

# *Upslope migration of snow avalanches in a warming climate*

## Complete data and model source files

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### **Folder *Statistical\_model\_source\_files\_Vosges\_GiaconaEtAl\_2021*:**

- `model_GiaconaEtAl_2021`: model source file, to be run under Winbugs. The model is fully described in supplement S2;
- `data_GiaconaEtAl_2021`: avalanche data file to be used with the model to reproduce the paper results in terms of evolution of avalanche activity (spatio-temporal data table detailed in Supplement S1.4);
- `inits_GiaconaEtAl_2021`: possible starting point for the MCMC sampling.

### **Folder *Avalanche\_sectors\_Vosges\_GiaconaEtAl\_2021*:**

Shape file of the 50 avalanche sectors of the Vosges Mountains, usable under a GIS environment.

### **Folder *Data\_files\_Vosges\_GiaconaEtAl\_2021*:**

- `Avalanche_size_class_Vosges_GiaconaEtAl_2021`: list of avalanche events with known size class (Fig. 4B);
- `Calendar_day_Vosges_GiaconaEtAl_2021`: list of avalanche events with known day of occurrence within the season (Fig. 4A);
- `Chimani_snowfall_Vosges_GiaconaEtAl_2021`: solid precipitation and fraction of precipitation in solid form from Chimani et al. (2011), sums/means over the DJF and NDJFMA winter periods computed for this study, 925 series corresponding to all grid points within the Vosges Mountains (Figure S12), the two grid points whose analysis is more detailed (e.g., Table 1, in red bold);
- `Climate_Snow_Vosges_GiaconaEtAl_2021`: complete set of climate data series analysed (Supplement S1-7), except the 923 Chimani et al. (2011) series whose analysis is not detailed : sums/means/SDs over the DJF and NDJFMA winter periods computed for this study;
- `Expected_counts_Vosges_GiaconaEtAl_2021`: spatio-temporal table of expected counts computed according to Eq. S2.3;
- `Original_avalanches_Vosges_GiaconaEtAl_2021`: Full list of avalanche events from the geohistorical enquiry (Giacona et al., 2017);

- Sectors\_Vosges\_GiaconaEtAl\_2021: Attributes and topographical characteristics of the 50 avalanche sectors;
- Sources\_Vosges\_GiaconaEtAl\_2021: source number and standardized source potential as function of time;
- Spatio\_temporal\_aval\_counts\_GiaconaEtAl\_2021: analysed spatio-temporal avalanche data set (same as the one that feeds the model).

#### References:

Chimani, B., Böhm, R., Matulla, C. & Ganekind, M. Development of a long term dataset of solid/liquid precipitation. *Advances in Science and Research* 6(1), 39-43 (2011).

Giacona, F., Eckert, N. & Martin, B. A 240-year history of avalanche risk in the Vosges Mountains based on non-conventional (re)sources. *Nat. Hazards Earth Syst. Sci.* 17, 887-904 (2017).

#### **Partial reference for the source paper:**

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