

Urban Regions under Change: towards social-ecological resilience (URC 2014)

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Keynote

Urban climate change – the story of several drivers.

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When designing policies for dealing with climate change, knowledge is needed whether the change is not just an expression of natural variability, but may be related to global change, which is expected to continue into the foreseeable future at a possibly accelerated pace, and/or to local change, which in some case may have led in the recent past to a new stationary (stochastic) state or which may evolve over a more limited time in the future, conditional upon modifications in the urban area.

Methodically, this is the “*detection and attribution*” problem, which has evolved over the decades for first global and later regional problems; for local problems, this concept has hardly be developed and tested. The “detection”, that a systematic change beyond the range of natural variations has taken place, may often be achieved with conventional data. However, the “attribution” of a mix of plausible causes for the systematic change needs space-time specific hypothesis of the local response to the different drivers. These are downscaling global change due to elevated greenhouse gases, downscaling regional change due to changing anthropogenic aerosol loads, and the local changes due to local aerosol emissions and land use changes (incl. urbanization). The former is less of a challenge, but for the latter two little scientific analysis is available.

Thus, tools need to be developed for assessing the character of ongoing and expected future change, for allowing the development of suitable response options. The issue must become part of regional climate servicing, and long-term simulations of changing local climates must become a standard piece in the tool box of climate modelers.

The situation is discussed with examples drawn from Hamburg and from the Baltic Sea region.