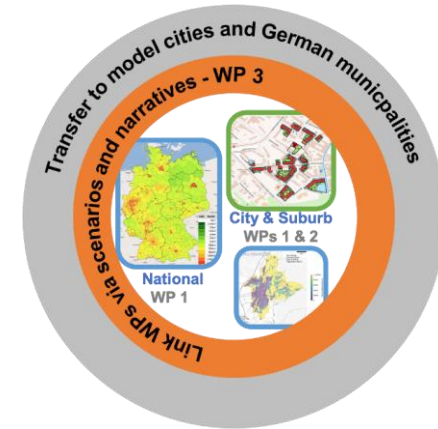


# Urban Transformations towards Blue-Green Infrastructures (UT-UBGI)

*Helmholtz Sustainability Challenge | Satellite Project*

**Jan Friesen, Snigdha Dev Roy, Roland Müller**

- Blau-grüne Ressourcengrenzen Raum & Wasser für Stadtgrün (deutschlandweit)
- Entsiegelungspotentiale & Wirtschaftlichkeit
- Vermessung von Stadtbäumen in Leipzig und Karlsruhe - Effekte von Bewässerung
- Stadtklimamodell
- Fokus auf Bürgerbeteiligung



## 5 Departments | 3 Helmholtzzentren

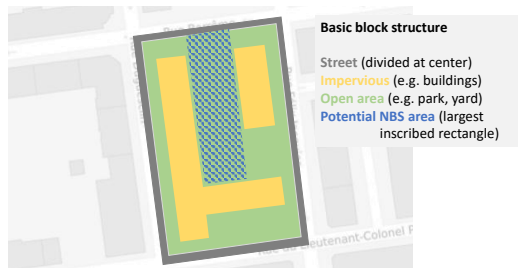
# BGI Ressourcenbedarf & skalierbarer Blockansatz (WP 1)

## UFZ-SUBT

- **Automate** block consolidation and BGI demand estimation
- Cross-city comparisons and **visualizations**
- Assess **environmental boundary conditions** across scales

### Key targets:

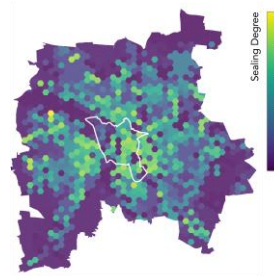
- Capability to reduce stormwater
- Potential to utilize rainfall runoff for irrigation



Block



Suburb



City

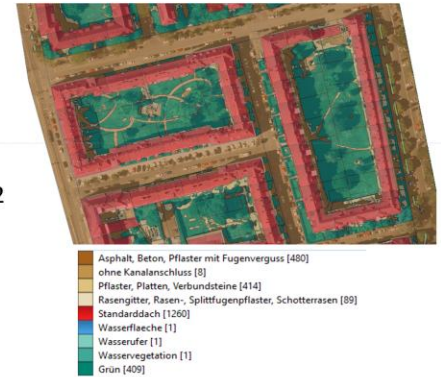


Cities

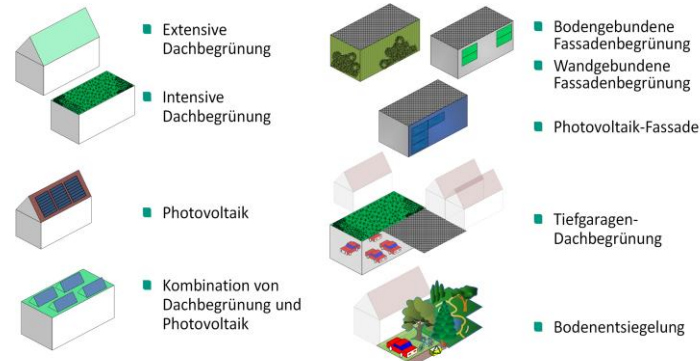
- Assessment of **desealing potential** at plot, block, and city levels using namares model
- Indicator-based techno-economic evaluation** of BGI measures (e.g., green roofs, facades, rainwater use)
- Translation of complex model outputs into actionable recommendations for urban planners and policymakers



