

Interactive comment on “Basin-scale water-balance dataset (BSWB): an update” by Martin Hirschi and Sonia I. Seneviratne

Anonymous Referee #2

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This paper presents a global data set of monthly water balance time series of up to 35 years in length for many of the largest river basins worldwide (BSWB v2016). The data are highly valuable for understanding large-scale hydrological dynamics and for validation of land surface and hydrological models. The article is clearly structured and describes in a concise and comprehensive way the methods used for generating the data set. Some reasonable analyses and figures are provided and illustrate the information content of the data and compare them to a previous version of the data set (BSWB v2011). The data themselves are easy to access and to read, and unambiguously described in the header of the data sets and with time specifiers. My only overall concern for publication in ESSD is that the data set BSWB v2011 using exactly the same methodology has already been published by Mueller et al. (2011) with data access on a website as indicated in the manuscript. While the data set BSWB v2016

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presented here clearly is a substantial extension of the previous one (with regard to number of river basins (341 versus 37 basins), time period (1979–2015 versus 1989–2008) and a more recent ERA-Interim re-analysis version), it is beyond my scope to judge whether the updated data set BSWB v2016 merits publication in ESSD according to its publication standards.

Some minor comments on the manuscript are as follows:

- 1) Lines 113-114: repetition of statement on critical basin size and of three references (already given in lines 92-93). Delete or re-formulate.
- 2) Line 115: “...the imbalance is diminished...”, better: “...the imbalance decreases...” ?
- 3) Line 121ff: “Thus, these drifts in TWS unlikely correspond to actual variations, though the latter can be important in some regions and could contribute to part of the signal (see above).” The sentence is contradictory in itself. There are good physical reasons for the drift as mentioned above (groundwater withdrawal, groundwater discharge to ocean) so that it should not be stated that the drifts unlikely correspond to actual variations.
- 4) line 141: ‘their’ instead of ‘its’
- 5) Figure 1: expand caption: “global coverage of river basins of the BSWB v2016 data set”, or similar.

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