

United Kingdom

In this section explore the latest projections about climate change

Graph one: What is the UK's climate like?

- The United Kingdom spans latitudes of 50 to 62°N. It has a maritime climate with four distinct seasons
- Average annual temperature varies between 4.5 °C in winter to 14 °C in summer with warmer conditions in the South
- Rainfall is highest in autumn and winter; average of approximately 110 mm per month, and 75 mm per month in spring and summer
- Mean annual rainfall varies between 2500mm in mountainous areas such as Wales to 500mm in the drier region of East Anglia
- Year to year variations in climate are linked to the North Atlantic Oscillation (NAO) which causes shifts in the average track of storms

Graph two: How did the UK's temperature change between 1960 and 2009?

- The black line shows the actual temperature anomaly for each year from 1960 to 2000. This is the difference in temperature between the year's recorded temperature and the average of all years between 1970 and 1999. If the anomaly is positive, that year was warmer than the 1970-1999 average. If it is negative, that year was colder than the 1970-1999 average
- The brown line shows past temperature anomalies as produced by a computer model with the brown shading showing the range of temperatures produced by the model
- Since 1960 the average temperature has increased by 0.9°C – a rate of 0.20°C per decade
- The green, blue and red lines show projected future temperatures from 2006 to 2100, according to three different emission scenarios – green (low), blue (medium) and red (high). The shading around each line shows the range of temperature that might be possible with each emission scenario
- All scenarios show future temperatures will be warmer
- Average annual temperature is expected to increase by 0.4 to 2.4°C by the 2060s, and 0.6 to 3.2°C by the 2090s

Graph three: How will the UK's temperature change between 2009 and 2100?

- The black line shows the actual temperature anomaly for each year from 1960 to 2000. This is the difference in temperature between the year's recorded temperature and the average of all years between 1970 and 1999. If the anomaly is positive, that year was warmer than the 1970-1999 average. If it is negative, that year was colder than the 1970-1999 average
- The brown line shows past temperature anomalies as produced by a computer model with the brown shading showing the range of temperatures produced by the model
- Since 1960 the average temperature has increased by 0.9°C – a rate of 0.20°C per decade
- The green, blue and red lines show projected future temperatures from 2006 to 2100, according to three different emission scenarios – green (low), blue (medium) and red (high). The shading around each line shows the range of temperature that might be possible with each emission scenario
- All scenarios show future temperatures will be warmer
- Average annual temperature is expected to increase by 0.4 to 2.4°C by the 2060s, and 0.6 to 3.2°C by the 2090s

Climate 4 Classrooms: National Futures

Graphs four - six: How will the United Kingdom's temperature change during the 2030s, 2060s and 2090s? December, January and February

- These three maps show projected December, January and February (DJF) temperatures in the 2030s, 60s and 90s (according to a high carbon dioxide emissions scenario, A2)
- All values are anomalies – the difference in temperature to the average of 1970 to 1999 temperatures
- Areas shaded red will be 6-7°C hotter than average temperatures from 1970 to 1999, whereas areas shaded green will be the same as the 1970-1999 average
- The number in the centre of each grid box is the average projected temperature; numbers in the upper and lower corners give the highest and lowest possible DJF mean temperature
- Temperature increase is expected to be greater in the summer (JJA) at an average rate of 0.22°C per decade

Graph seven - nine: How will the United Kingdom's temperature change during the 2030s, 60s and 90s? March, April and May

- These three maps show projected March, April and May (MAM) temperatures in the 2030s, 60s and 90s (according to a high carbon dioxide emission scenario, A2)
- All values are anomalies – the difference in temperature to the average of 1970 to 1999 temperatures
- Areas shaded red will be 6-7°C hotter than average temperatures from 1970 to 1999, whereas areas shaded green will be about the same as the 1970-1999 average
- The number in the centre of each grid box is the average MAM temperature anomaly we expect having had high carbon dioxide emissions; the smaller numbers in the upper and lower corners give the range of average temperature anomalies that might occur
- Temperature increase is expected to be most rapid in Summer (JJA) at an average rate of 0.22°C per decade
- We use the term MAM rather than spring because most climate change maps are for the whole globe and seasons are reversed in the northern and southern hemispheres

Graphs 10-12: How will the United Kingdom's temperature change during the 2030s, 60s and 90s? - June, July, August

- These three maps show projected June, July and August (JJA) temperatures in the 2030s, 60s and 90s (according to a high carbon dioxide emission scenario, A2)
- All values are anomalies – the difference in temperature to the average of 1970 to 1999 temperatures
- Areas shaded red will be 6-7°C hotter than average temperatures from 1970 to 1999, whereas areas shaded green will be about the same as the 1970-1999 average
- The number in the centre of each grid box is the average JJA temperature anomaly we expect having had high carbon dioxide emissions; the smaller numbers in the upper and lower corners give the range of average temperature anomalies that might occur
- Temperature increase is expected to be less in the summer (JJA)
- We use the term JJA rather than summer because most climate change maps are for the whole globe and seasons vary around the globe.

Graphs 13-15: How will the United Kingdom's temperature change during the 2030s, 60s and 90s? - Seasonally – September, October, November

- These three maps show projected September, October and November (SON) temperatures in the 2030s, 60s and 90s (according to a high carbon dioxide emission scenario, A2)
- All values are anomalies – the difference in temperature to the average of 1970 to 1999 temperatures
- Areas shaded red will be 6-7°C hotter than average temperatures from 1970 to 1999, whereas areas shaded green will be about the same as the 1970-1999 average

Climate 4 Classrooms: National Futures

- The number in the centre of each grid box is the average SON temperature anomaly we expect having had high carbon dioxide emissions; the smaller numbers in the upper and lower corners give the range of average temperature anomalies that might occur
- Temperature increase is expected to be least in the summer (JJA)
- We use the term SON rather than Autumn because seasons vary around the globe.

Graphs 16-17: How will the United Kingdom's frequency of hot days change?

- These two maps show the percentage of hot days expected during the 2060s and 2090s given high carbon dioxide emissions through the century (scenario A2)
- A hot day is defined by the temperature exceeded on 10% of days in 1970-1999. So, in 1970-1999, you would have expected 1 in 10 days to be hot. If the map shading indicates that more than 10% of days are hot, then there has been an increase in the number of hot days
- In areas shaded deep red, every day will be a hot day. Yellow areas will have 30% hot days
- The number in the centre of each grid box is the number of hot days we expect; the smaller numbers in the upper and lower corners give the range of numbers of hot days that might occur
- The frequency of hot days has increased since 1960 in every season – especially summer (JJA)
- Hot days will become more frequent in all areas of the UK
- Hot days will occur on 9-25% of days by 2060s and 14-35% of days by 2090s. The fastest increases will be in the summer (JJA)

Graphs 18-19: How will the United Kingdom's frequency of hot nights change?

- Hot days will occur on 9-25% of days by 2060s and 14-35% of days by 2090s. The fastest increases will be in the summer (JJA)
- A hot night is defined by the temperature exceeded on 10% of nights in 1970-1999. So, in 1970 – 1999, you would have expected 1 in 10 nights to be hot. If the map shading indicates that more than 10% of nights are hot, then there has been an increase in the number of hot nights
- In areas shaded deep red, every night will be a hot night. Yellow areas will have 30% hot nights
- The number in the centre of each grid box is the number of hot nights we expect; the smaller numbers in the upper and lower corners give the range of numbers of hot nights that might occur
- Hot nights will occur on 10-26% of all nights by the 2060s and 14-36% of nights by the 2090s
- Cold days and nights will become less frequent, occurring on less than 6% of days by the 2090s

Graph 20: How will the United Kingdom's precipitation change?

