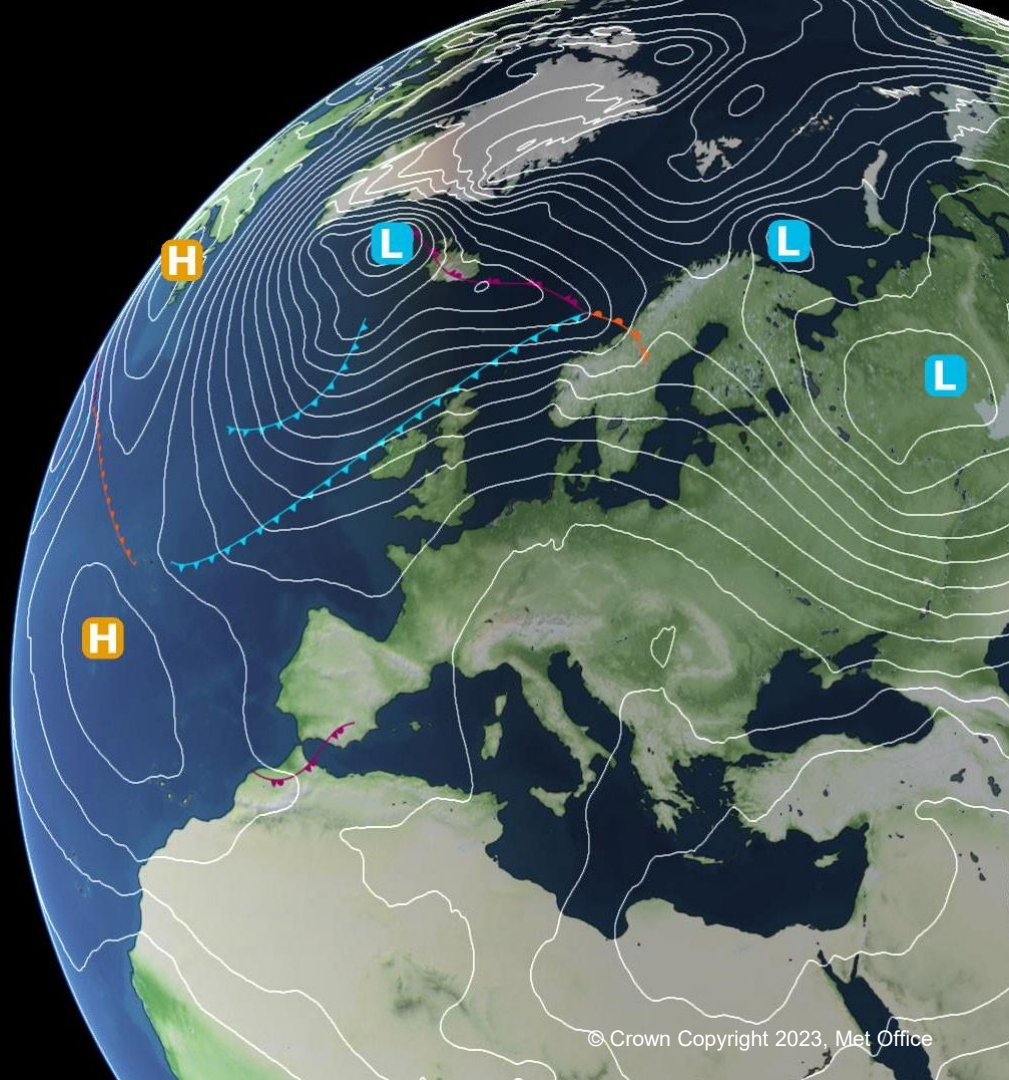
Tendring District Council

Local Community Resilience Workshop

September 2025



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Main Winter Risks

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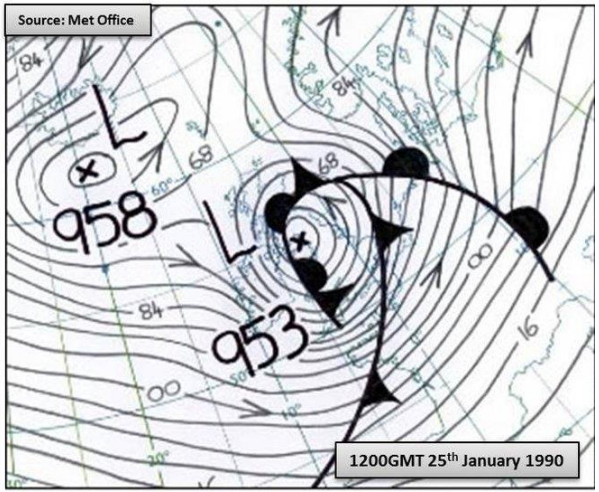
Storms



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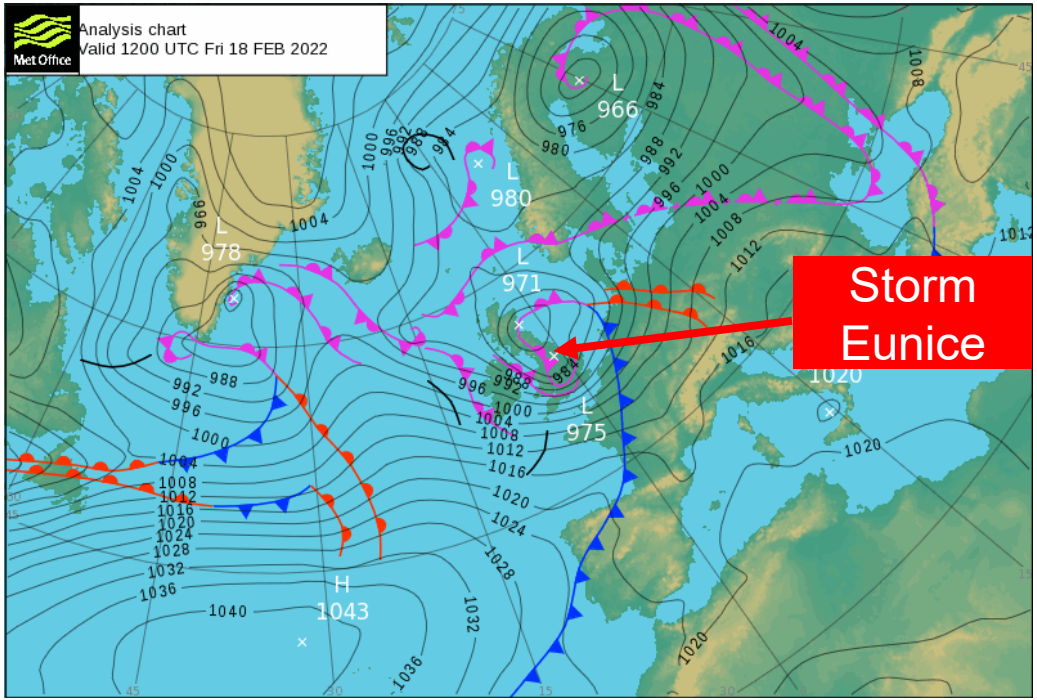
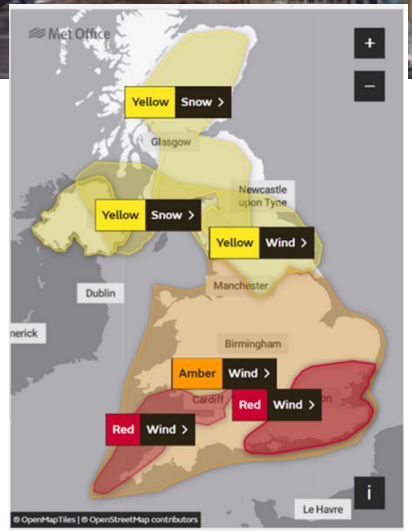
Storm Example

