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Scenarios of street green space to inform future heat adaptation in cities

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Urban green has the potential to reduce urban heat stress, with shading and evapotranspiration being both important contributors. We here investigate street green space (SGS), which comprises street-level vegetation in the form of trees, bushes or green facades, i.e. that is “visible to a person in the street”. We measure SGS using the green view index (GVI).

We first analyze the relationship between climate zone, urban form and SGS. This is based on published research on current SGS in 181 global cities. We find that observed attainable GVI values vary by urban form, but more importantly, by climate zone at large. Cities in temperate and tropical climates showing much larger values than in dry climate zones. In the next step, we develop three scenarios of future street green space. These are based on the observed greenness from 2016-2023, and on a careful trend analysis. We extend the current values until 2050, using optimistic assumptions that we deem plausible and that have been informed by the trends. In two “optimistic outlook” scenarios, we assume positive trends that are however constrained by maximum observation. This is complemented by a more pessimistic “baseline scenario”, for which we assume current street green space conditions, but negatively impacted by climate change.

In a second step we translate these scenarios into a quantifiable perspective of future urban heat mitigation potential for 143 cities using high-resolution climate model data from the URBCLIM project. The cooling potential of SGS by urban form and climate zone has been determined using a random-effects regression analysis with place-specific confounding factors in a related project (EGU presentation EGU25-5169).

This work results in a dataset of urban cooling potential of greening scenarios in 143 cities. The scenarios also take into account different climate change scenarios from the RCP-SSP framework.