URBAN CLIMATOLOGY

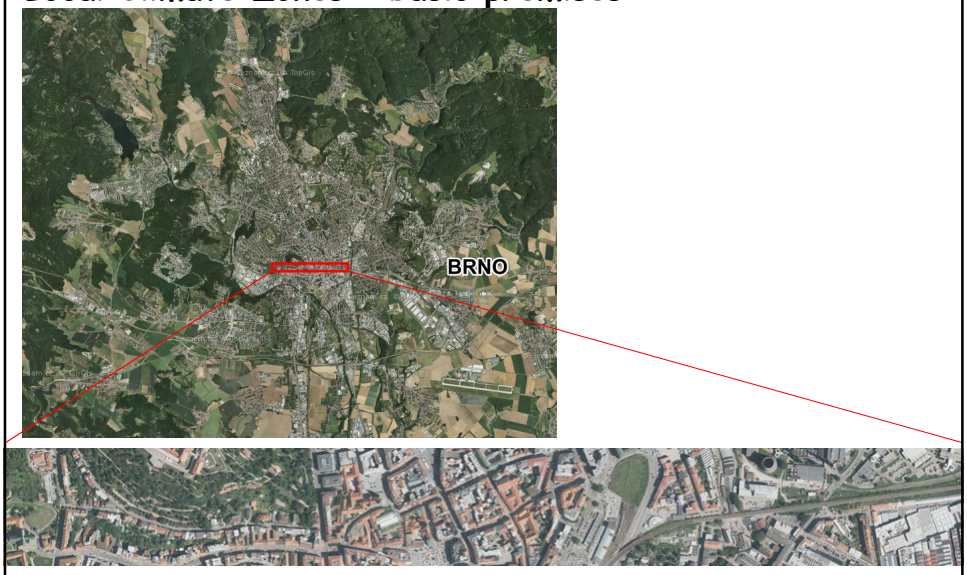
Map of the local climate zones

practical excercise

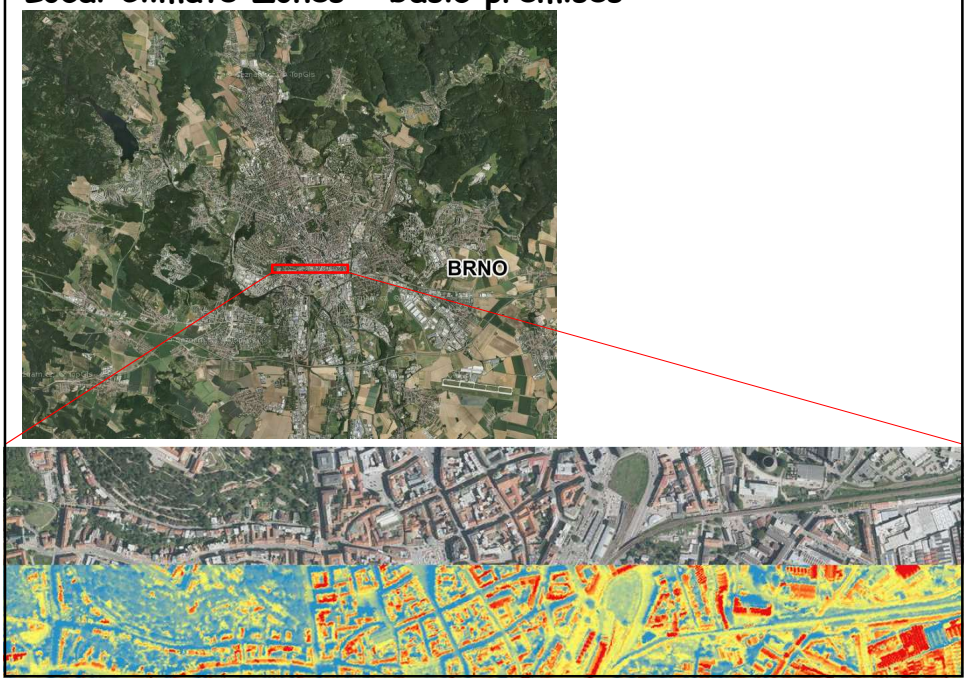
Local Climate Zones – basic premises

- Urban climate is **highly variable** in space and time
- To study the urban climate, we need to **classify** it somehow
- One of the main factors that create a characteristic urban climate is **land cover** (= active surface)
- Land cover mapping may serve as a basis for urban climate classification
- In urban climatology, the **concept of the Local Climate Zones** was created during the last decade