v1 v2



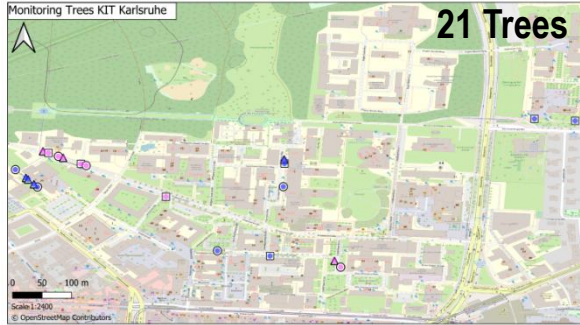
Automated detection of sealing type



Types of measurements

# Stadtgrün & Bewässerungseffekte (WP 2.2)

## KIT-ITAS



Tree selection for long-term monitoring in KIT and UFZ Campus



### Canopy

- Relative humidity
- Temperature
- Foliage
- Canopy structure
- Leaf area index

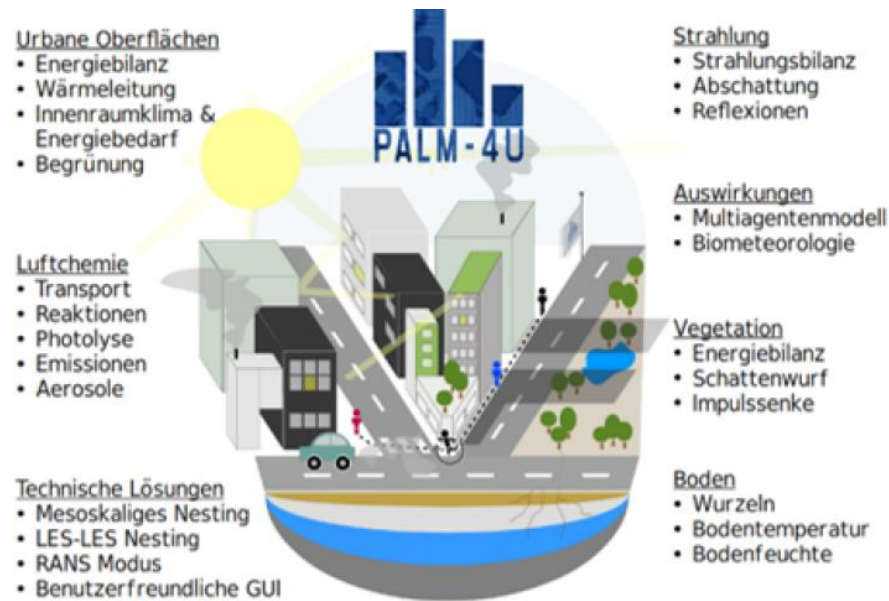
### Tree trunk

- Continuous sapflow
- Tree growth
- Distance to neighbouring trees
- Distance to buildings/streets

### Ground

- Vegetation assessment of tree plate
- Fine root observation (18 trees)
- Availability of water (soil water potential sensors)
- Soil analysis (one time sampling)

Contribution on defining requirements for **static** (topography model, digital twin) and **dynamic** drivers (weather conditions, critical multiday phenomena) for modeling BGI cooling effects (in collaboration with KIT)



PALM-4U-Komponenten, Maronga (2023)

- Analyze **narratives** and **conflicts** around BGI
- Selection of **‘Superblocks Leipzig’** for initial case study
- Through case studies and stakeholder engagement, develop practical strategies for negotiating UBGI conflicts and enabling broader implementation

The Superblocks project in Leipzig



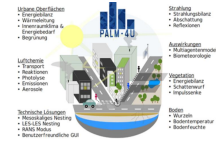
Future Case Studies

Case: Bürgerbahnhof Plagwitz



Case: Alte Deponie Seehausen





## ■ Blau-grüne Transformation aus Sicht verschiedener Disziplinen

Infrastrukturplanung | Ökonomie | Pflanzenphysiologie | Stadtklima | Konfliktanalyse



## ■ Zusammenführung der Ergebnisse in blau-grünen Szenarien

## ■ Blau-grüne Informationsplattform für deutsche Städte

