



## Supplement of

## Mapping vulnerability to climate change for spatial planning in the region of Stuttgart

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## **Supplementary material**

## GIS-based workflow for calculating the effective available accessible green space per resident:

1. Extract and dissolve the heat-relevant green spaces from the *land-use cadastre*: forest, parks, green spaces, garden land and cemeteries (output file = *green space*)



2. 200m buffer around *suburb* polygons (output file = *buffered suburbs*)



3. Clip the *buffered suburbs* with the *green space* to create multi-part polygons (output file: *accessible green space*)



- 4. Calculate the area of accessible green area per suburb (output attribute = *area of accessible green space*)
- 5. Calculate the *use-intensity* of each green area (i.e., the number of residents per square metre of green space) of the green space by dividing the number of residents in the suburb by the *area of accessible green space* (output attribute = *use-intensity*)



 Break up the green area (using Union) into individual parts which results in overlapping parts of green areas, each containing a *contribution to use-intensity* of each suburb of each part (output file = *parts*)



7. Calculate the *total use-intensity* of each part of green space (using join attribute by location with summary or spatial join) and sum up the use-intensity of the overlapping parts



- 8. Calculate the percentage amount of use-intensity that each suburb contributes to the total useintensity of a part of green space using the formula: *relative contribution = contribution to use-intensity / total use-intensity*
- 9. Calculate the available accessible green space for each suburb using the formula: *available green area* = *relative contribution* \* *part area*
- 10. Join the results with the *buffered suburbs*
- 11. Sum up the available area per suburb (join by location with summary) (output attribute = *available green area per suburb*)
- 12. Calculate the available accessible green area per resident per suburb using the formula: *green space per resident = available green area pers suburb / number of residents*