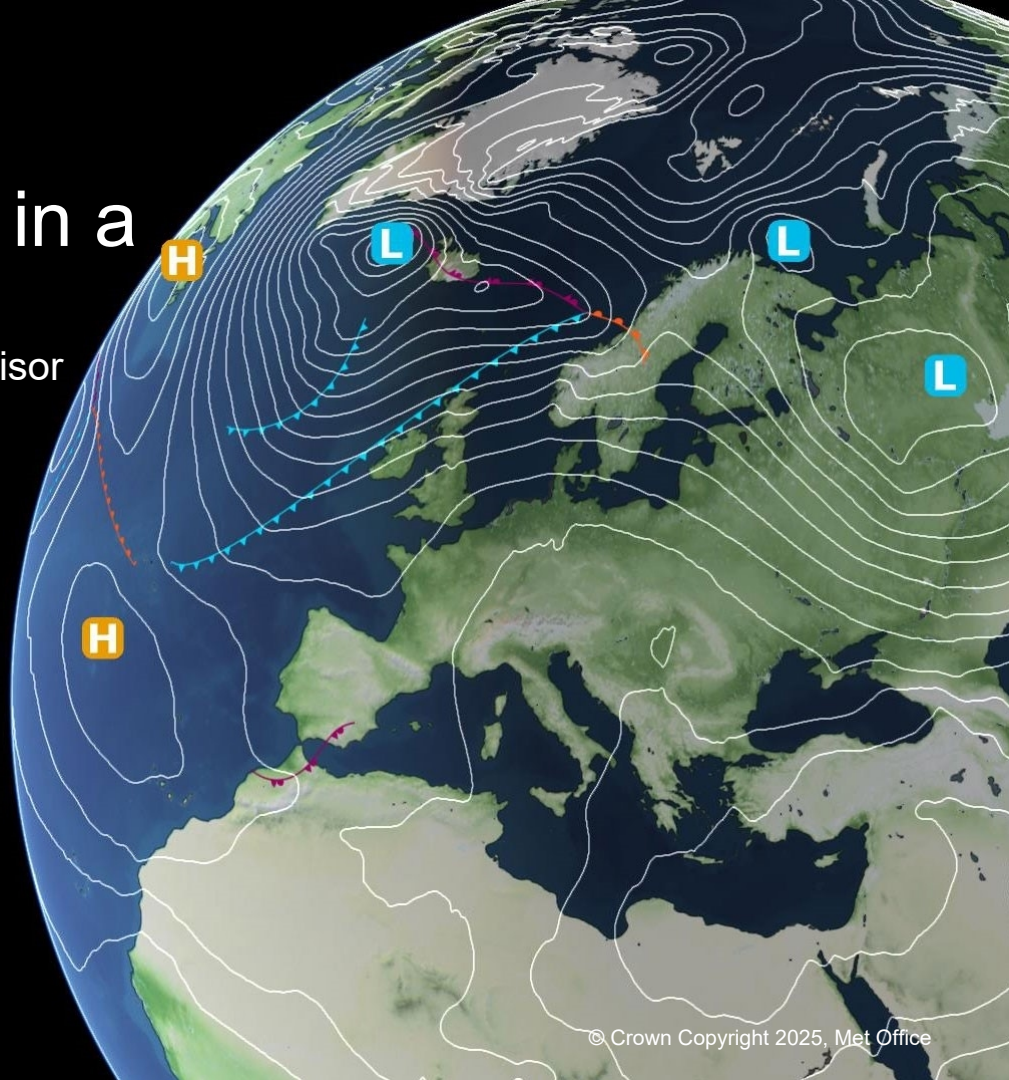


Changing Weather Risks in a Warming World

Mark Rogers, Met Office Civil Contingencies Advisor

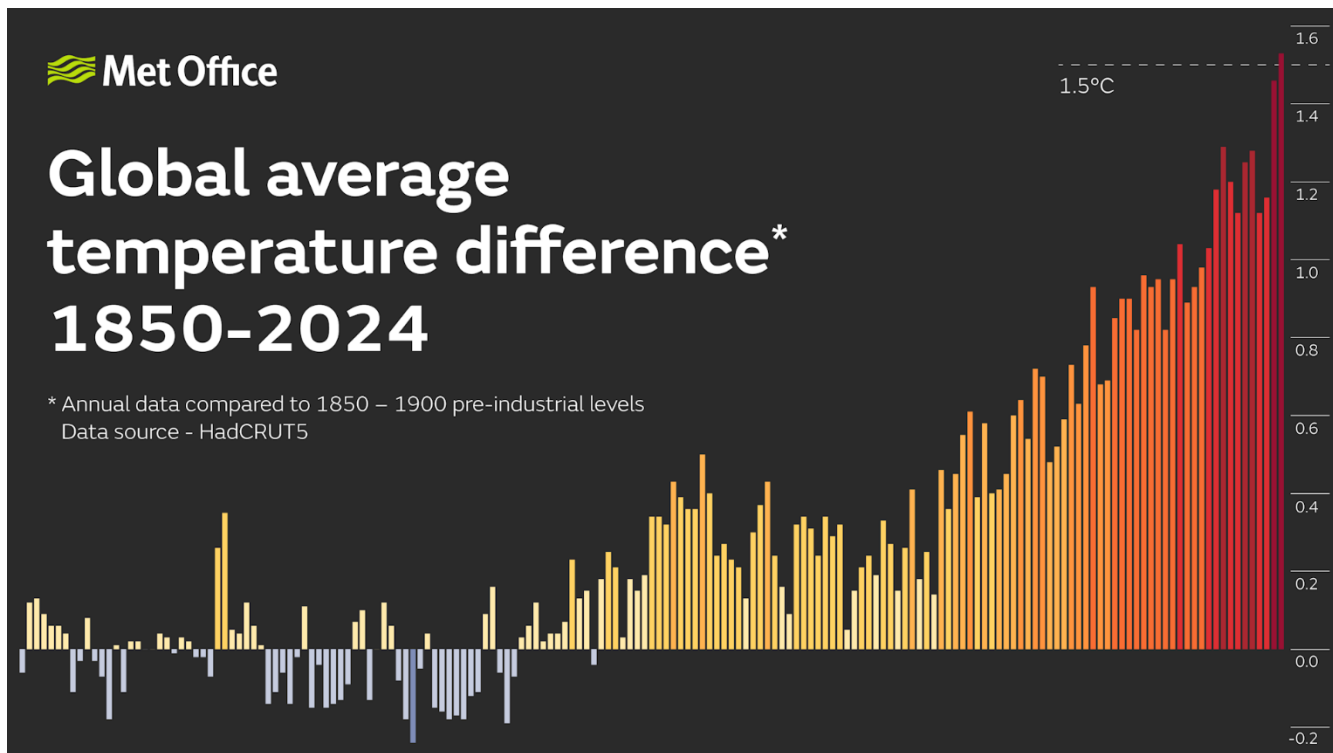


A Changing Climate

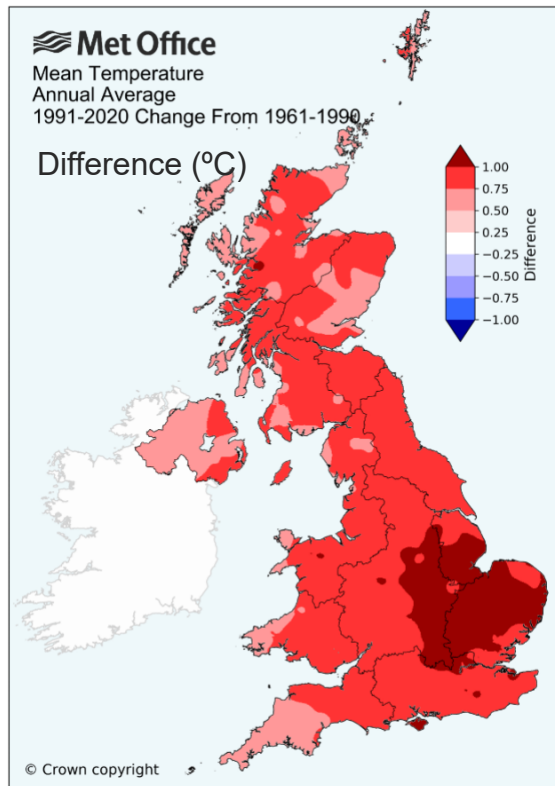
“Human-induced climate change is already affecting weather and climate extremes in every region across the globe.”

