

Figure S1: For a selection of the evaluated non-gauge-corrected P datasets, temporal correlations between 3-day mean gauge- and dataset-based P time series ($R_{3 \text{ day}}$). Each data point represents a gauge.

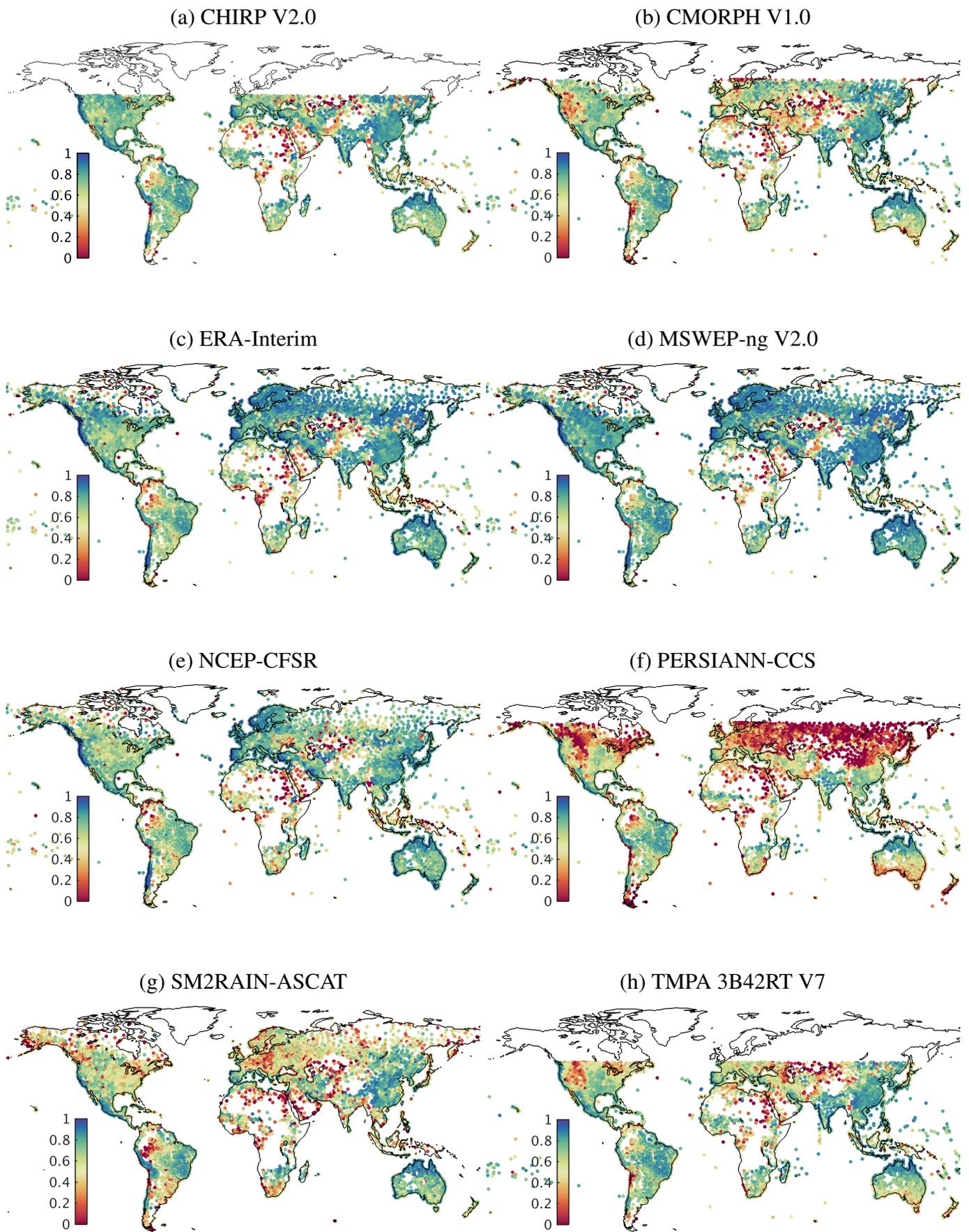


Figure S2: For a selection of the evaluated non-gauge-corrected P datasets, temporal correlations between monthly mean gauge- and dataset-based P time series (R_{monthly}). Each data point represents a gauge.

