# Responses to the comments of Referee 2

We appreciate the positive and constructive comments provided by the Referee 2. We have revised the manuscript carefully by incorporating those comments. The following are our responses to the referee comments.

(1) The author needs to revise the English grammar, which is confused in some sections.

Response: The English grammar is carefully checked and the errors were corrected. The singular/plural, punctuation tenses were checked and corrected. Some descriptions in the ms were revised for a better understanding. The ms was sent for professional proofreading at AJE, and carefully edited by co-author Prof. Pietro Teatini.
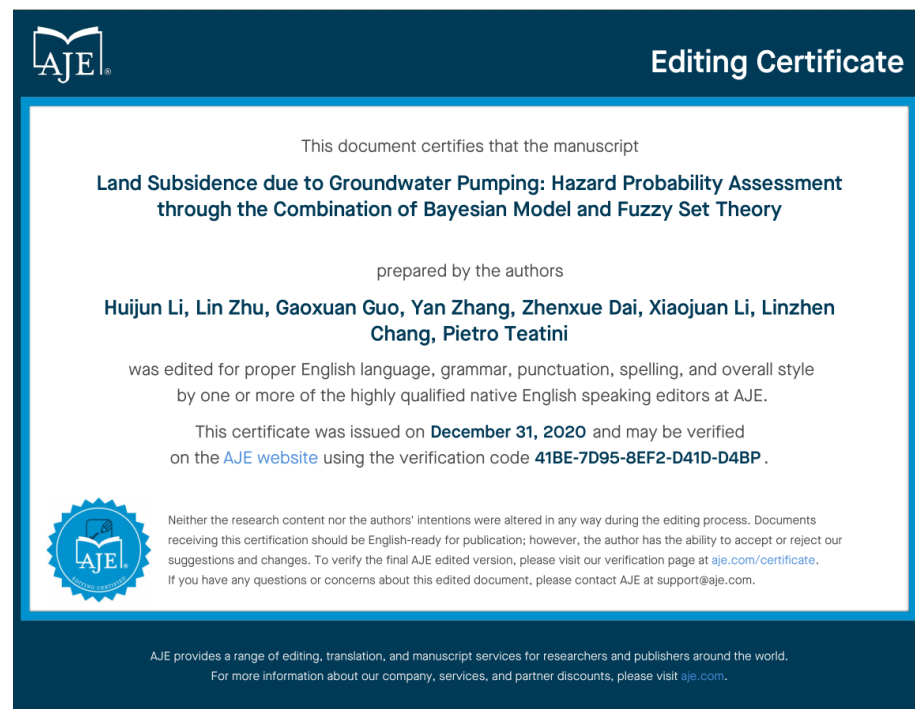
(2) In this work, some operations need to be more explaining for a better understanding of this approach.

Response: We checked the method description again.

As for Section 2 (Methodology):

In line 105, the definition of Y, Y represents the hazard factor, was added in the ms. The definition of $P(Y|\mathcal{S})$ is revised to "the posterior probability of Y when $\mathcal{S}$ is observed".

In line 110, the definition of Y_j is revised as "Y_j is the j-th of the m factors that influence T".

In line 121, the description of Equation (3) is revised as "We developed the FWBM by extend Equation (2) with the introduction of a fuzzy-based weight".

In line 128, the definition of $X_{j,i}$ is revised as "$X=\{X_{j,1}, X_{j,2}, ..., X_{j,i-1}, X_{j,i}, ..., X_{j,n}\}$, where $X_{j,i}$ is defined as the i-th of the n-th features of the j-th factor. The value of n depends on the feature classification.".

In line 134, the definition of prior probability "with the initial value calculated with feature grid number ratio" is unclear. It is revised as "The initial prior probability is calculated based on the feature grid number ratio between the number of grid cell with that feature and the total number of grid cells covering the study area.".

Section 3 (Case study):

In line 186, the description "the rate of decline in the groundwater level slowed due to the long-term loss of groundwater and increased rainfall (Zhang et al. 2015)" is not clear. This is revised as "the rate of decline in the groundwater level slowed due to the long-term loss of groundwater which reduces the capacity of water supplying and increased rainfall (Zhang et al. 2015)".

In line 192, the PS points with a subsidence rate above 10 mm/y were regarded as subsidence points. The reason for the threshold is explained as follows. The subsidence rate obtained by InSAR is characterized by an uncertainty of 1-3 mm/y, depending on the number and quality of the processed images (Teatini et al., 2012). Considering the subsidence data used in this study has an error of ±7mm (for one year), the threshold of subsidence rate was set to 10 mm/y.

Section 4 (Results and discussion)

In line 231, the levels of change between FWBM and WBM were calculated (the numbers in the legend in Fig. 7), which is not clear. This has been explained in Section 3.3.1. The result of WBM was reclassified and subtracted it from FWBM to compare the levels of change while consider or not consider the ambiguity.

In Table 2, the calculation of the match ratio is explained in the caption. The match ratio is calculated by the ratio between the sum of the amount of SrI in high hazard area and SrD in low hazard area, and the total number of SrI and SrD.