“Evidence of observed changes in extremes such as heatwaves, heavy precipitation, droughts, and tropical cyclones, and, in particular, their attribution to human influence, has strengthened since AR5.”

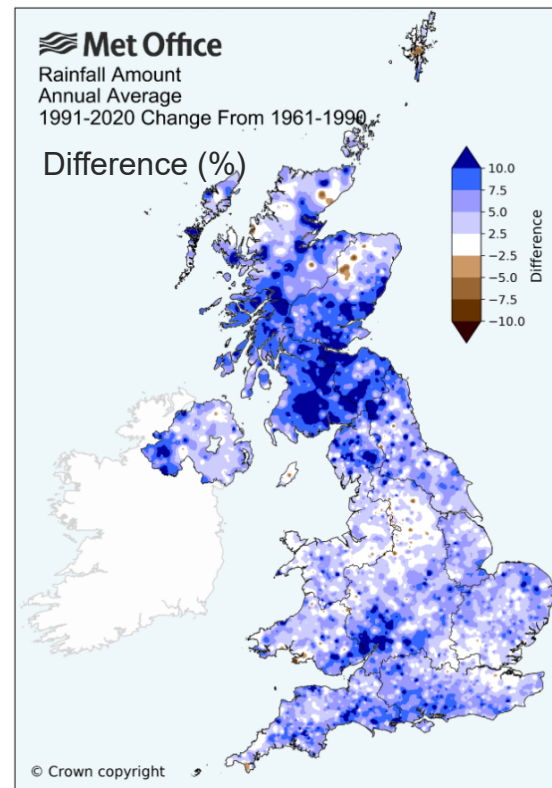
[IPCC AR6 WG1 SPM A3 \(2021\).](#)



2024 was the warmest year on record globally and the first year that was likely more than 1.5°C above pre-industrial levels

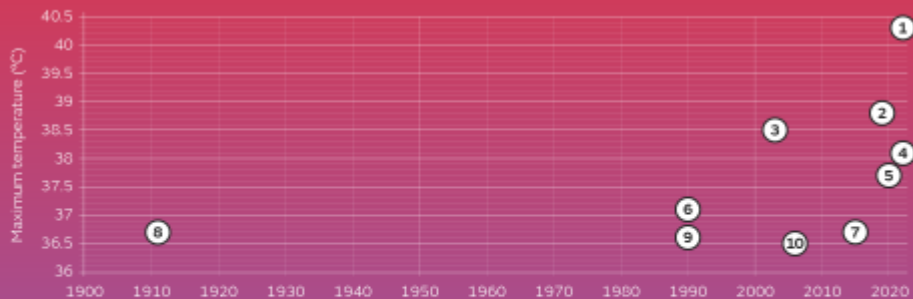


Kent = +0.96 C



Kent = +25.8 mm (3.8%)

Met Office Top ten hottest UK days on record

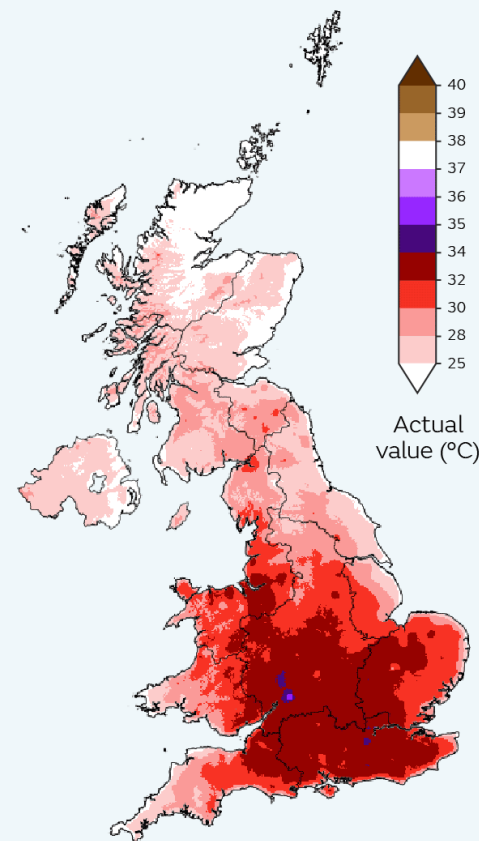


- 19 July 2022, Coningsby, Lincolnshire - **40.3 °C***
 - 25 July 2019, Cambridge Botanic Gardens - **38.7 °C**
 - 10 Aug 2003, Faversham, Kent - **38.5 °C**
 - 18 July 2022, Santon Downham - **38.1 °C***
 - 31 July 2020, Heathrow, London - **37.8 °C**
 - 03 Aug 1990, Cheltenham, Gloucestershire - **37.1 °C**
 - 01 Jul 2015, Heathrow, London - **36.7 °C**
 - 09 Aug 1911, Raunds Northamptonshire - **36.7 °C**
 - 02 Aug 1990, Worcester, Worcestershire - **36.6 °C**
 - 19 Jul 2006, Wisley, Surrey - **36.5 °C**
- * Provisional data

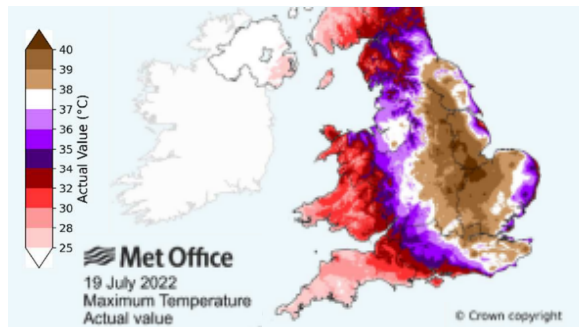
- A new record daily maximum temperature was reached on 19 July 2022, with **40.3°C** recorded at Coningsby, Lincolnshire, exceeding the previous record by 1.6°C.
- A total of **46 stations** across the UK exceeded the previous UK record of 38.7°C.

Maximum temperature

3 July
1976



Extreme events are impacting the UK



• Heatwaves

- **July 2022** UK exceeded 40°C for the first time on record in the UK.
- The **Summer 2020 heatwave** was the most significant heatwave of the last 60 years, leading to over **2500 excess deaths** across the UK
- By **2050** hot summers (like 2018) could happen **every other year**.



Heavy rainfall

- **February 2020** was the wettest February on record
- **Storm Ciara** saw a month's worth of rain fall across parts of West Yorkshire in just 18 hours, leading to **widespread flooding**
- By **2070**, winter rainfall events, similar to these, are expected to **increase by up to 25%**



Wildfires

- Figures suggest the number of **UK wildfires has been increasing** in recent years
- Wildfires could be **5 times more likely** by 2100 due to increases in high temperatures and low summer rainfall; conditions highly conducive to wildfires.

UK Climate Projections (UKCP18)

A diverse set of climate projections:

Global (60km)	Observations
Regional (12km)	Marine
Local (2.2km)	Probabilistic

Headline results:

“a greater chance of warmer, wetter winters and hotter, drier summers”

“Sea levels have been rising and will continue to rise”



Current risks: How will they change?

