Supplementary material

Brief communication: Impact of a bedrock–ice collapse on glacier dynamics: the 2026 Gyirong-Rasuwa disaster, Central Himalaya, Nepal

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Table S1. Model parameters used for surface mass balance calculation. The values are taken from studies on Yala glacier which is in the adjacent valley of the study glacier having similar elevation profile.

Parameter	Description	Value
Z_{ELA}	Equilibrium line altitude	5455 m a.s.l.
C_{abl}	Clean-ice ablation gradient	0.0104 m w.e. yr^{-1} m^{-1}
C_{acc}	Accumulation gradient	0.0052 m w.e. yr^{-1} m^{-1}
Z_d	Upper debris-cover limit	5200 m a.s.l.
f_d	Debris-shielding factor on C_{abl} below Z_d	0.3
A_{max}	Accumulation cap	1.5 m w.e. yr^{-1}
A_{min}	Ablation cap	-3.5 m w.e. yr^{-1}

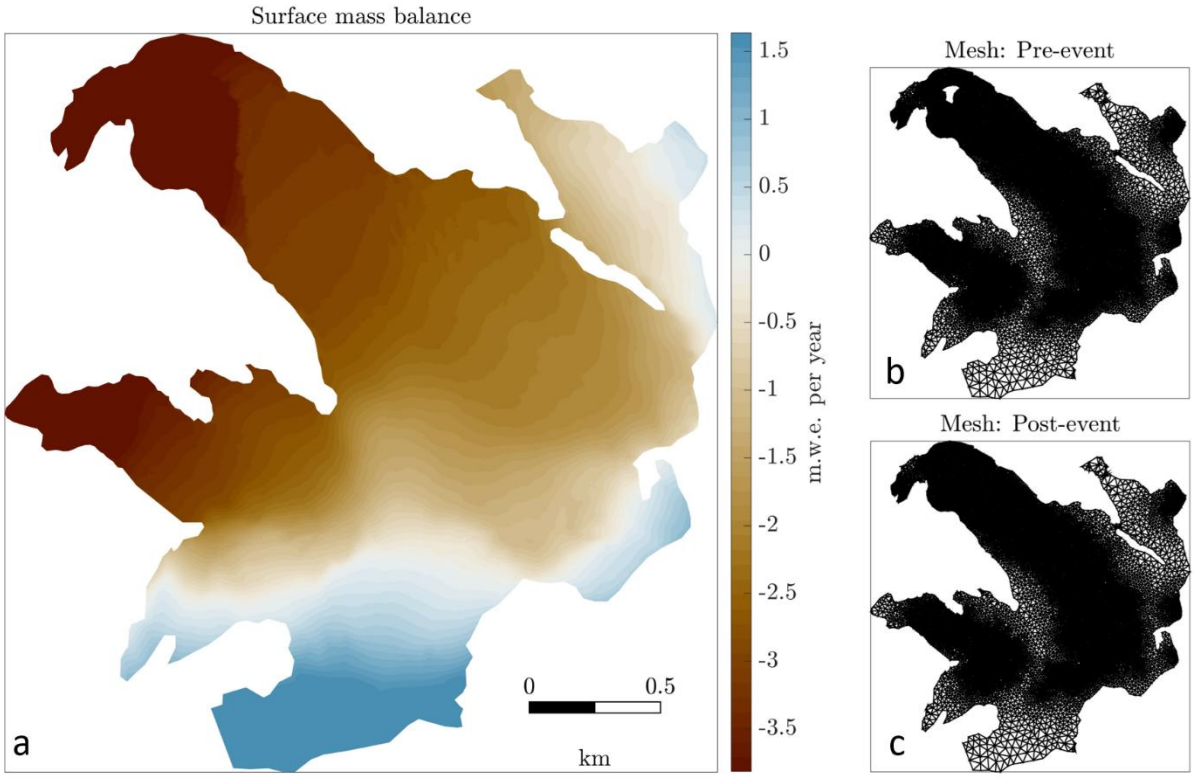


Fig. S1: Surface mass balance used for the simulation (a), Pre-event mesh (b), and Post-event mesh (c). There was a nunatak at the lower part of the glacier pre-collapse which was not part of the mesh generation for pre-event simulation. The nunatak collapsed during the event leaving the topography smooth where glacier may flow over. Therefore, we filled that gap area by adding extra nodes on the existing mesh.

