

This paper presents a detailed, well-designed comparison of runoff generation processes in catchments with contrasting land use histories. Forested mountain catchments like these are important to water supply for many regions in the tropics, and more studies geared toward understanding the effects of deforestation on the hydrology are needed. The researchers applied numerous field measurements and analyses to interpret the results, and this paper represents a solid contribution. The paper is generally well-written and well-organized and should be published with minor revisions to improve clarity and add missing information. Suggestions are listed below:

**Reply:** Thank you for your positive and helpful comments to improve this manuscript. Please find our replies to your comments and suggestions below.

Main comments:

The analysis of EC hysteresis that is described briefly in section 3.3.5 needs more explanation if it is to be included in the paper. At the least, please add a figure for illustration of the results, and a description of the technique and how hysteresis loops are interpreted, with references, in the methods section.

**Reply:** More explanation about the discharge-EC relations has been provided in the revised version. As also requested by Reviewer #1, we have included a figure in the ms (Figure 7) showing the hysteresis loop patterns observed for different storms throughout the wetting-up period. As the hysteresis loops can be interpreted visually with the information contained in the figures, a short explanation is given in the figure caption.

In section 2.1, and table 1, the soil profiles are briefly discussed and physical parameters are given, but there is not enough description of how they were measured. More detail about differences in the subsurface properties in the catchments is needed, as it becomes part of the explanation of the results later.

**Reply:** We have added a more detailed description of the soil profiles in the forest and pasture catchments (Section 2.1). However, for details on how some of the soil physical parameters were obtained, the reader is invited to check the references provided in this section and in Table 1.

In the Discussion, the authors note that undisturbed and regenerated forest catchments are important for environmental services to society, however, it is not clearly explained which hydrologic characteristics are ‘better’ in forests vs. pastures. It is implied that the forests, despite their higher ET and canopy interception, have greater storage, but not explicitly stated. Further discussion, and clarification of ideas in the conclusions would be helpful.

**Reply:** We agree with the view of the reviewer that this is an important point. Therefore, we have clarified in the Discussion and Conclusions which hydrologic characteristics are ‘better’ in the forests vs. the pastures. More specifically, we have made clear that dry season base flow sustenance and modulation of rainfall-runoff responses of high intensity storms in the wet season are the important hydrologic services that provide this forest ecosystem to society.

Suggested edits: p. 5284, lines 19-24: Condense to one sentence – ‘five storms during the wetting up cycle were suitable for analysis’; if necessary, a dissertation could be referenced for the details.

**Reply:** Thank you for the suggestion. However, since this work has not been published elsewhere we consider it important to describe here in detail how the storms for hydrograph separation analysis were selected.

p. 5286, lines 21-24: It is not clear what is being explained here – do authors mean to say that 18O and 2H results were similar?

**Reply:** We have rephrased the sentence for clarification. What we meant to say was that a very small difference was found in the pre-event fractions as derived using either  $\delta^{2}\text{H}$  or  $\delta^{18}\text{O}$ . This difference ranged on average between 4 and 5%.

p. 5287, line 11-12: suggested grammatical correction “: : except for Storm 5 during which the pre-event water was calculated to be, on average, 22% and 39% of soil and ground water, respectively (Fig. 7).

**Reply:** We have incorporated the suggestion.

P 5287, line 16: The wet season was described as being from May through October, and figure 3 shows some rainfall during May-July. I'm curious as to why the wetting-up period did not start until August?

**Reply:** Indeed, there was some rainfall during the months of May and June, as shown in Figure 3. Nevertheless, the wet season was interrupted by a dry spell in July, and this was the reason why the true beginning of the wet season and the wetting-up cycle period occurred until August.

Discussion, line 13: the 2-year runoff series is not shown, please add a reference here if it is published elsewhere.

**Reply:** We have changed the "2-year time series" for "the 2-year study period", instead.

p. 5290, line 16: please define "intensity of land use".

**Reply:** We have clarified this by adding the word "management" before "intensity of land use" in the text.

p. 5292, line 18: "storm hydrograph separation analysis: : : demonstrated: : : increases of rainfall-runoff event ratios" which parameter is being referred to here?

**Reply:**  $Q_t/P_{ev}$ . We have clarified this in the text.

p. 5294, line 25: "leaded to" should be "led to"

**Reply:** We have made the correction.

Figures and tables:

Figure 5: The isotopic compositions of rainfall would not be expected to differ much between sites as close together as these, and there are so many overlapping data points on the plots, it is difficult to see the differences. The figure might be more effective as a 4-panel figure, with each panel showing one type of water with points for each of the 3 sites, for example, the soil water samples for all 3 sites on one plot, with the meteoric water lines.

**Reply:** We agree with the reviewer comment. Hence, we have changed our Figure 5 for a 4-panel figure as suggested.

Figures 6 and 7 show some of the same information, are they both necessary? Can the figures be re-drafted to show only the unique information given by the 2- and 3-component hydrograph separations? or could the information in one of the figures be described in a table?

**Reply:** We prefer to present these findings in figures to visualize the temporal variation of the stream water sources throughout the wetting-up cycle. We also think it is important to show the results obtained from both the one-tracer two-component HS analysis (Figure 6) and the two-tracer three-component HS analysis (Figure 7) because of the good agreement in event/pre-event water fractions obtained with the two approaches.