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Intercomparison of radar rainfall nowcasting techniques for the Netherlands

Ruben Imhoff (1,2), Claudia Brauer (1), Albrecht Weerts (1,2), and Remko Uijlenhoet (1)

(1) Hydrology and Quantitative Water Management Group, Wageningen University and Research, Wageningen, The Netherlands, (2) Operational Water Management, Deltares, Delft, The Netherlands

Accurate and timely hydrological forecasts highly depend on the meteorological input. Current numerical weather predictions (NWP) do not have sufficiently high spatial and temporal resolutions for adequate use for short lead times (<6 hours) in fast responding lowland and polder catchments. Radar nowcasting seems to be a solution and an increasing number of nowcasting algorithms is becoming available. However, best practice for the use and choice of these algorithms within operational forecasting systems is not available yet. In this study, we performed an analysis in time over 12 catchments in the Netherlands, by making use of state-of-the-art nowcasting algorithms (pySTEPS and SBMcast), benchmarking systems (RainyMotion) and the local NWP (HARMONIE). We focussed on the rainfall predictability of different nowcasting algorithms and the choice for simple advection, deterministic or probabilistic nowcasting. We quantified this as a function of lead time, rainfall type, initial conditions, catchment size and catchment location with regard to the radar rainfall estimates.