Assessing Outdoor Thermal Comfort through Microclimatic Modeling: A Case Study in Lecce (Italy)

Author:

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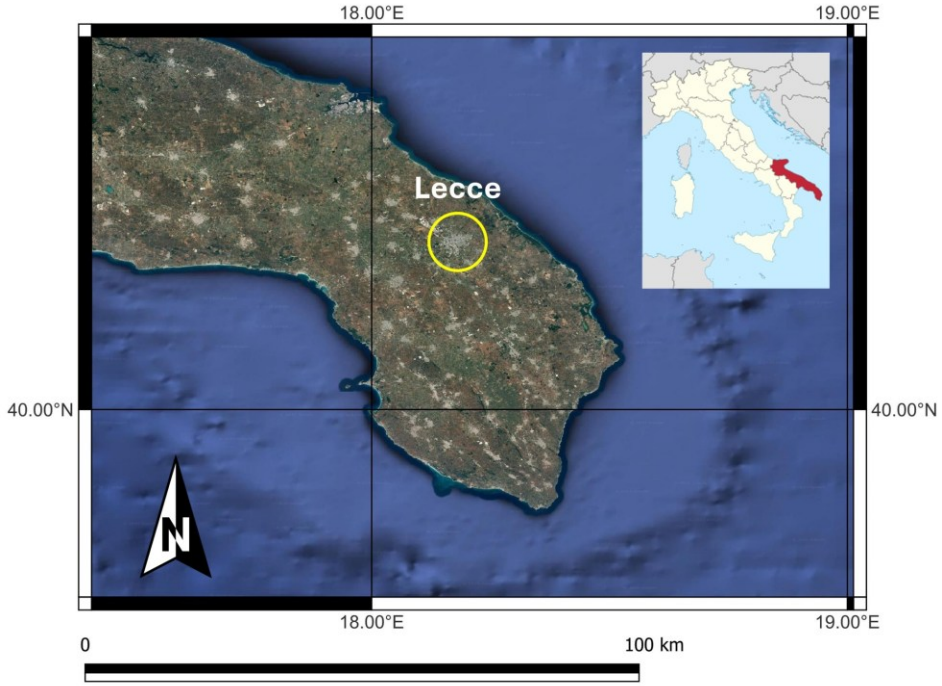
OBJECTIVE

The aim of this work is to analyze **thermal comfort** in terms of ***Universal Thermal Climate Index*** **(UTCI)**, in a selected area of **Lecce**, a typical Mediterranean city, using a **modelling approach** to evaluate the microclimatic mitigation effects of urban greenery.



Piazzetta S. Michele Arcangelo – Lecce (Italy)

