

# Urban Green Spaces – Demands, Opportunities and Planning Approaches for Urban Climate Adaptation

**Stefanie Röbner, Juliane Mathey**

**Network conference of Spa-ce.net**

Green Infrastructure in Central, Eastern and South Eastern Europe: A universal solution to current environmental and spatial challenges?

September 28<sup>th</sup> 2015, Ljubljana

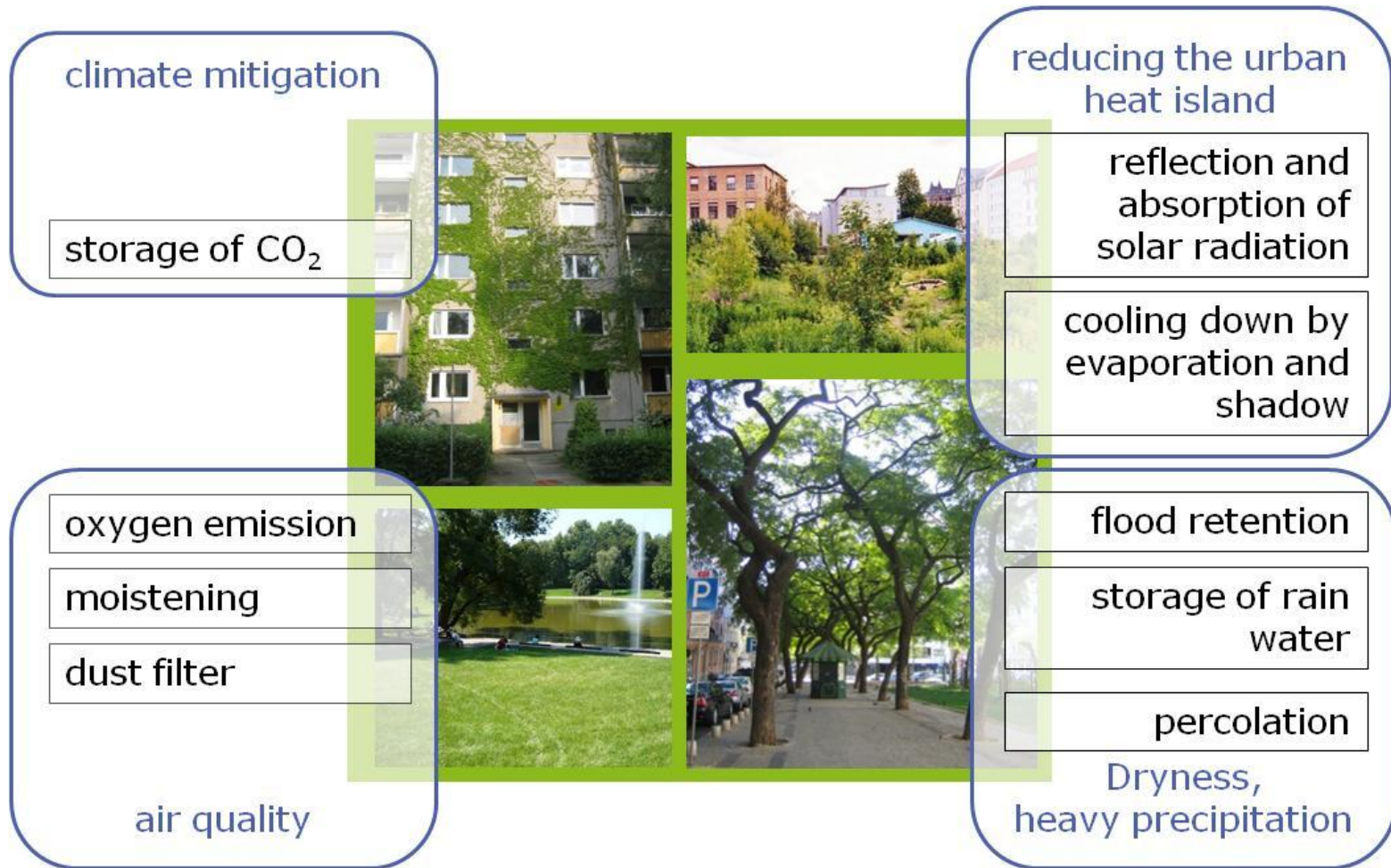


# Outline

- Demands: Research findings
- Opportunities: Planning Approaches
- Conclusions

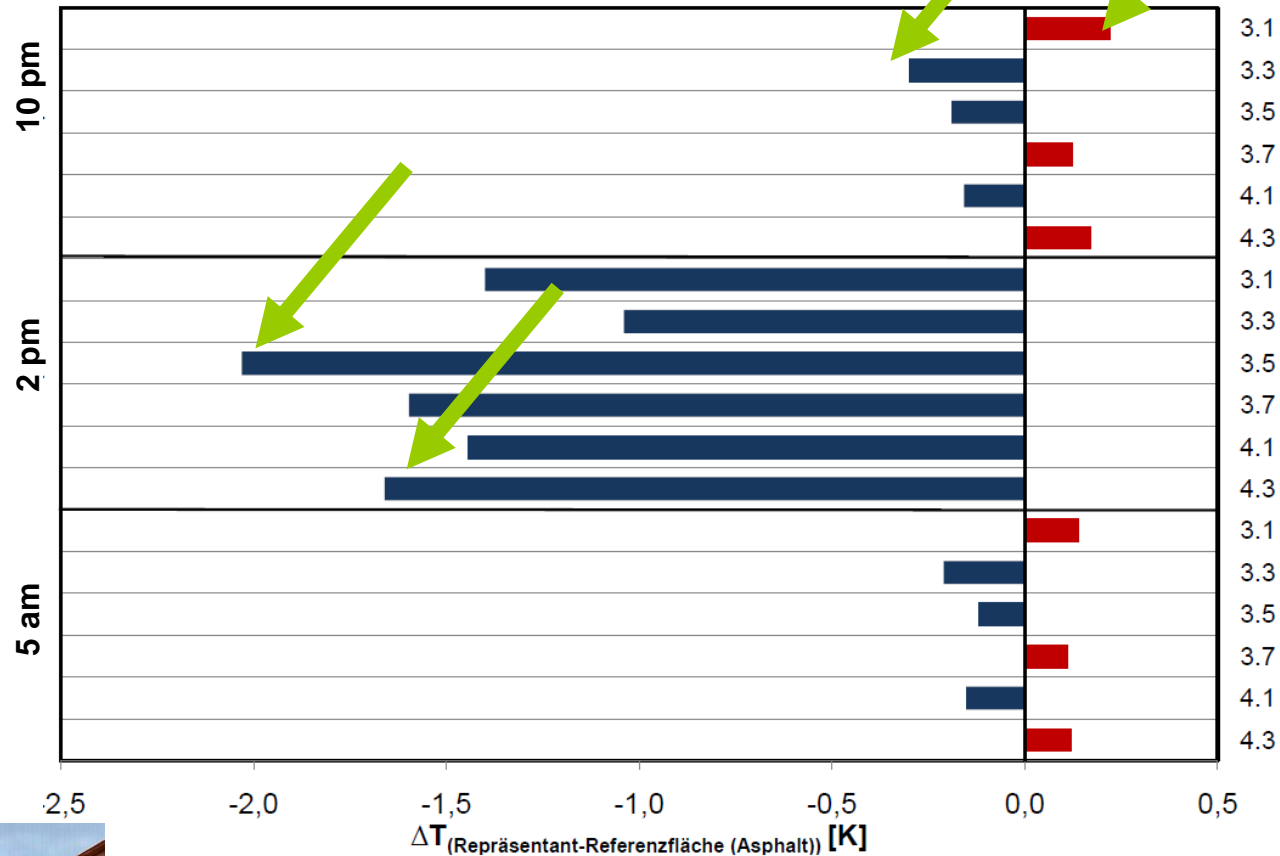


# Regulating services of green infrastructure



# Green space types: micro-climatic effects

Difference of air temperature (height 1,2 m) in relation to an asphalt covered site



