Water Sensitive Urban Design and Climate Change

Experiences from the *dynaklim*-pilot areas

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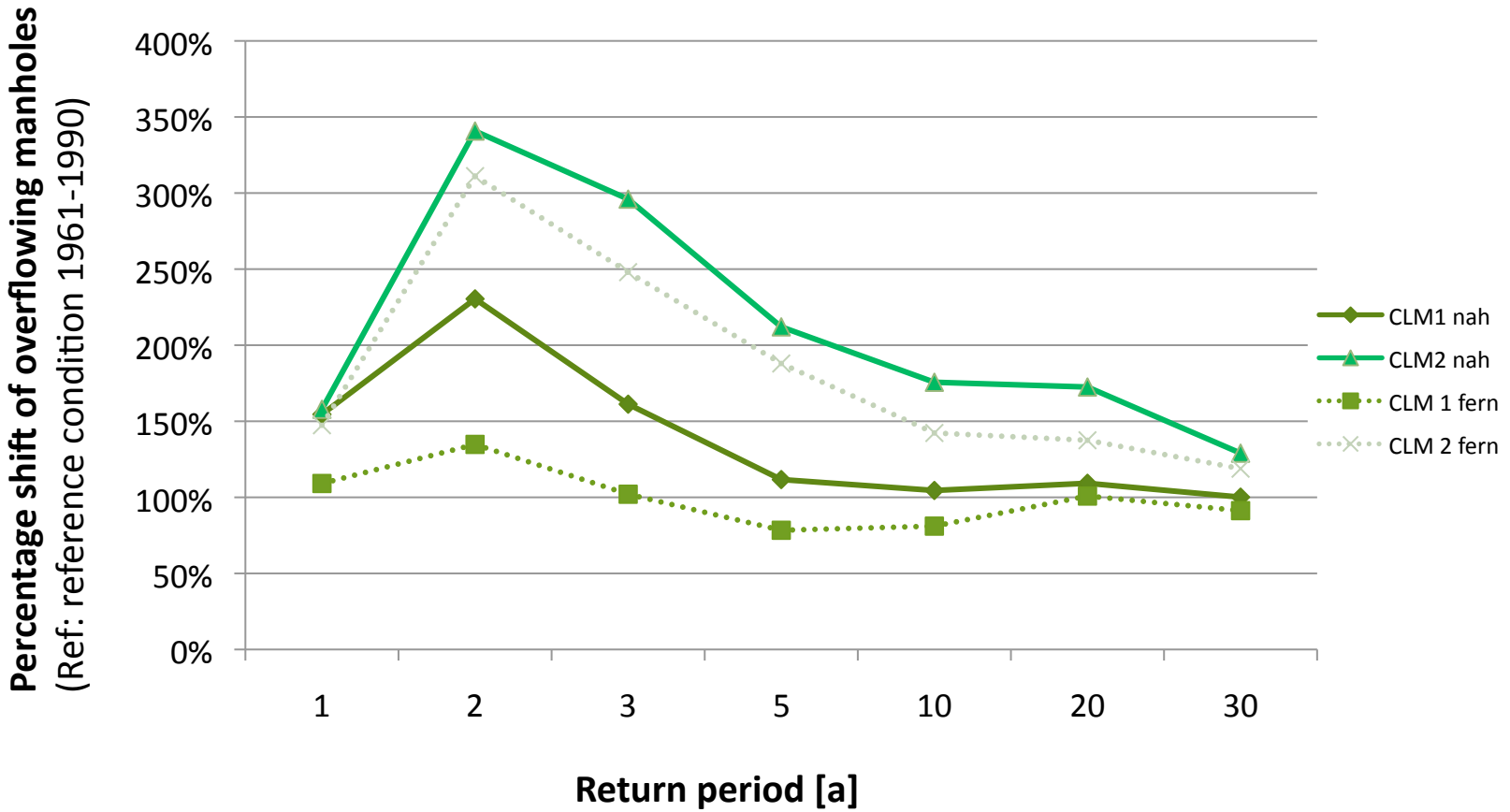
Content

- Effect of Climate Change on Urban Drainage in Germany
- Adaption Options
  - Water Sensitive Urban Design
  - Realization Constraints
- Realization options (pilot projects *dynaklim*)

What we have...

