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Quantifying fire effects on debris flow runout using a morphodynamic model and stochastic surrogates

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This supporting information file contains 4 figures.

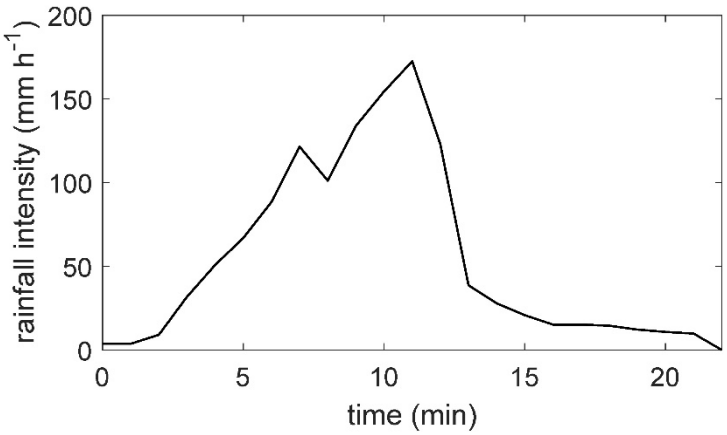

Figure S1: Rainfall hyetograph used in simulations. Data come from the KTYD rain gauge, located approximately 5 km west of the San Ysidro Creek watershed.

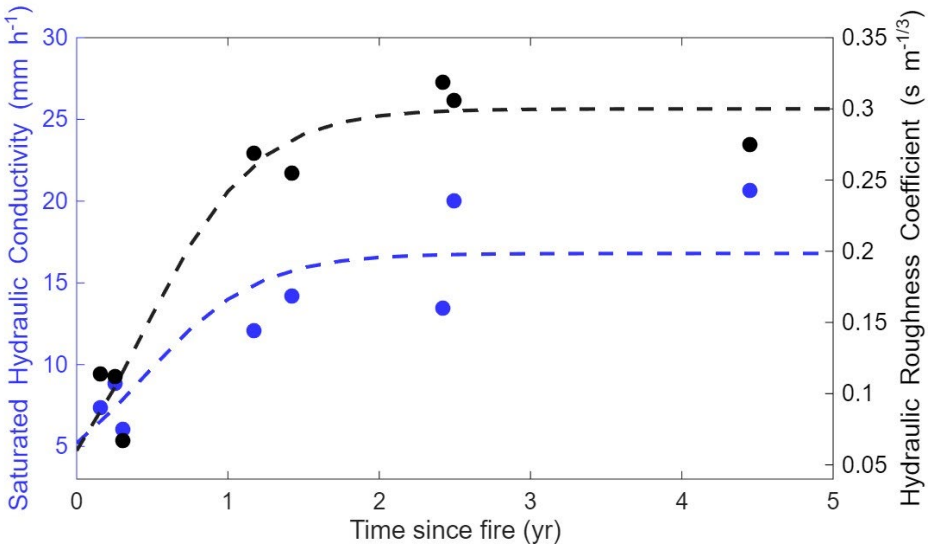

Figure S2: Nonlinear logistic curves, as defined by Ebel and Martin (2017), fit to data from Liu et al. (2021).