18th February 2022 – Storm Eunice





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Storm Naming

A joint project with Met Éireann (Irish Met Service) and KNMI (Dutch Met Services)

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Flooding

Coastal Flooding

Fluvial Flooding

Groundwater Flooding

Other types of flooding include: Surface water (Pluvial), sewerage and reservoir

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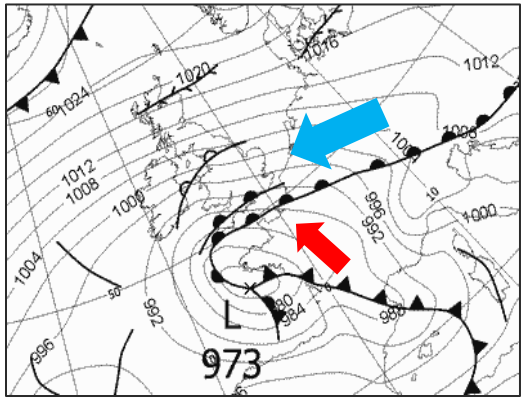
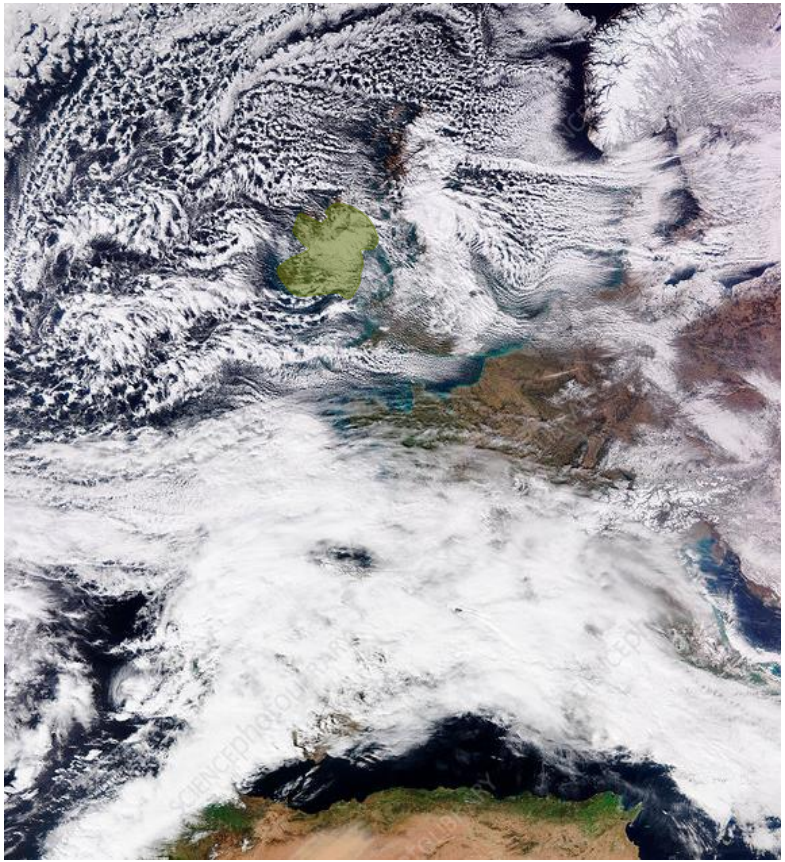
Snow



2nd March 2018 – Severe Late Winter Weather



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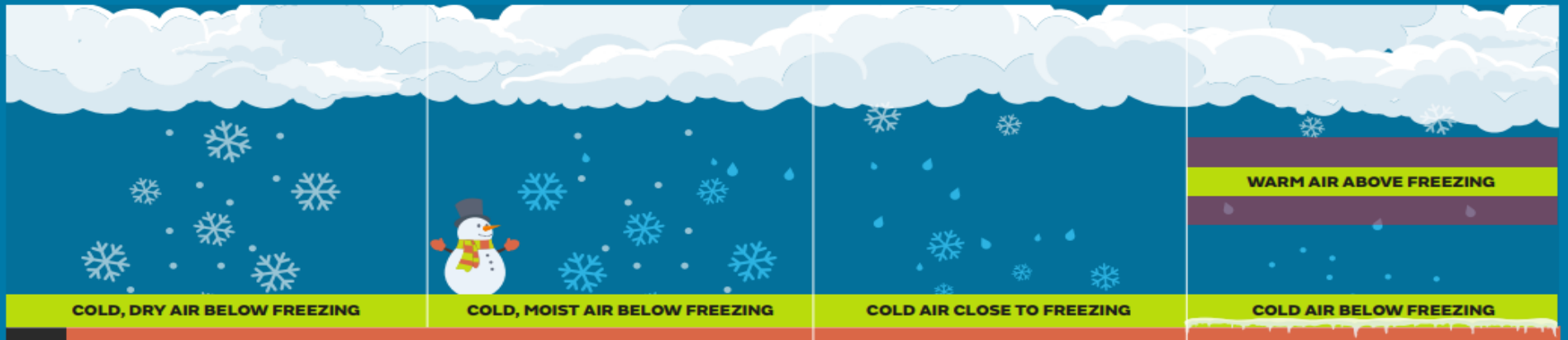
Met Office

What are the different impacts of snow, sleet and freezing rain?

