

Interactive comment on “Variability in riparian zone potential and actual evapotranspiration in a 1st order agricultural catchment in Southern Ontario, Canada” by R. M. Petrone et al.

Anonymous Referee #1

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General comments

The paper describes the difference in actual evapotranspiration (AET) measured using lysimeters in the upper and lower part of a riparian zone. The differences measured in AET for the Upper and Lower part of the basin are attributed to differences in wind speeds and soil moisture status.

This review was prepared before seeing the review by referee #2, as such some of the remarks made by referee #2 are repeated here.

Although the paper aims to delude subcatchment differences in evapotranspiration, which is certainly an interesting research area, it seems to lack enough measurements at the appropriate scale. The paper generally lacks detailed description, thorough anal-

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ysis and needs rewriting. Uncertainty of the measurements and statistical differences are not discussed, and this seems a necessity to make it suitable for publication. A total of 8 point measurements (duplicate lysimeters of bare soil and vegetation in the upper and lower sites) seems not sufficient to draw conclusions on differences between upper and lower basin. It seems that the relation presented in Fig. 2 doesn't hold if just two of the points (possibly "outliers") are removed. Furthermore the differences in wind direction between the two sites presented in Fig. 6 do not seem to be significant. It is recommended that the Penman-Monteith approach is used as previously suggested by the second reviewer. The manuscript in the present form is not suitable for publication and I would at least suggest a major revision. Additional data would be necessary to illustrate the point made by the authors.

The first suggestion I would like to make to the authors is to include a reference to the project website including a virtual tour of the strawberry creek (<http://info.wlu.ca/~wwwgeog/special/strawberry/tour.htm>). Here relevant information and pictures can be found. On the website it is for example remarked that Strawberry creek is partly canalised, about a meter in width and that the area is drained by extensive tile drainage networks.

Specific Comments

Some specific comments are made on the manuscript simply to illustrate some of the problems with the current manuscript.

In the abstract (p. 266) include volume of weighing lysimeters (l. 4.), include values of AET to illustrate the differences between the upper and lower part of the basin.

P. 269 (l. 13) 320 instead of 3200. P. 270 (l. 8) remove "only". P. 269 (l. 24) 10-15 wide, meters? Pictures on the website seem to suggest a smaller strip.

P. 270 (l. 25) What is the surface area of the weighing lysimeter? Are these lysimeters actually large enough? P 270 What vegetation (l. 27) or plant (p.271, l. 3) grew on the

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weighing lysimeter? Was there a difference in the vegetation?

P. 272 (l. 20). “in vegetated areas with very small, or no, water deficits approximately 95% of the annual evaporative demand was supplied by radiation”. It is suggested by Fig. 4 that soil moisture contents actually changes considerably, is this therefore a relevant remark? In other words, doesn't the effect of soil moisture status on evapotranspiration needs a more thorough evaluation?

P. 274 (l. 19). Note the number of lysimeters used for each AET estimation.

P. 278 (l. 21). Based on the data presented, and the number of measurements, these conclusions seem to strong.

Fig. 1. It may be useful to indicate general wind direction. Fig. 2. 'FR' shouldn't this be lower? Fig. 2. It is odd to have an AET of 0 at the lower site and an AET of 12 at the upper site. Furthermore, removal of this point and the highest AET measured at the upper site would suggest a quite similar AET for lower and upper site. This is rather problematic. Fig. 3. Bars are not clear. Fig. 4. The soil moisture contents measured at 5 cm for both sites suggests different soil hydraulic properties. This is also noted by the authors (P. 277, l.2) but could these differences not be sufficient enough to explain the differences in observed AET? Fig. 5. Missing Legend Box (upper & lower sites). Fig. 6. Wind speed does not seem to be that different from this figure. A difference of about 2 m s⁻¹ in wind gusts (P. 276 l. 8 and again P. 278, l. 2) doesn't seem extraordinary, especially since this reviewer wasn't able to find the temporal accuracy of the wind measurement.

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