

## ***Interactive comment on “Towards quantifying the increase of rainfall interception during secondary forest succession” by B. Zimmermann et al.***

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This study shows, through extensive throughfall and vegetation data sets, how throughfall changes with forest succession in the tropical lowland region of Panama.

However, instead of describing changes in throughfall, the authors describe changes in rainfall interception, which they justify by assuming that stemflow is negligible in their study forests (page 8006, lines 15–16). This assumption is based on unpublished data of the authors and data from two other studies (numbers are not presented, however).

Nevertheless, even though overall values of stemflow in the study forests might be relatively small compared to the corresponding total rainfall, ignoring stemflow results in possibly significant errors in the estimated interception values (which are also small

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fractions of rainfall). Therefore, the focus of the paper should be “throughfall” instead of “rainfall interception” and the title should be changed to not include “rainfall interception” (see also comment by reviewer 2).

Moreover, it is hard for me to believe, without any solid proof, that stemflow is negligible in all the studied forest stands. Manfroi et al. (Hydrol. Processes 18, 2004) showed that in undisturbed tropical forest in Borneo, trees with diameters between 1 and 10 cm contribute the majority of stemflow, whereas the contribution of trees with dbh > 10 cm is much smaller. Hence, without an extensive sampling effort, including large as well as small trees, the conclusion that stemflow is negligible in all stands is unfounded.

The authors need to put their results into context of what has been found at other tropical sites. Your data suggest that rainfall interception values for young forests differ from those observed in mature forest only within the first 10 years of forest regeneration. This time frame is much shorter than found for regenerating lower montane cloud forest in Mexico (Holwerda et al., Journal of Hydrology 384, 2010; Muñoz-Villers et al., Journal of Hydrology 462–463, 2012). Please discuss and search literature for other throughfall and stemflow studies in secondary forests in the tropics. Also incorporate more recent work in the Introduction. Note in this respect that the work by Schellekens has been updated (Holwerda et al., Journal of Hydrology 414–415, 2012).

Page 8014, L4–11. Again, recent work in Mexico shows that streamflow regimes and hydrological responses of secondary and mature forest catchments are very alike, despite differences in interception loss by the two forests (Muñoz-Villers et al., Journal of Hydrology 462–463, 2012; Muñoz-Villers and McDonnell, HESS, 2013). Please discuss.

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