- This graph shows the 'precipitation anomaly' – the difference in rain or snowfall to the 1970-1999 average. If the graph shows a positive number, then it is wetter than the 1970-1999 average. If the graph shows a negative number, then it is drier
- The black line shows the actual precipitation anomaly for each year from 1960 to 2006. This is the difference in rain/ snowfall between the year's recorded precipitation and the average of all years between 1970 and 1999
- The brown line shows past precipitation anomalies as produced by a computer model with the brown shading showing the range produced by the model
- The green, blue and red lines show projected future precipitation from 2006 to 2100, according to three different carbon dioxide emission scenarios – green (low), blue (medium) and red (high). The shading around each line shows the range of precipitation that might be possible with each emission scenario. Average rainfall has not consistently increased or decreased since 1960
- Models project an overall increase in mean annual rainfall in the UK. The greatest changes will be in the autumn and winter (SON and DJF) and a decrease in rainfall in the summer

Climate 4 Classrooms: National Futures

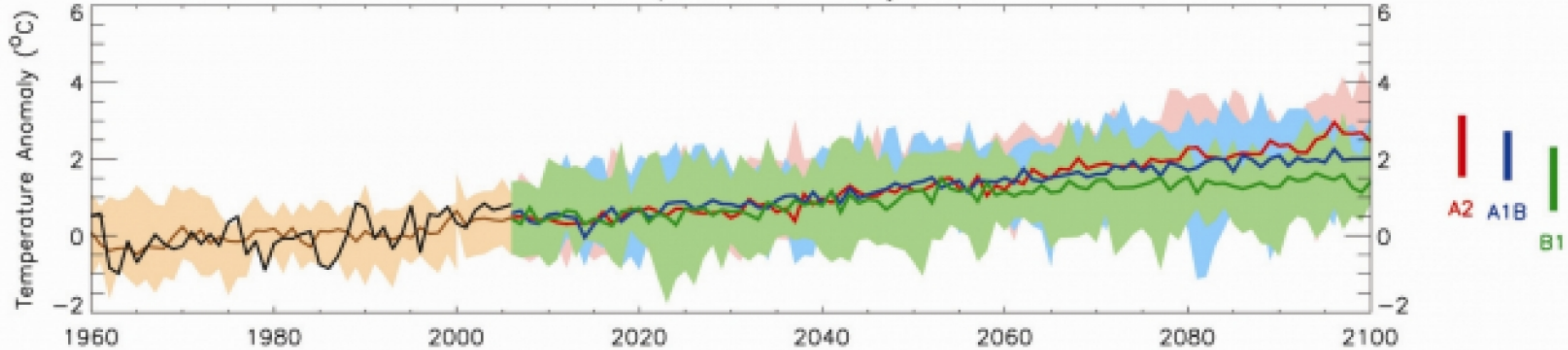
- The range of projections by the 2060's is 2-8mm per month and -2 –11 mm per month by the 2090's
- Melt water from the Greenland Ice sheet into the North Atlantic is expected to cause a weakening of the Atlantic Ocean Circulation, reducing the effect of the Gulf Stream on the UK and Western Europe climate. This is likely to partially offset the overall warming
- Coastal regions may be vulnerable to sea-level rise. However, the increases in absolute sea level are partially offset by gradual increase in land elevation in the north of the UK and vice-versa in the south

Graphs 21-23: How will the UK's annual temperature change between the 2030s, 2060s, 2090s?

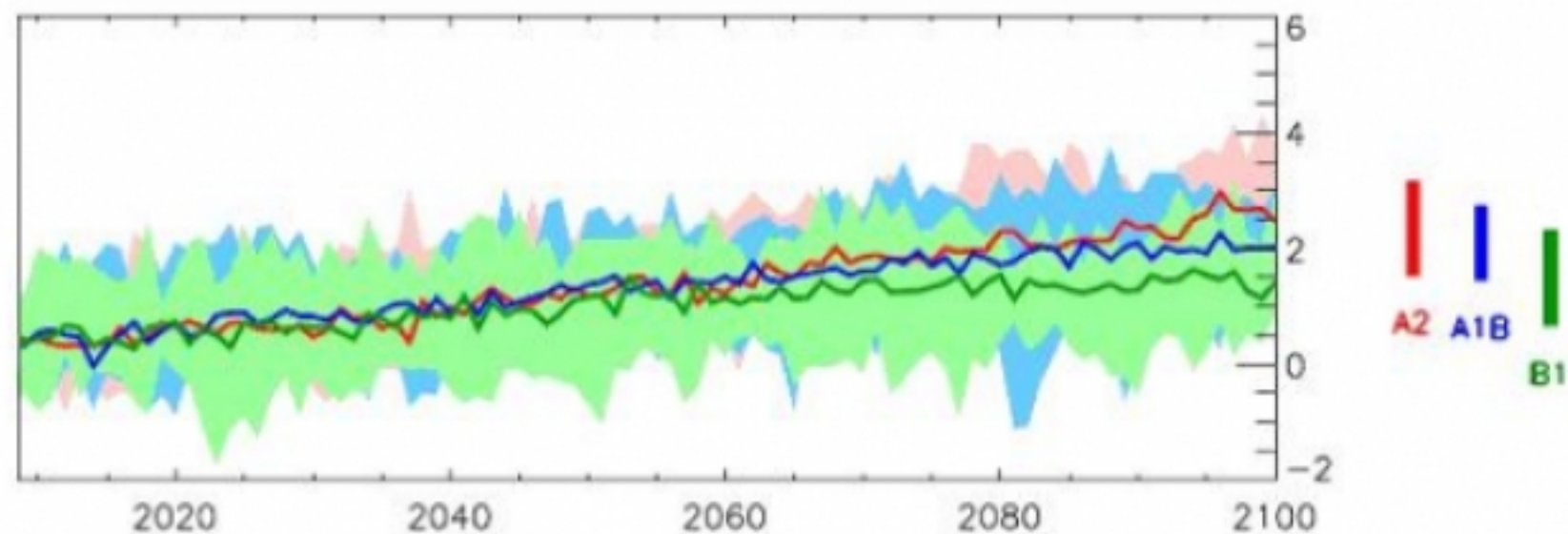
- These three maps show projected temperatures in the 2030s, 60s and 90s (according to a high carbon dioxide emission scenario, A2)
- All values are anomalies – compared to average temperatures from 1970 to 1999
- Areas shaded deep orange will be 6°C hotter than average temperatures from 1970 to 1999, whereas areas shaded green will be the same as the 1970-1999 average
- The numbers in the centre of each grid box is the average projected temperature; numbers in the upper and lower corners give the highest and lowest possible annual mean temperature

