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## Cluster analysis of the ensembles of EURO-CORDEX simulations

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Climate models play an important role in global and regional climate change research, improving our understanding and predictability of climate behaviour. The CORDEX (Coordinated Regional Downscaling Experiment) program was established to provide a framework for the assessment of Regional Climate Models (RCMs) and to contribute to climate change impact assessment and adaptation processes. The climate simulations are based on multiple dynamical and empirical-statistical downscaling models forced by multiple global climate models (GCMs). The motivation behind the use of multiple models in climate change research is to cover different sources of uncertainties, that is why it is recommended to use all available simulations in climate change studies. However, many climate change impact studies face difficulties (e.g., limited computing resources or free access to climate data) using all the available simulations, and therefore it is quite often the case that only subsets of simulations are used. Another problem is that the ensembles of GCM-RCM simulations are too big to be handled by many impact modellers. The selection of model simulations is subjective in most cases, and it is often reduced by hand-picking climate simulations depending on the partners involved in the project. An objective method can be based on cluster analysis, which is a flexible and unsupervised numerical technique that involves the sorting of data into statistically similar groups. These groups can be either (i) determined entirely by the properties of the data themselves or (ii) guided by user constraints. In the present study, we focus on Central-Eastern Europe, because the model simulations are particularly uncertain in the precipitation and temperature distribution over this region. The aim of the study is to develop a method based on the precipitation and temperature values of 55 EURO-CORDEX simulations for a near-present historical period (1995–2014), which could help to select suitable subsets of ensembles of climate simulations tailored to the needs within climate change impact studies.

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