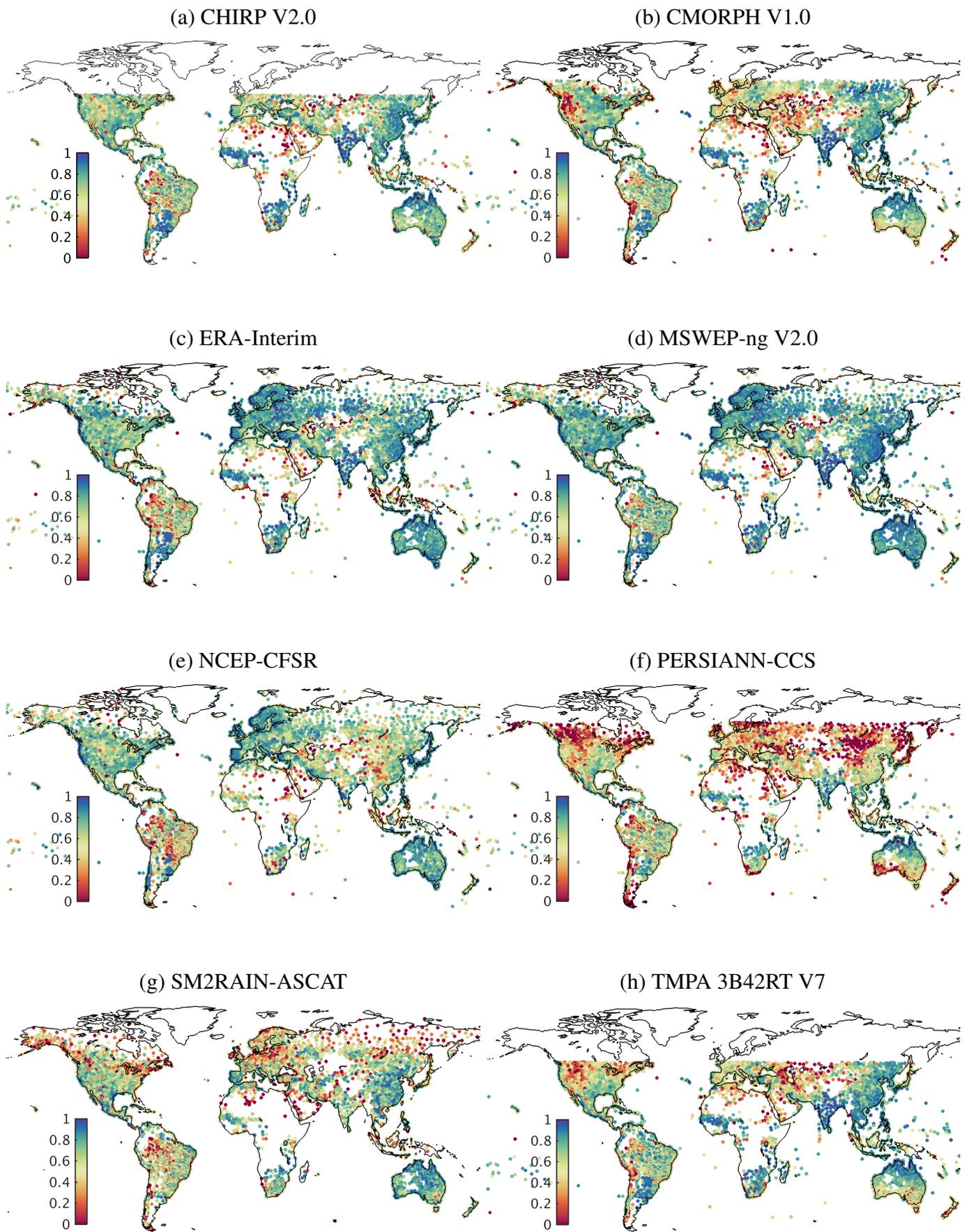


Figure S3: For a selection of the evaluated non-gauge-corrected P datasets, temporal correlations between gauge- and dataset-based SPI-6 time series (R_{SPI-6}). Each data point represents a gauge.

