Demarcation of urban areas for evaluation vulnerability indicators

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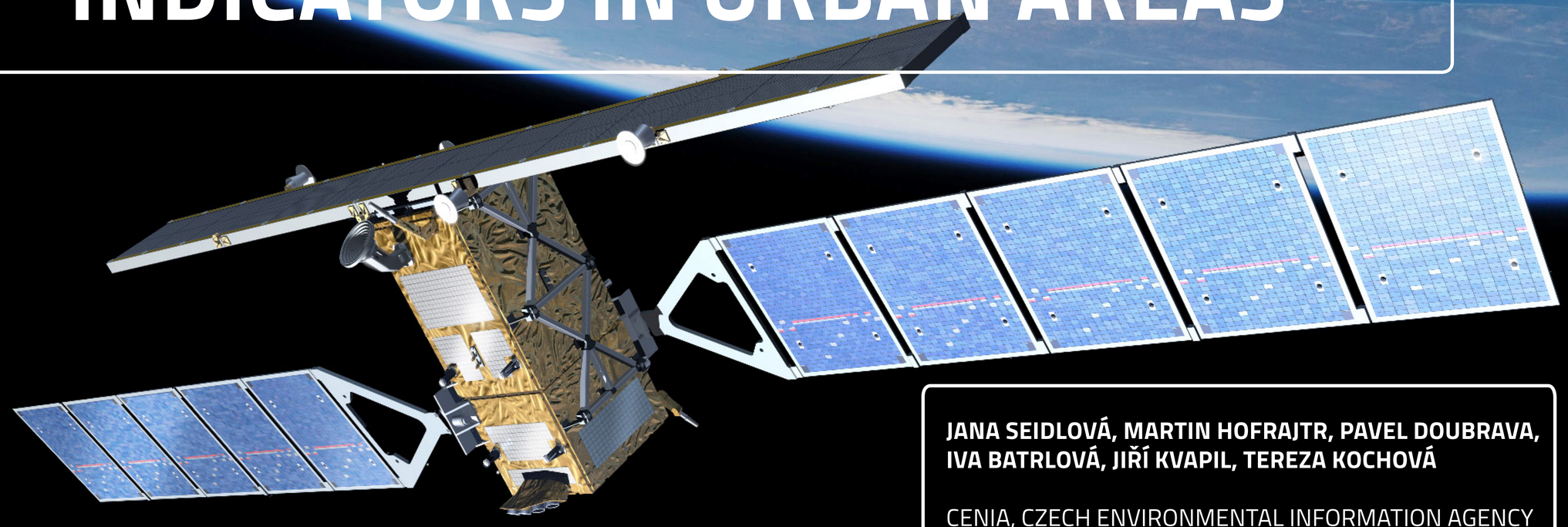
EVALUATION OF VULNERABILITY INDICATORS IN URBAN AREAS



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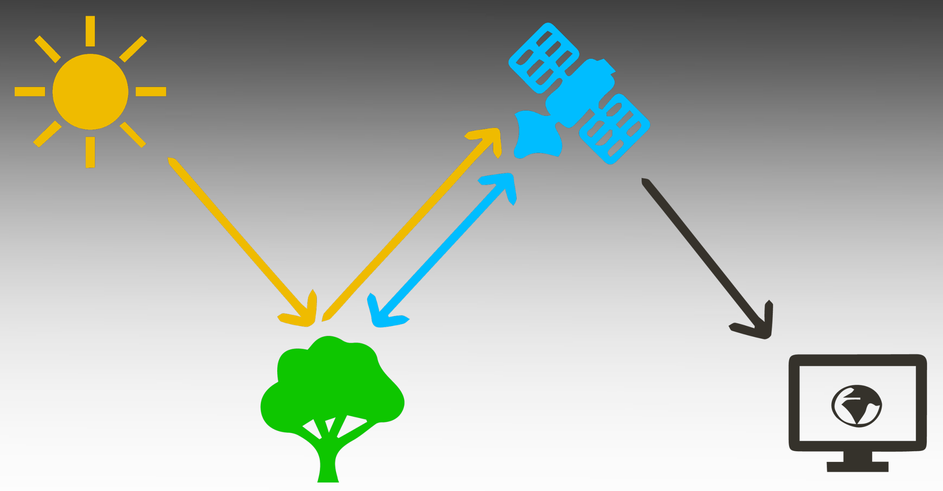
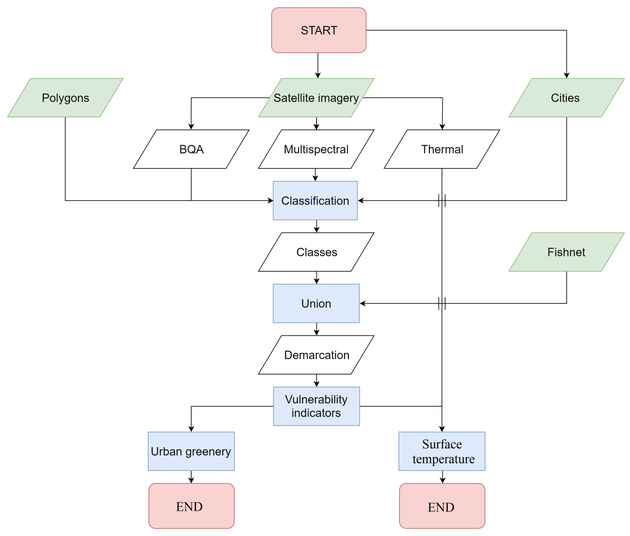
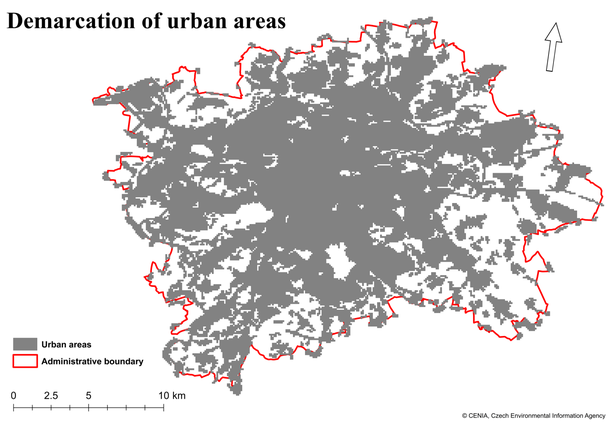
CENIA, Czech Environmental Information Agency (Remote Sensing Laboratory) was tasked with the evaluation of so-called vulnerability indicators, which are part of the National Action Plan on Adaptation to Climate Change.
Demarcation of urban area serves as a basis for assessing the vulnerability of cities to the effects of climate change. The phenomena that will be evaluated based on these data are, among other things, land surface temperature of the city and the proportion of urban greenery with water.