Urban drainage – Climate Change due to changes in overload situations



→Higher frequency of heavy rainfall events/hydraulic overloads
→Extent of change: uncertainties

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Source precipitation data: dr. papadakis GmbH

Adaptation goals and options for action …

Adaptation goals for the city drainage

Maintaining of innocuous hygienic conditions in settlement and cultivation areas.

Largely avoiding any damage by flooding and waterlogging

The usability of the settlement areas should be maintained as much as possible – regardless of the weather conditions

Course of action 1:

- uncont ed flooding of s , squares, bas ents
- Risk to mans by flash flood
- Damage infrastructure and bu gs

No Option!

Adaptation goals and options for action …

Adaptation goals for the city drainage

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Course of action 2:

Conventional (technical) adjustment

stormwater holding tank, sewer with higher storage capacity, larger diameter etc.

- maintain, as far as possible, the current drainage comfort with high technical and financial effort
- secure up to the maximum design load, above: “higher force”, “force of nature”…
- high capital and operating costs => fees may increase
- unflexible, non-reversible infrastructure for the next 60-80 years

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Adaptation goals and options for action …

Adaptation goals for the city drainage

Maintaining of innocuous hygienic conditions in settlement and cultivation areas.	Largely avoiding any damage by flooding and waterlogging	The usability of the settlement areas should be maintained as much as possible – regardless of the weather conditions

Course of action 3: [„Water sensitive urban design“]

Dynamic, flexible, innovative adaptation

More retention “on the surface”	Integrated urban, water and environmental planning	Multifunctional land use	Liability questions Insurance cover	Improved communication
Waterways + Water squares	Higher curbs + driveway bumps	More protection of property by owner	More precautionary measures by owner	Information of the affected public

- limited investment and maintenance costs for a similar comfort
- more financing options by combining different budgets
- flexible, i.e. expandable, changeable and deconstructable infrastructure
- modifiable distribution of costs, risks and opportunities

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Examples...
Decentralized storm water management and treatment

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Further advantages ...

- Cooling effect of evaporation
- Reinforcement of natural water cycle
- Attractive architectural opportunities
- No-regret measures

Water Sensitive Urban Design – Realization Constraints in Germany

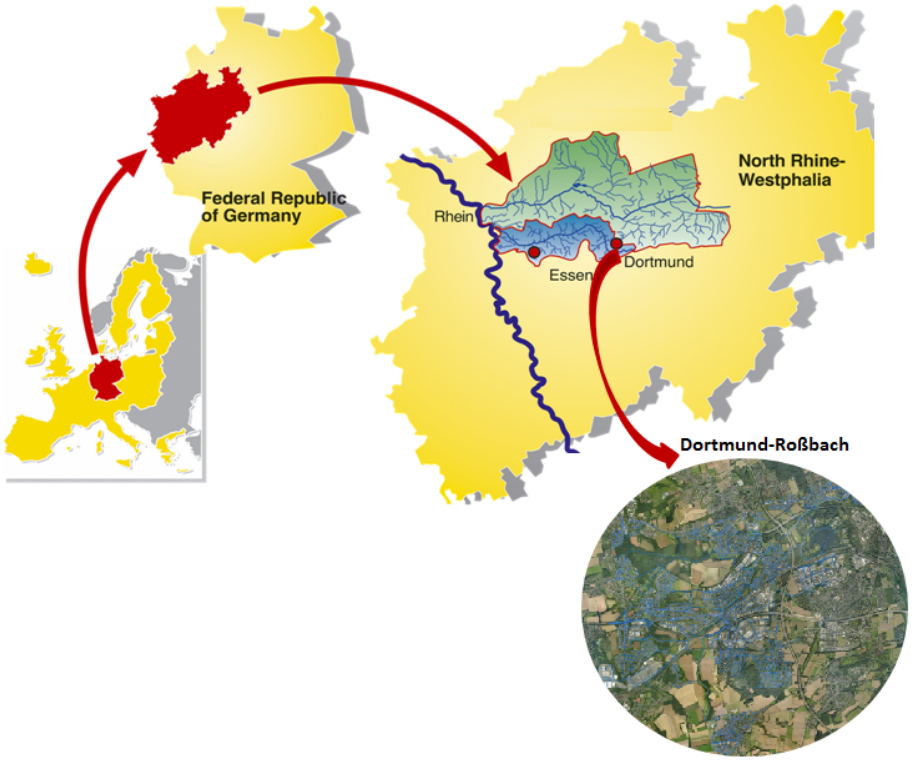
- General scepticism towards changes
  - Understanding of climate change
  - Measures come to the surface
- Cross-sectoral measures vs. sectoral public administration/financing systems
- Lack of resources
  - Knowledge, methodologies, data
  - Personnel, finances
- Lack of Best-Practice examples
- Lack of legislative/normative orientation
- Neglect of the chances coming with Water Sensitive Urban Design
- Missing political prioritization of climate change adaption