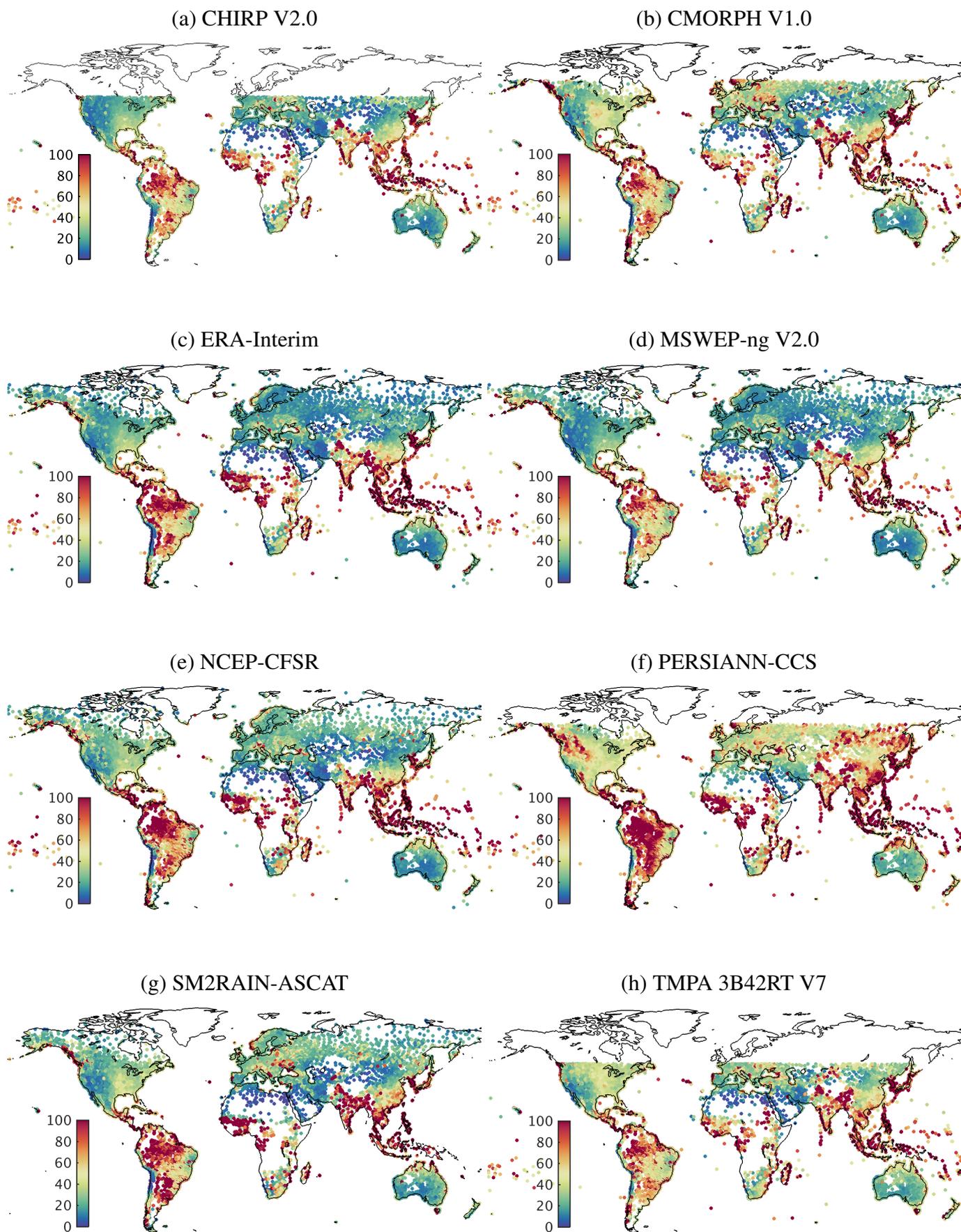


Figure S4: For a selection of the evaluated non-gauge-corrected P datasets, the MAE calculated between monthly mean gauge- and dataset-based P time series. Each data point represents a gauge.

