

Interactive comment on “Partitioning of soil water among canopy trees during a soil desiccation period in a temperate mixed forest” by M. Meißner et al.

Anonymous Referee #2

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General comments:

This is an interesting study exploring complementarity of plant water use in a novel way. It is generally well-written and I think it is appropriate for the journal, pending some clarifications and other suggested changes outlined below.

Specific comments:

1. Page 7 lines 21-22: For IsoSource “the fractional increment used in our model calculations was set to 0.1 ...”. If this means 0.1%, this is too fine an increment and the calculations would take a very long time. If this mean $0.1 \times 100\% = 10\%$, then this is too coarse and numerous possible solutions might be missed as discussed by
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Phillips & Gregg (2003).

2. Page 8 lines 23-26: Considerably more detail is needed for the data analysis methods.

a. How exactly was this ANOVA done for the water uptake fractions from the different horizons?

b. Was each feasible solution identified by IsoSource used as a replicate?

c. How many were there?

d. Large n values lead to statistical significance for even small fractional differences, but n is completely dependent on the choice of the Increment and Tolerance parameters.

e. Was a separate ANOVA done for each horizon? These tests are not independent since the water uptake values from the different horizons must sum to 1. Rather than multiple univariate tests of this sort, a multivariate test might have been used that would incorporate this non-independence.

3. Figure 5:

a. The same questions about the details of the ANOVA above apply here.

b. Distributions of source proportions from mixing models like IsoSource are often quite strongly skewed, making symmetric confidence intervals like mean \pm SD not very appropriate. Empirical confidence limits (e.g., 5th %ile to 95th %ile) may be better.

c. The means do not seem to always sum to 1. For example, for Fraxinus, the 0.3-0.5 m horizon contributes ~ 0.4 , the 0.5-0.7 m horizon contributes >0.7 , and the shallower horizons contribute <0.1 each, but more than 0. This appears to sum to at least 1.1.

Technical comments:

1. Page 2 line 23: Insert “rather” between “roughness,” and “than”.

2. Page 7 line 22: Change “uncertainty level” to “tolerance” since that is the specific
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parameter term used in IsoSource.

3. Page 12 line 3: Change “futher” to “further”.

4. Page 17 line 25: The Phillips & Gregg (2003) paper was published in *Oecologia*, not *Ecosystem Ecology*.

5. Page 27 line 2: I would suggest changing “Shannon index” to “Shannon biodiversity index” to clarify the type of data to which the Shannon index was applied.

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