

Supplementary Material



SM1: Average Soil wetness profile GEOS-FP Global map (Scale 0-1) for study period.



SM2: Average Snowmass GEOS-FP Global map (kg/m²/s) for study period.



SM3: Figure 1: Global map of number of days with false positives based on a threshold of 0.9 for LHASA-F 1-day landslide probability estimates (relative to LHASA-NRT). Panels A-D show zoomed versions of the areas highlighted with dotted circles. A and B) parts of Central America, C) parts of New Guinea, and D) parts of north central coast Vietnam.



SM4: LHASA probability estimates for Vietnam on Oct 17th, 2020. (A) LHASA-F 3-day, (B) LHASA-F 2day, (C) LHASA-F 1-day, and (D) LHASA-NRT. The triangles correspond to mapped landslides and the black line to administrative district level 2 limits.



SM5: Precipitation totals from IMERG Early (A) and GEOS-Forecast (B) for Hurricane Eta/Iota on November 5th, 2020.



SM6: Global Mean difference (MD) map between LHASA-NRT and LHASA-F 2-day (probabilities) for the study period. Red indicates that LHASA-NRT has higher values than LHASA-F and blue corresponds to greater LHASA-F probability. The bottom panel show the mean difference (MD) for Central and Northwestern parts of South America, where the LHASA-F 2-day probabilities are relatively higher (MD ~0.03) than LHASA-NRT.



SM7: Global Mean difference (MD) map between LHASA-NRT and LHASA-F 3-day (probabilities) for the study period. Red indicates that LHASA-NRT has higher values than LHASA-F and blue corresponds to greater LHASA-F probability. The bottom panel show the mean difference (MD) for Northwestern parts of South America, where the LHASA-F 3-day probabilities are relatively higher (MD ~0.04-0.05) than LHASA-NRT.

Location	Climate	Geology
Vanuatu	Tropical ¹	Submarine volcaniclastic rocks dominant, Alluvium ²
Guatemala	Warm tropical, hot tropical ¹	Quaternary pumice fills and pyroclastic mantles, Quaternary alluvium ²
Vietnam	Tropical rainforest, Tropical monsoon ¹	Lacustrine sediments with lignite, gravels ²
Greece	Mediterranean, Continental ¹	Sedimentary rocks ³

SM8: Climate and geological characteristics of the locations used for model evaluation.

¹Peel et al., 2007); ²Börker et al., 2018; ³ Hartmann and Moosdorf, 2012

1 Data Availability Statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.