

eWUDAPT: Bringing eScience to Urban Climate Mapping and Modelling

26 – 30 June 2017 @Snellius

Given the ongoing climate change and increasing urbanization worldwide, there is a pressing need to monitor and understand the urban climate in order to improve human well being, health, urban environmental quality and the economy of cities. The goal of this workshop was to utilize e-science techniques along with a range of state-of-the art modelling and crowdsourced observation techniques to increase our understanding of the urban environment. The platform of the World Urban Database and Portal Tool (WUDAPT), which collects data on the urban morphology at different level of complexity was used as the starting point for discussions. During the workshop there were 7 plenary talks, but most of the time was spent working (data analysis/discussion/modelling) in 3 individual working groups. In addition, the Wednesday was reserved for field work in Amsterdam.

Workgroup 1: Local Climate Zones

Using observations collected in September 2016, this working group developed a local climate zone map for Amsterdam and documented the metadata for the 30 professional weather stations available in Amsterdam (previously installed by Wageningen Univ.) as well as other citizen weather stations. The local climate zone map has been utilized to initialise the urban energy balance model SUEWS, which simulates the partitioning of available energy into sensible (direct heating) heat and latent (evaporation) heat fluxes. When these exchanges are mapped, clear spatial patterns are seen across the Amsterdam landscape associated with the type of urban land-cover. Finally this group evaluated the WUDAPT collect App in which for individual buildings the more sophisticated properties can be documented.

Workgroup 2: Crowdsourcing

Collecting environmental data from the general public via crowdsourcing is becoming more and more common; these data are collected via smartphones and private weather stations (www.wunderground.com; www.netatmo.com, etc). In the workshop temperature data from these sources were collected, quality controlled and compared. For the first time, a cross comparison of techniques was achieved and linked to climate zone maps developed by workgroup 1. For example, high resolution smartphone battery temperature data were employed to estimate the diurnal cycle in air temperature. Temperature data from all sources were evaluated against the 30 professional weather stations in Amsterdam. In addition, the working group worked towards developing a metadata protocol for crowdsourced data.

Workgroup 3: Modelling (SUBLIME)

Using observations provided by the University of Reading, this working group formulated a case study that consists of two consecutive clear sky hot summer days for the city of London (2012) on which numerical weather prediction models can now be evaluated and compared. The modelling recipe has been preliminary tested by workshop participants and adjusted concerning inputs forcing where necessary. The work is ongoing and the final recipe will be published to the whole community in autumn 2018. We expect about 20 research groups and operational weather forecast centers to participate.

Excursion

On Wednesday all participants took part in an excursion to Amsterdam. The first two hours were spent doing field work collecting urban morphological data of Amsterdam, in the close neighborhoods around the weather stations available. Moreover, the WUDAPT group collect App and Twitter were used to document the urban morphology and to work towards the metadata protocol.

Follow ups:

The results of the workshop will be compiled by the workgroup leaders and will be submitted to *Nature Climate and Atmospheric Science*. The SUBLIME model intercomparison will be announced in *Urban Climate News*, and will continue for the next ~2 years with intermediate results to be discussed at the 10th International Conference on Urban Climate in New York, summer 2018.

Organisation

The format of both talks, discussions and individual computer work appeared to be a good combination. The amount of work and results that could be accomplished was surprising. The organisation of the Lorentz center was excellent, very professional.

Organisers

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