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Interactive Comment

Interactive comment on "A novel algorithm with heuristic information for extracting drainage networks from raster DEMs" *by* W. Yang et al.

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Authors described an interesting algorithm to define DEM flowdirection in flat areas. The topic is surely important and interesting.

In this short communication I am going to generally comment the paper without analyzing the manuscript as a reviewer.

The artifact DEM correction is a complex problem difficult to solve and the approaches described in literature can be grouped in the following three points:

1)flow direction definition in DEM without flat areas or pits; 2)flow direction definition in flat areas; 3)flat area and pit removal problem.

1) Literature is full of flowdirection methods and usually the main hypothesis is that the DEM is pit or flat areas free. There are single-flow methods (O'Callaghan & Mark, 1984; Jenson & Domingue, 1988; Fairfield & Leymarie, 1991; Costa-Cabral & Burges, 1994; Garbrecht & Martz, 1997a; Orlandini et al., 2003) and multi-flow methods (Freeman, 1991; Quinn et al., 1991; Lea, 1992; Costa-Cabral & Burges, 1994; Holmgren, 1994; Quinn et al., 1995; Tarboton, 1997; Pilesjo et al., 1998; Lindsay, 2003, Seibert & McGlynn, 2007) D8 is the common approach (implemented in ArcGIS) but can often provide wrong results (straight and parallel bluelines).

2) Concerning flow direction definition in flat areas the most common approach (implemented in ArcGIS) is described in Jenson & Domingue, 1988

3) Flat area and pit removal problem. This is a very important point. Pit and consequently flat areas, do not allow either to correctly define the flowdirection (causing straight and parallel bluelines) and to have a correct blueline altrimetric profile. This latter point is serious since the 5-10% of cells are usually affected by slope=0 value. There are some approaches available in literature...among others: Garbrecht & Martz (1997a,b) Grimaldi et al., 2007. In Nardi et. al 2008 a complete review and comparison among several methods are provided. One conclusion of this paper is that that effect of flat area removal approach overcomes the choice of the flowdirection method. If the analyst removes the flat areas he will have also a reasonable planimetric blueline representation.

Therefore, the general comment to the submitted manuscript: it is better to modify the DEM flat area elevation (in order to eliminate slope=0 cells) instead to propose a new flowdirection algorithm for flat areas.

In any case, I think that the paper could be of interest if Authors improve the manuscript adding:

- a better description of literature in the introduction; a better description of the problem to allow the reader to understand in which contest the proposed method can give an

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added value; a better description of the method. A simple, didactic case study (just few cells) would help to understand it; a better description of the results:...comparing if possible the application of the proposed approach with and without the application of a flat removal method; a better description of results in any case....in the manuscript the comparison is done just visually while some useful indexes can be used (see Nardi et al. 2008 and Santini et al. 2009).

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