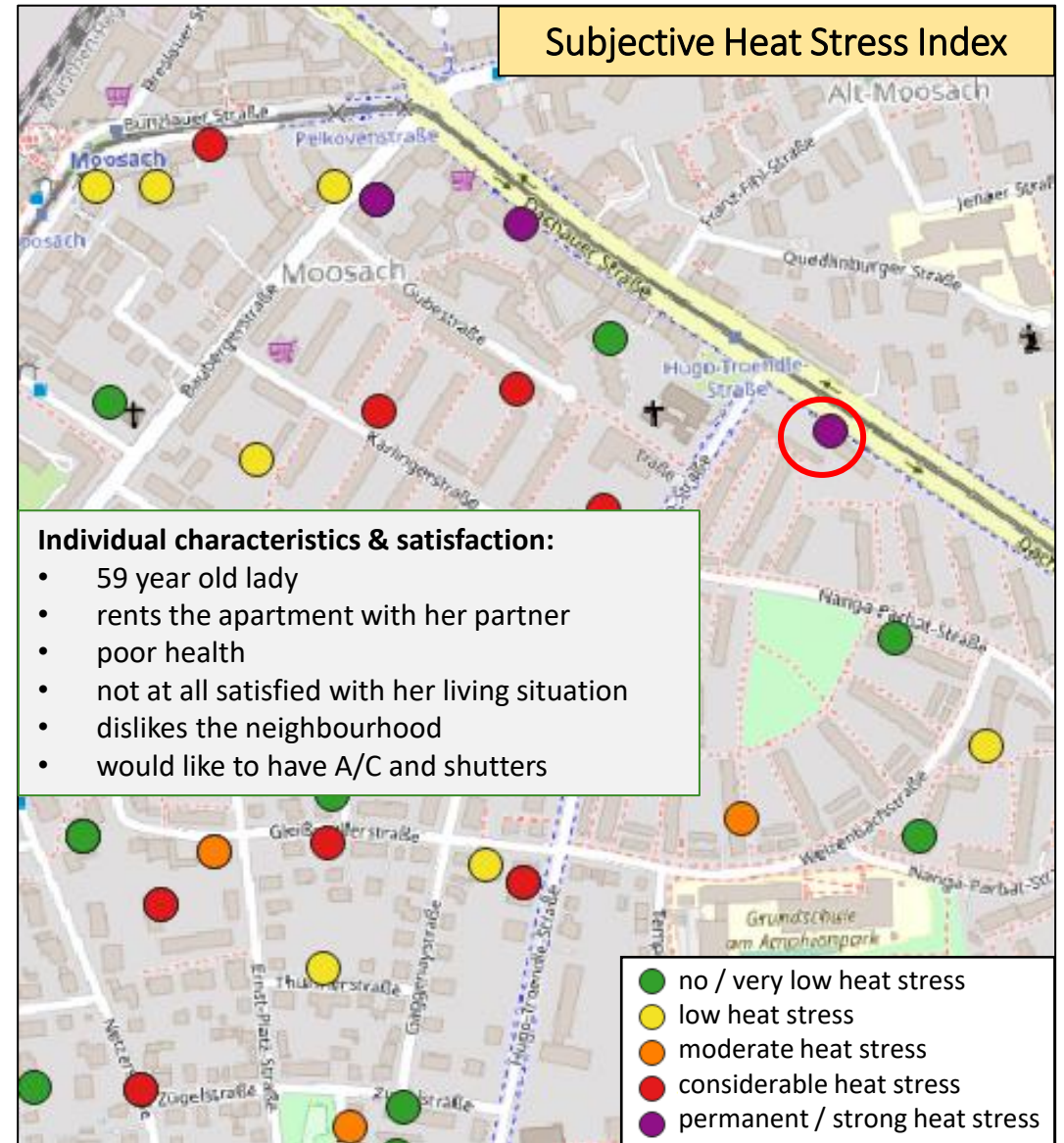
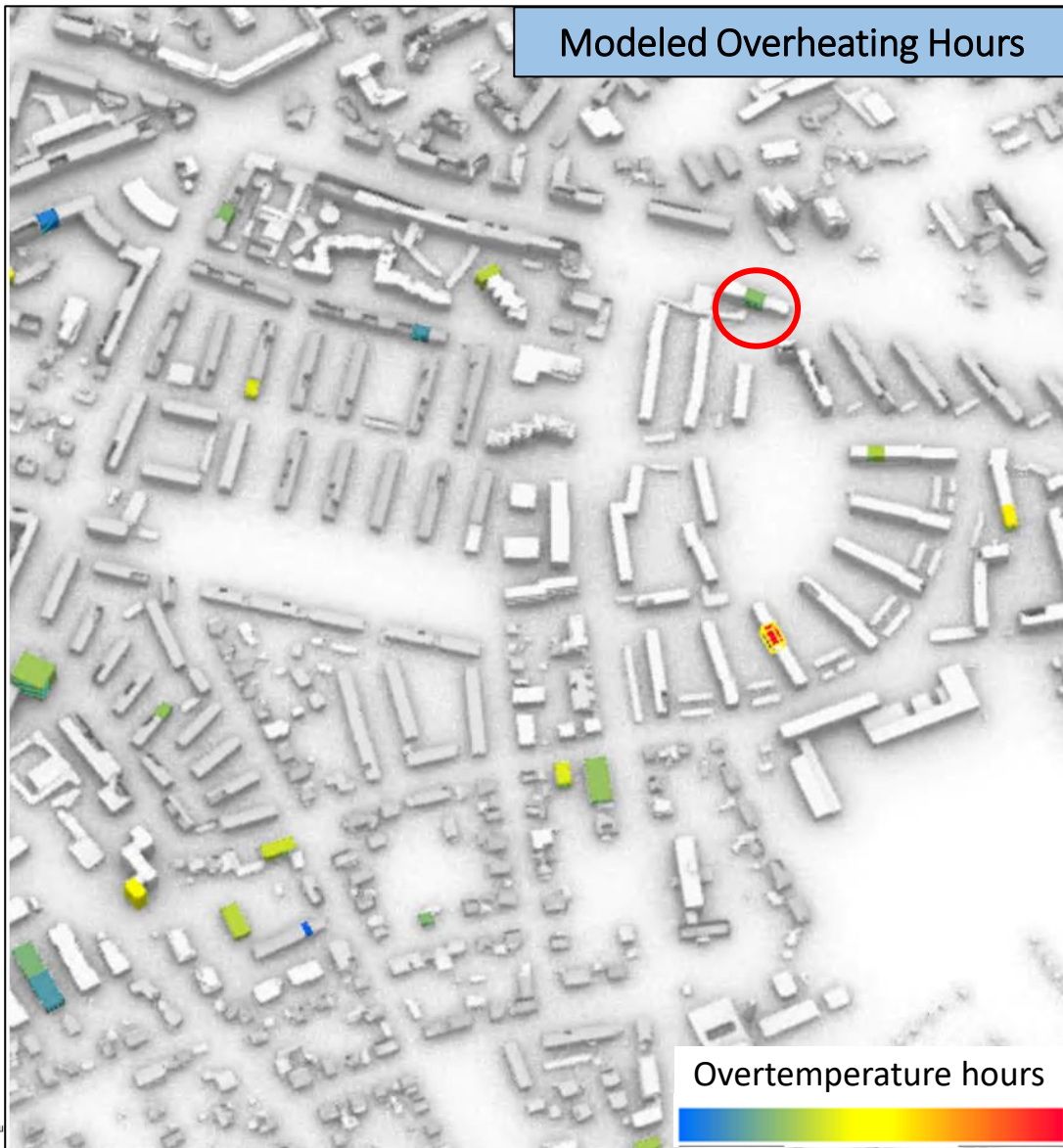
