Dear editor,

We are pleased that the manuscript is now accepted for publication with corrections. We have corrected the manuscript with respect to the points detailed in referee report #3 (referee comments in *italics*, our comments in upright, and changes in the manuscript are also in **bold**):

- *"Please define transpiration ratio at first occurrence to unsure clarity."*
  We changed the sentence "with a transpiration ratio of 59 %" in the abstract to **"of which 59 % is transpiration".** At L66-67, an explaining parenthesis **"(i.e., transpiration as part of total evaporation)"** is added after "transpiration ratios".

- *"L151 – perhaps "timing" rather than "time" would be a more clear indication of the question investigated."*
  We changed "time" to **"timing".**

We were not asked to address referee #1 report #1. Nevertheless, we would like to briefly comment on it. The issues of research motivation, model structure and choice of journal have already been thoroughly discussed in the interactive discussion, and we will not repeat ourselves here. However, we would like to address the referee's criticism on the relevance of the revised introduction and the claims that a number of studies have already been done on the subject:

- *"However, the literature review (lines 37 – 134) is all to do with the relative partitioning of the evaporative fluxes, and barely mentions the temporal aspect, except to (incorrectly) say that it has not been considered."*
  This is not correct since we did address temporal aspect of evaporation fluxes and acknowledge relevant previous research in the literature review: L59-76 describe issues that relate to the temporal properties of evaporation, and L77-92 were specifically dedicated to describe when the temporal aspect was considered. The only lines describing relative partitioning and uncertainty in determining partitioning were L93-128, and we consider this relevant for both the topic of Part 1, the validation of STEAM, and for Part 1 and Part 2 as a whole.

- *"Not only that, the temporal aspect of evapotranspirative fluxes has been considered, for instance by Entekhabi et al 1992, Yeh et al 1984, Dirmeyer et al 2009, Yepez et al 2003, Priestley and Taylor 1972, Farah et al 2004, Maurer et al 2001, Brubaker et al 1993, Scott et al 1995a, Yepez et al 2005, Raz-Yaseef et al 2012, Dirmeyer and Brubaker 2007, Trenberth 1999, Huang et al 1996)."*
  The listed references by the reviewer addressed (among many issues) moisture recycling of local versus advected evaporation (Brubaker, Entekhabi, & Eagleson, 1993; Trenberth, 1999), seasonal variations in global precipitation recycling (Dirmeyer & Brubaker, 2007), soil moisture time scale and relationship with precipitation anomalies or irrigation events (Dirmeyer, Schlosser, & Brubaker, 2009; Entekhabi, Rodriguez-Iturbe, & Bras, 1992; Huang, van den Dool, & Georgarakos, 1996; Yeh, Wetherald, & Manabe, 1984), response in grassland evaporation to moisture pulse (Yepez et al., 2005), evaluation of reanalysis products (Maurer, O'Donnell, Lettenmaier, & Roads, 2001), evaporation partitioning using isotope methods (Yepez, Williams, Scott, & Lin, 2003), formula for relationship between

sensible and latent heat fluxes (Priestley & Taylor, 1972), and the effects of temporal patterns of precipitation on different evaporation fluxes (Raz-Yaseef, Yakir, Schiller, & Cohen, 2012). Thus, most of these references are not directly dealing with the temporal aspect of evaporation fluxes and we decided not to include them in the literature review in the introduction. Nevertheless, we appreciate that the reviewer drew our attention to the study of Scott et al., (1995) and Farah et al., (2004). At L. 899, we add **"(also in consistency with e.g., Scott et al., 1995)"**, so the full sentence becomes "The higher the interception ratios, the lower the evaporation time scales on land (also in consistency with e.g., Scott et al., 1995), and the faster the overall feedback to the atmosphere." At L. 953, we add **"In for example the field study of Farah et al., (2004), transpiration at a tropical woodland site continued for two months after rainfall."**

- *"Moreover, aim 3 of the paper, 'how robust are the temporal characters to uncertainties in storage capacities' has been substantially answered by Scott et al (1995)."*
  We disagree that Scott et al. (1995) has substantially answered aim 3 of the paper. They investigated the robustness of overall hydrological persistence to the interception reservoir, but not the temporal characteristics of each evaporation flux due to uncertainties in storage capacities (also others than the interception reservoir).

- *"In the abstract, the authors claim that moisture recycling studies have only considered the fluxes' "lumped total"*. This is clearly not the case. (* "combined total" would be a more elegant phrase here.)"*
  We maintain that previous moisture recycling studies have not considered evaporation fluxes separately. In none of the references listed by the reviewer were different evaporation fluxes (e.g., transpiration and interception) studied separately in a moisture recycling study. However, we appreciated the reviewer's suggestion for a more elegant phrasing and have changed "lumped total" to **"combined total"**.

Kind regards,

Lan Wang-Erlandsson with co-authors

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