

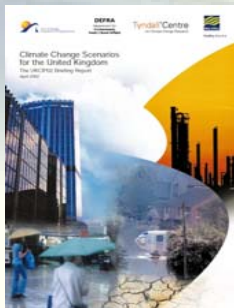
Predicting future climate change for the UK and East Anglia

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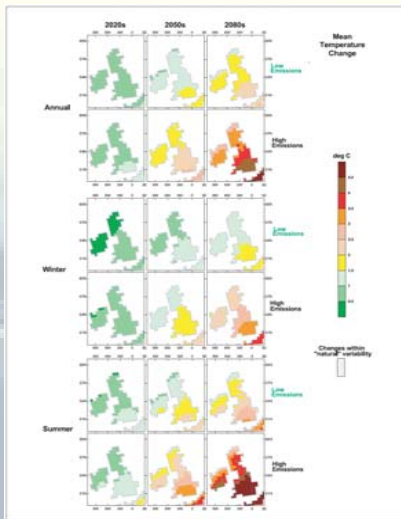
Climate scenarios

Climate scientists use 'climate scenarios' to predict the future. A climate scenario is 'a coherent, internally consistent and plausible description of a possible future state of the world'. They are based on output from global (GCMs) and regional (RCMs) climate models. These models are developed from weather forecasting models and provide information for grid boxes with a spatial resolution of 300 km for GCMs (about 9 boxes over the UK) and 50 km for RCMs.

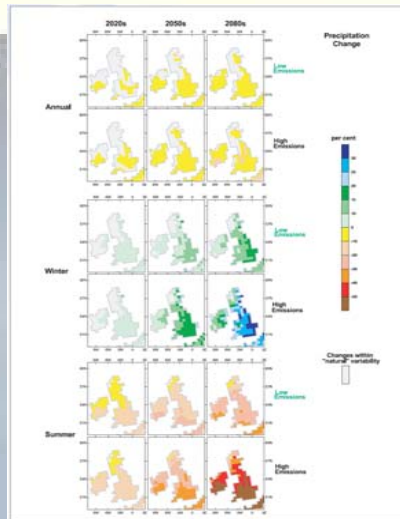
UKCIP02 – the national climate scenarios



In 2002, the UK Climate Impacts Programme, working with scientists from the University of East Anglia and the Hadley Centre, published a set of four alternative scenarios of UK climate over the next 100 years. Called UKCIP02, these scenarios are for Low, Medium-low, Medium-high and High Emissions (related to four scenarios of future global greenhouse gas emissions). The examples below show changes in temperature and rainfall for the 2020s, 2050s and 2080s for the Low and High Emissions scenarios.



Temperature changes



Rainfall changes

From the UKCIP02 scenarios we have high confidence in the following future changes in UK climate:

- ✓ Average temperature increases
- ✓ Summer temperature increases more in the southeast than the northwest
- ✓ High temperature extremes increase in frequency
- ✓ Thermal growing season lengthens
- ✓ Winter rainfall and winter rainfall intensity increases
- ✓ Summer soil moisture decreases
- ✓ Sea-level rises and extremes of sea level become more frequent

Weather and climate play a vital part in farming, so we might expect these changes to have an impact on agriculture – affecting both the yields of crops and the kind of crops that we can grow. Scientists explore these potential effects by running crop model and other impact models using climate scenarios. Since crops are very sensitive to local conditions and extreme weather events, scenario information at higher resolution than the UKCIP02 maps is desirable.

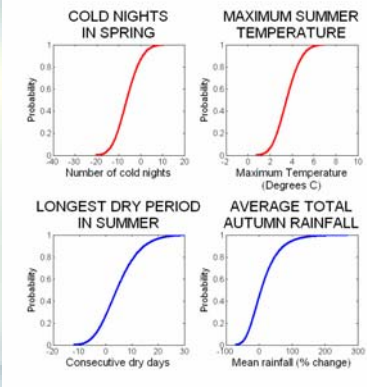
The newest scenarios for the East Anglian Region

A CRU team has produced the first probabilistic scenarios of extreme weather events for UK point locations. They are based on ten different European RCMs – allowing us to take some account of modelling uncertainties (UKCIP02 used a single model). A statistical weather generator is used to tune the scenarios to local weather conditions using observed data.

The graphs show the cumulative probability of getting certain changes at Coltishall in the 2080s, based on the Medium-high emissions scenario: e.g.,

- 52% chance of 5-15 fewer cold nights in spring
- 84% chance of 2-5°C rise in maximum summer temperature
- 87% chance of the longest dry period in summer increasing by up to 15 days
- 50% chance of autumn rainfall increasing by up to 100% (a doubling)

Coltishall – 2080s



For further information see:

<http://www.cru.uea.ac.uk/projects/cranium> & <http://www.ukcip.org.uk/>

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