Snow, sleet and freezing rain are all different types of winter precipitation.



	COLD, DRY AIR BELOW FREEZING	COLD, MOIST AIR BELOW FREEZING	COLD AIR CLOSE TO FREEZING	COLD AIR BELOW FREEZING
ABOUT	**SNOW** Ice crystals stick together in the cloud to form a snowflake. **DRY SNOW** Snowflakes fall through dry, cold air.	**WET SNOW** Snowflakes fall through moist, cold air.	**SLEET** Snow partially melts and falls as a mix of snowflakes and raindrops to the ground.	**FREEZING RAIN** Snow melts in the warm air, then as the droplets reach the cold air close to the ground they become 'supercooled'. On hitting the ground, the droplets turn to ice.
IMPACTS	• Less common than wet snow in UK. • Snowflakes are small, powdery and won't stick together. • Can be blown by wind to form snow drifts. • Salt treatment less effective than wet snow as dry snow does not have much water content.	• Snowflakes are heavier than dry snow and stick together easily. • Compacts easily (e.g. under car tyres). • Turns quickly to ice if the temperature drops below freezing (e.g. overnight). • Responds well to salt treatment as wet snow has a high water content.	• Sleet accumulation on roads is minimal. • Can cool the surface temperature of roads and pavements, this can cause ice formation if the temperature of the surface falls below freezing.	• Less common in UK. • Most dangerous type of winter precipitation. • Freezing rain can form on top of a layer of salt that has already been put down on the ground.

Ice / Freezing Rain

Icy conditions caused by water in the air freezing onto cold surfaces or wet surfaces freezing.

Freezing rain is the most dangerous weather that leads to icy conditions.

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Fog

Caused when water vapour in the air cools low enough to droplets of water.

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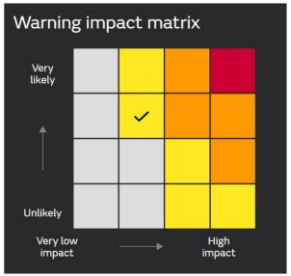
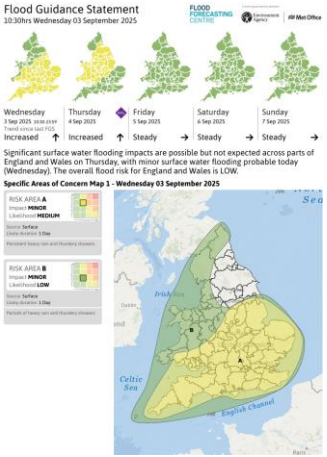
Met Office Warnings and Services

- Close working with UKHSA on Cold Health Alerts.
- Usual National Severe Weather Warnings for winter hazards:
  - Snow, Ice, Rain, Wind and Fog.
- Risk assessment and guidance for flooding in partnership with the Environment Agency, through the Flood Forecasting Centre.
- Regional Civil Contingencies Advisors.
- Hazard Manager web platform.
- Three Month Outlooks.
- Weather Ready – Seasonal Preparedness.





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Met Office Warnings and Services

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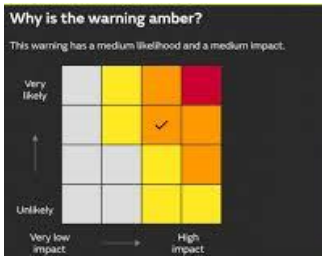

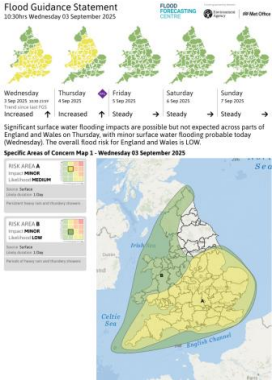

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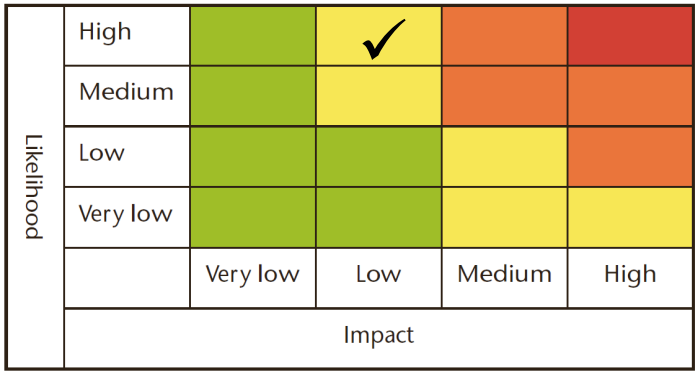
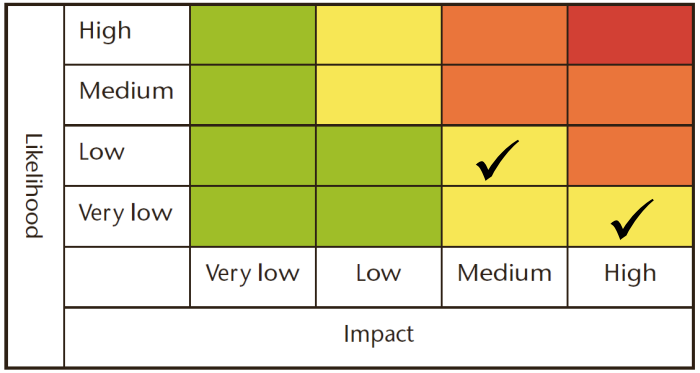
Locate the tick!

It is very important that you look to see where the tick is on the matrix.
Yellows are not all the same!



Low impacts – no major issues?



High impacts – risk to life?

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Impact Tables

There are impact tables for all Severe Weather and each of the eight weather elements warned for.

