

## 1. UKCP: The Philosophy

Understand the drive to create the UKCP Products and see examples of their use.

## 3. Accessing UKCP Data: Headline Findings & Key Results

The easiest way into the UKCP results, quick written statements, diagrams and a spreadsheet of pre-generated results.

## 5. Accessing UKCP Data: User Interface

Need to generate plots or datasheets from across our full range of products? The UKCP User Interface is ideal for your purposes.

## 7. Further Learning

From our free e-learning to the case studies of use, the final tools you would need to learn more about UKCP.

## 2. Using UKCP: Which Information Do I Require

Discover which UKCP information you need and where you can find it.

## 4. Accessing UKCP Data: Climate Data Portal

A user of GIS tools? The Climate Data Portal could be ideal for your to access UKCP data.

## 6. Accessing UKCP Data: CEDA Archive

Wanting to undertake bespoke analysis and create bespoke figures? Then our NetCDF outputs are ideal for your needs.



# UKCP: The Philosophy

An introduction to the background concepts behind UKCP and how UKCP is being used in a range of examples.



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# What is UKCP Trying To Achieve?

UKCP18 provides the most up to date observations and climate change projections for the UK and globally during the 21<sup>st</sup> Century. UKCP equips the UK with information to help adapt to the challenges and opportunities presented by climate change.

UKCP continues to evolve and develop, such as forming the Development and Knowledge Sharing (DaKS) network (which consists of user representatives from across sectors and experience levels). The network helps to inform future developments in the Defra-funded UKCP Climate Services project.



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# Using UKCP

UKCP is used in a range of ways from national climate reports, scientific publications to applications across the country, including the [Climate Change Risk Assessment](#) (CCRA). The CCRA is an independent assessment of UK Climate Risk, produced every 5 years, to fulfil UK Government commitments under the 2008 Climate Change Act.

An annually updated list of Met Office supported UKCP Publications can be found [here](#).

A selection of examples of UKCP usage are available [here](#).

# Examples of UKCP Usage

These examples highlight the use of UKCP products in applications. From assisting local authorities to foresters; understanding future drought risks to supporting Wimbledon campaigns, the UKCP products are highly versatile tools.

Case Studies and Demonstration Projects are also available on the [UKCP Website](#).

Working together on UK Climate Projections

WIMBLEDON ENVIRONMENT DAY TO PROVIDE A SPOTLIGHT ON CLIMATE CHANGE

While much of the attention of the past year has been consumed by the response to the pandemic, it has never been more important for sport to play its part in the great climate challenge.

That is why the AECF has joined forces with the BBC, COP26 – the UN Climate Change Summit set to be hosted by the UK in Glasgow later this year, and the Met Office to create a spotlight on the environment during this year's Championships, with Thursday 1 July set to be the first Environment Day.

Supporting the inaugural Wimbledon Championships Environment Day (1<sup>st</sup> July) with a future forecast based on the UKCP Regional data.

WIMBLEDON IN 2059  
[https://www.youtube.com/watch?v=d4dt\\_8M-K0Y](https://www.youtube.com/watch?v=d4dt_8M-K0Y)

[Wimbledon Environment Day 2022](#)

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## Forest Research: Climate Matching Tool

Selecting forest reproductive material suited to current and future climates to maintain forest resilience.

Supports practitioners in selecting better suited material from environments that may experience in the future in UK, all of Europe, and the Pacific Northwest.

Complementary to the [Ecological Site Classification tree selection tool](#).

Shows how trees will perform in a future climate

<https://www.forestresearch.gov.uk/tools-and-resources/climate-matching-tool>

[Climate Matching Tool](#)

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## CCRA3: Water resources project

Drought Severity Index for one Global (60km) member (PPE-05)

Modelled hydrological year DSI<sub>1-30</sub> month accumulation

Observed hydrological year DSI<sub>1-30</sub> month accumulation

Durant M and Counsell C (HR Wallingford, 2019)

[Water Resources Project](#)



# Using UKCP: Which Information Do I Require

The UK Climate Projections contain a range of climate information. You can use this information to understand observed changes through the 20<sup>th</sup> Century and future changes to the climate in the UK through the 21st century.



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# What Do You Want to Do?

What you want to do, really drives which UKCP information you wish to use.

Interested in understanding key messages about observed and future UK Climate? – [Headline Messages & Key Results](#)

Undertaking a bespoke climate analysis? – [See what is available from UKCP](#)

However, some users will be unsure of their risk and what they need to do, necessitating a [Climate Change Risk Assessment](#).

