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Vegetation response to upstream water yield in the Heihe river by time series analysis of MODIS data

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By Jia et al.

Reply to comments from Referee #1

1. Figure 1 needs give the coordinate information. The name of the Ejina Oasis has been written with wrong format in Figure 1.

Answer: We have added information of latitude and longitude in Fig 1. Typo in the name of Ejina Oasis was corrected too.

2. The name of the Ejina Oasis is normally used for the whole natural oasis in the lower part of the Heihe River Basin. The ROI mentioned in this manuscript is the core part of the Ejina Oasis. So I suggest that the authors can call the ROI as the center Ejina Oasis or the core Ejina Oasis.

Answer: We will use ‘central Ejina Oasis’.

3. The stream flow of the Zhengyixia hydrologic section is the crucial driving factor for the vegetation dynamics of the Ejina oasis. The data collected are just during 1980 to 2004. There are continuously abundant stream flows during 2005 to 2009, which will affect the vegetation cover changes.

Answer: Constrained by data policy we could not get recent years’ data. We could get data upto 2005 which have been included in the analysis.

According to the collected information from different sources (internet, internal report etc), stream flow through Zhengyixia to the down stream area of the Heihe river basin has significantly increased since the water allocation policy was made in 2000. From our results (Fig. 12) it is obvious that the vegetation conditions have improved accordingly in these recent years. However, we could not figure out the yearly and monthly numbers quantitatively during 2005 and 2009 according to such information. We are expecting to do more analysis on most recent year’s conditions in further studies if further stream flow data are available.

4. In pages of 4193 and 4194, the correlation analysis between NDVI and stream flow indicates good relationship. But there is no significance level analysis. Back to the third problem, correlation analysis is just made during a period of 5 years. Whether is it trustworthy?

Answer: We have added one more year’s data in analysis according to data availability. The analysis was done over 7 years for yearly analysis (previous year’s streamflow vs. current year’s NDVI), while monthly analysis are for 6 years periods. We agree that the results would

be more reliable if the analysis could have been done over longer period providing the data are available. The significance was also calculated for both cases which are 0.01.

We intended to show that in the limited period we could study two different patterns emerged and that these two patterns relate to different conditions. We do not claim these results would apply to observations over a long period of time, we are just explaining what we have observed in the seven years of the study.

5. The vegetation in Ejina oasis is rare and clump distribution. NDVI value may be influenced by soil background especially in arid region, the Soil-Adjusted Vegetation Index (SAVI) or Modified Soil-Adjusted Vegetation Index may be a better vegetation index.

Answer: We agree the referee's opinion and also thinking to use MSAVI to do the analysis in further study. However, results and conclusions using NDVI can still be acceptable since the analysis was done for multiple years' trends for each pixel.

6. Standardization would be performed for the figures of the manuscript. The main problem is with different sizes of fonts.

A: We have applied the same size of font in all the figures.