

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.

Anonymous Referee #2

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The topics raised in this paper are very relevant and informative for researchers planning soil respiration measurements. When comparing CO₂ fluxes among different studies it is essential that a standard protocol for measuring daily and annual CO₂ is implemented. This manuscript is well written and tackles some of the uncertainties and questions that many researchers encounter when planning field work/ field campaigns. Using an extensive data set, the authors address these specific questions: 1) to assess the performance of estimating daily Rs fluxes based on different numbers of measurements per day 2) to compare the performance of estimating the annual Rs flux using linear vs non-linear interpolation or modelling based on different number of

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measurements per year and 3) to analyse the effects of including night time respiration measurements on the accuracy of the estimations of daily and annual Rs.

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 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?

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.

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.

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