

## Response to Editor's Review

### Comments to the Author:

The manuscript underwent a significant discussion phase, with constructive comments by the two reviewers extensively addressed by the Authors in their replies. I have an additional point for the Authors' consideration: throughout the paper, variations in atmospheric and hydrologic variables are reported for actual, pre-dam, and non-irrigation scenarios; these variations are rather small in many cases, and it would be of interest to complement the information on these variations with some indication about their statistical significance. Is there a way to support the scenario analysis with some uncertainty estimation, so as to understand if a variation of, say, 0.1 degrees in temperature is within the uncertainty bands or not? Some uncertainty/significance analysis would very much increase the quality of the manuscript, also dispelling the doubts raised by the reviewers that the manuscript might be incremental with respect to other works recently published by the same group of Authors.

***Our Response:** we are grateful for the unreserved insights offered by the editor as well as the reviewers to improve the paper's quality. The editor has raised a very important point that can further supplement the scientific merits of the paper. In order to support the scenario analysis with some sort of significance test, we have tried to carry out further significance test analysis for the temperature and dew-point (Fig. 7 of the modified manuscript). The analysis is presented as follows:*

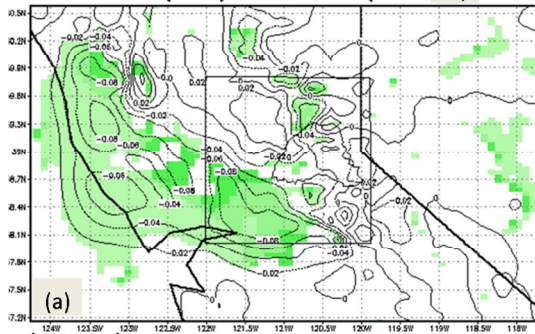
*As pointed out in Fig.7 and explained in section 4.1, for both the ARW and ORW, the largest change in temperature occurred in the regions close to the location of the perturbation to LULC. The temperature appeared to be lower in the 'control' than the other scenarios over the heavy storm episode, while the dew-point temperature becomes higher. In order to see how significant the simulated changes are among the different scenarios, we calculated statistical significance using t-test.*

*The tests were performed for the differences observed in averages of temperature and dew-point in the heavy storm episode periods (i.e Dec 29<sup>th</sup> 1996*

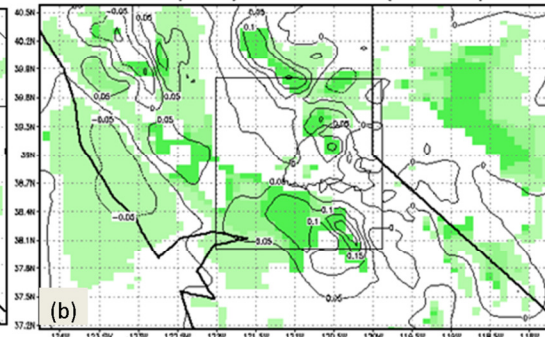
to Jan 03<sup>rd</sup> 1997) to the long term averages of the parameters simulation during the spin-up. The results of the significance tests are presented in Figure-1 (included as Fig. 8 in the modified manuscript) below.

We generally presented the 85%, 90% and 95% statistical significant levels shaded from light green to dark green. In general, statistically significant temperature and dew-point changes occurred over area where LULC was changed. More prominently, in ARW control – non-irrigation case (Figure-1a), the areas of significant changes of temperature correspond to the area of maximum irrigation to non-irrigation transformation. In ORW also the slight observed changes are statistically significant although the amounts of the changes are minimum. Temperature increase in the ORW control – pre-dam case was also statistically significant as observed by Figure 1g. All in all, the simulation differences observed in the scenarios were found to be significant to the acceptable level.

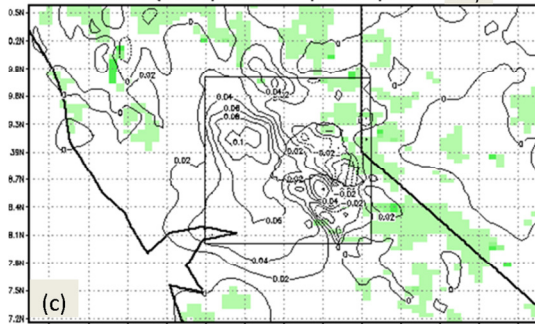
temperature Sig. at 85%, 90% & 95%  
t-values (shaded) Control - Non-Irr(contours oC)



