# A pragmatic approach to statistical modelling of big spatio-temporal climate data

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Motivation and method

- Question: "What is the future change in the number of times that summer temperature exceeds 24°C for 3 consecutive days in the UK"?

- Daily summer data from UKCP RCM over two 11-year periods (1985-1995 and 2065-2075).

- We can use **statistical modelling** since our event is **rare** and thus we have relatively little data to answer the question empirically:
  - **Extrapolate beyond the range of the data;**
  - **Uncertainty quantification (e.g. we should be more uncertain about rarer events);**
  - **More interpretable as quantities can be expressed directly in terms of probability.**

- Generalised Additive Models + Moving Window + Bayesian inference =
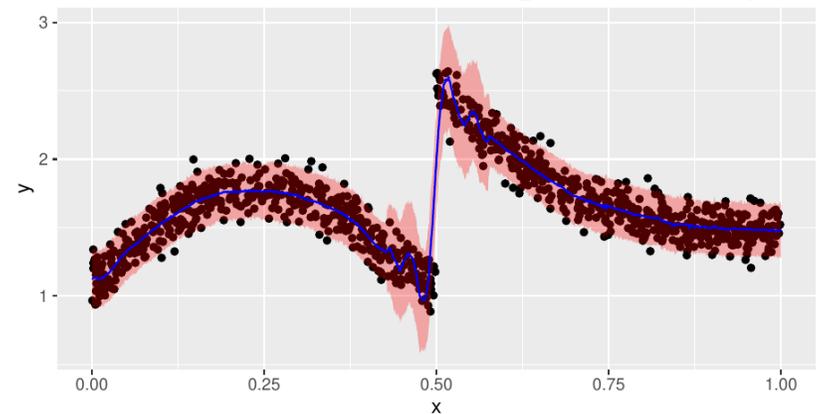
- Flexibly capture **mean patterns** but also **uncertainty** in terms of an appropriate **probability distribution**.

Results

The approach presented seems to do the job – i.e. it is ➤ flexible enough to capture variables with complex nature, such as precipitation; ➤ paralleliseable and scalable to big data sets; ➤ Bayesian so all uncertainty in the results is fully quantified.

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