

Review of "Long-term water storage change from a Satellite Water Cycle (SAWC) reconstruction over large south Asian basins" by Pellet et al, submitted to Hydrology and Earth System Sciences.

This paper explains how to estimate the total water storage change of a large basin using GRACE estimates by satellite. The water conservation equation is used to have an independent constraint, and uses satellite estimates of precipitation and evaporation together with a direct measure of river discharge near the mouth of the river. These complementary measures have to be at the monthly scale, as this is the temporal resolution of the GRACE estimates.

The methodology is applied to four large basins in India and Indochina and the methodology is able to produce estimates that compare well with GRACE observations. I find the paper and the methodology interesting and the results of application, since they allow to monitor the water status of large basins with very little in-situ observations (essentially only a discharge measurement is needed). The paper is clearly written and well organized.

My questions, being a meteorologist, are about the determination of the precipitation and evaporation by satellite. In the integration part, three sources are used for precipitation. More than providing the references, nothing is said about the characteristics of these data sets, how are they produced, what are the differences between them, which is the uncertainty for each of them, and how is the total uncertainty obtained. Similarly, more information about the ET databases should be provided.

I believe that the paper would benefit of related precipitation and evaporation maps and a discussion in depth of the uncertainties of the terms of water closure budget (P, ET, D). The last paragraph of subsection 2.2.1, or Table 3, only give the values imposed for the uncertainties, not how they are obtained. Also subsection 2.3.4 is vague on the subject.

On the other hand, ISBA-CTRIP and GLDAS are used as evaluation tools. Being these utilities models themselves, it is unclear if the results are good enough for validation in this area of the world. More details should be provided about the quality of these models in this region so that it appears legitimate to use it as a validation tool, discussing at least their uncertainties.

Furthermore, having a better description of the rationale in Section 3, more specifically in subsection 3.2, may be of help for the reader. In subsection 3.1 all the available sources (GRACE, SAWC, ISBA and GLDAS) are compared and it is stated that SAWC fits best with GRACE, admitting that it is by construction. Then, in subsection 3.2, it retains ISBA for the further comparison considering that it performs better than GLDAS. In this part a discussion on the uncertainties of all methods is missing.

For a non-specialist, the paper is interesting and the methodology seems powerful.