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Agroclimatic characteristics in the future climate over the Croatian Territory

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The factors which significantly affect the viticulture are temperature and precipitation. Consequently, viticulture is highly affected by climate change. The agroclimatic indices describe the suitability of particular region for wine production, so they are usually used as a tool for viticultural zoning. For the purpose of this study six indices (Average growing season temperature, Growing degree days, Huglin index, Dryness index, Cool night index and Composite index) were calculated using daily output from three CORDEX Regional Climate Models' (RCMs) simulations (CLMcom-CCLM4-8-17, SMHI-RCA4, CNRM-ALADIN5.3) for Croatian domain. All RCMs are forced by Global Climate Models (GCMs) with a moderate (RCP4.5) and a high-end (RCP8.5) greenhouse gass (GHG) scenario. SMHI-RCA4 is driven by five different GCMs (CNRM-CERFACS-CNRM-CM5, ICHEC-EC-EARTH, IPSL-IPSL-CM5A-MR, MOHC-HadGEM2-ES and MPI-M-MPI-ESM-LR), CLMcom by four (CNRM-CERFACS-CNRM-CM5, ICHEC-EC-EARTH and MOHC-HadGEM2-ES, MPI-M-MPI-ESM-LR), and CNRM-ALADIN5.3 with one (CNRM-CERFACS-CNRM-CM5). All the simulations have horizontal grid spacing of 0.11°. In order to determine future changes in agroclimatic indices, spatial distribution of the indices in historical runs (1971-2000) is compared to three different 30-year periods (2011-2040, 2041-2070 and 2070-2100). Also, monthly and seasonal values of predicted meteorological parameters (air temperature, air humidity, precipitation and wind speed) during the growing season (from April to October) have been compared against the corresponding parameters in historical runs. The sign and the robustness of future changes depend on the location/region analyzed. As wine production has a long tradition in Croatia, the results show whether the part of the country, which is suitable for grape cultivation in present climate (1971-2000) continues to be favourable in the future. We can also reveal whether some other parts of Croatia become suitable for cultivating grapevine in the future climate.