

# UKCP Guidance: Data availability, access and formats

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# 1. What data is available for download?

The UK Climate Projections (UKCP) data for the marine and land projections are available for download. The climate models and scenarios available are summarised in Tables 1 and 2. Note that while the CEDA Archive locations for the data are noted in Tables 1 and 2, much of the data is also available in a range of formats from the locations listed in Section 2. You can find a list of the variables and details of the regional averaging (e.g. over the UK, river basin and administrative regions) in Tables 4 and 5 below.

Dataset	Description	Emissions scenarios	Time period	Domain	Folder name on CEDA and Link to Catalogue Entry (Data Format)
<b>Time mean sea level at 12km</b>	Projections of future changes in time-mean sea water level	RCP 2.6 RCP 4.5 RCP 8.5	2007-2100	UK, Ireland, Channel Islands and Isle of Man coastlines	<a href="#">msl-proj</a> (netcdf) Available on the UI in various formats
	Exploratory projections of future changes in time-mean sea water level	RCP 2.6 RCP 4.5 RCP 8.5	2007-2300	UK, Ireland, Channel Islands and Isle of Man coastlines	<a href="#">msl-proj-expl</a> (netcdf) Available on the UI in various formats
<b>Storm surge trend at 12km</b>	Projections of trend in extreme still water level due to storminess change alone	RCP 8.5	2007-2099	UK, Ireland, Channel Islands and Isle of Man coastlines	<a href="#">skew-trend</a> (netcdf)
<b>Storm surge simulations</b>	Time series of gridded historical and future simulations of sea surface elevation due to tides only and tides and surge	RCP 8.5	June 1970- June 2099	UK, Ireland, Channel Islands and Isle of Man coastlines	<a href="#">bulk-proj</a> (netcdf)
<b>Short event case studies</b>	Time series of gridded historical and future simulations of sea water level for three events (6 Dec 2013, 3 Feb 2014, 11 Jan 2015)	N/A	6 Dec 2013, 3 Feb 2014, 11 Jan 2015	UK, Ireland, Channel Islands and Isle of Man coastlines	<a href="#">event-proj</a> (netcdf)
<b>Projected future still water return levels</b>	Projected future still water return levels at tide gauges around the UK coastline*	RCP 2.6 RCP 4.5 RCP 8.5	2020-2300	UK tide gauges	<a href="#">return_periods</a> , <a href="#">return-periods-ext</a> (netcdf)
<b>Potential changes in tide characteristics</b>	UKCP18 simulated impact of mean sea level change on tidal characteristics around the UK**	N/A	N/A	UK, Ireland, Channel Islands and Isle of Man coastlines	<a href="#">tide-proj</a> (netcdf)
<b>Global Time-mean Sea level projections</b>	Annual time series of the projected change in the time-mean coastal water level relative to the average value for the period 1986-2005	RCP 2.6 RCP 4.5 RCP 8.5	2007-2300	Selected global tide gauges	<a href="#">worldwide-proj</a> (csv)

Dataset	Description	Emissions scenarios	Time period	Domain	Folder name on CEDA and Link to Catalogue Entry (Data Format)
Projected extreme sea levels	Projected future extreme sea levels at approximately 2km spacing using 21st century time-mean sea-level projections	RCP 2.6 RCP 4.5 RCP 8.5	2020-2100	UK, Ireland, Channel Islands and Isle of Man coastlines	<a href="#">ext-sea-lev-shp</a> (shapefile) Shapefile data also available on the UI
	Projected future extreme sea levels at approximately 2km spacing using exploratory extended time-mean sea-level projections	RCP 2.6 RCP 4.5 RCP 8.5	2020-2300	UK, Ireland, Channel Islands and Isle of Man coastlines	<a href="#">ext-sea-lev-expl-shp</a> (shapefile) Shapefile data also available on the UI
	Projected future extreme sea levels at selected tide gauge locations using exploratory extended time-mean sea-level projections	RCP 2.6 RCP 4.5 RCP 8.5	2020-2300	UK tide gauges	<a href="#">ext-sea-lev-expl</a> (netcdf) Available on the UI in various formats

**Table 1** Summary of UK Climate Projections marine projections data. “Folder on CEDA” refers to the folder under /badc/ukcp18/data/marine-sim where the data for each dataset can be accessed. The annual time-mean sea level here is the average height of the sea over a year, with the shorter-term variations of tides and storm surges averaged out. \* based on the latest EA Coastal Flood Boundary Conditions.\*\* the spin-up period has been included in this dataset. For realistic tides, the first 48 hours of data should not be considered. Additionally, a land-sea mask has not been applied to the data and there is a rim of zeros around the edge of the data which should be ignored.