## 3. Green Spaces

- 3.1 Green space with tree canopy
- 3.3 Lawn
- 3.5 Green space with medium tree canopy
- 3.7 Green space with few trees

## 4. Brownfields

- 4.1 Young brownfield with pioneer vegetation
- 4.3 Older brownfield with spontaneous wood

3.1



3.3



3.5



3.7



4.1



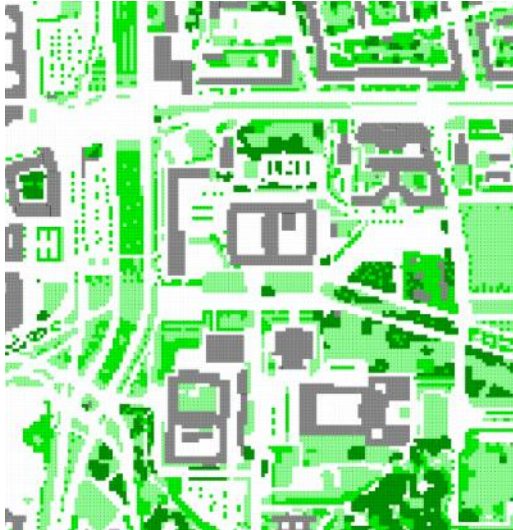
4.3



Source:  
Mathey et al.  
2011

# Urban form: micro-climatic impacts

Status Quo

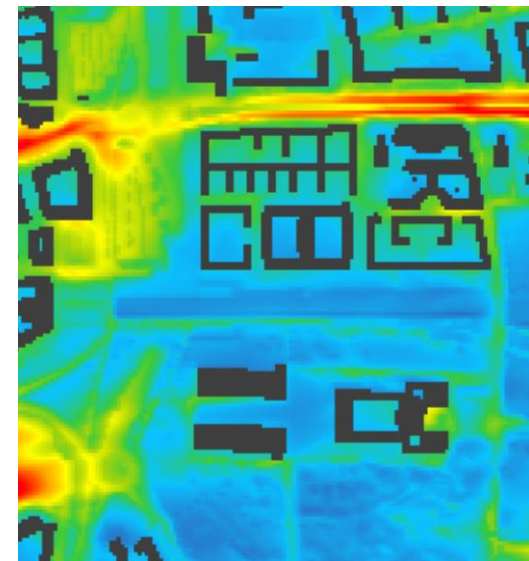
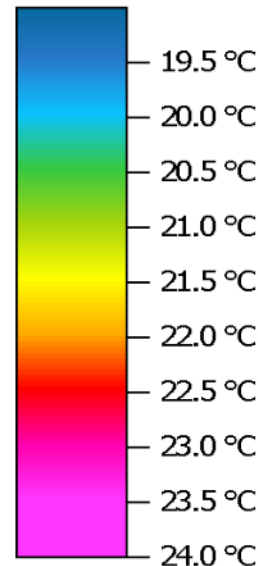
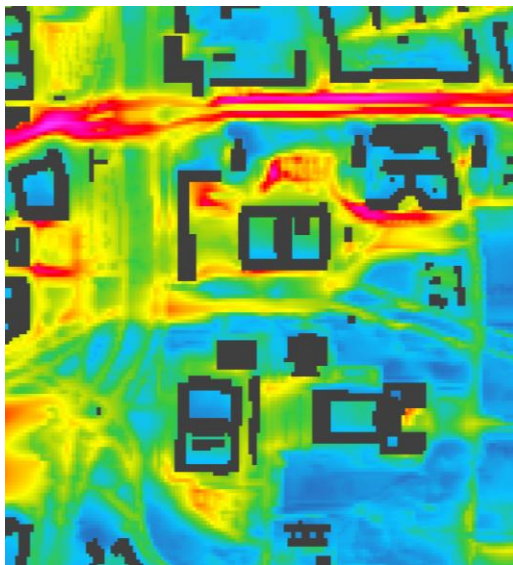


