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Interactive comment on "Spatial and Temporal Variability in Baseflow in the Mattole River Headwaters, California, USA" *by* N. Queener and A. P. Stubblefield

Anonymous Referee #2

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General comments:

The paper deals with the interesting topic of relating basin characteristics to base flow rates for a small scale catchments, and clearly testifies from a lot of work and efforts that have been done to compile it. In General the manuscript is adequately written, and the methods are well described. Discussion and conclusions are well-supported by the results. The figures and tables are nicely presented with sufficient legends and captions, though some tables and figures should be modified. However, the PCA statistical analysis are not well described and should be modified. First a coloration matrix should be constructed for all the variables to test the collinearity (New table should be added). After removing the highly correlated variables, a PCA analysis could

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be performed. The Author also should test the rotation of the PCA components in order to maximize the variance among the variables under each component.

Specific remarks

âĂć Page6, Line 10: stream not “stem”. âĂć Page 7, Line 17: PCA was based on standardized variables or original variables? âĂć Page 11, Line 6: “Principal components analysis was run on two subsets of the variables” âĂć A table should be added for the two runs with the eigenvalue and the variance of each principal component, also the loading of each variable. âĂć Page 11, Line 11: Which criteria has been chosen to detect the high loading factor? âĂć Why didn’t you try to rotate the PCA components to maximize the variance? âĂć Page 10, Line 16: “none of the vegetation metrics showed particularly strong correlations with the flow metrics” A recent study was conducted to estimate the controlling factors of base flow using PCA analysis, and vegetation was found to be the first dominating factor for spatial variation of base flow. (Zomlot, Z., Verbeiren, B., Huysmans, M., Batelaan, O. (2015). Spatial distribution of groundwater recharge and base flow: assessment of controlling factors. Journal of Hydrology: Regional Studies, 4(B), 349-368.) âĂć Figure2: The figure looks a bit crowded, clusters should be marked with colours or dashed lines to be clearly seen. The Yew catchment in Figure 2: seems to be an outlier?

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