

Comments on:

*Measuring precipitation with a geolysimeter*

By C.D. Smith et al.

General:

The paper is a useful contribution to the literature, in this case with the novelty aspect of using the area-integrating capabilities of geolysimeters as a snow measure to offset in part the high spatial variability of snow amount.

My comments are all of a minor nature related to the rainfall aspect, but might be taken into consideration in a revision.

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*However, the precipitation comparisons done so far have been more qualitative than quantitative due to the spatial separation of the geolysimeter and the measuring precipitation gauges.*

As noted in the independent comment, for the Bardsley-Campbell geolysimeter there was never at any time a spatial separation of the geolysimeter and the rain gauge. Is it really the case that in all other cited geolysimeter studies there was spatial separation between rain gauge and geolysimeter?

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Were the 30 minute well water levels recordings of the well water levels every 30 minutes, or the average of higher time resolution monitoring from the previous 30 minutes?

Fig. 2

The slope change in water level following the rain event in Fig. 2a is certainly a good argument for site discharge loss being the cause of the evident slight under-estimation of the rain event. However, is this possibly a time resolution effect? That is, the pore water pressure increase from surface loading is instantaneous for practical purposes but there will be some finite time (a few minutes?) before the site rainwater starts to depart as discharge after a sudden event. What was the duration of the rainfall event in Fig. 2a? If it was less than 30 minutes and water levels were recorded every 30 minutes, is it possible for the maximum rise of water level to have been missed due to the relatively coarse sampling interval?

Some comment might also be added as to the likely effect (or not) of 1 km spatial variation of rainfall, given that precipitation is a point measure and the geolysimeter is a spatial average. It is a pity that at least one more precipitation gauge was not in operation at the site, but presumably other measurements of closely spaced gauges in similar environments might be mentioned in this respect.

Some comment should be made about the cause of the declining trend in water level prior to the rain event – evaporation and / or net groundwater export from the site?

The zero point of the rainfall plot should be set to correspond with the start of the rainfall event

The rainfall representation in both plots of Fig 2 is confusing and should be converted to cumulative rainfall (no negative slopes).

Earl Bardsley