Guidance to Measuring, Modelling and Monitoring the Canopy Layer Urban Heat Island

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Today, every second person lives in a city, and urbanization is continuously increasing. For 2050, it is to be expected that 2 out of 3 people will live in a city and thus the vast majority of the world’s population will be affected not only by global climate change but also by locally induced climatic changes. The canopy layer urban heat island (CL-UHI) is one of the most well-known meteorological characteristics of urban areas found in cities small and large around the world. Its characteristics differ between cities, across a city and with time. The climate change induced warming cities experience is additionally impacted by the CL-UHI.

Despite the city-scale importance of CL-UHI, the WMO has not had any specific guidance on this. In response to the request of the 18th World Meteorological Congress (Resolutions 32 and 61) experts from WMO GAW (Global Atmosphere Watch) Urban Research Meteorology and Environment (GURME) initiated in 2020 preparation of a guidance on measuring, modelling and monitoring the CL-UHI. The guidance is a community-based development with 30 contributors providing expertise in all different aspects of CL-UHI. This includes a clear definition of what a CL-UHI is and clarifications of what it is not, how it develops (e.g. meteorological and morphological influences), methods to assess CL-UHI intensities (measurements, modelling approaches) as well as when its assessment (applications) is needed and how it can be reduced (or when it is beneficial).

The presentation will specifically focus on the key questions addressed in the guidance: what a CL-UHI is and what it is not, where CL-UHI values are relevant for and the many challenges that exist in simulating the CL-UHI with different models.