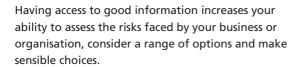# UK Climate Projections:
Using the User Interface – course 1

UK Climate Projections

No-one can know exactly what will happen in the future, but we must plan ahead and be ready to deal with the effects that our changing climate will bring. The UK Climate Projections (UKCP09), have been created by some of the UK's leading climate scientists in a project funded by Defra, to look at what the future climate of the UK might be like. The UK Climate Projections will underpin the Government's Adapting to Climate Change programme.

Having access to good information increases your ability to assess the risks faced by your business or organisation, consider a range of options and make sensible choices.

All the information from the UK Climate Projections (UKCP09) is available free of charge via the UKCP09 website.

Essential links

- UK Climate Projections (UKCP09):
  http://ukclimateprojections.defra.gov.uk

- UK Climate Projections User Interface
  http://ukclimateprojections-ui.defra.gov.uk

- Training resources for UKCP09:
  www.ukcip.org.uk/training

For more tools to help organisations adapt to climate change, including UKCP09, an Adaptation Wizard and more go to: www.ukcip.org.uk and click on *Tools to help you.*

Structured routes through the UKCP09 User Interface

The following exercises will provide you with an opportunity to begin using the User Interface (UI) and explore the different sections and the online support materials available for the Projections.

Within the routes described, the **text in bold** represents the different selections you have to make in building your request. For each of the choices, select the option written next to it.

Remember to select **Next** to progress to the next screen and if you need to, use the back button on your browser to move back through the UI to change your selections.

Exercise 1

- **Starting point for my request:**
  - o Start a new request
  - o By selecting a selecting Data source

- **Data source:** UK Probabilistic Projections of Climate Change over Land

- **Climate Change Type:** Future Climate Change Only

- **Temperature Variables:** Change in mean daily maximum temperature (°C)

- **Emissions scenario:** Medium

- **Time Period:** 2050s

- **Temporal Averages:** Summer (JJA)

- **UK location:** Entire UK region

- **Output Type:** Map

- **Probability Level:** 50%

- **Add a Request Description:** *Exercise 1*

http://ukclimateprojections-ui.defra.gov.uk

Exercise 2

- **Starting point for my request:**
    - o Start a new request
    - o By selecting a Data source

- **Data source:** UK Probabilistic Projections of Climate Change over Land

- **Climate Change Type:** Future Absolute Climate Values

- **Variable:** Precipitation (mm/day)

- **Emissions Scenario:** High

- **Time Period:** 2080s

- **Monthly Temporal Averages:** December

- **UK location:** Entire UK region

- **Output Type:** Map

- **Probability Level:** 90%

- **Add a Request description:** *Excercise 2*

You have just built a simple request using the UKCP09 User Interface (UI). You should have a map of the UK on your screen.

Using the controls at the bottom of the screen you can save an image of this map.

- **Image size:** 800 x 1200

- **Output type:** JPEG

Once these options are selected click *Save As*

The file download box will appear. To save your file click the text *Click to download a zip file containing your requested plot and metadata file*.

Select an appropriate location to save the folder containing the requested files, for example your Desktop.

Locate the folder you have just saved and open the files inside to explore their content.

? *What does this show?*

The next exercises will allow you to reinforce your understanding of building a request and the different routes possible in doing so.

Exercise 3

The next two exercises will guide you through building a request with the UI but starting from the other two points: by selecting a climate variable and by selecting a UK location.

You will notice that as you start from different points in the UI, that the options appear in a different order and because you are making different selections, that your choices will also change as a result.

Once again, make the appropriate selections from options below in **bold**.

- **Starting point for my request:**
  - o Start a new request
  - o By selecting a Climate variable

- **Climate variable:** Mean air temperature

- **Data source:** UK Probabilistic Projections of Climate Change over Land

- **Climate Change Type:** Future Climate Change Only

- **Emissions Scenario:** Low

- **Time Period:** 2020s

- **Temporal Averages:** Annual

- **UK location:** Oxford (Oxfordshire) grid square. Select the grid square on the map.

- **Type of probabilistic projection data:** CDF data

- **Output Type:** Cumulative distribution function (CDF)

- **Add a Request description:** *Exercise 3*

- Now we have an opportunity to change the options from within the graphics output page:

- o **Emissions Scenario:** Add Medium and High
- o **Reload plot with current settings**
- o **Time Period:** 2070–2099 (2080s)
- o **Reload plot with current settings**

? *What does this show?*

The next exercise will continue to guide you through the request building process but starting from a known location.

Exercise 4

This guided route begins by selecting the location:

- **Starting point for my request:**
  - o Start a new request
  - o By selecting a UK location
- **Click** on London in the UK map or type *London* into the search place name box.

  If you use the search place name option you will need to either click on London on the UK map or click select in the latitude and longitude box before the data source options will appear.

- **Select a data source:** UK Probabilistic Projections of Climate Change over Land for the Administrative Region: London
- **Select a variable:** Change in temperature of the coldest night (°C)
- **Emissions Scenario:** High
- **Time Period:** Select all Time Periods
- **Seasonal Temporal Averages:** Winter
- **Output Type:** Plume Plot
- **Add a Request description:** *Exercise 4*
- Now we have an opportunity to change the options from within the graphics output page:
  - o **Emissions Scenario:** Change to Medium or Low
  - o **Reload plot with current settings**
  - o **Now change the Temporal Averaging Period:** Summer (JJA)
  - o **Reload plot with current settings**

? *What does this show?*

How might you use this output?

These exercises have provided you with an opportunity to begin understanding how to build requests for customisable outputs from the UK Climate Projections using the UI. You will have seen that depending on where you start in the process it will take you along different paths but you will still have to make the same number of choices.

