The UHI Risk Index for Austria: Introduction

https://www.adapt-uhi.org

The **UHI Risk Index for Austria** provides an indicator-based estimation of the local intensity of the Urban Heat Island (UHI)

Inputs and Drivers

Meteorology: expressed as indices of **thermal comfort.** Includes the perceived temperature of Hot Days (Temperature ≥ 30°C during the day) and Tropical Nights (Temperature ≥ 20°C at night) used to define heat periods (HP) based on meteorological data for the last 15 years. These are used to extract the following drivers causing the heat-related hazard:

- ✓ Average annual number of days of the HP
- ✓ Average maximum duration of the annual HP
- ✓ Duration of the longest HP

Land cover includes: Imperviousness of soil (sealing), Tree cover density, Grassland, and Water and Wetness probability based on COPERNICUS High Resolution Layers. These are used to derive the following:

- ✓ Percentage of soil sealing (imperviousness)
- ✓ Percentage of green areas (forest and non-forest)
- ✓ Percentage of blue areas (rivers, lakes, wetlands)

Settlements: considers **building structure** in terms of the floor space and built up surface area to calculate:

- ✓ Degree of shading produced by the buildings
- ✓ Vertical building area per surface area

Data Sources

1) INCA gridded meteorology data set (ZAMG 2019)
2) Copernicus Land Monitoring Service – High Resolution Layer (EEA 2018) for Imperviousness, Tree Cover Density, Grassland, Water and Wetness Probability Index, Water and Wetness
3) Building and Housing Register (Statistik Austria 2019a)
4) Labor statistics (Statistik Austria 2019b)

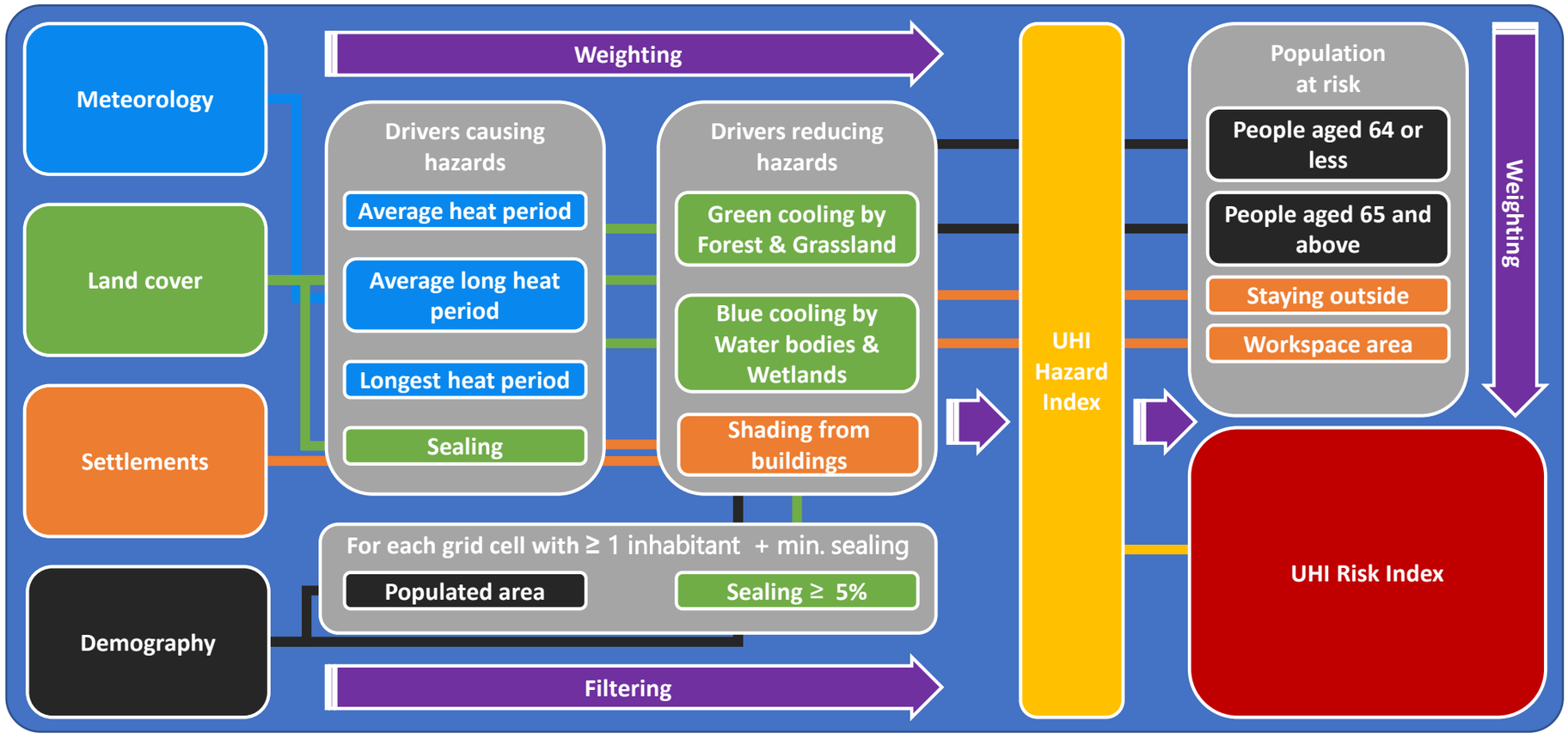
How Was the Index Built?