	Very Low	Low	Medium	High
Impact and advice applying to ALL SEVERE WEATHER	On the whole, day to day activities not affected but some localised, small scale impacts occur A few transport routes affected.	Some short lived disruption to day to day routines in affected areas Incidents dealt with under‘ business as usual' response by emergency services Some transport routes and travel services affected. Some journeys require longer travel times. .	Injuries with danger to life Disruption to day to day routines and activities. Short-term strain on emergency responder organisations. Transport routes and travel services affected. Longer journey times expected. Some vehicles and passengers stranded. Disruption to some utilities and services. Damage to buildings and property.	Danger to life Prolonged disruption to day to day routines and activities Prolonged strain on emergency responders organisations. Transport routes and travel services affected for a prolonged period. Long travel delays. Vehicles and passengers stranded for long periods. Disruption to utilities and services for a prolonged period. Extensive damage to buildings and property.

What are the National Severe Weather Warning Service Impact tables? - Met Office

Official

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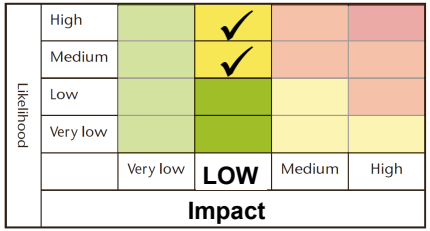
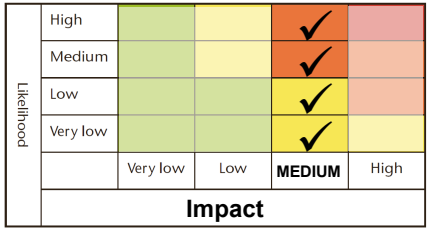
Understanding Weather Warnings



Some short lived disruption to day to day routines

‘Business as usual' response by emergency services

Some transport routes and travel services affected. Some journeys require longer travel times.

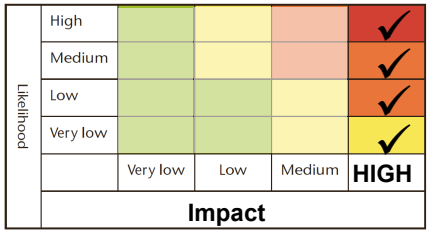


Injuries with danger to life and damage to buildings and property.

Disruption to day to day routines, activities and some utilities / services

Short-term strain on emergency responder organisations.

Transport routes and travel services affected. Longer journey times expected. Some vehicles and passengers stranded.



Danger to life and extensive damage to buildings and property.

Prolonged disruption to day to day routines, activities and utilities / services

Prolonged strain on emergency responders organisations.

Transport routes and travel services affected for a prolonged period. Long travel delays. Vehicles and passengers stranded for long periods.

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Common Warnings Framework

CWF Purpose Statement

The organisations agree to:

Engage with 'One Voice' and work together to develop an 'Authoritative Voice'.

Collaborate on the future development of shared warning methodology and that it will have shared ownership.

Make it easier to share our messages for others to re-use and enhance our 'Authoritative Voice'.

Have a shared primary focus on ultimately saving lives.

Department for Infrastructure
An Roinn Bonneagair
Department for Infrastructure

Environment Agency

FLOOD FORECASTING CENTRE
Environment Agency | Met Office

Met Office

Cyfoeth Naturiol Cymru
Natural Resources Wales

sepa
Scottish Environment Protection Agency
Buidheann Dìon Àrainneachd na h-Alba

Importance of a common warning framework (Why)

UK warning providers must deliver clear, consistent messages upon which responders and the public can act

Current differences in risk assessment matrices among providers complicate consensus on warning strategies and user communication

Essential to consider how UK warnings work within international alerting protocols, which enhance the reach and usability of warning data through redistributors

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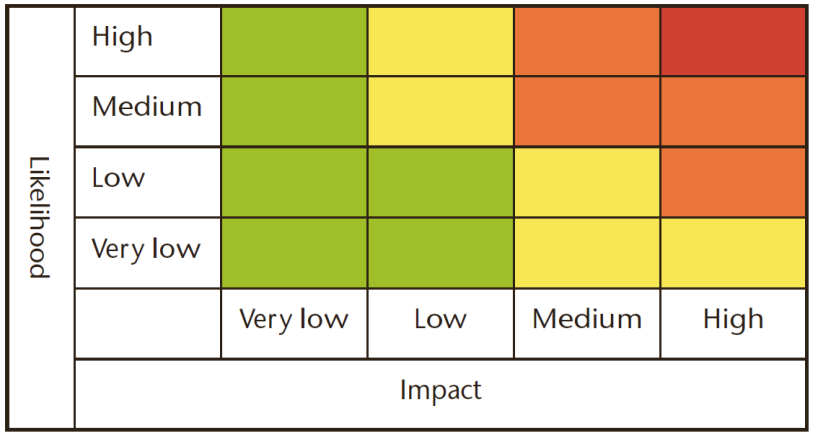
Common Warning Framework

Current Matrix



Updated Matrix

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Our changing climate

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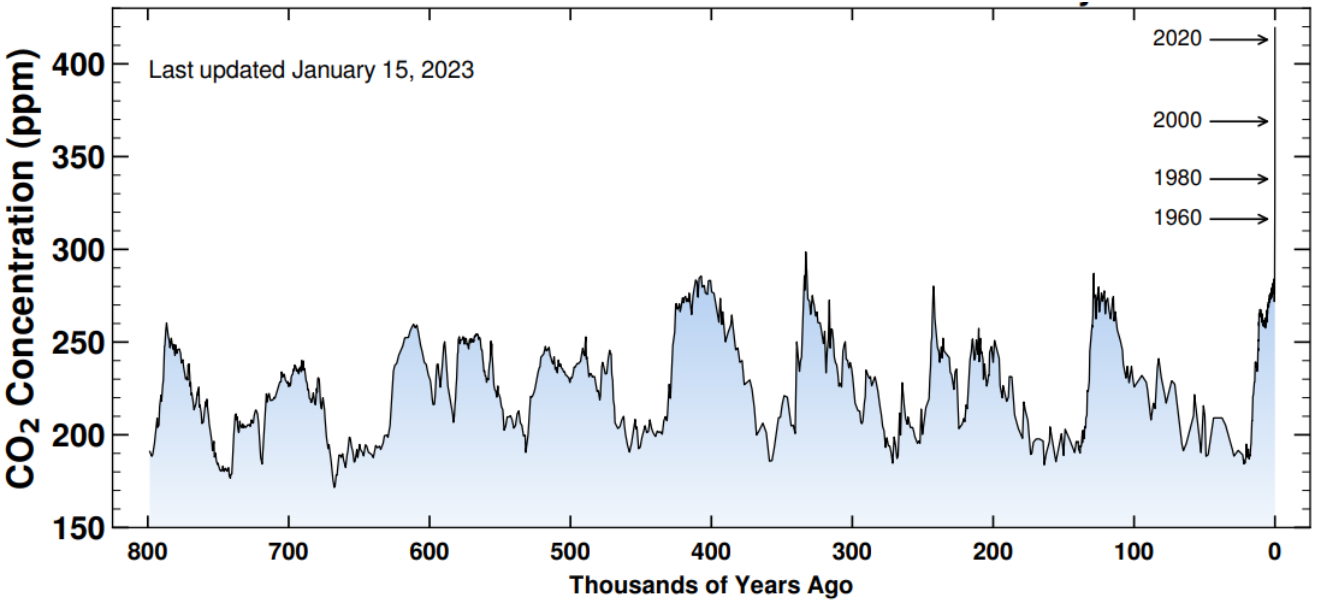
Current levels of atmospheric CO_2 are unprecedented in 800,000 years or more



