

Interactive comment on “Gully geometry: what are we measuring?” by J. Casalí et al.

Anonymous Referee #2

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General Comments The aim of this paper is to propose a measurement protocol for ephemeral Gullies for comparing the results obtained by different researchers. This topic is very interesting, because the lack of a standardized measurement protocol makes the results of volume of eroded soil, cannot be compared easily. The paper would improve if authors include analysis of proposed methodology with different gully geometry datasets.

Specific comments

* Page 325 Lines 20-23, the authors say “it is usually assumed that the width is defined by the imaginary line whose ends are located at both points of the two banks, where an abrupt change in slope is manifested.” The authors say the problem of presence of more than one points of slope inflection in one or both banks, it can use the concept used in stream geomorphology to determine the bankfull stage with the minimum width

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to depth ratio, bankfull represents in stream the breakpoints between in-channel and floodplain processes (see: NRCS 2007 Stream restoration design, Part 654. National Engineering Handbook. Department of Agriculture, Natural Resources Conservation Service; Pickup, G., and R.F. Warner. 1976. Effects of hydrologic regime on magnitude and frequency of dominant discharge. *J. of Hydrol.* 29:51–75.).

* Page 327 Lines 12-18, what criteria is used to determine the gully width in the figures 3b and 3c?.

* Page 328 Lines 6-9, “This same operation could be repeated in a multitude of other points x_i along the channel, thus obtaining the two width values of each new section (W_i).”, I don’t know how the authors obtain the two width values at each section, it could be the two width values of the reach.

* Page 328 Lines 9-10. “Finally, the average of the values W_i would define the effective width of the whole gully, W_e .” I think it’s better to use weighted average using distance between the adjacent gully cross-sections.

* It’s not clear for me the proposed methodology to calculate the gully width value when I haven’t the DEM prior to the appearance of the gully (DEM year n).

* The text of conclusions is very similar to abstract.

Technical corrections

* Page 324 lines 16-20, Change the sentence order “Rill erosion is produced in the form of numerous channels of a few centimeters in depth, distributed uniformly and randomly over sloping lands (Soil Science Society of America, 2015) and which can easily be obliterated by conventional tillage (Hutchinson and Pritchard, 1976). Also, permanent gullies are distinguished from ephemeral ones (Foster, 1986; Thorne et al., 1986; Casalí et al., 1999).”.

* Page 325, lines 2-3 “Rills, however, occur entirely on one single slope (Casalí et al., 1999); their formation is, therefore,…”.

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* Page 325, line 11 “ratio” instead of “quotient”.

Interactive comment on SOIL Discuss., 2, 323, 2015.

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