Exceedances over High Thresholds: A Guide to Threshold Selection

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Abstract

The modeling of exceedances over high thresholds is considered. The natural distribution for such exceedances, the generalized Pareto distribution (GPD), is used and the problematic issue of threshold selection is addressed. We fit the GPD robustly to the data using techniques based on optimal bias-robust estimates. The robust procedure will assign weights between 0 and 1 to each data point. These weights are used to assess the validity of the GPD model for exceedances of the proposed threshold and thus can guide threshold selection. That is, we can initially consider a low threshold and increase it (thus reducing the number of data points) until all weights are close to one. The new approach is used to analyze two of the NERC data sets.