

Interactive comment on “Impacts of drought on the quality of surface water of the basin” by B. B. Huang et al.

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Dear editor and reviewer, Thank you very much for your quickly respond. Your carefully working attitude impressed me deeply. The advices are very good and professional, some advices make important role in our further research. According with your advices, we amended the relevant part in manuscript. Some of your questions were replied below. English usage and grammar error are general problem in Chinese authors' paper. We also realize this problem, so the paper is revising by a English speaker. We are very sorry about the difficult in the reading brought by the paper. The reply of the comment is below. 1. In the introduction, we summarize the research in drought to the water quality, then point out the insufficient in current research, also introduce

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the method and work did by the paper. We deleted some words and added some reference. 2. The suggestions are very good. You are a very professional expert in the field from the detail suggestions of the method. The soil was collected by no bottom stainless steel box (50*40*20cm) at Daxing Experimental Base in 2011. The soil used for experiment was taken from the surface of corn experimental field at Daxing Experimental Base. Every soil sample was collected in 100 acres. Every soil sample was collected about 9 to 20 points. The collection depth of the sample is about 20 cm. In the sample collection, it must take by random, equal quantity and mixed by multiple points principles. The sample collected by S and X line. The field not fertilized recently. It's a sunny day that we collected the sample. See Table 4 for the soil basic physical and chemical properties. The leakage water was collected by the steel plate water collector under the experiment device. The leakage water was collected until no more water was flowed from the soil sample. The temperature of the soil and rainfall water held constant in 26.9°C. The date in the research came from the experiment. The pretreatment of the date used by Excel, and then plotted the date by Origin8.0. We held the temperature of the experiment at 26.9°C, this is the highest temperature in Daxin district in that month. The moisture is at 69%, this is the annual average moisture in Daxin district. We simulate different soil moisture by different rainfall duration or no rainfall time. The Tab. 1 was designed by standard of classification for drought severity in China (SL424-2008). 3. The explanation and amend of "Many statements in the results and discussion section are unsupported by either the study data or citations". a. We didn't measured the soil temperature, so we deleted the "there will be a rise in the soil temperature". b. We add a reference to support this statement. X H Cui, W H Xiao, B F Chen. Preliminary Study on Effects of Drought Events on the Quality of Surface Water in a Basin[J]. Yellow River, 2013, 35(5): 18-24. c. It also came from the reference of point b. d. The soil of severe drought degree will become hardened and impervious, so the loss of nitrate mainly from the surface soil. e. We added a reference of this statement. J An, F L Zhen, G F Li, B Wang. Effect of raindrop impact on nutrient losses under different near surface soil hydraulic conditions on black soil

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slope[J]. *Acta Ecologica Sinica*, 2011, 31(24): 7579-7590. f. We deleted the chemical pesticides, we are sorry about the mistake. In China, lack of scientific fertilizer method, a great amount of nitrogenous fertilizer remains in the soil. Z L Zhu. Research on soil nitrogen in China[J]. *Acta Pedologica Sinica*, 2008, 45(5): 778-783. g. We added a reference of this statement. W Zhang, X D Zhang, H B He, et al.. Research advances in soil nitrogen transformation as related to drying/wetting cycles[J]. *Chinese Journal of Ecology*, 2010, 29(4): 783-789. 3. The experiment is now in progress. Some conclusions are based on qualitative evaluation, we will give quantitative evaluation in the next experiment. 4. a. The continuous days of effective rainfall free (Dry spell) is used as one of the indicators of drought during the crop growth period (reference 22). Mild, moderate, severe and extraordinary drought was divided by soil moisture, it correspondence with the Dry spell indicator. The aim of section 4 "Assessment of the impact of basin scale" is verify the impacts of droughts of different degrees and the after drought rainfalls on the surface water quality of the basin. So we highlight the no rainfall days. The duration and severity of the rainfall after every period is roughly the same. The duration of the rainfall is about 16hours, and the intensity is 2.01mm/h. b. The factors were all the same except the soil moisture and rainfall, so we didn't considered the other factors. c. The higher the drought degree is, higher the concentration of the pollution, the worse the surface quality of the basin will be. In drought period, most of the pollution in the basin came from the point pollution(Y S Ma, Q Y Shi, D D Zhu. The impact of no-point sources pollution to water environment in Nenjiang River upstream basin[J]. *Journal of Northeast Agriculture University*, 2006, 37(6): 842-846). After the first rain of the dry period, no-point pollution enter into the basin with the runoff, the water quality get worse. The factors were all the same except the rainfall, so we think the first rain after the dry period is the main factor to the water quality. 5. a. In the dry period, the point pollution and water flow are the main reasons caused the deterioration of water environment. Water flow main influenced by climate change, the point pollution main caused by human activities, so we can get the conclusion. b. The change of temperature and river discharge were directly caused by drought. The

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water quality got worse in dry period. So, the key factors that determine water quality are a decrease in river discharge, a rise in temperature. c. This is our conclusion of the change in BOD5 density, we add the different temperature in different drought in basin scale. It consistent with the reference (Prathumratana L, Sthiannopkao S, Kim K W. The relationship of climatic and hydrological parameters to surface water quality in the lower Mekong River[J]. *Environment International*, 2008, 34(6): 860-866.). We also added this reference. 6. The experiment generates the transfer and transformation mechanisms of non-point source pollution from a micro level. We assesses the impacts of drought on the surface water quality in Nenjiang River from a macro level, so we don't think the title needs to provide a location. 7. In figure 2 and 3, the y-axis are Ammonia Nitrogen and Nitrate Nitrogen. We deleted the ambiguous words "Change". We will consult you some questions in our later research, that will improve scientific research level in our research team. I'm sorry about it will take you a lot of time. Should you have any questions, please contact us without hesitate. At last, thank you very much for your carefully work. With best wishes, Binbin Huang

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