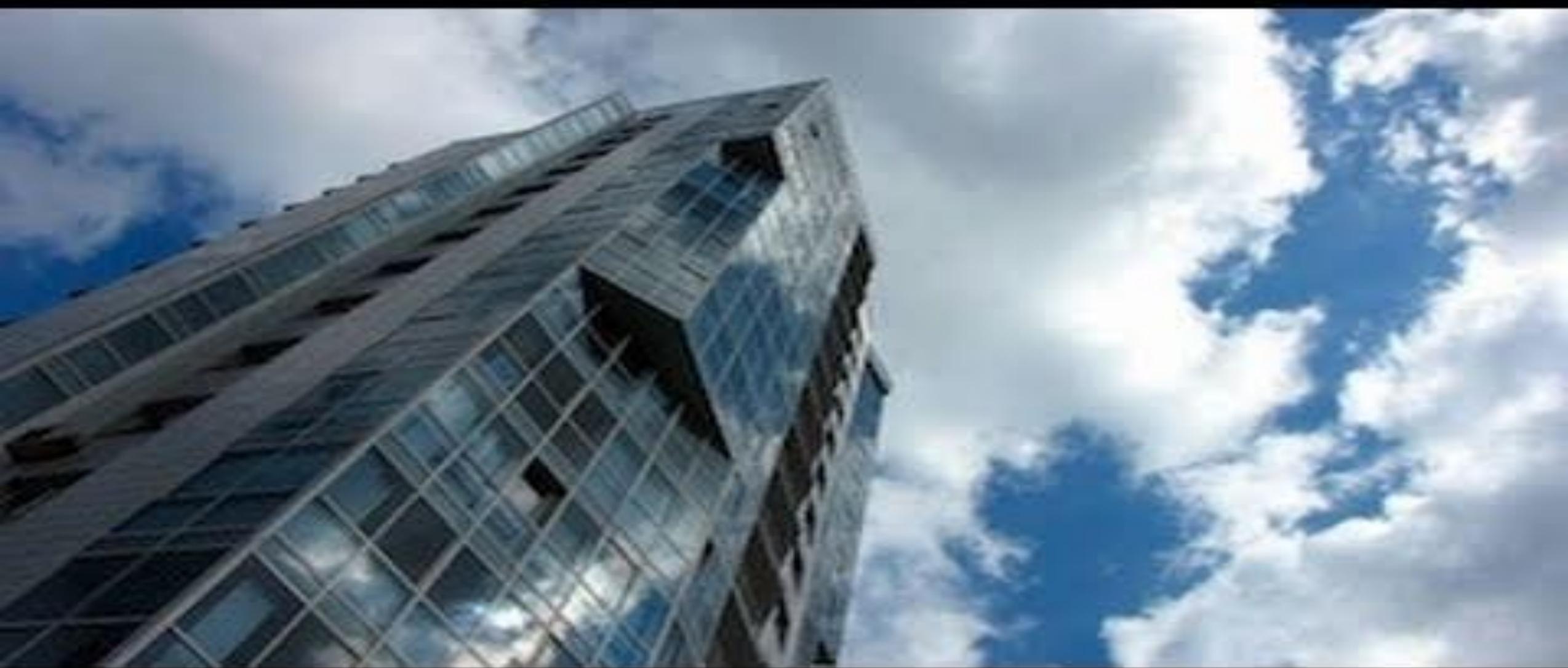


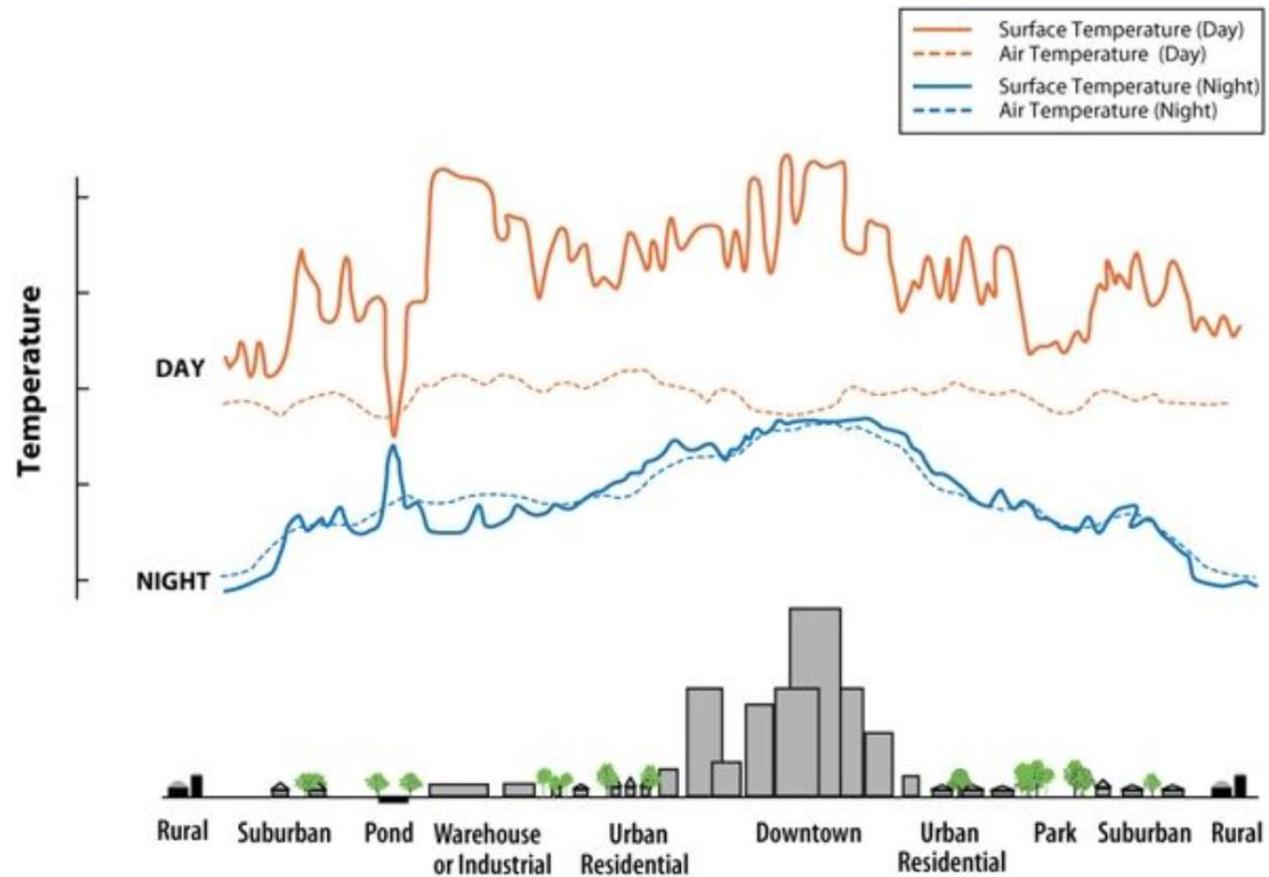
Urban Heat Island Effect

2022 GLOBE REGIONAL MEETING

LENKA KLEGER, GLOBE EUROPE AND EURASIA REGION COORDINATION OFFICE

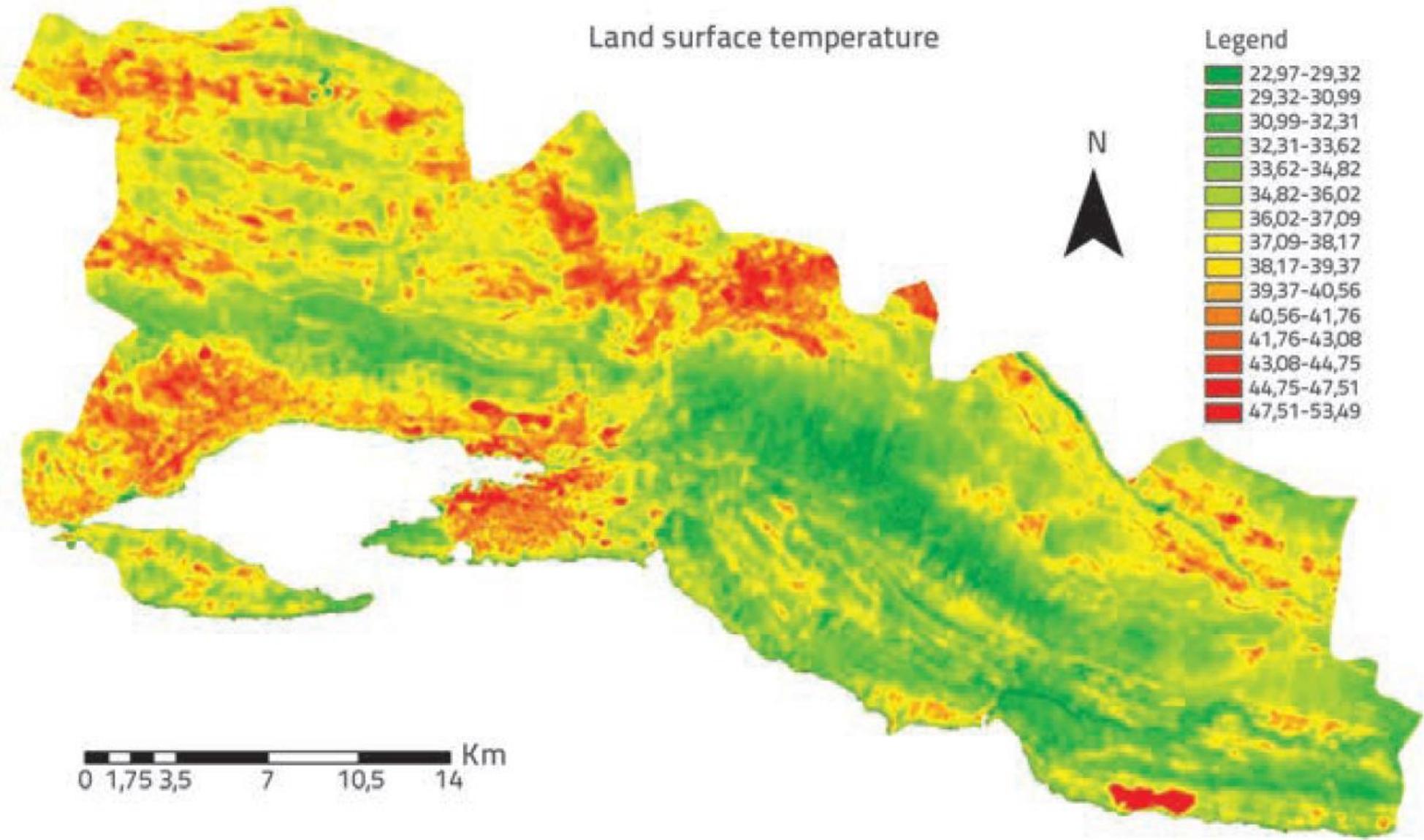
LENKA.KLEGER@TEREZANET.CZ





- in cities with over 100,000 inhabitants
- in summer on sunny day, no wind
- cities located in lowland areas or valleys
- temperature differences in such areas can reach 12°C and more