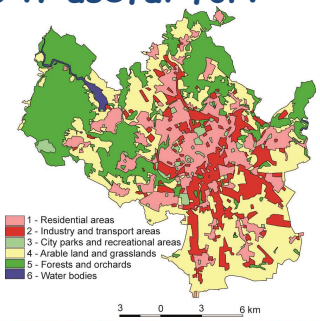
Local Climate Zones – basic premises



Local Climate Zones – basic premises

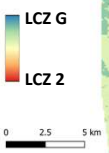


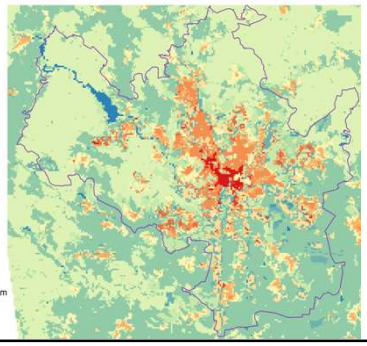
Local Climate Zones - What is it useful for?



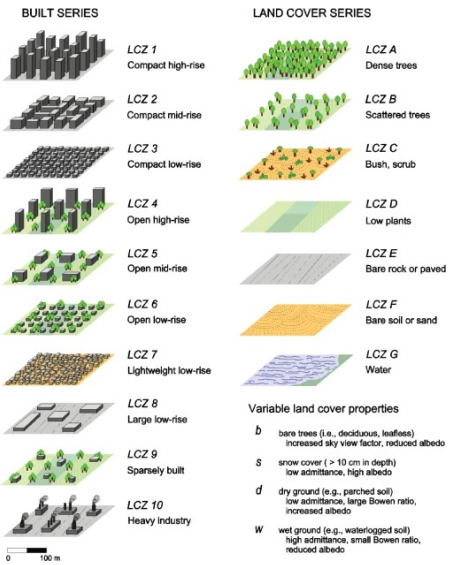
LCZs:

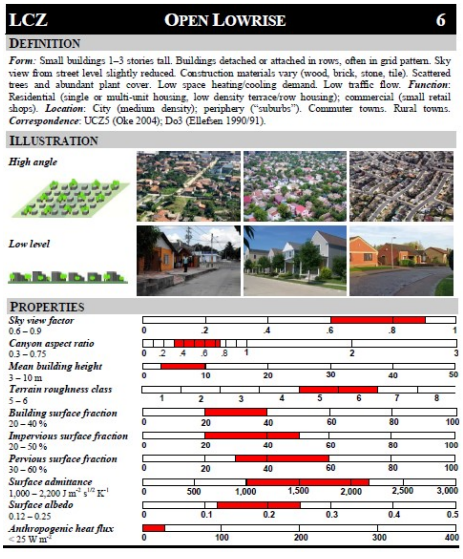
- regions of uniform surface cover, structure, material, and human activity
- regions of similar temperature regime





