Hydrology and Earth System Sciences Discussions

Interactive comment on "Delineating riparian zones for entire river networks using geomorphological criteria" *by* D. Fernández et al.

D. Fernández et al.

diegofgrm@gmail.com

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C1 → the Authors need to specify/discuss that their hydrologically-meaningful zones are not all riparian sensu strictu (e.g. because in the middle of these surfaces it might be present even a village). In this sense, following the delineation phase it should be mentioned that a further processing to mask e.g. urban and/or to identify relevant ecological variables should be done. Without these processing they are more potential riparian zones than riparian zones de facto. I think the Authors are perfectly aware of this, but to be coherent with the riparian zones definition and characteristics listed in the Introduction (p.4047) this should be somewhere specified in the text.

We have decided to used the term "potential riparian zones" when referring to the

output of our deliniation method, instead of adding a new step for "masking" urban areas.

C2 → Few methodological steps in the second part of Section 2.2 are not fully clear or do not allow reproducibility as they are too vague (e.g. we reclassified original geological classes into broader ones and then we assigned them a numerical value: : :"). Some information must be here added to allow full method reproducibility.

We have rewritten the methods section to make it more clear and a logical sequence, including this section (2.2). However, regarding geological hardness we consider that the provided reference (Snelder et al., 2008) is enough and no further information is needed. Specifically, Table 1 in Snelder et al (2008) contains the information the reviewer suggested to include.

C3 → P. 4047 line 27: Avoid 'sharp', at the contrary environmental gradients in R.Z. are often gradual.

We have removed the adjective "sharp"

C4 → P. 4048 line 7: why 'external' disturbance regimes? They are not part of the riverriparian system? Clarify or eliminate.

We agree that the use of the adjective "external" is not justified and introduce confussion. We have eliminated it.

C5 → line 14: 'In this regard..' etc. As it is written this is a too general statement and can be easily subject to criticisms. Be more precise, e.g.-just a suggestion- by saying that 40 m is an averaged minimum buffer necessary to maintain eight relevant riparian functions, as calculated considering a number of buffer distances from published studies (in Sutula et al 2006, etc).

We have included the suggestion of the reviewer in the correspondent paragraph.

C6 → Line 29: I would avoid confusion using the expression biological 'community'

(word which refers to a precise organization level in ecology) followed by a general term as 'vegetation'. Use instead e.g. based on biota, or 'vegetation communities'.

We have replaced "biological communities" with "biota".

C7 → P. 4049 Line 19. Sentence should be cut/rephrased to be clearly readable.

That sentence has been eliminated.

C8 → Page 4051 Line 9-11: use full names of plants (Genus, species) Line 15: correct wrong position of open parenthesis. Add dot at the end of the sentence Line 27-.. is this approximation proposed by Ilhardt et al (2000)? clarify.

We have written full names of plants in the description of the study area. Also we have replaced

"As valley floor width is difficult to define for some valley morphologies, we used valley width at a height of two times the bankfull depth as an approximation, based on its correspondence with the first terrace (Ilhardt et al., 2000)."

With

"Valley floor width is difficult to define for some valley morphologies. Generally, the edge of the valley floor is located in the first terrace or other major sloping surface, which usually corresponds with the 50-yr flood (Ilhardt et al., 2000). At the same time, 50-yr flood corresponds on average to a flood stage of twice the maximum bankfull depth (Rosgen, 1996). Hence, we used valley width at a height of two times the bankfull depth as an approximation of valley width."

C9 → P. 4052 Equation 1: can you provide a measure of accuracy or fit of the equation? As it is now we have no information on how good this fit is.

The following paragraph has been added following sentence has been added:

"This model has been used in other recent applications (Benda et al. 2011) and it

C3751

was the only one available at the time of pursuing this study for the Cantabrian region. However, it should be noted that BFD estimates might present deviations from observed values ($p < 0,001$; $R2=0,12$), as BFD is highly sensible to local channel morphology (REF) and the present model only includes catchment area an mean annual precipitation."

Also results and discussions has been rewritten considering the fit of this model.

C10 → P. 4054 Line 1: Did you mean GIS techniques (tools) in general? As it is written now it looks as there is one fast technique, not cited. Correct accordingly.

That sentence has been eliminated.

C11 → Line 23: Specify that the cost layer requested to calculate the path distance was associated in your analysis to the slope; this is important because in other cases other variables can be used to represent cost layers.

The sentence has been rewritten as follows:

"A PD raster was derived using the PD tool in ArcGis software (ESRI, 2011). PD tool required the following inputs: the river network (polyline shapefile) to identify stream cells, a DEM (a 10-m DEM, in order to be comparable with the surfaces generated by the BFD approach) as a surface raster and a slope raster as a cost layer."

C12 → P. 4055 Equation 2: Which is the meaning of '100' at the denominator?

We agree with the reviewer, the denominator in Eq. 2 is dispensable and comparison with total area values is improved by removing it. Therefore, Eq. 2 has been changed as follows:

Minimum exceeding score = T50EA + GSEA

C13 → P. 4058 Line 1: avoid 'easily'. Line 22: specify membership to what.

We have removed the word "easily" in line 1. Regarding line 22 we have replaced "...

C3752

by assigning membership scores to each band…" with "… by assigning "membership to riparian zones" scores to each band…"

C14 → Figure 1. Scale bar is missing. Increase the size of the zoomed part, which is now almost a black dot in the upper left image. Is it possible to use colors instead of b/w for rivers? It would increase notably river network visibility.

Figure 1 has been modified accordingly to these comments.

C15 → Figure 4. right image. Correct legend using T50EA and GSEA

Old figure 4 (new figure 5) has been modified accordingly to this comment.

Please also note the supplement to this comment:
http://www.hydrol-earth-syst-sci-discuss.net/9/C3749/2012/hessd-9-C3749-2012-supplement.pdf

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 9, 4045, 2012.