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Hydrology and Earth System Sciences
Discussions

# *Interactive comment on* "Climate regime and soil storage capacity interact to effect evapotranspiration in western United States mountain catchments" *by* E. S. Garcia and C. L. Tague

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We thank the reviewer for both the general and detailed comments provided, all of which will be used to improve our manuscript.

We address the general comments first.

A major critique common among all reviewers is the lack of a challenging and significant scientific question that contributes to hydrologic knowledge. This manuscript's



primary research objective is to address the interaction between soil characteristics and key climate metrics that influence forest water availability in Mediterranean environments that receive a significant amount of precipitation as winter snowpack. To our knowledge, little research has been focused on the soil-climate interaction in this geographic niche due, in part, to the difficulty in modeling these environments with empirical models. Yet forests in these regions are sensitive to forest mortality events that are increasingly common worldwide. Our results place new emphasis on the sensitivity of annual estimates of ET to climate variability that soil characterization imposes. This has implications for better estimating a major component of the hydrologic budget, and quantifies a range in the sensitivity of these long-term estimates to soil characteristics.

We agree with the reviewers that this goal was not clearly stated in our submitted manuscript. We believe that the most appropriate revision would restructure the manuscript's introduction and discussion to better emphasize the scientific motivation and findings. We provide a new introduction here as an example. We also agree with this reviewer that certain portions of the paper may be too lengthy and detailed and we would edit the document to make certain descriptions more concise.

Response to minor comments:

We agree that an equifinality may be present, as indicated by parameter sets giving the same AWC that result in different drainage rates. While additional experimental data indeed improves model credibility, we believe that validation of our hydrologic estimates against daily streamflow records and our estimates of annual net primary productivity against field measurements (Table 2) provide reasonable confidence in our annual ET estimates.

Please also note the supplement to this comment:
http://www.hydrol-earth-syst-sci-discuss.net/11/C2462/2014/hessd-11-C2462-2014-supplement.pdf