Charles David Keeling, 1928 – 2005

https://scripps.ucsd.edu/programs/keelingcurve/

Since the Industrial Revolution in the 18th Century, the globally averaged concentration of CO_2 in the atmosphere has risen by around 50%, to over 415 parts per million (ppm).

Records of Earth's climate, preserved in air bubbles trapped in Antarctic ice, show that the current level of CO_2 is unprecedented in at least 800,000 years.

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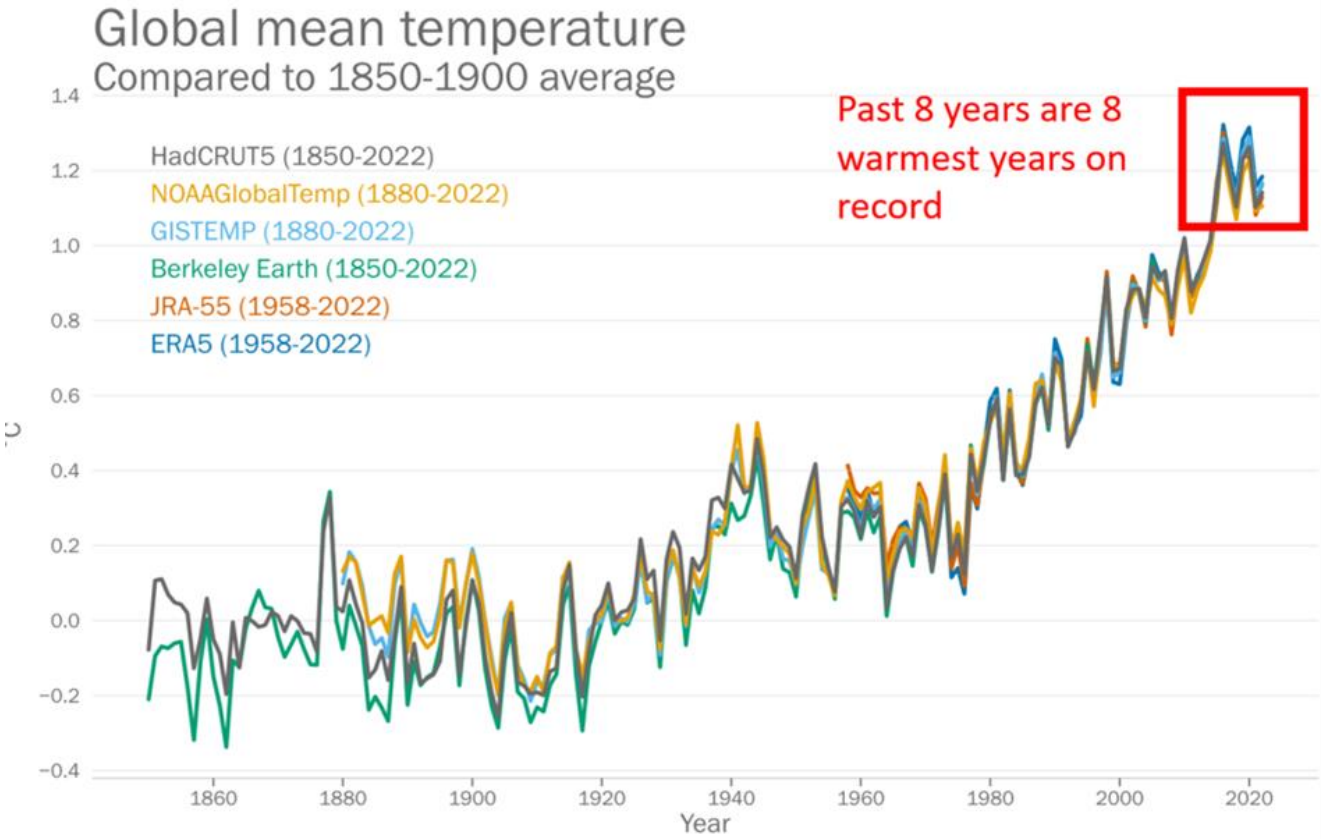
Global average surface temperature change



