



Supplement of

Climate change may increase landslide frequency despite generally drier conditions in the Mediterranean area

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Figure S1 presents detailed plots of the bias-corrected rainfall frequency distributions, focusing on the upper tail, complementing the bias correction analysis described in Section 2.3.1.

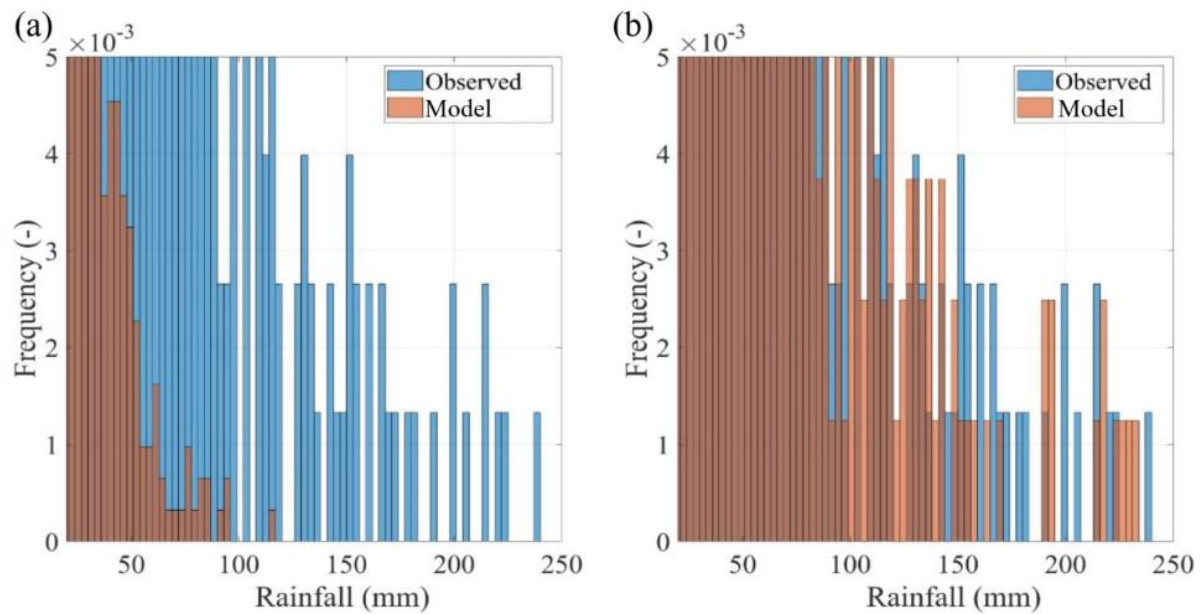


Figure S1. Detailed view of the upper tail of the rainfall frequency distributions for Observed (blue) and Modeled (orange) data at the Cervinara station. Panel (a) shows the distributions prior to the bias-correction procedure, and panel (b) shows the distributions after the application of the bias-correction procedure.

Figure S2 shows the long-term trend anomalies landslide frequency ($\Delta\lambda_{LS}$) over the study period under CTRL, RCP4.5 and RCP8.5 scenarios. The spread between scenarios is represented by the standard deviation (shaded areas). Temperature change (ΔT) is shown as anomaly relative to the 2006 baseline.