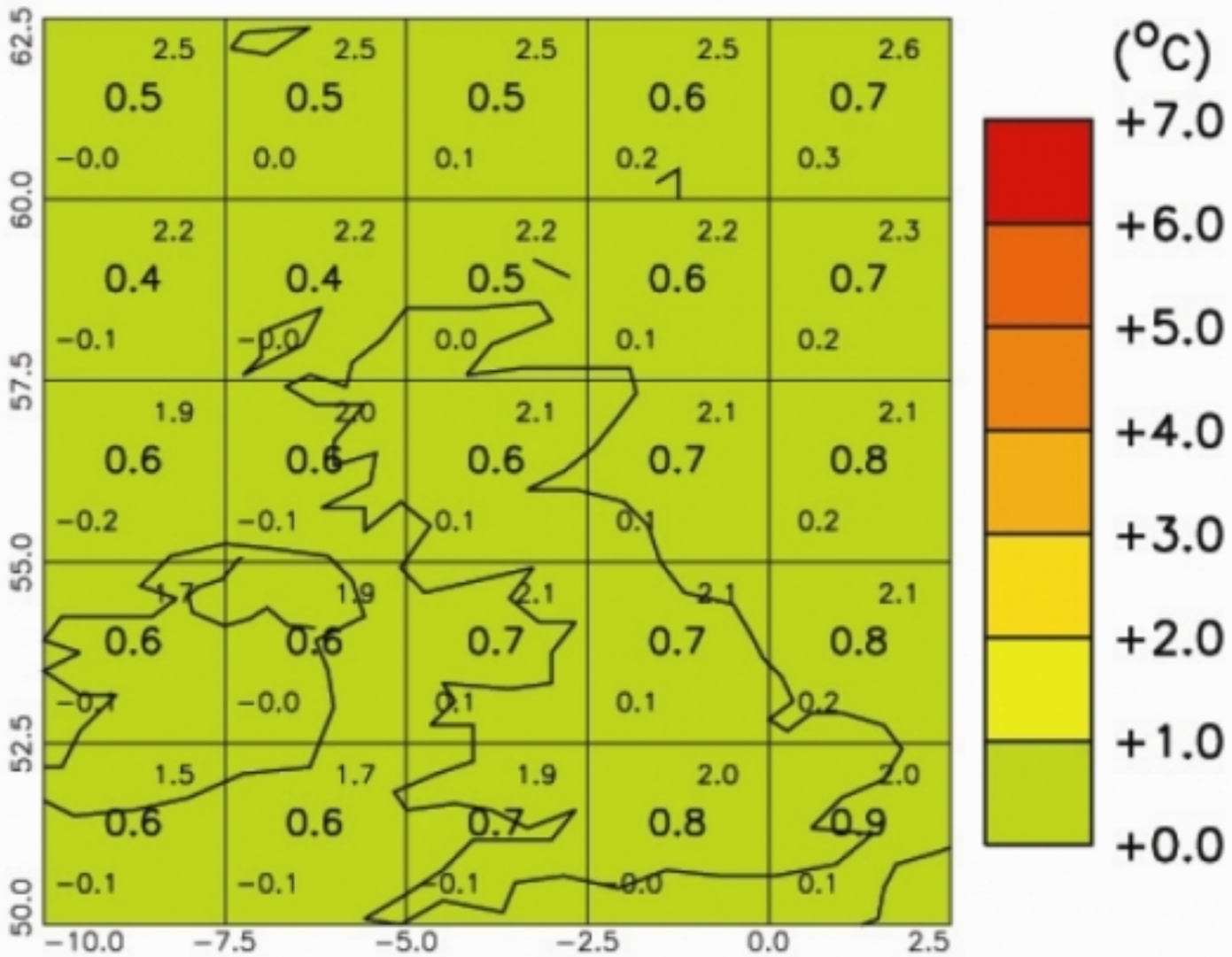


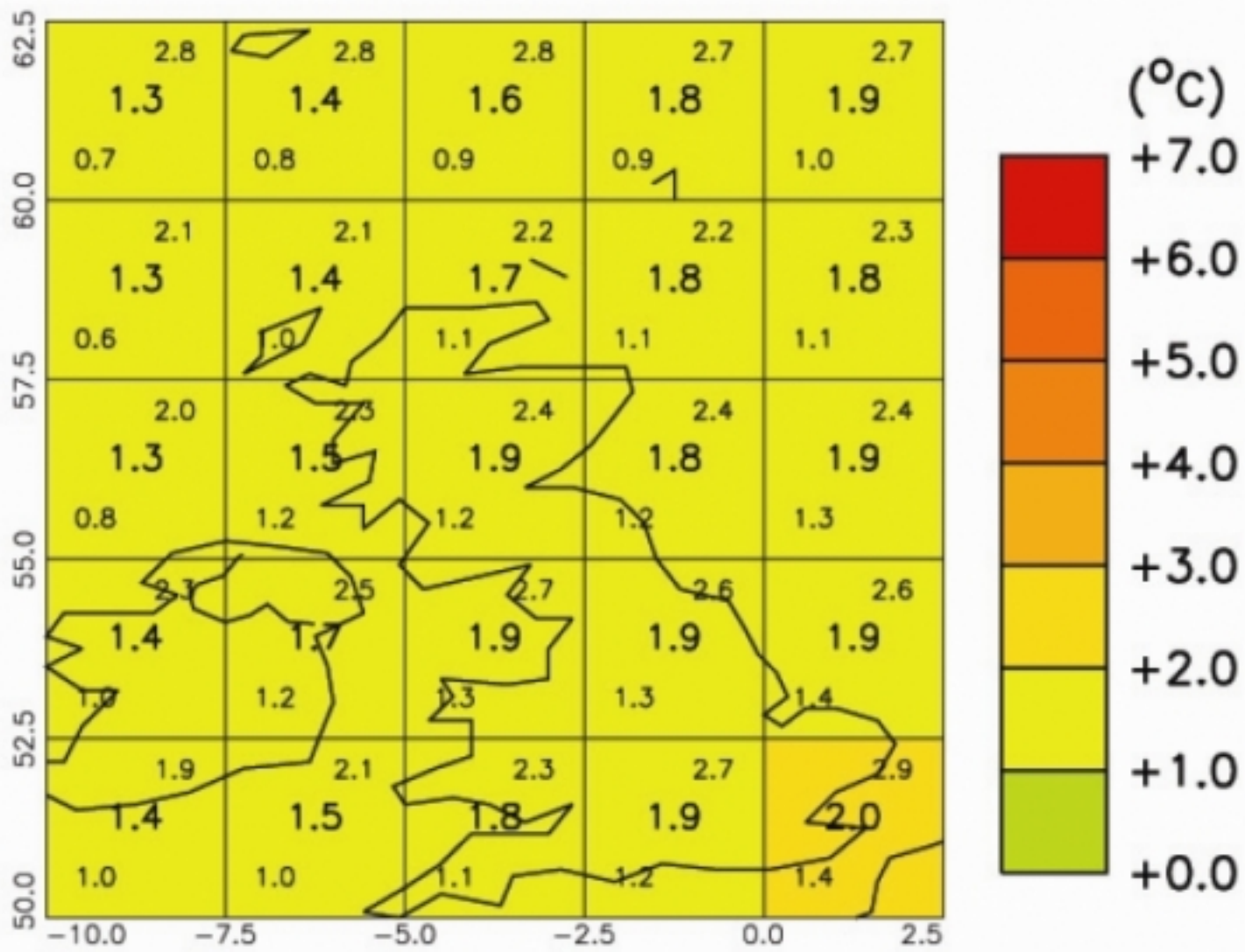
UK: Mean Temperature Anomaly Annual