Land surface temperature



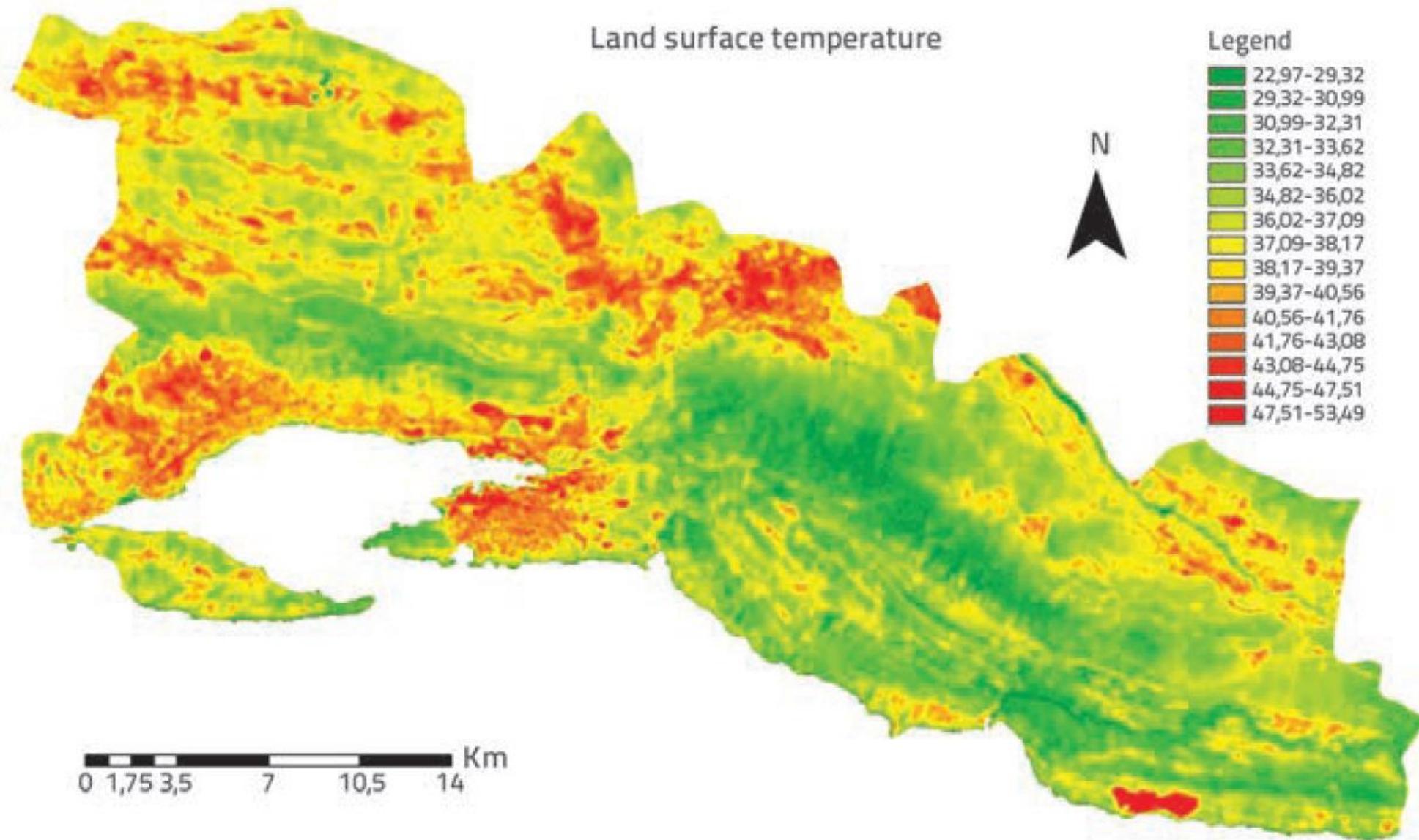


Figure 5. Landsat 8 satellite scene for the Split metropolitan area processed on 12 July 2015, surface temperature ranged from 23,0 to 53,5 °C