METHODOLOGY - *Study area*

CURRENT SCENARIO

MODIFIED SCENARIO

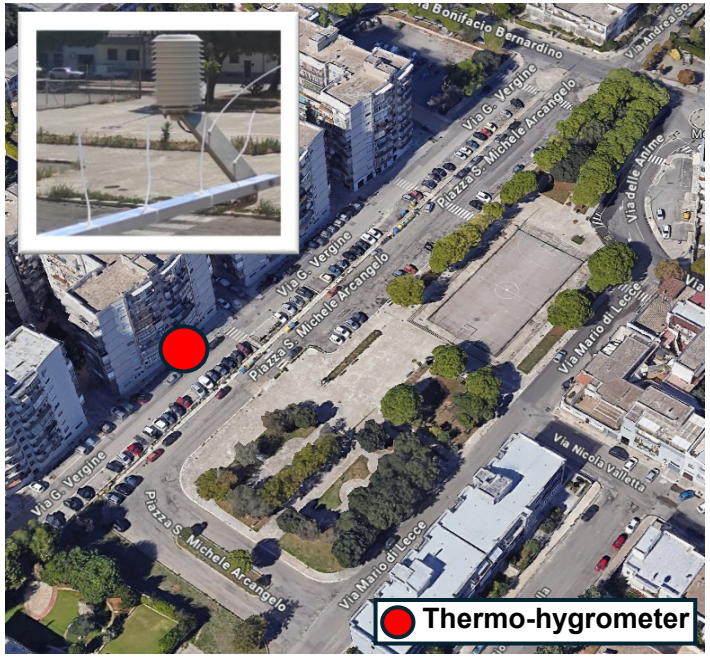
METHODOLOGY – *Weather forcings*

DATA COLLECTION

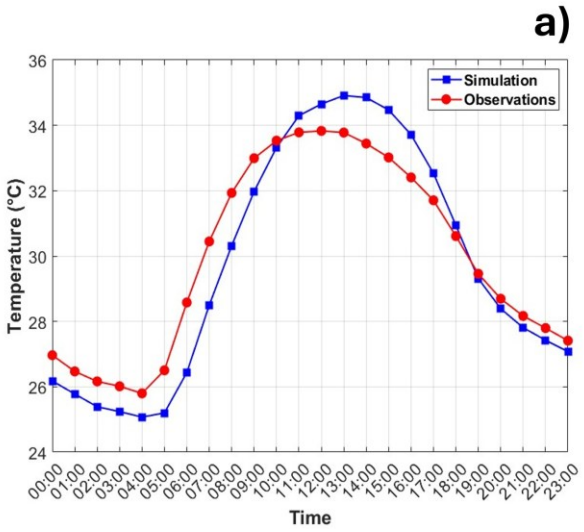
Weather station in the center of Lecce

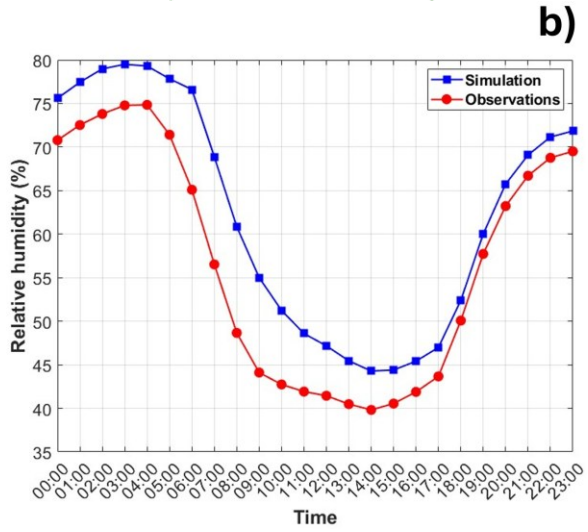
- Air temperature (°C);
- Relative humidity (%);
- Wind speed (m/s);
- Wind direction (°);
- Precipitation (mm)

Weather **input** in **ENVI-met** (**1st August 2024**)



