



A global quantification of compound precipitation and wind extremes

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The concomitant occurrence of extreme precipitation and winds can have severe impacts. Here this concomitant occurrence is quantified globally using ERA-Interim reanalysis data. A logistic regression model is used to determine significant changes in the odds ratio of precipitation extremes given a wind extreme occurs on the same day, the day before or the day after.

High percentages of co-occurring wind and precipitation extremes are found in coastal regions and in areas with frequent tropical cyclones, with maxima of more than 50% of concomitant events. Strong regional-scale variations in this percentage are related to the interaction of weather systems with topography resulting in Föhn winds, gap winds, and orographic drying, and the structure and tracks of extratropical and tropical cyclones. The percentage of concomitant events increases substantially if spatial shifts by one grid point are taken into account. Such spatially shifted, but co-occurring events are important in insurance applications.