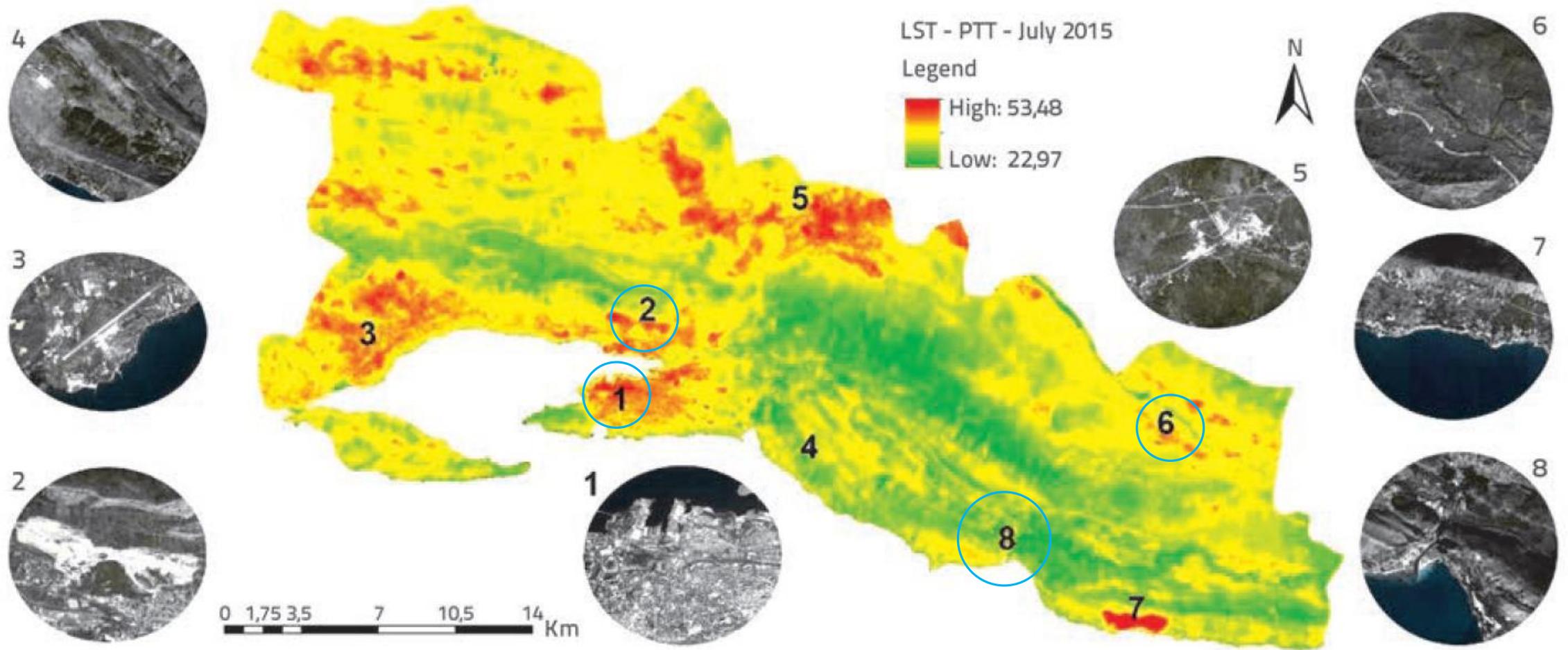
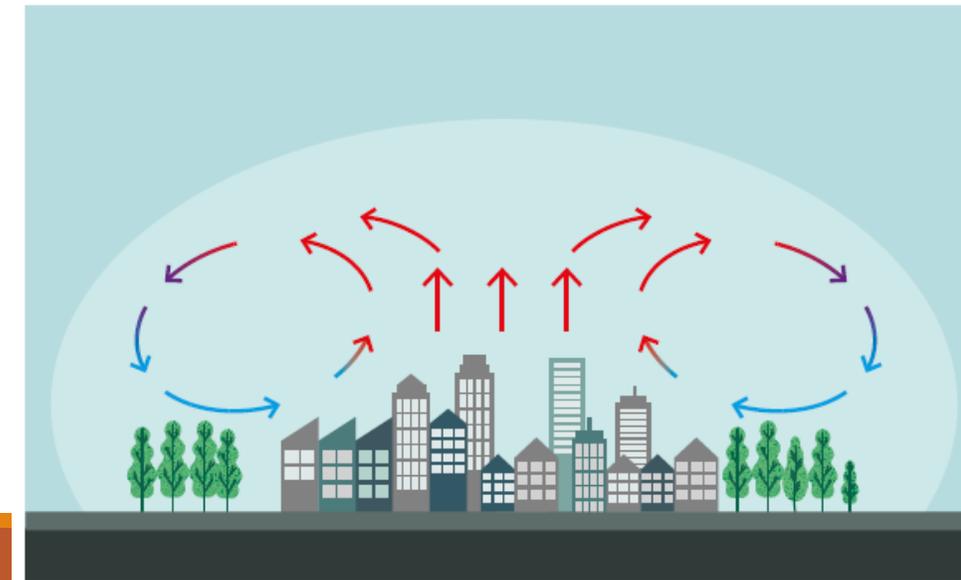
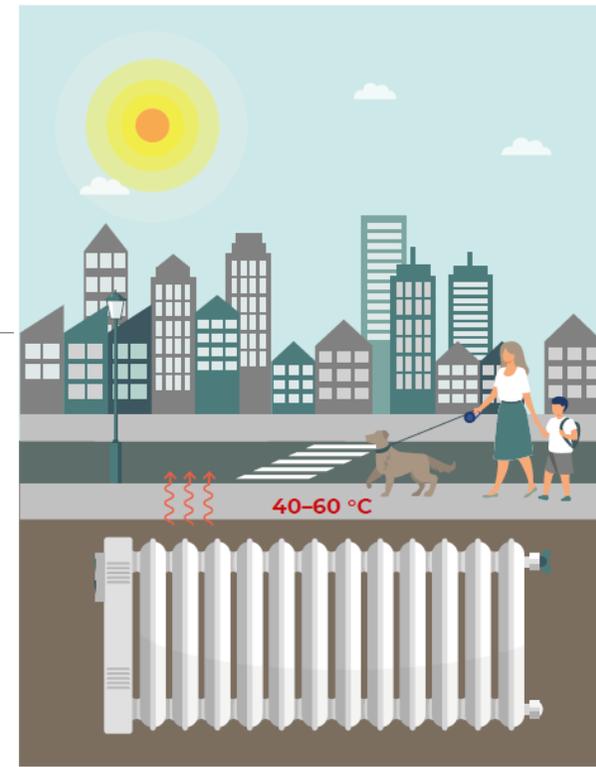


Figure 6. Position of typical UHI areas in the summer of 2015

Why UHIE is a problem?

