UKCP18
National Climate Projections

Fai Fung
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Climate Resilience and Extreme Incidents: Building Resilient Infrastructure and Communities
CIWEM Conference, 30 April 2019

Jason A. Lowe, Dan Bernie, Philip Bett, Lucy Bricheno, Simon Brown, Daley Calvert, Robin Clark, Karen Eagle, Tamsin Edwards, Giorgia Fosser, Fai Fung, Laila Gohar, Peter Good, Jonathan Gregory, Glen Harris, Tom Howard, Neil Kaye, Elizabeth Kendon, Justin Krijnen, Paul Maisey, Ruth McDonald, Rachel McInnes, Carol McSweeney, John F.B. Mitchell, James Murphy, Matthew Palmer, Chris Roberts, Jon Rostron, David Sexton, Hazel Thornton, Jon Tinker, Simon Tucker, Kuniko Yamazaki, and Stephen Belcher.

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UK Climate Projections

Climate Change Act 2008

Climate change risk assessment 2012

Climate change risk assessment 2017

UKCIP02

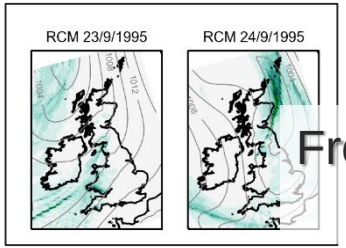
UKCP09

UKCP18

UKCIP98…

The best new science

Co-developed with users



From climate trends to future weather

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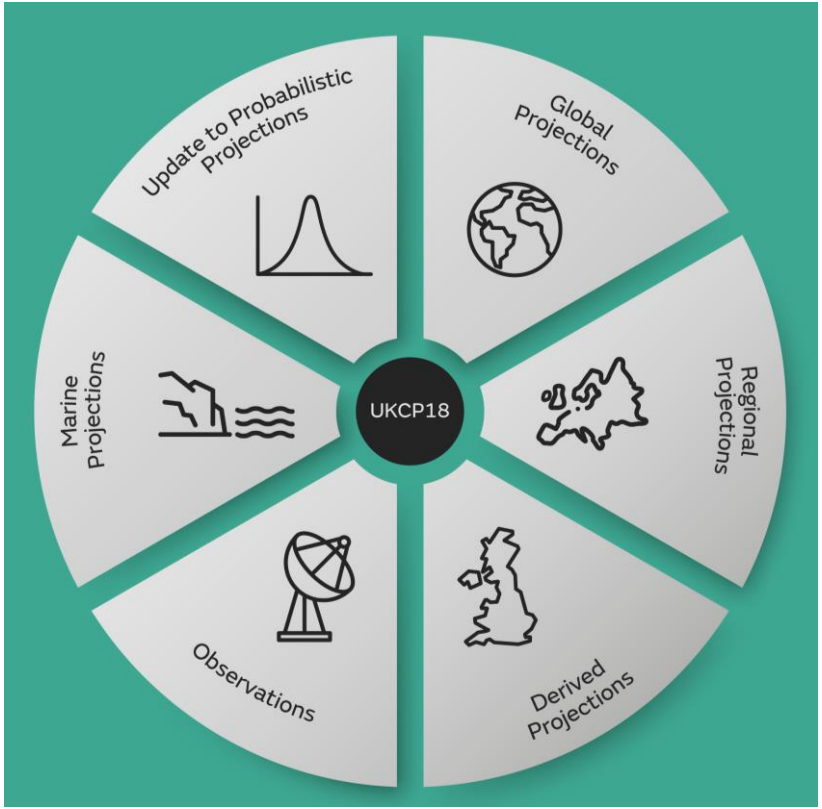
Headline results:

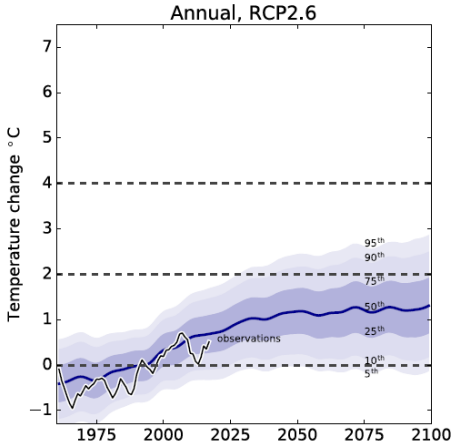
“A greater chance of warmer, wetter winters and hotter, drier summers”

