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Interactive comment on "Modeling the distributed effects of forest thinning on the long-term water balance and stream flow extremes for a semi-arid basin in the southwestern US" *by* H. A. Moreno et al.

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Additional Response to Anonymous Referee #1

1) The reviewer states: "1) My major concern is related to the rather poor confirmation of the tRIBS model performance in simulating the hydrography. In common, a NSE value of 0.66 is not good for a model application."

2) Our response: As stated in an earlier response: we believe that a single evaluation metric like the Nash Sutcliffe model Efficiency (NSE) coefficient may not fully capture the performance evaluation of a watershed model. In any case, Moriasi et al. (2007) concluded that in the evaluation of watershed models, simulations that exhibit an NSE value of greater than 0.50 can be considered satisfactory. Our NSE estimate, in combination with our added skill metrics demonstrate, we think, robust adequacy in our model performance.

Additional Response to Anonymous Referee #2

1) The reviewer states: "As far as I understood (PP 10840 Line 24-25 and Appendix B) the tRIBS model is used with all vegetation properties (LAI, albedo, canopy radiation transmittance roughness, etc.) being as static fields. In this context, changes due to forest thinning are substantially prescribed by the authors (PP 10843 LL 6-8) and vegetation cannot respond over time for instance trees cannot resprout, seedlings cannot grow or much more simply LAI cannot adjust and respond to the new conditions after the thinning. The lack of vegetation dynamics is a limitation that the authors are aware of but it is dismissed very quickly in the conclusions (PP 10855 LL 26-28)."

2) Our response: Indeed, our model does not consider dynamic changes in vegetation physiology, the response to thinning, subsequent re-growth, etc. We recognize that our assumptions of static vegetation dynamics ignores actual (probable) structural and physiology responses to thinning and re-growth. This would include, but is not limited to, decreased basal area (and thus sapwood area) and a concomitant linear decrease in projected leaf area index for juniper and pine (e.g., McDowell et al 2008); the temporal responses in the true radiation regime (Sampson et al. 2008) and the accompanying physiological responses of the over-story and understory vegetation (de Pury and Farquhar 1997, Sampson et al. 2006) are ignored. Moreover, species would be influenced differentially, with Juniper responding more favorably than pine (e.g., Plaut et al. 2012) on these sites with greater average annual peak discharge in juniper as opposed to pine (Baker 1982). Notwithstanding, typical growth rates (woody increment) at our site

are fairly low (about 2% per annum depending on the species) (Worley 1965) and, so, likely canopy processes would be slow to respond over our simulation period.

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