Global temperature has risen by 1.15ºC since the pre-industrial era

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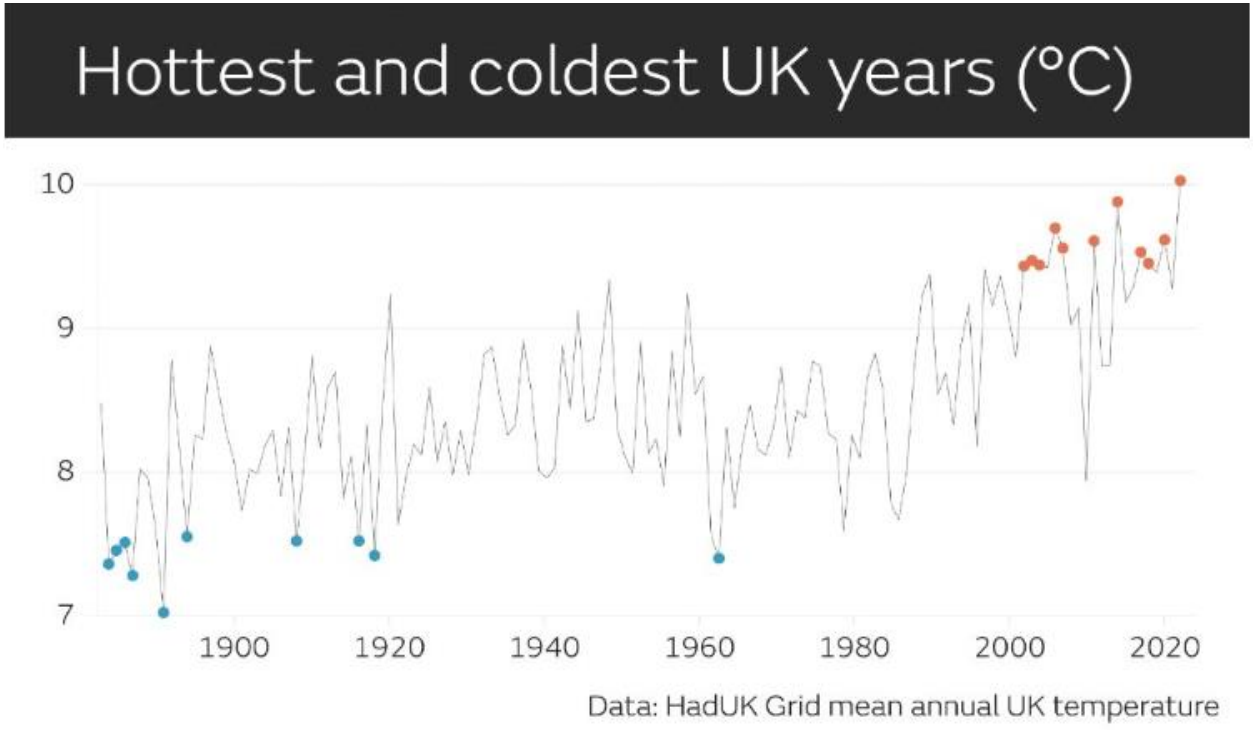
What is the difference between climate variability and change?



10 HOTTEST UK YEARS			
1	2022 - 10.03 °C	6	2007 - 9.56 °C
2	2014 - 9.88 °C	7	2017 - 9.53 °C
3	2006 - 9.70 °C	8	2003 - 9.47 °C
4	2020 - 9.62 °C	9	2018 - 9.45 °C
5	2011 - 9.61 °C	10	2002/4 - 9.44 °C

10 COLDEST UK YEARS			
1	1892 - 7.02 °C	6	1886 - 7.45 °C
2	1888 - 7.28 °C	7	1887 - 7.51 °C
3	1885 - 7.36 °C	8	1917 - 7.52 °C
4	1963 - 7.40 °C	9	1909 - 7.52 °C
5	1919 - 7.42 °C	10	1895 - 7.55 °C

Timeseries of UK annual average temperature from 1884 to 2022 with the hottest and coldest years in the series highlighted. Credit: Met Office.

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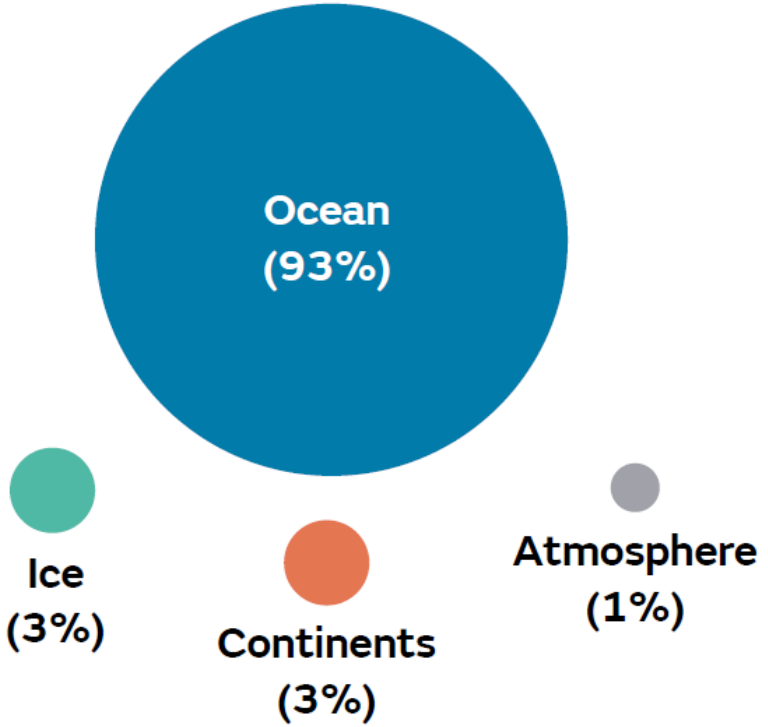
Where is the additional heat in the climate system going?

Research has found that since the 1970s more than 90% of the excess energy stored in the climate system has been absorbed by the oceans.