Dataset	Description	Emissions scenarios	Time period	Domain	Folder name on CEDA and Link to Catalogue Entry
Probabilistic projections	Probabilistic projections over land combine information from several collections of computer models with observations using advanced statistical methods	RCP2.6 RCP4.5 RCP6.0 RCP8.5 SRESA1B GWL1.5 GWL2.0 GWL2.5 GWL3.0 GWL4.0	1961-2100	UK, Channel Islands, Isle of Man	<a href="#">land-prob</a>
	Probabilistic Projections of Climate Extremes provide information on 21st century extremes	RCP2.6 RCP4.5 RCP6.0 RCP8.5 SRESA1B	1961-2100	UK, Channel Islands, Isle of Man	<a href="#">land-prob</a>
	Probabilistic Projections Global Temperature Means represents mean global temperature anomalies with respect to several baseline periods	RCP2.6 RCP4.5 RCP6.0 RCP8.5 SRESA1B	1860-2100	Global averages	<a href="#">land-prob/global</a>

Dataset	Description	Emissions scenarios	Time period	Domain	Folder name on CEDA and Link to Catalogue Entry
<b>Global (60km) projections</b>	Global climate model projections including 15 from the Met Office Hadley Centre (PPE-15) and 13 models from other international climate modelling centres (CMIP5-13)	RCP2.6 (not all the CMIP5-13 members are available for RCP2.6)  RCP8.5	1900-2100	Global  UK, Channel Islands, Isle of Man	<a href="#">land-gcm (global)</a> , <a href="#">land-gcm (UK)</a>
	UKCP Global (60km) - European Circulation Indices: a set of indices representing large-scale drivers of UK weather and climate	RCP8.5	1900-2100	North Atlantic	<a href="#">land-indices</a>
<b>Regional (12km) projections</b>	A set of 16 high resolution climate projections at 12km spatial resolution driven by the global climate model projections	RCP8.5 GWL1.0 GWL1.5 GWL2.0 GWL2.5 GWL3.0 GWL4.0*	1981-2080	Europe  UK, Channel Islands, Isle of Man	<a href="#">land-rcm (NW Europe)</a> , <a href="#">land-rcm (UK)</a>
<b>Local (2.2km) projections</b>	A set of 16 high resolution climate projections at 2.2km spatial resolution driven by the regional climate model projections	RCP8.5	1981-2080	UK, Channel Islands, Isle of Man	<a href="#">land-cpm</a>
<b>Derived projections</b>	Projections for RCP2.6 and worlds with 2°C and 4°C global warming produced using statistical methods and based on the global climate model projections	RCP2.6 2°C world 4°C world	1900-2100	UK, Channel Islands, Isle of Man	<a href="#">land-derived</a>

**Table 2** Summary of UK Climate Projections climate models and scenarios for projections over land. “Folder on CEDA” refers to the folder under / badc/ukcp18/data/ where the data for each dataset can be accessed. Note that the methodology used to calculate the 2°C and 4°C worlds for the derived projections (Gohar L et al., 2018) differs from the method used to calculate the various Global Warming Levels (GWLs) for the Regional and Probabilistic projections (Fung F et al., 2025). \*For the Regional projections the data at GWLs is not available on the CEDA Archive. Instead, it is available on the UKCP User Interface or the 20-year time slices in [UKCP Factsheet: Global Warming Level information in UKCP](#) can be used to extract the GWL proxies from the data yourself.

## Supplementary Data

There are several datasets which are supplementary to the climate projections data detailed in Tables 1 and 2. Some of this data is not produced by the Met Office but it may support the analysis of users working with UKCP data.

- **Ancillary files:** A selection of the land-sea masks, orography files and vegetation fraction files used in the production of the climate projections are available on the CEDA Archive for the [regional](#) and [local](#) data.

- **HadUK-Grid Datasets:** A set of gridded and regional land surface climate observations data for the UK produced by the National Climate Information Centre at the Met Office. Further information about the available data can be found on the [HadUK-Grid Datasets webpage](#). The data can be downloaded from the [CEDA Archive](#) and the UKCP UI.
- **MINERVA:** North-West European shelf seas marine climate projections funded by the MINERVA project. It provides an update to the shelf-seas component of UKCP09 Marine Report. The data, and more information, is available from the [CEDA Archive](#).
- **Extreme precipitation return level changes for the FUTURE-DRAINAGE Project:** Extreme short-duration precipitation changes, derived from the UKCP Local projections at 5km resolution have been estimated using a spatial statistical model as part of the NERC-funded Future-Drainage project. The data, and more information, is available from the [CEDA Archive](#).
- **EuroCORDEX-UK:** A set of regional climate projections for the UK for 1980-2080 under the RCP8.5 emissions scenario produced by the CoOrdinated Regional Downscaling Experiment (CORDEX). The data, and more information, is available from the [CEDA Archive](#).
- **CHESS-SCAPE:** Future projections of meteorological variables bias-corrected and downscaled to 1km resolution for the United Kingdom 1980-2080 derived from UKCP18 produced by the UK Centre for Ecology and Hydrology. Information about the data is available on the [UK-SCAPE webpage](#).
- **eFLaG:** Hydrological projections for the UK based on UKCP18 data, from the Enhanced Future Flows and Groundwater (eFLaG) project: [eFLaG: Enhanced Future Flows and Groundwater | UK Centre for Ecology & Hydrology](#).
- **Climate Risk Indicators:** Indicators of climate risk for the UK developed using the UKCP18 projections as part of the [UK Climate Resilience Programme](#).