Unsure where you sit? View the [Case Studies](#) as examples of use. You may need to use multiple UKCP Products

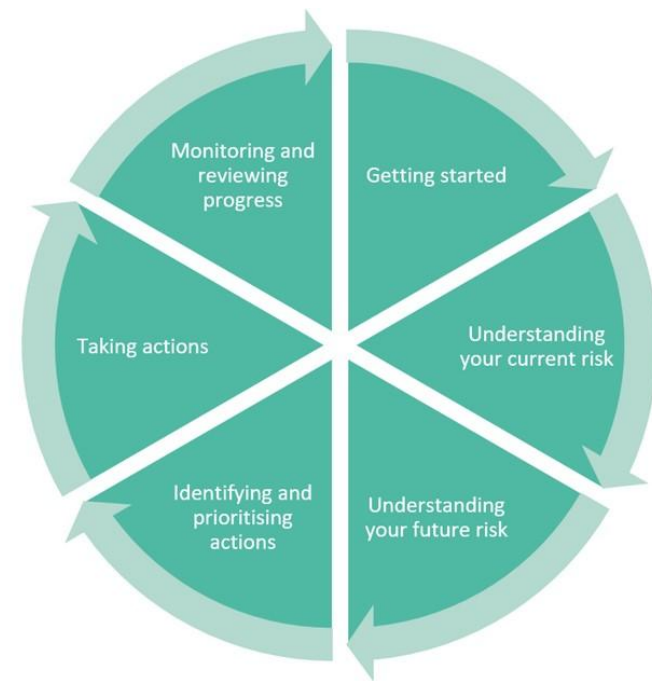


# Climate Change Risk & Risk Assessment

When planning for the future, you may wish to do a climate change risk assessment. Any assessment needs to consider the [hazard, exposure, vulnerability](#) and how these factors interact with each other.

To begin a climate change risk assessment, first follow the process outlined in the adaptation cycle.

Further details on this can be found on our [website](#).



*The adaptation cycle, based on the [UKCIP Adaptation Wizard](#) and [Adaptation Scotland Cycle](#).*

# What Is Available?

You can find a list of available datasets [here](#)

## UKCP Probabilistic

The probabilistic projections combine information from several collections of computer models with observations using advanced statistical methods. For more information see chapter 2.2 of the [Science Overview Report](#) and the [probabilistic update report](#).

## UKCP Marine

UKCP18 provides new projections of time mean sea-level rise and extreme water levels for the UK coastline. Read more ([link to factsheet](#)).

## UKCP Global

The new set of simulations using global climate models enable users to analyse changes in future climate that are coherent in space and time on a horizontal spatial scale of around 60 km. For more information see chapter 2.3 of the [Science Overview Report](#).

## UKCP Derived

The UKCP18 Derived Projections provide future scenarios of climate change at the 60km resolution of the Global Projections. Scenarios include a low emissions scenario and also projections at a global mean warming of 2°C and 4°C. Read more ([link to factsheet](#)).

## UKCP Regional

The Regional (12 km) projections are downscaled versions of the Global (60km) projections providing information on regional climate effects. For more information see chapter 2.3 of the [Science Overview Report](#).

## UKCP Local

The Local (2.2 km) projections are downscaled versions of the Regional (12 km) projections providing information on local climate effects. Read more ([link to factsheet](#)).

## Observations

UKCP18 includes a comprehensive set of observations of weather and climate covering the UK, with some records extending back over 150 years. Examining observations enables us to place the model simulated climate into context. Read more ([link to Met Office webpage](#)).

The UKCP datasets listed above are available on a range of [emissions scenarios](#). Further information on climate model resolutions is available [here](#). For information on how to access the dataset produced above, please see these following pages within this Guide.

[Accessing UKCP Data:](#)

[Headline Findings & Key Results](#)

[Accessing UKCP Data:](#)

[Climate Data Portal](#)

[Accessing UKCP Data:](#)

[User Interface](#)

[Accessing UKCP Data:](#)

[CEDA Archive](#)



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# Accessing UKCP Data: Headline Findings & Key Results

If you are in need of easy access, high level results from UKCP, these resources may be where you need to start.



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# Headline Findings

- A summary information document. Each section provides text-based statements on a section of the work in UKCP.
- The Headline Findings can be found here: [Headline Findings](#).
- Statements such as:

“General climate change trends projected over UK land for the 21st century in UKCP18 are broadly consistent with earlier projections (UKCP09) **showing an increased chance of warmer, wetter winters and hotter, drier summers** along with an increase in the frequency and intensity of extremes. This is seen in the Probabilistic (25km), Global (60km), Regional (12km) and Local (2.2km) projections.”



