

Interactive comment on “Does soil moisture overrule temperature dependency of soil respiration in Mediterranean riparian forests?” by C.-T. Chang et al.

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General Comments

Chang et al. present an important metric utilizable by the modelling community, in a simple and careful way. As pointed out in the paper, a soil moisture threshold is likely to be site-specific, making this data from a Mediterranean riparian forest both novel and important. The structure is logical, and the figures are clear and precise. There are a few surprising omissions from the references though (see below).

Specific Comments

C4614

It was my understanding that long-term global modelling studies do use a soil moisture correction factor, and do not rely solely on a temperature function to derive heterotrophic soil respiration, as stated on P7993, In:18-19. Whilst I agree that the way in which soil moisture is allowed to influence model output can be improved, it does exist. In fact, there is some debate on the varied methods used to derive the dynamic soil moisture correction factor- parabolic, linear etc. (see Falloon et al., (2011) for a comparison between different soil moisture-respiration functions). Maybe you mean that, currently, there is no consensus on the ‘best’ soil moisture correction factor, or that as this parameter is calculated in the same way over time (see Mayano et al., 2012), there is no predictive power for those systems where changes in precipitation regimes and infiltration affect biogeochemical cycling?

I don’t agree that the manuscript should be re-written to herald NPP as the primary driver of SR, as opposed to temperature and moisture: NPP is in turn controlled by temperature and moisture, so this manuscript is not wrong in its stance. Fairly arbitrary chicken-and-egg paradigm.

What is the error in the SM data? Is each data point an average of multiple readings? If so, what is the variation?

How much do the PVC tubes (planted 5months in advance) affect normal infiltration of soil water? (even with the two small, mesh-covered holes)

P7992, In:25- where is the reference for SR being 60-90% of total ecosystem respiration?

P7993, In:18-19- examples of studies?

The temperature was measured at the same fixed depth at all sites; was the depth-temperature gradient the same amongst the different levels, or is it possible that this could also change, akin to the water table depth? This would have implications for the current interpretations.

C4615

Technical Corrections

P7995, In:14- 'acidic', rather than 'acid'.

P8000, In:12- change 'till' to 'to' or 'until'.

P8000, In:23- change to 'sharp increase'.

P8002, In:18- Do you mean 'the inhibition of diffusion'?

P8003, In:7- 'total' is redundant in this sentence.

P8003, In:Title- 'confounding' should be in the 'confounded' tense.

References

Falloon, P., Jones, C.D., Ades, M. and Paul, K. Direct soil moisture controls of the future global soil carbon changes: An important source of uncertainty, *Global Biogeochemical Cycles*, 25, 2001.

Moyano, F.E., Vasilyeva, N. Bouckaert, L. et al. The moisture response of soil heterotrophic respiration : interaction with soil properties, *Biogeosciences*, 9, 1173-1182, 2012.

Interactive comment on *Biogeosciences Discuss.*, 11, 7991, 2014.