**Natural Hazards
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Discussions

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**Interactive
comment**

Interactive comment on "An improved logistic probability prediction model for water shortage risk in situations with insufficient data" *by* L. Qian et al.

Anonymous Referee #1

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The authors had proposes an improved logistic probability prediction model for water-shortage risk and applied to Beijing (China) to predict water-shortage risk probability in 2020. Water supply is important in metropolitan-area development and mitigation of water-shortage is an essential measure to reduce shortage induced economic losses. This manuscript presents an important idea in such issues. However, parts of this manuscript including used data and results are not well explained in this manuscript. Major revisions are needed before this manuscript can be considered for acceptance. Specific comments are given below. 1. Line 8. It is not clear what is the meaning of the "information flow" when it is firstly appeared in the Abstract. The authors should briefly explain the "information flow" in the Abstract. 2. Line 139, equation (1). What

is the definition of the total amount water resources (W)? 3. Line 164. What is the unit of the information flow? What is the "nats" per unit time? 4. Lines 189, 190, 193, 194, 196, 198, 201, ... What is the meaning of "L"? 5. Line 193. Does pi denote the conditional probability of "water shortage"? 6. Lien 195, equation (11). What is the definition of "K" in equation (1)? 7. Lines 306-307. What is the criterion to remove the Sr, IWp, and DWp should be clearly defined in the manuscript. 8. Figure 3 and Table 5. The authors should discuss why prediction of 1982 and two other years is that no risk occurs, but risk actually occurs. 9. Lines 358-360. Does the total amount of water resources from 1956 to "2020" mean 1956 to "2012"? 10. Figures 4, 5, and 6. How to obtain the prediction of water shortage in 2020 should be more clearly described in manuscript, especially the input data. For example, (1) Lines 354-356. How to estimate the GDP in 2020? (2) Lines 358-360. The total amount of water resources from 1956 to 2020 (should be 2012) were considered in 2020. However, the total amount of water resources from 1979 to 2012 were provided Beijing Hydrological Station (lines 111-112), which is inconsistent with the statement in lines 358-360. What total amount of water resources used in 2020 should be precisely described in the manuscript. (3) Are the same year of precipitation and total amount of water resources used to predict water-shortage risk probability in 2020 shown in Figures 4, 5, and 6 ? 11. Other minor editorial suggestions include: (1) Lines 35-36. "Giannikopoulou et al., 2015" is inconsistent with "Giannikopoulou et al., 2017" (lines 491-493) in the section of References. (2) Line 61. "Balakrishnan, 1992" is inconsistent with "Balakrishnan, 1991" (lines 476-477) in the section of References. (3) References listed in the section of References should be alphabetically listed.