# Key Results Spreadsheet

- Uses the [Probabilistic](#) and [Marine](#) projections.
- Subset of information for quick numbers for temperature and precipitation on a range of emissions scenarios and regions for different 20 year time periods.
- All data is already calculated, simply a case of selecting the desired options!
- Explore the options here:

## [Regions](#)

## [Emissions Scenarios](#)

Spatial domain	Region name	Variable	Time Horizon (relative to 1981-2000)	Emissions Scenario	5th percentile change	10th percentile change	50th percentile change	90th percentile change	95th percentile change
Country	United Kingdom	mean annual temperature	2080-2099	RCP6.0	1.1	1.4	2.7	4.1	4.5
Sub-select from Country, River or admin region grouping	Select a specific region from the groupings	Select temperature or precipitation variables	Select from a number of 20 year future time slices.	Select from one of five emissions scenarios	Percentile changes, where the 50 <sup>th</sup> Percentile change is the median value and the 5 <sup>th</sup> , 10 <sup>th</sup> , 90 <sup>th</sup> and 95 <sup>th</sup> percentiles provided bounded confidence estimates.				

# Maps from Probabilistic Projections

Downloadable maps available for the four metrics from the [Key Results Spreadsheet](#).

Select your:

region

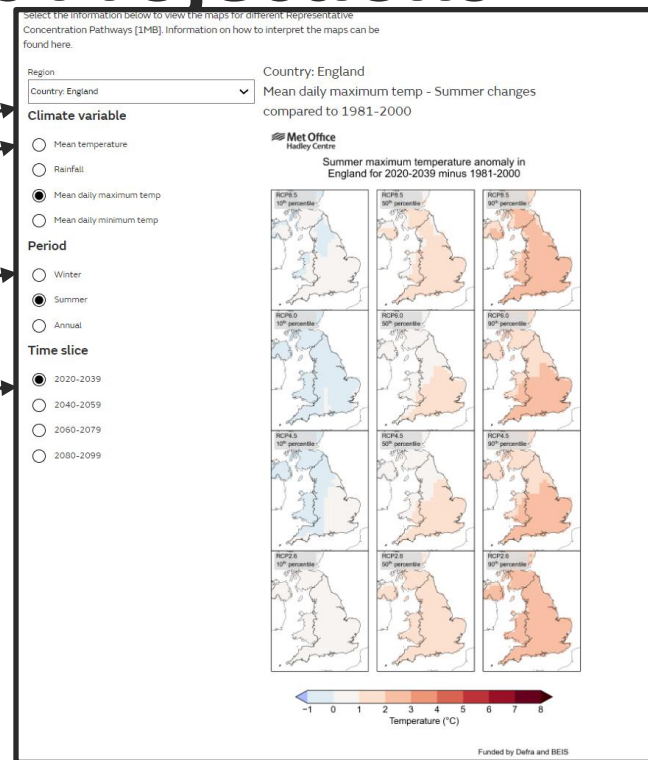
variable

period

time slice

to generate quick maps based on the [probabilistic projections](#).

To explore these maps [click here](#).



# Accessing UKCP Data: Climate Data Portal

A guide to using the UKCP products that are available on the Climate Data Portal.



