

Interactive comment on “Impacts of extreme precipitation and seasonal changes in precipitation on plants” by M. J. B. Zeppel et al.

KL Holland (Referee)

kate.holland@csiro.au

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This paper reviews 16 seasonal and eight extreme rainfall manipulation experiments to draw conclusions about how altered rainfall patterns affects grassland, shrubland and forest vegetation. The review could be improved by using a consistent comparison metric such as the climate aridity index (PET/P) to compare sites. Mean annual precipitation (MAP) alone is not a good indicator of plant water availability. Comparison of seasonal or monthly PET/P ratios may also provide insight into the plant responses to seasonal and extreme precipitation patterns. Several of the studies showed that soil water content (SWC) was a driver of plant response, however there is little discussion of the role of soil type or description of site soils in determining soil responses to rainfall. The review is limited to experimental studies of rainfall manipulation, however

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this is not clearly stated in the title or introduction. Value could be gained by inclusion of studies in natural ecosystems where the study period occurred during drought or altered rainfall seasonality. This could expand the review to include altered rainfall patterns where annual totals increase.

Specific comments It is not clear from where the hypotheses contained in Box 1 are derived. Are they from Brzostek et al. (2012)? The conclusions of the review appear to rely heavily on the six studies in Table 3 and Figure 2. Is there value in referring the reader to Box 1 during the conclusion section? Could the studies in Tables 1 and 2 be summarised in a 3D plot of growth response (+ or -), seasonal change and PET/P for each biome and climate classification? Even the qualitative nature of this plot would help the reader to compare these studies. Title, abstract, introduction: please emphasize that the review is limited to experimental rainfall manipulation studies. Ln 69 change to ‘individual droughts.’ Ln 78 change to ‘links between soil’ Ln 92 change to ‘knowledge of the’ Ln 139 please define SWC Ln 145 please clarify whether Box 1 is derived from Brzostek et al. (2012) Ln 282-294 what role does soil type play at these sites? Ln 301 change to ‘in Africa reported’ Ln 339-341 sentence incomplete Ln 343-344 could this also be due to their adaptation to drought? Ln 369 change to ‘particularly trees’ Ln 406 change to ‘had a larger positive impact’ Table 3 MAP, Co and KS are not defined.

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