

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 R_s during one sun day and one post-rain day, so the diurnal pattern of R_s in Fig 3 may can not represent the diurnal pattern of R_s across the whole year. If not, the measured R_s during 10:00-

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12:00 may show large difference with the daily average of R_s and further failed to show the effect of treatment on R_s for everyday in 2014-2016. It may be better to show the diurnal pattern of R_s at different seasons. Response: Thank you for your comment. Diurnal variations of R_s 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 R_s 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 R_s during an extreme wet day (with daily precipitation 33 mm) rather than one small post-rainy day. We found that the diurnal average of R_s 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 R_s . Response: Yes, a varying effect on R_s was observed by warming in Fig 3. The data came from extreme precipitation and drought events mainly, which may overestimate the warming effect on R_s . The R_s 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 R_s in spring (e.g. April) and autumn although high temperature reduced R_s , because the observed values on the diurnal average of R_s in warming plots are close to the real values of R_s 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 R_s as a whole. We also have made further discussion in the revised text. Please see lines 299-307.

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Please also note the supplement to this comment:

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

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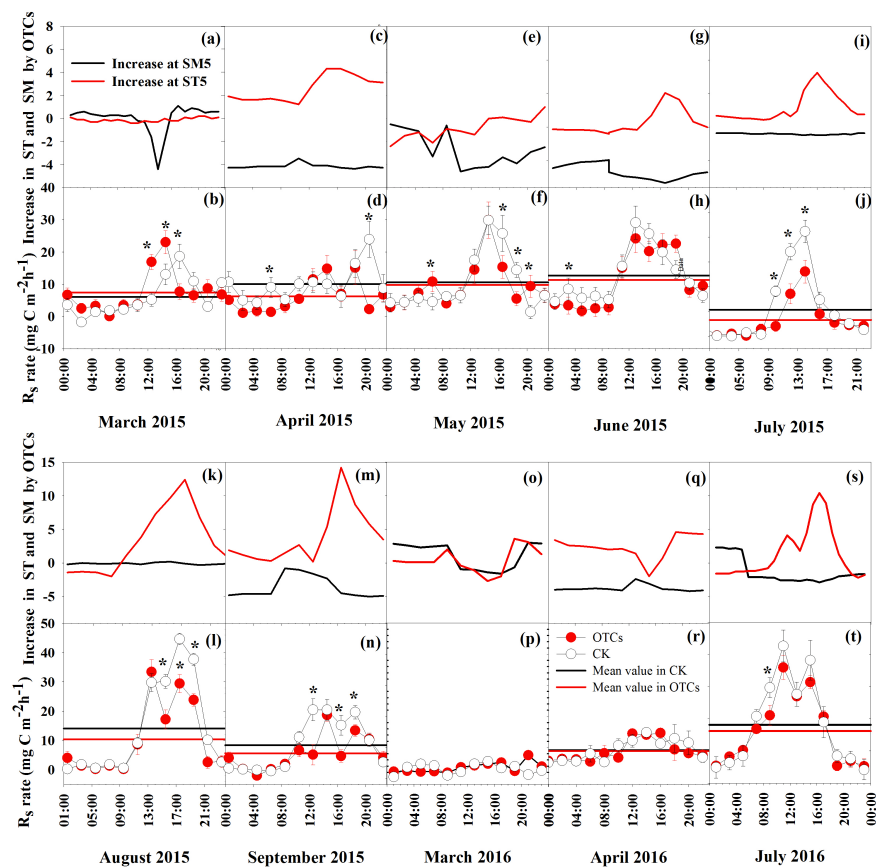


Fig. 1.