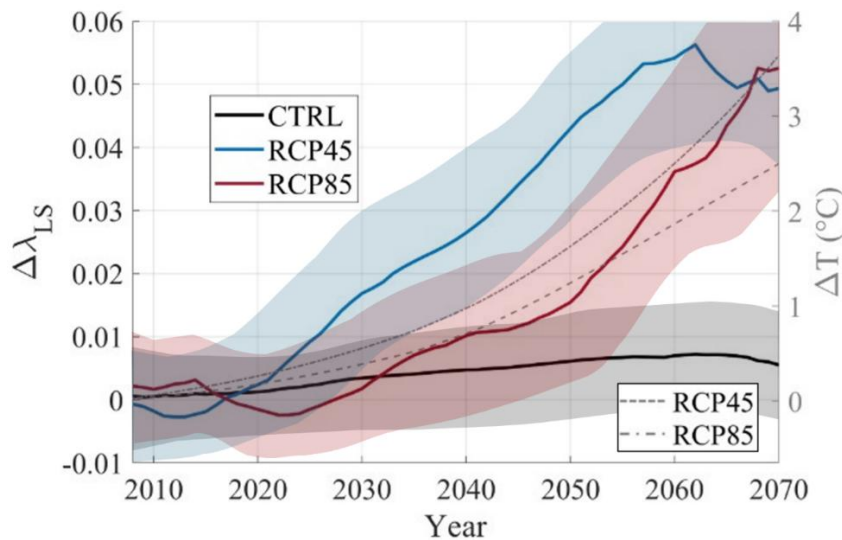


Figure S2. Anomalies on the trend component of the time series of temperature (ΔT) and landslide frequency ($\Delta\lambda_{LS}$) in the study period under CTRL (black), RCP4.5 (blue) and RCP8.5 (red) scenarios, based on climate model ensemble simulations. Temperature change (ΔT) represents the anomaly relative to the 2006 baseline. Shaded areas represent the standard deviation.

Figure S3 presents seasonal anomalies in ensemble landslide frequency ($\Delta\lambda_{LS}$) under RCP4.5 and RCP8.5 scenarios for (a) September–November (SON), (b) December–February (DJF), and (c) March–May (MAM). Dash-dot lines represent the trend component of the time series, solid lines its linear interpolation, and shaded areas the standard deviation. Average landslide frequency ($\bar{\lambda}_{LS}$) at the start of the projected period is provided in each panel as a reference.

