

Summary of current predictions of main UK climate change parameters



Steve Head

The data presented are simplified from the UK Meteorological Office Hadley Centre 2009 projectionsⁱ. These projections have been made for low, medium and high continued emission scenarios, but only the high and medium projections are quoted here, because it seems increasingly unlikely that carbon emission reduction targets will be metⁱⁱ. These are overall UK predictions, but the paper cited gives separate regional predictions as well. The predictions are listed here at the mid (50%) probability level, but the original includes high and low extremes at 10% and 90% probability.

Temperature

All UK regions will experience temperature rise. The greatest rise will be in summer, adding potentially more than 5°C to daily maxima, but the winter daily minimum could rise by about 4°C, reducing the likelihood of frosts.

		Winter temperatures			Summer temperatures		
Climate Change Scenario	Range over UK	Overall Mean	Mean daily max.	Mean daily min.	Overall Mean	Mean daily max.	Mean daily min.
High	Highest change	3.8°C	3.4°C	4.2°C	5.3°C	6.8°C	5.3°C
	Lowest change	2.1°C	2.3°C	2.4°C	3.1°C	3.5°C	3.3°C
Medium	Highest change	3.1°C	2.9°C	3.5°C	4.2°C	5.4°C	4.1°C
	Lowest change	1.8°C	2.0°C	2.1°C	2.5°C	2.8°C	2.7°C

Predicted UK temperature changes for 2080s relative to 1961-1990 means (all changes are positive in sign)

Precipitation - rain snow and hail

Across the year, changes in precipitation are likely to be small, but with considerable increases in winter rain, and decreases in summer rain. This could increase the frequency of seasonal droughts and flooding, and could have impacts on wetland habitats and their ecology.

		Winter			Summer	
Climate Change Scenario	Range over UK	Mean Annual	Mean	Wettest day	Mean	Wettest day
High	Highest change	+3%	+47%	+35%	0	+14%
	Lowest change	+6%	-3%	0	-49%	-18%
Medium	Highest change	+2%	+33%	+25%	+1%	+12%
	Lowest change	-3%	-2%	0	-40%	-12%

Predicted UK Precipitation changes for 2080s relative to 1961-1990 means

Cloud cover and humidity

There will be little change in winter, but in the summer cloud cover is likely to be substantially reduced, and so will be the relative humidity, making the summer air drier than at present. These changes will increase the summer solar heating of plants, and increase their rate of water loss. This will exacerbate the effects of reduced summer rainfall.

Climate Change Scenario	Range over UK	Total Cloud		Relative humidity	
		Winter	Summer	Winter	Summer
High	Highest change	+2%	+7%	+4%	+2%
	Lowest change	-4%	-23%	0	-11%
Medium	Highest change	+1%	+5%	+3%	+2%
	Lowest change	-3%	-18%	-	-9%

Predicted UK cloud cover and humidity changes for 2080s relative to 1961-1990 means

Extreme weather events

As the energy in the global atmospheric systems increases with warming, the likelihood of exceptional weather events would be expected to increase.

Current modelling is not considered sufficient to assign probabilities to changes in frequency of extreme weather events, such as prolonged drought, major flooding or severe storms. The frequency of such events definitely appears to be increasing, although this cannot yet be statistically linked to climate change.

ⁱ Murphy, J.M., Sexton, D.M.H., Jenkins, G.J., Boorman, P.M., Booth, B.B.B., Brown, C.C., Clark, R.T., Collins, M., Harris, G.R., Kendon, E.J., Betts, R.A., Brown, S.J., Howard, T. P., Humphrey, K. A., McCarthy, M. P., McDonald, R. E., Stephens, A., Wallace, C., Warren, R., Wilby, R., Wood, R. A. (2009), *UK Climate Projections Science Report: Climate change projections*. Met Office Hadley Centre, Exeter.

ⁱⁱ <http://www.theguardian.com/environment/blog/2012/nov/26/kyoto-protocol-carbon-emissions>