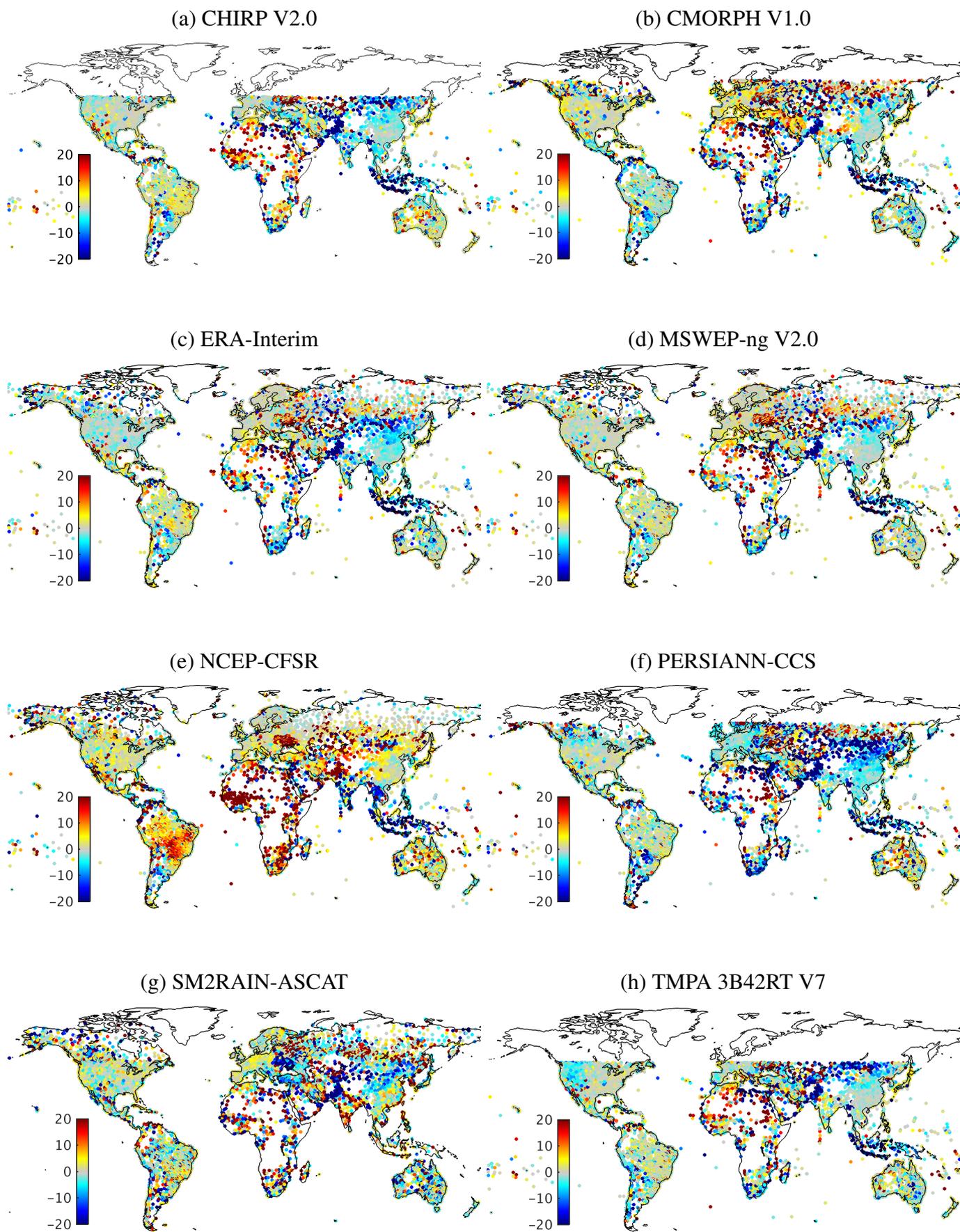


Figure S5: For a selection of the evaluated non-gauge-corrected P datasets, the error between gauge- and dataset-based mean annual P trends ($\% \text{ yr}^{-1}$). Each data point represents a gauge.

