

This article is a comparative analysis of two adjacent watersheds using the integrated surface-subsurface hydrological model (ISSHM) to examine the effects of topography and land use/land cover change (LULCC) on hydrological processes within the Greater Bay Area (GBA) of China. In general, the datasets used and methodology for the analyses are clear and appropriate. The results are well-organized. In the conclusion part, by mentioning the importance for hydrologic management strategies to consider the specific topography and LULCC characteristics of each watershed, the high-level significance of the study stands out.

However, if the significance of the study could be fully investigated with more in-depth thoughts about the results and conclusion, the publication would represent a more substantial contribution to scientific progress in the field.

The four scenarios using HLU and CLU seems intuitive and simple to apply, which might become a lightly novel or highlight of the methodology that could be potentially widely-applied. However, insufficient details about "all built-type land uses" and the process of "The HLU pattern involves reverting all built-type land uses in both watersheds to their pre-construction conditions" are provided. This is not addressed explicitly in the discussion or supplementary, which could become a valuable contribution to future studies.

Moderate to major revision is suggested to this manuscript.

Specific comments are listed below:

- 1) Introduction:
  - a. L73-74: consider adding reference to support the statement "they are mainly based on single and spatially homogeneous watersheds".
  - b. L77: may consider adding one or two sentences to describe "crucial economic zone" in China to highlight the importance of the study area.
- 2) Methodology:
  - a. In section 3.4, the four scenarios using HLU and CLU seems intuitive and straightforward to apply, which might become a highlight of the methodology that could be potentially widely-applied. However, insufficient details about "all built-type land uses" and the process of "The HLU pattern involves reverting all built-type land uses in both watersheds to their pre-construction conditions" are provided. This is not addressed explicitly in the discussion or conclusion, and could be a valuable contribution in future studies.
  - b. L187: consider adding reference of 40 meter, at which Zone 1 and Zone 2 are divided.
  - c. L192-203: consider having a flowchart or a table instead of a long paragraph to demonstrate the key factors/processes, could also help the readers better understand the results.
- 3) Results:
  - a. Figure 8: the text in the x and y-axis are too small to read.
  - b. Figure 9: the current figure is busy with many equations/texts embedded with the dots, may considering make it concise by leaving the p-values in the figure but putting the equations in the captions or texts.
  - c. Figure 10: similar to Figure 9

- 4) Conclusion:  
L373-379: the author may consider adding more specific examples or related references about how hydrologic management or local watershed agencies could use this study to improve their methodology and strategies. Thus, the application of this publication could not only benefit not only the future studies in academia but also shed light on the practical water management or engineering world.
- 5) Discussion (e.g., the Limitation and future work section in the current manuscript) can be substantially improved.
  - a. It lacks the in-depth analysis of evapotranspiration (ET), which correlates with climatic factors such as solar radiation, temperature, humidity, etc. It is worth noting that ET is different from surface runoff, subsurface flow, and infiltration. The author may consider adding sentences in the limitation/discussion section.
  - b. Groundwater dynamics was mentioned in other sections except the discussion part, considering address it in section 4.4.
  - c. L258-262: consider adding text about the statement that "topographic indices more accurately reflect hydrological responses under steady-state conditions" in discussion part.
  - d. Considering the study areas are the important economic zone, the author may consider relating it to other economic zone or highly-urbanized areas in other regions of the world. It may worth thinking and adding texts about how this publication could shed light on the practical water management or engineering world.
- 6) The abstract is also suggested to revise based on the updated revision.