

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

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We acknowledge the interest in our work. As outlined in the comment by M. Amo-Boateng, obtaining reliable estimates of throughfall is a difficult task, particularly if the aim is to estimate throughfall for a number of forest stands. In the current work we monitored throughfall for a two-month period at 20 secondary forest succession sites that comprised a gradient of 3 yr old to about 130 yr old forests. Subsequently, we used aggregated throughfall data to investigate the change of canopy interception during forest succession. Using aggregated data is probably the only practical way to obtain reliable estimates of mean throughfall for many forest stands simultaneously. However, even though we used a total number of 536 throughfall collectors, our results

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indicate that there is still potential for improvement. As discussed in Sect. 4.3 of our manuscript, sampling efforts should be increased further to better detect changes of interception during secondary forest succession. We also agree with the statement of M. Amo-Boateng that reliable predictions of interception are important for quantifying the water balance of catchments and eventually for water resources management. The reason why it is so important to detect even apparently minor changes in interception during forest succession is that these changes translate into large quantities of water that do not contribute to runoff generation. For instance, our results show that interception increases up to about 20 % in the first decades of secondary forest succession, which equals 530 mm of rain in an average year in central Panama (given an average annual rainfall of 2640 mm). This amount of water is certainly large enough to influence the water balance of small catchments subject to forest regrowth (cf. Bruijnzeel, 1989; Brown et al., 2005). The potential relevance of secondary forest succession for hydrological ecosystem services motivated us to discuss the implications of our findings regarding the hydrological functioning of catchments (see Sect. 4.1 of our manuscript).

References

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