

Interactive comment on “Delineating small karst watersheds based on digital elevation model and eco-hydrogeological principles” by G. J. Luo et al.

G. J. Luo et al.

luoguangjie@gznc.edu.cn

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Dear Referee,

Thanks for your thoughtful comments and suggestions. We believe that they are helpful to further improve the clarity and quality of our manuscript. We are sure that your technical comments and suggestions are suitably addressed as follows.

Comment: In this paper, authors discuss about the problem of low accuracy of traditional methods for mapping karst watersheds and propose a quite innovative method. The suggested methodology looks good and provides accurate results. Mathematical description of methods and results is correct. In my opinion, the manuscript should be published in Solid Earth.

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Response: Thanks for your comments.

Comment: Just some moderate changes need to be done before the paper is ready for publication. These changes are listed below.

Response: we will revise them according to your comments.

Comment: Delete keywords (not required by the journal)

Response: It will be deleted in revised manuscript.

Comment: Figures and tables: Figures and tables must be understood independently of the rest of the paper, so avoid abbreviations in the caption and define them when used in figures or tables.

Response: All will be modified in revised manuscript.

Comment: Line 40. Add units to the infiltration coefficient (80%?).

Response: It is 80% and will be revised.

Comment: Line 43. Delete 'hill'.

Response: It will be deleted in revised manuscript.

Comment: Lines 54-55. Check this sentence ("no papers have. . ."). What does "in geographical area scale" mean?

Response: They will be appropriately revised in revised manuscript.

Comment: Line 63. Substitute "as the basic unit of" with "for".

Response: It will be substituted in revised manuscript.

Comment: Line 64. Re-write: "Digital Elevation Models (DEMs) provide a solid basis for. . .".

Response: It will be re-written.

Comment: Line 70. Re-write: “DEMs are one of. . .”.

Response: It will be re-written.

Comment: Line 82. Substitute “DEM” with “DEMs” or “a DEM”. Re-write: “Geographic Information System”.

Response: They will be revised in revised manuscript.

Comment: Lines 85-86: Squared kilometers?

Response: Yes and it will be revised in revised manuscript.

Comment: Line 137. Substitute “The data employed” with “Data used”.

Response: It will be substituted in revised manuscript.

Comment: Line 90 and others. Do not use “rocky desertification”, just “desertification”.

Response: All will be modified in revised manuscript.

Comment: Lines 107-111. Add just some words to explain the expected benefits and consequences of your work.

Response: Some words will be added to the revised manuscript.

Comment: Line 113. Re-write: “Methods”.

Response: It will be re-written.

Comment: Line 120. Delete “/a”.

Response: It will be deleted in revised manuscript.

Comment: Lines 121-122. Re-write: “15.6 oC (for data between 1961 and 2006)”.

Response: It will be re-written in revised manuscript.

Comment: Lines 121-122. Re-write: “15.6 oC (for data between 1961 and 2006)”.

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Response: It will be re-written in revised manuscript.

Comment: Figure 1: Add letters to identify images: A (general view of. . .), B (Location of the study area) and C (elevation map of the study area).

Response: They will be added to the revised manuscript.

Comment: Line 137. Substitute “The data employed” with “Data used”.

Response: It will be substituted in revised manuscript.

Comment: Line 151 and following. Avoid the use of lists. Re-write: “In this study, the delineation of KW is completed by the following five steps: (i) ATW is delineated by using the hydrological tools in ArcGIS 10 (ESRI 2010), (ii) regional corrosion–erosion datum and exit of watershed are determined, (iii) the. . .”.

Response: It will be re-written in revised manuscript.

Comment: Line 162. Re-write: “The basic process is shown in Fig. 2.”

Response: It will be re-written in revised manuscript.

Comment: Figure 2. Please, check that this is open-access material. Otherwise, prepare a new figure or delete it.

Response: We think that it is more suitable to delete it in revised manuscript.

Comment: Figure 3. Delete the excessive blank space in the top of the figure.

Response: It will be improved in revised manuscript.

Comment: Figure 4. Consider the size of the print paper and homogenize the size of fonts in the image. Yellow text in a, b, c and d images may be not legible. In ‘c’, re-write: “No runoff”.

Response: It will be improved in revised manuscript.

Comment: Line 281. Re-write: “conducted”.

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Response: It will be re-written in revised manuscript.

Comment: Line 288. Here and through the text, avoid abbreviations in section titles.

Response: All will be modified in revised manuscript.

Comment: Lines 301-303. This lines should be moved to “discussion” or “conclusions” sections.

Response: It will be moved in revised manuscript.

Comment: Table 3. No colors in tables! Colors seem to correspond to last column values, so do not use colors. Use the same font from the main text.

Response: it will be modified in revised manuscript.

Comment: Figure 7. Add letters to graphs. The R2 coefficient is OK, but can you add the pvalue of regression? Is the second graph (discharge/upstream accumulation area of subsurface runoff in ATW) significant? Not an outlier?

Response: The second graph will be deleted and p-value of regression will be add to the first graph in revised manuscript.

Comment: Table 4. Do not use shaded cells in tables. Check the excessively long titles in the first row. Can you use shorter expression or codes (and explain them in the caption) instead?

Response: it will be modified in revised manuscript.

Comment: The following references should be considered and possibly included in the discussion of this paper: A threshold artificial neural network model for improving runoff prediction in a karst watershed. DOI: <http://dx.doi.org/10.1007/s12665-015-4562-9> Assessing spatial-temporal evolution processes of karst rocky desertification land: indications for restoration strategies. DOI: <http://dx.doi.org/10.1002/ldr.1102> Delineating groundwater/surface water interaction in a karst watershed: Lower Flint River Basin,

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southwestern Georgia, USA. DOI: <http://dx.doi.org/10.1016/j.ejrh.2015.11.011> Multi-scale anthropogenic driving forces of karst rocky desertification in southwest China. DOI: <http://dx.doi.org/10.1002/ldr.2209> Object-based mapping of karst rocky desertification using a support vector machine. DOI: <http://dx.doi.org/10.1002/ldr.2193> Soil loss from erosion in the next 50 years in karst regions of Mayabeque province, Cuba. DOI: <http://dx.doi.org/10.1002/ldr.2184>

Response: All will be discussed and added to the revised manuscript.

Interactive comment on Solid Earth Discuss., doi:10.5194/se-2016-20, 2016.

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