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Assessment of precipitation extremes in CMIP6 decadal hindcasts over India

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A skillful decadal precipitation prediction (DPP) is valuable for sustainable development, which currently face many challenges. Deriving reliable information from DPP is still a challenge because of the difficulties linked with precipitation predictions and coarse spatial resolution by General Circulation Models (GCMs) not able to be in a straight line appropriate for impact assessment. This study examines the decadal hindcast simulations of precipitation extreme over seven sub regions of India from different ocean-atmosphere coupled models from the Coupled Model Intercomparison Project (CMIP6) by applying quantile mapping approach. Each decadal hindcast consists of predictions for a 10-year period from the initial climate states of 1961 to 2014/2018 and the assessment of skill is carried out lead-wise from 1 to 10 for different season and different regions over India (both raw and bias corrected). The potential skill of precipitation extreme is examined in terms of extreme precipitation index (EPIs) i.e. cumulative wet days (CWD), cumulative dry days (CDD), precipitation events between P1020(10 and 20 mm), P20P40(20 and 40 mm), PG40(>40 mm) and annual maximum 1 & 5 day precipitation (Rx1day and Rx5day). The promising results revealed that the skills of DPPs are enhanced after the bias adjustment and the data product can be used as a key input for impacts assessments in the region.