Hot Weather / Heatwaves

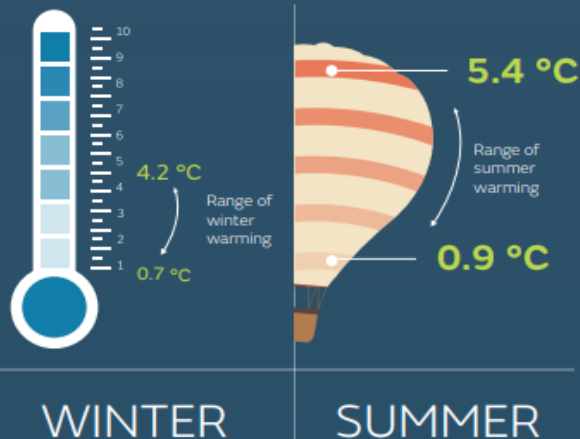
R73 – High temperatures and Heatwaves

FUTURE TEMPERATURE CHANGE

PROBABILISTIC PROJECTIONS

RIISING SEASONAL TEMPERATURES*

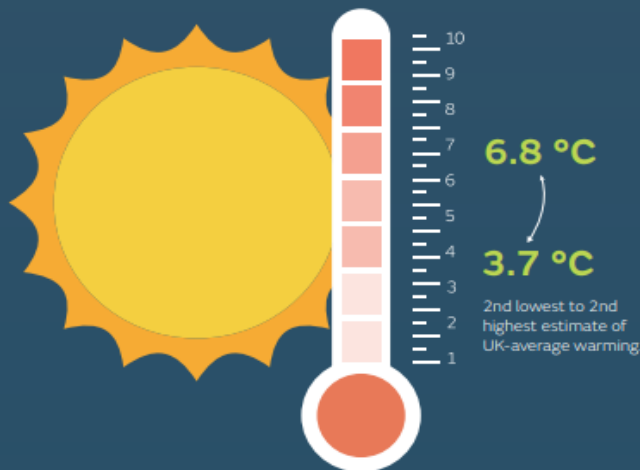
UKCP Probabilistic (25km) projections show that by 2070, the range of average seasonal temperature changes are projected to increase*.



UKCP LOCAL (2.2KM)

HOT SUMMER DAYS

Temperature of hot summer days**, by 2070, is projected to increase in the Local (2.2km) projections.



THE FREQUENCY OF HOT SPELLS*** IS PROJECTED TO INCREASE

The average frequency of hot spells, locally over the southern UK for the period 1981-2000, is once every 4 years.



By 2070, the average frequency of hot spells is projected to rise to about four times per year.



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& Industrial Strategy



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Hadley Centre



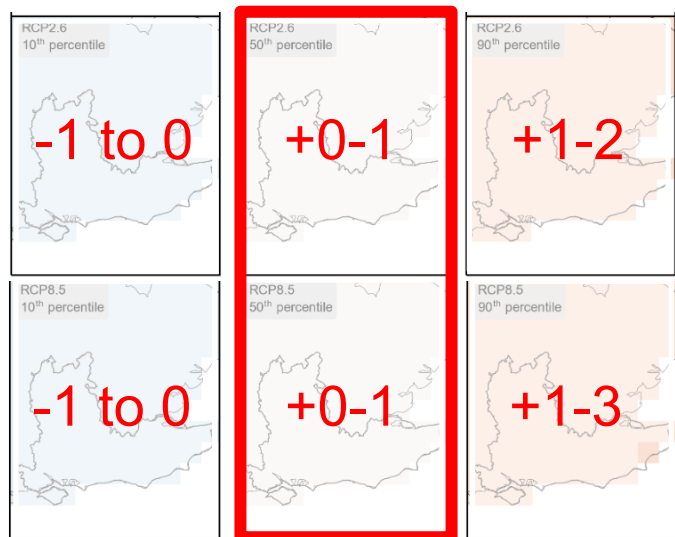
Environment
Agency

Working together on

UK Climate Projections

Winter Temperatures

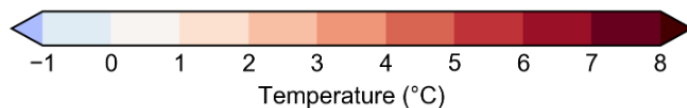
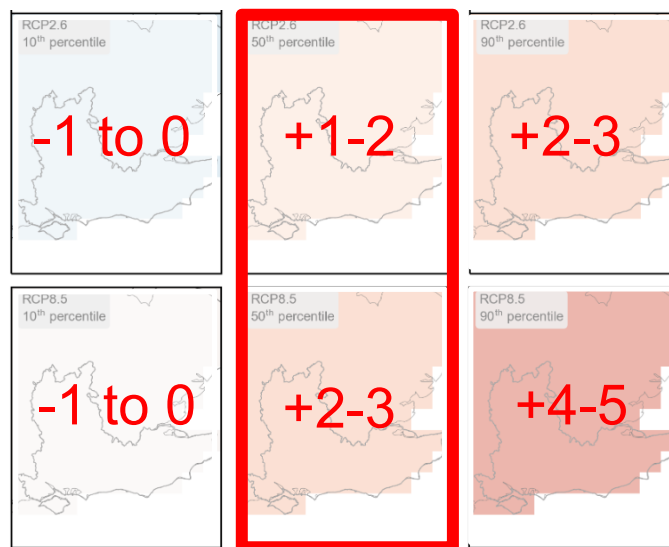
2020-2039



RCP2.6
Best Case

RCP8.5
Worst Case

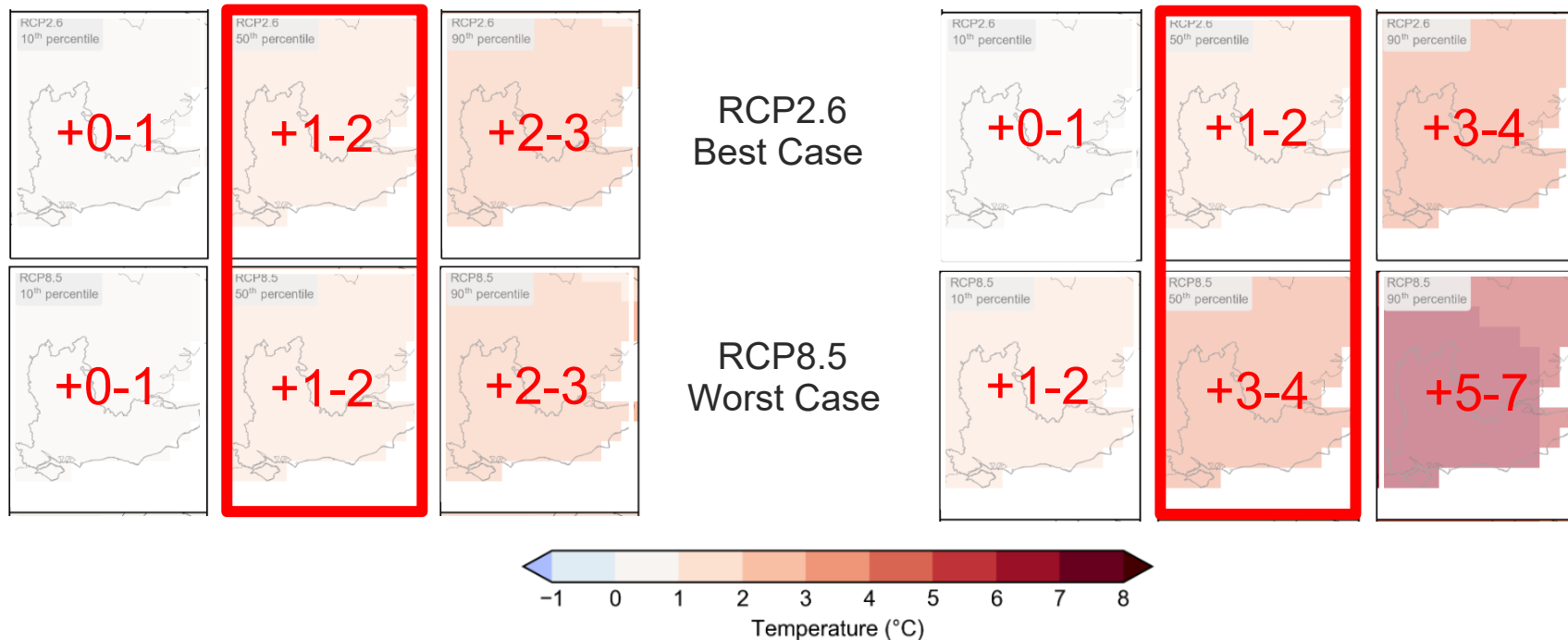
2060-2079



Summer Temperatures

2020-2039

2060-2079



Higher temperatures could include an increased risk of.....

