

Windstorm Risk Model for the Canton of Zurich: Impact Forecasting and Probabilistic Risk Assessment

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Abstract:

We present the development and application of the GVZ (cantonal building insurance Zurich) windstorm risk model to assess building damages in the Canton of Zurich, Switzerland. This model offers two key applications that support both rapid damage estimation immediately after a windstorm event and probabilistic risk modelling.

The first application uses high-resolution meteorological data from MeteoSwiss's ICON model to provide impact forecasting and post-event analysis. The model estimates the number of buildings affected and the potential damages at the municipal level, visualized through an interactive dashboard. This tool supports resource allocation and informed decision-making during and immediately after windstorm events.

The second application involves a probabilistic risk assessment based on a winterstorm hazard event set generated using the CLIMADA platform (ETH Zurich, Aznar-Siguan and Bresch, 2019) and the method described by Schwierz et al. (2010) and Welker et al. (2021). We estimate return periods for extreme events like Winterstorm Lothar. Our findings indicate that a storm of Lothar's magnitude today would result in approximately CHF 80 million in damages, corresponding to a 130-year return period.

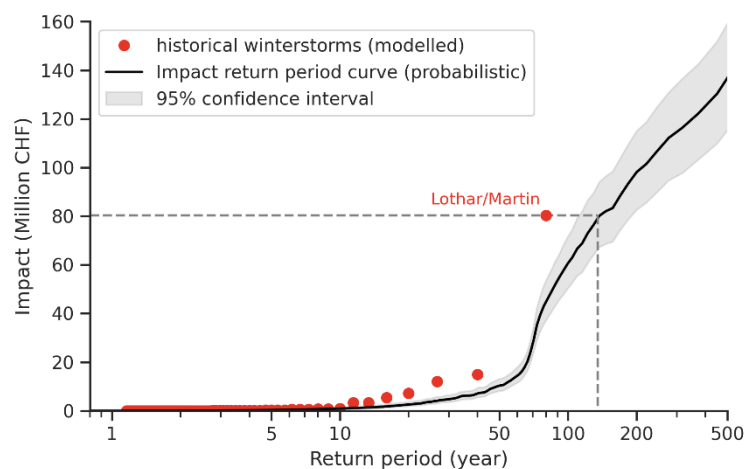


Figure 1. Impact return period curve for the probabilistic winterstorm hazard event set (black line) and 73 years of historical winterstorms (red dots) for modelled building damages in the Canton of Zurich.

References

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