Dear Referee,

Thank you for the invaluable time for the review. Your suggestions are informative and constructive, especially on the estimation of bandwidth for the CDF (Q1). I did necessary amendments on the paper based on your suggestion as shown in the attachment.

Q1:

Section 3.4 has been modified based on the referee's comments on the estimation of CDF.

The bivariate cumulative density function (CDF) obtained from the aggregation of the joint PDFs of the duration and intensity is used to estimate the joint return period for different drought events. Doing so will result in a slightly oversmothed estimation for CDF compared to a direct kernel density estimation of the CDF. The optimal bandwidth for estimating the PDF is slightly larger than the optimal bandwidth for estimating the CDF, because the empirical CDF is already much smoother than the empirical PDF, which requires a smaller bandwidth than the PDF to achieve optimal estimation. Since the study focused on the kernel density estimation for the PDF, the current way of CDF estimation is adopted to illustrate the results.

Q2:

The formula (9) has been modified as:

$$\hat{f}(x,y) = \sum_{i=1}^{n}\sum_{j=1}^{n}\frac{1}{2\sqrt{t_x t_y}}e^{-(\frac{(x-x_i)^2}{2t_x}+\frac{(y-y_j)^2}{2t_y})} \quad 9$$

Q3 and 4:

The typo mistake of formula (10) (11) (12) has been modified as below:

An improved plug-in bandwidth selection method is introduced by Botev (2010) with parameter $\hat{t}^*$ given by:

$$\hat{t}^* = (2\pi n(\psi_{0,2} + \psi_{2,0} + 2\psi_{1,1}))^{-1/3} \quad 10$$

Where,

$$\psi_{i,j} = \int(\frac{\partial^{(i+j)}}{\partial x^i \partial y^j}f(x))^2 dx \quad 11$$

$$\hat{t}_{i,j} = (\frac{1+2^{-i-j-1}}{3}\frac{-2q(i)q(j)}{n(\hat{\psi}_{i+1,j}+\hat{\psi}_{i,J+1})})^{1/(2+i+j)} \quad 12$$

Thanks again.