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Towards impact-based warnings

Impact-based warnings have been gaining the attention of National Meteorological and Hydrological Services to assess their potential to provide a more effective collaboration with disaster reduction and civil protection agencies, as well as to better inform the public and stakeholders. It is currently a common practice to analyze the hazardous meteorological and hydrological components together with the vulnerability of the targeted exposure to assess weather related impacts and resulting warnings. Advanced quantitative processes involving impact models using geolocated vulnerability and exposure datasets are still a challenge for many agencies due to missing data and validation strategies.

In this work we evaluate an impact model that quantifies expected damage to infrastructure using probabilistic wind gust forecasts combined with an infrastructure distribution model based on nightlight intensities and population distribution (LitPop model developed by Eberenz et al 2019). The COSMO-E wind forecast adjusted for the Swiss topography developed at MeteoSwiss is tested against the raw IFS model for Burglind's winter storm and its reported damages in Switzerland. This is done using the CLIMADA (Aznar-Siguan & Bresch 2018) framework and the vulnerability function defined by Schwierz et al 2010.

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