Trend Estimation for Climatological Extremes

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Extreme climatological events have profound societal, ecological, and economic impacts. Studying trends in climatological extreme data is crucial for our life. This talk presents trend estimation methods for climatological extremes, focusing on trend estimation for monthly maximum and minimum temperature time series observed in the conterminous United States. Previous authors have suggested that minimum temperatures are warming faster than maximum temperatures in the United States; such an aspect can be rigorously investigated via the methods discussed in this study. Here, statistical models with extreme value and changepoint features are used to estimate trends and their standard errors. The results show that monthly maximum temperatures are not often greatly changing — perhaps surprisingly, there are many stations that show some cooling. In contrast, the minimum temperatures show significant warming. Our methods are also applied to extreme precipitation data products: MERRA, CPC, and USHCN. New findings will be discussed.

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