

Supplementary material for

**Global dynamic rainfall-induced landslide susceptibility mapping
using machine learning**

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Table S1 presents the data sources and citations for the landslide points used

Figures S1-S2 shows all the features used by the global dynamic rainfall-induced landslides susceptibility mapping model.

Figure S3 shows the dynamic landslide influencing factors used in the prediction case

Table S1

Event import source	Name	Link	Citation
GLC	Global Landslide Catalog	https://landslides.nasa.gov	[1]
LRC	Landslide Reporter Catalog	https://landslides.nasa.gov/reporter	[2]
Combeima	Spatio-temporal distribution of slides (1999-2015) in Combeima's River hydrographic basin, Colombia	https://www.researchgate.net/publication/328229319_Spatio-temporal_distribution_of_slides_1999-2015_in_Combeima_s_River_hydrographic_basin_Colombia	[3]
LIWEAR	Landslide Inventory for the central section of the Western branch of the East African Rift (LIWEAR)	https://doi.org/10.1007/s10346-018-1008-y	[4]
RMD	Republic of Macedonia Database		[5]
SMMML	SERVIR- Mekong Myanmar Mapathon Landslides	https://servir.adpc.net	[6]
CAS	Czech Academy of	https://www.irms.cas.cz/landslides	[7]

	Sciences		
	Landslides		
	Inventory		
	Based on		
	Media		
	Reports		
ODOT	Oregon Department of Transportation	https://www.oregon.gov/odot/GeoEnvironmental/Pages/Unstable-Slopes.aspx	-
	Landslide Inventory		
Reuleut	Reuleut Landslide Inventory	https://landslides.nasa.gov	[8]
Porgera	Porgera Landslide Inventory	https://landslides.nasa.gov	[8]
SKP	Sulawesi-Kasiguncu-Palu Landslide Inventory	https://landslides.nasa.gov	[8]
Pokot	Pokot Landslide Inventory	https://landslides.nasa.gov	[9]
LMR	Rainfall-induced landslide inventories for Lower Mekong	https://doi.org/10.1002/gdj3.145	[10,11]

