

Description of data files in Supplementary Material

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The file *Mass_movement_observations_2000_2025.csv* contains over 6000 observations of landslides and slushflows in 2000-2025 downloaded from the NSDB database.

There are 12 datafiles (semicolon-separated table format) which contain the sum of indicator occurrences in each grid cell over the 30-year period (August-November for HMG indicator and December-April for RFS indicator). These files have their file name constructed as:

<indicator name>_<min. hazard level>_<period>.csv

For example, the file *HMG_red_1991_2020.csv* contains data from the HMG indicator for \geq red hazard levels for the period 1991-2020.

Rows in these tables are the different grid points, and the datafiles *region_vec.csv*, *elevation_vec.csv* and *susceptibility_vec.csv* indicate the corresponding region (1=eastern, 2=western, 3= middle, 4=northern), elevation (m a.s.l.) and susceptibility index value (1 to 4) for each grid cell, respectively.

Columns 1-10 in these tables are the 10 different climate models (*cnrm-r1i1p1f2-racmo*, *ecearth-r1i1p1f1-racmo*, *ecearthveg-r1i1p1f1-cclm*, *miroc-r1i1p1f1-icon*, *mpi-r1i1p1f1-hclim*, *mpi-r1i1p1f1-icon*, *mpi-r1i1p1f1-racmo*, *cnrm-r1i1p1f2-hclim*, *ecearthveg-r1i1p1f1-hclim*, *noresm-r1i1p1f1-hclim*) in the model ensemble bias-adjusted with method “eqm”, and columns 11-20 are the same models bias-adjusted with method “3dbc-eqm”.

There are 8 datafiles (semicolon-separated table format) which contain region- and elevation-wise mean values of the input variables to the indicator models (*Hs*, *Qs*, *Srel*, *Qrel*). These files have their file name constructed as:

<indicator name>_<input variable>_reg_elev_<period>.csv

For example, the file *RFS_Hs_reg_elev_1991_2020.csv* contains mean values of the snow depth data used as input for the RFS indicator for the period 1991-2020.

The 80 rows in these tables are the 4 different regions and the 20 different elevation bins (0 to 100, 100 to 200, ... 1900 to 2000 m.a.s.l.).

Columns 1 and 2 in these tables show the region (1=eastern, 2=western, 3= middle, 4=northern) and the 100-meter elevation bin (bin center elevation), while columns 3-22 are the 20 different climate model and bias adjustment combinations in the ensemble, as described above.

Units for the input variables are: cm for *Hs*, mm accumulated in December-April for *Qs*, % for *Srel*, and % for *Qrel* (mm accumulated in August-November divided by the same grid cell's normal annual precipitation in 1981-2010).