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Geoscientific Model Development Discussions
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Interactive comment on "Discrete k-nearest neighbor resampling for simulating multisite precipitation occurrence and adaption to climate change" *by* Taesam Lee and Vijay P. Singh

Anonymous Referee #1

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1. The manuscript presents discrete k-nearest neighbor resampling for simulating multisite precipitation occurrence and adaption to climate change, which is interesting. The subject addressed is within the scope of the journal. 2. However, the manuscript, in its present form, contains several weaknesses. Appropriate revisions to the following points should be undertaken in order to justify recommendation for publication. 3. For readers to quickly catch your contribution, it would be better to highlight major difficulties and challenges, and your original achievements to overcome them, in a clearer way in abstract and introduction. 4. It is shown in the reference list that the authors have several publications in this field. This raises some concerns regarding the potential overlap with their previous works. The authors should explicitly state the novel

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Discussion paper

contribution of this work, the similarities and the differences of this work with their previous publications. 5. It is mentioned in p.2 that k-nearest neighbor resampling coupling with genetic algorithm is adopted to simulate multisite precipitation occurrence. What are other feasible alternatives? What are the advantages of adopting this particular soft computing technique over others in this case? How will this affect the results? The authors should provide more details on this. 6. It is mentioned in p.2 that multisite occurrence model with standard normal variate is adopted as benchmark for comparison. What are the other feasible alternatives? What are the advantages of adopting this particular model over others in this case? How will this affect the results? More details should be furnished. 7. It is mentioned in p.8 that a random selection procedure is adopted to take into account the cases with the same quantity. What are other feasible alternatives? What are the advantages of adopting this particular procedure over others in this case? How will this affect the results? The authors should provide more details on this. 8. It is mentioned in p.9 that the reproduction procedure in (6-1) is adopted in this study. What are other feasible alternatives? What are the advantages of adopting this particular approach over others in this case? How will this affect the results? The authors should provide more details on this. 9. It is mentioned in p.9 that Eq.(13) is adopted for crossover. What are other feasible alternatives? What are the advantages of adopting this particular crossover type over others in this case? How will this affect the results? The authors should provide more details on this. 10. It is mentioned in p.9 that Eq.(14) is adopted for mutation. What are other feasible alternatives? What are the advantages of adopting this particular mutation type over others in this case? How will this affect the results? The authors should provide more details on this. 11. It is mentioned in p.9 that a simple selection method is adopted for the selection of the number of nearest neighbors. What are other feasible alternatives? What are the advantages of adopting this particular method over others in this case? How will this affect the results? The authors should provide more details on this. 12. It is mentioned in p.11 that 12 weather stations were selected from Yeongnam province are adopted as the case study. What are other feasible alternatives? What are the ad-

vantages of adopting this particular case study over others in this case? How will this affect the results? The authors should provide more details on this. 13. It is mentioned in p.11 that historical records of 1976 to 2008 are taken. Why are more recent data not included in the study? Is there any difficulty in obtaining more recent data? Are there any changes to situation in recent years? What are its effects on the result? 14. It is mentioned in p.12 that the root mean square error is adopted to evaluate statistics from 100 generated series. What are the other feasible alternatives? What are the advantages of adopting this particular evaluation metric over others in this case? How will this affect the results? More details should be furnished. 15. It is mentioned in p.16 that "...Special remedy should be applied, such as decreasing cross-correlation by force, but further remedy was not applied in the current study since..." More justification should be furnished on this issue. 16. It is mentioned in p.17 that "...However, the probability P01 fluctuated along with the increase of Pcr. Elaborate work to adjust all the probabilities is however required..." More justification should be furnished on this issue. 17. Some key parameters are not mentioned. The rationale on the choice of the particular set of parameters should be explained with more details. Have the authors experimented with other sets of values? What are the sensitivities of these parameters on the results? 18. Some assumptions are stated in various sections. Justifications should be provided on these assumptions. Evaluation on how they will affect the results should be made. 19. The discussion section in the present form is relatively weak and should be strengthened with more details and justifications. 20. Moreover, the manuscript could be substantially improved by relying and citing more on recent literatures about contemporary real-life case studies of soft computing techniques in hydrological forecasting such as the followings: ïĄň Fotovatikhah, F., et al., "Survey of Computational Intelligence as Basis to Big Flood Management: Challenges, research directions and Future Work," Engineering Applications of Computational Fluid Mechanics 12 (1): 411-437 2018. ïĄň Wu, C.L., et al., "Rainfall-Runoff Modeling Using Artificial Neural Network Coupled with Singular Spectrum Analysis", Journal of Hydrology 399 (3-4): 394-409 2011. ïĄň Taormina, R., et al., "Neural network river forecasting through

baseflow separation and binary-coded swarm optimization", Journal of Hydrology 529 (3): 1788-1797 2015. ïĄň Wang, W.C., et al., "Improved annual rainfall-runoff forecasting using PSO-SVM model based on EEMD," Journal of Hydroinformatics 15 (4): 1377-1390 2013. ïĄň Cheng, C.T., et al., "Flood control management system for reservoirs," Environmental Modeling & Software 19 (12): 1141-1150 2004. ïĄň Chau, K.W., et al., "Use of Meta-Heuristic Techniques in Rainfall-Runoff Modelling" Water 9(3): article no. 186, 6p 2017. 21. Some inconsistencies and minor errors that needed attention are: ïĄň Replace "...had a slight better..." with "...had a slightly better..." in line 250 of p.13 22. In the conclusion section, the limitations of this study and suggested improvements of this work should be highlighted.

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