Earth Surface Dynamics

Journal

Supporting Information for "Short communication: Stream laws in tectonic landscape analogue models"

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Additional Supporting Information (Files uploaded separately)

Raw data: DEMs and pictures of models: https://dataservices.gfz-potsdam.de/panmetaworks/review/08e477e94c543368eec875408be0db5a4e08ff87ac66f5f03736fcd976b96ac0/

Introduction

This supplementary material contains

- Description of the calculation of the eroded volumes.
- Description of acquisition time methods
- Table S1, where we present the models and the applied boundary conditions
- Figure S1, in which we describe the experimental apparatus
- Figure S2, in which we present the DEMs of the models
- Figure S3, in which we report the Erosional DEMs of the models
- Figure S4, in which we show the streams longitudinal profiles of streams for every model
- Data set, in which we uploaded the raw DEMs and picture of the models presented in the main text.

Eroded volumes

We create a numeric regular grid on the model surface. The eroded volumes are extracted calculating the cumulative difference in elevation (Δz) of the same cells at consecutive times. The cells dimension is function of the horizontal resolution of the laser scan (here 0.05 mm). Knowing the cell dimensions and the corresponding Δz, is it possible to obtain the total volume of eroded material at every time step.

Acquisition time

Data have been collected at specific times. These times are (min): 15, 30, 45, 60, 90, 120, 150 ,180, 240, 300.

Model name	**Imposed regional slope (degrees)**	**Rainfall rate (mm h^{-1})**
mod1009	10	9
mod1022	10	22
mod1070	10	70
mod1509	15	9
mod1522	15	22
mod1570	15	70
mod2009	20	9
mod2022	20	22
mod2070	20	70

These times correspond to the moments when laser scans have been taken.

Table S1. Models name and relative boundary conditions applied.