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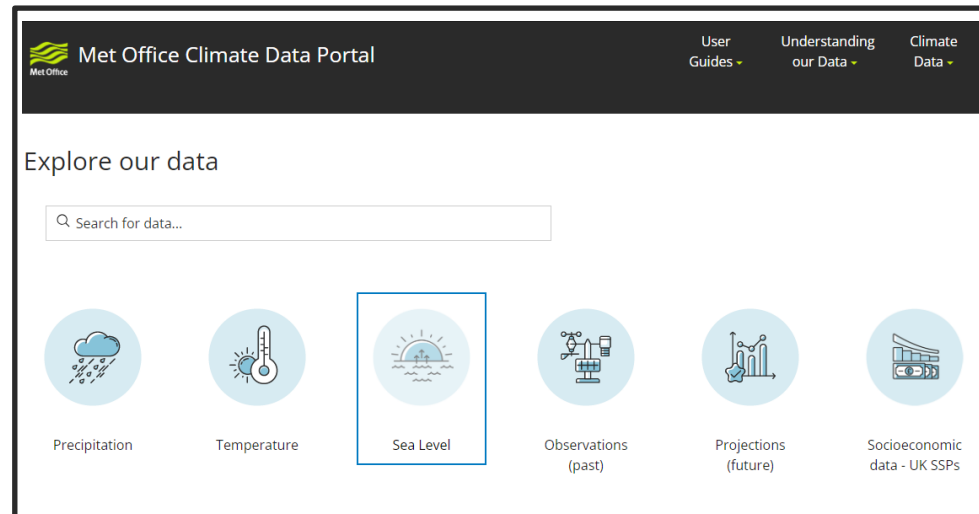
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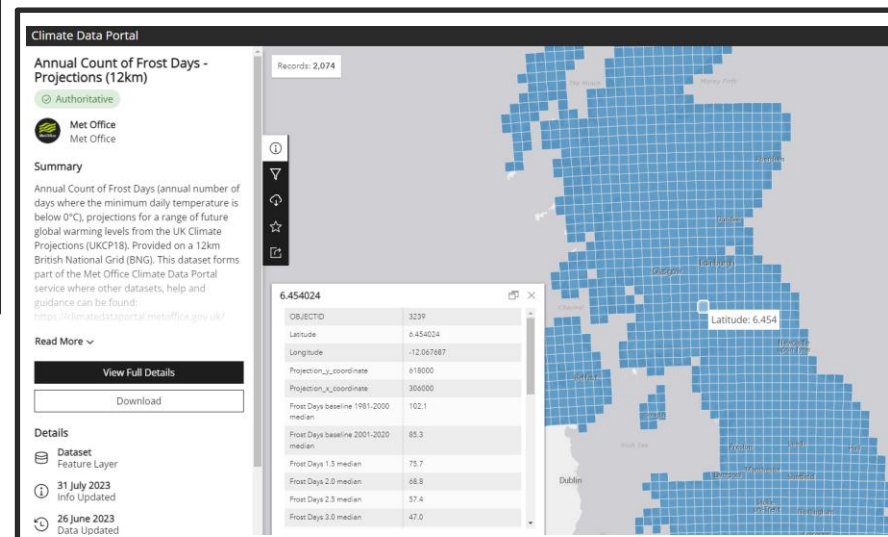
# The Climate Data Portal

The [climate data portal](#) contains a selection of UKCP and other Met Office data including some observations.



The screenshot shows the Met Office Climate Data Portal interface. At the top, there is a navigation bar with the Met Office logo and the text 'Met Office Climate Data Portal'. To the right of the logo are three menu items: 'User Guides', 'Understanding our Data', and 'Climate Data'. Below the navigation bar is a search bar with the placeholder text 'Search for data...'. Underneath the search bar are six circular icons representing different data categories: Precipitation, Temperature, Sea Level (highlighted with a blue border), Observations (past), Projections (future), and Socioeconomic data - UK SSPs.

The portal covers key variables with information on different temporal scales, and also includes an analysis of different indices based on thresholds.



The screenshot shows a detailed view of the Climate Data Portal. The main content area displays 'Annual Count of Frost Days - Projections (12km)' with a record count of 2,074. It includes a 'Summary' section with a description of the data and a 'Read More' link. Below the summary is a 'View Full Details' button and a 'Download' button. On the right side, there is a map of the UK with a blue grid overlay representing the data. A details panel is open over the map, showing the following information:

6.454024	
OBJECTID	3339
Latitude	6.454024
Longitude	-12.067687
Projection_x_coordinate	618000
Projection_y_coordinate	306000
Frost Days baseline 1981-2000 median	102.1
Frost Days baseline 2001-2020 median	85.3
Frost Days 1.5 median	75.7
Frost Days 2.0 median	68.8
Frost Days 2.5 median	57.4
Frost Days 3.0 median	47.0



# Accessing UKCP Data: User Interface

A guide to using the UKCP User Interface. This section includes some hints and tips to working with the UI and a demonstration video.



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## UK Climate Projections User Interface



Before you start...