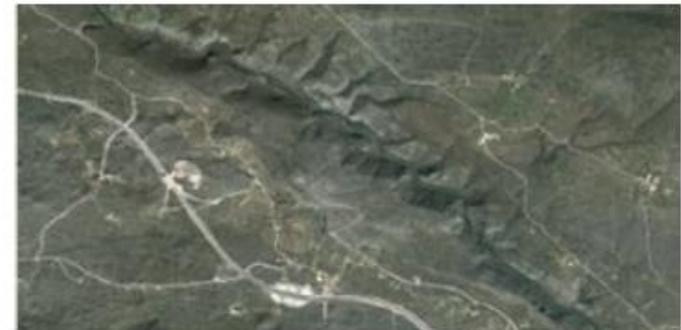
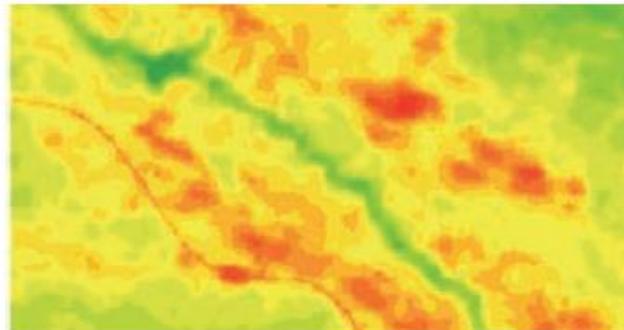
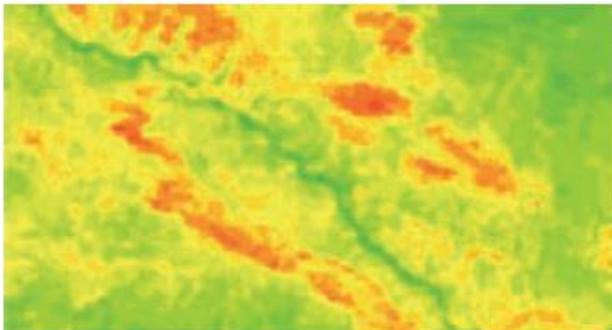
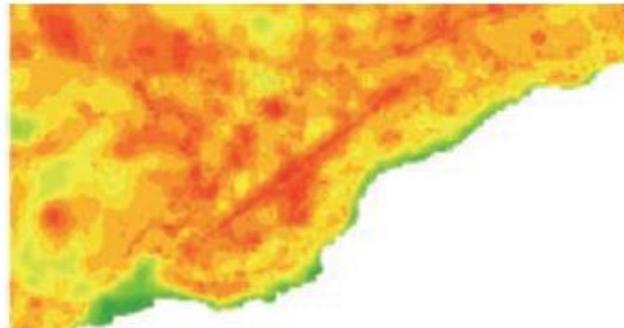
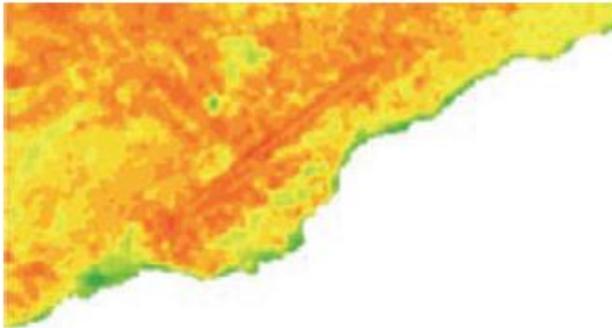
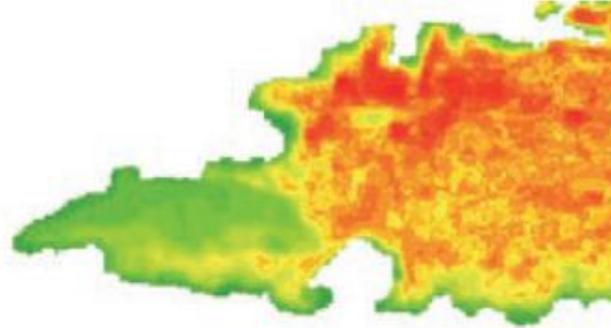
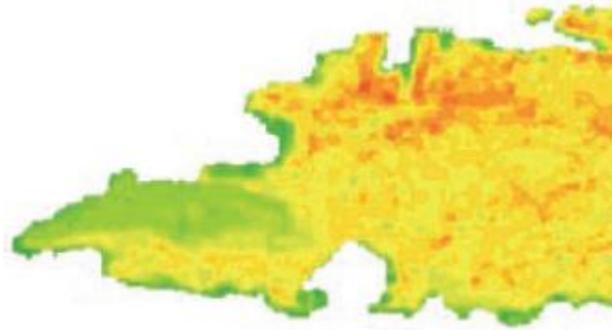
- Health impacts
- Social aspect
- Environmental quality deterioration (air, water, impact on plants and animals)
- The rise in temperatures represents the most significant climatic risk for urban environment – reinforced by heat Island effect
 - Related to other risks – drought or floods.
- With climate change – the impact of heat is more obvious



