

## ***Interactive comment on “A framework for evaluating regional hydrologic sensitivity to climate change using archetypal watershed modeling” by S. R. Lopez et al.***

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Received and published: 14 March 2013

In section 2.3.1, you got a set of hydrologic parameter values through the calibration procedure. I have two concerns about this process:

(1) would you comment the impact of number of Region on the parameter identification?

The number of regions in this study was determined through previous work on regional climatology (Nezlin and Stein, 2005), physiographic similarities (Figure 1) and familiarity with this region by the authors of the manuscript. This description is provided in

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Section 2.1. Obviously, the number of regions could vary if this approach was applied in other urban or mixed-urban areas as local climatology and physiological features would determine the total number of regions.

(2) I would like to know the prediction capability of using the calibrated parameter in future. On the other hand, in my opinion, the sensitivity analysis of calibrated parameters would be carried out from the point of completeness.

We agree with the reviewer that parameters can ultimately impact prediction capabilities. However, we feel our approach is useful in approaching a broader range of potential parameter values for our region and we highlight several examples:

(1) If the system of interest is highly vegetated (Region I), and increases in urbanization extent, then the hydrologic and sediment changes due to climate variability would be similar to what we show from Region III (Mixed) or Region II (Urban), depending on the increase in urbanization extent. (2) On the other hand, if the system of interest is highly urbanized (Region II) and the local government was interested in implementing green infrastructure, then the results from Region I could be used to explain hydrologic and sediment changes due to precipitation variability and/or temperature increase.

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 9, 13729, 2012.

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