- Excess Deaths / Health Issues
- Transport Disruption
- Water shortages / outages
- Water rescues
- Wildfires
- Drought?

Flooding

R75a – Coastal Flooding

R75b – Fluvial Flooding

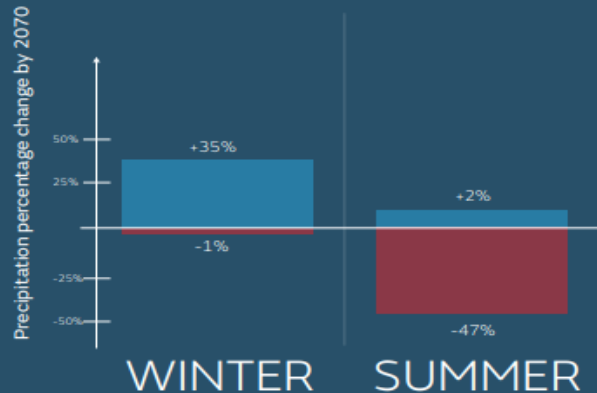
R75c – Surface water Flooding

FUTURE PRECIPITATION CHANGE

PROBABILISTIC PROJECTIONS

WETTER WINTERS, DRIER SUMMERS*

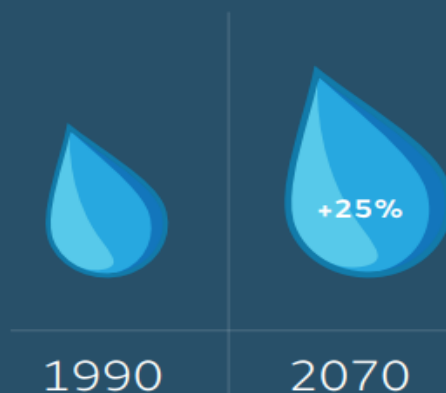
UKCP Probabilistic (25km) projections show that by 2070, under a high emission scenario, average winter precipitation is projected to increase, whilst average summer rainfall is projected to decrease.



UKCP LOCAL (2.2KM)

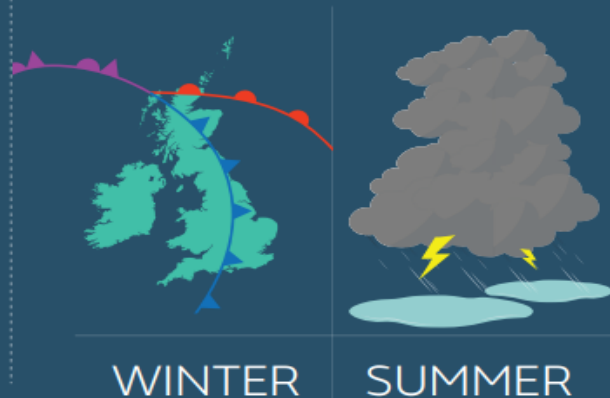
FUTURE INCREASES IN EXTREME HOURLY RAINFALL INTENSITY

By 2070, extreme hourly rainfall intensity associated with an event that typically occurs once every two years increases by 25%.



CHANGES IN THE TYPE OF RAINFALL

By 2070, Local (2.2km) projects more of the rain in winter will come from frontal rain events of higher intensity and in summer from short lived high intensity showers.



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Agency

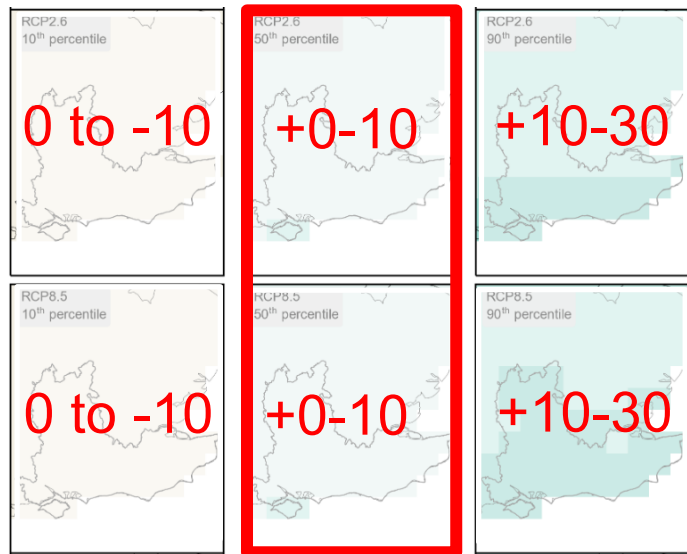
Working together on

UK Climate Projections

Winter Precipitation

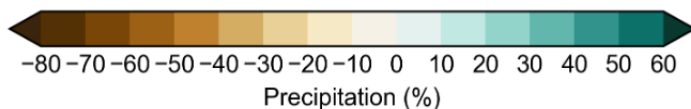
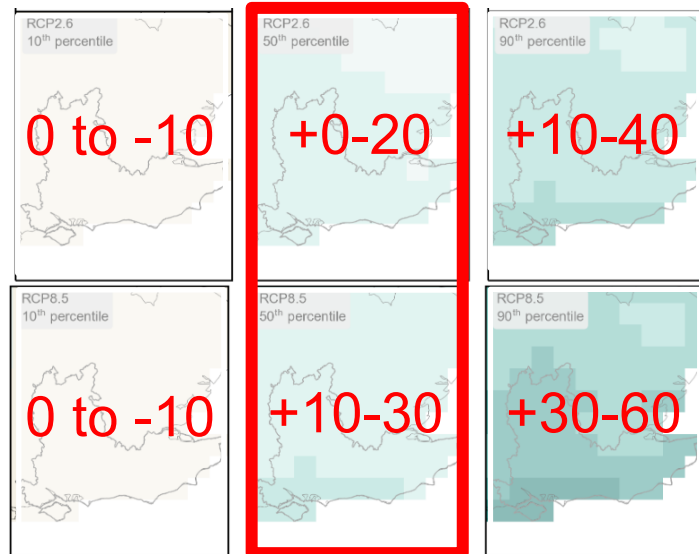
2020-2039