→ Addressed in JRP *dynaklim* (English summary on www.dynaklim.de)

“More flexible infrastructure – create innovations”

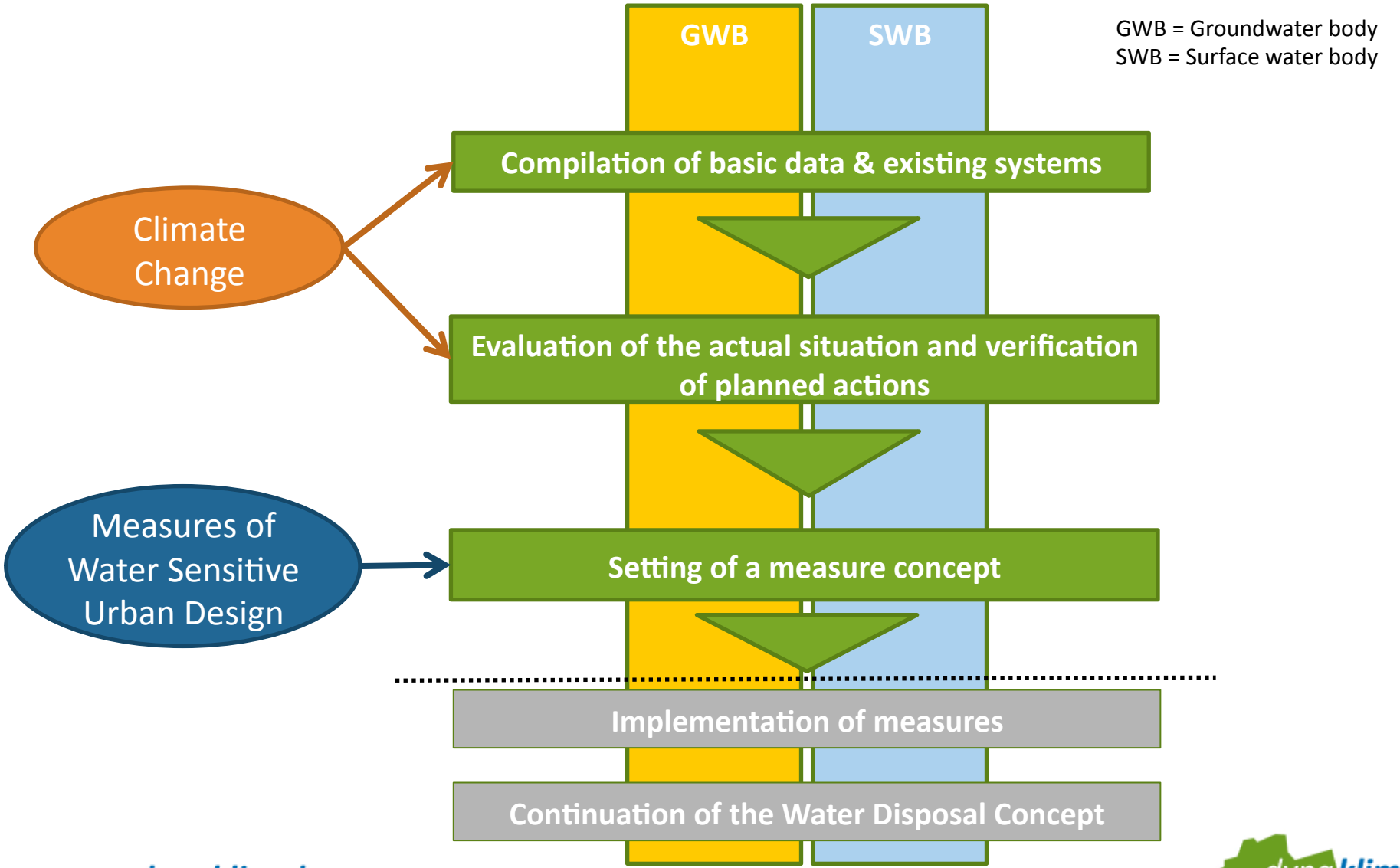
Pilot project Roßbach Dortmund

Water Sensitive Urban Design with the “rain water disposal concept”*