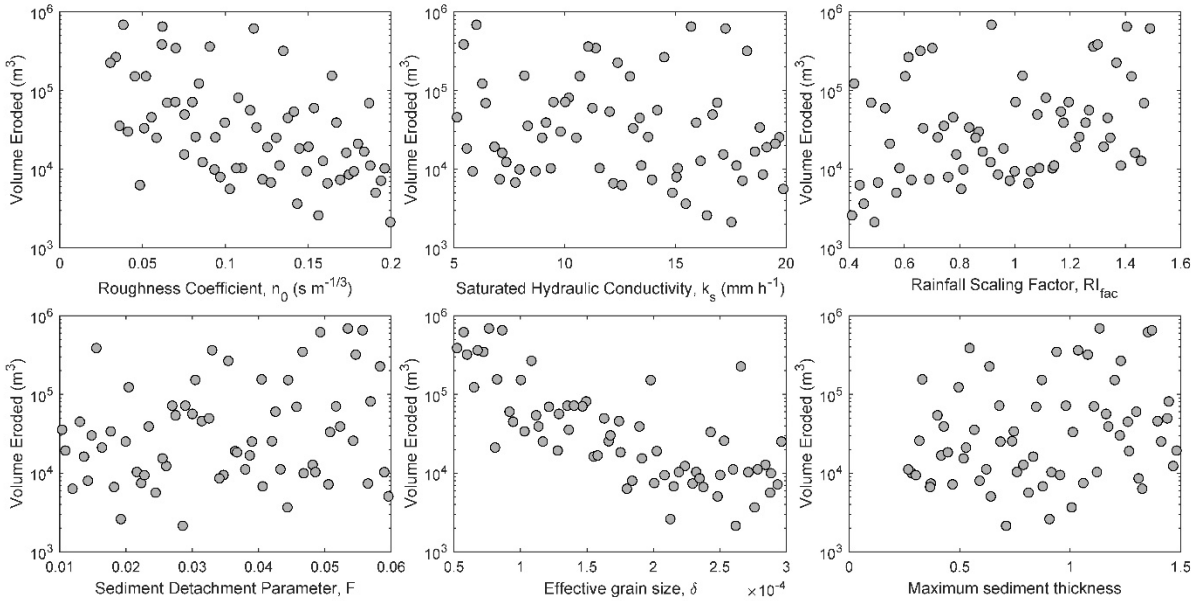

Figure S3: Relationships between the volume of sediment eroded from the upper San Ysidro and Oak Creek watersheds and the six input parameters that varied among simulations. The observed volume of erosion was 307,000 m^3.

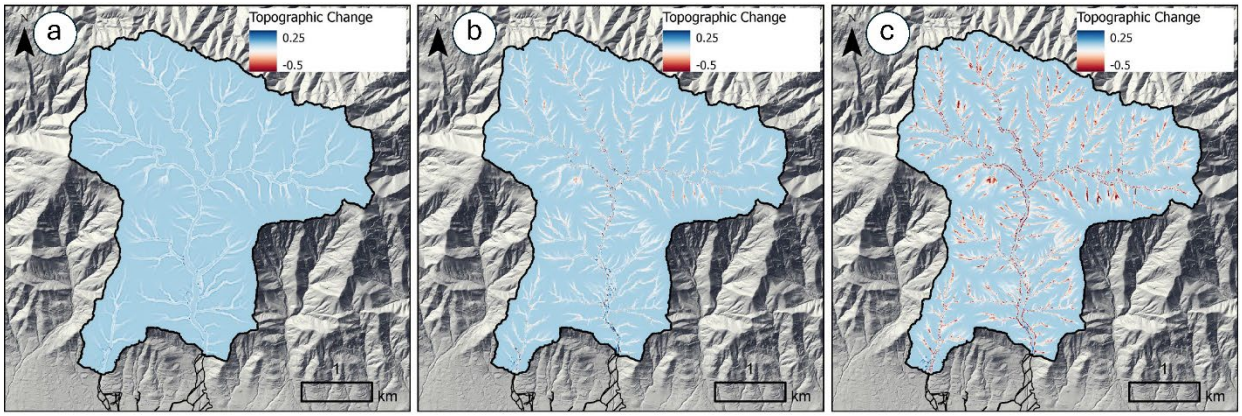

Figure S4: Maps showing the spatial pattern of modelled topographic change for three simulations where the total volume eroded from the upper watersheds (outlined in black) varies from (a) 60,000 m^3, (b) 152,000 m^3, to (c) 363,000 m^3. Negative values indicate erosion and positive values indicate deposition.

References

Ebel, B. A. and Martin, D. A. (2017). Meta-analysis of field-saturated hydraulic conductivity recovery following wildland fire: Applications for hydrologic model parameterization and resilience assessment. Hydrological Processes, 31(21):3682–3696.

Liu, T., McGuire, L. A., Wei, H., Rengers, F. K., Gupta, H., Ji, L., and Goodrich, D. C. (2021). The timing and magnitude of changes to hortonian overland flow at the watershed scale during the post-fire recovery process. Hydrological Processes, 35(5):e14208.