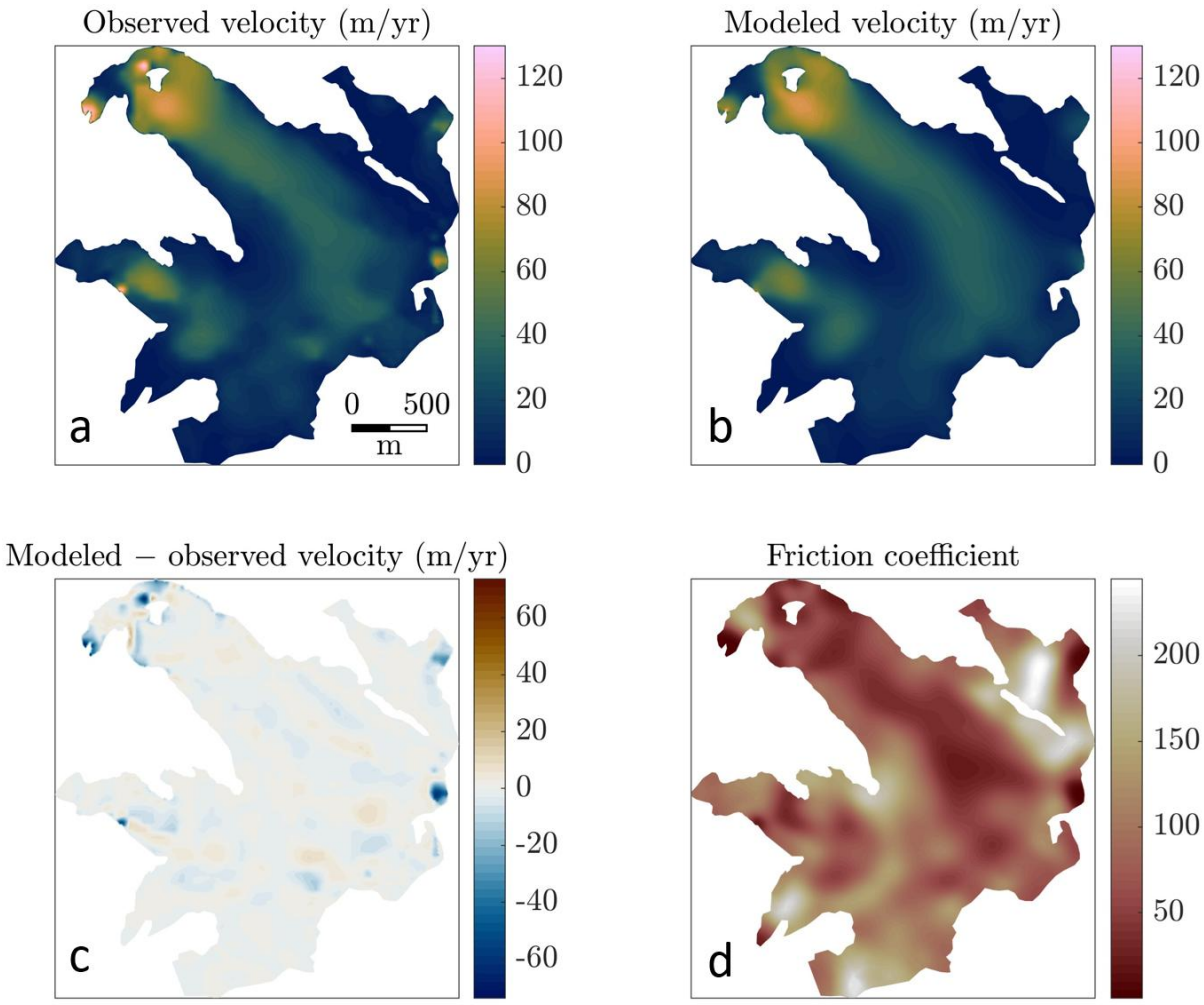


Fig. S2: Observed velocity (a), Modelled velocity after inversion (b), their difference (c) and the friction coefficient of Budd sliding law (d).

Animations:

Two gifs are uploaded

1. **Distributed Velocity change for Break-off and Hanging scenarios**
2. **Distributed Stress change for Hanging scenario, along with likely fracture zone**