Department for Environment Food & Rural Affairs
Department for Business, Energy & Industrial Strategy
Met Office Hadley Centre
Environment Agency

UKCP18 Guidance: How to use probabilistic projections maps

What do the probabilistic projections maps show?

The probabilistic projections can be presented as a map and they show the spatial pattern of the projected climate change at a given probability level across an area such as the whole of the UK or administrative region.

The probabilistic projections are provided at 25km grid resolution. For each grid square, the maps show the value (e.g. temperature change) for which there is a given relative probability of the change being below that value. So for example, the left panel in Figure 1 shows the temperature change for 2080-2099 at the 10% probability level. A grid square showing 1˚C would indicate that in that 25km area, there is a 10% probability that temperatures will rise by less than 1˚C.

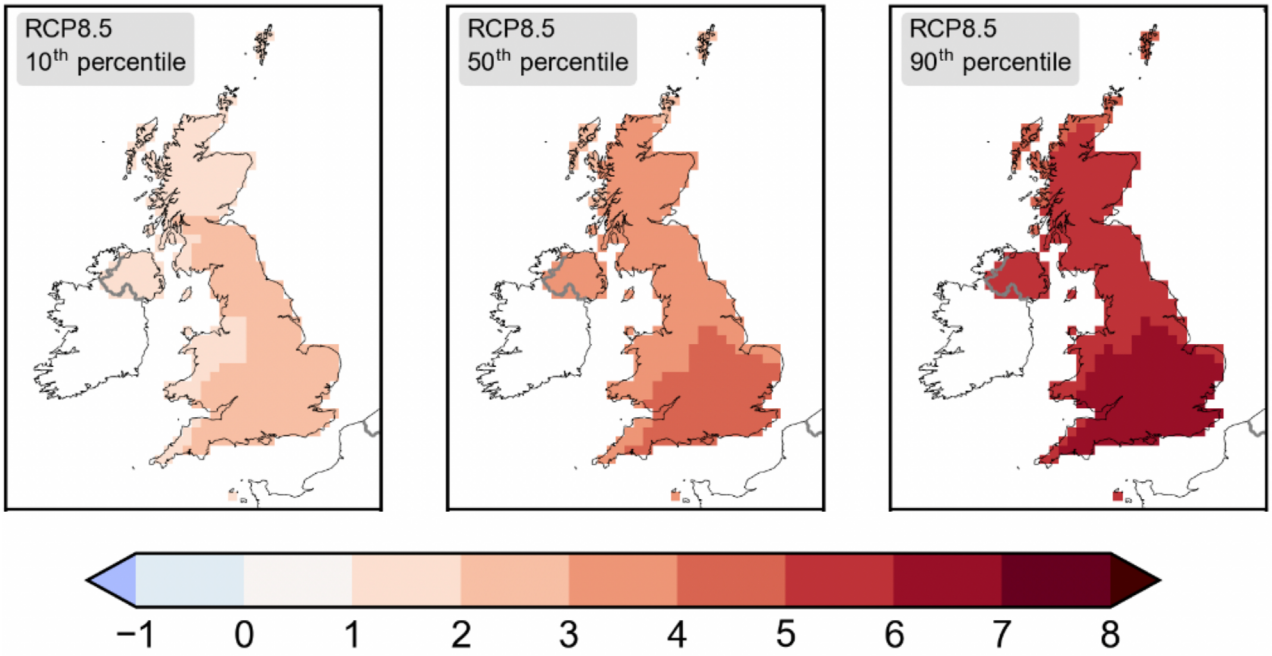

Figure 1 Annual mean temperature change for 2080-2099 relative to 1981-2000 for RCP8.5 for the UK from Key Results section of UKCP18 Website.

How to use the probabilistic projections maps: some examples

The probabilistic projections maps can be used:

- As an overview of the range of future outcomes at the regional or national level for a variable.

- To show the spatial pattern of projected changes at a given probability level.
- To understand the level of uncertainty associated with each 25 km grid square which may be helpful to inform the use of projections from two separate locations. It can also be used to assess confidence in the projections for any specific location, by comparing the width of the uncertainty ranges in neighbouring grid squares.

What to be aware of when using probabilistic projection maps

The probabilistic projections maps reflect the probability ranges obtained using the UKCP18 method. The range of projections captures the important known uncertainties associated with climate projections.

The values indicated for each grid square are a reflection of the contributions of the various sources of uncertainty for that grid square. These uncertainties are different for each grid square. As a result of this the values depicted across a given map are not necessarily spatially coherent. This means that it is not possible to aggregate the projections for multiple grid squares.

Each map reflects the results for one emissions scenario, so multiple maps need to be consulted in order to get a fuller assessment of future changes. Where individual maps are used, state the emissions scenario and the reasons for the choice.

Each map shows the change for a specific future period of time. Depending on the trend in future change, an individual map may not fully reflect the future changes with time: state the period and the reasons for the choice.

Where to find probabilistic projections maps

Maps of the probabilistic projections are available in the Key Results section of the UKCP18 website and in the UKCP18 Science Reports.

You can create your own maps for the UK on the UKCP18 User Interface. The full dataset is available from the CEDA Data Catalogue: note that this requires familiarity with handling large datasets.