Products



Conditions of use



UKCP18 web pages

<https://ukclimateprojections-ui.metoffice.gov.uk/ui/home>



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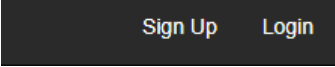
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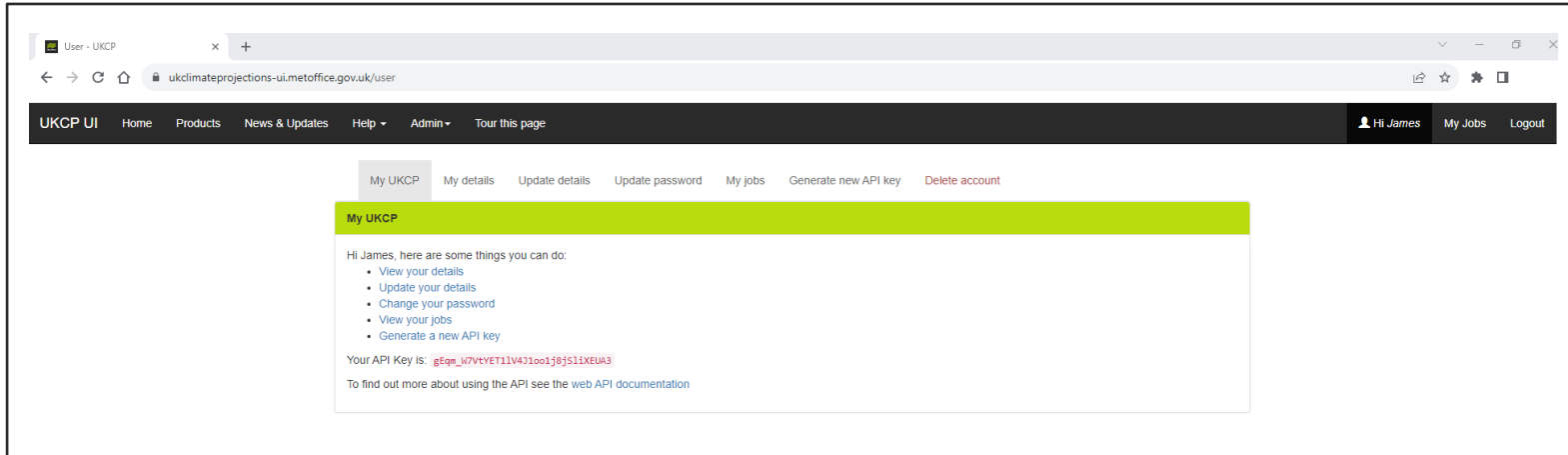
# Accessing the UKCP User Interface

*A free registration is required to access the UKCP User Interface! If you are already registered please skip this step!*

1. Navigate to: <https://ukclimateprojections-ui.metoffice.gov.uk/ui/home>
2. In the top right hand corner select “Sign Up” 
3. Complete the registration form and await the confirmation e-mail.
4. Any problems please use [this form](#) to let us know.



# Using the User Interface



[Watch the Video Here](#)



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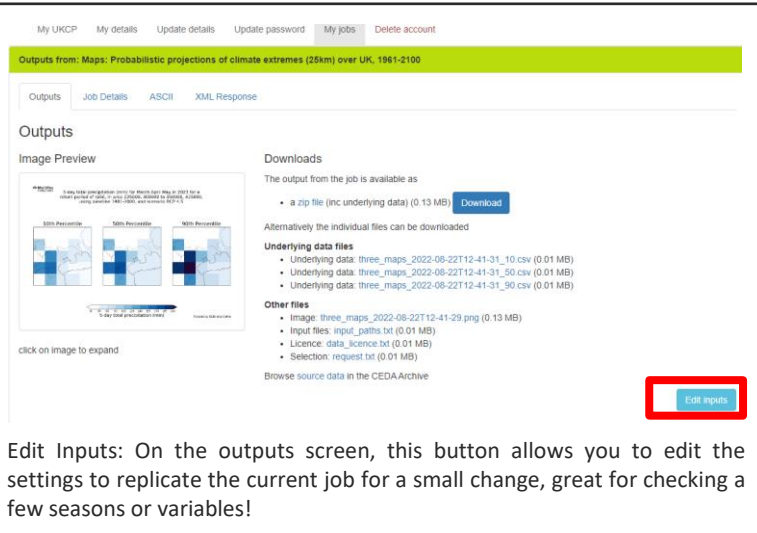


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# Hints and Tips



My UKCP My details Update details Update password My jobs Delete account

Outputs from: Maps: Probabilistic projections of climate extremes (25km) over UK, 1961-2100

Outputs Job Details ASCII XML Response

### Outputs

Image Preview

Downloads

The output from the job is available as

- a zip file (inc underlying data) (0.13 MB) [Download](#)

