



Cluster analysis of increased future precipitation extremes on the Norwegian west coast

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Winter precipitation extremes on the Norwegian west coast are mostly driven by low pressure systems on the North Atlantic. A dynamical downscaling of the Arpege AGCM using the WRF regional climate model (30 km horizontal resolution) has been performed for the 30-year periods of 1961-1990 and 2021-2050. An increase of extreme precipitation (0.995 quantile) of 35% was predicted between the future and the present periods. We connect these extremes to the variations of the mean sea-level pressure (MSLP). We employ the k-mean cluster analysis to detect persisting MSLP patterns connected to the extreme precipitation days. We define a "risk of extremes" describing how many of the days with a given MSLP pattern actually include extreme precipitation. This "risk of extremes" increases between 60% and 80% in the future, depending on the MSLP pattern. This means that no significant change in the weather patterns is predicted in the future but more days belonging to a given pattern cause extreme precipitation due to higher temperatures and therefore increased moisture content in the air.