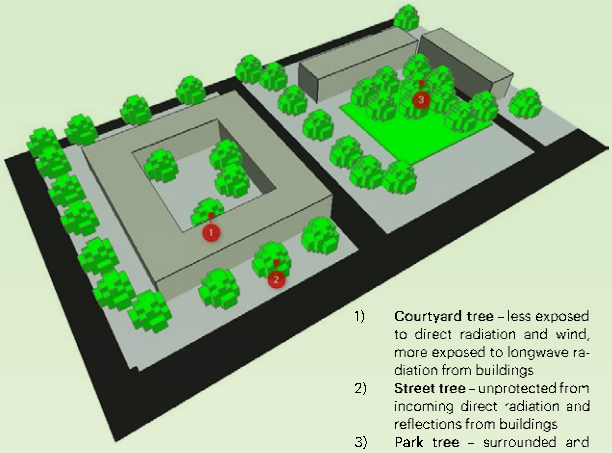
ENVI-MET

CASE STUDY
VEGETATION ANALYSIS
provided by ENVI-met
10/2018

Vegetation Analysis



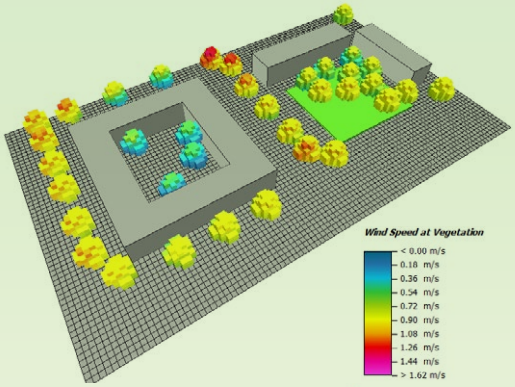
ANALYSIS OBJECTIVE

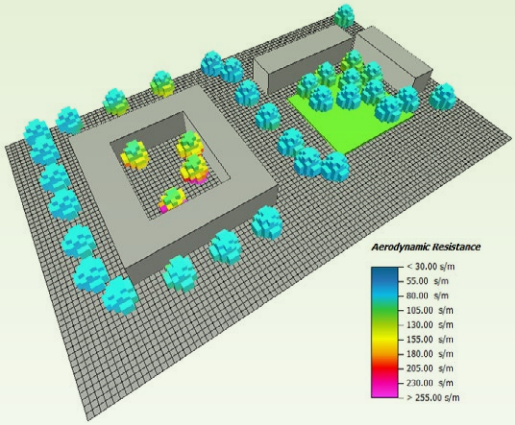
ENVI-met provides a multitude of tools to simulate and analyze the interactions between vegetation and microclimate. In an exemplary study, the effects of different microclimates onto the aggregated tree vitality parameters are examined. In order to isolate the effects of the different microclimates, the tree parameters were kept constant and the model area consists of different urban structures that generate their own local microclimates.

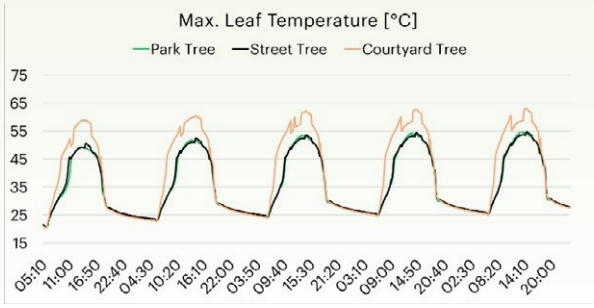
ANALYSIS

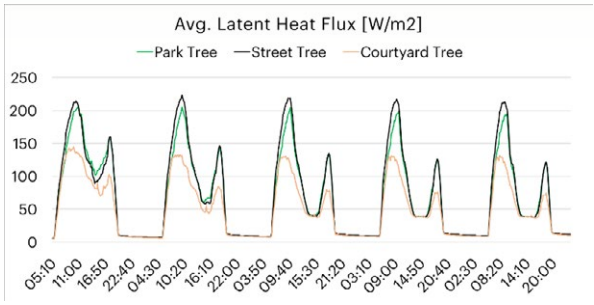
Due to its high transpiration flux, the park tree exhibits the overall lowest maximum leaf temperatures. The courtyard tree, on the other hand, stands out with the highest maximum leaf temperature of 63°C. It can be assumed that, due to the reduced PAR and wind speed inside the courtyard, the latent heat fluxes for the courtyard tree are reduced. Combining all simulation results, the dependence of water vapor flux on wind speed is clearly visible. The lower wind speeds lead to increased aerodynamic resistances at the leaves that hinder the exchange of CO2 and water vapor massively, reducing the transpiration rate and thus the latent heat fluxes.
This study shows ENVI-met's capability to analyze vegetation elements and their interactions with the surrounding microclimatic parameters.

SIMULATION RESULTS









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