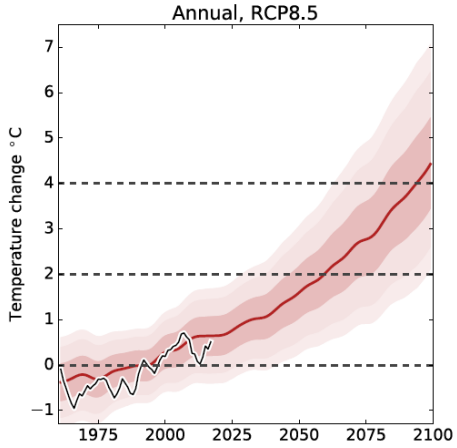
“Sea levels have been rising and will continue to rise”



Future UK temperatures

- All areas of the UK are projected to experience warming
- Warming is greater in the summer than the winter
- Future rise depends on the amount of greenhouse gases the world emits
- The lowest scenario is compatible with aims to limit global warming since pre-industrial levels to below 2°C
- The highest scenario will likely require **significant further adaptation**





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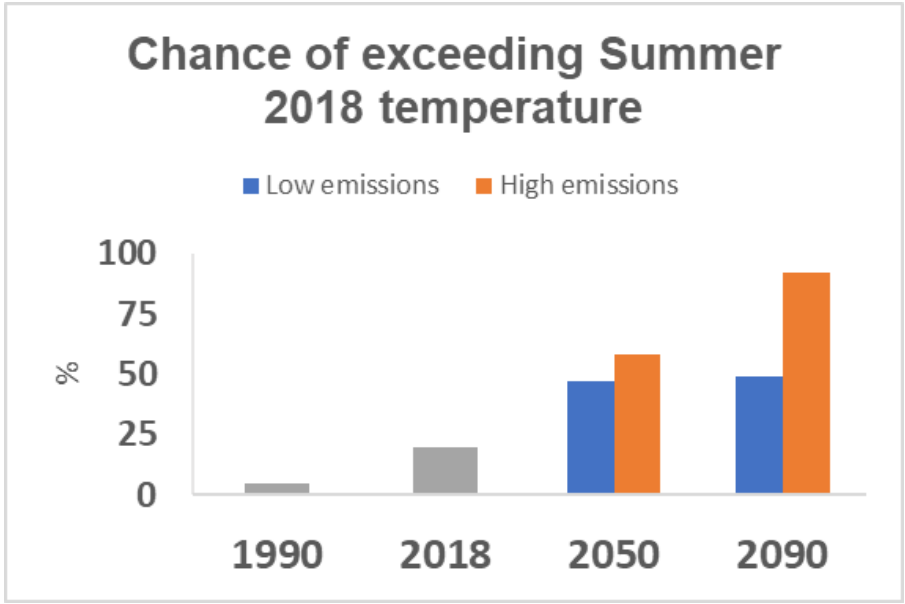
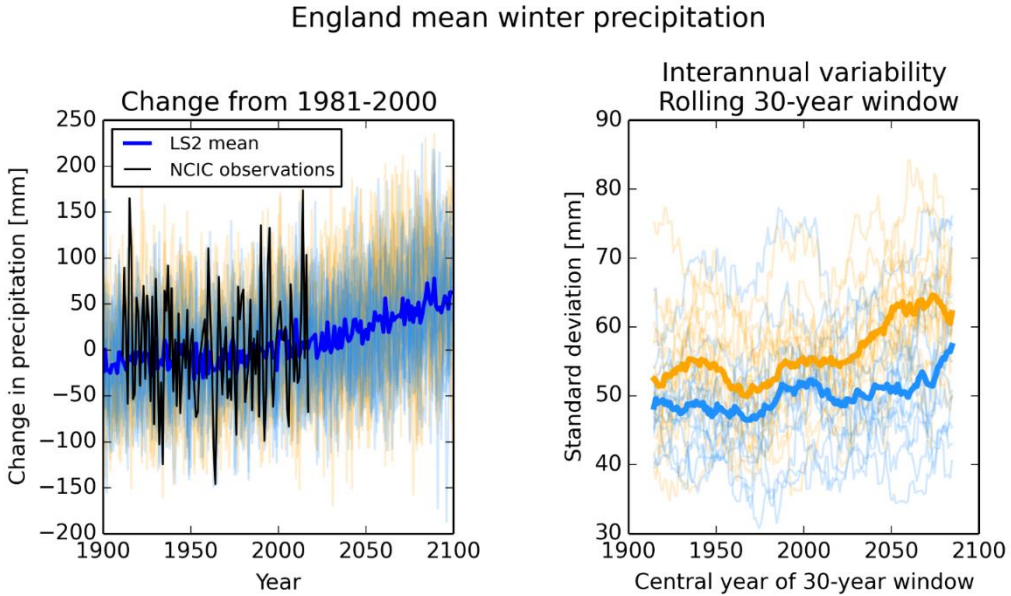
Summer 2018 heatwave

