

## ***Interactive comment on “Soil responses to manipulated precipitation changes: A synthesis of meta-analyses” by Akane O. Abbasi et al.***

**Feike Dijkstra (Referee)**

feike.dijkstra@sydney.edu.au

Received and published: 3 March 2020

In this paper Abbasi et al. summarises 16 meta-analyses about the effects of decreased and increased precipitation on 42 soil variables. This paper highlights the existence of a large number of meta-analyses, and highlights their consistencies and discrepancies, but unfortunately does not go much beyond that. Unlike what the title suggests, this is not a synthesis, but merely a summary, which is unfortunate. It provides some research gaps (e.g., lack of data on nitrification, denitrification and fixation), but even there, the authors do not really provide a rationale for WHY more information on this is needed. I also disagree about the statement in the abstract that “rates of processes underlying these variables are less frequently covered” than pools. Indeed, respiration rates (Figure 1) have some of the largest observations compared to some

C1

of the pools.

I was further disappointed that no distinctions were made that go beyond effects of decreased and increased precipitation. It is well known that a large number of the 42 soil response variables listed here are quite dynamic in time and depend not only on the overall relative decrease or increase in precipitation, but also on timing, duration and frequency. I believe different soil responses to changes in precipitation among studies could for a large degree be described to differences in intensity and frequency, and I think this is a missed opportunity for discussing these issues in greater detail.

It was further unclear if only field studies were included when extracting the data from the 16 meta-analyses. I know some of the meta-analyses did include soil laboratory incubation studies, but I am not sure about all 16 meta-analyses. I can imagine that some of the soil variables would respond quite differently depending if they were measured in the field, greenhouse, or lab (and with or without plants).

Other comments: I was unclear what the difference was between “root biomass” and “belowground biomass” (Table 2). How are they different? l. 110: I guess strong agreement is not surprising if the same data are used for different meta-analyses. How much overlap in data used does there exist among the meta-analyses? l. 234: “humidity affects P deposition”. How? I thought most atmospheric deposition of P was in the form of dry deposition. l. 268-272: I don’t believe microbial community responses to precipitation changes are as clear as suggested here, and probably strongly depend on timing, intensity and frequency of the precipitation manipulation.

---

Interactive comment on Biogeosciences Discuss., <https://doi.org/10.5194/bg-2020-30>, 2020.

C2