Geophysical Research Abstracts
Vol. 19, EGU2017-207, 2017
EGU General Assembly 2017

Integrating remotely sensed hydrologic parameters into an index of sediment connectivity

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As a consequence of a changing climate the occurrence of unexpected events, like flooding and erosion, that affects urban areas will most likely increase. The infrastructure is especially vulnerable to heavy rainfall events due to high costs and long term investments. Accumulation of water and sediments thus has a large impact on the consequences of such events, and it is therefore essential to identify factors that influence the catchment and the occurrence of flooding.

Both spatial and temporal characteristics of the patterns of sediment connectivity is important for estimating the sediment contribution and transfer paths in a catchment. In recent years several approaches have been developed to assess sediment connectivity, as for example the geomorphometric indices of sediment connectivity which mainly picture a static frame of the system. With the development of remote sensing technology and the growing availability of satellite images the opportunity to consider also temporal variability and hydrological parameters as soil moisture within this kind of indices is increasing (e.g., Foerster et al., 2014; Gay et al., 2015). However, there is still a knowledge gap in considering the potential of soil moisture satellite imagery in assessing sediment connectivity at the catchment scale.

This study aims to integrate spatial and temporal soil moisture properties in the index of sediment connectivity by Cavalli et al. (2013), which can be used to predict where flood events will have the strongest impact. The results will provide decision makers with a prediction tool to identify road-intersections that are prone to flood risk at the catchment scale. The method developed in this study would increase awareness and be a basis for decision makers and stakeholders to promote action towards enabling sustainable water and land management.

References

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