

Interactive comment on “Influence of basin connectivity on sediment source, transport, and storage within the Mkabela Basin, South Africa” by J. R. Miller et al.

A. Parsons (Referee)

a.j.parsons@sheffield.ac.uk

Received and published: 25 September 2012

General issues Can we have a map of current land use comparable to that of soils? Also, there is the issue of trying to map sediment provenience onto land use if the latter is not constant through time (as is shown not to be the case on p10172. Some discussion of this issue is called for, particularly in the light of . . . I have a problem with sediment fingerprinting to identify sources of sediment. Mixture modelling presumes that all sediment leaves all sources and arrives at the point of sampling simultaneously, and gives no consideration to how long it may take sediment to travel from source

C4345

to sampling point. Any differences in travel time that may arise from differences in particle size, or simply differences in distance from the sampling point will invalidate the analysis of relative contributions from different parts of the catchment. Such differences in travel time may be minor in small catchments and for the finest fraction of sediment (though I am not convinced they are always sufficiently small to be disregarded). It may be unreasonable to expect this paper to address this issue, but at the very least it should acknowledge that the assumption of uniform travel time underpins the analysis. The technique also is capable only of telling us the ultimate source of sediment and not its proximal one. If sediment has sat in storage from a nearby proximal source, in fingerprint perms it will be identical to that which arrives at the sampling location at the same time from the ultimate source (which is related to the issue discussed at the top of p10177). Again, this issue should at least be discussed.

Specific points P10153 I 11 Don't split infinitive - shown to impact water quality negatively. L13 practices L13 that not which L26 effectively to address P10154 I10 is morphologically L17 provide a reference for the term process zones L20-22 confused singular and plural usage L25-7 ditto P10155 I1 better as longer timescales L19 in what ways is the catchment representative? P10156 I3 land use should not be hyphenated here L5 ditto L18 ditto L24 regard 010157 I4 should be field-checked. Were all zones field checked? L9 has increased 10158 I 4 was collected L13-14 This assumes that erosion is interill. Do you have evidence to support this assumption? The following statement simply refers to gullies and not rills. 10159 I20 them not these 10160 I 13 delete comma 10162 I17 is dominated L18 occurs 10164 I8 bordered, presumably 10165 I19 although land-use category is correctly hyphenated, the previous land use should not be. L22 land cover 10166 I5 consists L10 correlates L21 dominant L25 lowermost L29 ditto 10167 I4 ditto L7 land use L18 lowermost L20 uppermost L24 land use L25 lowermost L28 uppermost (at this point I think I have made my point about upper- and lowermost and land use and will not point out further incorrect usage) 10168 five notable, but thin, horizons L28 which, 10169 I1 This what? L15 to determine with confidence L22 affected L23 delete comma after inert 10170 I7 the most upstream 10171

C4346

l4 land-use L7 loam-textured L18 These what? L20 sandy-loam 10175 l3 cane-field
10176 l9 finer grained 10178 l12-13 to transport sediment downstream effectively L13
fine sediment L17 bordered? L22 adequately to address 10179 l3 its L7 higher-gradient
L8 lower-gradient 10180 l2 fully to determine

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 9, 10151, 2012.

C4347