Alternatively the individual files can be downloaded

**Underlying data files**

- Underlying data: three\_maps\_2022-08-22T12-41-31\_10.csv (0.01 MB)
- Underlying data: three\_maps\_2022-08-22T12-41-31\_50.csv (0.01 MB)
- Underlying data: three\_maps\_2022-08-22T12-41-31\_90.csv (0.01 MB)

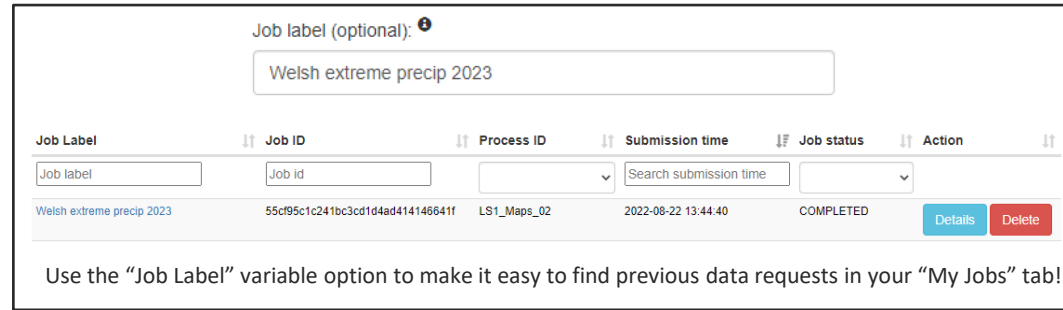
**Other files**

- Image: three\_maps\_2022-08-22T12-41-29.png (0.13 MB)
- Input files: input\_paths.txt (0.01 MB)
- Licence: data\_science.txt (0.01 MB)
- Selection: request.txt (0.01 MB)

Browse source data in the CEDAArchive

[Edit inputs](#)

Edit Inputs: On the outputs screen, this button allows you to edit the settings to replicate the current job for a small change, great for checking a few seasons or variables!



Job label (optional): <sup>?</sup>

Job Label	Job ID	Process ID	Submission time	Job status	Action
Job label	Job id		Search submission time		
Welsh extreme precip 2023	55cf95c1c241bc3cd1d4ad414146641f	LS1_Maps_02	2022-08-22 13:44:40	COMPLETED	<a href="#">Details</a> <a href="#">Delete</a>

Use the “Job Label” variable option to make it easy to find previous data requests in your “My Jobs” tab!

# Accessing UKCP Data: CEDA Archive

The Centre for Environmental Data Analysis (CEDA) is a data centre that hosts the UKCP data in NetCDF format files for all UKCP products that are available in the User Interface, Climate Data Portal or through some of our factsheets and publications.



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# What is Available on the CEDA Archive

The CEDA archive represents the complete archive of UKCP data.

The data is available in the NetCDF form, and requires the use of visualisation tools (e.g. NCview or Panoply) or a code language (e.g. Python, R or Matlab) to open and analyse the data.

Users are able to undertake bespoke analysis using the raw data on both native model (latitude-longitude) grids (including rotated pole for the Regional and Local data) or on the regrided OSGB grids.

Additional datasets, such as the climate indices are also available in full here.



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# Accessing the Data

The screenshot shows the CEDA Archive website. The header includes the CEDA Archive logo, navigation links (Search Catalogue, Get Data, Help, Tools, Deposit, News), and a Sign in button. The main content area displays a breadcrumb path: archive / badc / ukcp18 / data / land-gcm / global / 60km / rcp85 / 04 / tas / mon / v20180825. A shopping trolley icon is highlighted with a green box, and a 'Calculating...' button is visible. Below the path, a table lists files. The first file, 'tas\_rcp85\_land-gcm\_global\_60km\_04\_mon\_189912-209911.nc', is highlighted with a purple box. A download icon is highlighted with a blue box.

0 dirs 1 files	Description	Size	Actions
 tas_rcp85_land-gcm_global_60km_04_mon_189912-209911.nc		1.3 GB	 

The UKCP CEDA Archive can be accessed [here](#), a free registration is required.

Data can be downloaded as individual files by selecting along the path (**red box**) to the file you wish to use (**purple box**) and clicking on the download button (**blue box**).

Alternatively, the “shopping trolley” icon (**green box**) provides bulk download options.

# Further Learning

Moving beyond this starters guide, there are a range of ways to increase your knowledge about UKCP. Information on that is available in this section.

# Learning Opportunities

Examples of use of UKCP can be found in our [Case Studies](#).

