

Interactive comment on “Climate, tectonics or morphology: what signals can we see in drainage basin sediment yields?” by T. J. Coulthard and M. J. Van de Wiel

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This is a very interesting modelling approach that contributes significantly to answering current questions about the relation between erosion and sediment export. Results seem to indicate that relatively small-scale response is very important, and that a few kilometres of river valley can very significantly shred signals from further upstream, particularly tectonic signals. As such it is a nice illustration of recent laboratory work that plays to the strengths of landscape evolution models by spatially upscaling the results of that laboratory work.

The manuscript is short yet substantial and generally well presented. I do however

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miss a more formal methods section, where the progression of model experiments is visualized with a flowchart. As it stands, the set of experiments is insufficiently discussed in the model setup section, and the results section is not short enough to allow a step-by-step approach that is clear enough.

Moreover, I think some additional consideration of the effects of model simplifications on the outcomes is required to be of interest to a wider readership that is unfamiliar with this model. This particularly relates to the simplifications in hydrological and hydraulic calculations and their potential effects, and to the fact that a homogenous parent material was used (what would thin upland soils and sediment starvation do to your results?).

Some minor corrections and points of attention are below:

71 10-15 This information belongs in the methods section, which should be upgraded with an overview of the different simulations that were performed. A flowchart would really help to get that overview. 71 15 It seems strange to have a 250m uplift event, and then test for transient response and longer term changes over a timescale of 50 years. Recent results of Goren et al indicate that transient rather than equilibrium response in the NZ Alps (admittedly a much larger area) dominates for millions of years. The confusion here may result from a different idea about what 'transient' means. Please explain. 20 73 You probably mean 2 to 3 times larger increases in sediment yields 13 76 both a great indication... 'Both' is unmatched. 16 76 provide us

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