- Chance of such hot summers low in the baseline period (<10%)
- By mid-century the chance of hot summers will be of the order of 50%
- Beyond 2050 the chance of a warmer summer more strongly depends on emission scenario

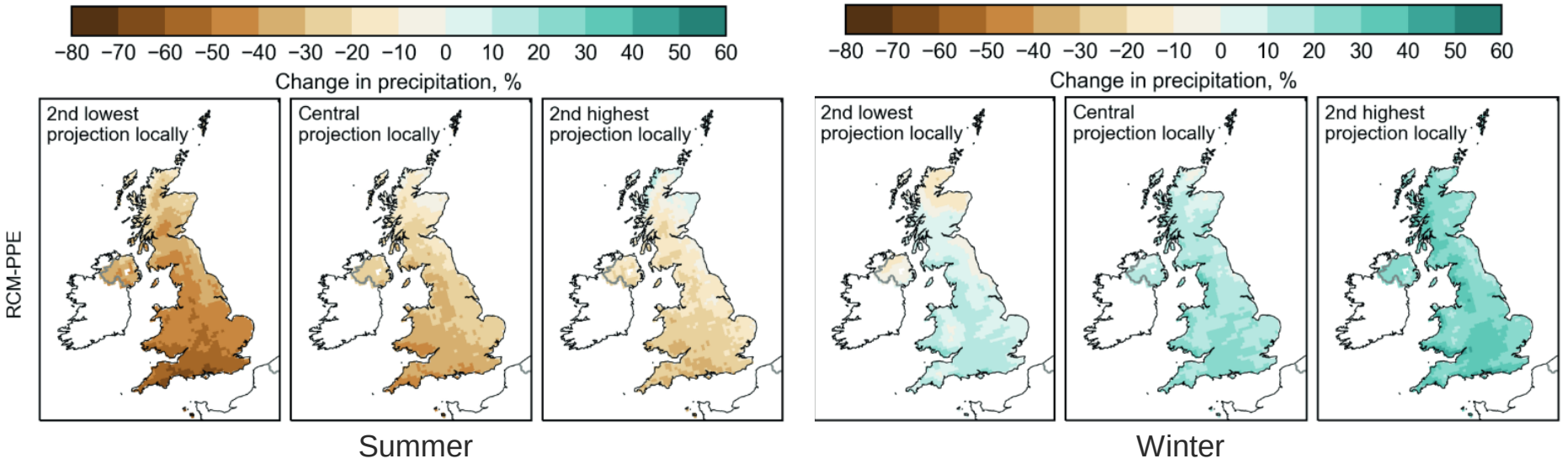


Future UK precipitation

- Winter precipitation is expected to increase significantly but still have relatively dry winters
- Summer rainfall is expected to decrease significantly. But when it rains in summer there may be more intense storms
- Increase in year-to-year variability in winter precipitation in Met Office members of global projections
- Wider range of weather to adapt to in the future