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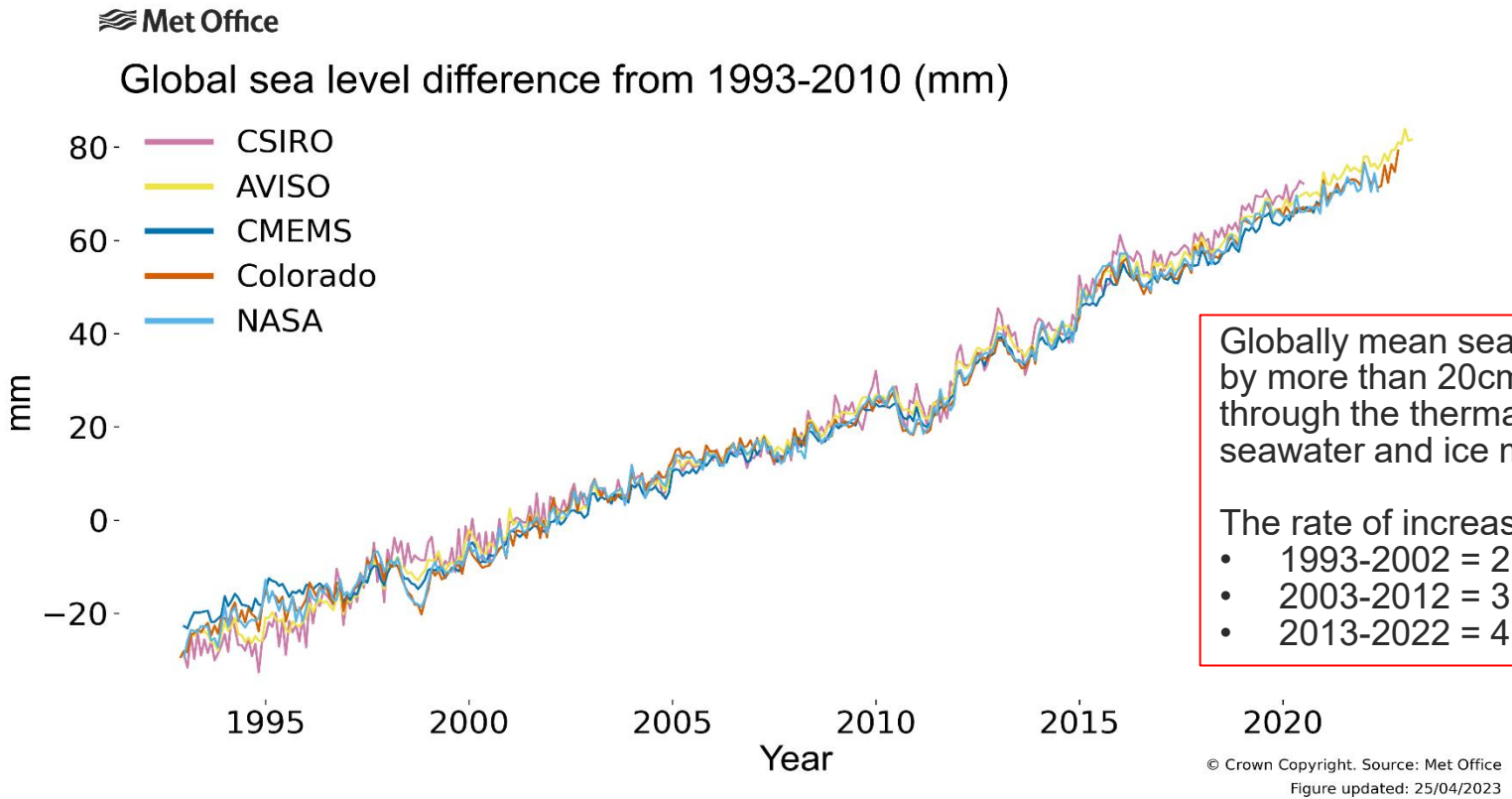
Sea level has risen and continues to rise…



Globally mean sea level has risen by more than 20cm since 1901 through the thermal expansion of seawater and ice melt on land.

The rate of increase is rising:

- 1993-2002 = 2.27 mm/year
- 2003-2012 = 3.30 mm/year
- 2013-2022 = 4.62 mm/year

https://www.metoffice.gov.uk/hadobs/monitoring/dashboard.html

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Climate change is already impacting on extreme weather across the planet

Siberian heatwave

- Widespread, prolonged event over the first 6 months of 2020 resulting in **wildfires** and **loss of permafrost**
- Event was **600 times more likely** due to climate change

European flooding

- July 2021 **heavy rainfall event** resulted in extreme impacts, and led to over **200 deaths**
- Event was **1.2 to 9 times more likely** and **rainfall intensity 3-19% higher** due to climate change

North America heatwave

- Record breaking temperatures in June 2021, **49.6°C recorded in Canada**
- **Almost impossible** to hit such record-breaking temperatures in the Western United States **without human-caused climate change**

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Current state of the UK climate

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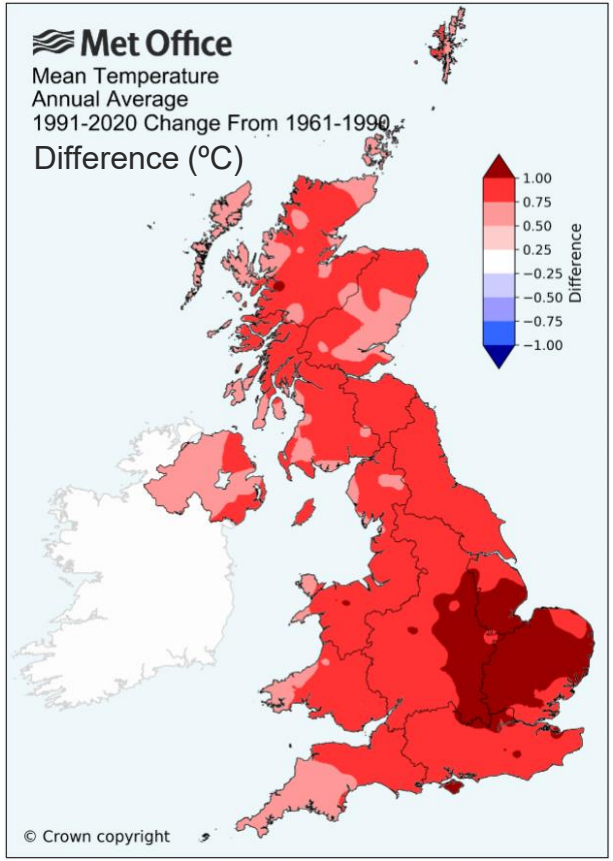
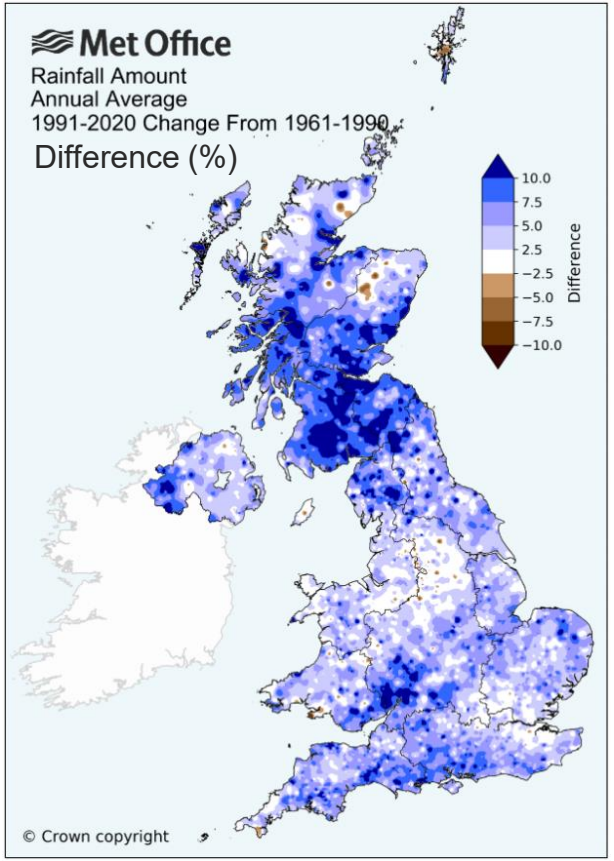
UK Climate Changes