## 2. Where can you download the data?

There are multiple locations where you can download the data:

- [UKCP Website](#). You can download a [spreadsheet](#) with the key results from the marine and probabilistic projections and view a [subset of maps](#) of the future projections over land.
- [UKCP User interface \(UI\)](#). You can download datasets and plot graphs and maps for the UK from the user interface. Beware that the UI provides easy access to frequently requested data for the UK and some datasets are not available (e.g. storm surge case studies and the Local (2.2km) projections data on the rotated pole grid). These can be downloaded from the CEDA Archive (see below). You need to register to access the products on the UI and instructions for this are available on the UI.
- [CEDA Data Catalogue](#). All datasets set out in Tables 1, 2, 4 and 5 are available for download via the CEDA data catalogue. You can click and download individual files or write a script to download a set of files automatically (see the [CEDA website](#) for more details). For most of the data, you need to be registered with the CEDA Archive to be able to download it.
- [Application Programming Interface \(API\)](#). You can develop web applications that call upon the web-processing services underpinning the UI. Instructions on how to use the API are available at the [UKCP UI](#).
- [Met Office Climate Data Portal](#). A set of observations and projections data is available to view on ArcGIS Map Viewer or download in a range of file types. The metrics available from the projections data include threshold-based indicators and those derived from other variables.
- [Local Authority Climate Service \(LACS\)](#). Climate information, based on UKCP18 data, for each Local Authority area is available to view through a dashboard explorer and to download as a climate report which includes additional information to aid adaptation planning.

## 3. How do you register for access to the data?

For the UKCP User Interface, you can register at the [Sign Up](#) page. Enter your information in the fields and click “Submit”. The interface will send you an email with a link to activate your account. Please check your spam/junk folder- you may need to move it to your inbox to allow it to activate your account. For the CEDA Archive, you can find more information and start the registration process from the [New User Registration Information page](#).

## 4. Where can you find out more about the underpinning science

If you want to find out more about the UKCP18 project visit the [UKCP website](#). For further information about the projections, including details of the underpinning science, please refer to the reports, factsheets, guidance documents and technical notes detailed on the [UKCP Guidance webpage](#).

If you can't find what you are looking in the documentation, have feedback for the UKCP User Interface or CEDA Data Catalogue or have other questions relating to the use of UKCP please contact us through the [online support form](#) on the UKCP website.

## 5. What are the restrictions on use?

The [Open Government Licence](#) (OGL) applies to all datasets.

## 6. What do you need to be aware of before using the data?

Before using the data, familiarise yourself with [UKCP18 Guidance: Caveats and Limitations](#). Additionally, if you're interested in using UKCP Local (2.2km) for rainfall analysis, you should read the [UKCP Guidance: Extreme rainfall features in UKCP Local](#).

Whilst the projections represent the latest scientific understanding and the results have been peer reviewed by independent experts, keep in mind the caveats and limitations of the projections. Although our understanding and ability to simulate the climate is advancing all the time, our models are not able to represent all the features seen in the present-day real climate. This means that when applying the climate projections to your decision-making, consider how best to factor the capabilities and limitations of UKCP. This should be informed by a thorough understanding of the consequences of different climate outcomes – perhaps including those beyond the ranges of uncertainty presented in UKCP.

## 7. What data formats are available?

The following table summarises the available file formats.

Platform	Product	File Format
<b>CEDA Archive</b>	Raw data	netCDF* CSV (for Global time-mean sea level projections only) shapefile formats (for projected extreme sea levels along the British Isles coastline only)
<b>UKCP UI</b>	Raw data	CSV netCDF shapefile formats (for projected extreme sea levels along the UK coastline only)
	CDF plot Joint probability plot Maps PDF plot Plume plot	png, jpg, pdf resolutions of 900x600, 1200x800, 2400x1600
<b>Met Office Climate Data Portal</b>	A wide range of UKCP climate and derived data accessed via a GIS platform	CSV, Shapefile, GeoJSON, KML, File Geodatabase, Feature Collection, Excel, GeoPackage, SQLite Geodatabase

**Table 3** Summary of UKCP file formats available from each platform. \* for users familiar with programming and details can be found at [www.unidata.ucar.edu/software/netcdf](http://www.unidata.ucar.edu/software/netcdf).

## 8. What spatial resolutions and regional averages are available?

### Spatial resolutions and coordinate systems

The data is available in more than one spatial coordinate system. All projections over land for the UK are available in the Ordnance Survey's [National Grid](#). See Table 4 for a summary of the spatial coordinate systems used for each dataset.

The raw model data from the projections over land are in a number of different coordinate systems. We have opted to make the data available in British National Grid for the UK for all land projections to ease analysis for most UK users. It is also consistent with the coordinate system used by the Met Office's National Climate Information Centre who provide observations datasets. This required regridding the original climate model data and the details of the method and coordinate systems can be found in Appendix B. Users in Northern Ireland may need to carry out their own regridding if the Irish Grid is required.

Dataset	Spatial resolution	Domain	Spatial coordinate system	Regional averages available
<b>Probabilistic projections</b>	25km	UK Channel Islands Isle of Man	British National Grid (OSGB)	Countries Administrative regions River basin regions
<b>Probabilistic projections of climate extremes</b>	25km	UK Channel Islands Isle of Man	British National Grid (OSGB)	None
<b>Global (60km) projections</b>	60km	Global	Regular latitude-longitude in geographic projection	None
		UK Channel Islands Isle of Man	British National Grid (OSGB)	Country Administrative regions River basin regions
<b>Regional (12km) projections</b>	12km	Europe	Latitude-longitude in rotated pole coordinates	None
		UK Channel Islands Isle of Man	British National Grid (OSGB)	Country Administrative regions River basin regions
<b>Local (2.2km) projections</b>	2.2km*	UK Channel Islands Isle of Man	Latitude-longitude in rotated pole coordinates	Country Administrative regions River basin regions
	5km		British National Grid (OSGB)	
<b>Derived projections</b>	60km	UK	Regular latitude-longitude in geographic projection	Country Administrative regions River basin regions
			British National Grid (OSGB)	
<b>Marine projections (not including data at tide gauge locations)**</b>	12km (excluding gridded projected sea level extremes)	British Isles coastline	Regular latitude-longitude in geographic projection	None
	2km (projected sea level extremes only)	British Isles coastline	Point data at 2km spacing	None

**Table 4** Summary of geographical characteristics of UK Climate Projections data. \* The four downscaled CMIP5 ensemble members in the Local (2.2km) projections are not available at 2.2km resolution. \*\* See Table 1 for more details of the available Marine projections including data at tide-gauge locations.

