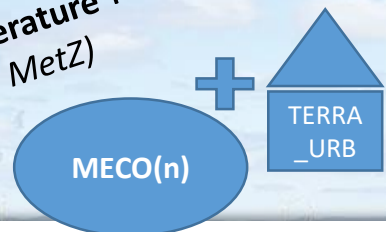




Re-thinking "Smart City" – transferring urban climate research into city planning processes

Joachim Fallmann, Stefan Emeis (Karlsruhe Institute of Technology, Institute of Meteorology and Climate Research, joachim.fallmann@kit.edu)

Impact of imperviousness on surface and boundary layer temperature + chemistry (Fallmann et al. 2021 MetZ)



Guideline to Smart Urban Planning

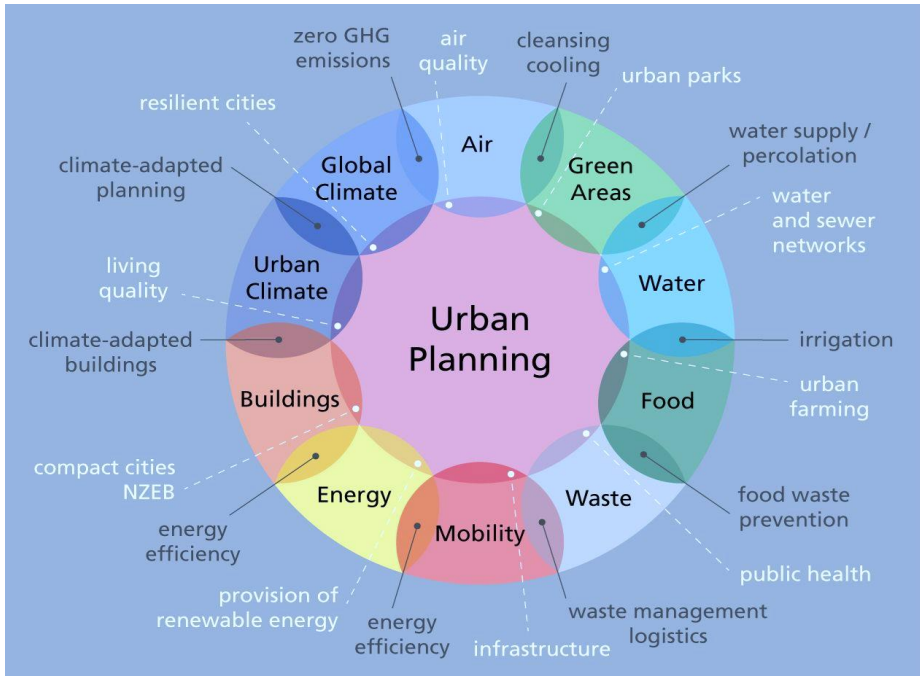
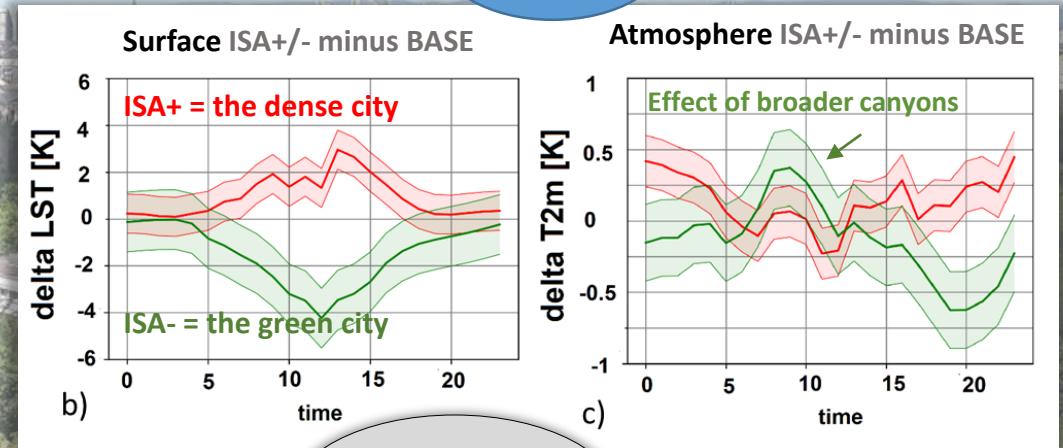
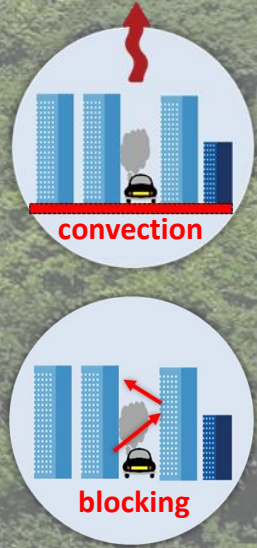
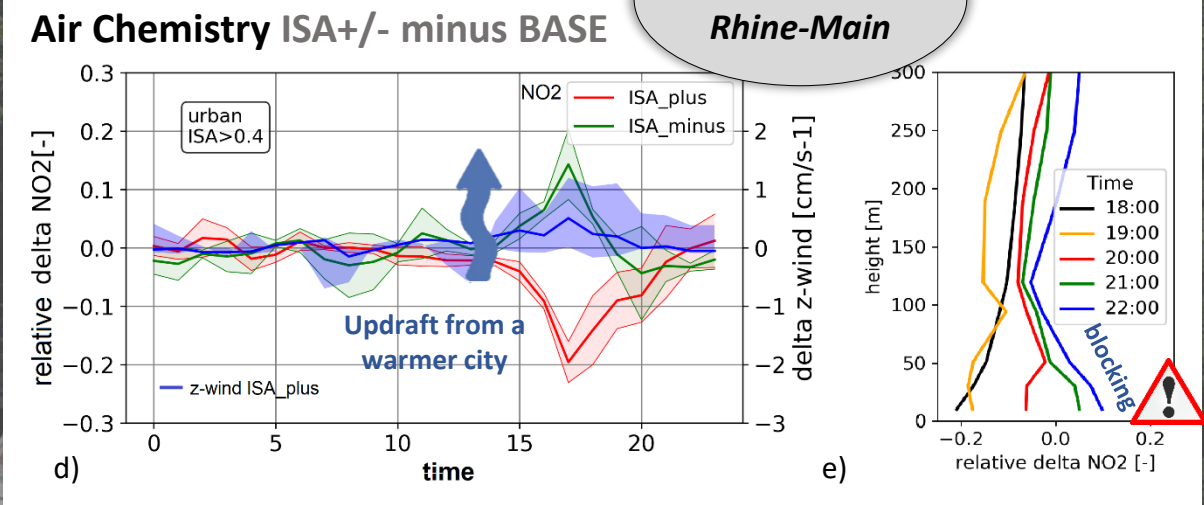