2060-2079



RCP2.6
Best Case

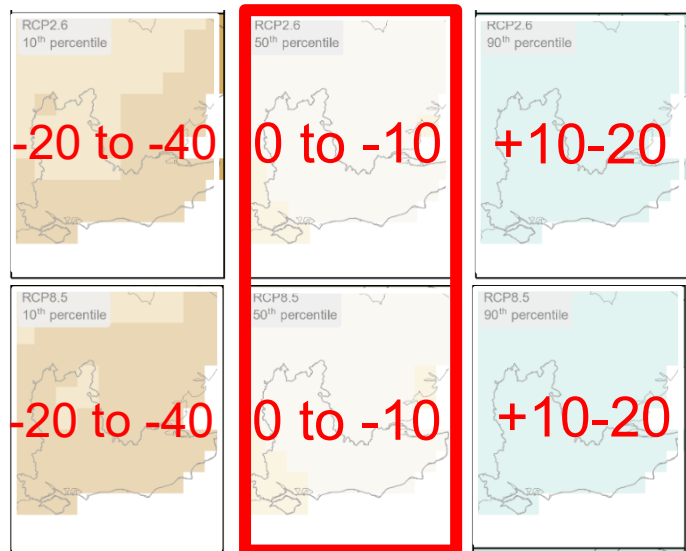
RCP8.5
Worst Case



Summer Precipitation

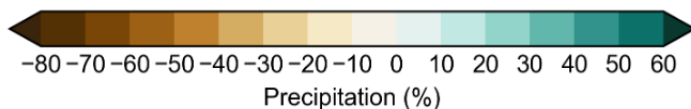
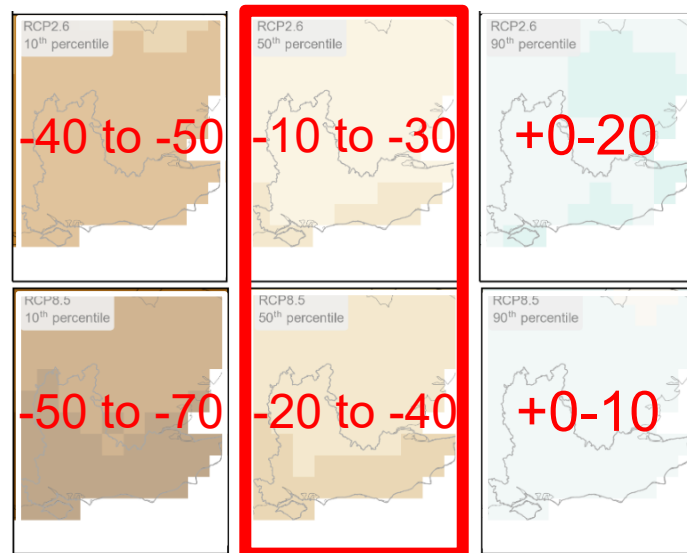
2020-2039

2060-2079



RCP2.6
Best Case

RCP8.5
Worst Case



Heavier rainfall in the future could lead to an increased risk of.....

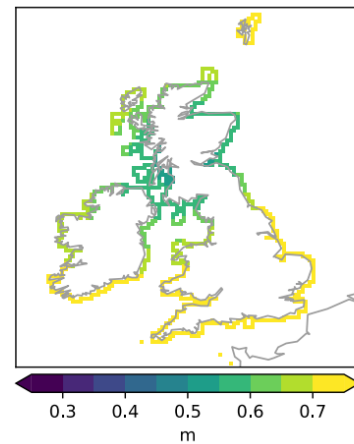
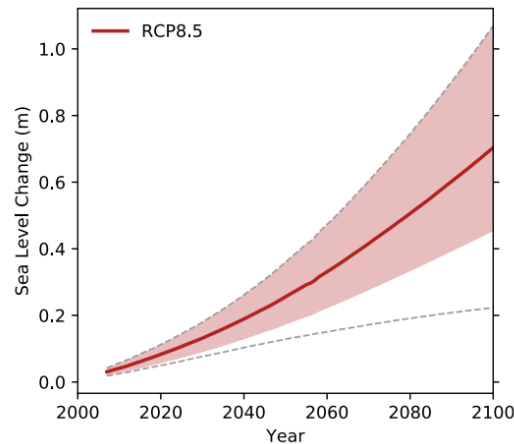
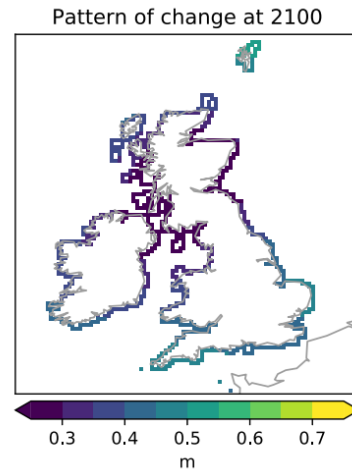
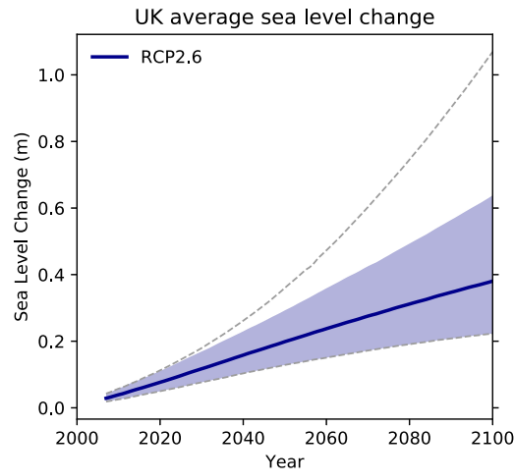
- River and groundwater flooding in the winter
- Surface water flooding in the summer

Sea Level

Sea level rise in the UK

- Sea levels will rise more in England/Wales than in Scotland/Northern Ireland. This is due to glacial isostatic adjustment.
- In a high emissions scenario, sea level could rise between 0.5-1.15m by 2100 in London. Under a low emission scenario this would be 0.3-0.7m*

* Relative to 1980-2000 average



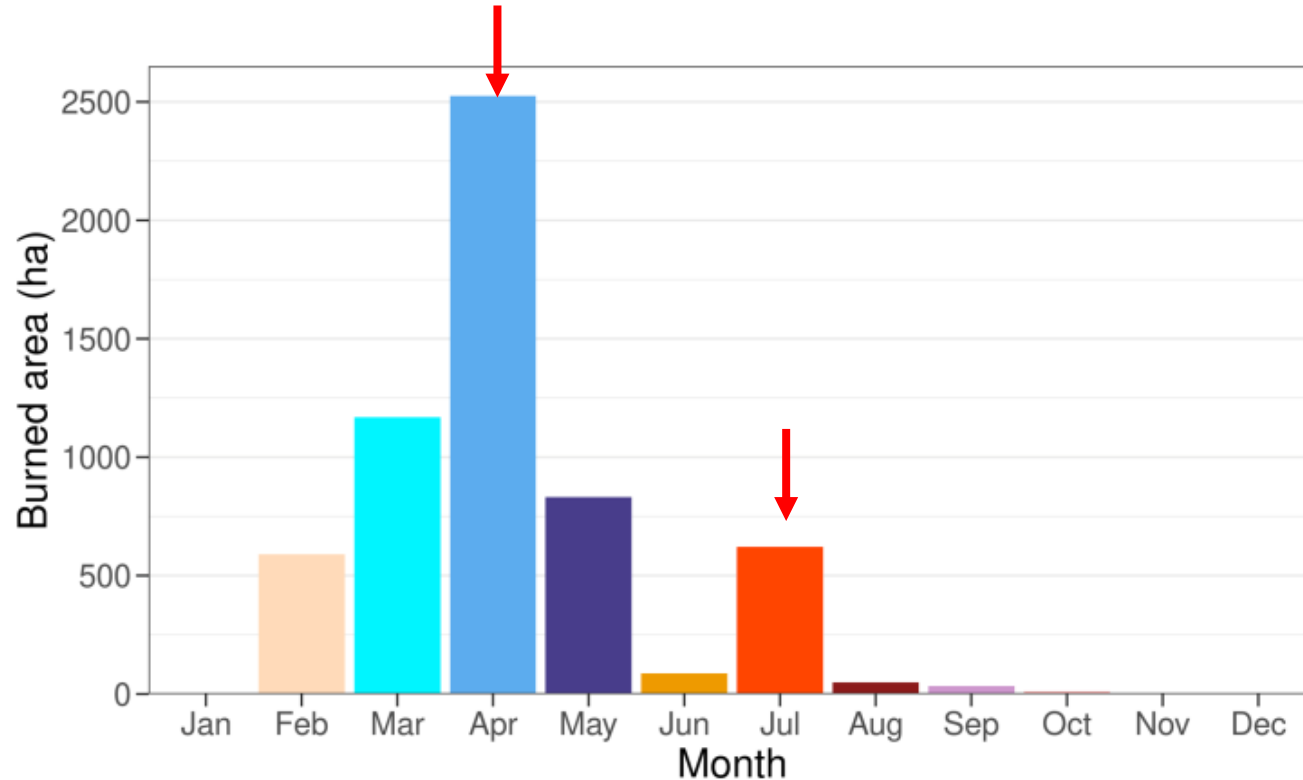
A rise in sea level in the future could lead to an increased risk of.....

