

Responses letter

We are very grateful to the reviewer for his/her constructive suggestions for this manuscript, which is a great help and guidance for this study and our future research. Here are our responses to the comments from the reviewer and the details of how we made the changes in our manuscript.

Responses to the comments from the anonymous referee

1. In the introduction part, the definitions of VFS, IEM, IDM were poorly presented, I suggest adding more clear descriptions of them.

Thanks to the reviewer for pointing out the poorly explanation of some key definitions. We have re-written the introduction part and added some preliminaries in Section 2.

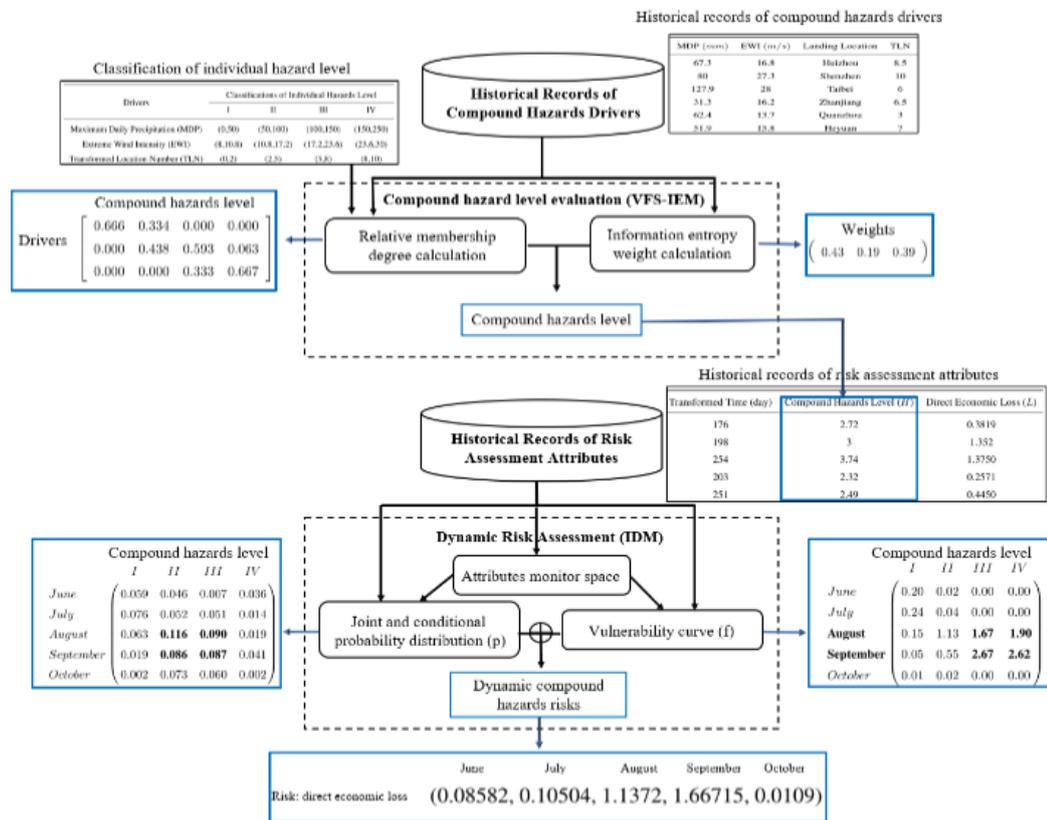
2 Preliminaries

2.1 Basic concepts

Variable fuzzy set is used to express the fuzzy effect of the hazard drivers by relative membership degree (RMD) functions, and then the compound effects between different drivers can be modeled. This method provides an enhanced implementation of the compound hazards level evaluation process and can reflect the coupled characteristics of compound hazards. *Information entropy* is based on the entropy coefficient calculation process, which is used to measure the importance of the individual hazard drivers and determine the weight of different drivers. *Information diffusion* is a function learning method with high estimation accuracy from a small data set, which makes full use of the diffusion information given by the data samples to estimate the probability density of the data samples or the relationship between the data samples without the knowledge of the distribution from which the data samples were drawn. This method is applied to estimate the probability distribution p (hazard potential) of the occurrence of hazards, and the causal relationship f (hazard vulnerability).

2. “The advantages and usage of the combined model should be declared more reliable.

Thanks to the reviewer for the comments on this manuscript. As the reviewer suggested, some technological innovations have been concluded at the end of the introduction. We have also presented the workflow of our proposed model which shows a detailed procedure and gives useful results of case study. Furthermore, we have illustrated the model efficient via a predict model and discussed the superiority of the normal diffusion estimator in the Discussion part.



3. In the part of case study, figures might be more readable than formulas and code.

Thanks for your constructive suggestions for this manuscript. We gave a more detailed introduction in the case study part by setting up multi-level headings. Furthermore, we hope that the major revision corresponded with the steps in the workflow proposed in Section 2, which can deepen the understanding of the proposed model.