A bespoke e-learning is available through the Met Office Learning Portal. Registration information can be found [here](#) (Scroll down to 13<sup>th</sup> January 2022).

An interactive training course, over 10 hours of virtual face to face workshops (plus ~12 hours self-led learning) is also available. This training includes a participation fee. Further information can be found at <https://www.metoffice.gov.uk/services/research-consulting/weather-climate-consultancy/climate-change-data-training>



# Additional Material



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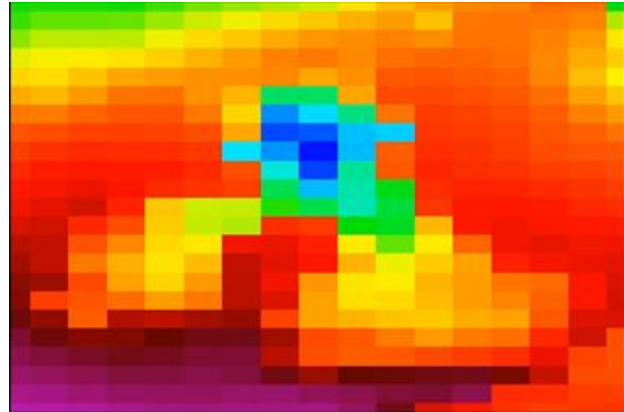
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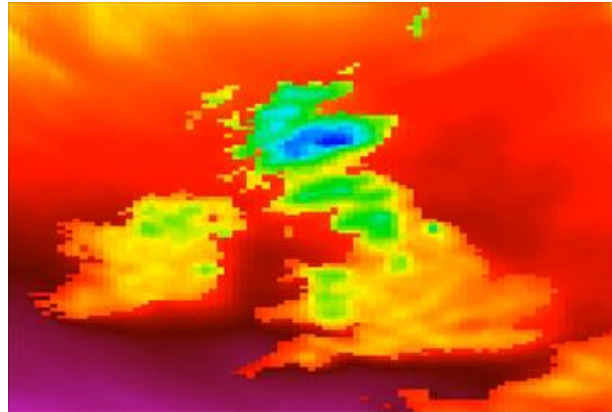
# Model Resolution

UKCP Global (60 km)



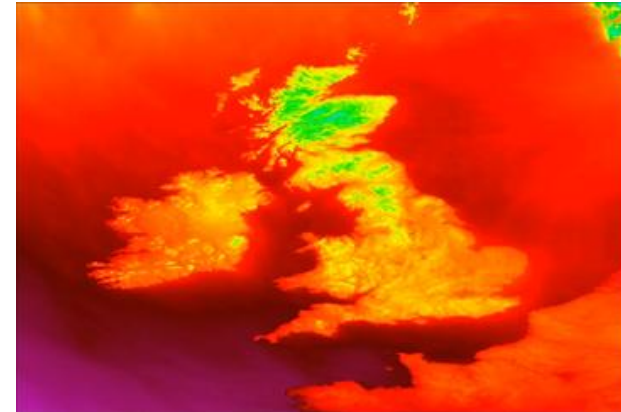
28 ensemble members  
1900-2100

UKCP Regional (12 km)



12 ensemble members  
1980-2080

UKCP Local (2.2 km)



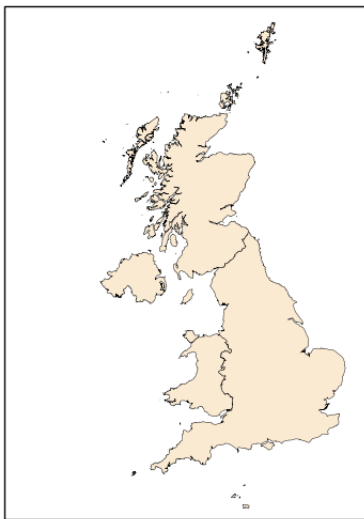
12 ensemble members  
1980-2080

Visualisation of the British Isles for each of the three UKCP model-based products to demonstrate the different resolutions of each model. Also provided is the number of members in the ensemble (the different number of models in each product) and the years covered by the simulations.



