

Interactive comment on “Impact of elevated precipitation, nitrogen deposition and warming on soil respiration in a temperate desert” by Ping Yue et al.

Ping Yue et al.

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Reviewer 1 The effects of elevated precipitation, N deposition and warming on soil respiration was analyzed in a temperature desert based on 2-years data. Its valuable to promote the research on the response of soil respiration to climate change in dry land. But this manuscript needs major revision before publication. Response: Thanks very much for your revision. We accept and have made the changes requested.

Detailed comments: 1. Fig 3 showed the diurnal variation of Rs during one sun day and one post-rain day, so the diurnal pattern of Rs in Fig 3 may not represent the diurnal pattern of Rs across the whole year. If not, the measured Rs during 10:00-

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12:00 may show large difference with the daily average of Rs and further failed to show the effect of treatment on Rs for everyday in 2014-2016. It may be better to show the diurnal pattern of Rs at different seasons. Response: Thank you for your comment. Diurnal variations of Rs were only measured from March to September in 2015, March, April and July in 2016 (Fig.1S.). Firstly, we have also corrected a 'wrong' description in Fig 3 in the original manuscript. Now the Fig 3a and b have shown the diurnal variation of Rs during extreme drought (continuous high temperature drought) rather than one normal sunny day, and the Fig 3c and d have shown the diurnal variation of Rs during an extreme wet day (with daily precipitation 33 mm) rather than one small post-rainy day. We found that the diurnal average of Rs were closed to the observed value during 10:00-12:00 from daily change observations in 2015 and 2016, except in July 2015, (Fig.1S. J). Therefore, this supported the effect of treatments. Please see lines 147-149. Thanks again.

2. All gas samples were taken at 10:00-12:00 in everyday, however, the warming effect on soil temperature is not obvious during this sampling time (the obvious warming effect on soil temperature occurred at midday and afternoon time, fig 3a). So the samples during 10:00-12:00 in this study may failed to catch the real warming effects on Rs. Response: Yes, a varying effect on Rs was observed by warming in Fig 3. The data came from extreme precipitation and drought events mainly, which may overestimate the warming effect on Rs. The Rs can be inhibited at high temperature and low humidity, a common phenomenon in the summer; and warming can reinforce this effect in Fig 1S. j, l, n and t. However, our results could represent the warming effects on Rs in spring (e.g. April) and autumn although high temperature reduced Rs, because the observed values on the diurnal average of Rs in warming plots are close to the real values of Rs during 10:00-12:00, except some extreme precipitation and drought events that in summer. So the samples during 10:00-12:00 in this study could catch the mean warming effects on Rs as a whole. We also have made further discussion in the revised text. Please see lines 299-307.

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<https://www.biogeosciences-discuss.net/bg-2017-465/bg-2017-465-AC3-supplement.zip>

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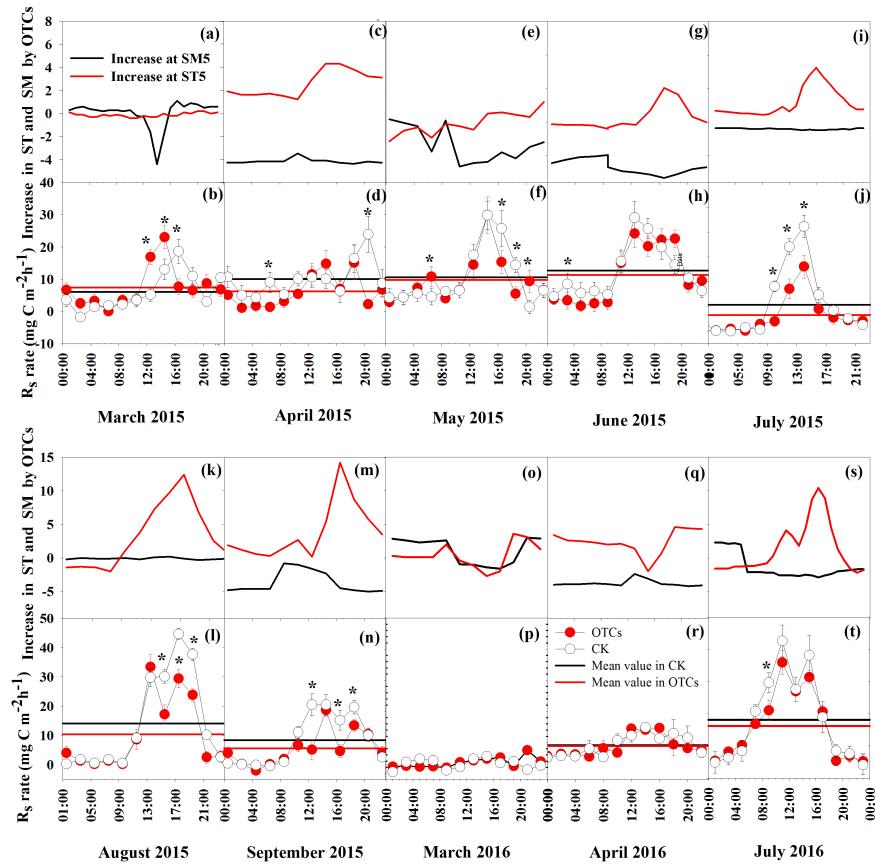


Fig. 1.