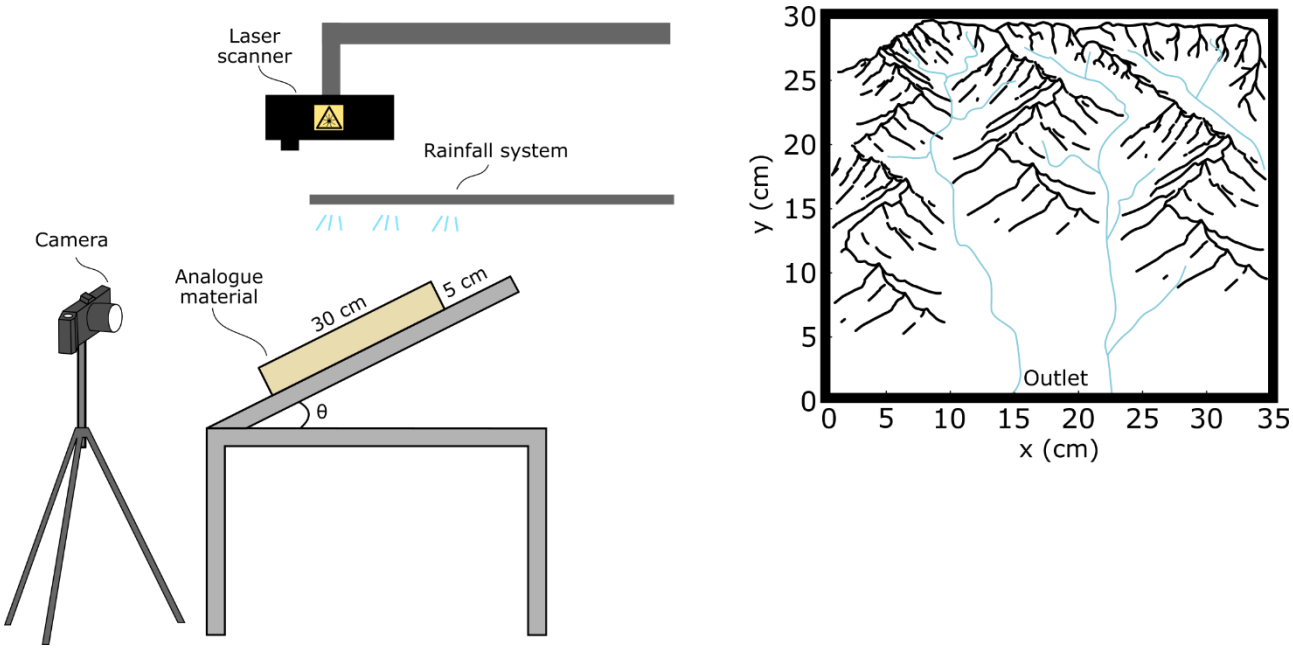

Figure S1. Schematic representation of the experimental setup. A Plexiglass box (30×35×5 cm^3) lays on a reclinable table and is filled with analogue material. The rainfall system (commercial sprinklers) provides rainfall over the model surface. A single camera and a high-definition laser scan provide records for the experiments. Modified after Reitano et al. (2020).

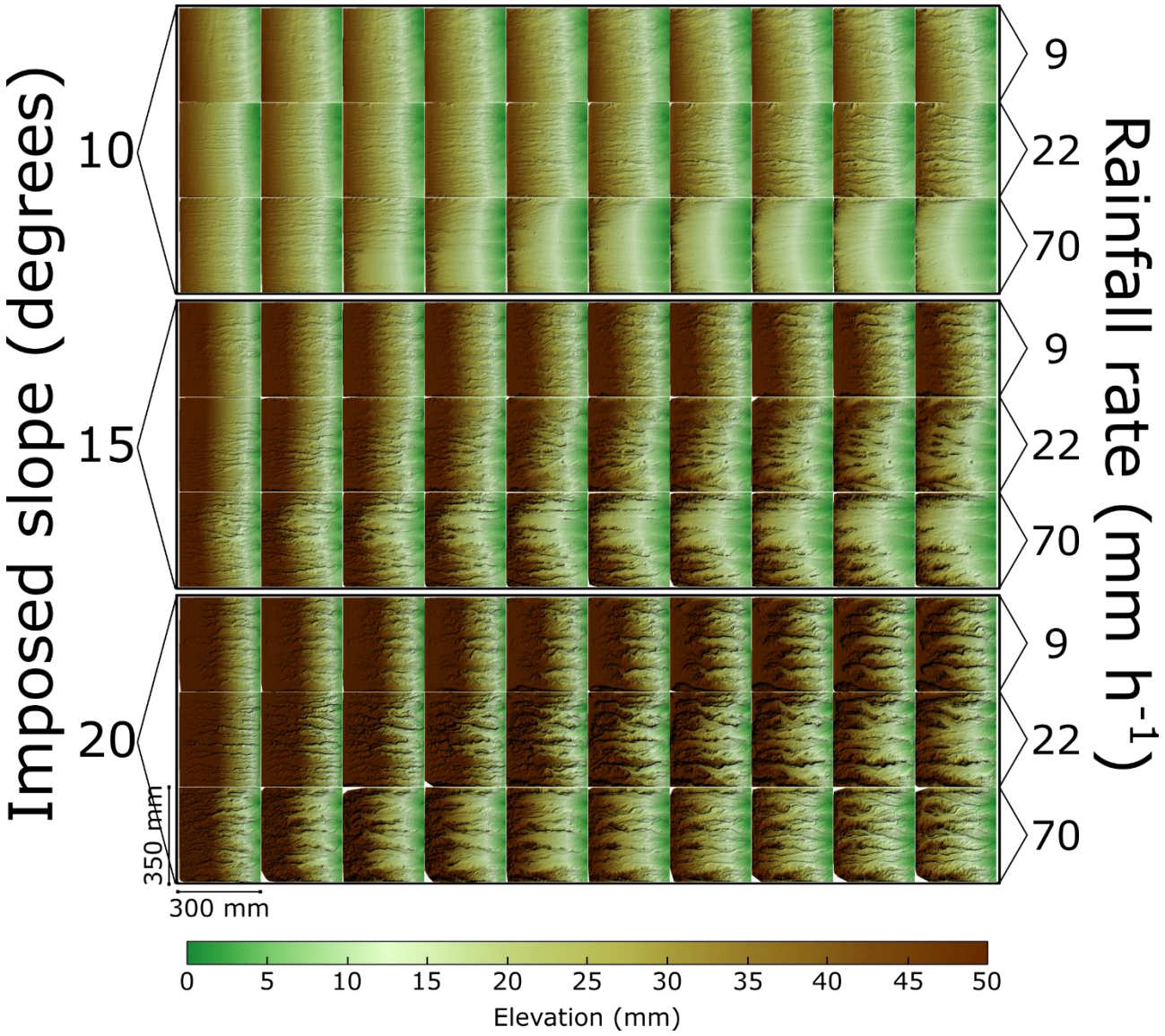

Figure S2. DEMs of the performed experiments.