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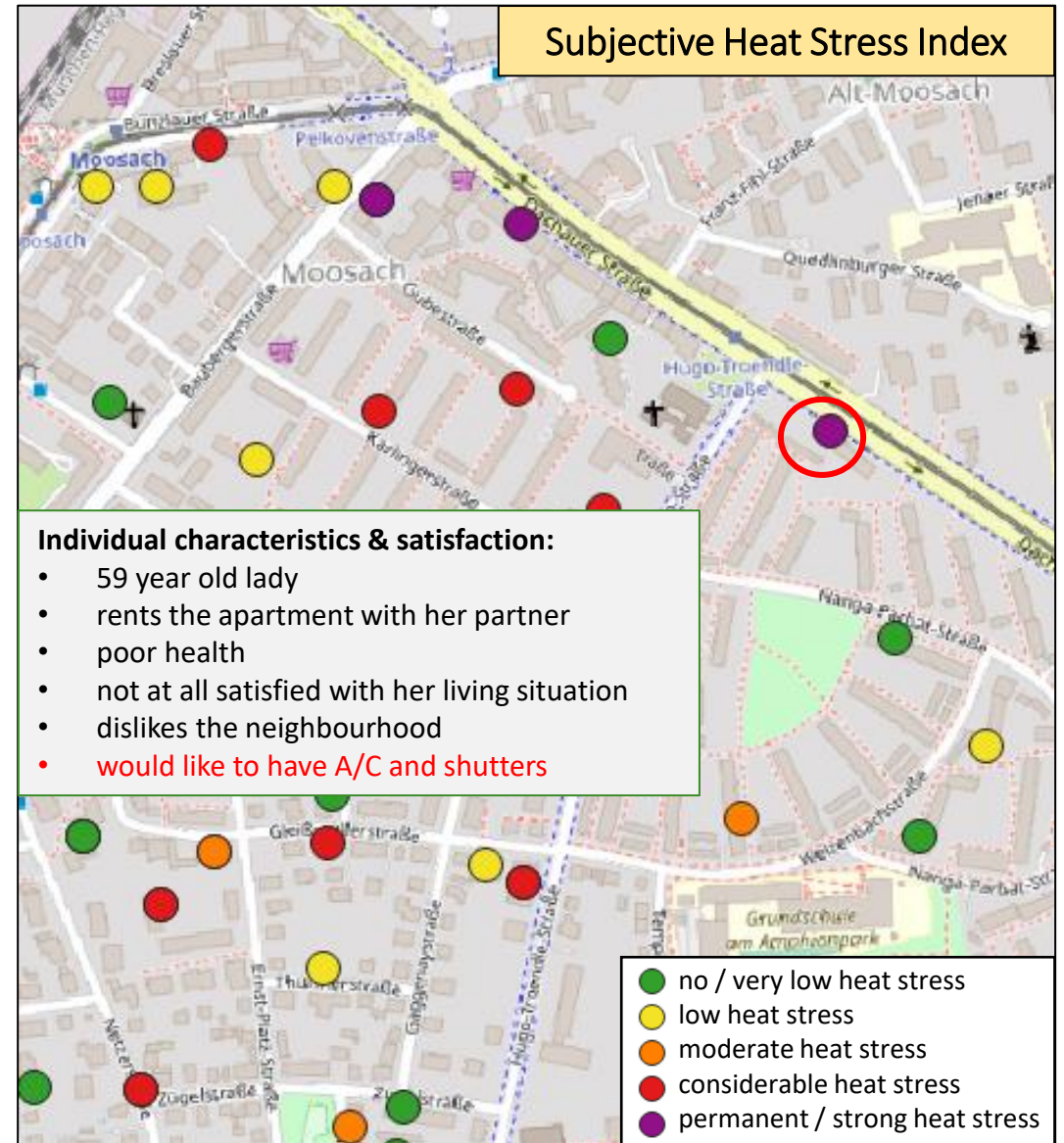