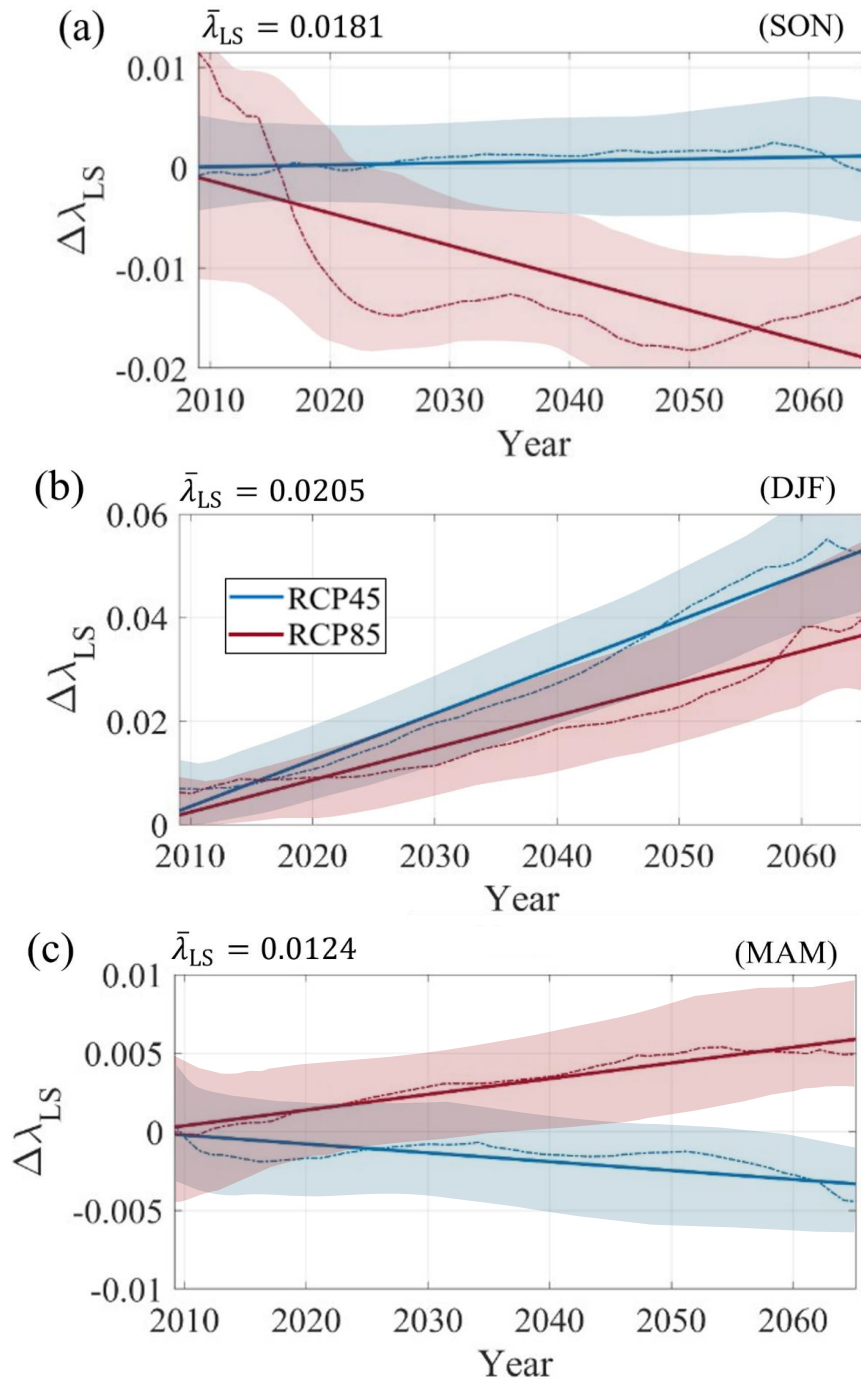


Figure S3. Anomalies on ensemble landslide frequency ($\Delta\lambda_{LS}$) for the three climate scenarios during the projected period. Panels (a–c) show seasonal trends for SON (a), DJF (b), and MAM (c), comparing RCP4.5 (blue) and RCP8.5 (red). Average landslide frequency ($\bar{\lambda}_{LS}$) at the start of the projected period is presented on top left side of each panel as reference.

Figure S4 presents anomalies in antecedent volumetric water content ($\Delta\theta$) one hour prior to the onset of landslide-triggering rainfall events for (a) December–February (DJF) and (b) March–May (MAM). Dash-dot lines represent the trend component of the time series, solid lines its linear interpolation, and shaded areas the standard deviation. Average water content at the start of the period is provided on top left as a reference. Temperature change (ΔT) is shown as anomaly relative to the 2006 baseline.

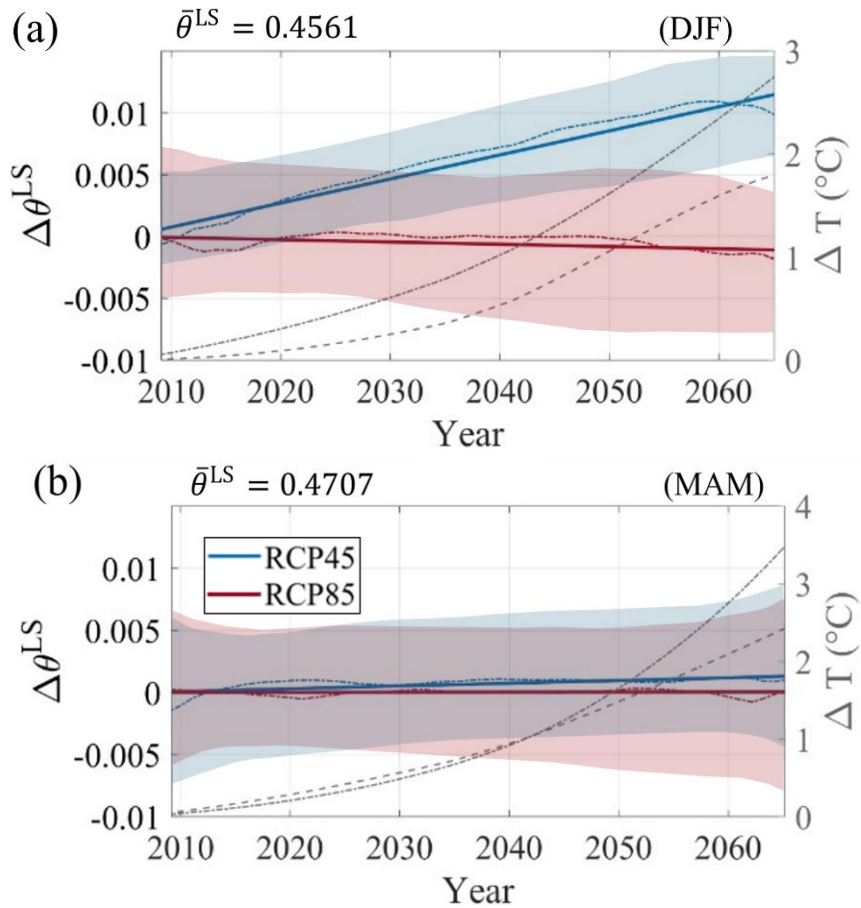


Figure S4. Anomalies of antecedent volumetric water content ($\Delta\theta^{LS}$) one hour before the onset of triggering rainfall events in DJF (a) and MAM (b). Shaded areas represent the standard deviation around the ensemble value for RCP4.5 (blue) and RCP8.5 (red) climate change scenarios.