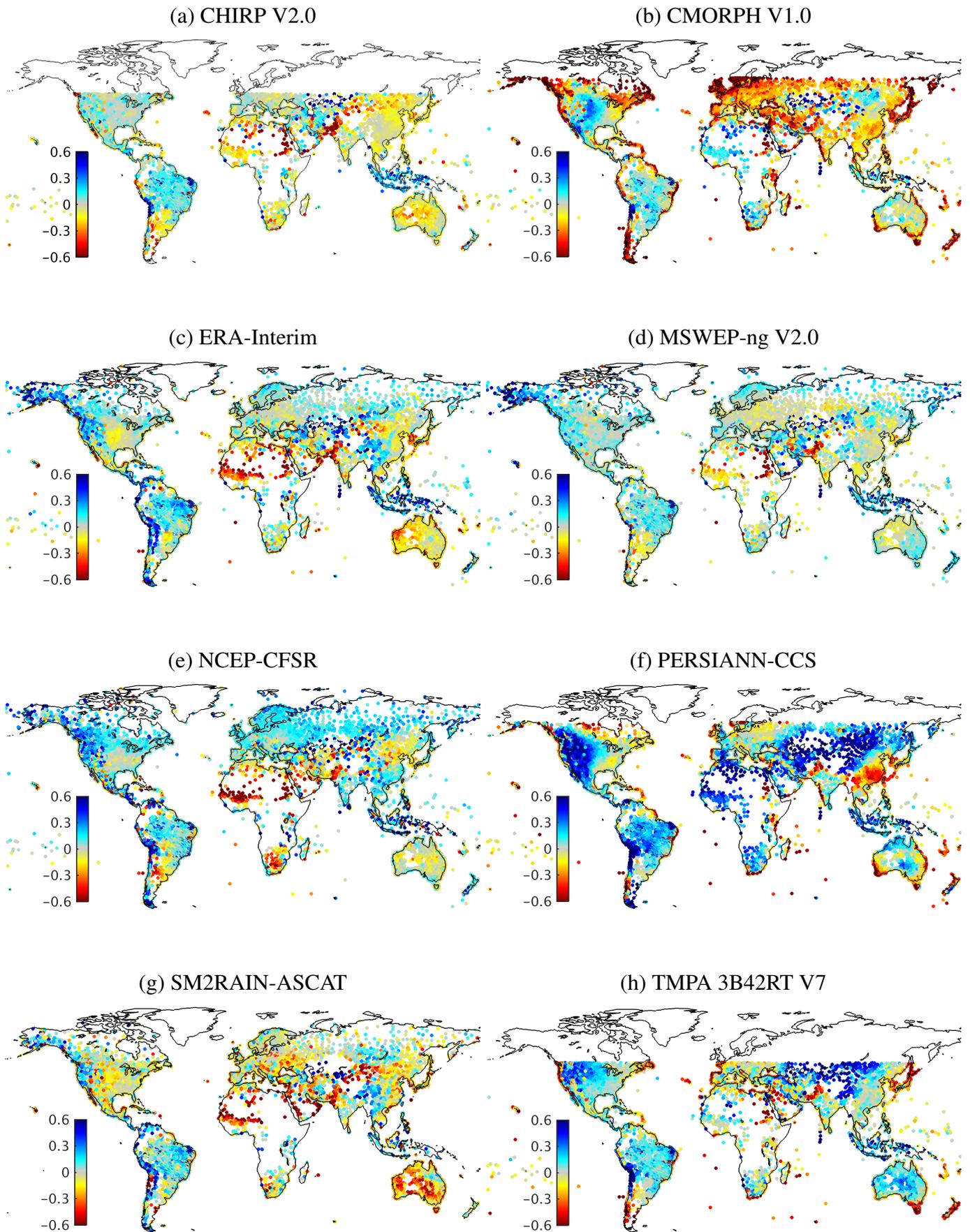


Figure S6: Bias values for a selection of the evaluated non-gauge-corrected P datasets. The bias was calculated as $[\bar{s} - \bar{o}] / [\bar{s} + \bar{o}]$, where \bar{s} and \bar{o} represent the dataset- and gauge-based long-term means, respectively. Each data point represents a gauge.