Fig. a) Interrelations among urban issues towards sustainability. The bubbles depict mutual overlaps among the urban issues and one example for each overlap is provided (white dashed lines point to overlaps with the central bubble and black full lines to overlaps between neighbouring outer bubbles)(Copyright: IMK-IFU, Petra Guppenberger, inspired by Fig. 2 in (Petit-Boix et al., 2017))
Cite: Fallmann, J. and Emeis, S., 2020. How to Bring Urban and Global Climate Studies together with Urban Planning and Architecture?. Developments in the Built Environment, p.100023.

Scenarios



Mean urban area Rhine-Main



Impact of urban imperviousness on boundary layer meteorology and air chemistry on a regional scale

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³Max-Planck Institute for Chemistry, Mainz

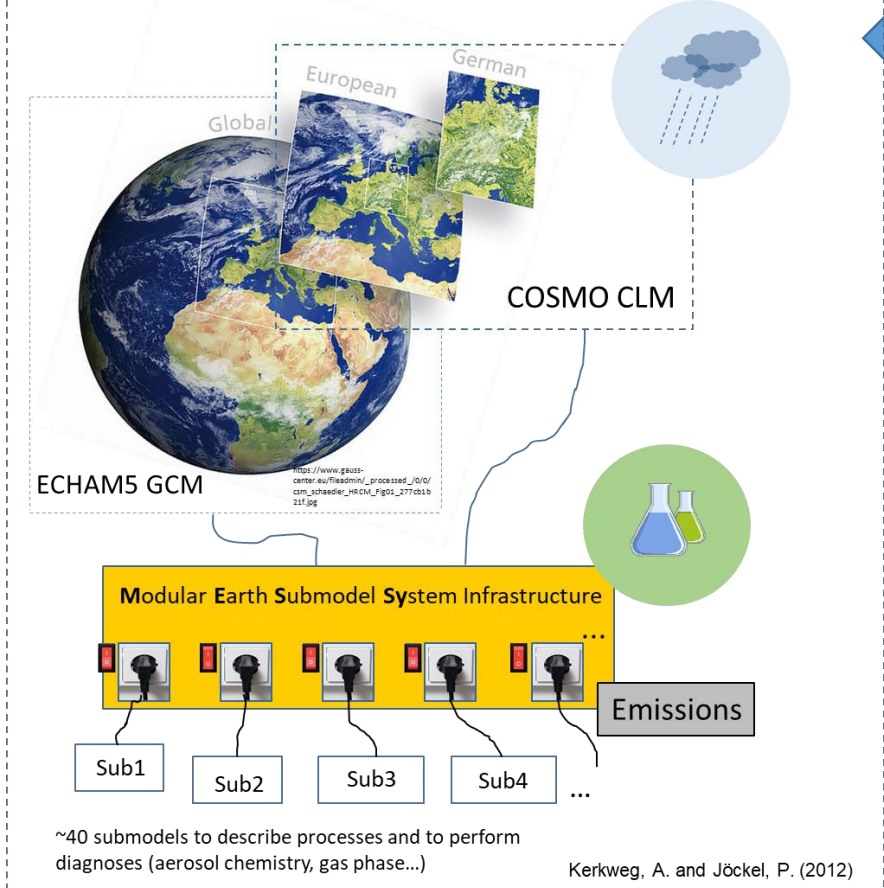
Scenarios

- **+50% imperviousness in urban center**
- **-50% imperviousness in urban center**

Sensitivity:

→ ISA+/- minus BASE

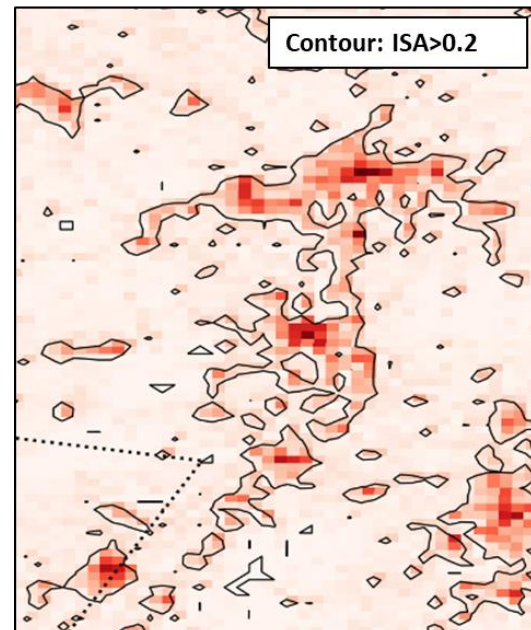
Regional climate air chemistry model MECO(n)



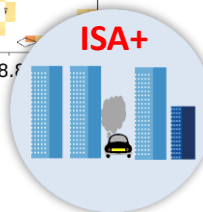
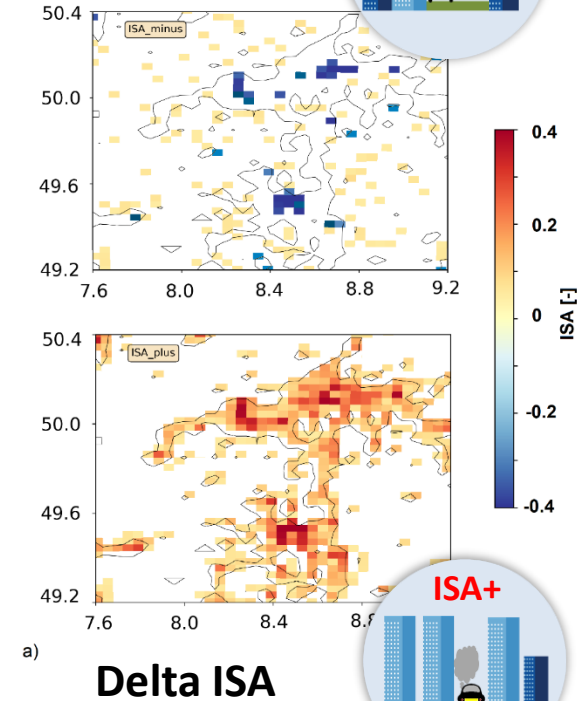
+ TERRA_URB coupling



Extract of German domain



Impervious surface area [%]



Con't: Surface to boundary layer interaction

Difference in cloud cover