## Regional Averages

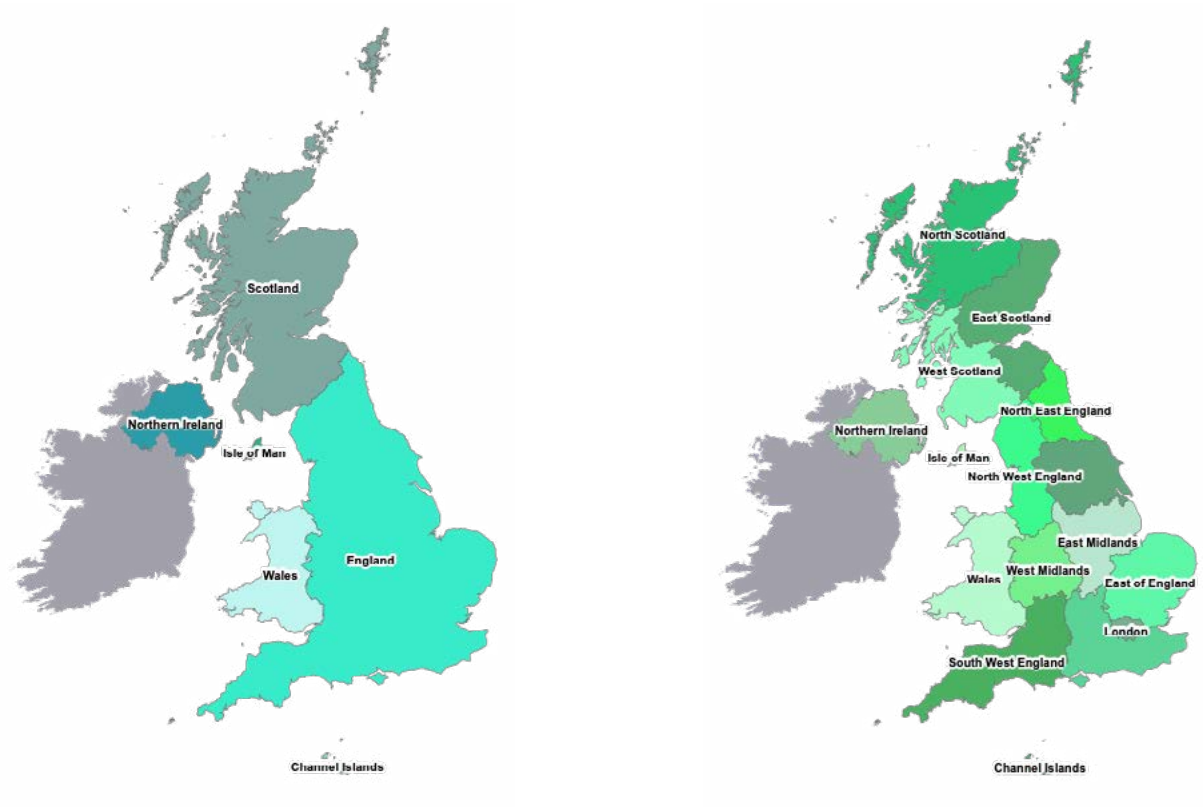
The data will be available for three types of aggregated areas country regions (see Figure 1), administrative regions (see Figure 2) and river basin regions (see Figure 3). The regional averages for all aggregated areas have been calculated using a 2-D conservative method. See Appendix B for details.

We have also created shapefiles for the country, administration and river basin regions from open-source datasets. The shapefiles are available with an Open Government Licence. Note that there are some differences between UKCP09 and the latest UKCP administration region shapefiles. These are in Scotland where Eastern, Western and Northern Scotland are based on aggregating regions from [OS Boundary Line](#). There are also some small changes to river basins which are based on the European Environment Agency's [European river catchments](#).

UKCP Local (2.2km) provides the most spatially detailed picture of future climate for the mainland UK. However, due to the proximity of the Shetland Isles to the northern boundary of the model domain used for these projections, data produced here is not reliable and should not be used. This is because at the edge of the model domain the projections are influenced by the techniques required to drive the model at its boundaries, which prevent Local (2.2km) from developing its own climatology over Shetland. We do not include these grid cells to calculate the regional average.

UKCP Local (2.2km) is just one of the tools available in the UKCP suite that provide national climate change information. We advise using alternative tools to access future climate data over the Shetland Islands. For example, the Regional (12km) projections use a much larger European model domain which places the northern boundaries much further north. Shetland is represented at a 12km resolution and is free from any boundary issues.

The shapefiles are available at <https://github.com/ukcp-data/ukcp-spatial-files>.



**Figure 1** Map of countries used in the latest UK Climate Projections. The four countries covering the United Kingdom as well as the three Crown Dependencies are included.

**Figure 2** Map of administrative regions used in the latest UK Climate Projections.



**Figure 3** Map of river basin regions used in the latest UK Climate Projections.

## 9. What variables are available?

All of the data listed in Table 5 are available on the CEDA Catalogue. Many of the variables are also available on the UKCP User Interface.

