

Urban Climate Management System (UCMS) Gelsenkirchen

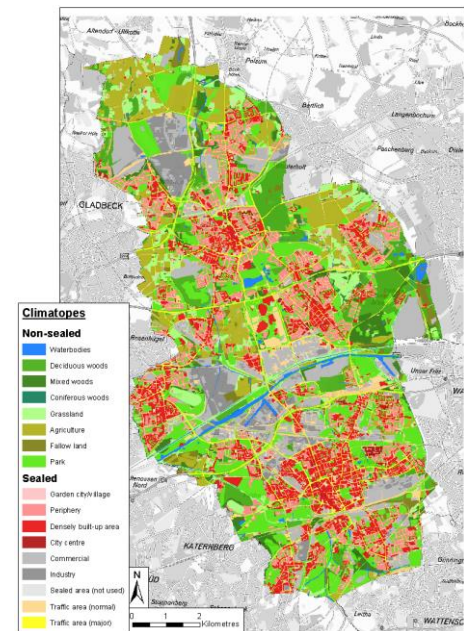
1. Institutional setting

Area 105 km²; 259,000 inhabitants
part of German Ruhr agglomeration (5.2 million inhabitants), 2,470 inhabitants/km²
over 15,000 inhabitants/ km² in the city centres
extensive industrial and commercial areas,

Areas with heat-stress: 2011 5% → 2060 48%

Adaptation to climate change is unavoidable

→ Resolution of the municipal council regarding implementation of the concept for climate adaptation



2. Starting point/Project goal

- **Intention:** Long-term maintenance of a well-balanced urban climate
- **Challenge/Problem:** Urban development leads to continuous change of urban land use with impact to climatic quality of those areas
- **Consequence:** Danger of unnoticed proceeding consumption of climatic valuable areas with a function of climatic compensation for urban areas especially those with heatstress
- **Conclusion:** Control of losses or gains of areas with high climatic quality → **development and use of UCMS**

3. Approach / Method



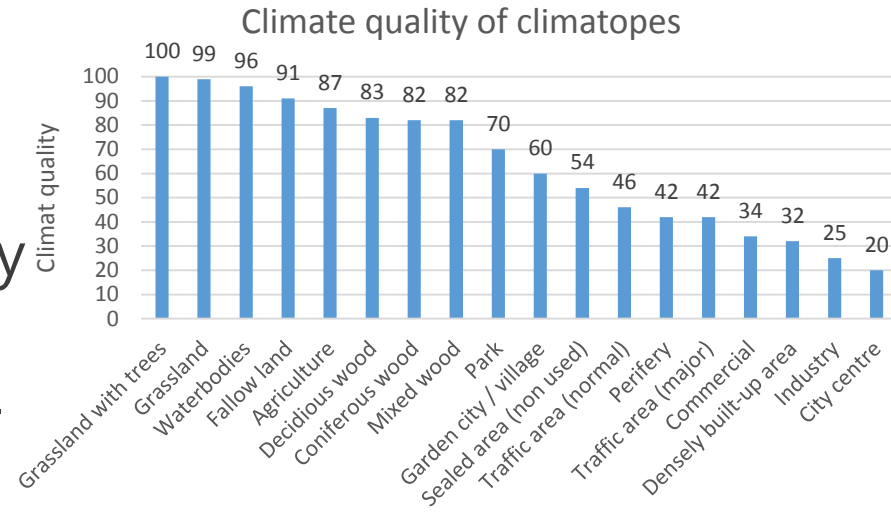
Land Use Mapping (FNK),
18,000 areas, 153 categories

18 Climatopes

Development of Climate quality
value (CQ) for each climatope
based on five climatic key indi-
cators (PET, UHI, z_0 , CAP, AQI)

$CQ \times Area = CQAV$ Climate quality area value

Monitoring/Accounting of climatic changes
(comparison of actual/planned Situation,
entire city or sub-areas)



Climatope	Area ha	CQ	CQAV
Agriculture	18.8	87	1,636
Grassland	0.5	99	50
Fallow land	1.9	91	173
Garden city	0.3	60	19
Park	0.4	70	31
Mixed wood	3.6	82	295
Sum	25.5		2,204

4. Outputs

Regular monitoring of urban climate changes due to land use changes is both useful and necessary

Application in all planning processes for assessing the influence of urban planning to both climate quality and adaptation to climate change, as a tool of preliminary assessment

**With the aim of
high transparency and control options with regard to
urban climatic consequences of urban development and
planning, especially for municipal decision makers
(municipal council)**

5. Lessons

Timely involvement of planning staffs and politicians – and the sooner the better

Absolute necessary to show that UCMS is neither a mystery or the book of seven seals nor only another difficult and unpleasant issue that has to be done but

A simply handy tool quite helpful on the way to qualified urban planning and for municipal decisions with effects on urban climate

After that a high acceptance and appreciation of the UCMS could be observed

6. Follow up

Consideration of the effect of measures against heat stress in the assessment of climatic quality using the UCMS

Application in other regions and countries, research of transferability to Local Climate Zones (LCZ)