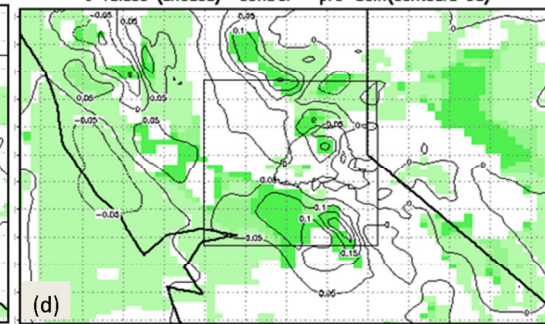
Dew-point Sig. at 85%, 90% & 95%  
t-values (shaded) Control - non-irr(contours oC)



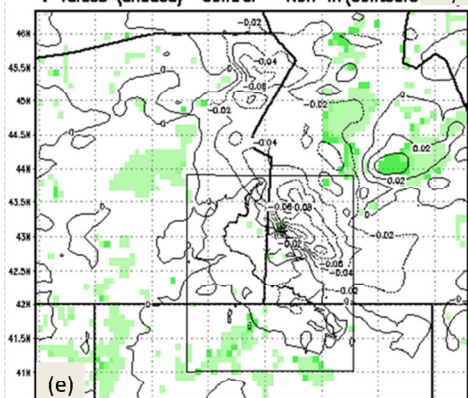
temperature Sig. at 85%, 90% & 95%  
t-values (shaded) Control - pre-dam(contours oC)



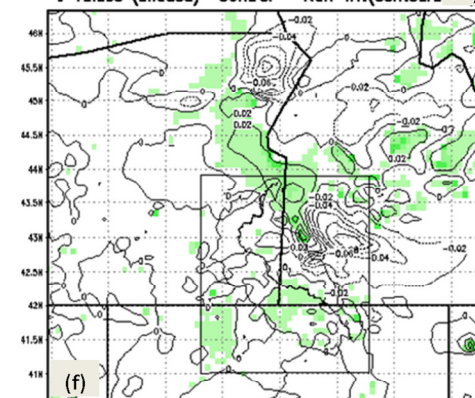
Dew-point Sig. at 85%, 90% & 95%  
t-values (shaded) Control - pre-dam(contours oC)



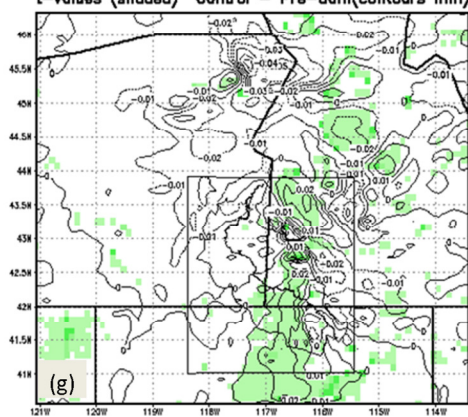
temperature Sig. at 85%, 90% & 95%  
t-values (shaded) Control - Non-irr(contours oC)



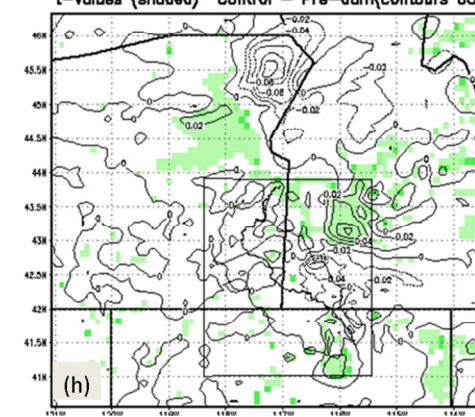
Dew-point Sig. at 85%, 90% & 95%  
t-values (shaded) Control - Non-irr(contours oC)



temperature Sig. at 85%, 90% & 95%  
t-values (shaded) Control - Pre-dam(contours mm)



Dew-point Sig. at 85%, 90% & 95%  
t-values (shaded) Control - Pre-dam(contours oC)



**Figure-1:** statistical significance tests at confidence levels of 85%, 90% and 95% from light to dark green for temperature and dew-point. (a) & (e) for control – non-irrigation for ARW and ORW, respectively. (c) & (g) for control – pre-dam for ARW and ORW, respectively. Differences in dew point temperature (oc): (b) & (f) for control – non-irrigation for ARW and ORW, respectively. (d) & (h) for control – pre-dam for ARW and ORW, respectively.

*Other changes made in the manuscript include:*

1. *Additional validation discussion included from lines 300 to 334 of the revised manuscript.*
2. *Corresponding to the discussions from lines 300 to 334, additional fig. 5 and fig.6 are included in the manuscript.*
3. *Additional discussion included starting from lines 358 to 368, and correspondingly a new figure fig. 8 is included.*
4. *Additional discussion included from lines 387 to 391.*
5. *Discussions improved from lines 459 to 502 and previous Figs. 12 and 13 replaced by new figs. 15 and 16.*
6. *Figure numbers and captions in the manuscript modified accordingly.*