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

hess-2010-137

By Jia et al.

Reply to comments from Referee #2

We appreciate very much the useful comments from referee 2, our answers are given below corresponding to each comment (reviewer's comments are in *italic* font).

The paper provides an interesting analysis of the relationships between the vegetation dynamics of Erjina oasis to the precipitation and river runoff of the Heihe river. In general the analysis is correctly carried out and where relevant adequate explanations to the observed vegetation patterns in terms of NDVI are given.

It is however noticed that one related previous study likely known to the authors was not mentioned in the paper:

- X. Jin, M. Schaepman, J. Clevers, Z. Su, G. Hu, 2009, Correlation Between Annual Runoff in the Heihe River to the Vegetation Cover in the Ejina Oasis (China), Arid Land Research and Management, 24: 1, 31-41.

It would be very helpful to provide a comparison between the findings of the present study to the above one.

Answer:

We have included this reference and made comparison.

Specific comments:

P5L6-7: 'Once ..., it can be used to gaps generated by removing the cloud-contaminated observations.' is not comprehensible and needs to be modified.

P12L7: 'reconstruct' -> 'reconstructed'

Answer:

The above two points were corrected.

P18L25-26: 'Here the temperature sum was calculated using a generic threshold of 10 _C.', the reason for this temperature threshold of 10 degree should be explained or cited from literature. There have been previous studies that suggested for other areas other values.

Answer:

We have added appropriate references in the text.

P19L1-2: it was stated that "Vegetation development and green-up in 2000 was clearly limited by the rather large temperature sum, the largest observed during the five years considered in this study.", this does not appear true when looking at Fig.8 where NDVI in 2000 is not smaller than other years, it appears warmer in earlier months in 2000 which may

facilitate earlier growth. Since the area is water limited and not energy or temperature limited, the explanation might be for the wrong reasons.

Answer:

We revised our statements to make clear that we were analyzing the phase value (i.e. the time to peak green-up) and not the actual value of NDVI.

P19L18: intensive -> intensity

Answer:

It was corrected.

P20L2: “which could be degraded trees.” Needs more explanation – what are degraded trees, why do they have maximum NDVI in October and November? What are the evidence for these?

Answer:

We are only explaining the meaning of colors in terms of time of peak green-up. We have eliminated the reference to the degraded trees.

P21L29-21: “In particular, the positive anomalies in these two years occurred in the second half of the year when vegetation does not extract soil water, which most likely allowed ground water to be replenished sufficiently.” This is too much speculation - why no transpiration in 2nd half year? Is there any evidence.

Answer:

We have completely re-written this paragraph which we hope explains now the relation between the vegetation development and hydrological conditions in 2000 and 2001.

P23L24-25: “Deepening from 2.5m to 3m ...” -> “Deepening from 2.5m to 3m in groundwater level ...”

P26L28: “Heieh river” -> “Heihe river”

P27L29-30: Roerink et al., is a repetition.

P28L25-26: Wen et al., is also a repetition.

Answer:

All were corrected.