The UHI Risk Index has been produced at a grid resolution of 100m x100m covering all of Austria. There are two main steps to the methodology:

Step 1 Calculate the Hazard Index: A set of drivers that cause and reduce the heat load were derived from meteorological inputs, land cover and settlement structures. These drivers were then weighted and combined to produce the UHI Hazard Index map. Only grid cells with at least one or more equivalent inhabitants and a minimum soil sealing of 5% are considered. The UHI Hazard Map for Austria can be found on page 2 of this factsheet.

Step 2 Calculate the Risk Index: The population at risk is derived from a combination of demographic data (0-64 years, 65 years and above), the number of people employed at workplaces and the estimated duration that people stay outside in the heat. The population at risk is then multiplied by the UHI Hazard Index to produce the UHI Risk Index map. The UHI Risk Index map for Austria can be found on page 3 of the factsheet.

Both maps can be viewed online at: https://www.adapt-uhi.org/



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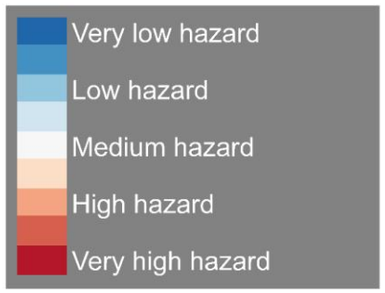
The UHI Hazard Index for Austria

The **UHI Hazard Index for Austria** shows the locations in Austria (on a 100m x 100m grid) that have some heat-related hazard identified. This is due to the dense clustering of buildings and sealed surfaces such as roads and parking areas, which contribute to the urban heat island, thermal discomfort and potentially life-threatening conditions during periods of extended heat.



Areas with an identified heat-related level of hazard cover around 10% of Austria. Considering only these areas, just under 10% fall within the high and very high hazard categories.

The UHI Hazard Index is then translated into risk by considering vulnerable populations and areas of employment, which shows a higher level of UHI risk (see the next page) than the hazard alone would indicate.

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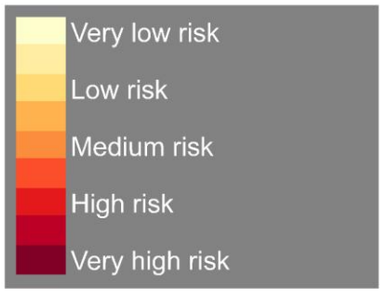
The UHI Risk Index for Austria

The **UHI Risk Index for Austria** shows the locations in Austria that are at highest risk from the urban heat island., i.e., the effects of increased heat load found in urban areas. Urban areas are at the same time locations where many vulnerable populations live, i.e., the elderly and workers who commute to the city during the daytime. People aged 65 and older contribute the most to the population at risk.



Around 10% of Austria is subject to some degree of heat-related risk where these include the main city centers in Austria. However, many smaller settlements are also shown as being at risk.

Of those areas at risk, around 30% are in the high and very high risk categories, with a further 20% in the medium risk category.

