Geophysical Research Abstracts
Vol. 17, EGU2015-8905, 2015
EGU General Assembly 2015

Quantifying the quality of precipitation data from different sources

Hidde Leijnse (1), Wiel Wauben (1), Aart Overeem (1,2), and Marijn de Haij (1)

(1) Royal Netherlands Meteorological Institute (KNMI), De Bilt, Netherlands (hidde.leijnse@knmi.nl), (2) Wageningen University, Wageningen, Netherlands

There is an increasing demand for high-resolution rainfall data. The current manual and automatic networks of climate and meteorological stations provide high quality rainfall data, but they cannot provide the high spatial and temporal resolution required for many applications. This can only partly be solved by using remotely sensed data. It is therefore necessary to consider third-party data, such as rain gauges operated by amateurs and rainfall intensities from commercial cellular communication links. The quality of such third-party data is highly variable and generally lower than that of dedicated networks. Often, such data quality information is missing for third party data. In order to be able to use data from various sources it is vital that quantitative knowledge of the data quality is available. This holds for all data sources, including the rain gauges in the reference networks of climate and meteorological stations.

Data quality information is generally either not available or very limited for third-party data sources. For most dedicated climate meteorological networks, this information is only available for the sensor in laboratory conditions. In many cases, however, a significant part of the measurement errors and uncertainties is determined by the siting and maintenance of the sensor, for which generally only qualitative information is available. Furthermore sensors may have limitations under specific conditions. We aim to quantify data quality for different data sources by performing analyses on collocated data sets.

Here we present an intercomparison of two years of precipitation data from six different sources (manual rain gauge, automatic rain gauge, present weather sensor, weather radar, commercial cellular communication links, and Meteosat) at three different locations in the Netherlands. We use auxiliary meteorological data to determine if the quality is influenced by other variables (e.g. the temperature influencing the evaporation from the rain gauge). We use three techniques to compare the data sets: 1) direct comparison; 2) triple collocation (see Stoffelen, 1998); and 3) comparison of statistics.

Stoffelen, A. (1998). Toward the true near-surface wind speed: Error modeling and calibration using triple collocation. Journal of Geophysical Research: Oceans (1978–2012), 103(C4), 7755-7766.