*mandatory formal planning and operation instrument in Germany

Innovative Water Disposal Concept



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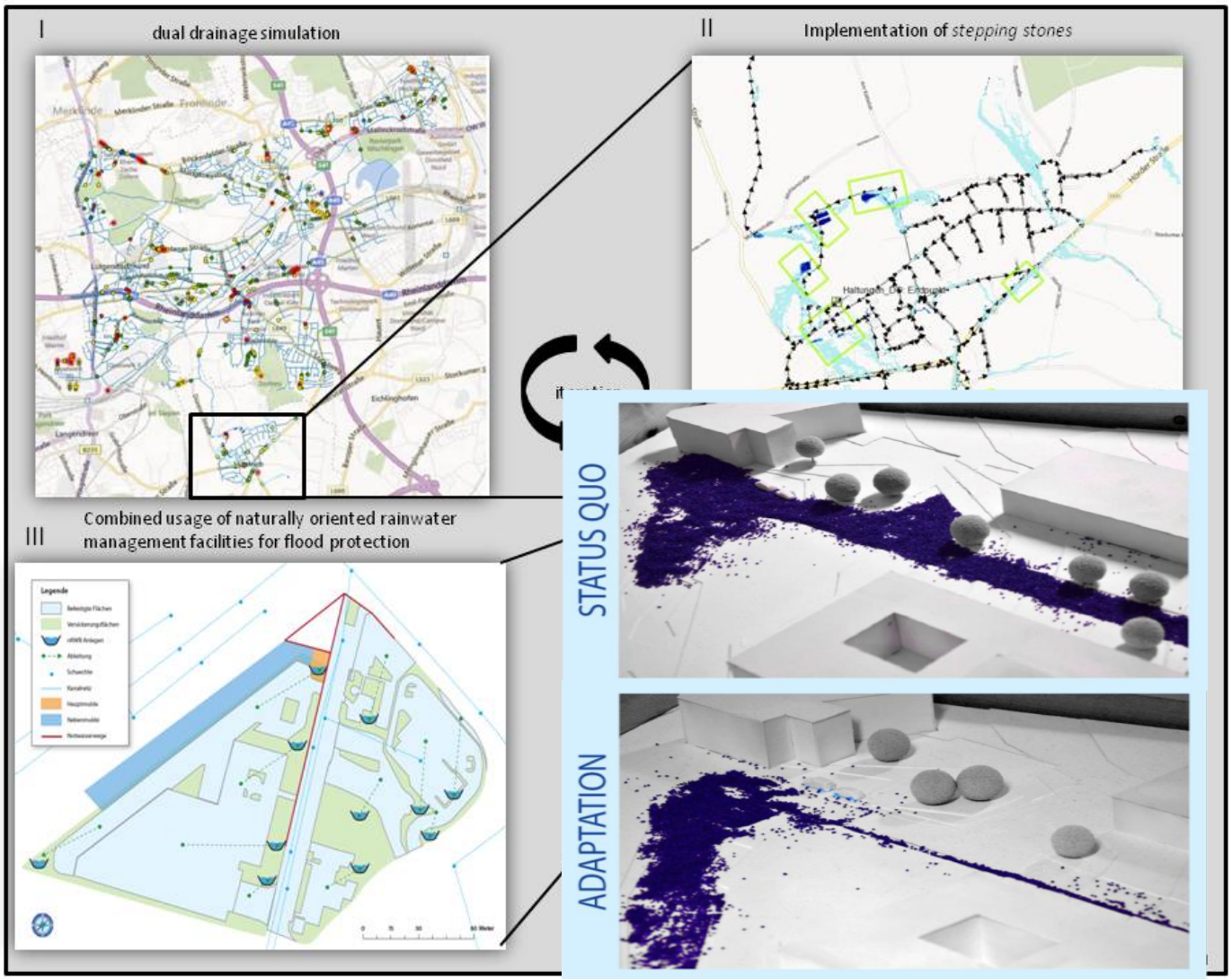
Methodology and results…

