Earth Surf. Dynam. Discuss.,
doi:10.5194/esurf-2016-55-SC4, 2016

Earth Surface Dynamics Discussions

Interactive comment on "Assessment of structural sediment connectivity within catchments: insights from graph theory" *by* Étienne Cossart and Mathieu Fressard

R. Masselink

rens.masselink@wur.nl

Received and published: 8 December 2016

The manuscript submitted by Cossart and Fressard is an interesting and new approach for looking at sediment cascades by using graph theory.

Networks/graphs (or network representation) have been used for a longer time period already in hydrology, for instance the work of Strahler (1957) and Shreve (1974). Also more recently Marra et al., (2014) looked at the importance of river bifurcations using node betweenness centrality. I think some of these will make a good addition to the introduction of graph theory in the paper.

Furthermore, we recently published an article about using networks to quantify over-

land flow connectivity on a hillslope. The methodology we used is partly similar to what the authors are proposing in section 3.1. A structural graph was created from a high-resolution digital terrain model, after which dynamical graphs were created using measured overland flow data. Several graph theoretical measures (path lenght, nr of components, weighted network size) were tested on these graphs and using one of these measures the overland flow connectivity at a hillslope was determined.

Although these studies do not look at sediment transport/cascades, I believe these additional articles could enrich the discussion within the Manuscript.

Kind regards,

Rens Masselink

Literature: Masselink, R.J.H., Heckmann, T., Temme, A.J.A.M., Anders, N.S., Gooren, H.P.A., Keesstra, S.D., 2016. A network theory approach for a better understanding of overland flow connectivity. Hydrol. Process. doi:10.1002/hyp.10993 Shreve, R.L., 1974. Variation of mainstream length with basin area in river networks. Water Resour. Res. 10, 1167–1177. doi:10.1029/WR010i006p01167 Strahler, A.N., 1957. Quantitative analysis of watershed geomorphology. Trans. Am. Geophys. Union 38, 913. doi:10.1029/TR038i006p00913

Interactive comment on Earth Surf. Dynam. Discuss., doi:10.5194/esurf-2016-55, 2016.