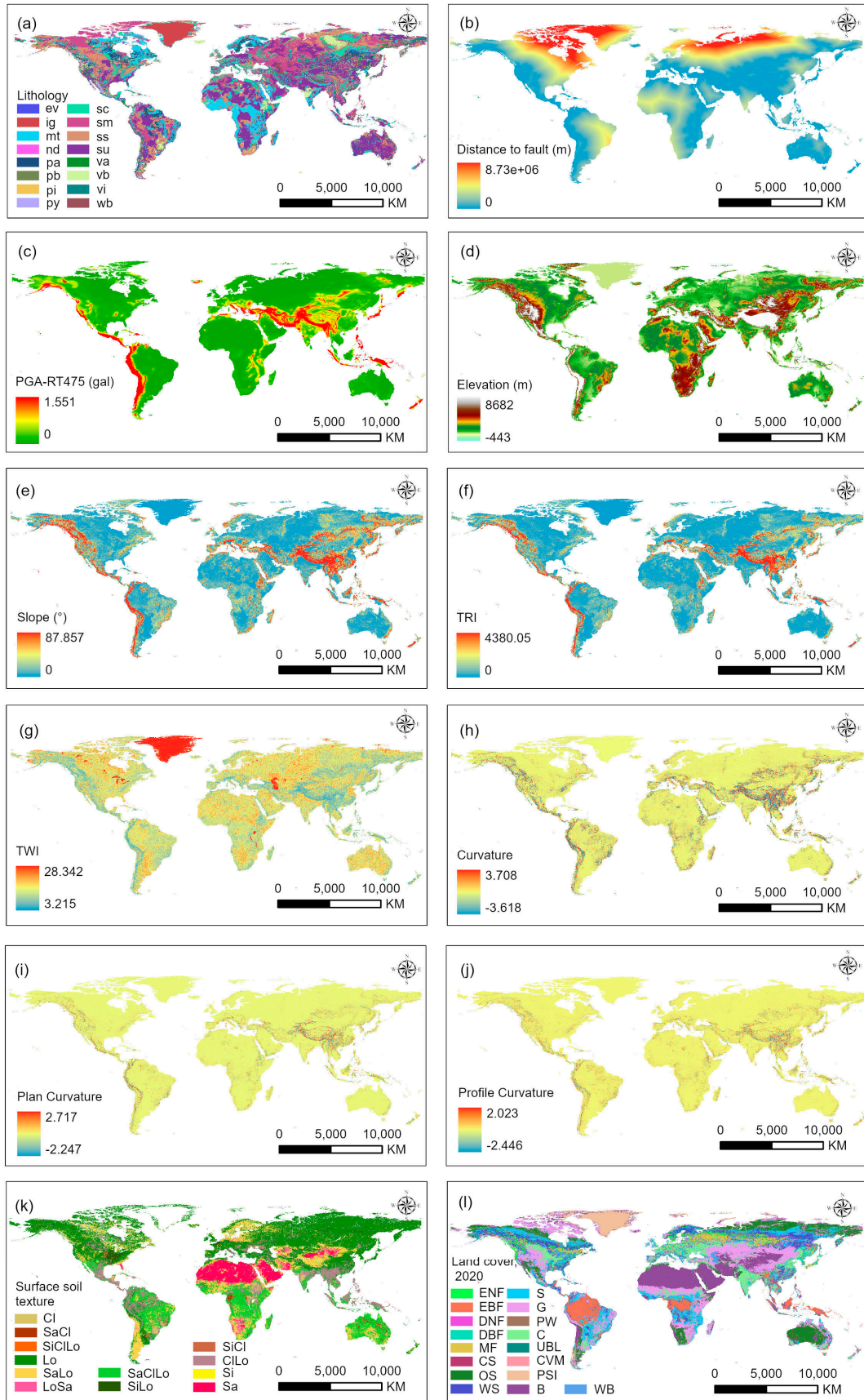


Figure S1. (a) lithology, ev: evaporites, sc: carbonate sedimentary rocks, ig: ice and glaciers, sm: mixed sedimentary rocks, mt: metamorphics, ss: siliciclastic sedimentary rocks, nd: nodata, su:

unconsolidated sediments, pa: acidic plutonic rocks, va: acidic volcanic rocks, pb: basic plutonic rocks, pi: intermediate plutonic rocks, vi: intermediate volcanic rocks, py: pyroclastics, wb: water bodies, (b) distance to fault, (c) 475-year return period PGA, (d) elevation, (e) slope, (f) TRI, (g) TWI, (h) curvature, (i) plan curvature, (j) profile curvature, (k) surface soil texture, and (l) landcover in 2020, ENF: Evergreen Needleleaf Forests, EBF: Evergreen Broadleaf Forests, DNF: Deciduous Needleleaf Forests, DBF: Deciduous Broadleaf Forests, MF: Mixed Forests, CS: Closed Shrublands, OS: Open Shrublands, WS: Woody Savannas, S: Savannas, G: Grasslands, PW: Permanent Wetlands, C: Croplands, UBL: Urban and Built-up Lands, CVM: Cropland/Natural Vegetation Mosaics, PSI: Permanent Snow and Ice, B: Barren, WB: Water Bodies. The source of lithology is GLIM. The global fault data was obtained from GAF-DB. 475-year return period PGA derived from Global Seismic Hazard Map. The sources of the DEM data are SRTM and GMTED. We obtained elevation, slope, TRI, TWI, curvature, plan curvature and profile curvature based on the DEM data. Soil texture was downloaded from OpenLandMap.org. Land cover was obtained from MODIS product (MCD12Q1 V6).

