

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

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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: due to the specific dual structure of the surface and subsurface in karst area, the method to delineate sub-catchment in traditional topography field often cannot accurately reflect the real hydrological processes, which has caused a long-term puzzle for the researchers and governors to accurately assess the geographical, ecological and hydrological characteristics in catchment landscape scale. Therefore, this manuscript deals with an important and interesting thought that small karst catchment

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is delineated by combined topographic features with geo-hydrologic characteristics.

Response: Thanks for your comments

Comment: there is a universal scientific significance that the minimum unit of the river basin in karst regions should be the watershed whose exit is the corrosion and corrosion baselevel, which fully reflects the characteristics of the regional karst landform evolution. In the method, delineating small karst catchment shown by this manuscript, is practiced in the typical karst area in China and in Discussion part, the method's applicability is evaluated, which is worth the attention of the scientists all over the world.

Response: Thanks for your comments

Comment: the method provided here seems partially automatic because of the complexity of karst hydraulic characteristics. Therefore, I strongly recommend that based on this research, the scholars should join to delineate the karst sub-catchment from the regional to global scale and then form a vector database set about karst sub-catchment, which could be open and shared in order to accurately assess ecology and efficiently manage karst catchment.

Response: Thanks for your comments and we will adopt the recommendations in the future work.

Comment: there are detailed revised comments follow. (1) Line27: Summary, corrosion–erosion datum (shown in other parts as well) → an important terminology but is used in confusion. Corrosion and corrosion baselevel is advised. (Please see Ford, D., Williams, P., 2007. Karst hydrogeology and geomorphology. pp. 321, 359) (2) Line 30: delineation of karst watershed→ should be 'delineating karst watershed'. (3) Line 55: double-deck structure→ should be dual structure. (4) Line 151: KW → please write in full. (5) Line 152: ATW → please write in full. (6) Fig.2: pour points → should be outlet. (7) Line343, line345: hydrogeological background → should be eco-hydrogeological principles.

Response: All will be modified in revised manuscript.

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