2 August 2000

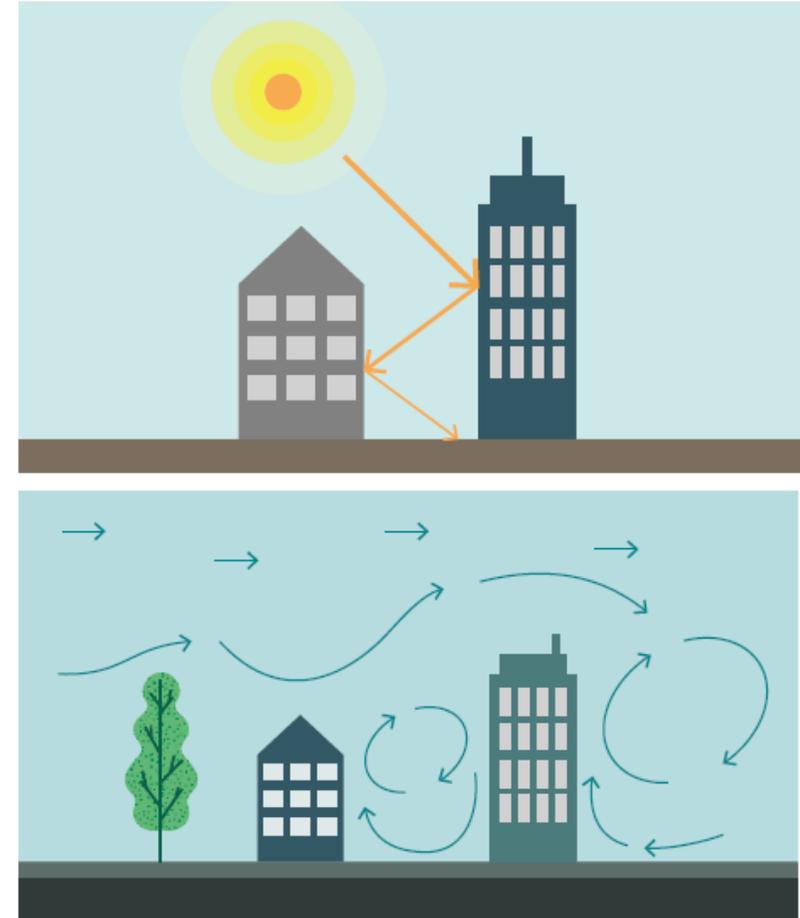
12 July 2015

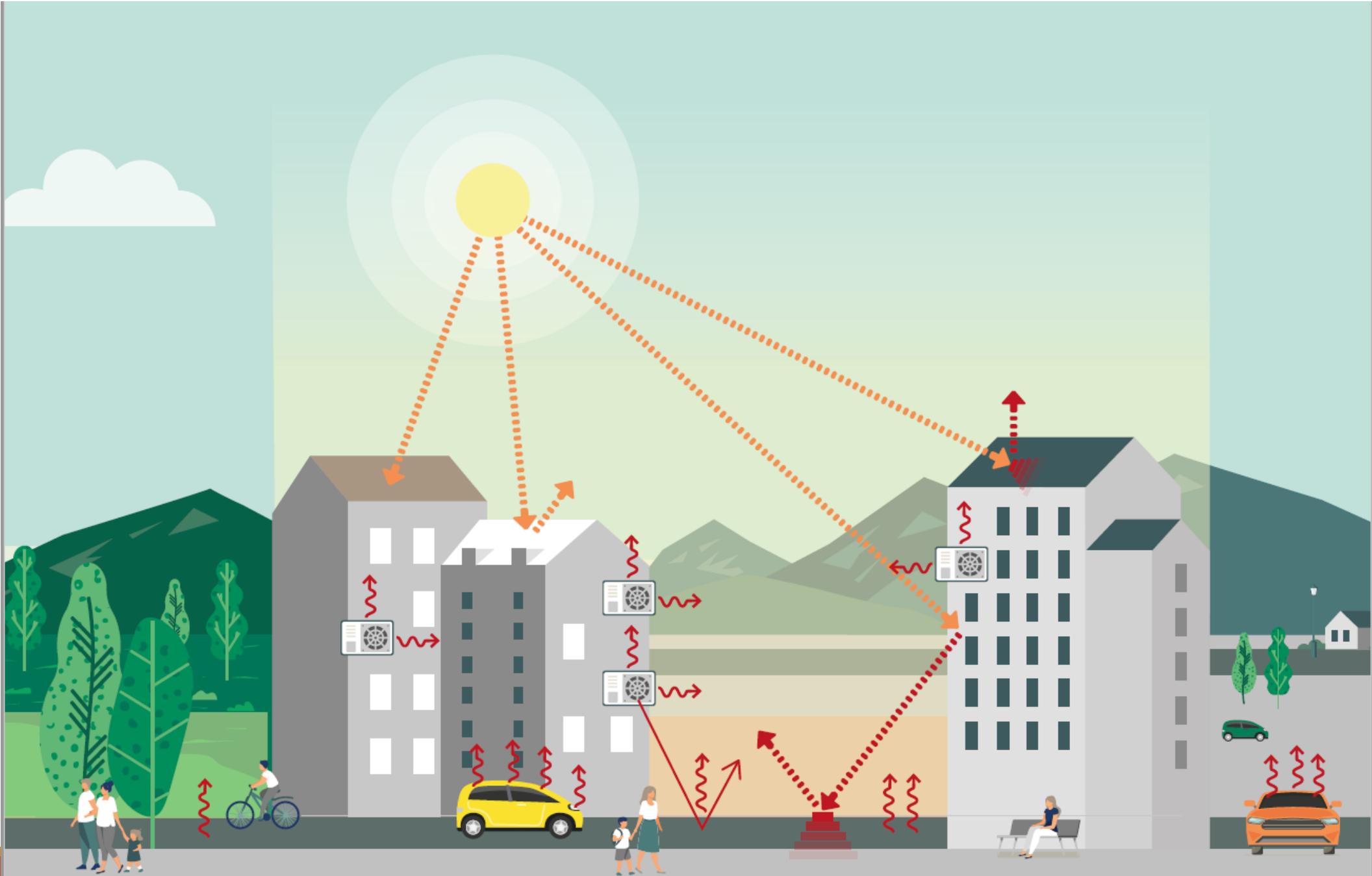
Google Earth (Digital Globe)
14 November 2015