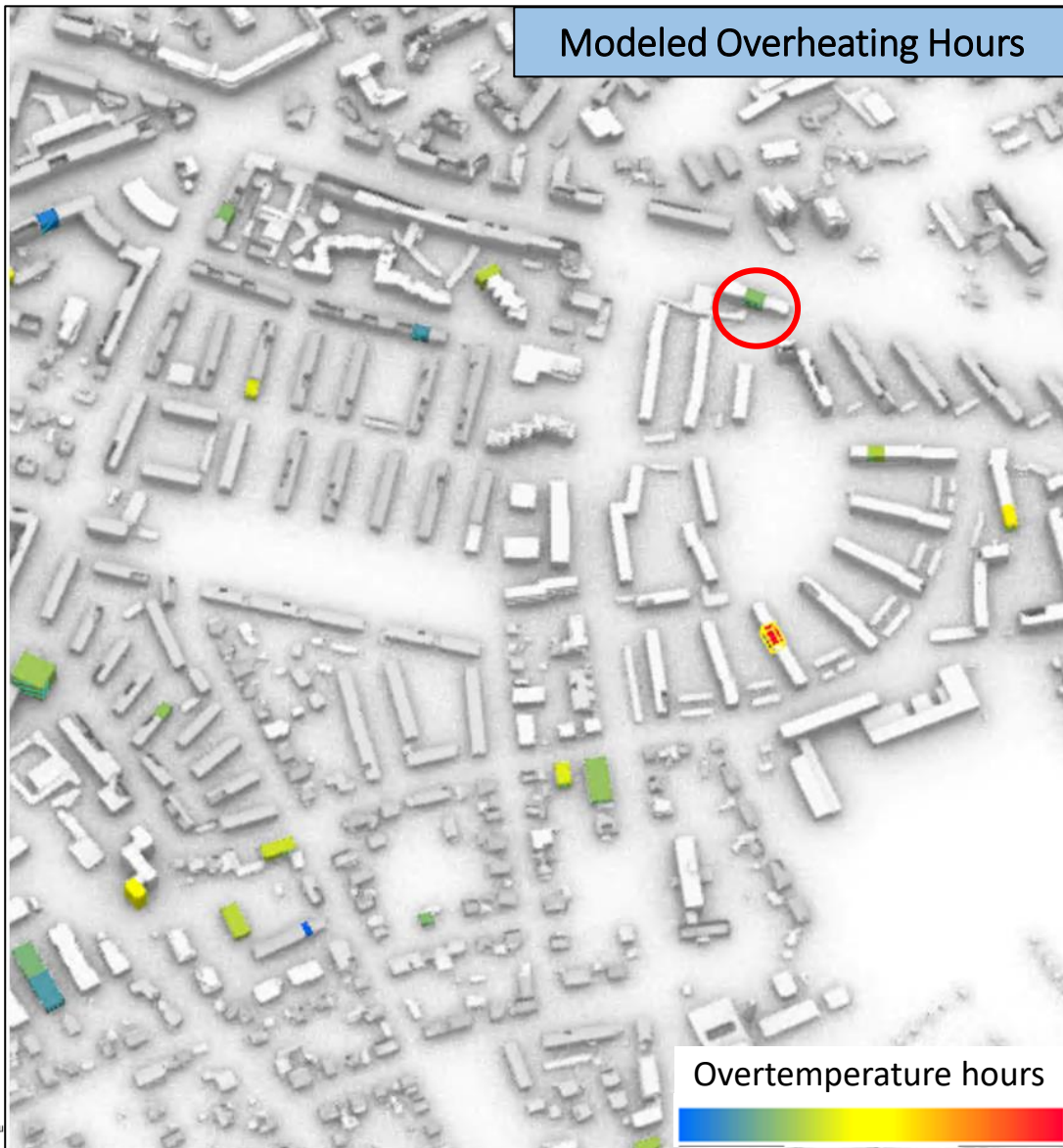