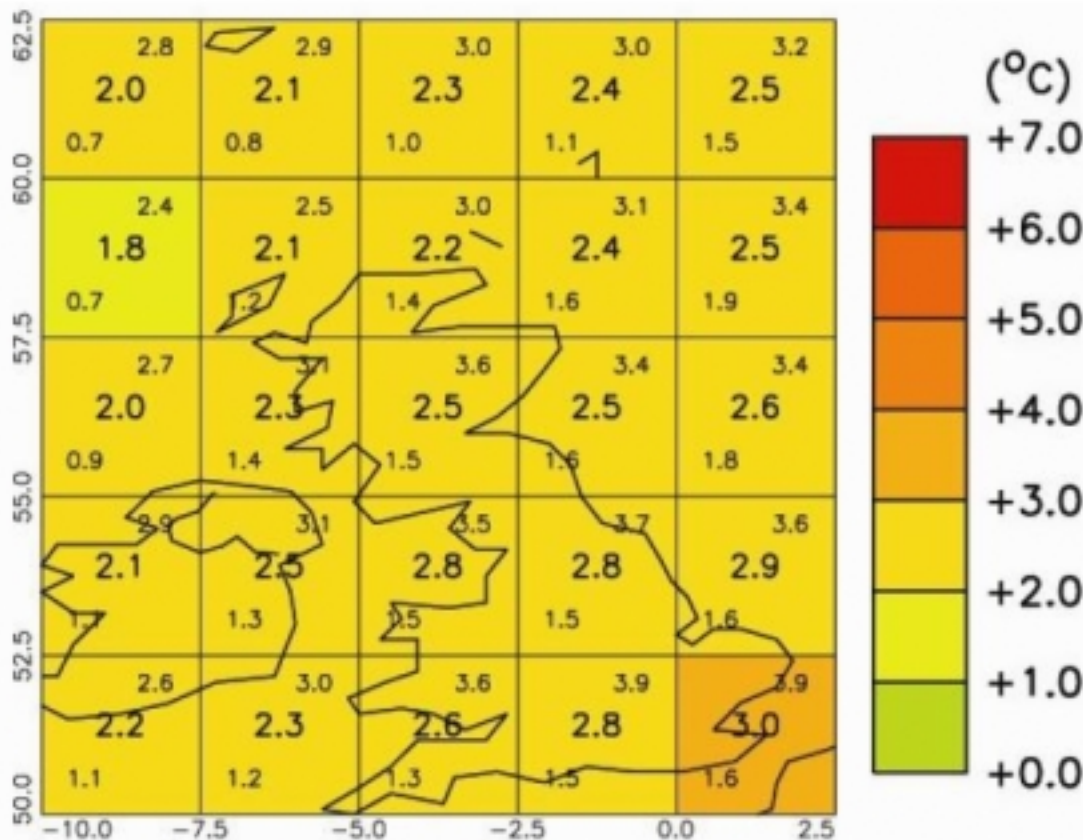


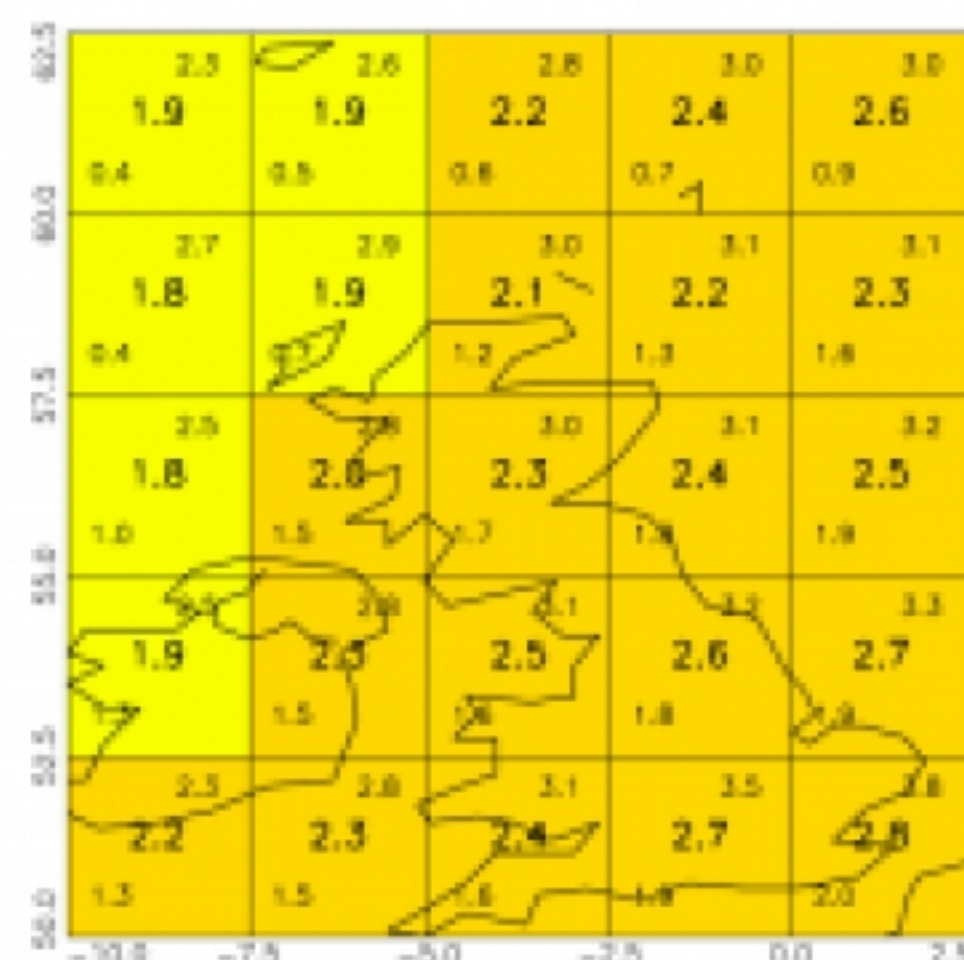
