



## **Future changes in climatic indices over the Aegean area; potential micro-climate changes in Andros after land use modifications**

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The islands of the Aegean are characterised by strong relief and low vegetation cover and are listed as a region of high desertification risk where impacts of climate change, such as temperature increase and extreme weather phenomena, are expected to affect significantly agricultural production and local economic activities. In this study, projections derived from state-of-the-art Regional Climate Model (RCM) -within the framework of EURO-CORDEX- are used to examine the potential future climate changes (and micro-climate changes) in the Aegean region (and Andros island, respectively) in order to identify the most vulnerable areas and prioritize future interventions. This work is part of the LIFE TERRACESCAPE project that aims to demonstrate at the Aegean island of Andros the use of drystone terraces as green infrastructures resilient to climate change impacts. The micro-climate improvement in Andros island after land-use modifications, will be investigated using basic meteorological parameters such as air temperature and relative humidity collected from installed meteorological stations. Observational data will provide a solid basis for comparisons with changes projected for the future climate, focusing on extreme events such as heatwaves and floods. Future projections of temperature and precipitation, from the RCA4 regional climate model SMHI with boundary conditions from the global HadGEM- ES model of the Met Office Hadley Centre (MOHC) were used, after detailed evaluation for the present climate representation in the Aegean region. In order to depict changes in climatic indices relevant to agriculture, geographical maps for the Aegean area were constructed based on model simulations at a horizontal resolution of approximately 12km. Changes in climate indices between control (1971-2000) and future [the near future period (2031 - 2060) and the distant future period (2069-2098)] periods are examined under the RCP4.5 medium mitigation scenario and the RCP8.5 high emission scenario. Annual averaged maximum ( $T_{max}$ ) and minimum ( $T_{min}$ ) temperatures show increases in the range of 4-6°C across the Aegean in the near- and distant future, especially under the RCP8.5 climate change scenario. Hot days ( $T_{max} > 30^{\circ}\text{C}$ ) are projected to increase considerably in the future (reaching up to 75-80 days/year in the E-N Aegean), while tropical nights ( $T_{min} > 20^{\circ}\text{C}$ ) are to double and triple in the near- to distant future for all Aegean islands. Total annual precipitation decreases significantly in the distant future, by 15-25%, while the maximum length of dry spells (precipitation  $< 1\text{mm}$ ) shows large increases across the Aegean under both RCP scenarios.