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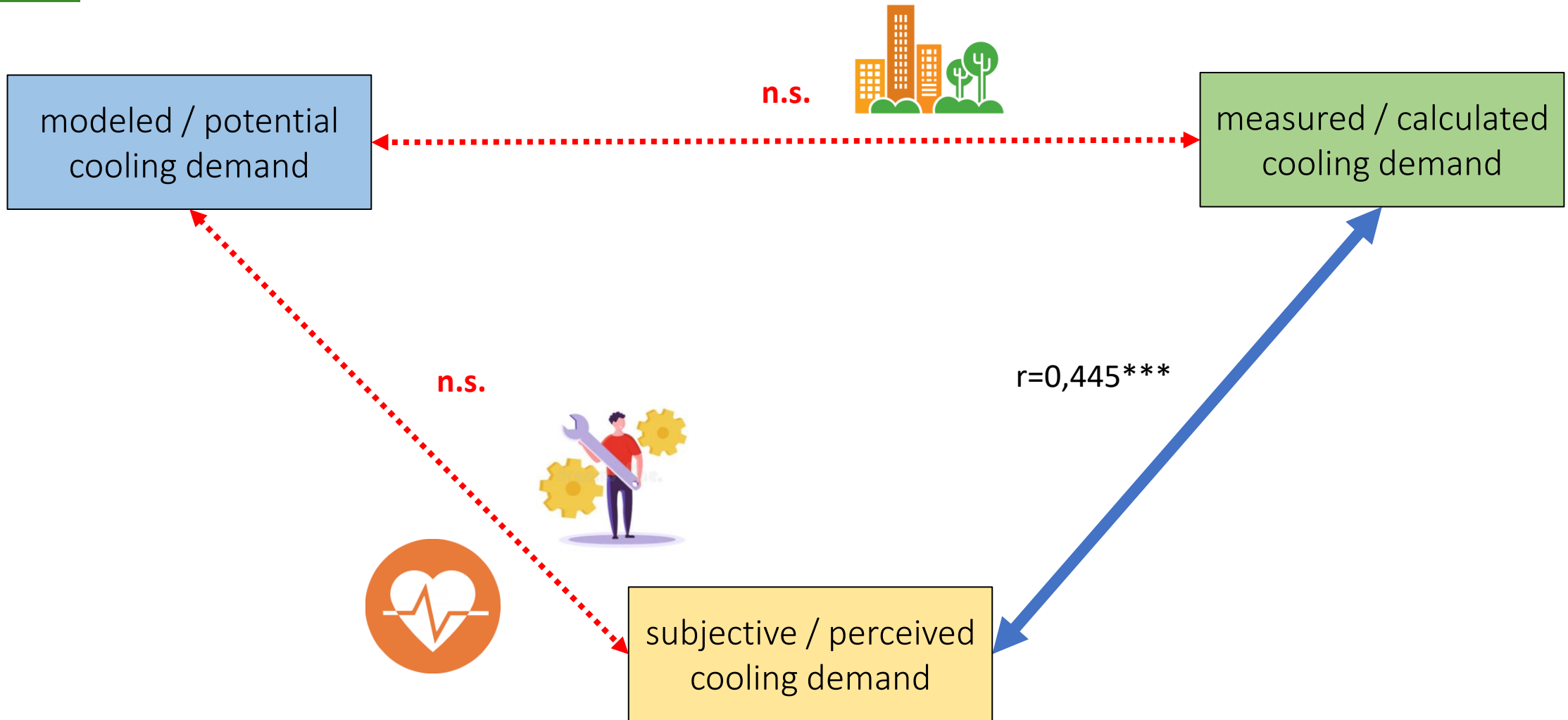