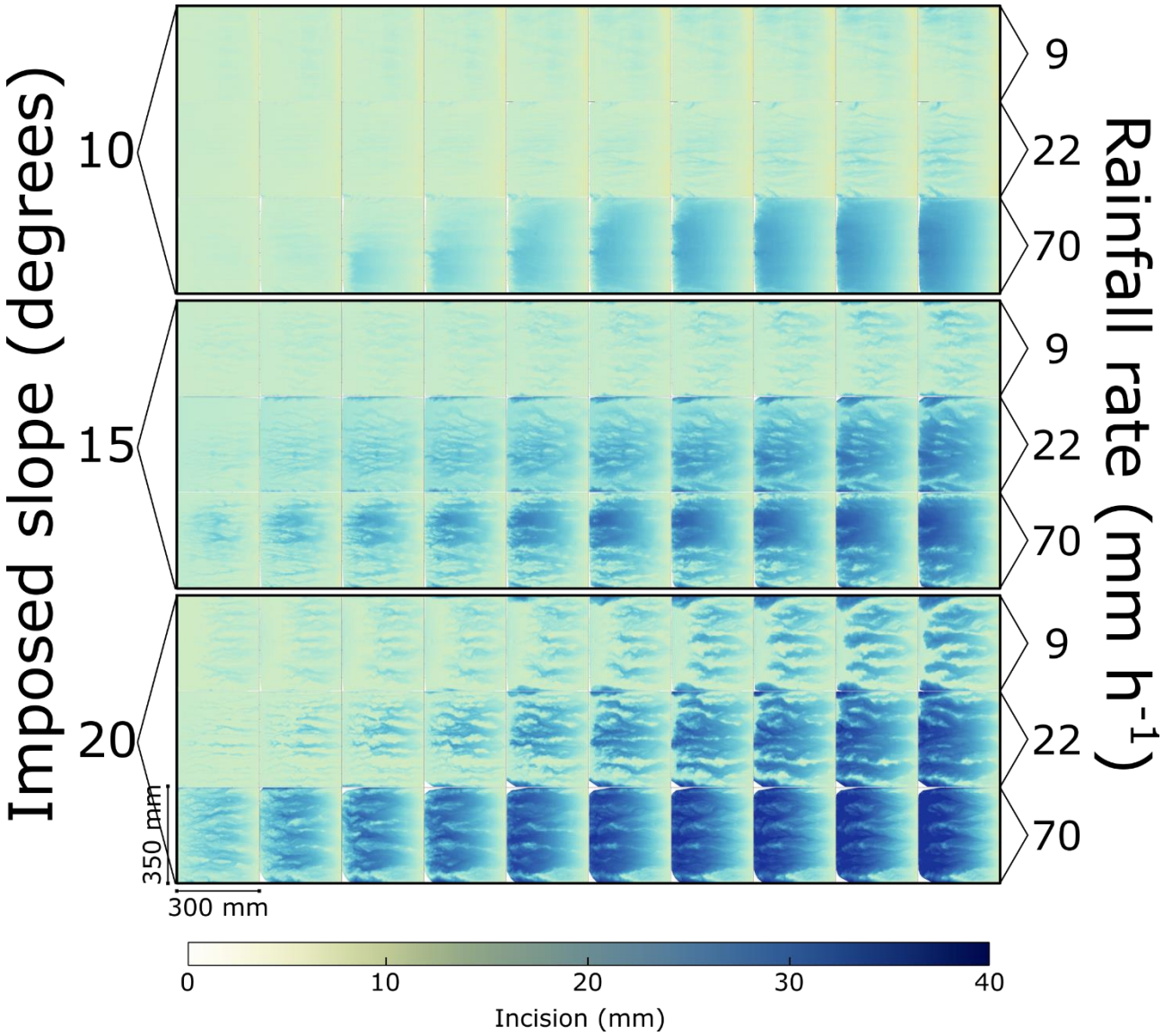

Figure S3. Erosion DEMs of the performed experiments. The erosion DEMs are obtained by computing the difference in elevation (Δz) of the same cell at consecutive times.

