



Comparison between European and US severe convective weather environments

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We studied the relations between the occurrence of convective storms and a range of atmospheric parameters representing instability, moisture or shear derived from ERA-Interim reanalysis data. The objective was to increase the understanding of the conditions under which thunderstorms form. Besides thunderstorm occurrence, we investigated severe convective weather environments that produce hazards such as large hail and severe wind gusts.

For Europe, lightning data from the European Cooperation for Lightning Detection (EUCLID) between 2008 and 2013 served as indicator for thunderstorms and data from the European Severe Weather Database (ESWD) as indicator for hazard occurrence.

To analyze severe convective weather environments in the US, lightning data from the National Lightning Detection Network (NLDN) and hazard data from the Storm Prediction Center (SPC) were considered for the time period 2010 to 2014.

We will present the favorable environments of thunderstorms and severe convective weather for both regions and highlight its differences. We compared spatial distributions as well as mean annual cycles and further analyzed relative frequencies for thunderstorms and severe convective weather in different parameter spaces. Finally, we investigated trends in the atmospheric parameters during the last decades for Europe and the US.