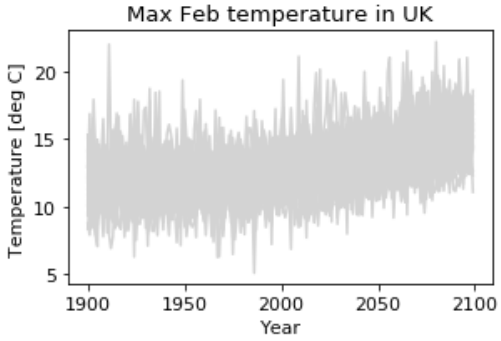
Pattern of precipitation change

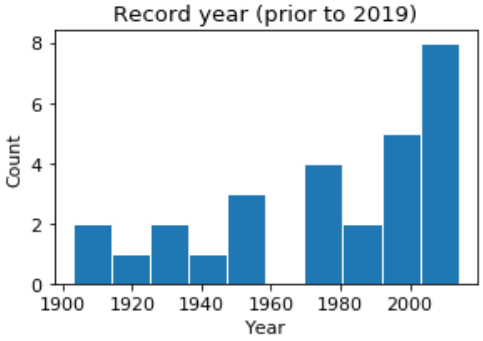


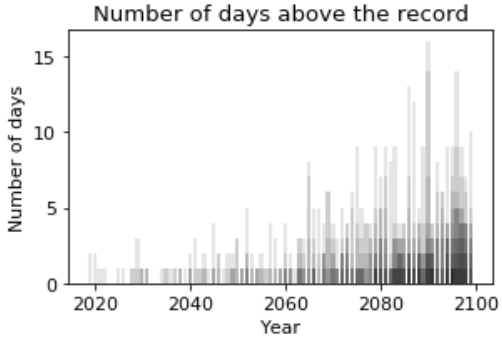
The spatial pattern of change to 2061-2080 shows detailed structure over the UK (RCP8.5). Compare SE England and N Scotland.

February 2019 record temperature

- Records can come from any year in 20th century with a slightly greater chance from 2000-2018
- Suggests largely natural variability topped up by anthropogenic warming
- Records difficult to beat until 2060s onwards