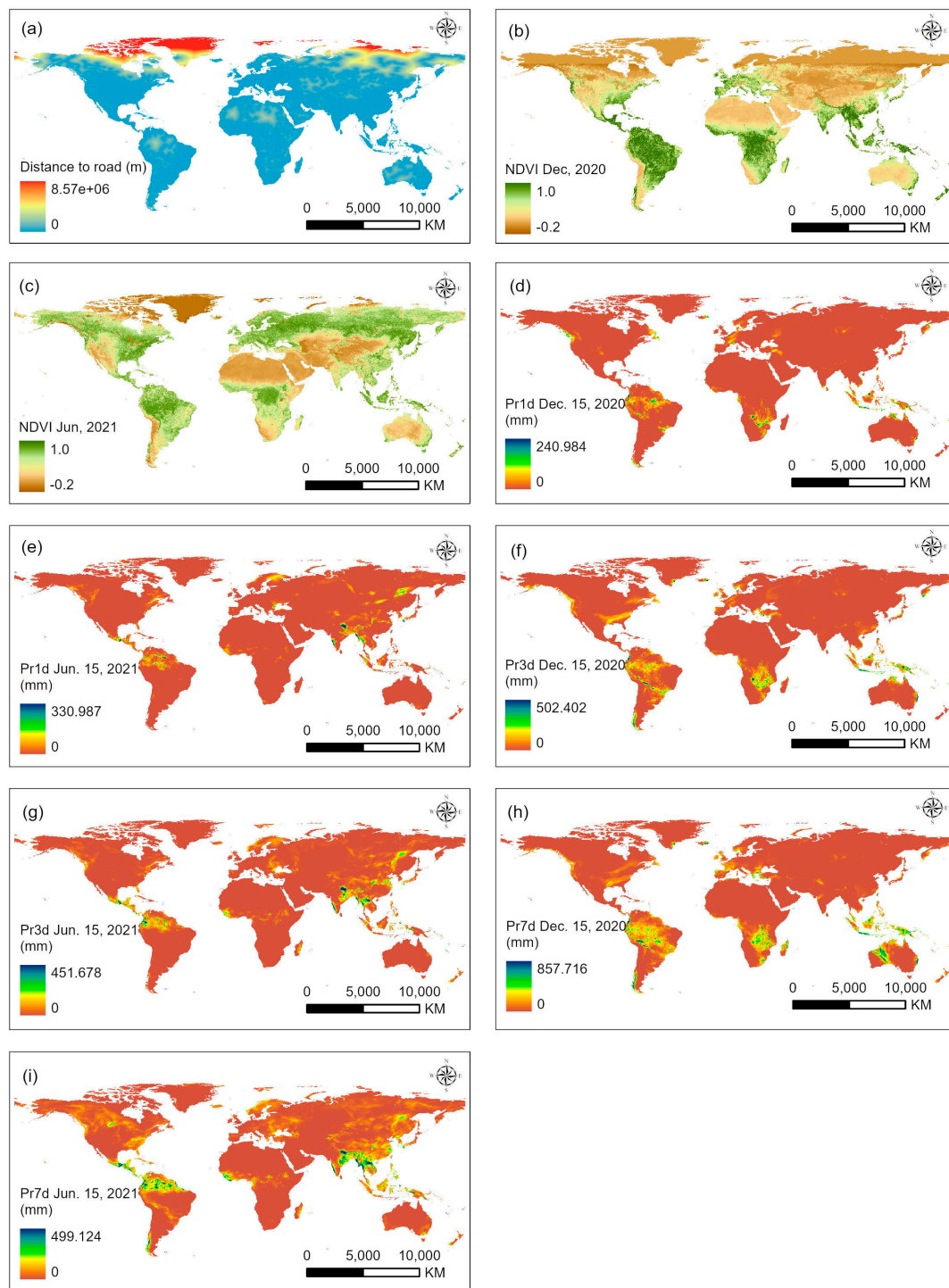


Figure S2. (a) distance to road, (b) NDVI December, 2020, (c) NDVI June, 2021, (d) Pr1d December 15, 2020, (e) Pr1d June 15, 2021, (f) Pr3d December 15, 2020, (g) Pr3d June 15, 2021, (h) Pr7d December 15, 2020, and (i) Pr7d June 15, 2021. Distance to road is calculated based on world's major roads which were downloaded from www.openstreetmap.org. NDVI is obtained from MODIS product (MOD13Q1 V6). Precipitation data source is the ERA5-Land Hourly – ECMWF Climate Reanalysis dataset.

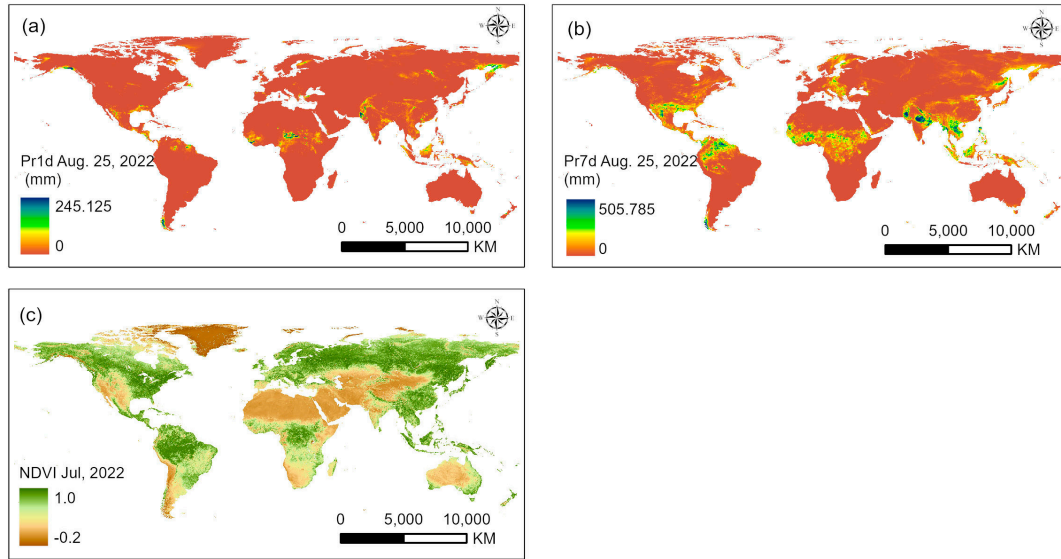


Figure S3 (a) Pr1d August 25, 2022, (b) Pr7d August 25, 2022, and (c) NDVI Jul, 2022

Note: the land cover data for 2020 was used here (**Figure S1i**). Precipitation data source is the ERA5-Land Hourly – ECMWF Climate Reanalysis dataset. NDVI was obtained from MODIS product (MOD13Q1 V6).

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