



Analysis of a 18-year climatology of German derechos

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This work presents the results of a systematic search for derechos across Germany. Derechos were classified using wind gust measurements, ESWD data, and subjectively analyzed radar images. Derechos that crossed the borders of Germany were followed into neighbouring countries when possible. The results are compared to the derecho climatology of the United States.

Between 1997 and 2014, 40 derechos were classified that at least partly affected Germany. The derecho frequency across central Germany is comparable to the Great Lakes region across the United States with about one derecho per year affecting a 200x200 km area. The seasonal distribution indicates a warm and a cold season maximum similar to the United States, although the contribution of the cold-season is larger in Europe. An analysis of the associated weather pattern shows that warm-season derechos tend to occur in south-westerly flow, whereas cold-season events tend to occur in north-westerly flow. The development of CAPE is analyzed using trajectory plots and COSMO model runs, concentrating on the development of lapse rates in cold-season derecho situations. An analysis of proximity soundings, focussed on the environmental moisture, lapse rate, and vertical wind shear is presented as well as the performance of Estofex forecasts for derecho events.