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Comparison of spatial extreme value models for snow depth extremes in Austria

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In Alpine regions like Austria a spatial representation of extreme snow depth is of crucial importance for numerous purposes such as the designing of construction projects. Extreme value theory builds the well-established foundation of modeling extremes.
Two different approaches for the spatial modeling of snow depth extremes have been extensively investigated lately: Smooth Spatial Modeling (Blanchet and Lehning, 2010) and different classes of max-stable processes (Blanchet and Davison, 2011; Nicolet et al., 2015), both outperforming classical interpolation techniques. While max-stable models are generally considered as improvement over smooth modeling, the methods have not been compared in the context of extreme snow depth.
In the present study a great variety of different GEV models is fitted to seasonal snow depth maxima measured at more than 200 Austrian weather stations. Return levels of smooth spatial models and several max-stable representations (Schlather, Brown-Resnick, Geometric Gaussian, Extremal-t) and covariance models (Powered Exponential, Brown, Whittle-Matern), also allowing for anisotropic extremal dependence are compared by a modified Anderson-Darling score and a normalized RMSE.
Preliminary results show, that for snow depth extremes in Austria smooth spatial modeling and a version with extremal coefficients as covariates deliver slightly better scores than (an)-isotropic max-stable models.