

## **Large-scale water balance estimations through regional atmospheric moisture flux modelling and comparison to GRACE signals**

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**Abstract** Terrestrial water storage variations for continental-scale river catchments and basins derived from global and regional atmospheric moisture budgets modelling are evaluated and compared to GRACE satellite measurements. The regions considered in this study are the Amazon basin, the river catchments of Yenisei and Lena, the Sahara and Central Australia. If GRACE is taken as reference, the regional simulations have the potential to add value to the global moisture budgets for periods with small storage variation amplitudes. If the synoptic period is dominated by convective rainfall, the regional atmospheric model tends to overestimate precipitation.

**Key words** joint land-surface-atmosphere modelling; WRF; GRACE; regional atmospheric modelling; continental water balance modelling; atmospheric moisture flux divergence