



## Countries with future highest exposure to unprecedented climate extremes

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In the last decades, the World experienced an increasing frequency and severity of weather-related extremes. Such events can remarkably affect multiple sectors as food, energy, and biosphere. In the framework of the activities of the ERC project EUNICE, and in order to understand the possible future impacts caused by climate extremes on population and socio-economic indicators, we firstly constructed a global database of climate indicators including eleven hazards (e.g., heatwaves, droughts, rainfall extremes, and windstorms), ranging from 1881 to 2100. For each grid point (0.5°), we provided different metrics as frequency, intensity, and number of unprecedented events at annual scale, dividing the future into five SSPs (plus two including temperature overshoot), and using the bias-adjusted CMIP6-based ISIMIP3b dataset as input. We therefore aggregated the parameters at country-scale - for each hazard - and we focused on the exposure of population and GDP to unprecedented future climate extremes, i.e. events never recorded in the past. We performed the analyses for two 30-year periods (2041-2070 and 2071-2100) and four Global Warming Levels (GWLs from 1.5 °C to 4 °C). Depending on the selected SSP and period, we present a structured ranking of countries that show the highest socioeconomic exposure to single or combined climate impact drivers. In this presentation, we also discuss the cost, in terms of cumulated events, of temperature overshoot above the 1.5 °C level to comply with Paris Agreement's goals. At a later stage, this new set of climate indicators will be also used to quantify the added value of including climate extremes in dedicated damage functions.