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On spatial scale changes in extreme precipitation events over Europe for different climate targets

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Extreme precipitation events have severe repercussions to society. For example, on the evening on July 2, 2011 a severe cloud burst occurred in the Copenhagen area. During the late afternoon deep moist convection developed over Skåne (the southernmost part of Sweden) in an airstream from east-northeast. In the early evening the DMC passed over Øresund to Copenhagen, where it created a severe flash flood. Between 90 and 135 mm of precipitation in less than 2 hours was recorded flooding cellars, streets, and key roads. The deluge caused 6 billion Danish kroner in damage. Although that such extreme event is rare, its impacts on society is important and should be understood under a warmer climate.

Although many studies have indicated that it is likely that the frequency of such events will increase in a warmer climate, little has been done to assess if and how the spatial structure and scale could evolve. Using the 0.11° grid mesh EURO-CORDEX ensemble, this study investigates how the spatial scale of extreme precipitation according to different climate targets evolve as a consequence of the warming. We present the preliminary results from our analyses. The members from the hindcast members show similar results when compared with several dataset. To analyze the evolution of the spatial scales, climate targets such as 1°C, 2°C and 3°C are used. Our results suggest that not only the intensity of such events increase, but their size (the geographical area impacted) will also change in a warmer future simulated according to the representative concentration pathway 8.5.