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High resolution climatology
- towards climate change services

Consistent geographical patterns of changes in high-impact European heatwaves

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Climate change projections suggest more frequent and intense European summer heatwaves during this century consistent with observed trends of the last decades. The most severe impacts arise from multi-days heatwaves, associated with warm night-time temperatures and high relative humidity, respectively.

Here we analyse a new set of high-resolution regional climate simulations and show that there is a geographically consistent signal among climate models: Most pronounced changes are projected in southernmost Europe for heatwave frequency and duration, further north for heatwave amplitude, and in low-altitude southern European regions for health-related indicators. For the Iberian Peninsula and the Mediterranean region, the frequency of heatwave days is projected to increase from an average of about 2 days per summer (1961-1990) to around 13 days in 2021-2050, and 40 days in 2071-2100.

In terms of health impacts, projections are most concerning for low-altitude southern European river basins and the Mediterranean coasts (with many densely populated urban centers), where the frequency of dangerous heat conditions increases significantly stronger and faster. The associated geographical pattern is a robust feature across different models and health indicators.