# Filling the Gaps: An Example from the Real World





# Conclusion: The Devil is in the Details



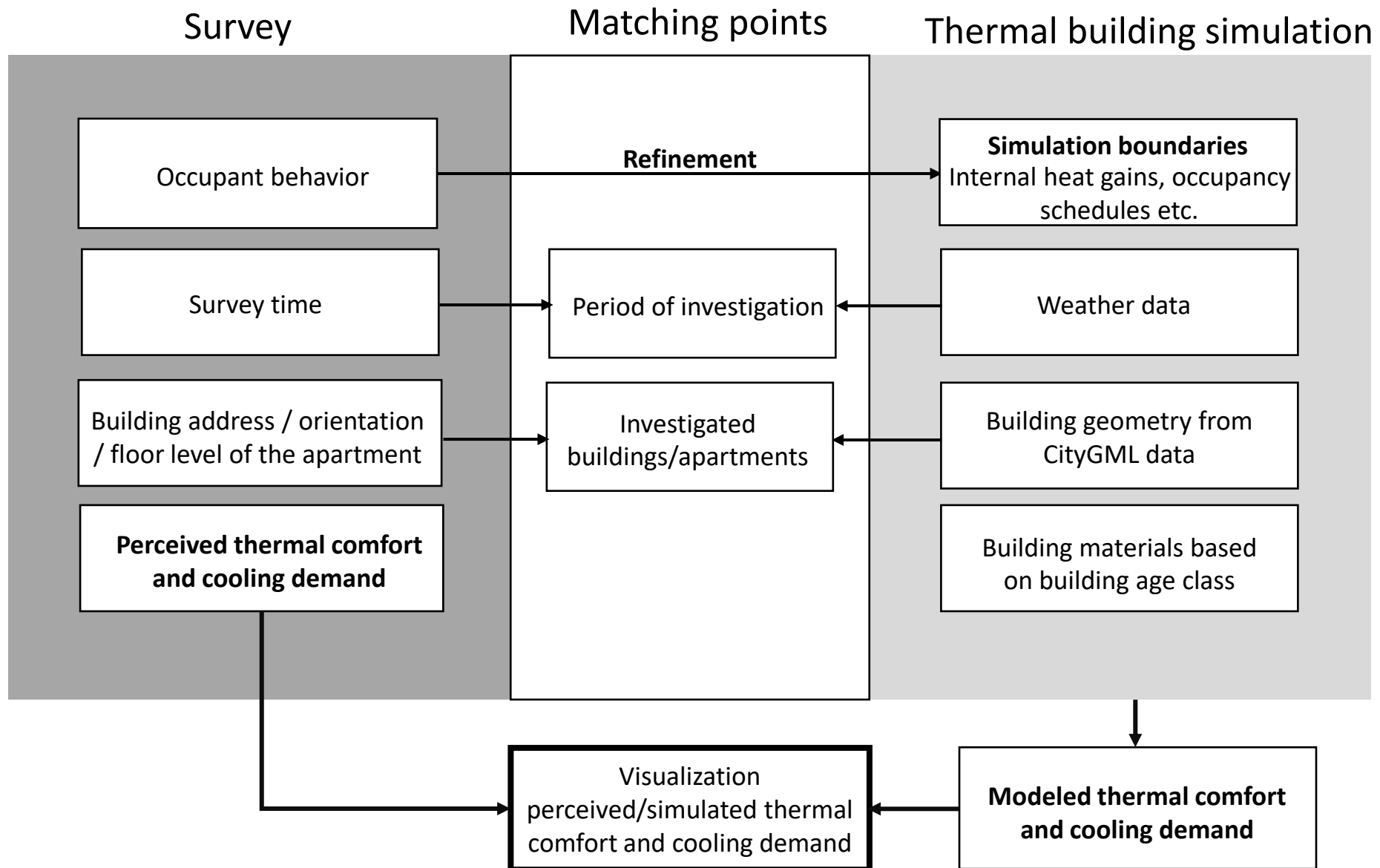
Thank You – Questions Welcome!