View the map on https://www.adapt-uhi.org

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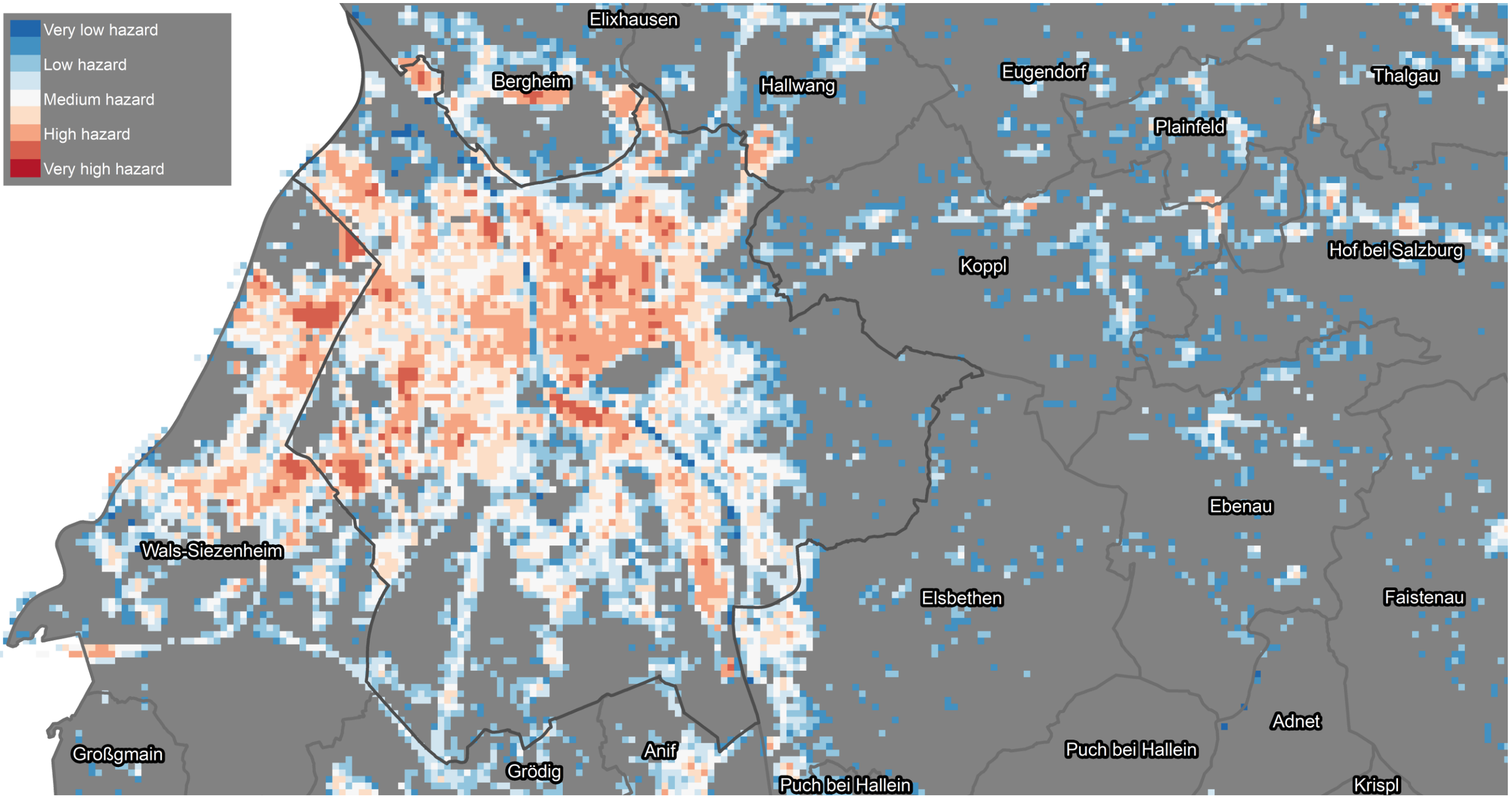
The UHI Hazard Index for Salzburg and Neighbouring Municipalities

Below is the **UHI Hazard Index for Salzburg and the neighboring municipalities**. Areas identified with heat-related hazards clearly overlap with built up areas in the city, covering just under 64% of the city of Salzburg. Of those areas with some identified level of hazard, around 20% are in the high and very high hazard categories and 42% are in the medium category. The UHI Hazard Index is then translated into the UHI Risk Index (next page) by considering vulnerable populations such as the elderly and places of employment.