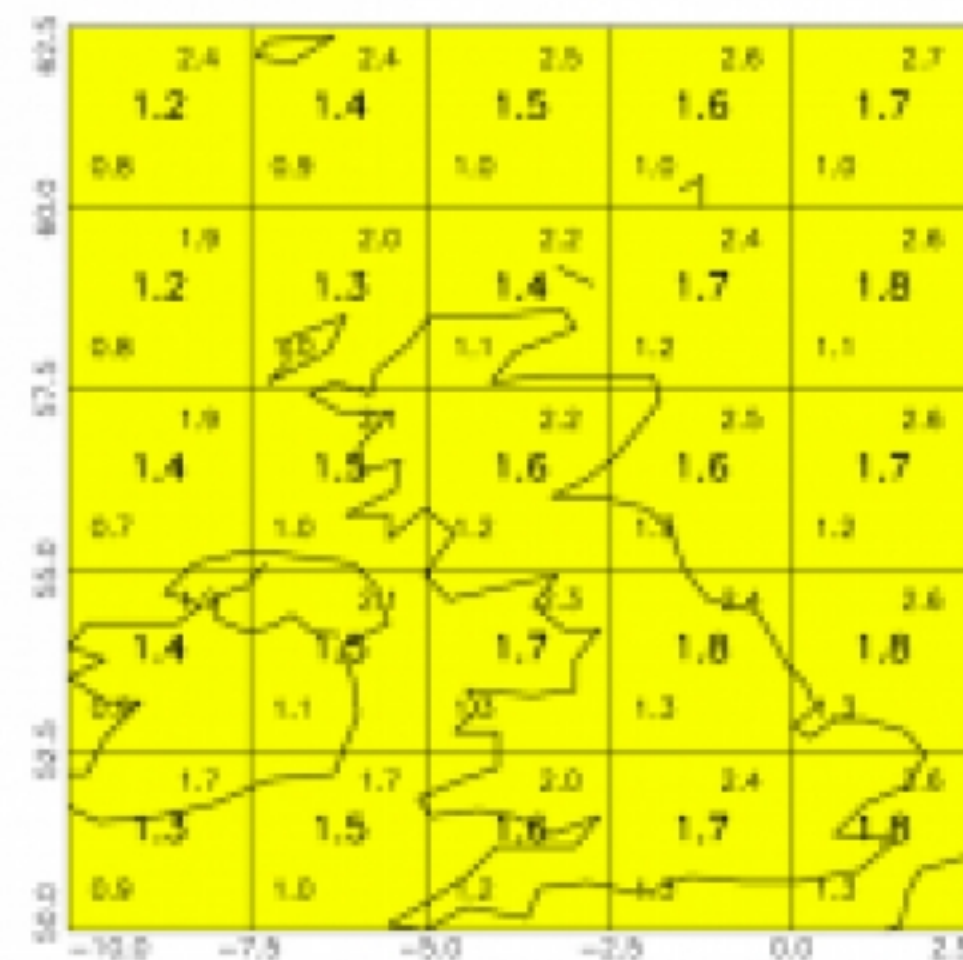
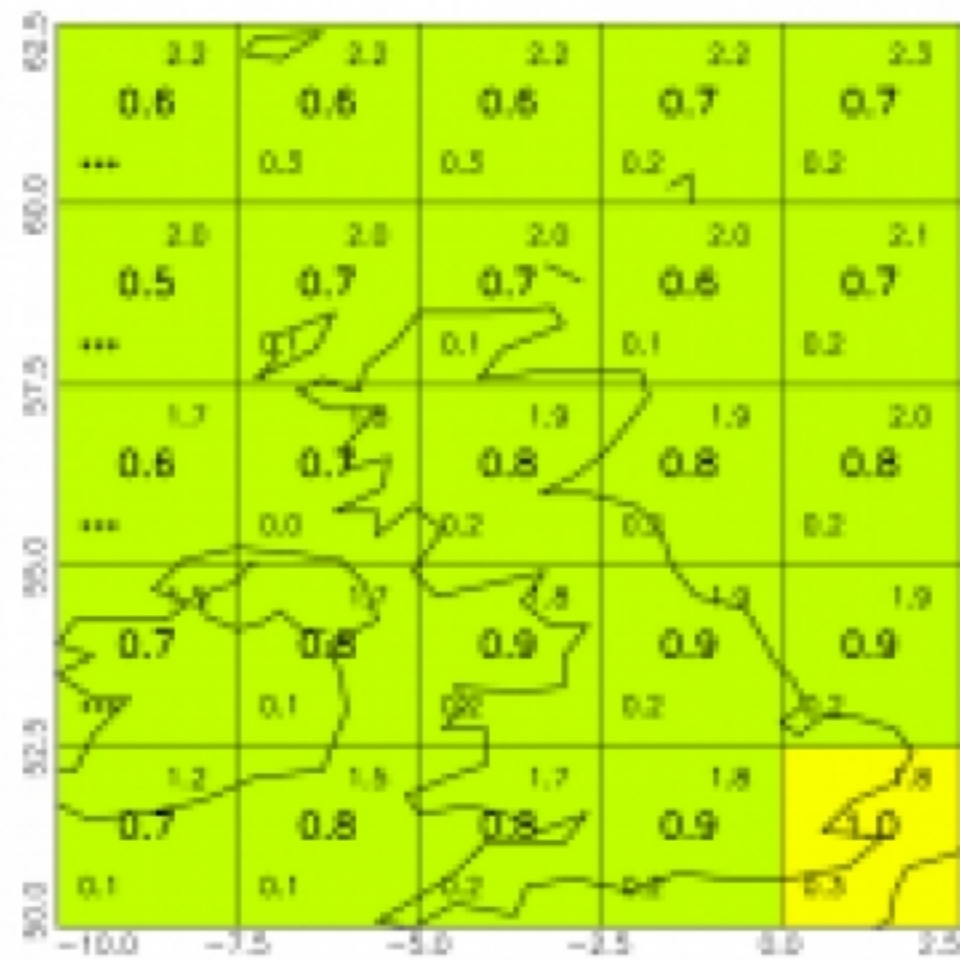
UK: Mean Temperature Anomaly Annual