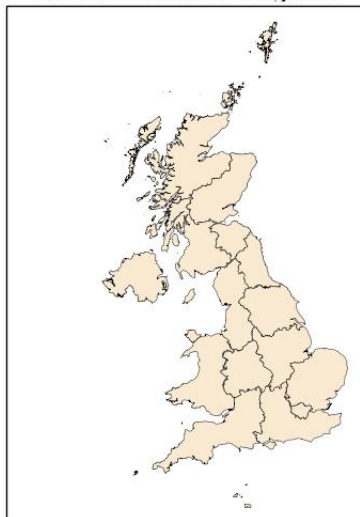
# Key Results: Regions

countries



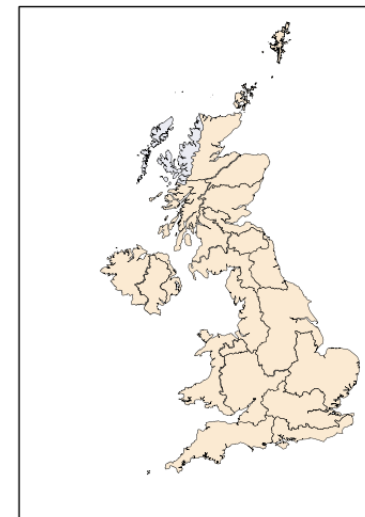
Channel Islands, England, England & Wales, Isle of Man, Northern Ireland, Scotland, United Kingdom, Wales.

administrative regions



East Midlands, East of England, East Scotland, London, North East England, North Scotland, North West England, South East England, South West England, West Midlands, West Scotland, Yorkshire and Humber, Channel Islands, Isle of Man, Northern Ireland, Wales.

river basins



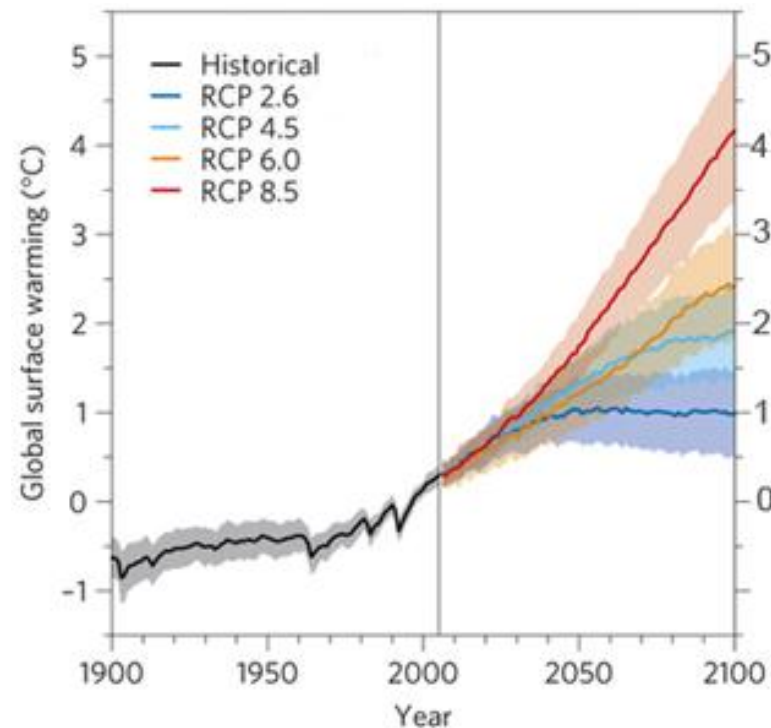
Anglian, Argyll, Clyde, Dee, Forth, Humber, Neagh Bann, North East Scotland, North Eastern Ireland, North Highland, North West England, North Western Ireland, Northumbria, Orkney and Shetlands, Severn, Solway, South East England, South West England, Tay, Thames, Tweed, West Highland, Western Wales.

# Key Results: Emissions Scenarios

Emissions scenarios are a way to investigate different climate futures based on the quantity of greenhouse gases emitted through the 21<sup>st</sup> Century.

The figure on the right displays four of the five pathways in the Key Results Spreadsheet based on the Representative Concentration Pathways (RCPs) which were produced for the CMIP5 model simulations contributing to the 2013 IPCC Report in addition to the UKCP18 products.

Alternatives include the older Special Report on Emissions Scenarios (SRES) which were used in CMIP3 (plus the 2007 IPCC Report, and UKCP09), and the most recent Shared Socio-economic Pathways (SSPs) which were used for CMIP6 and the 2021 IPCC Report.



# Defining: Hazard, Exposure and Vulnerability

In the context of climate change, your risk is a combination of hazard, vulnerability and exposure

- **Hazards** come from weather and climate, e.g. extreme heat, heavy rainfall or sea-level rise.
- **Exposure** refers to the elements that could suffer should the hazard occur.
- **Vulnerability** refers to how susceptible those elements are to feel the effects of the hazard.