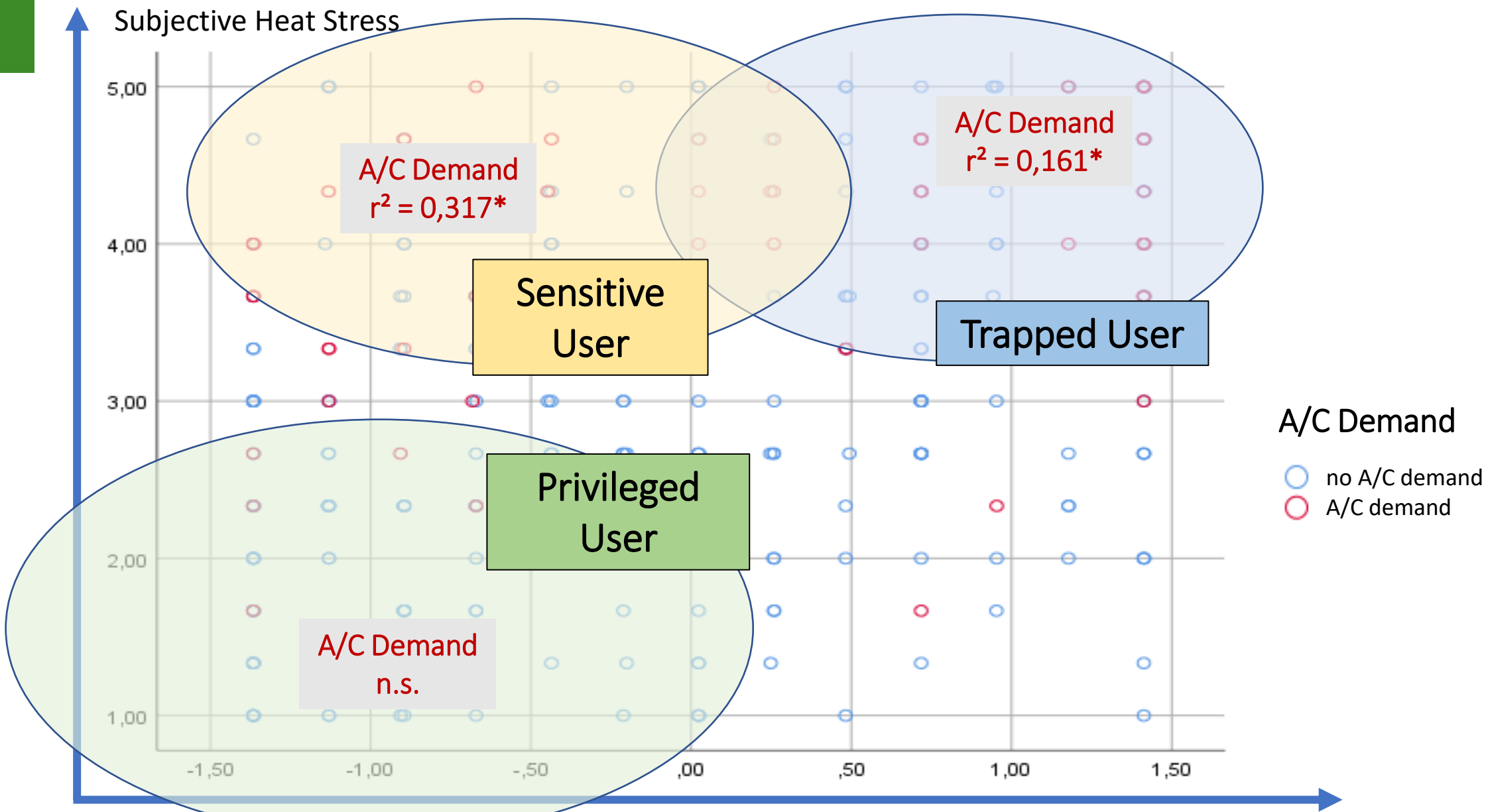
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Backup

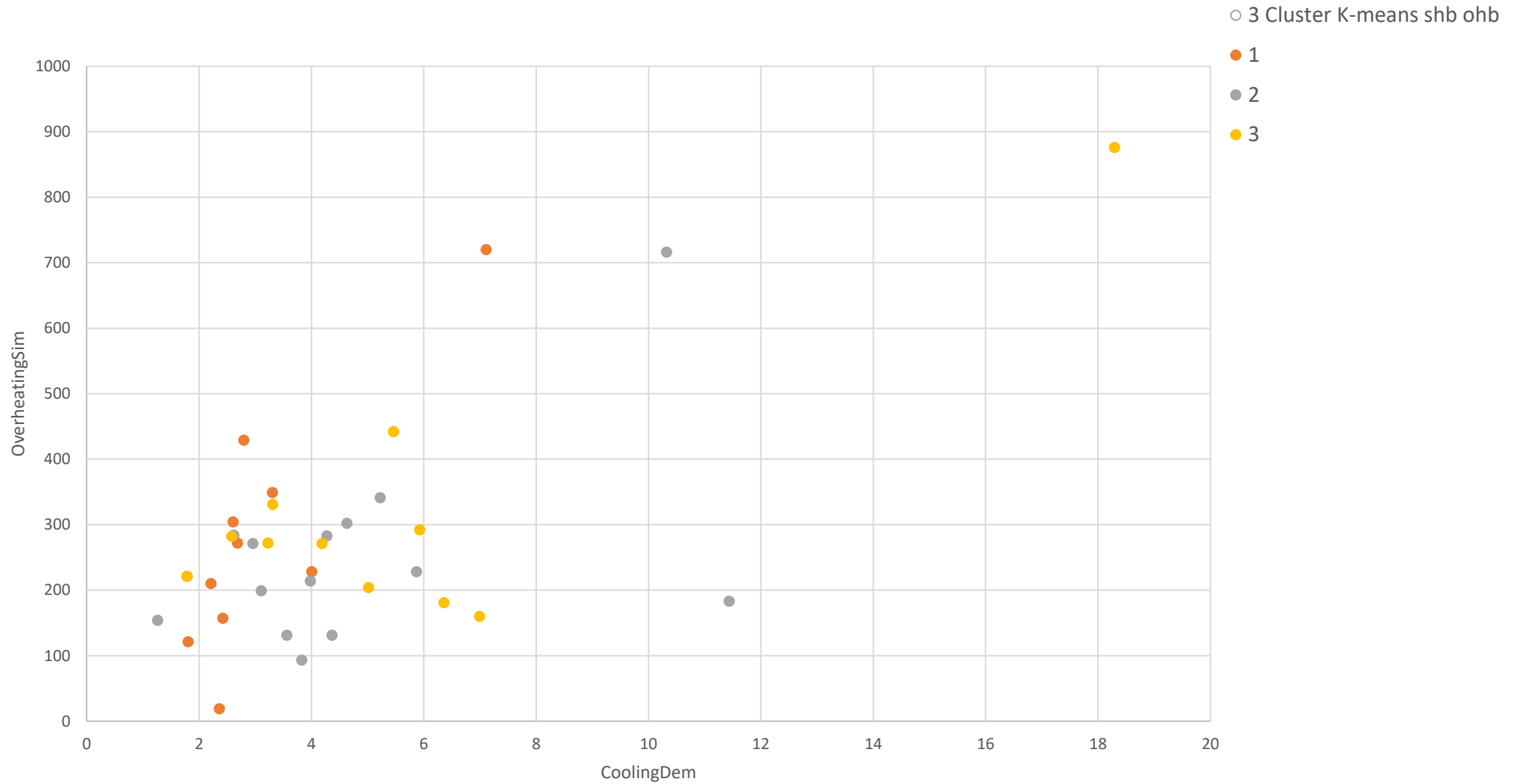
# Methodological Overview





Objective Heat Stress

# Subjective Heat Stress



Objective Heat Stress