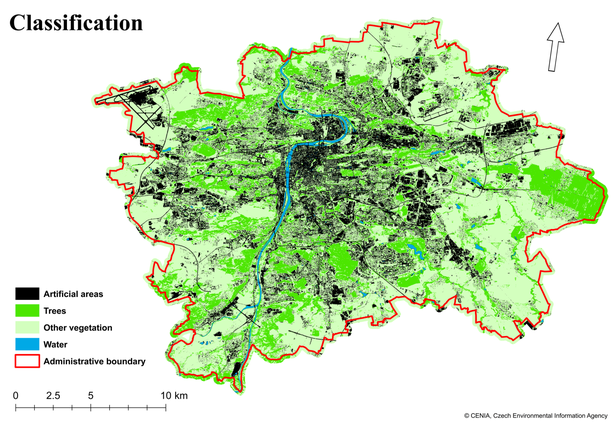




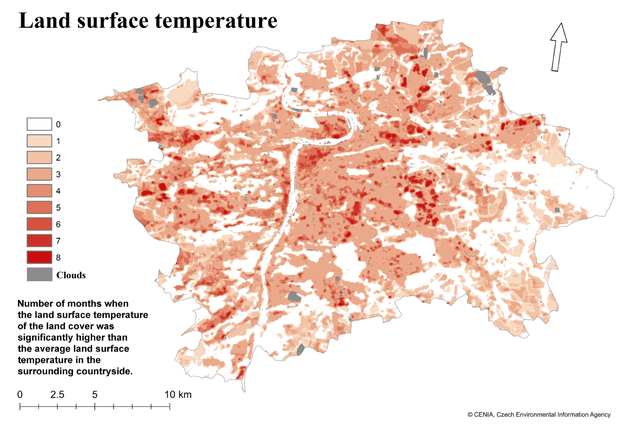
Conditions for defining the boundary of the urban area of the city were its repeatability and detail. The optimal replication analysis interval, which would guarantee the creation of time series, was determined once in 2–4 years. Using of this analysis in the future to evaluate other indicators is dependent on size of the scale.
The identification of the urban area was based on an analysis of several selected partial approaches, while the best solution for the further identification and evaluation of vulnerability indicators was the Supervised Classification (Maximum Likelihood) of Sentinel satellite imagery and the subsequent use of grid. The chosen procedure was applied to several selected cities, which varied both in the size and variety of landscape coverage. The identified urban area was discussed and subsequently approved by experts from the Ministry of the Environment.
This methodology can be repeated and applied throughout the Czech Republic. It has ambitions to be used to compare the entire territory and time series (depending on the availability of images) for further analyses.



Demarcation of urban area layer within the administrative division of towns and municipalities in the Czech Republic based on defined surface classes (artificial area, trees, low vegetation and water) in all towns and municipalities in the Czech Republic at different time horizons and international comparison.



Proportion of urban greenery with water in the area of interest – urban area of selected cities of the Czech Republic over 20 thousand inhabitants in individual time horizons. International comparison is an advantage.



Analysis of land surface temperature in the urban area and its surroundings in four largest Czech cities – Prague, Brno, Ostrava and Pilsen. Detect areas that are more susceptible to overheating due to altered active surface in the Czech Republic at different time horizons and international comparison.