



Surface Urban Heat Island

THE OFFER COVERS:

- DOCUMENTATION, INCLUDING SPATIAL DISTRIBUTION OF AREAS WITH HIGH SURFACE TEMPERATURE, WHICH FORM A SURFACE URBAN HEAT ISLAND (SUHI)
- LIST OF ACTIVITIES AIMED AT REDUCTION OF NEGATIVE IMPACTS OF SUHI



www.ietu.pl

Institute for Ecology of Industrial Areas

The service offered by IETU includes determination of spatial distribution of areas with an elevated temperature of land surface, forming the Surface Urban Heat Island (SUHI) along with an analysis of potential threats and a list of remedial actions.

The documentation is prepared on the basis of a series of satellite images from the Landsat satellite (4-5 TM, 7 ETM+, 8 OLI) and ASTER - using the TIRS sensor (Thermal Infrared Sensor), generating thermal images at 4-5 TM resolution: 120 m, 7 ETM+: 60 m, 100 m and ASTER: 90 m.

SUHI spatial distribution map contains

- permanent heat emitters (clusters of areas with dense urban development)
- industrial areas
- landfills and coal dumps
- relatively cold roads and surfaces (forests, watercourses and water reservoirs - temperature regulators that can reduce SUHI)

Service description

SUHI distribution prepared on the basis of satellite images from the last 2-3 years

Possibility of preparing comparative maps based on archival photos of Landsat 4-5TM from 30 years ago and Aster from 17 years ago

Analysis based on satellite images, recorded during cloudless days of the summer season, at morning hours

Possibility of extended analysis in the context of mitigation of the effects of climate change in the city

Benefits for the customer

Tailor-made map of the spatial distribution of the Surface Urban Heat Island for a given city

Thermal characteristics of the urban surface

Spatial distribution of emitters and heat reducers in the city

What the customer receives

The customer receives a study on the spatial distribution of areas with increased surface temperature which form SUHI, along with a description and a list of remedial actions.

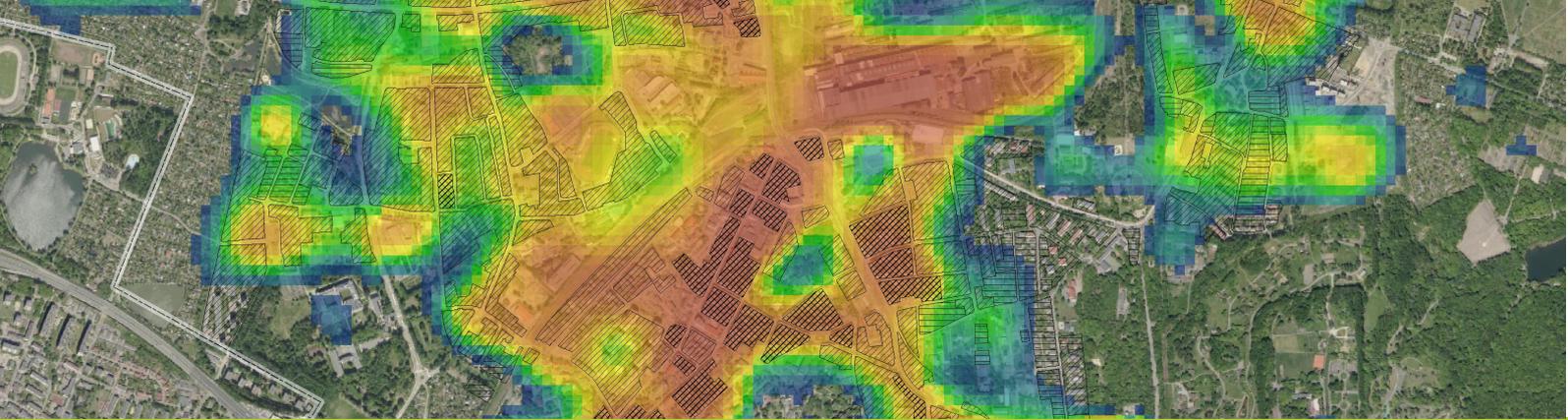
Recipients of the service

- local government units
- architectural and urban planning offices and studios

Contact

Leading expert — Prof. Janina Fudała, j.fudala@ietu.pl, ph. +48 32 254 60 31 ext. 193

Leading expert — Dr. Justyna Gorgoń, j.gorgon@ietu.pl, ph. +48 32 254 60 31 ext. 287



The Urban Heat Island (UHI) is a characteristic element of the city's climate. The area covered by UHI is characterised by an increased air temperature at the over-ground air layer in comparison to the air temperature outside the city. UHI affects the thermal comfort of residents, poses threat to human health and even life, particularly in the case of elderly people and children.

The phenomenon of the Urban Heat Island results from the specificity of the urban areas. It has been intensified by a global climate change. Scientific research carried out in many cities around the world has shown that urban areas have significantly higher temperatures in comparison to non-urban areas. The temperature difference between urban and non-urban areas varies from 0.5 °C to 0.8 °C in summer and from 1.1 °C to 1.6 °C in winter. Due to the urban layout, there are large clusters of areas with dense urban development, which are characterised by a high heat accumulation capacity.

An important factor contributing to the formation of UHI is the high population density in urban areas, which affects its intensity. Climate change causes continuous intensification of this phenomenon, mainly due to the more frequent occurrence of heat waves and longer periods of high temperatures

in the city. Quite important is also the significant increase in anthropogenic heat and a mosaic of materials connected with various types of urban development. Extreme temperatures in cities often go together with violent storms and torrential rains, hence the need for a multi-faceted approach to the cities' vulnerability to climate change. All these phenomena have a negative impact on residents, causing disturbances in the comfort of living in areas with dense urban development. They may, e.g. contribute to the increased morbidity in the case of respiratory and cardiovascular system disorders, heart diseases, as well as cause allergies due increased concentrations of air pollutants and inefficient urban air ventilation, which in most cases is the result of dense urban development and closure of corridors aerating the city.

More information: ietu.pl/en/services/



Contact

Institute for Ecology of Industrial Areas, 6 Kossutha Str., 40-844 Katowice, Poland, email: ietu@ietu.pl, ph. +48 32 254 60 31, secreatriat +48 32 254 01 64, fax +48 32 254 17 17