



Future changes in heat-waves, droughts and floods in 571 European cities

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Future changes in heat-waves, droughts and floods were assessed for 571 European cities. We used all available climate model runs from the Coupled Model Intercomparison Project Phase 5 – CMIP5 – for their higher emission scenario (RCP8.5) and grouped the projections into Low, Mid and High impact scenarios.

This resulted in impact projections outside the range of published literature, but enabled us to better understand uncertainties in future climate projections (both due to climate model errors but also the effects of natural variability) therefore providing the basis for broad scale risk analysis and thereafter identification of robust adaptation strategies.

While heat-waves will worsen for every European city, changes in droughts and floods are spatially variable and climate model dependent. The largest increases in the number of heat-wave days are shown to be in southern Europe, but higher heat-wave maximum temperature increases are expected in the mid-latitudes. In the low impact scenario, drought conditions are expected to intensify only in southern Europe while river flooding is expected to worsen in the north. However, in the high impact scenario most European cities show increases in both drought conditions and river flooding.

There is a very wide range of projections for future changes in Europe with disagreement between different studies, partly due to their methodological differences but potentially also due to the small number of climate model runs that limits the uncertainties due to natural variability and model errors that each study captures.