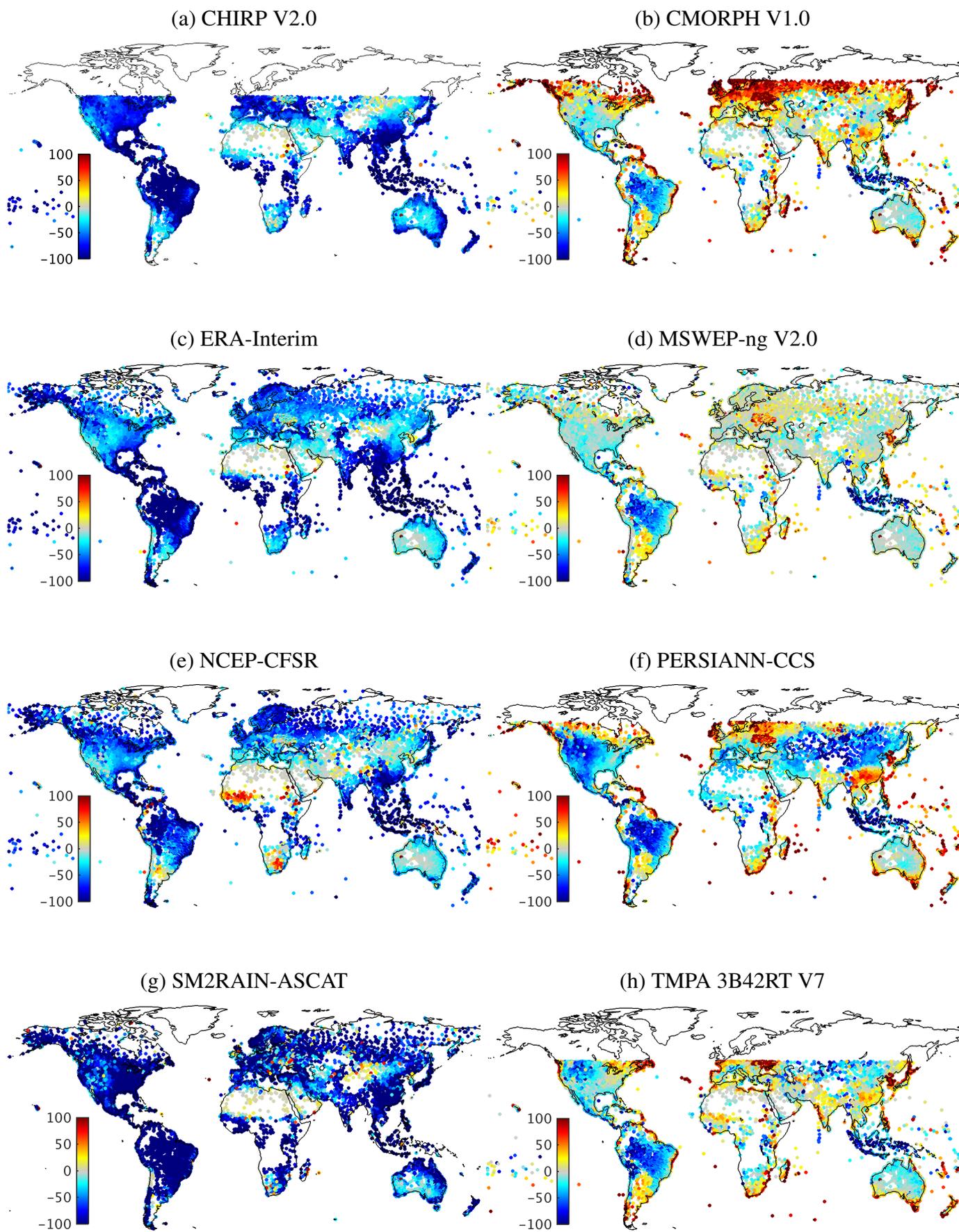


Figure S7: For a selection of the evaluated non-gauge-corrected P datasets, the error in the annual number of dry days. Each data point represents a gauge.

