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Hydrology and Earth System Sciences Discussions

Interactive comment on "Hydrological heterogeneity in Mediterranean reclaimed slopes: runoff and sediment yield at the patch and slope scales along a gradient of overland flow" *by* L. Merino-Martín et al.

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General Comments This paper reports results around a case study examining the ecoâĂŘhydrological role of vegetation established on reclaimed slopes after mining activities in a Mediterranean environment. It presents an important contribution to understanding the ecohydrology of restored slopes in waterâĂŘstressed environments. The paper does well to integrate concepts and approaches from different disciplines and generates new applied knowledge for the specific problem of stabilization of re-

claimed slopes. The data collected is not necessarily novel, but the methodology is detailed, used to undertake a data-rich analysis, and builds on and develops previously published concepts explored in the last two decades. Substantial conclusions are reached, supported nicely by data, analysis and interpretations.

In my opinion the paper maps directly in to the scope of the HESS journal and could be published after further clarification and revision. The title clearly reflects the contents of the paper. The abstract provides a concise and complete summary of the article. However, I have a number of suggestions for revision.

Issues to be clarified Overall I think the presentation and structure needs to be improved and whilst the language is mostly fluent and precise, there are many minor typographical and grammatical errors which need correcting.

1) Methodology. Currently I do not think the description of experiments and calculations is sufficiently complete and precise to allow their reproduction by fellow scientists. A clear location map is required. The methodology also needs to be much more clearly explained. The text is currently too dense and hard to make sense of. For instance especially on P9933 it is difficult to understand how Gerlach troughs were used. Also why were TDR sensor deployed at 25 cm depths?

2) I would also like more explanation and discussion of the distribution and characteristics of the plots around Table 2. This underpins the methodology and analysis and is hence crucial.

3) Results. I think that the results section is also too dense and too bitty and could be re-written to flow more easily. I also had trouble with the structure and wanted to see some of the discussions about vegetation patterns and sinks on P9939 and 9940 earlier. This could have been done at the point Table 3 is introduced.

4) I would also like more detail about the rainfall events which could easily be illustrated by the inclusion of relevant diagrams.

5) I also thought there was an important gap in the analysis around the runoff response of patches and hillslopes to rainfall and how this varied temporally and spatially within the study sites. I am keen for a discussion of this to be included in the results since it would underpin and develop the data analysis presented and make the paper much more comprehensive and hard hitting.

6) Discussion. I think this could do with splitting up using subsections.

Missing references

Turnbull, L; Wainwright, J; Brazier, RE; Bol, R. 2010. Biotic and Abiotic Changes in Ecosystem Structure over a Shrub-Encroachment Gradient in the Southwestern USA. ECOSYSTEMS: 13,1239-1255.

Turnbull Laura; Wainwright John; Brazier Richard E. 2010. Hydrology, erosion and nutrient transfers over a transition from semi-arid grassland to shrubland in the South-Western USA: A modelling assessment. JOURNAL OF HYDROLOGY Volume: 388 Issue: 3-4 Pages: 258-272

Turnbull L.; Wainwright John ; Brazier R. E. 2008. A conceptual framework for understanding semi-arid land degradation: ecohydrological interactions across multiple-space and time scales ECOHYDROLOGY Volume: 1 Issue: 1 Pages: 23-34

Bracken, L.J. and Kirkby, M.J. 2005. Differences in Hillslope runoff and sediment transport rates within two semi-arid catchments in south-east Spain. Geomorphology, 68, 183-200.

Minor corrections

P9928 l4 change to '..of runoff and sediment source patches and sinks..' L7 'We conducted field research..' L8 'three reclaimed slopes originally used for mining in a ..' L11 '..associated with seven..' L23 need to define what is meant by 'resources' e.g. water, sediment nutrients etc. L25 '..roles..' L22-25 No link between the first two sentences. Need to develop this link and logical flow of ideas.

P9929 l7 '..transfer of water and sediment..' L13 need to also cite Turnbull et al, Wainwright et al L21 '..frequently associated with the .. L26 delete 'could'

P9930 l4 'develop; rill...' L7 '..vegetation dynamics are affected..' L7 need to also cite Bracken and Kirkby 2005 here L22 '..developed rill networks (i.e. spatially continuous)...' L27 '..aimed to: (a)... L29 '..processes; and ..'

P9931 l11 need to cite Smith et al ?? here L24 '..with an air frost..'

P9932 l7 '..250cm clay loam overlying ..' L14 need to be explicit about geomorphological differences

P9937 l2 types of sinks rather than kinds L11 '..describe the actual .. L12 delete 'the fact'

P9941 l14 Puidefabregas et al?

P9942 l29 need to also cite Bracken and Kirby 2005

References Check Aronson et al 1993 and Cerda 1997 are cited in the text.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 8, 9927, 2011.