

Royal Haskoning was appointed by the Environment Agency to analyse rainfall datasets derived from gauging stations across Northumberland, Tyne & Wear, County Durham and Tees Valley. Data from eight locations (red circles in Figure 1) spanning between 49 and 151 years were analysed in order to identify trends within recent climatic history which can be used to inform further studies of climate change within the North East of England.

Further studies have included the use of the Environment Agency Rainfall and Weather Impact Generator (EARWIG) to predict rainfall by the 2050s at ten sites across the region (squares shown Figure 1).

Trends looking at annual and seasonal average and accumulated 1, 2, 5 and 10 day annual maximum were plotted.

The key findings are:

- Historic records show an overall decreasing trend in average annual rainfall which supports future projections from the EARWIG model.
- These records also show an overall increase in average winter rainfall which also supports the EARWIG model.
- During spring, half of the sites show a slight increase and the other half show a slight decrease in average rainfall.
- Gauged data show a decrease in average summer rainfall during the study period (Figure 2), which also supports future projections made using the EARWIG Model.
- During autumn, all eight sites show a slight decrease in rainfall.
- Modelling of intensive rainfall events shows more variability. However, when considering measured data, accumulated annual maximum (A_{max}) rainfall over 1, 2, 5 and 10 days, there is a clear increasing trend across all parameters.
- It is concluded that recent historic rainfall records from a spread of sites across the region already demonstrate the onset of climate changes that are projected to occur by the 2050s using EARWIG modelling across the North East.

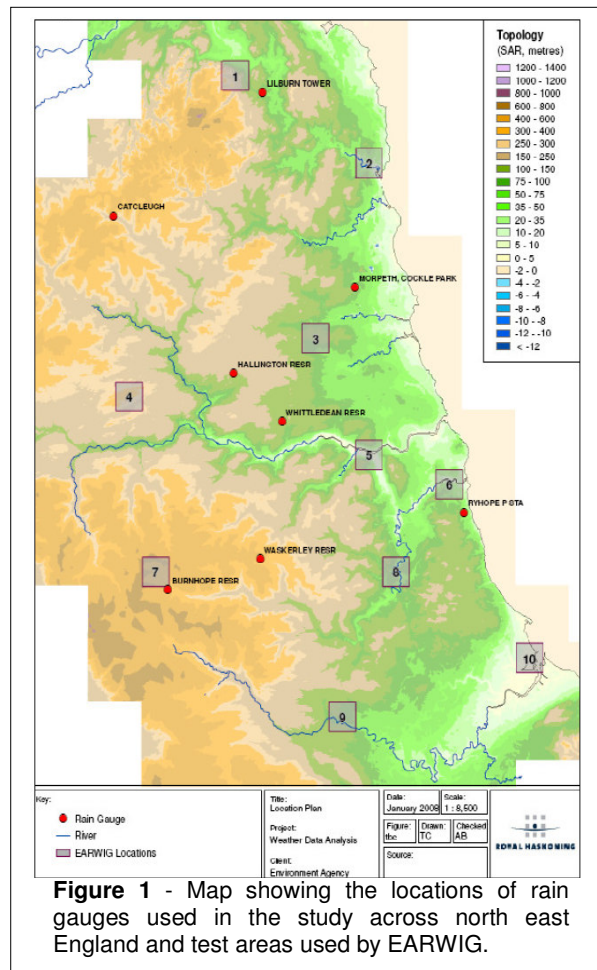


Figure 1 - Map showing the locations of rain gauges used in the study across north east England and test areas used by EARWIG.

Figure 2 - Typical plot showing the reducing trend of average summer rainfall over recent decades and the projected reduction in summer rainfall by the 2050s.