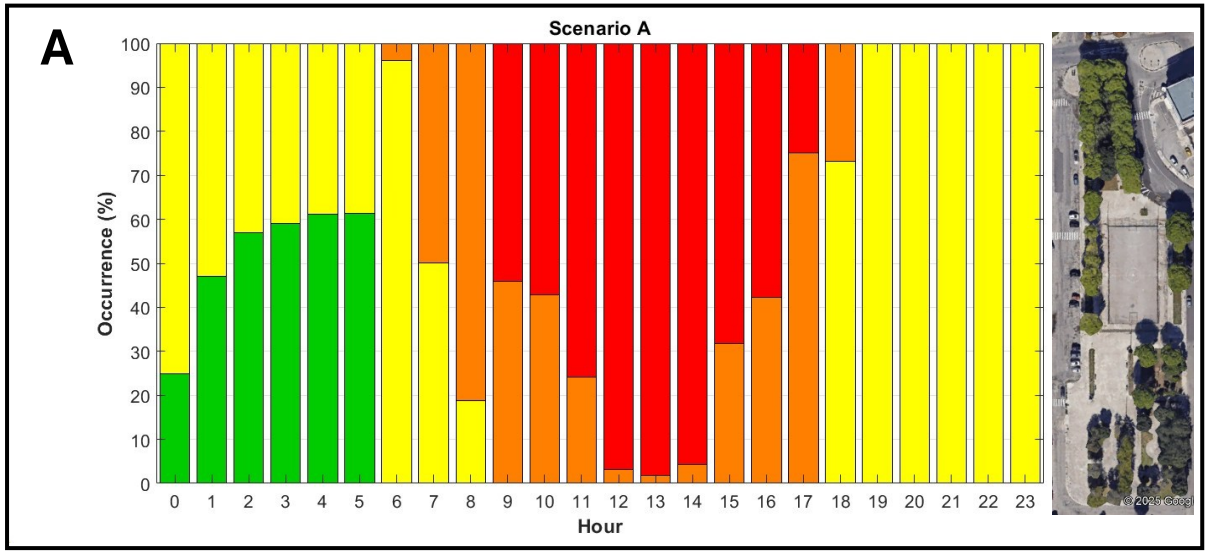
VALIDATION

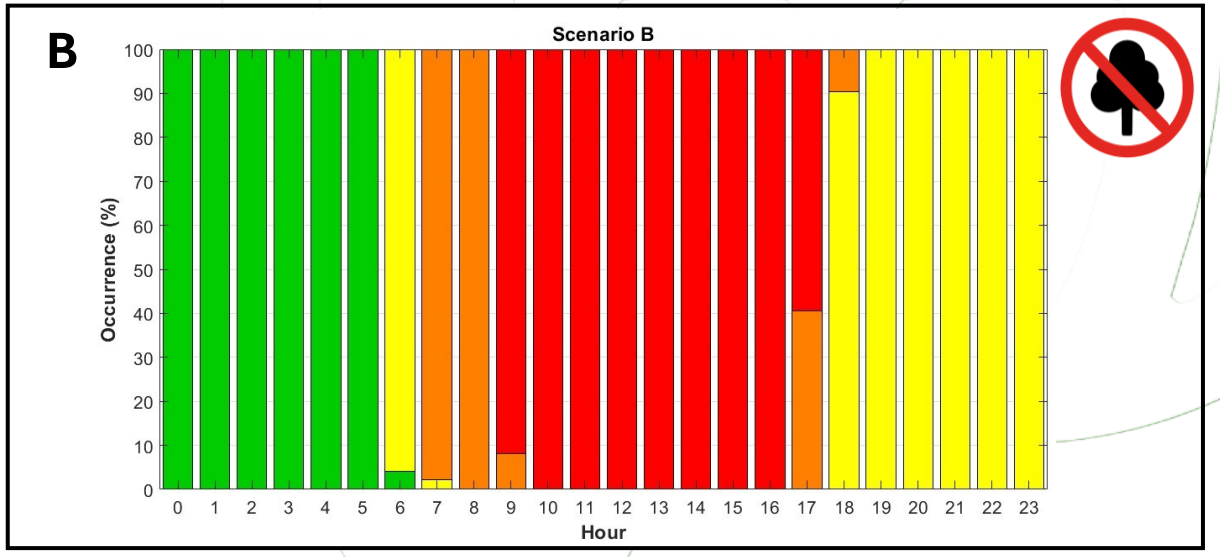


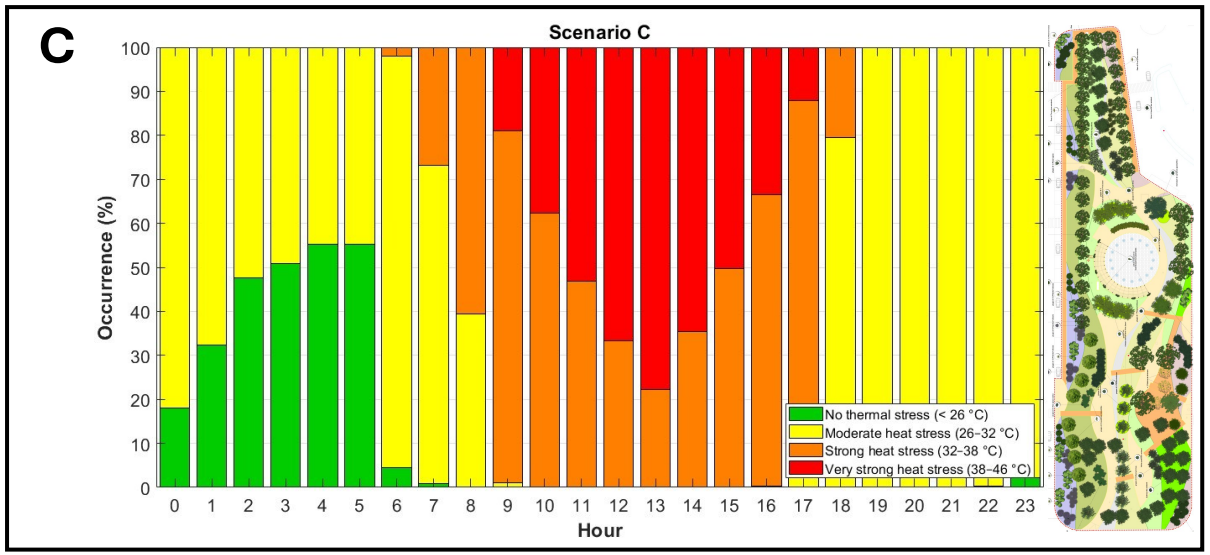


	RMSE	BIAS
T (°C)	1.06	0.24
RH (%)	6.4	5.5

RESULTS - *UTCI Occurence %*



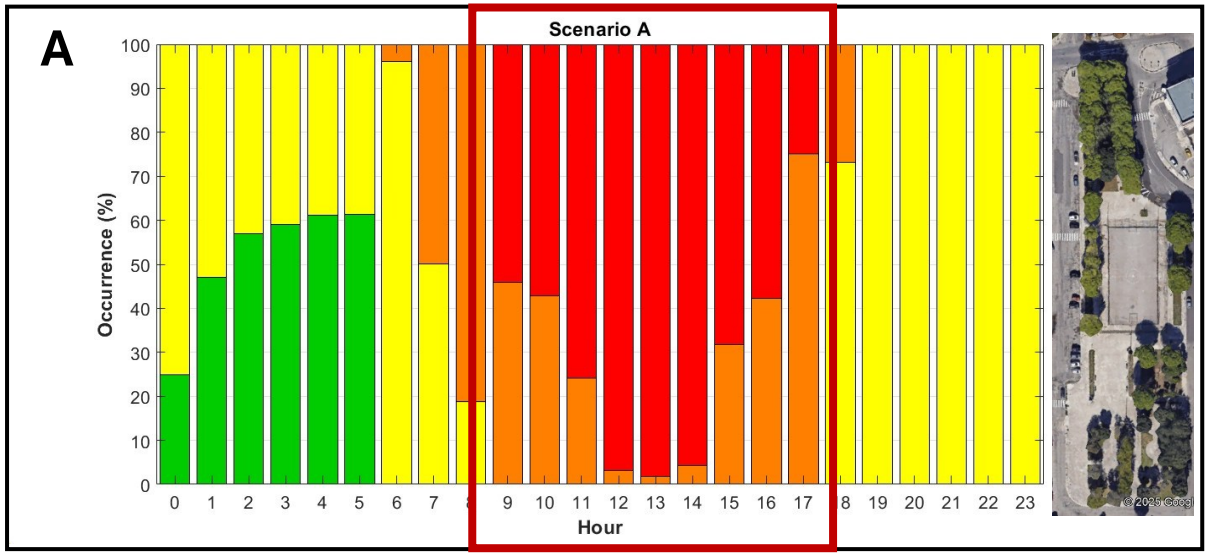


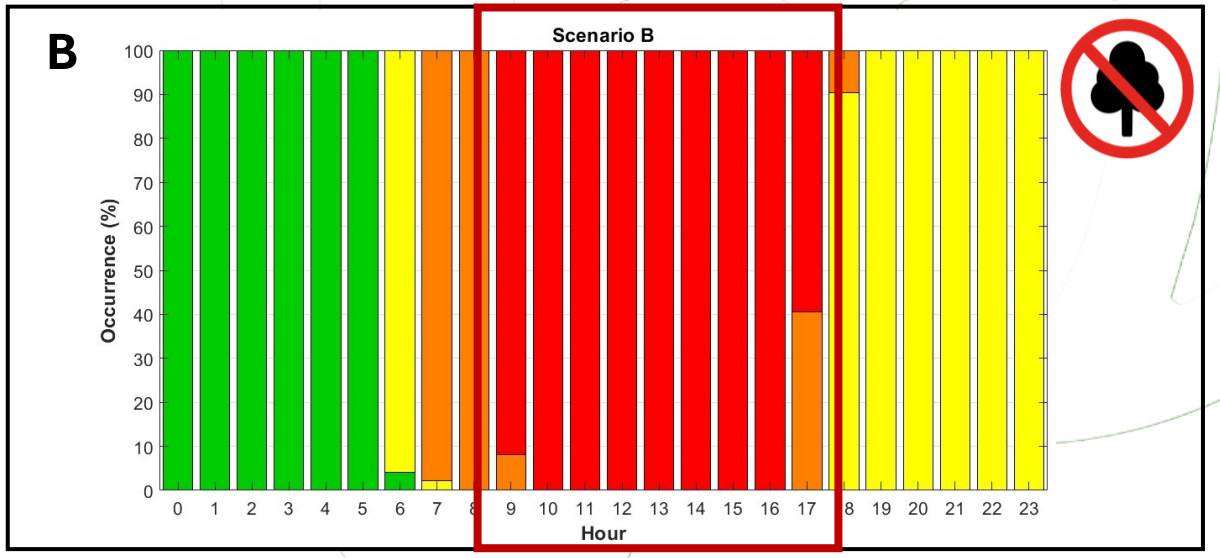


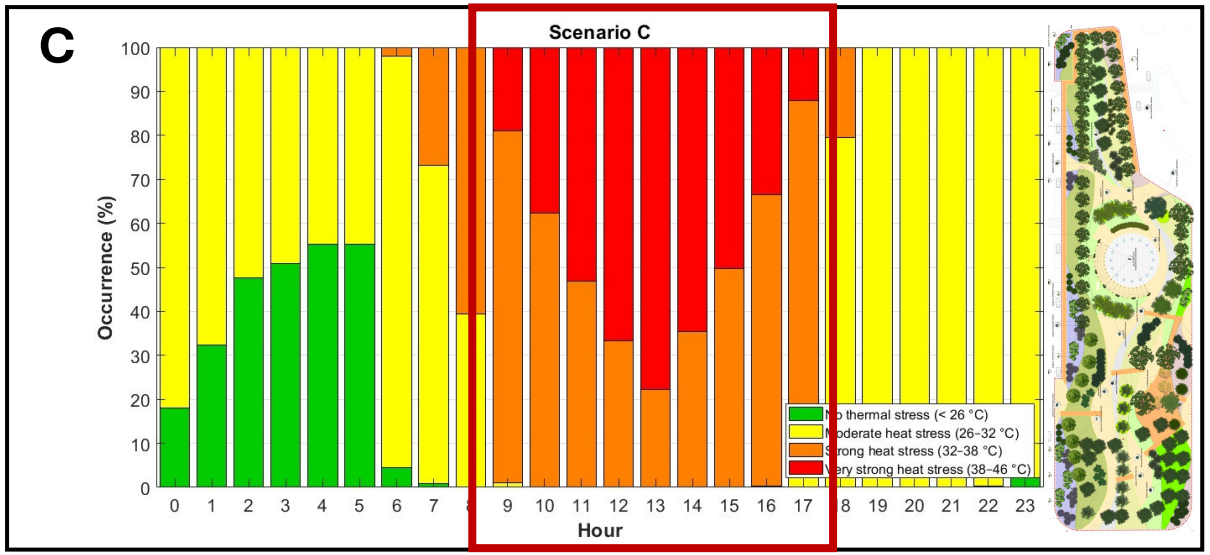
Reduction of '***very strong heat stress***' from 09:00 to 17:00

	Average
B-A	25%
B-C	48%
A-C	24%

RESULTS - *UTCI Occurence %*







Reduction of '***very strong heat stress***' from 09:00 to 17:00

	Average
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A-C	24%

CONCLUSIONS

- The modified scenario (C) presents an improvement in outdoor thermal comfort for citizens, especially in the central hours.

- **Future activities:**

In the future, evaluate the effectiveness of mitigation measures under future climate scenarios using climate projections and the MLUCM BEP + BEM/ENVI-met modeling chain.

THANKS!

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