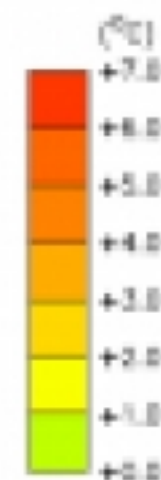


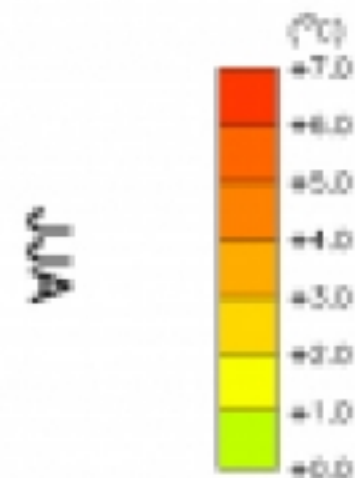
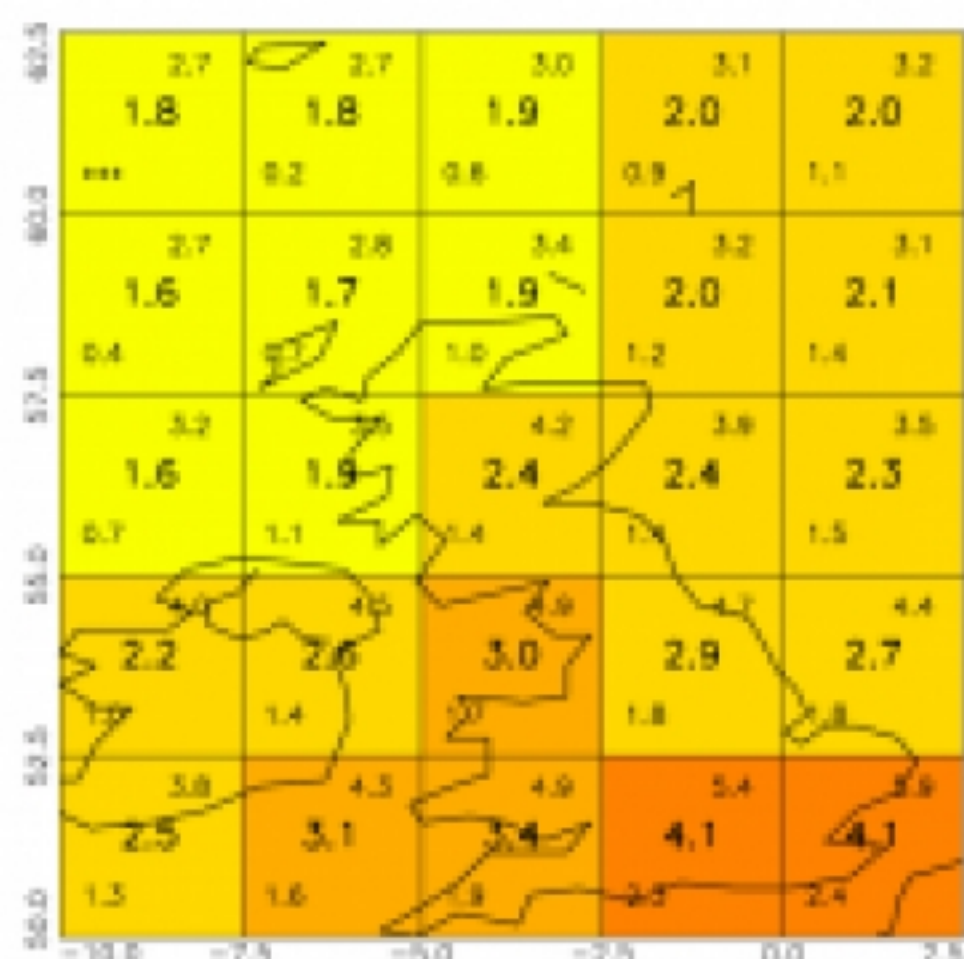
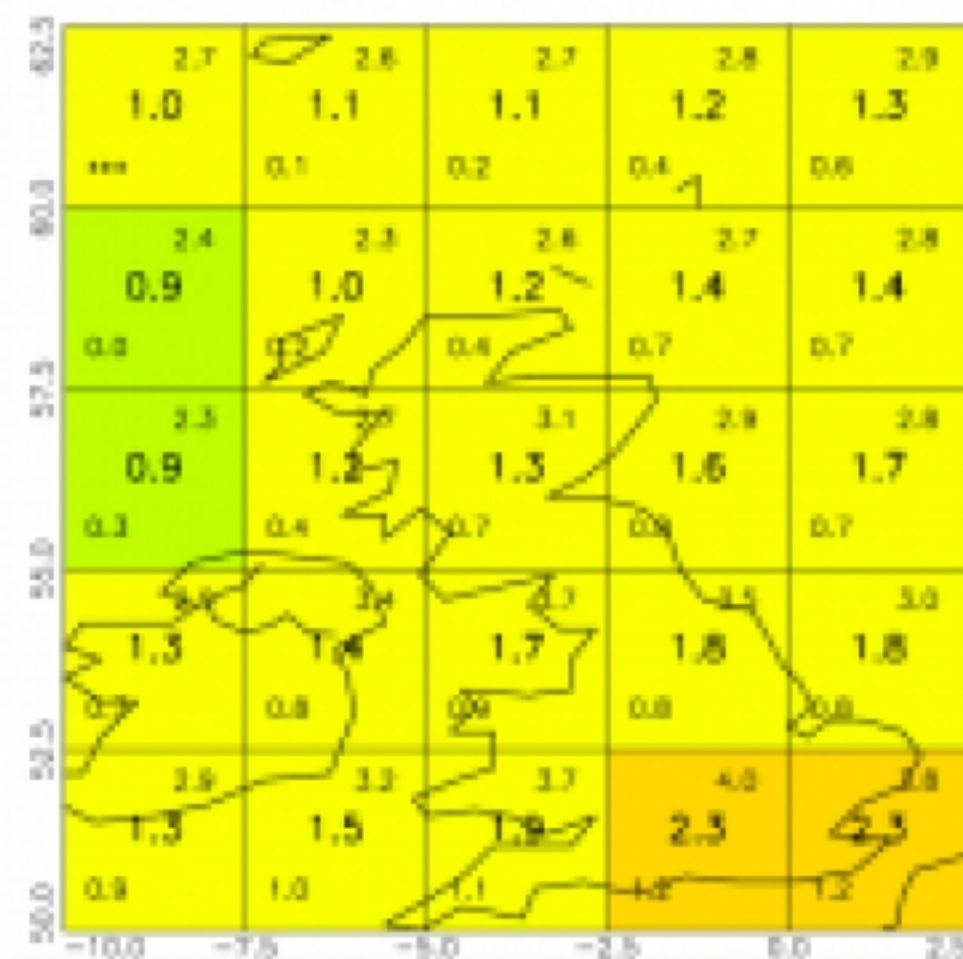
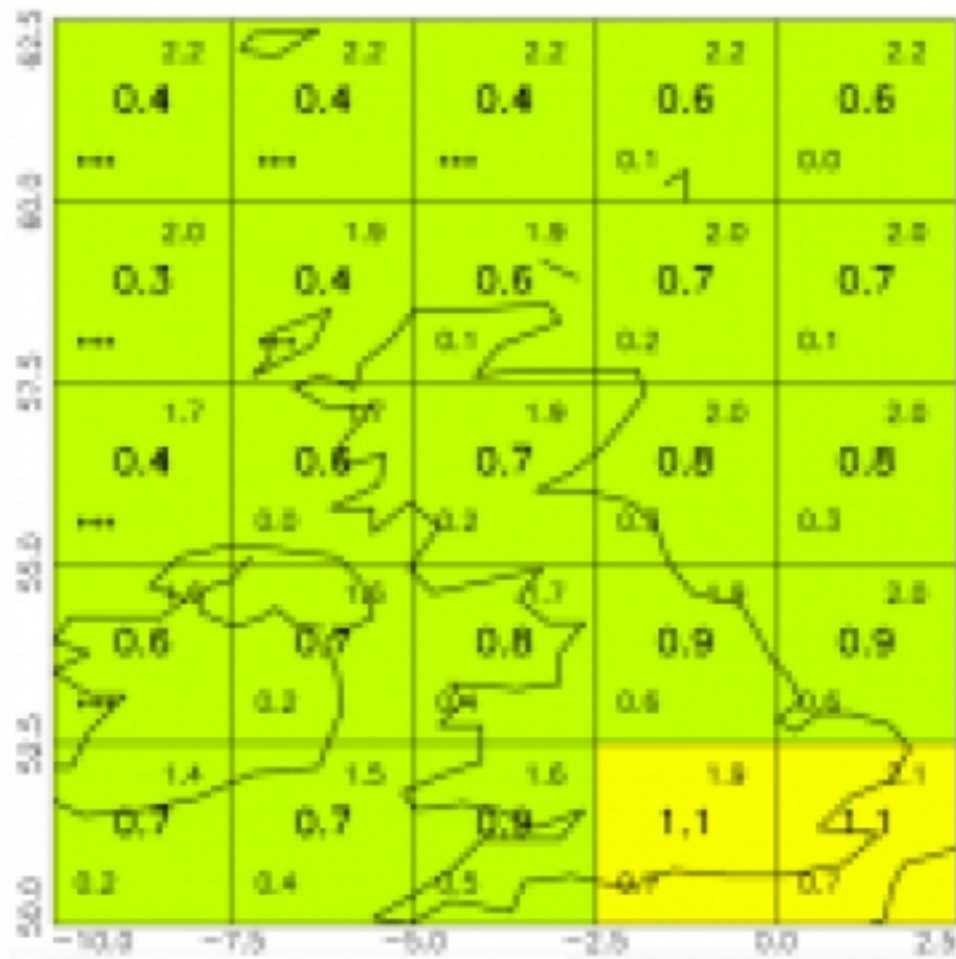


