Hydrol. Earth Syst. Sci. Discuss., 7, C42–C43, 2010
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Hydrology and Earth System Sciences Discussions

Interactive comment on "Identification and mapping of soil erosion areas in the Blue Nile-Eastern Sudan using multispectral ASTER and MODIS satellite data and the SRTM elevation model" *by* M. El Haj El Tahir et al.

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Received and published: 17 February 2010

The paper objective is the assessment of soil erosion by means of ASTER and MODIS imageries in the Blue-Nile Eastern Sudan. The relevance of the problem is clearly stated in the introduction and in the Section "Economic impacts". In Sections 2 and 3 the authors describe different processing steps applied to the choosen imageries. Here I need to raise several probematic issues: 1) Some elaboration products are not used in the subsequent sections, i.e. the calculation of NDVI and EVI does not find any further application in the paper (or it is very hidden). The authors should clearly explain

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the usage of this information or remove it. 2) The core of the paper is then found in Section 4, where the application of a supervised classification is described, based on 9 ASTER spectral data and 4 morphological variables derived from SRTM DEM. There are elements which arise doubts about the classification procedure adopted (and the attempts done for reducing the redundancy of input data). For example, the authors mention the lack of satisfactory separability between the two classes of main interest in this study (Gully and Flat_land). 3) Field data have not been used for assessing the final classification accuracy. The absence of any field control on the output does not allow the authors to draw conclusions on the reliability of their classification results, which I expect to be quite low. 4) Another important issue - which is not even mentioned in the paper - is related to the spatial scale of the studied process (gully erosion) and the geometrical resolution (both horizontal and vertical) of the used data. While ASTER spectral data in the visible ranges might be consistent with the average dimension of gullies (also shown in the picture of Fig.2), it might not be the case with infrared bands and especially with SRTM data. For the same reason, I'm convinced that the attempt in using MODIS is completely ill-posed, and it should be completely removed from the text.

At the end, although the authors have sufficient knowledge of the processes and they are able to manage the tools described in the paper, I believe that they need to deeply revise the text to address the issues mentioned earlier to make the paper a full convincing one.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 7, 135, 2010.