Biogeosciences Discuss.,
doi:10.5194/bg-2016-341-AC3, 2016

Biogeosciences Discussions
Open Access
EGU

Interactive comment on "How many measurements are needed to estimate accurate daily and annual soil respiration fluxes? Analysis using data from a temperate rainforest" *by* Jorge F. Perez-Quezada et al.

Jorge F. Perez-Quezada et al.

jorgepq@uchile.cl

Received and published: 15 November 2016

Response to Anonymous Referee #2

There are a couple of points that should be given some attention: 1) I agree that the issue of daily measurements is still an open question. You mention that most studies take samples in the morning. Could you elaborate for the reader as to why most studies have chosen this time? Also, you conclude that the more appropriate number of samples taken for an effective sampling strategy should be a minimum of two samples per day (one day-time and one night-time). I realise that you propose an

Printer-friendly version

Discussion paper

assessment at the beginning of each study but could you give a general approximation (time window) as to when those two samples should be taken? For example, should they be taken between 7:00-12:00 and 19:00-23:00?

R: As stated in the manuscript, “Davidson et al. (1998) found that their measurements made between 9:00 AM and 12:00 PM adequately represented the average daily Rs flux in a temperate mixed hardwood forest, although this conclusion was derived from intensive measurements made on only two consecutive days.” We found now that Luo and Zhou (2006) made a similar recommendation (making measurements between 9:00-11:00), based on other studies. We believe these suggestions spread out and became a rule of thumb. It could also be due to practical reasons, regarding the use of normal working hours. Luo, Y. & Zhou, X. (2010). Soil respiration and the environment. Academic Press.

In fact, we found that a minimum of two samples per day (one day-time and one night-time) was an effective strategy. Because we defined ‘day’ between 7:00 and 19:00, a good way to start would be to take samples between 7:00-10:00 and 19:00-22:00. But, this depends on the latitude of the site, as sunrise and sunset occur at different times of the day. We could add the recommendation to test with the first three hours of the day and the first three hours of the night. However, this should be part of the intensive sampling that we already suggested to do at the beginning of the study.

2) Only 3 chamber measurements were used for this study. Although you are not specifically looking at the spatial variation, I think some discussion needs to be given on the number of samples necessary when advising other researchers on sampling protocols.

R: We think we should not make recommendations on the number of samples to represent the spatial variation, because this is not our focus and other papers have addressed this issue more deeply. We could though add references to these works, as the one suggested by reviewer #1 (Davidson et al. 2002).

Specific science and written points: Pg 3 line 9: ‘were’ instead of ‘where’ Figure 2 and 4: Simply reiterating the previous reviewer. Make sure the y axis and secondary y axis are labelled correctly and include the soil water units in the text and graphs.

R: All these points have been corrected.

Interactive comment on Biogeosciences Discuss., doi:10.5194/bg-2016-341, 2016.

Printer-friendly version

Discussion paper