Variable at the surface (short name in CEDA catalogue)	Units	Probabilistic (anomalies)	Probabilistic Climate Extremes	Global (60km)*	Regional (12km)*	Local (2.2km)*	Derived*
Cloud cover (clt)	%	✓		✓	✓	✓	
Precipitation (pr or ppr1day/pr5day)	mm/day	✓	pr1day, pr5day	✓	✓	✓ hourly	✓ daily
Radiation, total downward short wave flux (rsds)	Wm <sup>-2</sup>	✓					
Radiation, net long wave (rls)	Wm <sup>-2</sup>	✓		✓	✓	✓	
Radiation, net short wave (rss)	Wm <sup>-2</sup>	✓		✓	✓	✓	✓
Relative humidity (hurs)	%			✓	✓	✓	✓
Sea level pressure (psl)	hPa	✓		✓	✓	✓	
Snow: snowfall amount (prsn)	mm				✓†	✓	
Snow: lying snow amount (snw)	mm				✓	✓	
Specific humidity (huss)		✓		✓	✓	✓	
Temperature, maximum (tasmax)	°C	✓	✓	✓	✓	✓	
Temperature, Mean (tas)	°C	✓		✓	✓	✓ hourly	✓ daily
Temperature, minimum (tasmin)	°C	✓		✓	✓	✓	
Wind gusts (wsgmax10m)	m/s					✓ hourly 3- hourly	
Wind speed (sfcWind)	m/s			✓	✓	✓ hourly 3- hourly	✓
Wind speed eastwards/northwards (uas/vas)	m/s			✓	✓	✓	✓
Soil moisture stress factor (beta)				✓ (Global domain only)	✓† (European domain only)		
Water evaporation flux (evspsbl)	mm/day			✓ (Global domain only)	✓† (European domain only)		
Evapotranspiration from soil moisture store (evspsblsoi)	mm/day			✓ (Global domain only)	✓† (European domain only)		
Evaporation from canopy (evspsblveg)	mm/day			✓ (Global domain only)	✓† (European domain only)		
Subsurface runoff flux (mrrob)	mm/day			✓ (Global domain only)	✓† (European domain only)		
Surface runoff flux (mrros)	mm/day			✓ (Global domain only)	✓† (European domain only)		
Moisture content of soil layer (mrso)	kg m <sup>-2</sup>			✓ (Global domain only)	✓† (European domain only)		

Variable at the surface (short name in CEDA catalogue)	Units	Probabilistic (anomalies)	Probabilistic Climate Extremes	Global (60km)*	Regional (12km)*	Local (2.2km)*	Derived*
Time steps		Monthly	Seasonal	Hourly/ 3-hourly (indicated variables only)			Daily (indicated variables only)
		Seasonal		Daily			Monthly
		Annual		Monthly			Seasonal
		20/30-year means		Seasonal (UK only)			Annual
				Annual (UK only)			20/30-year means
				20/30-year means (UK only)			

**Table 5** Available variables for the latest UK climate projections over land. Only anomalies (changes compared to a baseline time period) are available for the Probabilistic Projections. \*Not all variables are available for CMIP5-13 (see Appendix A). † This variable is unavailable for the CMIP5-13 downscaled ensemble members.

Variable in the marine projections (short name in CEDA catalogue)	Units
Extreme sea level (extremeSeaLevel)	m
Local time-mean relative sea level anomaly (seaLevelAnom)	m
21st century trend in extreme still water level due to storminess change alone (skewSurgeTrend)	m/yr
Still water return level in metres above where the zero level of Ordnance Datum Newlyn was for the location in 2017 (stillWaterReturnLevel)	m
Sea surface height above mean sea level due to modelled astronomical tide only (tideAnom)	m
Sea surface height above mean sea level due to modelled astronomical tide and meteorological surge (tideSurgeAnom)	m

**Table 6** Available variables for the latest marine UK climate projections.

In addition to the variables listed in Tables 5 and 6, a set of indices representing large-scale drivers of UK weather and climate in the UKCP Global (60km) are also available on the CEDA Data Archive from the UKCP Global (60km)- European Circulation Indices dataset which is included in Table 2.

## 10. References

Gohar L, Bernie D, Good P and Lowe JA, 2018. UKCP18 Derived Projections of Future Climate over the UK, Met Office. Available at: <https://www.metoffice.gov.uk/pub/data/weather/uk/ukcp18/sciencereports/UKCP18-Derived-Projections-of-Future-Climate-over-the-UK.pdf>

Fung F, Lowe JA, Woods L, Chamberlain-Clay A and Griffith H, 2025. UKCP Factsheet: Global Warming Level information in UKCP, Met Office. Available at: <https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/research/ukcp/ukcp-factsheet---global-warming-levels.pdf>

## Appendix A: Climate model name and conventions for Global (60km), Regional (12km), Local (2.2km) and Derived Projections

The Global (60km) projections comprise results from the Met Office Hadley Centre global climate model (HadGEM3-GC3.05) as well as climate models (CMIP5) used in the latest assessment report from the Intergovernmental Panel on Climate Change. Table D.1 shows the naming convention that was used in the filenames and metadata stored on the CEDA Data Archive.