Focus area “Kley”



“More flexible infrastructure – create innovations”

Pilot project Duisburg Mitte

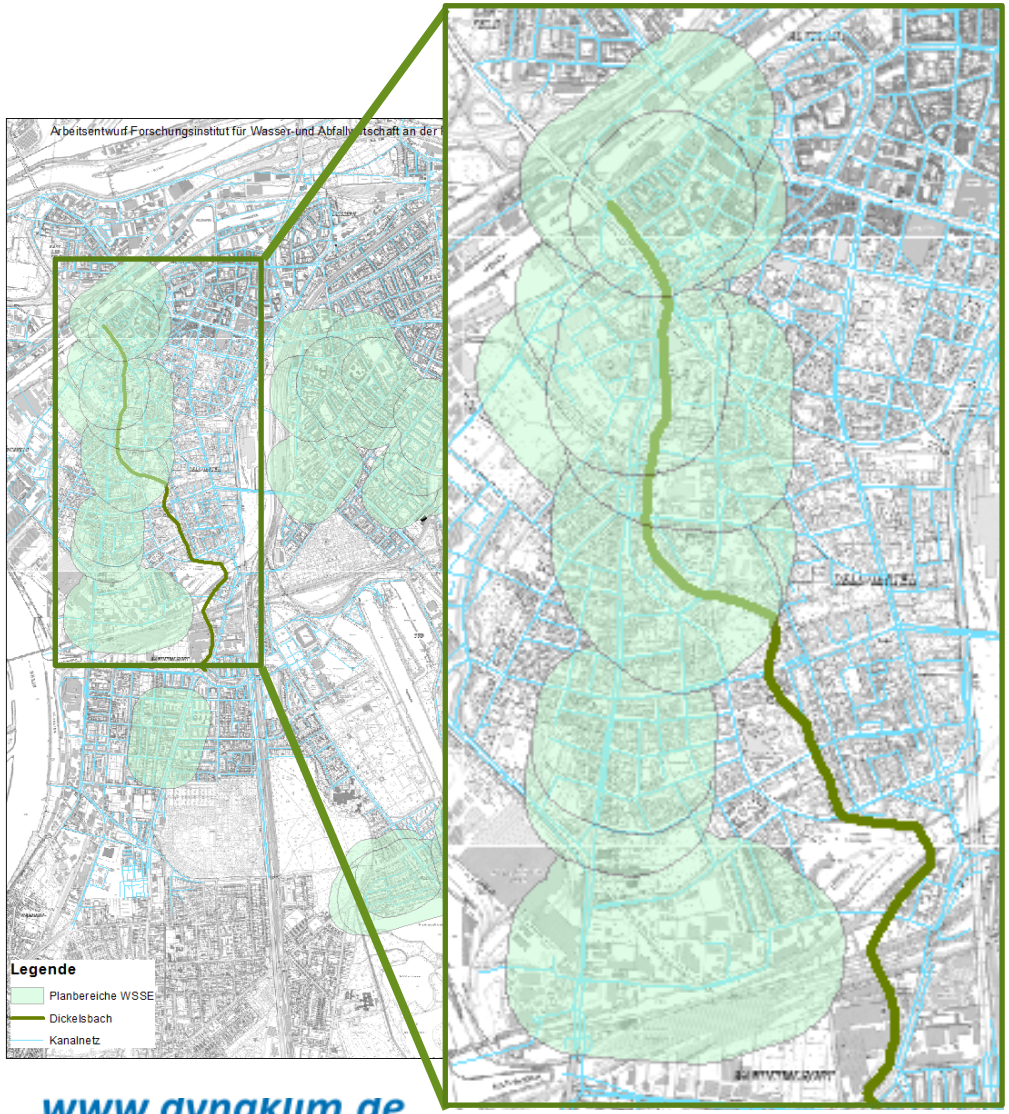
Water Sensitive Urban Design with an integrated informal approach