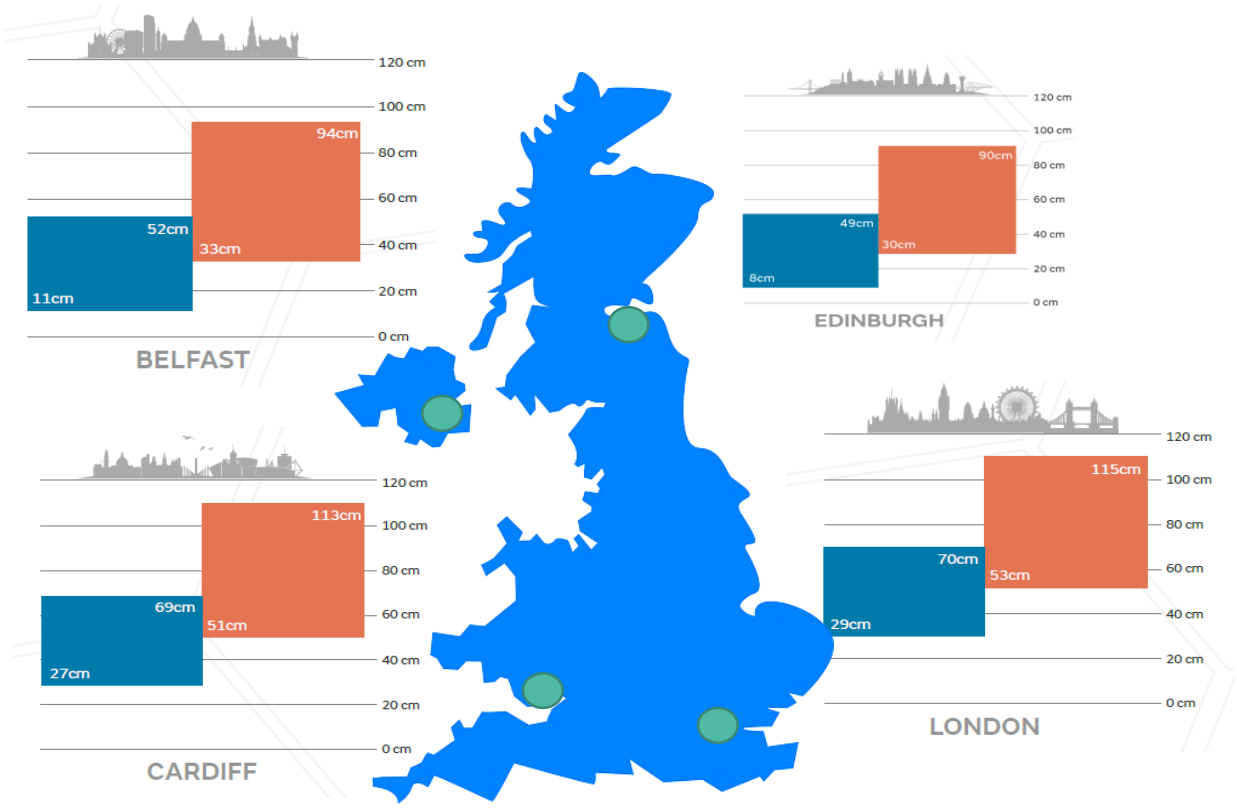


Sea-level rise

Increase will generally be greater in the south than in the north

Range in low emission scenario *Range in high emission scenario*

(by 2100 relative to 1981-2000)



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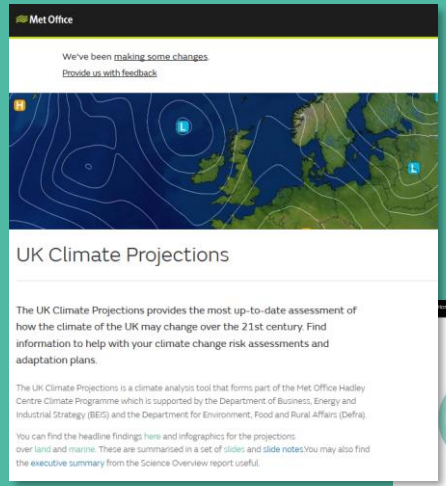
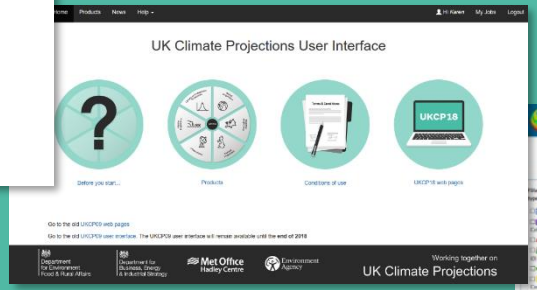
Where to find the information

https://ukclimateprojections.metofffice.gov.uk





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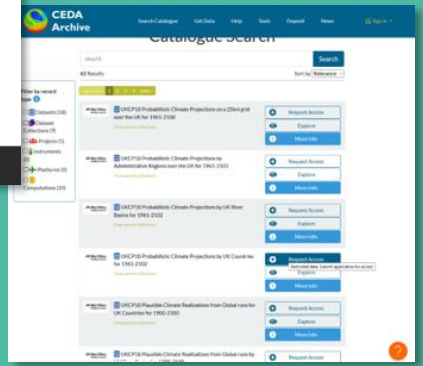
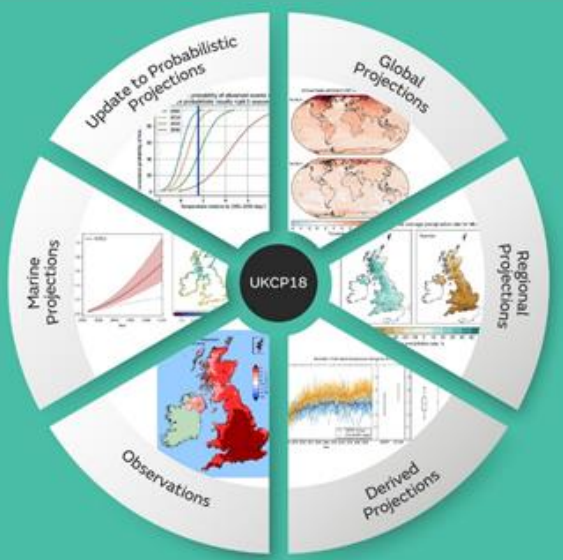