Why are cities overheating?

- Loss of natural vegetation and its replacement with vapour impermeable materials - reduced evapotranspiration, lower humidity and higher drought
- Dominant urban building materials that increase storage of thermal energy
- Structure of the city - parts of urban geometry, e.g. urban canyons as a predominant structure
- Lack of vegetation and poor water cycle
- Antropogenic heat and pollution - vehicle exhaust fumes, industry, air conditioning equipment







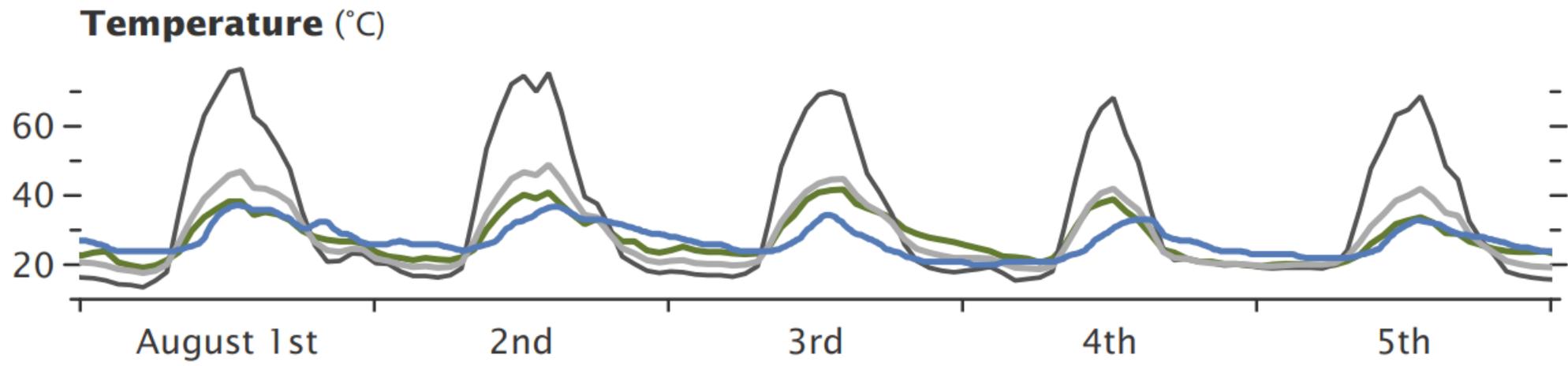
How to cool cities?







Black roofs can be 30° hotter than green or white roofs



Measuring UHIE

- Remote sensing - the method most commonly used for surface land temperature
- Ground measurement are necessary for satellite data validation





Thank you!

Factors affecting the UHI

1. Geographical location: climate, topography, rural environmental;
2. Time: day, season;
3. Synoptic situation (UHI limits): wind, clouds;
4. Urban form: materials, geometry, green areas;
5. Urban functions: energy usage, water usage, pollution;
6. Size of urban community: connection between form and function.