EGU23-14062, updated on 14 Apr 2024
https://doi.org/10.5194/egusphere-egu23-14062
EGU General Assembly 2023

Suitability of near-real time precipitation products for Flood Risk Forecasting

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Accurate real and near-real time forecasting of extreme flood events has lately become more and more important for the insurance and re-insurance industry (e.g., for claims allocations, Insurance Linked Securities and Catastrophe Bonds...). Examples of such events triggering significant losses in recent years are low-pressure system Bernd (July 2021, eastern Belgium, western Germany, and north-eastern France), hurricane Ida (August-September 2021, Louisiana and Northeastern United States), or hurricane Ian (September 2022, Florida). In order to estimate overall flood risk and flood losses in near-real time, a precipitation product released with a short latency is necessary.

This study analyses the use of the near-real time precipitation products NOAA's Climate Prediction Center (CPC) and Multi-Radar/Multi-Sensor System (MRMS) for flood forecasting, the latter having a higher spatial and temporal resolution than the former. We investigate and compare their different rainfall characteristics in terms of their ability to capture rainfall extremes, their suitability as input for hydrological/inundation models, and the effect that they have on overall economic losses for a series of selected historical events over the Conterminous United States. Finally, we include in the comparison the more stablished, long-latency dataset North American Land Data Assimilation System (NLDAS), more frequently used for event reconstruction c.a. 1 week after the event.