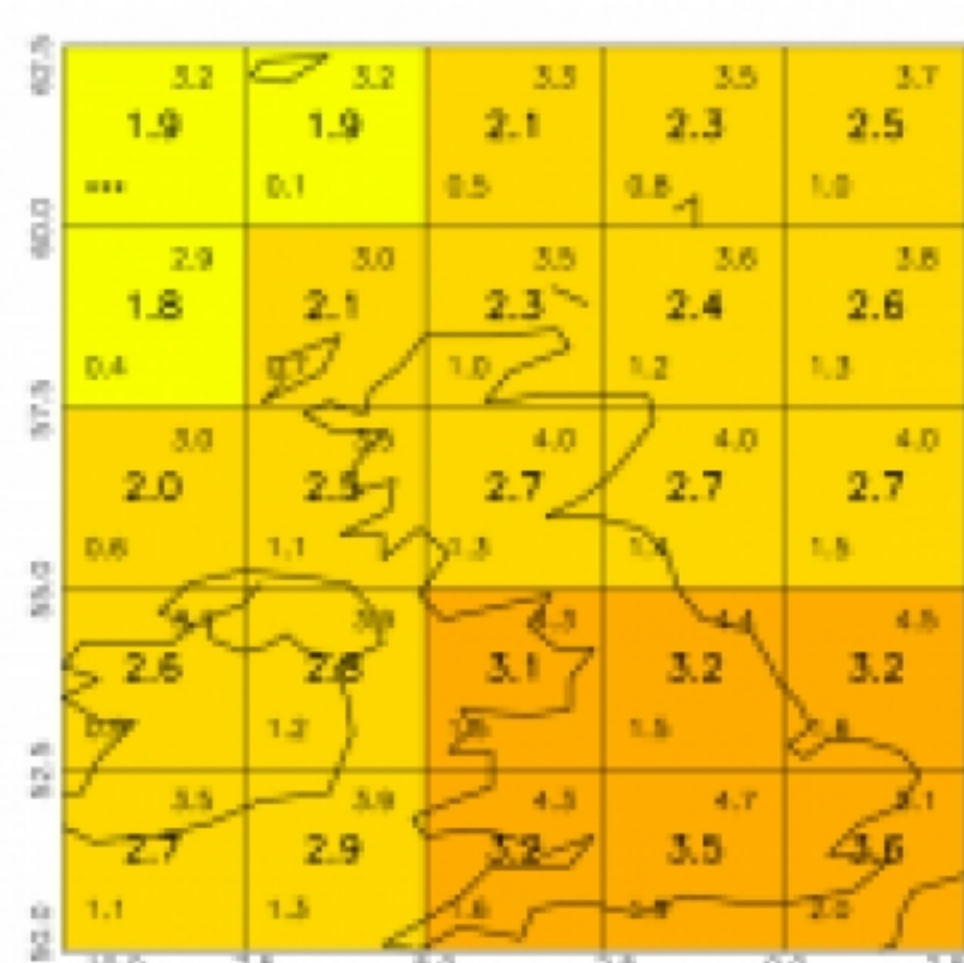
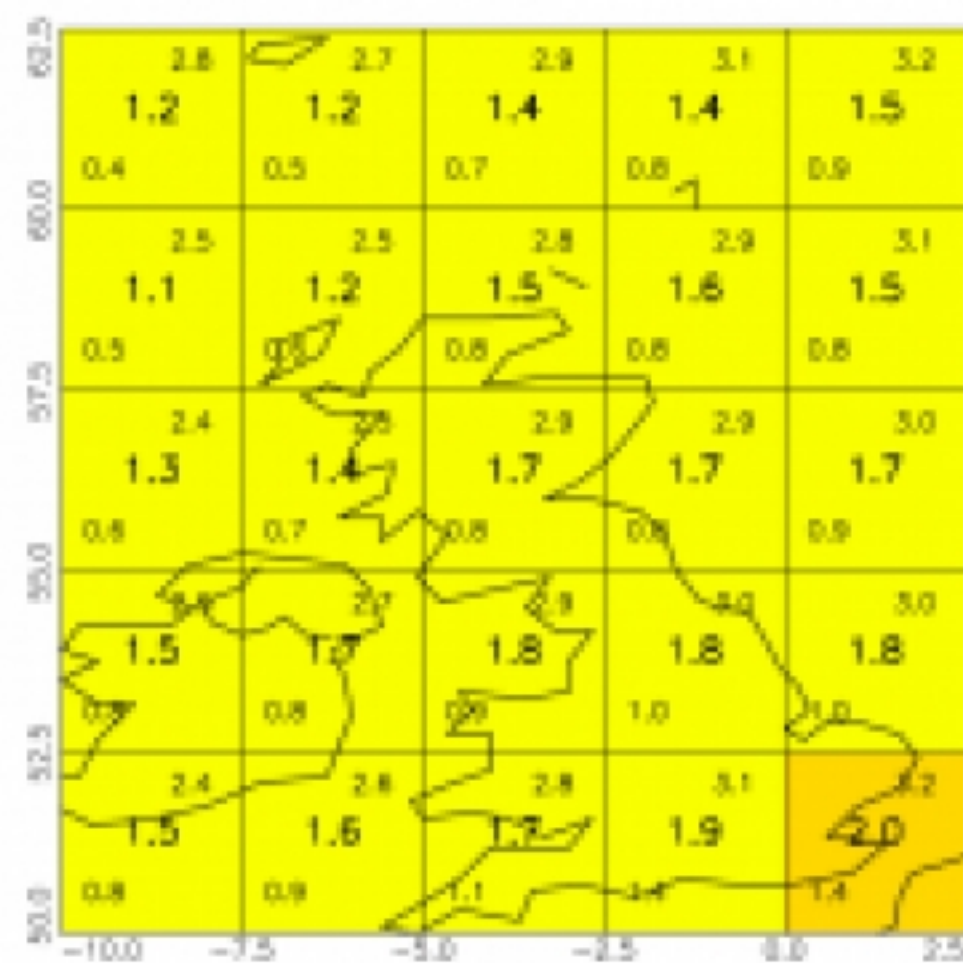
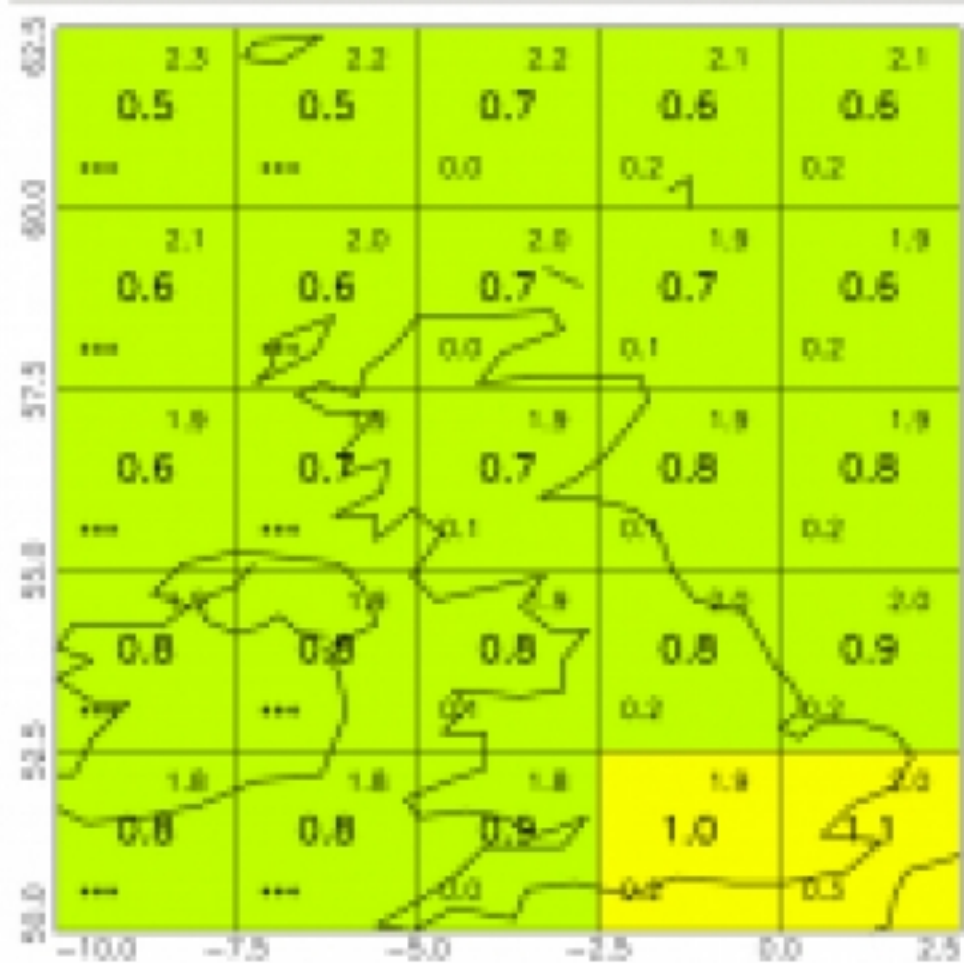