Aim

Bringing together of different urban planning disciplines to anticipate and adapt to climate change.

www.duisburg.de

Methods and Results… (ongoing work)



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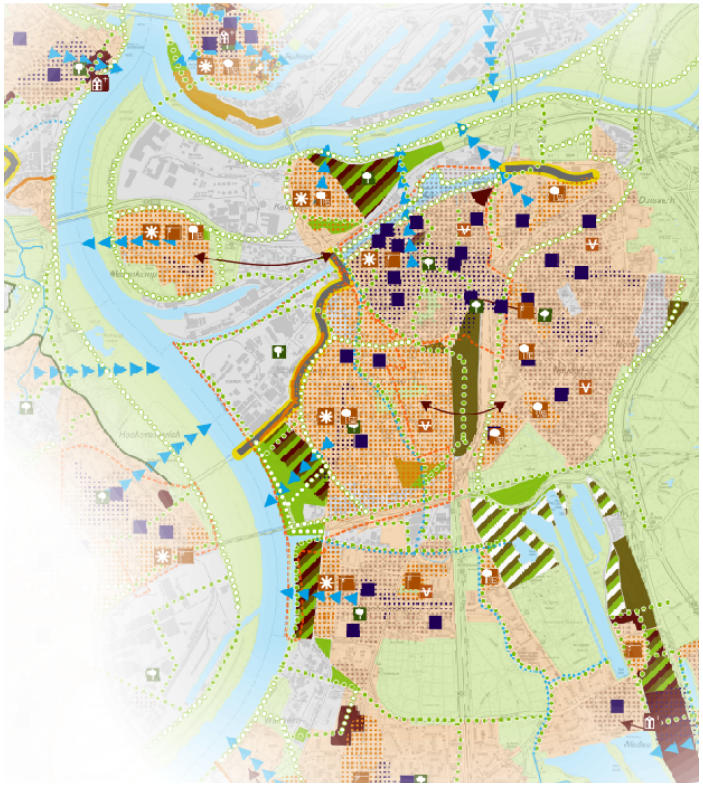
- Inter-institutional meeting of urban administration offices
  - Urban planning
  - Building permit authority
  - Water board
- Discussion based on
  - Information on Water Sensitive Urban Design
  - Map: searching areas (green circles)

Methods and Results… (ongoing work)

Synergies with Urban Development Program “Duisburg 2027“



- Revision of land use management
- Water as theme for attractive urban architecture
- Communication message:
  „We have the water you‘re looking for!“

Reference: Integrierte Karte Bezirk Mitte, Duisburg 2027, 2013

Key message: We have to work together!