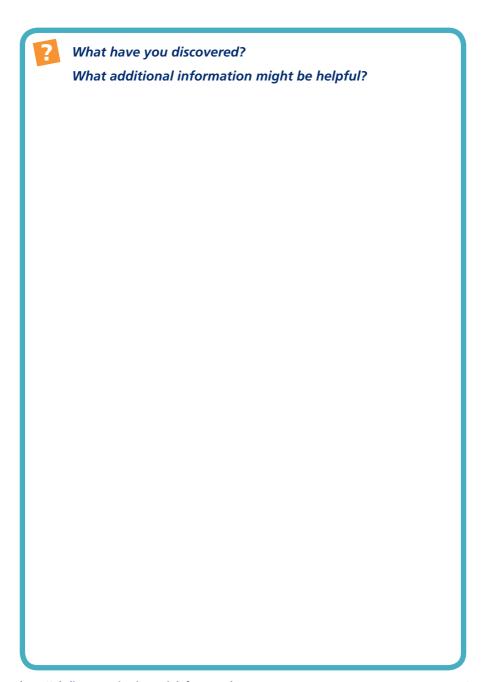## Using the UKCP09 User Interface to support decision making

The following set of exercises will allow you to begin testing your understanding by presenting you with a range of scenarios and asking you to consider how the UI can be used to support your decision making.

Exercise 5

For commercial producers of blackcurrants, a very cool period during the winter is essential for good crops and ongoing plant health.

How would you use the User Interface to investigate winter temperatures within the main blackcurrant growing area of the West Midlands?

- Using the Tubemap (on the back cover of this booklet), look at what type of information is available for temperatures in the West Midlands.

- Explore the Key findings for the region.

- Using the User Interface, produce outputs that might help illustrate the key findings.

? *What have you discovered?*

What additional information might be helpful?

Exercise 6

You have been asked to investigate sea level rise around Swansea, as part of a review of coastal management, under a HIGH emission scenario.
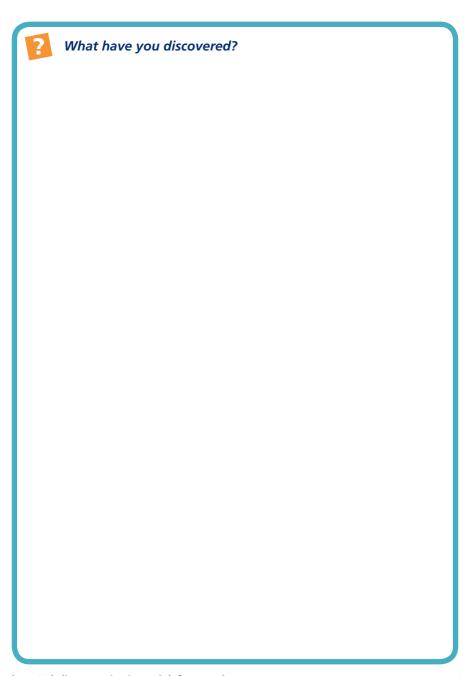
- Using the Tubemap (on the back cover of this booklet), look at what type of information is available for sea level rise.

- Using the User Interface, generate a graphical output that could be used to help illustrate the issue.

- Do you understand the terminology on your output? Use the FAQs to investigate this.

? *What have you discovered?*

Exercise 7

A paint manufacturing company in Maidstone, Kent uses a variety of chemicals in its processes, some of which are sensitive to changes in temperature. The chemicals are currently stored in external tanks and a goods yard.

In order to ensure the smooth running of the factory, the company holds stock of key ingredients, one of which becomes unstable when exposed to average temperatures in excess of 24.6°C.

- Using the Tubemap (on the back cover of this booklet), the Projections web site and the User Interface, explore this situation.

? *What have you discovered?*

Exercise 8

The Wye Valley Salmon Fisheries Group wish to evaluate the potential occurrence of critical river water temperatures in summer that could affect upstream migration or be lethal to the Atlantic salmon stock in the river Wye.

Thresholds to salmon migration were determined using historical relationships between air and water temperatures in the river. The following thresholds were determined:

At air temperatures of 20°C salmon will not enter the river beyond the tidal limit.

At air temperatures of 23°C salmon will not migrate upstream.

Air temperatures of 28°C for 7 consecutive days are regarded as the 7-day upper lethal temperature for salmon.

- Using the Tubemap (on the back cover of this booklet), the Projections web site and the User Interface, explore this situation.

? *What have you discovered?*

Exercise 9

To celebrate the 500th Anniversary of the parish where you live, your local Parish Council has decided to plant an area of woodland. You have been approached by one of your Parish Councillors to provide climate change information, so that a local tree 'expert' can select appropriate species for planting that will thrive through to the end of the century, and hopefully beyond.

? *Using the Climate Projections web site, explore the information already available.*

Using the User Interface, generate outputs that you could share with the tree expert. How would you explain the information you have produced?

UKCP09 Tubemap

USER INTERFACE

PUBLISHED MATERIAL

KEY FINDINGS

Key findings

11 member RCM output (LINK)

Joint probability plots

Sampled data

Plume plots

CDFs

PDFs

CDF data

Multi-level ocean output (LINK)

Customisable maps

Pre-prepared maps & graphs

Climate projections report

Briefing report

11 member RCM output (LINK)

Threshold detector

Weather Generator output

Weather Generator report

Marine & coastal projections report

Storm surge height graph

Observed trends report

Observed climate datasets (Met Office)

Legend:

- Probabilistic climate projections (land)
- Probabilistic climate projections (marine)
- Multi-level ocean output
- Sea level projections
- Storm surge height projections
- Observed climate information
- Wind projections
- Weather Generator

UK CLIMATE PROJECTIONS