

Interactive comment on “An algorithm for delineating and extracting hillslopes and hillslope width functions from gridded elevation data” by P. Noel et al.

Anonymous Referee #1

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In this paper, the authors develop a method to delineate individual hillslopes from DTM data, and to check the shape of these functions. The idea of the paper is good, but a number of parts of the paper are written in a rather unclear manner. For this reason, I recommend revisions to the paper before it can be accepted.

More specifically, my remarks are:

- There are a disproportionate amount of figures for the amount of text in the paper. The number of figures should be reduced to at the most 12. Furthermore, some parts of the paper need more explanation (see later). This will balance the paper better.

- Figure 3 is not referenced in the text.
- Abstract and introduction: commonest -> most common.
- Last sentence abstract: THE hillslope width function, THE entire watershed.
- Second paragraph introduction: the first sentence states "from the divide to the river segment". The sentence after states: "begins at the river segment". Please make consistent.
- Section 2.1. is very difficult to read. It is difficult to understand what exactly is happening. Please expand this section and provide a better explanation.
- Section 2.2.: why not use a threshold of zero meter? Even if a hillslope is slightly convergent (or divergent), it is still convergent (or divergent).
- Section 2.3.1.: which optimization algorithm is used? Please provide an explanation on how it is applied in this particular case.
- Section 4: what is "sinous" ?
- Please provide a color legend for figure 6. Also, from what I think (and from figure 1), pink is the color for a headwater hillslope. I do not understand how the headwater hillslope can be located where it is located in this figure.
- Figure 15: If a hillslope is approximated by a triangular shape, and if a model needs to be applied to it, how can the groundwater table discharge water into the stream if the width at the bottom is equal to zero? Water needs a nonzero width in order to be able to flow. Please justify this approach.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 8, 8865, 2011.

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