Integral merge of sectoral research

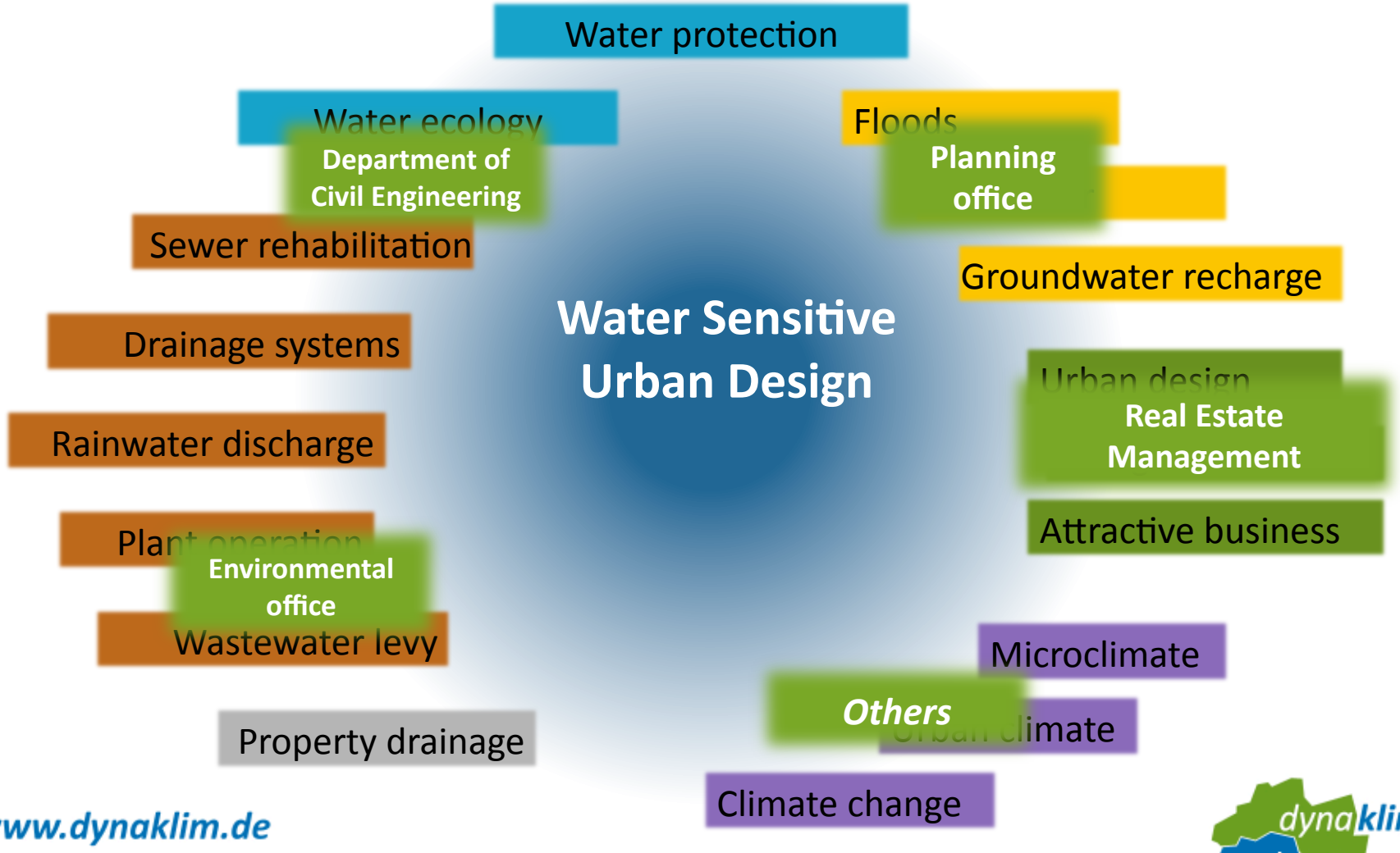


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Abbildung verändert nach EGLV

Thank you for your attention

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Intruduction of *dynaklim*...

Dynamic Adaptation of Regional Planning and Development Processes to the Effects of Climate Change

- Network project
  - 14 project partners
  - More than 25 cooperating partners
  - Trans- & interdiscplinary
- Emscher-Lippe Region (Northern Ruhr Basin)
  - High population density (3.8 Mio People)
  - Industrialized
- Project duration
  - July 2009 - June 2014

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