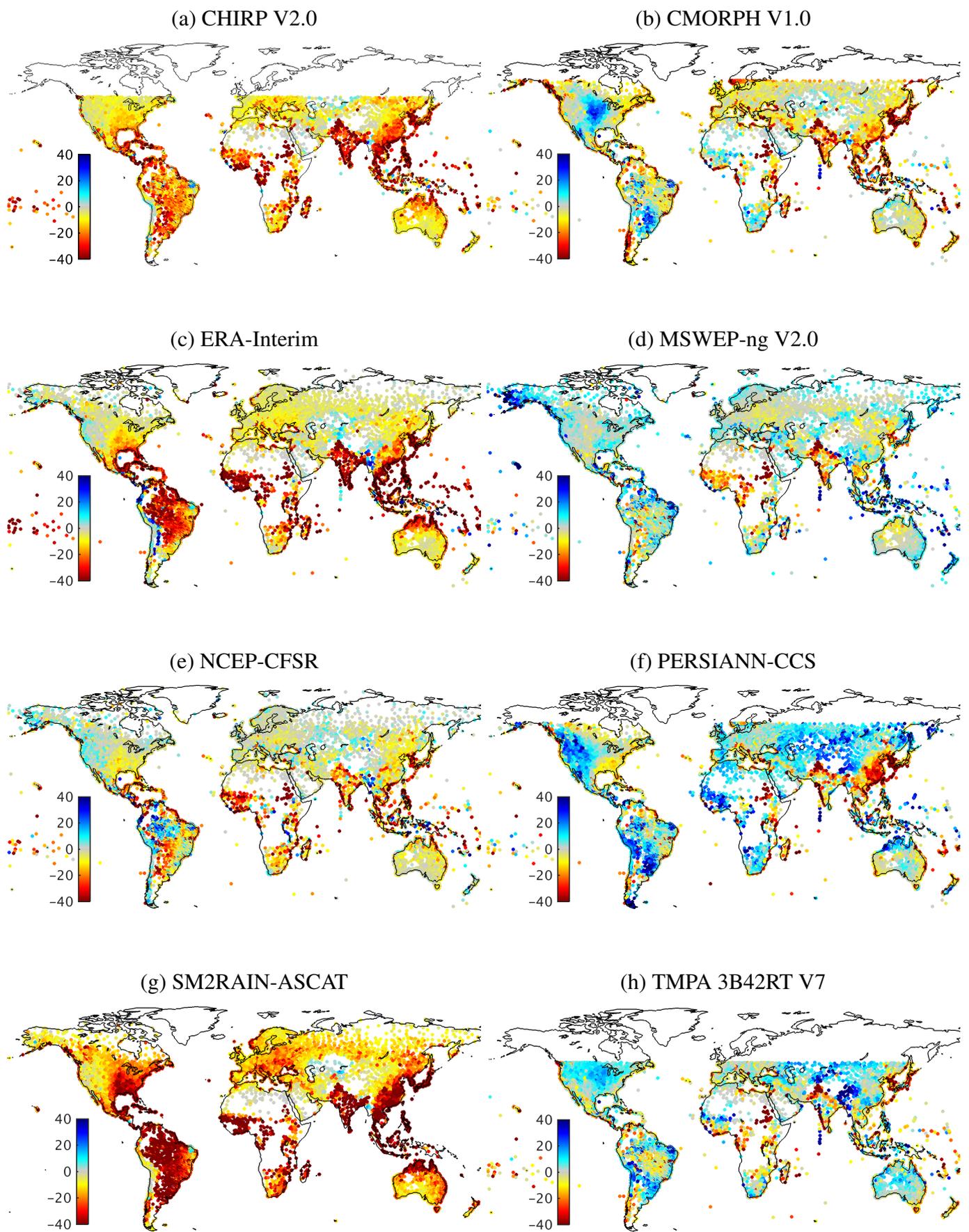


Figure S8: For a selection of the evaluated non-gauge-corrected P datasets, the error in the 99th percentile daily P magnitude (mm d^{-1}). Each data point represents a gauge.