- Coastal flooding
- Coastal erosion

Wildfire

R66 - Wildfire

Met Office UK Wildfire seasons



Monthly mean burned area (km²) for the UK from 2003 to 2020.

Wildfire Risk

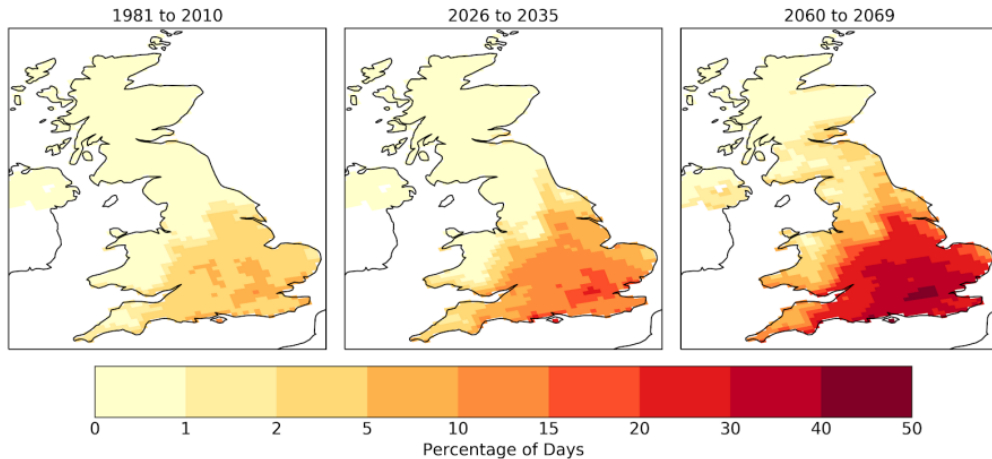


Figure D4: Annual occurrence (% of days) with Fire Weather Index (FWI) > 17.35 (Fire Danger Class 4/5) during summer (JJA) from the UKCP18 12km regional model averaged over the 12 ensemble members for a) 1981-2010 baseline period b) 2026-2035 (2 degC global warming level) and c) 2060-2069 (4 degC global warming level).

Belcher et al., (2021)

Combination of high temperatures, low humidity, low rainfall and often high winds

Wildfire risk does occur naturally but is increasing in frequency and severity due to climate change

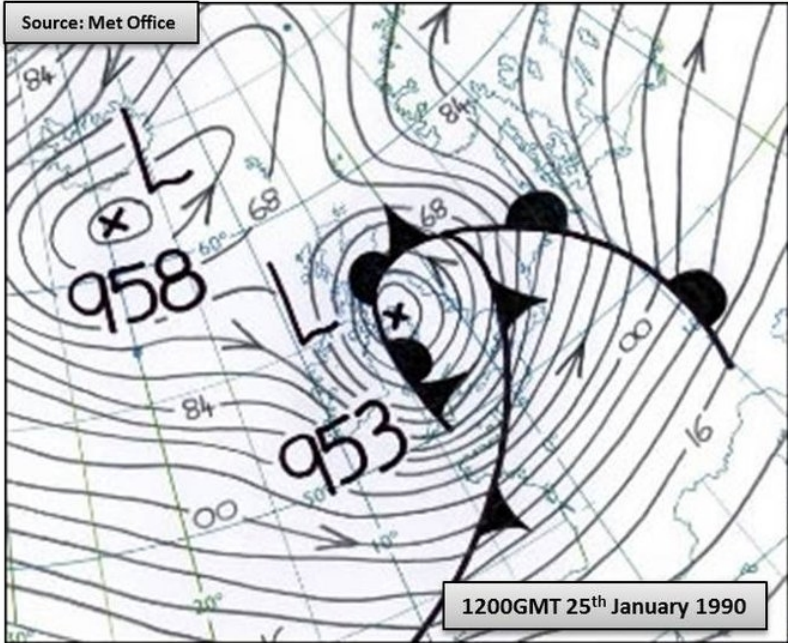
A future likelihood of seeing wildfire conditions could lead to an increased risk of.....

- Destruction of land
- Danger to buildings on the rural / urban boundary
- Poor air quality
- Impacts on FRS resources

Storms

R72 - Storms

Warnings for these type of events will be issued as Wind warnings.



More active storms could lead to an increased risk of.....

- Structural damage
- Environmental damage (e.g. fallen trees)
- Power outages
- Transport disruption
- Coastal flooding

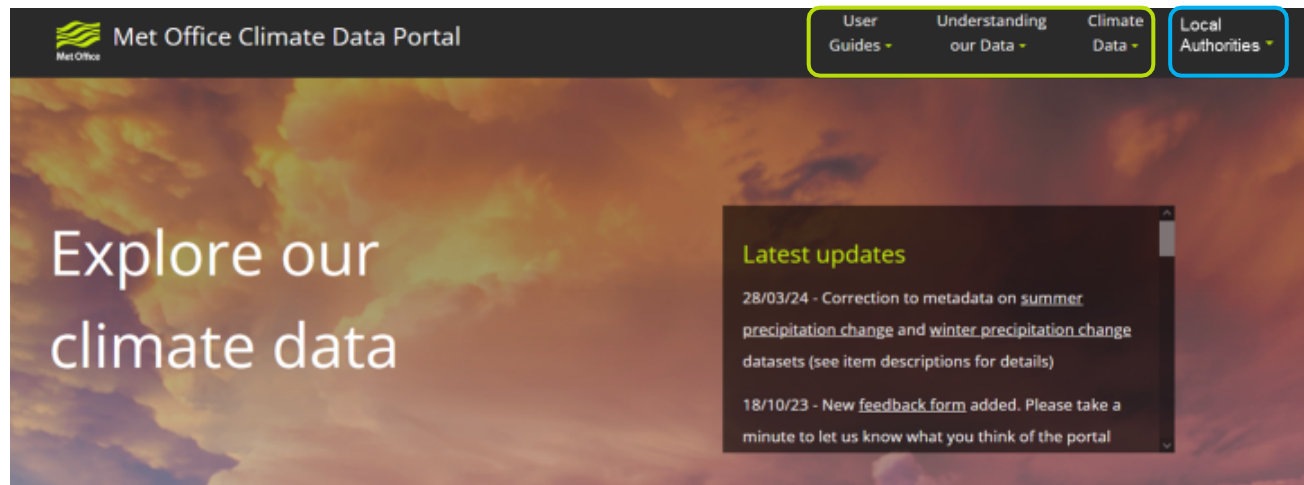
Where to access Climate projections

Climate Data Portal (●CDP) Local Authority Climate Service (●LACS)

●CDP and ●LACS
have a single point
of entry.

The ●CDP provides
climate data layers.

The ●LACS provides
easy-to-access guidance
on local climate.



Local Authority Climate Service (●LACS)