Climate Model	Global Climate Model name	Member ID	Perturbed-Physics ID	Regional Climate Model name**	Convection-Permitting Model name**
Met Office Hadley Centre climate model	HadGEM3-GC3.05	01	r001i1p00000	HadREM3-GA705	HadREM3-RA11M
		02			
		03			
		04	r001i1p01113	HadREM3-GA705	HadREM3-RA11M
		05	r001i1p01554	HadREM3-GA705	HadREM3-RA11M
		06	r001i1p01649	HadREM3-GA705	HadREM3-RA11M
		07	r001i1p01843	HadREM3-GA705	HadREM3-RA11M
		08	r001i1p01935	HadREM3-GA705	HadREM3-RA11M
		09	r001i1p02123	HadREM3-GA705	HadREM3-RA11M
		10	r001i1p02242	HadREM3-GA705	HadREM3-RA11M
		11	r001i1p02305	HadREM3-GA705	HadREM3-RA11M
		12	r001i1p02335	HadREM3-GA705	HadREM3-RA11M
		13	r001i1p02491	HadREM3-GA705	HadREM3-RA11M
		14			
		15	r001i1p02868	HadREM3-GA705	HadREM3-RA11M

Climate Model	Global Climate Model name	Member ID	Perturbed-Physics ID	Regional Climate Model name**	Convection-Permitting Model name**
CMIP5 Climate Models	bcc-csm1-1	16			
	CCSM4	17			
	CESM1-BGC	18			
	CanESM2	19			
	CMCC-CM	20			
	CNRM-CM5	21			
	EC-EARTH	22			
	ACCESS1-3	23		HadREM3-GA705-r001i1p00000-ACCESS1-3†	HadREM3-RA11M-r001i1p00000-ACCESS1-3
	HadGEM2-ES	24			
	IPSL-CM5A-MR	25		HadREM3-GA705-r001i1p00000-IPSL-CM5A-MR	HadREM3-RA11M-r001i1p00000-IPSL-CM5A-MR
	MPI-ESM-MR	26			
	MRI-CGCM3	27		HadREM3-GA705-r001i1p00000-MRI-CGCM3†	HadREM3-RA11M-r001i1p00000-MRI-CGCM3
	GFDL-ESM2G	28			
	MRI-ESM-LR	29*		HadREM3-GA705-r001i1p00000-MRI-ESM-LR	HadREM3-RA11M-r001i1p00000-MRI-ESM-LR

**Table D.1.** Climate models used in the Global (60km), Regional (12km), Local (2.2km) and Derived Projections. Table includes climate model names, corresponding identifier (member ID) and the perturbed-physics ID (for Met Office Hadley Centre models) used in the filename convention in the CEDA Archive. The Met Office Hadley Centre global climate models alongside four additional models from other modelling centres (models ACCESS1-3, IPSL-CM5A-MR, MRI-CGCM3, MRI-ESM-LR) were used as input to the 16 regional climate models. The 16 regional climate models were used as input to the 16 convection-permitting models. Further details of the HadGEM3-GC3.05 perturbed physics data is available at Sexton et al (2019)<sup>1</sup>. \*Model 29 (MRI-ESM-LR) is not included in the CMIP5-13 in the Global projections however, as the necessary driving data from MPI-ESM-MR was not available, MRI-ESM-LR was downscaled instead for inclusion in the regional and local projections. \*\* Note that for the Regional and Convection-Permitting models for members 23,25,27 and 29 there is an issue with the metadata of these files which means the model names given in this table do not correspond with the model names in the metadata of these files. † Data for the 30th November 2014 is missing for all variables from the regional data for models 23 and 27.

<sup>1</sup> Sexton et al (2019), The elicitation of distributions of parameters in HadGEM3 versions GA4 and GA7 for use in perturbed parameter ensembles, Technical Note 101, Met Office. Available at: [https://digital.nmla.metoffice.gov.uk/digitalFile\\_70d009c8-e04e-449b-98a2-ada3be97167d](https://digital.nmla.metoffice.gov.uk/digitalFile_70d009c8-e04e-449b-98a2-ada3be97167d)

## Appendix B Data availability: UKCP Global (60km), CMIP5-13

The UKCP Global (60km) data also include information from climate modelling centres other than the Met Office Hadley Centre. The availability of climate variables from these models are dependent on whether the climate modelling centres saved the data. Table A.1 set out the available daily variables for the CMIP5-13 set of global projections. Table A.2 sets out the monthly variables that are available for the CMIP5-13 set of global projections.

CMIP5-13 member ID	CMIP5 name	Scenario	Variable														
			clt	hurs	huss	pr	psl	rls	rss	sfcWind	tas	tasmax	tasmin	uas	vas		
16	bcc-csm1-1	RCP 2.6				✓						✓					
		RCP 8.5	1950+		✓	✓	✓	✓	✓		✓	✓	✓	1950+	✓		
17	CCSM4	RCP 2.6				✓						✓					
		RCP 8.5				✓	✓	✓	✓		✓	✓	✓				
18	CESM1-BGC	RCP 2.6				-2005	-2005					-2005	-2005	-2005			
		RCP 8.5				✓	✓	✓	✓		✓	✓	✓				✓
19	CanESM2	RCP 2.6	1979+			✓						✓	1979+	1979+	✗	✗	
		RCP 8.5	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
20	CMCC-CM	RCP 2.6				-2005	-2005					-2005	-2005	-2005			
		RCP 8.5	1950			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1950+	1950+
21	CNRM-CM5	RCP 2.6				✓						✓	✓	✓			
		RCP 8.5	1950+		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1950+	1950+
22	EC-EARTH	RCP 2.6				✓	✓					✓	✓	✓			
		RCP 8.5				✓	✓	✓	✓			✓	✓	1900+			
23	ACCESS1-3	RCP 2.6				✓	✓				✓	✓	✓	✓			
		RCP 8.5	1950+		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1950+	1950+
24	HadGEM2-ES	RCP 2.6				✓						✓	-2005	-2005			
		RCP 8.5	1949		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1949+	1949+
25	IPSL-CM5A-MR	RCP 2.6	1950+			✓	✓	✓				✓			1950+	1950+	
		RCP 8.5	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
26	MPI-ESM-MR	RCP 2.6				✓						✓					
		RCP 8.5	1950+			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1950+	1950+
27	MRI-CGCM3	RCP 2.6				✓							✓	✓			
		RCP 8.5	1950+		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1950+	1950+
28	GFDL-ESM2G	RCP 2.6				✓							✓	✓			
		RCP 8.5	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