Scenario



potential  
air temperature

2 p.m.  
1,20 m height

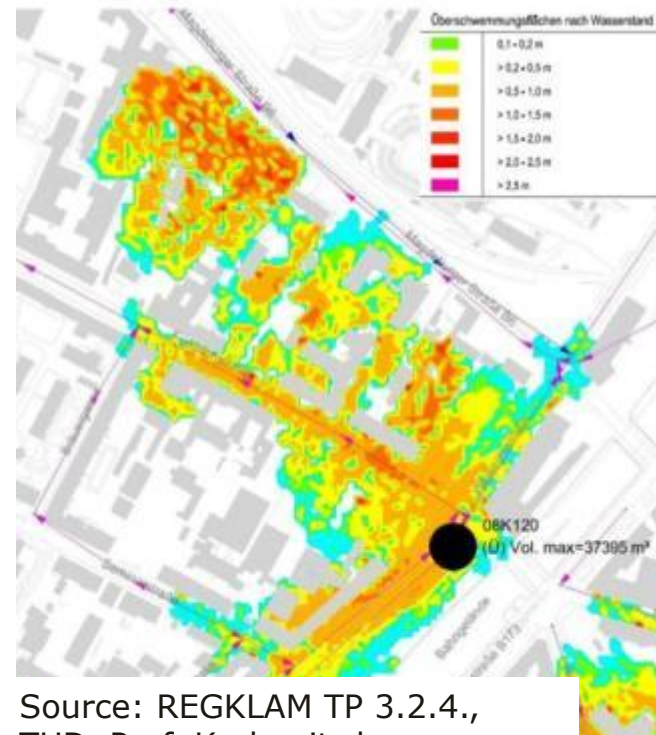


*Röbler, Wende (in prep.)*

# Adaptation to heavy precipitation



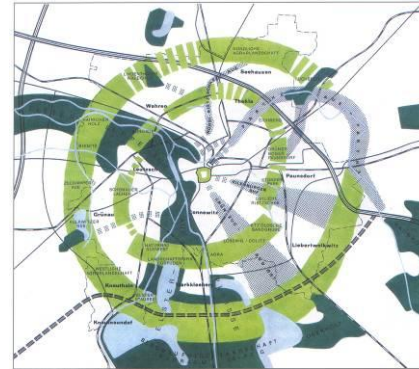
Impacts of heavy precipitation to the sewage system and potential impacts and damages



Source: REGKLAM TP 3.2.4., TUD, Prof. Krebs, itwh

# → Requirements for green space development

- Urban-regional network of regularly distributed and connected green spaces
- Quantity and quality (green spaces with a mixed vegetation inventory, e. g. trees, bushes, lawns)
- Entity of elements and manifold vegetation inventory on built-up sites