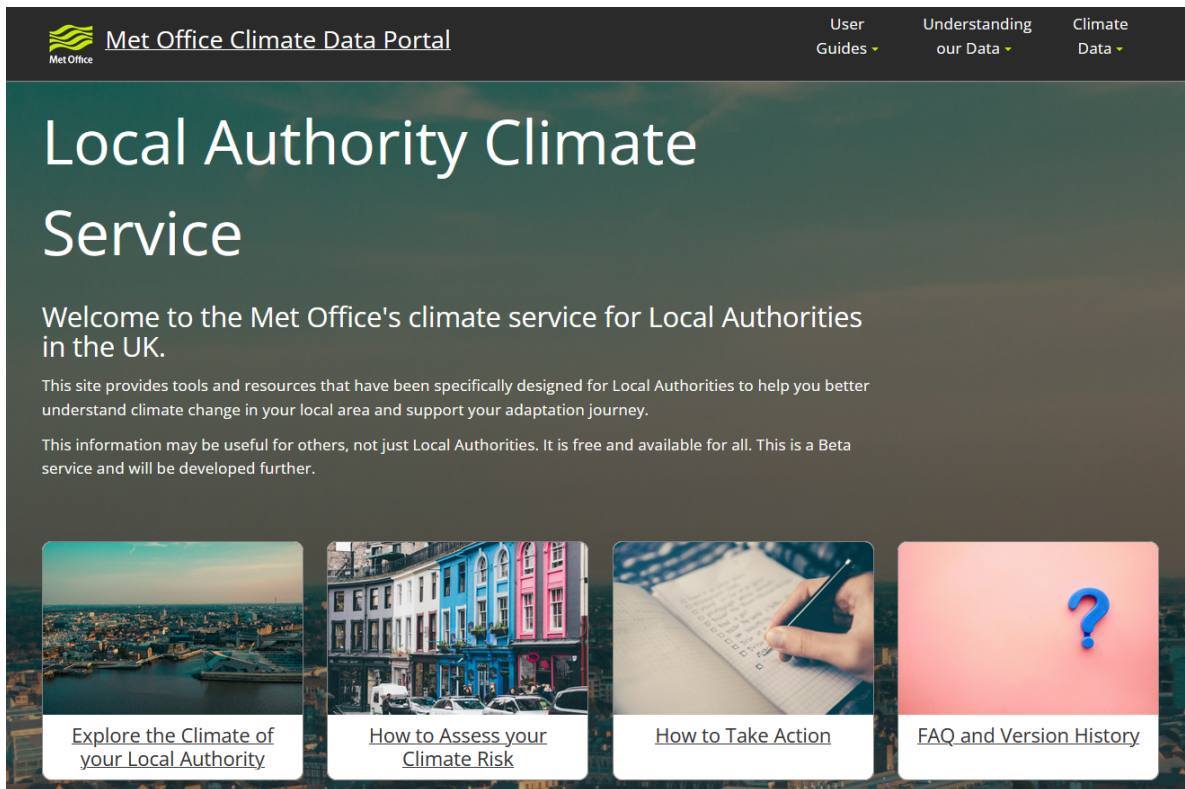
The service is intended for ...

- **Local Authority officers**
- **Councillors**
- **The public**
- **Leaders**

Invitation to feed back:

lacs@metoffice.gov.uk

... or the feedback form ...



The screenshot shows the homepage of the Met Office Climate Data Portal. At the top, there is a dark navigation bar with the Met Office logo on the left and three links: "User Guides", "Understanding our Data", and "Climate Data". Below the navigation bar, the main heading "Local Authority Climate Service" is displayed in large white text. A welcome message follows: "Welcome to the Met Office's climate service for Local Authorities in the UK." Below this, two paragraphs of text describe the service's purpose and availability. At the bottom, there are four rectangular tiles with images and text: "Explore the Climate of your Local Authority" (aerial view of a city), "How to Assess your Climate Risk" (a row of colorful townhouses), "How to Take Action" (a hand holding a pen over a document), and "FAQ and Version History" (a pink background with a blue question mark).

Met Office [Met Office Climate Data Portal](#)

User Guides ▾ Understanding our Data ▾ Climate Data ▾

Local Authority Climate Service

Welcome to the Met Office's climate service for Local Authorities in the UK.

This site provides tools and resources that have been specifically designed for Local Authorities to help you better understand climate change in your local area and support your adaptation journey.

This information may be useful for others, not just Local Authorities. It is free and available for all. This is a Beta service and will be developed further.

[Explore the Climate of your Local Authority](#)

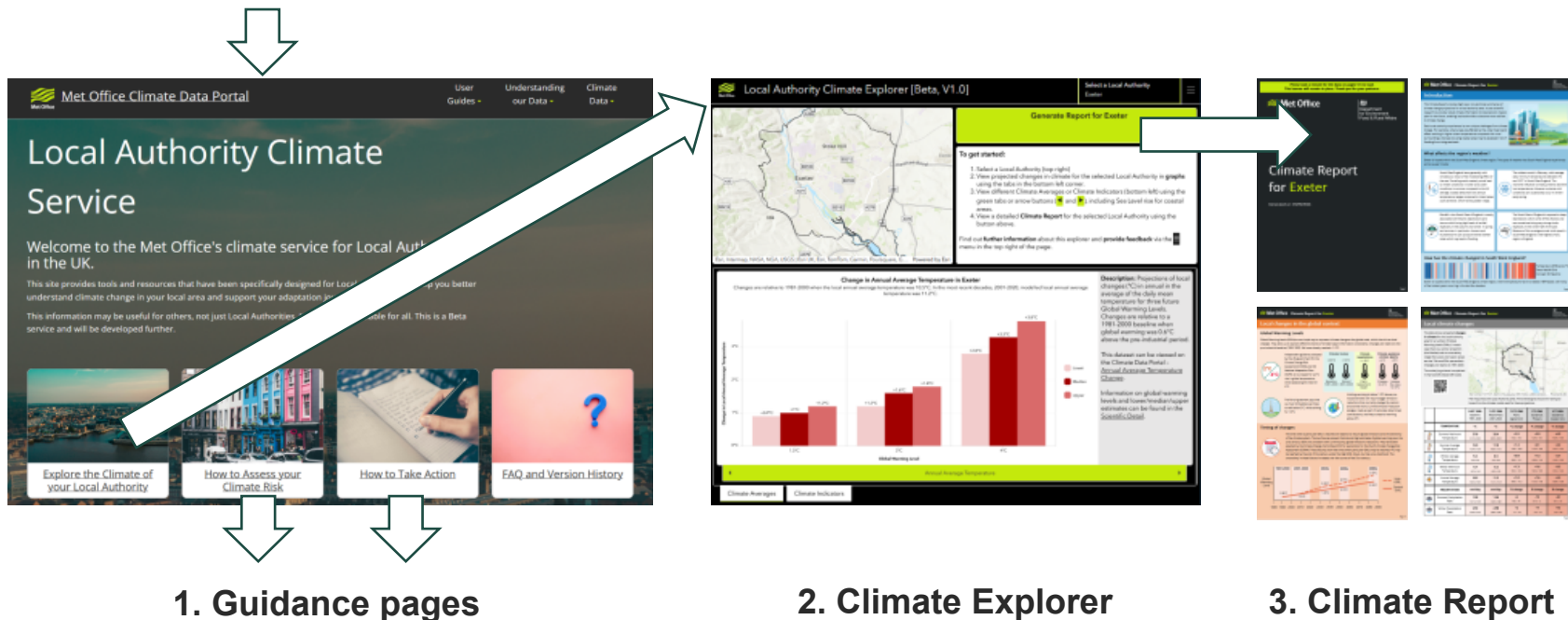
[How to Assess your Climate Risk](#)

[How to Take Action](#)

