

Improved natural hazard characterisation using multivariate extreme value models in an industrial context

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In recent years, within the statistical community there has been much work to model extremal dependence and incorporate more information within extreme value models. However, in many industrial contexts and for non-statistical academics, there is still a tendency to fit standard univariate extreme value models on a site-by-site basis. This is especially problematic for the estimation of very extreme return periods which are subject to large uncertainties.

In this presentation we shall discuss the application of different multivariate extreme value models to industry specific problems. We focus on two particular studies: (i) applying the conditional extremes model to characterise the risks posed by heatwaves over France; (ii) applying regional frequency analysis and spatial Bayesian extreme value models to reduce uncertainty in the estimation of return periods for rainfall over the UK. The aim of these case studies is to highlight how the better combination of environmental data and appropriate extreme value models can lead to improved inferences and better natural hazard characterisation.

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