Comparison of terrestrial water storage reconstructions of the Amazon Basin since 1993 from a combination of different data sets : in situ, altimetry and GRACE.

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Abstract Text
Over continents, GRACE total water storage (TWS) solutions are expected to represent main surface, soil and groundwater stocks variability since 2002. Quantifying the TWS history of the Amazon Basin is essential to understand the physical processes in the Amazon hydrological systems and the quantitative assessment of their interaction with climate change. For that purpose, we have already developed a reconstruction method of past Amazon Basin TWS (Becker et al. 2011) that combined long in situ river level in the Amazon Basin and 2-D TWS patterns based on GRACE data. In this work, we propose to test this TWS reconstruction method by replacing the in situ data with the water levels derived from multi-mission satellite radar altimetry (ERS, ENVISAT...). We compared this TWS altimetry-based reconstruction with the TWS in situ-based reconstruction and outputs of global hydrological models ISBA-TRIP and WGHM. The approach developed in this study offers interesting perspective for improving our knowledge of past TWS in many ungauged river basins over the world, especially in the African regions.