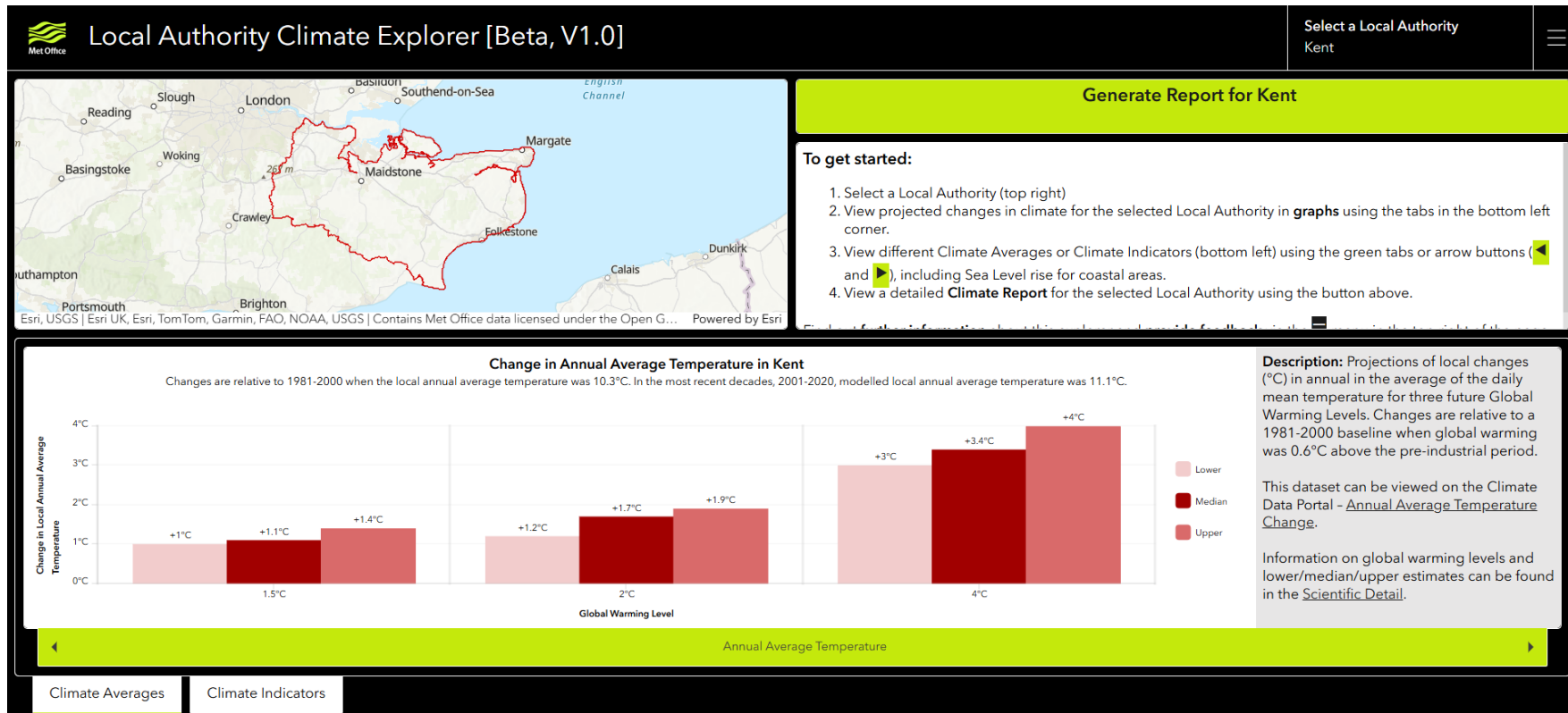
[FAQ and Version History](#)

Local Authority Climate Service (●LACS)

The landing page for the LACS



Local Authority Climate Explorer



Local Authority Climate Service (●LACS)

Please wait a minute for the data on pages 5-6 to load.
This banner will remain in place. Thank you for your patience.

Met Office
Department for Environment
Food & Rural Affairs

Climate Report for Kent


Generated on: 29/01/2025

Page 1

Met Office Climate Report for Kent

Local climate changes

The table shows projected changes in climate for the Local Authority area for a number of Global Warming Levels (GWLs). In each case there is a central projection (the Median) and an uncertainty range (the Lower and Upper values are the 10th and 90th percentiles). Changes are relative to 1981-2010. The underlying science is explained in the Scientific Detail (QR Code).



The map shows the Local Authority area. The overlaid grid shows the 12km grid boxes from the climate model used for these projections.

	0.6°C GWL Baseline 1981-2010	1.0°C GWL Recent Past 2001-2020	1.5°C GWL Paris Agreement	2°C GWL Guidance: Prepare	4°C GWL Guidance: Assess risks
TEMPERATURE	°C	°C	°C change	°C change	°C change
Summer Maximum Temperature	29.2 26.0 to 36.4	31.2 28.0 to 35.7	+2.0 +1.9 to +2.7	+2.0 +1.9 to +2.6	+2.0 +1.9 to +2.7
Summer Average Temperature	16.3 16.0 to 16.3	17.5 17.2 to 17.9	+1.2 +1.3 to +1.0	+1.2 +1.0 to +1.6	+1.2 +1.3 to +1.0
Winter Average Temperature	4.7 4.7 to 4.7	5.4 5.0 to 5.7	+0.7 +0.7 to +1.0	+0.7 +0.6 to +1.7	+0.7 +0.7 to +1.0
Winter Minimum Temperature	-6.8 -7.0 to -6.6	-5.2 -6.0 to -4.2	+1.4 +1.0 to +1.7	+1.5 +1.0 to +1.2	+1.7 +1.0 to +1.2
Annual Average Temperature	10.3 10.0 to 10.3	11.1 10.8 to 11.3	+0.8 +1.0 to +1.6	+0.8 +1.0 to +1.2	+0.8 +1.0 to +1.2
PRECIPITATION	mm/day	mm/day	% change	% change	% change
Summer Precipitation Rate	1.56 1.06 to 1.07	1.55 1.26 to 1.76	-5 -16 to +12	-8 -26 to +10	-33 -46 to +10
Winter Precipitation Rate	2.03 2.00 to 2.06	2.09 1.96 to 2.05	+4 10 to +15	+6 7 to +17	+16 +10 to +27

Page 5

Met Office Climate Report for Kent

Local climate indicators

The table shows projected climate indicators for the Local Authority area for a number of Global Warming Levels. For each there are annual totals a central projection (the Median) and an uncertainty range (the Lower and Upper values are the 10th and 90th percentiles). See also the Scientific Detail (QR Code).



	0.6°C GWL Baseline 1981-2010	1.0°C GWL Recent Past 2001-2020	1.5°C GWL Paris Agreement	2°C GWL Guidance: Prepare	4°C GWL Guidance: Assess risks
Summer Days*	13 13 to 16	25 26 to 30	27 26 to 30	35 29 to 42	67 40 to 79
Daily maximum temperature > 25°C High daytime temperatures with health impacts for vulnerable people at risk of hospital admission or death. Transport disruption – e.g. track buckling on railways. Can also indicate periods of increased water demand.					
Hot Summer Days*	1 1 to 1	3 2 to 4	3 3 to 5	5 3 to 7	18 16 to 28
Daily maximum temperature > 30°C Increased heat related illnesses, hospital admissions or death. Further transport disruption – e.g. track buckling on railways, road melt. Overhead power lines become less efficient.					
Extreme Summer Days*	0 0 to 0	0 0 to 1	0 0 to 1	0 0 to 1	2 2 to 6
Daily maximum temperature > 35°C Increased heat related illnesses, hospital admissions or death affecting not just the vulnerable. Further transport disruption – e.g. track buckling on railways, road melt.					
Tropical Nights	0 0 to 0	0 0 to 1	0 0 to 1	1 0 to 1	6 0 to 7
Daily minimum temperature > 20°C Health impact due to high night-time temperatures with potential for heat stress. Vulnerable people at increased risk of hospital admission or death.					
Frost Days	42 42 to 42	31 26 to 36	27 26 to 30	24 19 to 30	8 6 to 16
Daily minimum temperature < 0°C Cold weather disruption due to higher than normal chance of ice and snow.					
Ice Days	2 2 to 2	1 1 to 2	1 0 to 1	1 0 to 2	0 0 to 0
Daily maximum temperature < 0°C More extreme than frost days, so more severe cold weather impacts.					
Growing Degree Days*	1,991 1,989 to 1,992	2,236 2,087 to 2,328	2,324 2,281 to 2,388	2,494 2,385 to 2,588	3,005 2,936 to 3,237
Daily mean temperature > 5.0°C Energy available for plants growth over a year. This is not a measure of season length.					
Heating Degree Days*	2,549 2,548 to 2,549	1,941 1,986 to 1,896	1,875 1,826 to 1,943	1,745 1,708 to 1,825	1,382 1,290 to 1,530
Daily mean temperature < 15.0°C Indicator of energy demand for heating.					
Cooling Degree Days*	27 26 to 27	50 40 to 62	55 48 to 73	72 59 to 88	165 140 to 215
Daily mean temperature > 22°C Indicator of energy demand for cooling.					

* Number days above the stated temperature thresholds can occur at any time of year.
* Degree Days are not a number of days, but the number of degrees the daily average temperature exceeds the threshold, each day, added up over a year.

Page 6

Any Questions?