**Table A.1.** Summary of daily fields that are available for the CMIP5-13 set of UKCP Global (60km) projections where ✓ denotes data available for the whole period 1/12/1899 to 30/11/2099, 1950+ denotes a start year in 1950, -2005 denotes an end year of 2005. clt is total cloud cover, hurs is relative humidity at the surface, huss is specific humidity at the surface, psl is sea level pressure, rls is the long wave radiation at the surface, rss is the short wave radiation at the surface, sfcWind is wind speed at 10m, tas is mean temperature at the surface, tasmin is minimum temperature at the surface, tasmax is maximum temperature at the surface, uas is eastward wind at the surface and vas is northward wind at the surface.

CMIP5-13 member ID	CMIP5 name	Scenario														
			clt	hurs	huss	pr	psl	rls	rss	sfcWind	tas	tasmx	tasmin	uas	vas	
16	bcc-csm1-1	RCP 2.6	✓	✓	✓	✓	✓					✓	✓	✓	✓	✓
		RCP 8.5	✓	✓	✓	✓	✓					✓	✓	✓	✓	✓
17	CCSM4	RCP 2.6	✓	✓	✓	✓	✓					✓				
		RCP 8.5	✓	✓	✓	✓	✓					✓	✓	✓		
18	CESM1-BGC	RCP 2.6				-2005	-2005					-2005	-2005	-2005		
		RCP 8.5	✓	✓	✓	✓	✓					✓	✓	✓		
19	CanESM2	RCP 2.6	✓	✓	✓	✓	✓				✓	✓	1979+	1979+	✓	✓
		RCP 8.5	✓	✓	✓	✓	✓				✓	✓	✓	✓	✓	✓
20	CMCC-CM	RCP 2.6				-2005	-2005					-2005	-2005	-2005		
		RCP 8.5	✓			✓	✓				✓	✓	✓	✓	✓	✓
21	CNRM-CM5	RCP 2.6	✓	✓	✓	✓	✓					✓	✓	✓		
		RCP 8.5	✓	✓	✓	✓	✓				✓	✓	✓	✓		
22	EC-EARTH	RCP 2.6				-2009	-2009					-2009	-2009	-2009		
		RCP 8.5				✓	✓					✓	✓			
23	ACCESS1-3	RCP 2.6			-2005	-2005						-2005	-2005	-2005		
		RCP 8.5	✓	✓	✓	✓	✓				✓	✓	✓	✓	✓	✓
24	HadGEM2-ES	RCP 2.6	✓	✓	✓	✓	✓					✓	✓	-2005	-2005	
		RCP 8.5	✓	✓	✓	✓	✓					✓	✓	✓	✓	✓
25	IPSL-CM5A-MR	RCP 2.6	✓	✓	✓	✓	✓					✓	✓			✓
		RCP 8.5	✓	✓	✓	✓	✓					✓	✓	✓	✓	✓*
26	MPI-ESM-MR	RCP 2.6	✓			✓	✓					✓	✓			✓
		RCP 8.5	✓			✓	✓					✓	✓	✓	✓	✓
27	MRI-CGCM3	RCP 2.6	✓	✓	✓	✓	✓					✓	✓	✓	✓	
		RCP 8.5	✓	✓	✓	✓	✓					✓	✓	✓	✓	
28	GFDL-ESM2G	RCP 2.6	✓	✓	✓	✓	✓					✓	✓	✓	✓	✓
		RCP 8.5	✓	✓	✓	✓	✓					✓	✓	✓	✓	✓

**Table A.2.** Summary of monthly fields that are available for the CMIP5-13 set of UKCP Global (60km) projections where ✓ denotes data available for the whole period 1/12/1899 to 30/11/2099, 1950+ denotes a start year in 1950, -2005 denotes an end year of 2005. clt is total cloud cover, hurs is relative humidity at the surface, huss is specific humidity at the surface, psl is sea level pressure, rls is the long wave radiation at the surface, rss is the short wave radiation at the surface, sfcWind is wind speed at 10m, tas is mean temperature at the surface, tasmin is minimum temperature at the surface, tasmx is maximum temperature at the surface, uas is eastward wind at the surface and vas is northward wind at the surface. \*as both northward and eastward winds are required, this has not been transformed to the British National Grid.

# Appendix C: Coordinate Systems, Regridding and Regional Averages

## Coordinate Systems

As listed in Table 4, the climate projections are available in different coordinate systems and resolutions. The following are definitions of the different coordinate systems used in UKCP raw model data:

### UKCP Global and Marine Projections

The global and marine projections raw model data are provided on the geographic projection.

