Interactive comment on “Intercomparison of freshwater fluxes over ocean and investigations into water budget closure” by Marloes Gutenstein et al.

Anonymous Referee #1

Received and published: 28 August 2020

Review of: Intercomparison of freshwater fluxes over ocean and investigations into water budget closure By Gutenstein et al. This paper presents an inter-comparison of five recent satellite-based and one re-analysis E-P data sets. The different data-sets and the assumptions behind them are described. The different components of the hydrological cycle are presented separately. This is a well written paper, which presents a valuable contribution to the climate community. I have little to add to this paper, which in my opinion is almost ready for publication in its current form. The few and very minor comments I have are: àÁč In the introduction I missed a section motivating the study from a climate change perspective like you added to the “Final Comments” section. Monitoring trends in the hydrological cycle is of great importance under uncertain
changing climate conditions. In that aspect I would like to point the authors to some recent papers on the topic 1-3. The inter-comparison presented here is a very nice and useful framework also for comparing with climate models 4-6 such as CMIP6. I suggest to propose it in the “Final Comments” section (or elsewhere) for future work. It could enlarge the connection of this work to climate change research. L96: Could you please elaborate on how wind speed is calculated based on temperature (BT) measurements? In addition, if E estimates are based on BT measurements, which are more accurate in clear sky conditions than in cloudy sky conditions, wouldn’t that cause a bias? How is it calculated in cloudy (and rainy) conditions? If it is only calculated in clear sky conditions, wouldn’t the E estimations be biased high (as in cloudy and rainy conditions the evaporation is lower)? L368: is the largest deviation in E estimates in the tropics due to the large (and optically thick) cloud cover? L437: I think that the correlation does not decrease when Delat Qocean is not considered because there is basically no correlation even when it is considered. So, it can’t get any lower than that. Is that correct?

References