1 Supplement

In the following, additional information on the model inputs and the calibration process are reported.

1.1 Soil erodibility and land cover-management factors

Figure S1 shows the spatial distribution of the soil erodibility factor K and land cover-management factor C of the Universal Soil Loss Equation for the Kleine Emme river basin. The two factors were used to derive the spatial distribution of the surface erodibility parameter α of the model. The soil erodibility factor K was taken from the work of Schmidt et al. (2018) and the land cover-management factor derived from Yang et al. (2003).

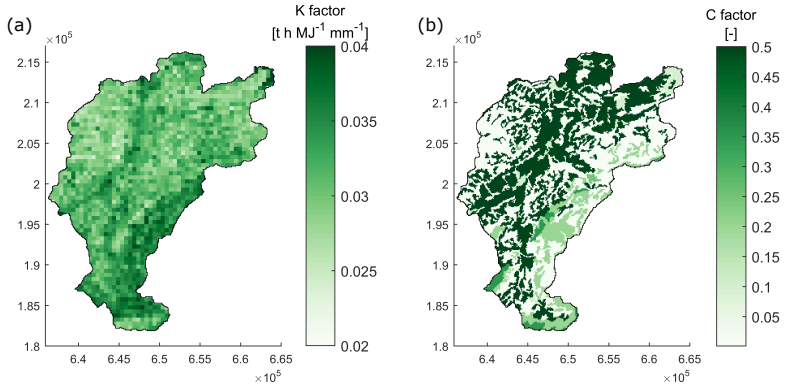

Figure S1. Maps of the (a) soil erodibility USLE factor K (source: Schmidt et al. (2018)) and (b) cover-management factor C for the Kleine Emme basin (derived from Yang et al. (2003)).

1.2 Simulated and observed SSCs

In Figure S2 the histogram of the simulated SSCs sampled at the hours of collection of suspended sediment bottle samples is compared with the histogram of measured SSCs smaller than the 85^{th} percentile. The comparison of the two histograms provides an evaluation of the model performance.

1.3 River initiation threshold effect on hydrological model

Table S1 shows the influence of the river initiation threshold on the hydrological performance of the model. The performance is evaluated through the correlation coefficient (r), Nash-Sutcliffe efficiency (NSE) and root mean square error (RMSE).

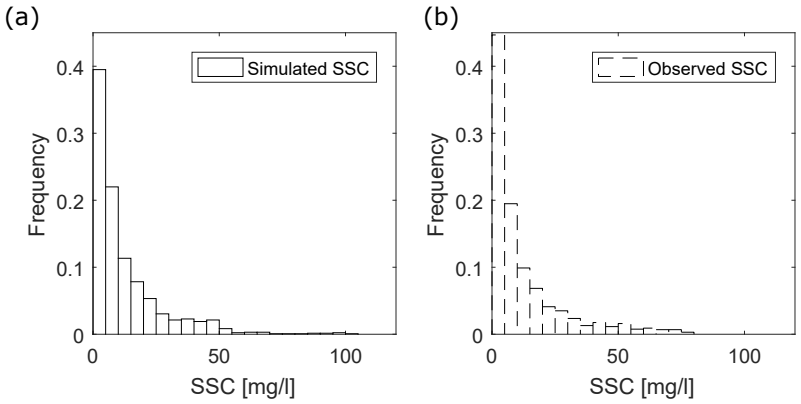

Figure S2. Frequency distribution of measured SSCs sampled at the hours of suspended sediment sample collection (a) compared with the frequency distribution of measured SSCs smaller than the 85^{th} percentile (b).

Table S1. Linear correlation coefficient (r), Nash-Sutcliffe efficiency (NSE), root mean square error (RMSE) computed from hourly, daily and monthly discharge at outlet for the period 2004-2016 for two different river initiation thresholds (RT)

	r		NSE		RMSE	
	RT=1.25 km^2	RT=0.4 km^2	RT=1.25 km^2	RT=0.4 km^2	RT=1.25 km^2	RT=0.4 km^2
Hour	0.84	0.84	0.69	0.69	0.75	0.75
Day	0.91	0.90	0.80	0.79	0.53	0.55
Month	0.93	0.93	0.76	0.77	0.26	0.27

References

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Yang, D., Kanae, S., Oki, T., Koike, T., and Musiake, K.: Global potential soil erosion with reference to land use and climate changes, Hydrological Processes, 17, 2913–2928, https://doi.org/10.1002/hyp.1441, 2003.