Biogeosciences
Discussions

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Interactive comment on "Recovery dynamics and invasibility of herbaceous plant communities after exposure to fifty-year climate extremes in different seasons" *by* F. E. Dreesen et al.

Anonymous Referee #2

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In Biogeosciences Discuss., 10, 1–27, 2013, the Dreesen et al. present mortality, biomass, and invasibility data for artificially assembled three-species plant communities after drought and heat events in different seasons. The paper is generally well written, the topic timely and novel. I find the experiment well-designed and (mostly) well analyzed, although I recommend additional analyses with regard to the invisibility part and have some question on the applied ANOVA's. My major concern, however, is that there is no link to biogeochemistry in this paper except for some speculations at the start of the discussion which are not backed up with any data. Therefore, my impression is that this paper will make a valuable contribution in a journal specialized in community ecology or vegetation science, but seems out of place in Biogeosciences.

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Interactive Discussion

Discussion Paper

Yet I leave this decision to the editors and rate the paper not with regards to this aspect. - I find the analysis of the invasibility data interesting, but not yet sufficient to back up the conclusion of no major changes in the community composition beyond transient effects: The Euclidian distance within two groups can be exactly the same yet species compositions can be completely different. The same is true for CSR-scores. A change in species composition sustained over two years following the drought events, however, would be quite important and seems likely when looking at the species biomass of the species initially planted. Ordination techniques can illustrate changes in community composition, and ANOSIM or MRPP can tell if the compositions between groups differ signifcantly. - Page 4/ Line 8: I recommend Hughes et al. 2007 Ecology Letters for further reading. In general, references should be sorted chronologically. - 4/ 26: What would be the opposite event? Grasses dropping out our shrubs invading a grassland? - 7/ 2: The shelters appear small and high, what about rain coming in from the side? - 9/ 1: why Euclidean Distance? It is quite sensitive to rare species. Bray-Curtis is more often used in vegetation science. - 9/ 10: As far as I understand the design of the experiment, I would expect a two-way ANOVA with timing of the drought and drought treatment as fixed effects. What about the blocking of the single pots, how was it acknowledged in the analyses? - 14/ 17: The reduction in biomass by the second year is interesting, yet I have the impression that it cannot be related to the drought in the previous year but rather to overall growing conditions in 2010 as all plots, even the controls, show a similar reduction in biomass. A discussion of the differences in ambient growing conditions would also be helpful for the evaluation of seasonal differences in drought effects. I miss a discussion if the developmental stage is leading to different responses among seasons, or if it is simply a difference in realized drought severity (e.g. comparison of outside weather conditions and the soil moisture availability). - Fig. 1: Information for the treatment year should be added here. - Fig. 3: In addition, the total biomass of invaders would be interesting, as the number of species does not give information on the importance.

Interactive comment on Biogeosciences Discuss., 10, 15851, 2013.