EGU21-1946
https://doi.org/10.5194/egusphere-egu21-1946
EGU General Assembly 2021

Climate change impacts on thermal comfort in one of the most popular tourist destinations in the world, Santorini Island, Greece

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To date, climate change has caused serious problems both in human societies and in various ecosystems. Worldwide, the observed climate change hazards include increased droughts and floods, extreme heat waves, sea-level rise, storms and changes in natural land cover. Tourism, as an important pillar of the economy, is expected to be further affected until the end of the century by climate change hazards. An important factor in the selection of a tourist destination is the climatic conditions of the location.

This research aims to investigate the observed and projected heat stress conditions in a top world tourist destination, the island of Santorini, in Greece. The Mediterranean has been identified as a vulnerable region regarding the heat related risk. Simulations by Regional Climate Models downscaled over the island of Santorini were performed for the 1982–2005 control period, the near future period 2035–2058 and the distant future period 2075–2098. The data for the future simulations are under the RCP4.5 and RCP8.5 future emissions scenarios. Thermal stress conditions were evaluated employing the Universal Thermal Climate Index (UTCI), which has a thermo-physiological basis and derived from the heat exchange theory between the thermal environment and the human body.

The analysis reveals that the thermal conditions in Santorini that cause moderate heat stress and strong heat stress are expected to increase in both RCPs scenarios in near and distant future. In particular, the exposure time under at least strong heat stress reaches 1.8% in the control period (1982–2005), increasing to 5.3% in the near future (2035–2058) and to 7.8% in the distant future (2075–2098) under the RCP4.5 scenario. In the distant future (2075–2098), under the RCP8.5 scenario, the exposure time under these conditions will exceed 12%.

The increasing heat related risk in one of the most popular tourist destinations in the world could be a wake-up call to the policy makers urging them to take prevention measures.