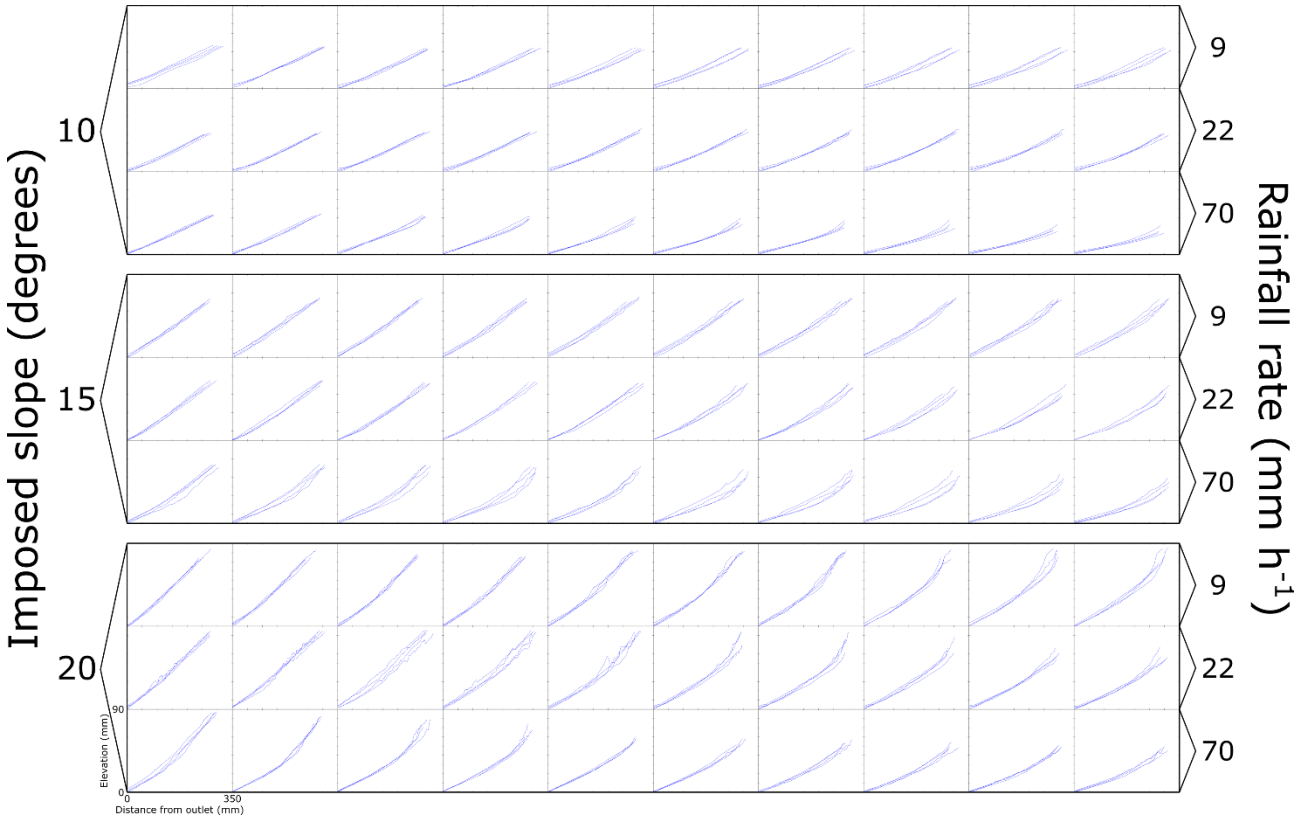

Figure S4. Streams longitudinal profiles of the four rivers described in the main text, for every model at every time step.

References

Reitano, R., Faccenna, C., Funiciello, F., Corbi, F., & Willett, S. D. (2020). Erosional response of granular material in landscape models. Earth Surf. Dynam., 8(4), 973–993. https://doi.org/10.5194/esurf-8-973-2020