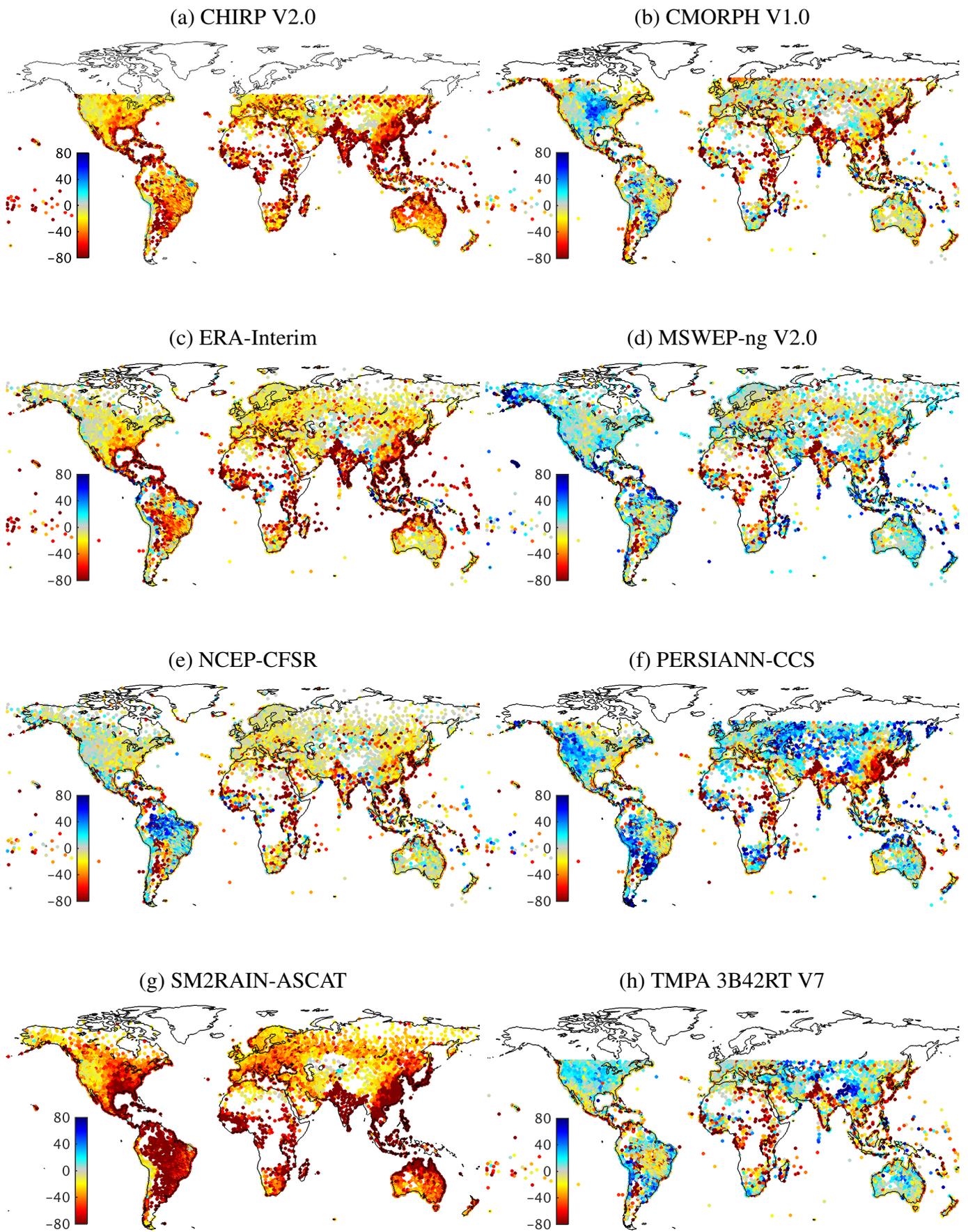


Figure S9: For a selection of the evaluated non-gauge-corrected P datasets, the error in the 99.9th percentile daily P magnitude (mm d^{-1}). Each data point represents a gauge.