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Hydrology and Earth System Sciences Discussions

Interactive comment on "Simple physics-based models of compensatory plant water uptake: concepts and eco-hydrological consequences" *by* N. J. Jarvis

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I would like to thank Dr. Schymanski for his additional comments. These have prompted me to make three further small modifications in the paper, which should help to avoid any possibility of misunderstanding. My responses to these comments are as follows:

1. I can't really understand why there should be any confusion concerning the definitions of Ep(s) and Ep(t). They were clearly defined (as potential soil evaporation and potential transpiration respectively) in connection to equations 22 and 23 (lines 5 and 6

on p.6803). I also think that it should have been clear that I am talking about soil evaporation on lines 12/13, but to make absolutely sure I will add the word 'soil' between 'potential' and 'evaporation' (effectively defining Ep(s) a second time).

2. The text on page 6806 (lines 9 to 15) and the associated data in table 2 are only meant as background information to broadly characterize the climates at the different sites in terms of precipitation and evaporative demand (the same is true of the text on p.6811, line 5, which is just meant as a general comment). But I agree with the referee that it is best not to use different terms on page 6806 (lines 9 to 15) and in table 2, so I will change the table heading in table 2 from 'potential evaporation' to 'potential evapotranspiration'. In the modeling, potential evapotranspiration is, of course, defined by equations 22 and 23.

3. Equilibrium evaporation was fixed at a constant value for the first case study (section 3.1, p. 6803, line 9) and was calculated with the Priestley-Taylor equation for the second (section 3.2). An inexact use of terminology may have been slightly confusing here. I will replace the words 'potential evapotranspiration' with the words 'equilibrium evaporation' on page 6806, line 15. Please note that I did not think it necessary to give the actual equation for the Priestley-Taylor formula, as it is so well known.

4. Yes, the leaf area index does vary across the aridity gradient in a predictable way. It is described in the paper (see page 6807, lines 6 to 14) how leaf area index was varied as a linear function of precipitation based on literature data (please note that the equation given by Dr. Schymanski is not quite correct as it neglects the Priestley-Taylor coefficient αt, which also depends on leaf area index; see equations 23 and 25).

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