

TRMM rainfall data estimation over the Peruvian Amazon-Andes basin and its assimilation into a monthly water balance model

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Abstract The Peruvian Amazon-Andes basin corresponds to about 10% of the total Amazonian basin and is characterized by sparse rainfall data, particularly over the lowland zone (rainforest). We compare the 3B43 product of the Tropical Rainfall Measuring Mission (TRMM) with raingauge data over two sub-basins (Urubamba and Tambo) in the Ucayali basin located in the Peruvian Amazon-Andes basin. The spatial distribution of the 3B43 product is $0.25^\circ \times 0.25^\circ$ (approx. 27.8×27.8 km) and data are at a monthly scale. The period of comparison between on-site rainfall and 3B43 TRMM data is from January 1998 to December 2007. Comparison between on-site rainfall observations and 3B43 product is carried out using correlation coefficient and relative error. Improvement of the TRMM rainfall data is then proposed based on on-site rainfall data. After analysis of the 3B43 product, three sets of distributed rainfall data (*in situ*, TRMM and on-site TRMM improved) were used as input in a GR2M monthly water balance model to simulate discharge at Urubamba and Tambo. Classical statistical overcalibration and validation procedure show a better accuracy in flow simulations, using only original TRMM data over Urubamba basin and improved data over Tambo basin.

Key words Amazon basin; TRMM; Andes; Peru; monthly water balance model