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Drivers of heatwaves in CMIP6 models: an evaluation on historical simulations

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Heatwaves heavily affect European public health, society and economy. A full understanding of the drivers behind the occurrence and intensity of heatwaves (HW) is one of the priorities of H2020 CLimate INTelligence (CLINT) project. Particular attention is given to the detection and attribution of HWs in future climate projections. However, it is important to assess the capability of climate models to thoroughly describe relationships between the drivers and the occurrence and intensity of HWs. For this reason, a feature selection framework, based on the Coral Reef Optimization (Salcedo-Sanz et al., 2014) has been developed. This has been applied to ERA5 summer data, using as a target the Lake Como HW occurrence and, as candidate predictors, time series of weather variables calculated on clustered areas on European and global scales. The same algorithm has been applied to historical climate simulations included in CMIP6. The comparison of the results of these two steps has first focused on the similarities in maximum temperature and HW trends in the target region of Lake Como. Then, the selected drivers in each historical climate simulation have been evaluated, using ERA5 results as benchmark. Thanks to this, the models that better resemble the statistical properties and teleconnections described by the reanalysis have been identified. This set of models will be considered for the detection and attribution of heatwaves in future climate projections under different emission scenarios. In this upcoming phase the goal will be to analyse changes in the relationship between the drivers and HW occurrence and intensity, giving an insight about possible future evolutions in heatwaves frequency and magnitude.