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- **Opportunities: Planning Approaches**
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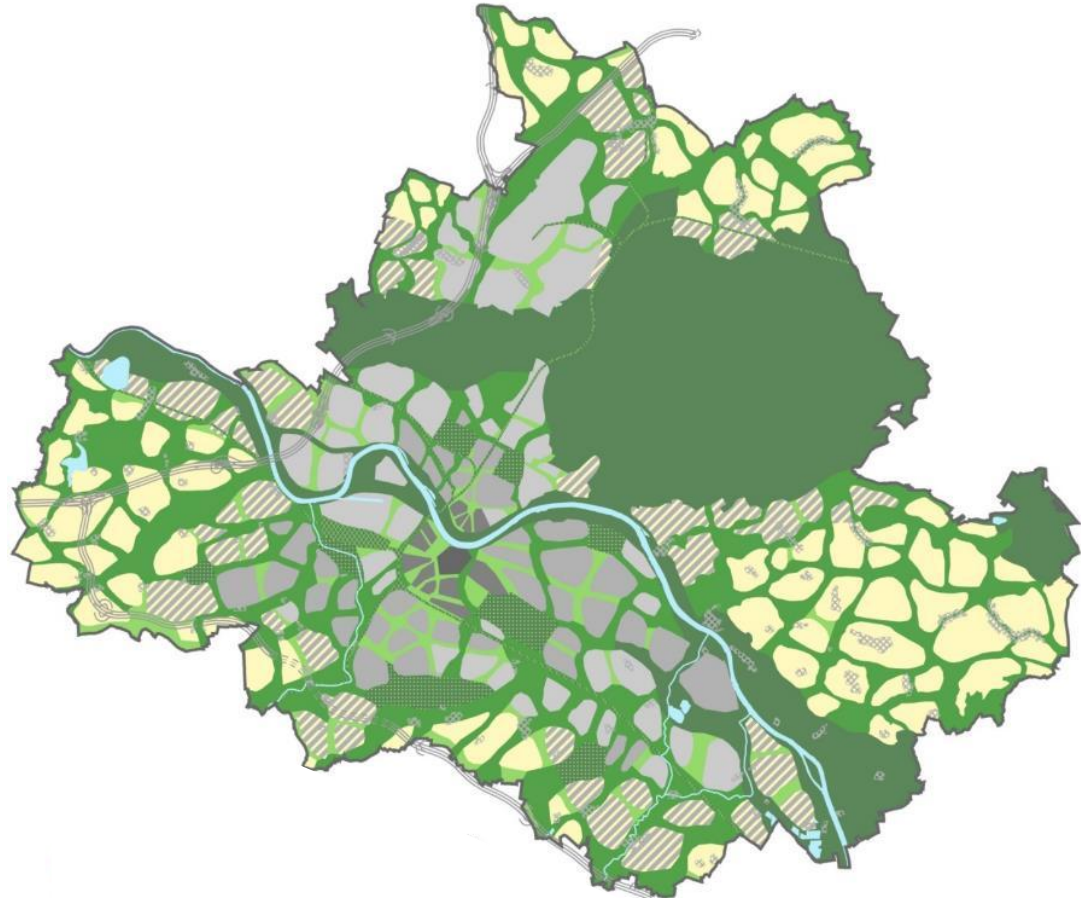
# Overall strategies on urban form

## Challenges:

- resilient structures: mitigation + adaptation
- compact structures + strengthen the urban green system

*Example: Landscape Plan  
City of Dresden/Germany*

**„Compact city within an  
ecological network“**

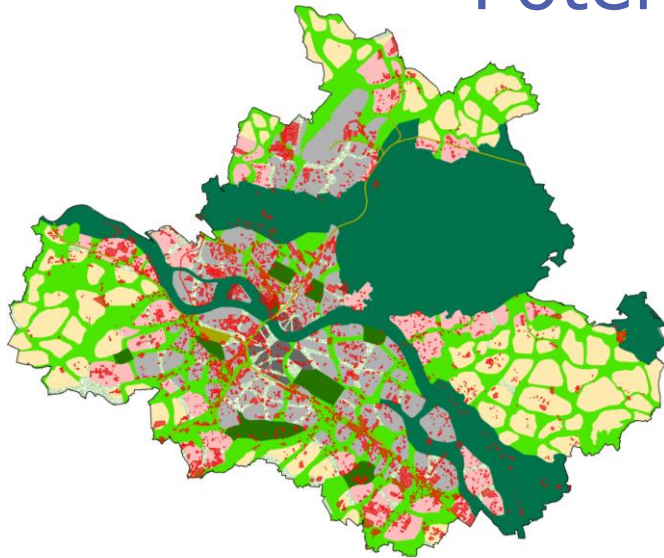


→ **Strategic approaches**

→ **Green spaces as a guiding principle**

Source: City of Dresden,  
draft of the Landscape Plan 2014

# Potentials of brownfields



Multiple benefits:

