

## ***Interactive comment on “Using Respiration Quotients to Track Changing Sources of Soil Respiration Seasonally and with Experimental Warming” by Caitlin Hicks Pries et al.***

**Caitlin Hicks Pries et al.**

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We agree that our attribution of changes to ARQ to different substrates is speculative. We added this sentence to the manuscript to highlight the uncertainty: "We caution that direct experimental evidence of how ARQ changes with sources is needed before our inferences of substrate use can be proven." we also now report ranges of ARQ values for each substrate type in Table 1.

We added the height of ambient air sampling (0.5 to 1 m aboveground).

We added a citation for the atmospheric concentration of oxygen.

C1

We changed enriched and depleted to higher/greater and lower when referring to delta values. We rewrote that results paragraph with better parallel construction of the sentences. Since these were mixed model multiple regressions, we do not have traditional ANOVA tables to report.

We fixed the table number.

The suggestion that we investigate the effect of the warming on temperature sensitivity was a great one. We re-ran our linear models of ARQ and  $^{13}\text{CO}_2$  vs climate (soil T or VWC) with a climate by warming treatment interaction, which improved the model in all cases except for one ( $^{13}\text{CO}_2$  vs VWC). The reviewer was correct in stating that this was a missed opportunity. These new analyses make a much stronger case for the experimental warming treatment affecting the substrates being used to fuel soil respiration. We have thus expanded our discussion section to include more about how warming and soil moisture can affect root respiration and substrate utilization.

We added the sample size ( $n=4$ ) for the incubations. We did not have  $^{13}\text{C}$  values as we had issues with our Picarro at that time.

We reworded line 242.

We added your comment about advection possibly leading to erroneous diffusive fractionation corrections to the manuscript.

The data (doi:10.15485/1596312) are available on ESS DIVE now.

We added a range of RQ values for the molecules in table 1.

We have added sample sized to all the captions of all tables and figures.

In figure 1, we chose to keep the lines connecting the ARQ points as the point of figure 1 is to show how the ARQ and  $^{13}\text{C}$  patterns are similar. We added the fit statistics to the caption.

In figure 2, we changed the x-axis so they are the same for both panels, and, as

C2

requested, we include all the data points for the ARQ data as well.

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Interactive comment on Biogeosciences Discuss., <https://doi.org/10.5194/bg-2019-232>, 2019.