

## ***Interactive comment on “Increase in surface runoff in the central mountains of Mexico: lessons from the past and predictive scenario for the next century” by N. Gratiot et al.***

### **Anonymous Referee #2**

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#### General comments.

The topic addressed by the paper, the increase of annual surface runoff for the Cointzio basin and its relationship with land uses and soil changes, is of great importance in order to understand the alterations that the hydrologic cycle is already experiencing and how to face these changes. The paper is well organized and the methods used in the analysis are well described and valid to the purpose. For this reasons in my opinion the paper is suitable for publication. However there are some points and choices of the authors that need a clarification in order to improve the quality of the discussion.

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Initially, the paper described 5 different meteorological stations. The results are shown and discussed only for the two station. Sometimes it is not clear if the investigation has been performed for all the station and why the authors have taken into account also other stations without commenting any results about them. Also the choiche of the two reference stations is not completely clear.

In my opinion the discussion needs a deeper explanation with regard to the land uses and soil changes. The authors state that the alterations in the hydrologic cycle (in terms of ratio between surface runoff and baseflow) are not caused by precipitation patterns but human impacts. While the first part of the assertion is well documented, the second part needs an improvement.

Specific comment.

P 6867 Line1. To this purpose instead of to that purpose

P 6867 Line 17. downstream (without s)

P 6867 Lines 24. Mean annual rainfall is described for the period 1975-2005. this is not the same period of the investigation (1956-2001). Can the authors consider the idea of keeping the same temporal reference?

P 6869 Line 3. The station of Jesus del Monte has been considered in the analysis in order to examine potential orographic effect. Nevertheless, this topic does not seem to be discussed in the following.

P 6869 Line 10. What do you mean with “the only consistent time series within the watershed”?

P 6870 Lines 19-20.

P 6872 Eq. 3: what is ctte?

P 6875 Line1. Could you add an explanation for the “5% days undergoing maximum rainfall events”. It seems very confusing to me. Maybe the description of its calculation

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could be helpful.

P 6875 Lines 7-11. precipitation without s.

P 6875 Lines 18-19. Why do not use the same order of magnitude used in Fig.7?

P 6875 Line 29. What do you want to show when you write “the latest values remain in a typical range of values...”?

P 6876 Lines 2-8. The statement “surface runoff versus baseflow is not affected by precipitation patterns” needs some more explanations than the comparison with total water discharge. Could you elaborate this concept?

P 6876 Lines 18-22. Why the trend analysis has not been applied to all the precipitation indicator considered in the paper? Does the results of the different stations considered agree also for trend or not?

P 6876 Lines 24-25. In my opinion speaking about possible detection of climate change signal in less than 50 years of precipitation data may be misleading.

P 6877 Line 1. Could you elaborate this statement?

P 6877 Line 3. Another important aspect of the Qd max time series is its variability.

P 6877 Line 15. Centered

P 6878 Lines 7-8. The connection between the aridity index and the vegetation may require an improved discussion with regard also to agriculture practices, since the authors mention the avocados cultivation in the conclusion.

Fig 2, 6, 7. Why do not represent the investigation time interval (1956-2001) in all the figures?

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 6, 6865, 2009.

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