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Interactive comment on "Inter-annual precipitation fluctuations alter the responses of above- and belowground biomass to water and N enrichment" *by* D. L. Kong et al.

Anonymous Referee #1

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General comments

This paper reports some interesting results among years from a careful experiment in Eurasian grasslands. The paper is not really testing new ideas around water and nutrient limitation in semi-arid grassland communities, but exploits a major rainfall difference among years to leverage additional interpretations. This is an interesting opportunity and maybe more could be made of it in terms of the types of conclusions other studies make from short-term experiments. While the experimental design appears robust if the authors are going for one small location I would like to see some detail around this site (e.g. pre-treatment variability on experimental site) and a stronger context for this site representing a more widespread ecosystem. While the text could be shortened

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a little (see example suggested below)the analyses, Tables , and Figures all seem apprpriate and are of good quality.

Specific comments

The Introduction considers the role of extreme events, but less so the role of variation in "inter-annual precipitation", which is in the title of the paper. The reader is left wondering is the paper going to be about an extreme event or more just variation among years. Authors need to think about emphasis here - see my comments below around clarity of extreme events.

The study focuses on an experiment that is subject to an uncontollable across all treatments among years (precipitation). However, little is said about whether there is another uncontrollable across treatments among years (nutrients). Nutrients could vary among years through dry or wet deposition (for example, through high precipitation) or through some effect of changes in soil moisture among years on nutrient mineralisation. I would like to see some consideration of this topic in the Introduction. In fact it is one of these, nutrient leaching/loss, among years that gives the more surprising result from this study. This is the basis for arguing maybe experiments for a biome should run long enough to characterise the decadal level fluctuations found at a site.

Detailed comments on text

Page 13429 Line 6 Delete "changes of" Page 13430 Line 26 Surely must read "individual rainfall event size" Page 13431 Line 9 In what way is your ca. 500 m2 study area representative of the Eurasian steppe? Your location is not random and you only have one location. I would drop the word representative Page 13433 Line 11 Why did you average biomass across the four sampling dates per year? Page 13434 line 15 Now I see the focus is not on one extreme event, but a number of large events. Page 13436 Line 18 Now we see large rainfall events but extreme rainfall events in the next line. What is meant by large versus extreme, and then what is typical? Page 13437 Line 16 I dont find the sentence starting "To illustrate, —-" that informative. It does not

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provide a clear link between the previous and next sentence Page 13437 Line 23 Now its an extreme rainfall event not events Page 13438 Line 4 Can you integrate your data on soil nutrient availability through time in the Results to support your view in the Discussion Page 13439 Line 3 Is it not possible in 2008 that plants were not N limited so didnt increase roots to improve uptake, but just increased above ground growth to get height. Page 13439 Line 6 Needs rewording Page 13440 Line 3 But on Page 13434 Line 14 it gives an average amount per event???

Interactive comment on Biogeosciences Discuss., 10, 13427, 2013.