Spatial Heat and Albedo Dynamics for Environmental Resilience – A case study of Salzburg city

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# Abstract

Urban heat islands (UHIs) present significant challenges for urban city planning and climate adaptation. In times of increasing global temperatures, urban growth, and densification, cities intensify heat stress and impact liveability of humans, plants and animals. This project aims to assess UHI susceptibility and classify high-risk zones within Salzburg, Austria, to provide stakeholders with insights for urban development and climate mitigation strategies. The study utilizes Sentinel-2 imagery data and combines key environmental indicators. The vegetation index (NDVI), urban built-up areas (NDBI), water presence (NDSI) and surface albedo are used to derive a classification of high, moderate, and low UHI risk zones within the AOI. To ensure accuracy, the analysis will be validated using Landsat 8 thermal data. This study provides a detailed assessment of UHI susceptibility at city offering a higher-resolution (30m) evaluation of risk zones compared to existing low-resolution LST data (100m - 1000m). The project will deliver a UHI risk map to help city planners, policymakers, and environmentalists to address UHI effects and develop targeted mitigation strategies. The findings will support climate resilience by identifying priority areas to support sustainable urban planning.

# Keywords

Urban Heat Island, Sentinel-2, risk mapping