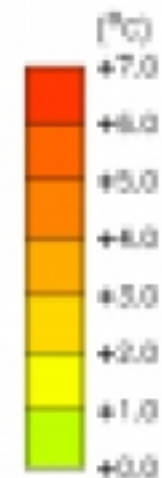
MAM





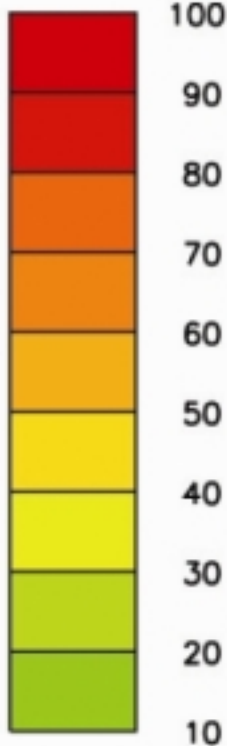
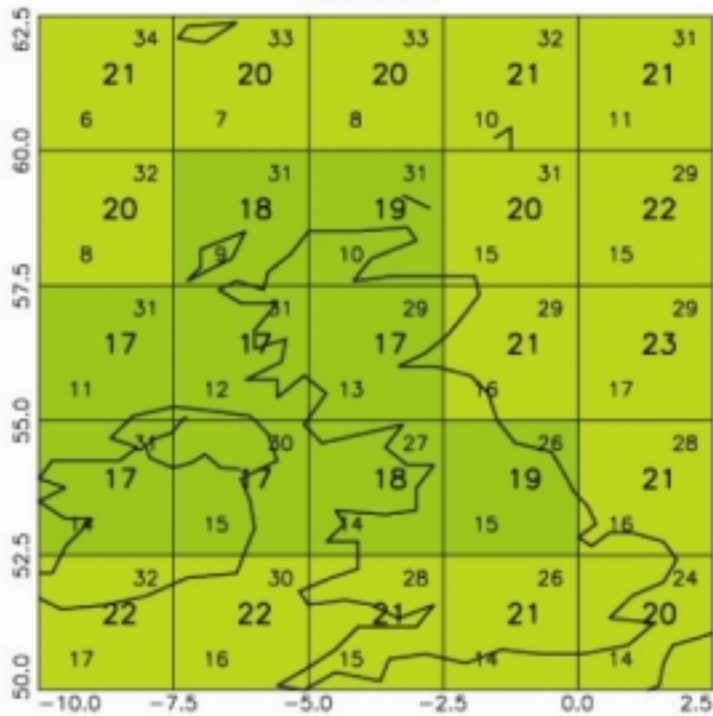


NOS



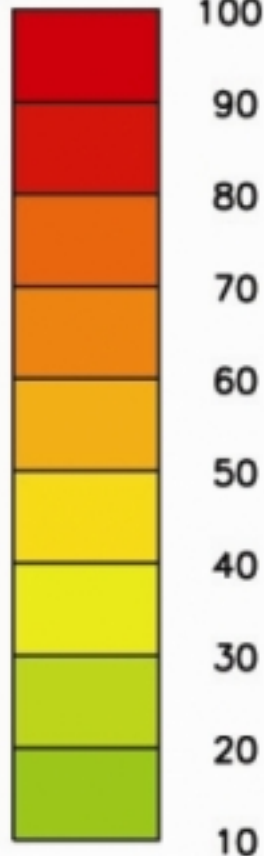
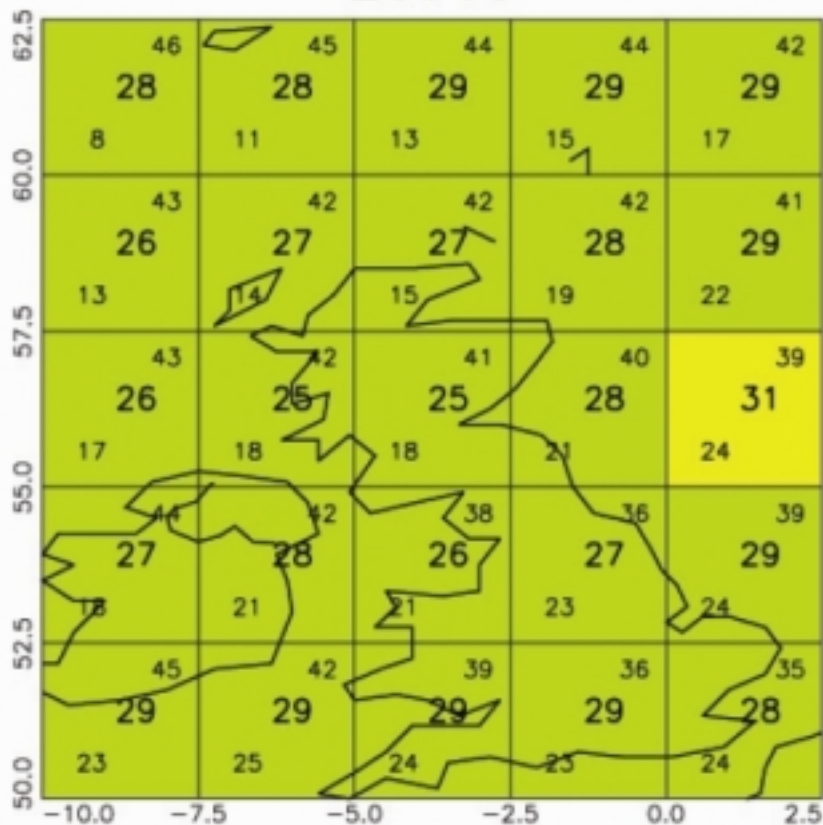
% Hot days

2060s



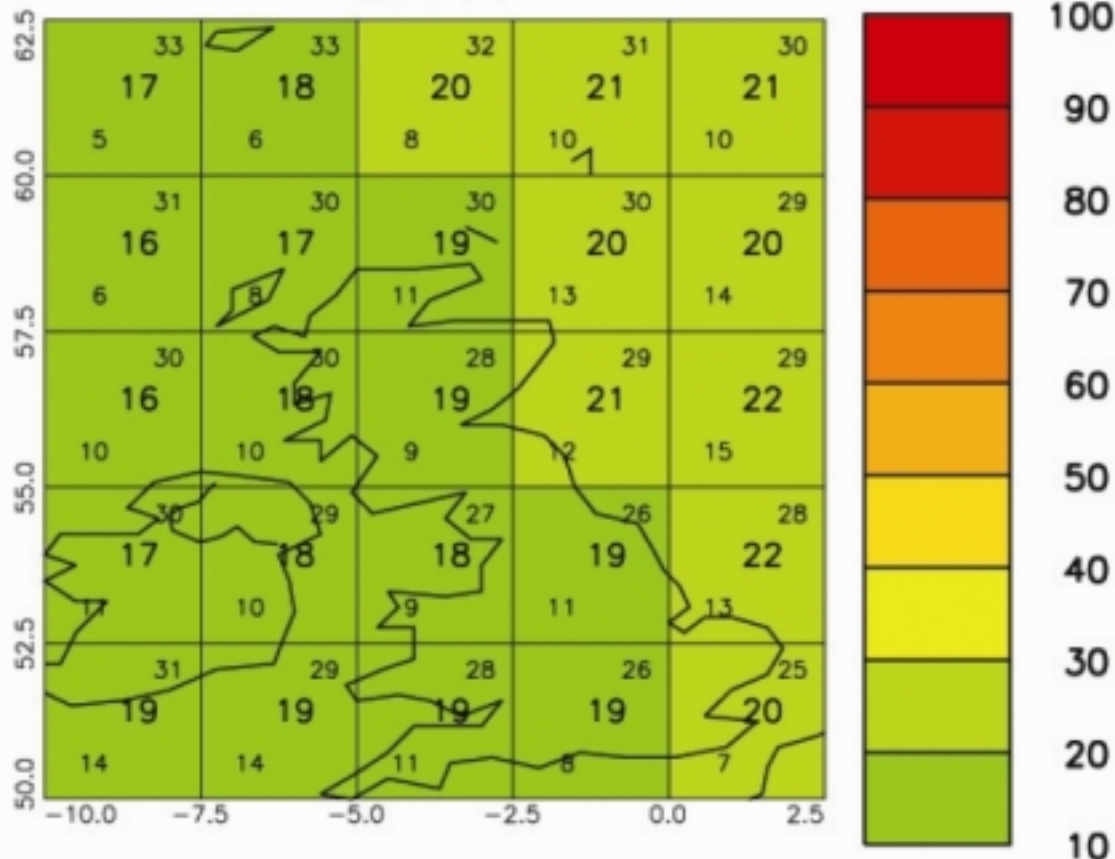
% Hot days

2090s



2060s

% Hot nights



2030s

