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Groundwater recharge estimation in Undai watershed area, southern Mongolia

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Recharge estimation in arid and semi-arid areas is complicated. As for the country where the potable water for both the people and livestock is supplied from shallow unconfined aquifer due to the lack of existing ground water, the recharge estimation is crucial to water source management. However, since the deficiency of available data, such estimation has not been completed in the Gobi desert of Mongolia. Water-bearing rock units of the Undai river basin consist of Upper Quaternary alluvial-proluvial sands, gravels and pebbles. In this paper, direct recharge was estimated using chloride mass balance (CMB) and rainfall infiltration breakthrough (RIB) model in shallow unconfined aquifer, Undai watershed area Southern Mongolia. As a result of groundwater recharge estimation survey conducted in 2018, the annual mean recharge of the groundwater along the Undai dry riverbed is calculated to be 13.7mm/year according to RIB model based on the water level fluctuation, which makes up 6.3% of total precipitation and 21.7mm/year according to CMB (chloride mass balance), which comprises 10% of the total annual precipitation. The largest recharge estimates were determined using the daily basis RIB method and the smallest estimates were determined using the chloride-mass-balance method.