

University of South Bohemia in České Budějovice

Faculty of Science

**Green and blue infrastructure: means of reducing surface
temperatures in the urban environment**

RNDr. Thesis

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Abstract

Climate change may accelerate the Urban Heat Island (UHI) effect with many consequences for the well-being of human populations in cities. Green and blue infrastructures (GBI) are presented as a way to mitigate the UHI effect. In our study, the influence of GBI (primarily less studied types) on surface temperature (ST) was tested using a thermal camera. Various types of GBI (e. g. tree shade and lawn) and their combination were compared.

Declaration (in Czech)

Prohlašuji, že jsem autorem této kvalifikační práce (v rámci podílu specifikovaného na stránce o spoluautorství) a že jsem ji vypracoval pouze s použitím pramenů a literatury uvedených v seznamu použitých zdrojů.

V Rokycanech, dne 13. 9. 2021



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Declaration: Participation of each co-author (in Czech)

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Jan Sedláček:

- sběr a zpracování dat (zeleň)
- tvorba grafů a tabulek
- psaní literární rešerše
- psaní výsledků a diskuze
- zapracování připomínek
- odeslání práce a korespondence s časopisem

Martin Hais:

- zajištění termální kamery a její technické nastavení
- zajištění programů a skriptu pro zpracování dat
- dohled nad celou prací, psaní připomínek

Kristýna Pouchová:

- sběr a zpracování dat (vodní prvky)
- asistence u literární rešerše

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Abstract

Climate change may accelerate the Urban Heat Island (UHI) effect with many consequences for the well-being of human populations in cities. Green and blue infrastructures (GBI) are presented as a way to mitigate the UHI effect. In our study, the influence of GBI (primarily less studied types) on surface temperature (ST) was tested using a thermal camera. Various types of GBI (e. g. tree shade and lawn) and their combination were compared. The studied GBI, including less common forms such as containers with ornamental plants, green roofs and fountains, reduced daytime ST. Moreover, they reduced the thermal amplitudes of surrounding areas (up to 30 m). The results imply that besides larger GBI (e.g. parks, rivers) smaller structures may significantly decrease the UHI effect. We recommend a combination of both blue and green structures especially in street canyons and the use of green roofs and walls when the space for adding GBI is limited.

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