### Regional and Local Projections

The regional and local climate model projections for the European and British Isles domains respectively are available in a rotated pole coordinate system. The details are as follows:

- Rotated Pole
- Grid North Pole latitude = 39.25
- Grid North Pole longitude = 198.0

### Regional Averages and Regridding

The processing tools used to provide the climate model data over land were developed in [Python 2.7](#) (and migrated to Python 3) and [Iris](#). The probabilistic, global, regional and local projections are available regridded to the UK on the Ordnance Survey's National Grid as well as averaged regionally for countries, administrative regions and river basin regions. The same method was used for both regridding and regional averaging; this requires using shapefiles for the target National Grid or region and then carrying out an area-weighted method using [iris.analysis.geometry](#).

Note that there are no values for some of the small land areas for the global projections due to the coarser model grid resolution.

## Appendix D: Filename and Folder Structure Conventions

### Folder structure

The UKCP data files for the projections over land have been stored on the CEDA Data Archive using the conventions set out in Tables C.1, C.2 and C.3.

Dataset	Folder structure
Probabilistic	collection/domain/resolution/scenario/filetype/baseline/year/variable/frequency/version
Global (60km), Regional (12km), Local (2.2km), Derived	collection/domain/resolution/scenario/member/variable/frequency/version

Table C.1 Folder structure convention for files on CEDA Data Archive

Dataset	Folder structure
Probabilistic	variable_scenario_collection_domain_resolution_filetype_baseline_year_frequency_timeslice.nc
Probabilistic Extremes	variable_returnperiod_scenario_collection_domain_resolution_filetype_baseline_year_frequency_timeslice.nc
Global (60km), Regional (12km), Local (2.2km), Derived	variable_scenario_collection_domain_resolution_member_frequency_timeslice.nc

Table C.2 Filename convention for files on CEDA Data Archive

Category	Category description	Possible values	Value descriptions
<b>collection</b>	Describes the data collection	land-prob  land-gcm land-rcm land-cpm	Probabilistic projections and Probabilistic projections of climate extremes Global (60km) projections Regional (12km) projections Local (2.2km) projections
<b>domain</b>	The spatial extent of the data	global eur uk	Global Europe UK only
<b>resolution</b>	The resolution of the dataset	60km, 12km, 2.2km	Resolution of the climate model
		60km, 12km , 5km, country, region, river	Resolution of the regrided data and regional averages
<b>scenario</b>	Representative concentration pathway or emissions scenario	rcp2.6, rcp4.5, rcp6.0,rcp8.5, sres-a1b	
<b>filetype</b>	The type of result	cdf pdf sample	Cumulative-distribution frequency Probability distribution function Samples
<b>baseline</b>	Baseline years used for calculating anomalies	b8100, b6190, b8110	1981-2000, 1961-1990, 1981-2010
<b>nyear</b>	Number of years used for calculating anomalies or indicates that the data is provided on global warming levels	1y, 20y, 30y, gwl	
<b>member</b>	Member number	see Table D.1	
<b>variable</b>	Variable short name	see Table 5	
<b>frequency</b>	Averaging frequency	1hr, 3hr, day, mon, seas, ann	1 hour, 3 hour, daily, monthly, seasonal, annual
		mon-20y, seas-20y, ann-20y	20-year monthly, seasonal and annual averages
		mon-30y, seas-30y, ann-30y	30-year monthly, seasonal and annual averages
<b>version</b>	Version number		
<b>returnperiod</b>	Return period	20, 50, 100	Return period of 20, 50,100 years

**Table C.3** Description of folder and file-naming conventions used in CEDA Data Archive

## Appendix E Data availability: Derived Projections, CMIP5-13

The Derived Projections data also include information from climate modelling centres other than the Met Office Hadley Centre. The availability of climate variables from these models are dependent on whether the climate modelling centres saved the data. In addition, the global mean surface temperature for the CMIP5-13 members 16, 21, 26, 28 do not reach 4°C above preindustrial levels.

The only daily variables available are precipitation and temperature for the Derived Projections. Table E.1 sets out the available monthly variables for the CMIP5-13 set of Derived Projections.

CMIP5-13 member ID	CMIP5 name	hurs	pr	rss	sfcWind	tas	uas	vas
16	bcc-csm1-1	✓	✓			✓	✓	✓
17	CCSM4	✓	✓			✓		
18	CESM1-BGC	✓	✓			✓		
19	CanESM2	✓	✓		✓	✓	✓	✓
20	CMCC-CM		✓		✓	✓	✓	✓
21	CNRM-CM5	✓	✓		✓	✓		
22	EC-EARTH		✓			✓		
23	ACCESS1-3	✓	✓		✓	✓	✓	✓
24	HadGEM2-ES	✓	✓		✓	✓	✓	✓
25	IPSL-CM5A-MR	✓	✓		✓	✓	✓*	
26	MPI-ESM-MR		✓		✓	✓	✓	✓
27	MRI-CGCM3	✓	✓		✓	✓		
28	GFDL-ESM2G	✓	✓		✓	✓	✓	✓

**Table E.1** Summary of monthly fields that are available for CMIP5-13 set of Derived Projections where ✓ denotes data available. hurs is relative humidity at the surface, pr is precipitation, rss is the short wave radiation at the surface, sfcWind is wind speed at 10m, tas is mean temperature at the surface, uas is eastward wind at the surface and vas is northward wind at the surface. \*as both northward and eastward winds are required, this has not been transformed to the British National Grid.