https://catalogue.ceda.ac.uk



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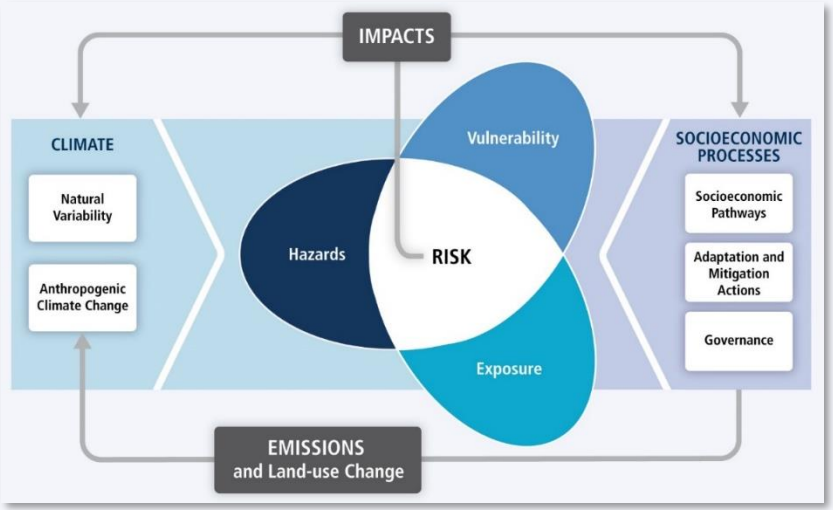
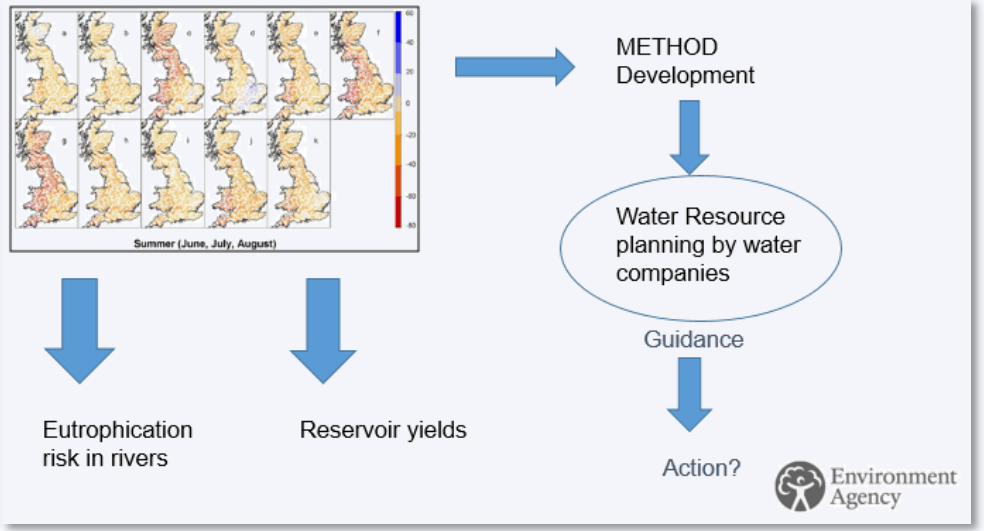
From climate hazard to risk





IPCC (2013)

Climate projections at 2.2km resolution

UKCP18 2.2km ensemble

- 2.2km resolution for UK
- 12 members
- 1980-2000, 2020-40, 2060-80

Launch 2019

New estimates of changes in daily and hourly extremes
- Storms
- Summer downpours
- Severe wind gusts

Supports UK risk assessments e.g. CCRA3

First estimate of uncertainties in changes at local and hourly scales

Hydrological impacts modelling e.g. flash

Climate change for cities e.g. urban extremes

- Improved representation of convection
- Added-value particularly for precipitation (especially extremes) and subdaily timescales
- Improved daily timing of convection and extremes, hourly intensity of extremes, spatial structure

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