Hydrol. Earth Syst. Sci. Discuss., 11, C2971–C2973, 2014
www.hydrol-earth-syst-sci-discuss.net/11/C2971/2014/

Hydrology and Earth System Sciences
Open Access
Discussions

Interactive comment on "The hydrological regime of a forested tropical Andean valley" *by* K. E. Clark et al.

M.B. Gush (Referee)

mgush@csir.co.za

Received and published: 7 August 2014

General Comments: This is a well-argued and thought through paper, with results that are comprehensively supported by the data. The authors have competently described the derivation of the water balance for a mountainous Peruvian Andes catchment under Tropical Montane Cloud Forest. The limited hydrological gauging equipment in the catchment necessitated a combination of interpolation, extrapolation and modelling exercises, combined with short-term in-field sampling to derive the necessary data. This introduces a degree of uncertainty, which the authors acknowledge and address. The grammar and overall quality of the paper is of a high standard.

Specific Comments: Page 8612, Section 3.3. Transpiration and evaporation of inter-

Full Screen / Esc
Printer-friendly Version
Interactive Discussion
Discussion Paper

cepted water by undercanopy vegetation may contribute significantly to overall forest evapotranspiration. Was this taken into account? If the NDVI estimate was only based on the highest forest canopy layer this may have underestimated overall leaf area of the forest, and hence resulted in an underestimate of ET by the PT-JPL model? Page 8617, Section 4.5. Is it possible that contributions by cloud water to streamflow may have been pulsed, (i.e. related to specific seasons or climatic conditions where there was significant cloudiness)? If this is the case, then the timing of streamflow sample collections would have been important in order to capture the isotopic signature of the cloud water as it was passing the collection points. Or is cloudiness at the site relatively consistent throughout the year, and hence assumed to be constantly contributing to streamflow to a greater or lesser degree? Page 8622, Section 5.2.2. This argument and equation could potentially be reversed, assuming the 40% volumetric water content of soils, and a soil depth of 0.5 m, to back-calculate Excess Discharge (ED), and the result could be used to justify down-sizing the runoff total in the final water balance. This may contribute to reducing the 10% unaccounted for portion of the water balance. Page 8623, Section 5.2.3.The authors comment that it is uncertain how the annual water balance derived from the stated observation period (Feb 2010 to Jan 2011) might differ from past or future trends (e.g. based on anticipated landuse changes / climate change). This is largely attributable to the paucity of streamflow data in this catchment, and intensification of streamflow gauging in the catchment may consequently be worth recommending.

Technical Corrections: Page 8613, Section 4.1, line 9. Units should be mm, not mm.yr-1 as the sentence has already stated that the estimate is for a single year (2010/2011). Page 8613, Section 4.2, line 20. Units should be mm, not mm.yr-1 and the sentence could be altered to read “was estimated to have a mean discharge of $14.6 \pm 0.7 m3\ s-1$ and runoff of 2796 ± 126mm (Table 2) over the 1-year study period.” Page 8614, Section 4.2, line 1. As above Units should be mm, not mm.yr-1. Page 8614, Section 4.3, line 9. As above Units should be mm, not mm as the estimate is only for the single study year.

HESSD
11, C2971–C2973, 2014

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 11, 8603, 2014.