



IAHS2022-457, updated on 28 May 2023

<https://doi.org/10.5194/iahs2022-457>

IAHS-AISH Scientific Assembly 2022

© Author(s) 2023. This work is distributed under the Creative Commons Attribution 4.0 License.



Delft Measures Rain – sharing experiences from two rainfall measurement campaigns by citizens

Remko Uijlenhoet¹, Marie-Claire ten Veldhuis¹, Sandra de Vries², Marit Bogert³, Illias Timori¹, Karen Chen¹, and Rafaël van Beek¹

¹Delft University of Technology, Faculty of Civil Engineering and Geosciences, Department of Water Management, Delft, Netherlands (r.uijlenhoet@tudelft.nl)

²Pulsaqua, Delft, Netherlands (sandra@pulsaqua.com)

³Delft University of Technology, Science Centre Delft, WaterLab, Delft, Netherlands (j.m.bogert@tudelft.nl)

Rainfall varies strongly in space and time. Capturing this variability is essential for hydrology and water management, particularly in rapidly responding urban areas. Traditional dedicated rain gauge networks are often too sparse for hydrological applications. This is especially the case in cities, where gauges often cannot be installed according to official requirements. This is where citizen science can come to the rescue.

Many citizens have an interest in their living environment, notably in the amount of rain falling in their city, neighbourhood, street or backyard. We took advantage of this intrinsic motivation by inviting inhabitants of the Dutch city of Delft to participate in rainfall measurement campaigns for two years in a row. Both in 2020 and in 2021 some 100 citizens installed simple funnel type rain gauges we provided to them in their backyards or on the roofs of their houses. This allowed them to take daily measurements from late summer to early fall (August – October).

After initial quality control, rainfall was found to vary strongly across the city. Readings by citizens were found to match well with official measurements of a KNMI station. This indicated that observed spatial variations could be attributed to real rainfall variability rather than to instrumental artefacts. The nearest automatic gauge from KNMI is operated 10 kilometres south of Delft. The general tendency of the daily accumulations measured by the citizens matched well with that from the KNMI gauge. However, for some days, appreciable differences were found. These could be attributed to spatial rainfall variability, as detected by the KNMI weather radars.

During the 2021 campaign, we also provided 10 citizens with automatic tipping bucket gauges. Rainfall accumulations from the tipping buckets were found to be in close correspondence with those from the funnel gauges. Although automatic gauges are more expensive than simple manual gauges, they can provide rainfall information at higher temporal resolutions. That is why we hope to be able to deploy more automatic gauges next year. This would allow us to study spatial rainfall variability across a range of temporal scales. Systematic comparisons with radar measurements are another objective for next year.