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Is WaPOR precipitation data reliable over Iran?

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As a result of satellite observations, ground observations, and data assimilation, global precipitation datasets have been developed for regions like Iran, where ground observations are limited. This study presents a comprehensive evaluation of WaPOR precipitation dataset over Iran at daily time scale. We considered a period of three years from 2019 to the end of 2021 and 394 synoptic rain gauges are used for the assessment. Daily WaPOR precipitation data at 250m scale downloaded and compared pixel-to-point with in-situ data. In addition, the WaPOR data and stations data were compared based on time classification (seasonal), location in the main catchment basins of Iran, and elevation above sea level. Calculating MSE, R score, RMSE and MSLE between real data(stations) and predict data(Wapor) shows some important result: 1. From the time point of view, WaPOR has best performance in summer (MSE = 4.94 and MSLE = 0.16) 2. Location, the best performance is related to stations of the catchment areas of the eastern part of Iran (Qaraqom basin with MSE = 11.9 and eastern border basin with MSE = 6.26) and the worst performance is related to the catchment area of the Caspian Sea (Mazandaran Sea basin with MSE = 64.06). 3. For analyzing the effect of elevation on precipitation, we divided the stations into 5 groups with an interval of approximately 600 meters (according to the lowest and highest elevation, which is -25 meters and 2965 meters). The best performance is related to stations with an altitude between 572 and 1170 meters (MSE = 21.61) and the worst is related to stations with an altitude between 1768 and 2366 meters (MSE = 43.79). 4. Moreover, on average for each station, in the three years of study (1096 days), we have 166 days (with standard deviation 119 days) that station has recorded precipitation but WaPOR dataset didn't represent any record, so it's not appropriate for daily hydrological models. 5. The difference between the three-year precipitation total at the station and the WaPOR precipitation total is 449.6 mm on average (with standard deviation 724.5).

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