Introduction to extRemes and climextRemes
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Abstract: Many statistical analyses concern sums or averages of random variables, and often rely upon limiting results such as the Central Limit Theorem (CLT) to justify use of the normal distribution. When interest is in extreme values, the bulk of the data may be misleading, and the normal distribution is not appropriate. A similar theorem to the CLT, the Extremal Types Theorem, provides justification for using a family of distributions (in the univariate setting, similar results hold for multivariate analysis) known as the generalized extreme value (GEV) distribution. In order to make sure the audience is up-to-speed on the basics of statistical extreme-value analysis (EVA), a very brief introduction to the field will be given, which will be complemented with some basic applications using extRemes. Specific climate applications will be discussed along with highlights from climextRemes. While code will be displayed for the audience to follow along, the main thrust will be a simple overview of EVA and the R packages.