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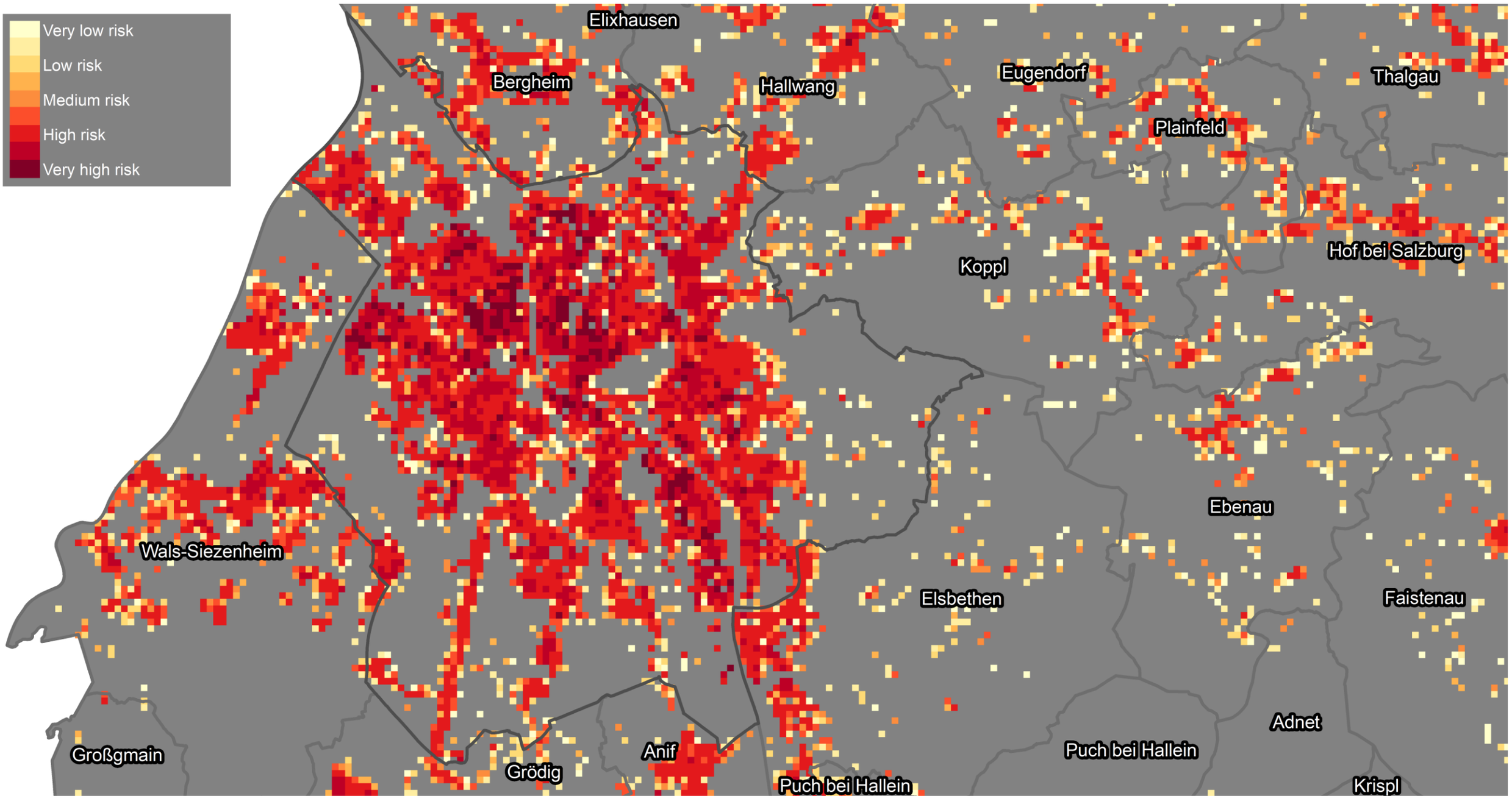
The UHI Risk Index for Salzburg and Neighbouring Municipalities

Below is the **UHI Risk Index for Salzburg and the neighboring municipalities**. Around 50% of Salzburg is at risk from the urban heat island effect. Of those areas with an identified level of risk, around 74% of these fall within the high to very high risk categories, primarily due to vulnerable populations and locations of employment within the city. Such a map can help urban planners pinpoint where climate change adaptation and mitigation measures can be targeted.



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