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# Daily hydrological modeling in the Amazon basin using TRMM rainfall estimates

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## Summary

Rainfall measurements by conventional raingauges provide relatively accurate estimates at a few points of a region. The actual rainfield can be approximated by interpolating the available raingauge data to the remaining of the area of interest. In places with relatively low gauge density such interpolated rainfields will be very rough estimates of the actual events. This is especially true for tropical regions where most rainfall has a convective origin with high spatial variability at the daily level. Estimates of rainfall by remote sensing can be very useful in regions such as the Amazon basin, where raingauge density is very low and rainfall highly variable. This paper evaluates the rainfall estimates of the Tropical Rainfall Measuring Mission (TRMM) satellite over the Tapajás river basin, a major tributary of the Amazon. Three-hour TRMM rainfall estimates were aggregated to daily values and were compared with catch of ground-level precipitation gauges on a daily basis after interpolating both data to a regular grid. Both daily TRMM and raingauge-

interpolated rainfields were then used as input to a large-scale hydrological model for the whole basin; the calculated hydrographs were then compared to observations at several streamgauges along the river Tapajos and its main tributaries. Results of the rainfield comparisons showed that satellite estimates can be a practical tool for identifying damaged or aberrant raingauges at a basin-wide scale. Results of the hydrological modeling showed that TRMM-based calculated hydrographs are comparable with those obtained using raingauge data.



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## Keywords

Satellite-estimated precipitation; TRMM; Amazon basin

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