- Green volume for micro-climatic effects
- Storage and infiltration of rainwater
- Alternative habitats
- Production of biomass

**Neighbourhood gardens**



**Urban forests**



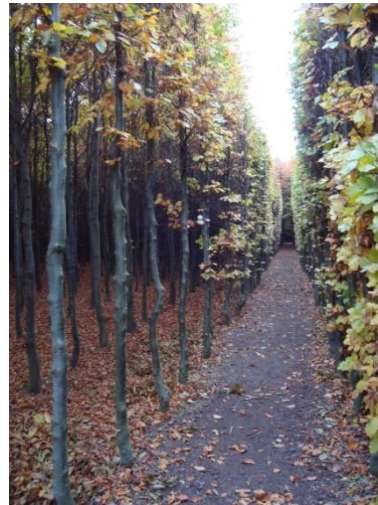
Foto: F. Schoder (2007)

**Urban agriculture**



- **Awareness**
- **Windows of opportunity**
- **New types of green spaces**

# Variety of green infrastructure elements



→ **New stakeholders and partnerships**

→ **Value creation**

# Multi-functional green spaces

Demands:

- limited areas + resources
- multiple benefits

Example:

- rain water storage, infiltration
  - micro-climate regulation
  - improvement of green space provision
- retention area with recreational functions

→ **Synergies**

## Neighbourhood park

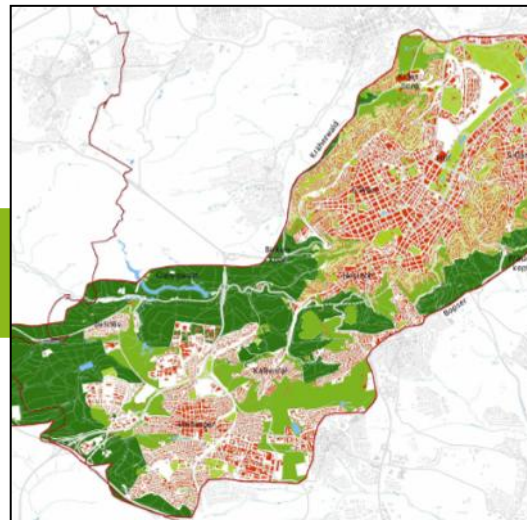
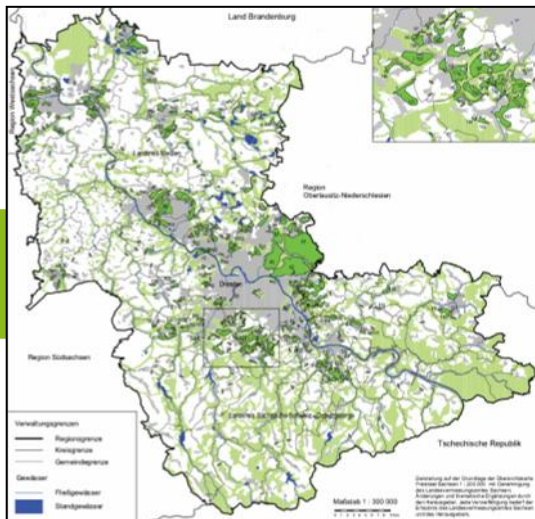


## Rain water storage



# Conclusions

- Limitations to adapt the existing built structures (private responsibility, funding, land use conflicts)
- Synergies with other challenges (urban biodiversity, public health, environmental justice)
- Variety of green spaces types and multifunctionality
- Integrative, formal and informal planning
- Multi-stage implementation
- Mainstreaming: Implementation in planning procedures



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