Local Climate Zones classification system





Excercise – LCZs mapping

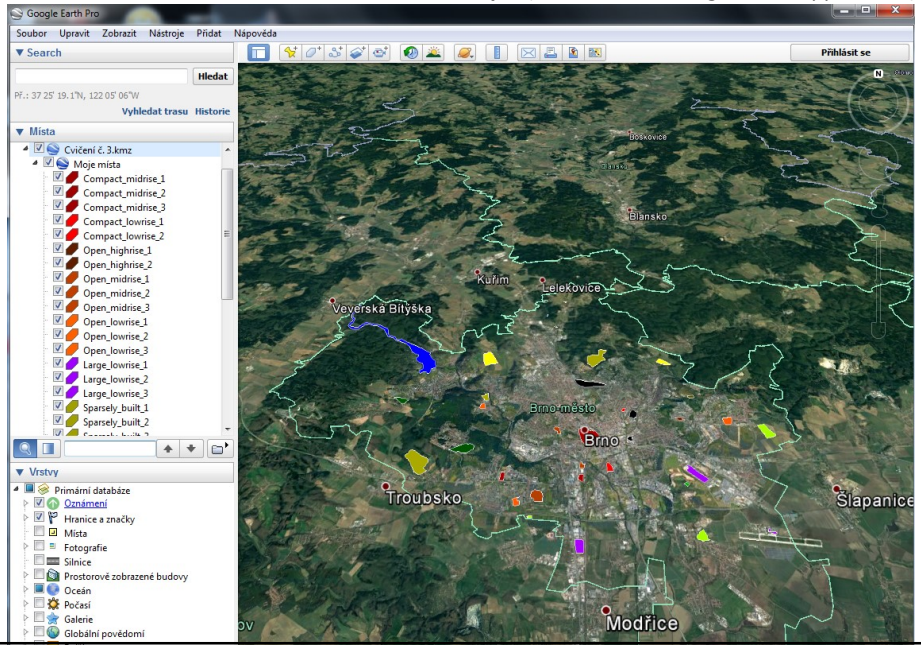
Motivation: Land cover types and spatial structure of built-up areas, which can be directly seen on aerial photographs, well correlate with typical features of local climate in urban environment.

Tasks:
1. Explore e.g. Google Earth map (or any other tool) providing detailed aerial view of Your city, this presentation explaining concept of LCZ, and study material (link below)
2. Find a typical representative of individual LCZs in Your city (two typical snapshots)
3. Specify typical position of individual LCZs – for instance w.r.t. the city center
4. Describe each LCZ in a few key words
5. Describe typical LCZs that are well represented in Your city
6. Mention those LCZs that do not occur in Your area

https://is.muni.cz/auth/el/sci/podzim2022/ZX601/um/exercise/Local_climate_zones.pdf

Excercise – LCZs mapping

Example (*elaborated in Google Earth application*)



Excercise – LCZs mapping

Draw 1-3 polygons that well represent individual LCZs in Your city. See Figure below as an example. In Google Earth You can add the legend (LCZ types with selected color) as follows:

Right click on
My places -> Add -> Folder
Create name of the of the folder – e.g. LCZ3
Then right click on LCZ3 folder
LCZ3 -> Add -> Polygon
Create name of the polygon (e.g. Site_3_1) and select color of the polygon, do not close window and place mouse over the map.
Find suitable place - left click defines polygon outer points, right click close the polygon
Repeat for 2–3 polygons for each LCZ

Now create folder for another LCZ – e.g. LCZ4 and repeat as above

Alternatively, You can create only the polygons (without folders). In this case You need to add proper names to individual polygons (see example – figure below)

Finally save Your map as follows:
File –> Save -> Save folder My places
This creates file My places.KMZ on Your computer.

Make also a simple print screen of Your map.

Excercise – LCZs mapping

When finished, write a report shortly discussing:

1) Which LCZs can be easily found (are typical) in Your city according Your opinion
2) Which LCZs do not exist in Your area or which are hard to recognize
3) Briefly describe where in your city there are areas that **positively** or **negatively** contribute to the formation of a typical urban climate

Besides the text (max 1 page), the final report will include the LCZ map (e.g. printscreen) and a short description of typical LCZs in Your city:

LCZ2 – compact mid-rise:
short paragraph with the LCZ characteristics

LCZ5 – open mid-rise:

Excercise – final notes and sources

- You can do the LCZ map by hand using the similar template as can be seen here:

https://is.muni.cz/auth/el/sci/podzim2022/ZX601/um/exercise/exercise_brno_map_template.pdf

- It is not necessary to cover the whole area; find just typical spots as a "training sites"
- Not all LCZ categories must occur in Your study area