

Earth Syst. Sci. Data Discuss., referee comment RC3
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Comment on essd-2020-362

Anonymous Referee #3

Referee comment on "The hysteretic response of a shallow pyroclastic deposit" by Luca Comegna et al., Earth Syst. Sci. Data Discuss.,
<https://doi.org/10.5194/essd-2020-362-RC3>, 2021

Comegna et al. present an interesting dataset of soil moisture and suction and associated relationships over approximately one hydrologic year. As such, the manuscript is an interesting read and the data likely have utility for modelling. That said, the authors do not offer much in the way of suggesting potential uses of the data unless I just missed that somehow. There are also many issues to be addressed in revision. I provide specific comments below for consideration in revisions. In revision, I suggest the authors clearly address the value of the dataset beyond the presented use. Limitations should also be discussed.

Specific comments:

Abstract, Line 10: Consider changing "concern" to "include".

Abstract, Line 10: Rainfall is referred to as a height here and throughout the manuscript. Consider referring to it as a depth and change throughout.

Abstract, Lines 11-13: This entire sentence needs revision for clarity. For example, "...the installation at the same depths..." refers to installation of what specifically?

Abstract: In general, the abstract is not particularly informative and should be revised to more clearly explain what is being provided and of what potential use(s) that content serves.

Page 1, Line 27: The text "that prevents to reach" needs revision for clarity. The meaning isn't clear to the reader.

Page 1, Line 29, The text "If moving along one of these paths a reverse process is initiated" is awkward.

Page 2, Lines 33-34: What is the point of this text?

Page 2, Line 36: TDR should be defined here.

Page 4, Figure 3: The drawing of the soil moisture probes is misleading. From the text, they are either 10 or 40 cm long. 40 cm would be much longer than what is drawn. Also, Figure 3A is too small. It's hard to read.

Page 4, first line on the page: Consider changing "...concern the time period going..." to "...concern the time period from..."

Page 4, Line 60: The word "far" is not necessary here.

Page 4, Line 62: "...precipitations..." should be "...precipitation..."

Page 4, Line 62: Insert "by" before "warm and dry summer" to read, "...and by warm and dry summers."

Page 5, Line 80: What is meant by "...some layers locally miss..."

Page 5, Line 83: Can the text "get dry and fall" be changed to "...Leaf senescence occurs in October..." or something like that.

Page 5, Lines 86-88: This is a really long sentence and should be broken up a bit for clarity.

Page 6, Line 92: What is "altered ash"?

Page 6, Table 1: Need to define columns. Table should be able to be interpreted independent of text. Consider this for all tables in the manuscript.

Page 6, Lines 94-97: Need to describe methods for determining these soil characteristics.

Page 6, Line 100: How many paired probes in total? What was the spatial sampling design? A table describing the location of all of your probes would be very helpful. And, introduction says data pertain to 2011 and 2012. Are these different data?

Page 6, Line 102: What kind a rain gauge? More detail needed on this and the "Jet fill" instruments, other instruments as well. Manufacturer, etc.

Page 6, Line 104: Should "...has been installed..." be "...was installed..."

Page 6, Line 105: 7 TDR probes or 7 metallic rods?

Page 6, Line 111: 100 or 400 mm? That's a very large area for TDR measurements. More detail needed? Is this the same sampling area as the tensiometers?

Page 6, Line 119: That is not what the following section describes. The structure of the paper is difficult to follow. Maybe a header to describe lab experiments here?

Page 6, Line 121: 40 or 10 cm? Does z equal the center or the bottom of the tensiometers and TDR probes?

Page 6, Line 122: How might the different volumes influence the results?

Page 7, 123: How does this section relate to the field data collected? It would be good to be explicit here. Are these data included in your repository on Zenodo?

Page 7, Table 2 caption: What is "lowest water retention boundary" mean?

Page 8, Line 42: What do you mean by "cover"? Be more specific...litter cover, basal plant cover...?

Page 8, Lines 144-146: More detail on the local weather station is needed, since PET is referenced frequently.

Page 8, Lines 160-162: This section needs some revision for clarity and to point out "missing data" rather than "data lacks". Also, the period of missing data is nearly half of the time you are highlighting. Why did you choose these two probes and this time period if there is such a large data gap?

Page 9, Section 3.1: Should provide an overview sentence here or table that explains that A-H are referring to specific dates (e.g. A = January 1st).

Page 9: For the discussion on the various windows of time and associated trends, I think a graph of cumulative precipitation, ET, and soil moisture would be beneficial to the reader. Those allow the user to more easily see trends in wetting and drying in relation to water inputs (precip) and water losses (ET). I know previous similar studies have even looked at water input – evapotranspiration as a useful metric.

Page 9, Line 184: Units for “-1”?

Page 9, Line 186: Do you mean infiltration? If so, how about just saying that.

Page 9, Line 188: How is this threshold value determined?

Page 9, Line 190: How is the curve fit?

Page 9, Line 194: The text “...starts growing further and further...” – what does this mean?

Figures: For nearly all figures, the captions could be greatly improved to inform the viewer what is depicted. For example, the caption for the graphs in Figure 10 say nothing about what the different upper case letters represent. This same issue occurs in many of the captions. As another example, the inset figure for Figure 2 is not explained. Nearly all captions need substantial improvement for clarity.

Conclusions: Are the highlighted data consistent with the rest of the data?

Data Availability: The data structure is not described at all in the paper. The description is central to the utility of the data for future analyses and a core component of publishing in ESSD.