



## **Runoff projection under climate change over Yarlung Zangbo River, Southwest China**

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The Yarlung Zangbo River is located in southwest of China, one of the major source of “Asian water tower”. The river has great hydropower potential and provides vital water resource for local and downstream agricultural production and livestock husbandry. Compared to its drainage area, gauge observation is sometimes not enough for good hydrological modeling in order to project future runoff. In this study, we employ a semi-distributed hydrologic model SWAT to simulate hydrological process of the river with rainfall observation and TRMM 3B4V7 respectively and the hydrological model performance is evaluated based on not only total runoff but snowmelt, precipitation and groundwater components. Firstly, calibration and validation of the hydrological model are executed to find behavioral parameter sets for both gauge observation and TRMM data respectively. Then, behavioral parameter sets with diverse efficiency coefficient (NS) values are selected and corresponding runoff components are analyzed. Robust parameter sets are further employed in SWAT coupled with CMIP5 GCMs to project future runoff. The final results show that precipitation is the dominating contributor nearly all year around, while snowmelt and groundwater are important in the summer and winter alternatively. Also sufficient robust parameter sets help reduce uncertainty in hydrological modeling. Finally, future possible runoff changes will have major consequences for water and flood security.