



Local meteorological simulations to define critical areas for agricultural production

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Agricultural production in semi-arid Mediterranean regions is extremely sensitive to impacts of global climate change, particularly to possible increase in excessive heat and drought events. Assessment of climatic trends and development of long-term planning strategies in coastal regions with complex topography, such as the mid-Adriatic islands, poses a problem since these areas are too small to be distinguished by the regional climate models. In scope of the COST Action ES 1106 “EURO-AGRIWAT Assessment of EUROpean AGRiculture WATER use and trade under climate change” we tested a novel method to obtain fine-scale climatic information using the local-scale climate model MUKLIMO_3 (DWD). We performed numerical simulations of atmospheric conditions for potential days with excessive heat load for three mid-Adriatic islands: Brac, Hvar and Korcula. Additionally, idealized simulations according to typical local winds relevant for these islands are considered. The model uses a grid with a horizontal resolution up to 100 m and CORINE land use data and ASTERGDM orography as input. In combination with the so-called “cuboid method”, it is possible to calculate climatological indices such as mean yearly number of summer and hot days based on observational data from the last 30-year climatic period from several stations settled in the area. We compared climatological indices derived with the modelling approach with observed climatological mean at the monitoring station for the period 1981-2010. Climatological charts of heat load during summer period are used to reveal critical areas for agriculture. Applicability of the results can be foreseen in future irrigation planning and protection from frequent wildland fires.