1991-2020 change from 1961-1990



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Essex Long-term Average Changes

30-year average	1961-1990	1991-2020
Mean temperature:	9.7 Celsius	10.7 Celsius
Annual rainfall:	572mm	595mm

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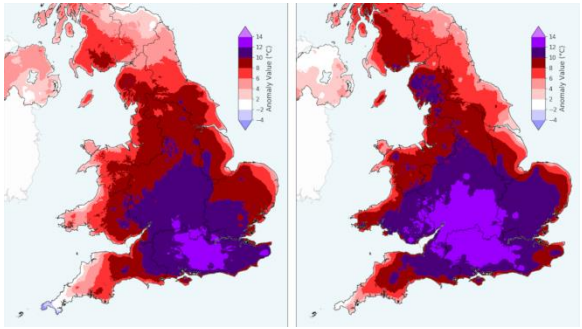
Met Office

Extreme events are also 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 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

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Changes in likelihood of UK Extreme Events due to man-made Greenhouse gases – extreme heat

Chances of seeing 40°C in the UK

Natural climate

1 in 100 - 1000 years

Present

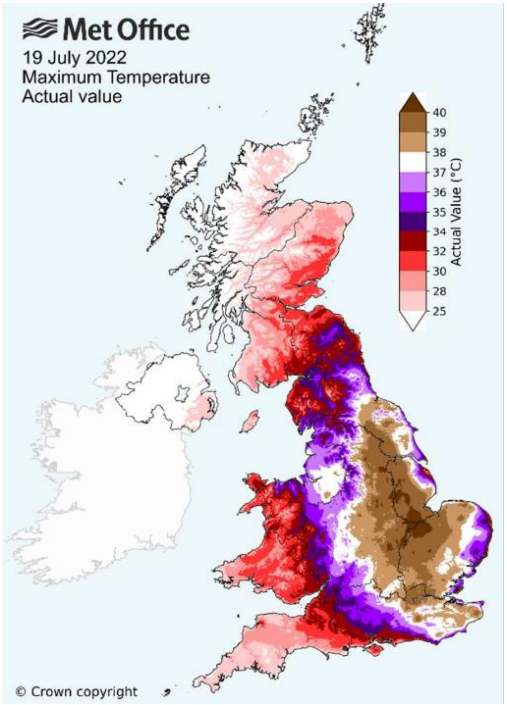
1 in 100 - 300 years

By 2100

1 in 15 years (medium emissions scenario)

1 in 3.5 years (high emissions scenario)

Wildfires destroys building in Ashill in the July 2022 heatwave



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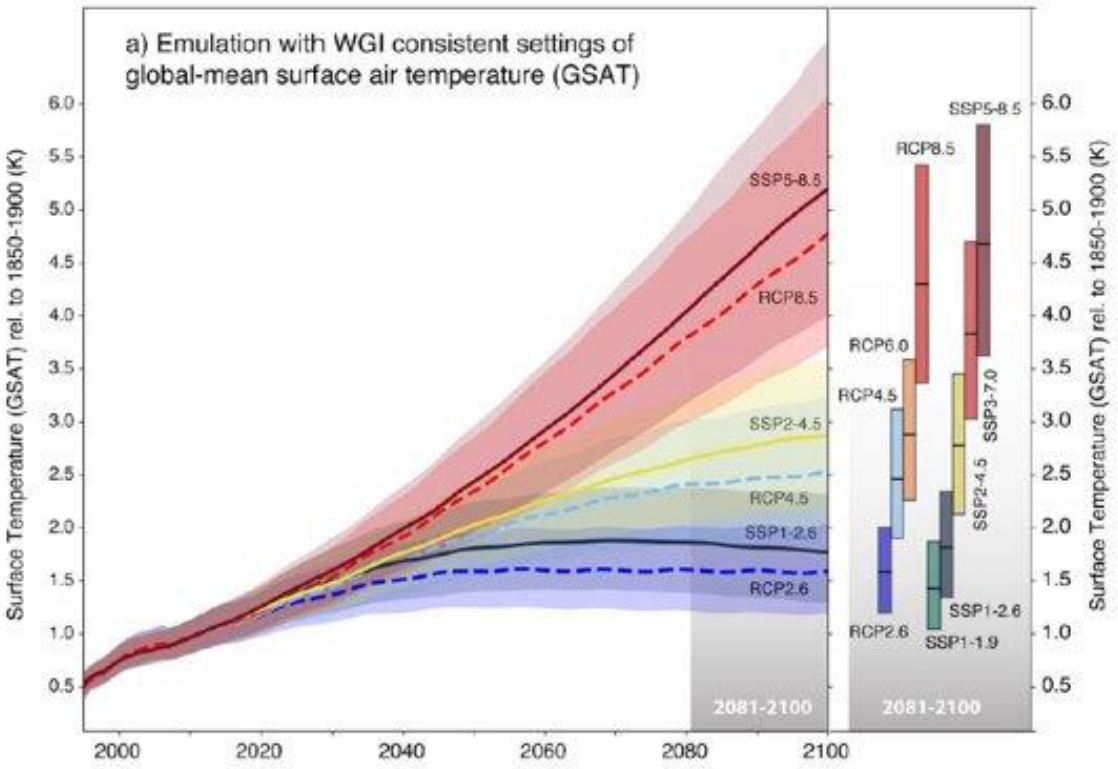
Emission scenarios

Intergovernmental
Panel on **C**limate
Change

Representative Concentration Pathways (RCP) & Shared Socioeconomic Pathways (SSPs)



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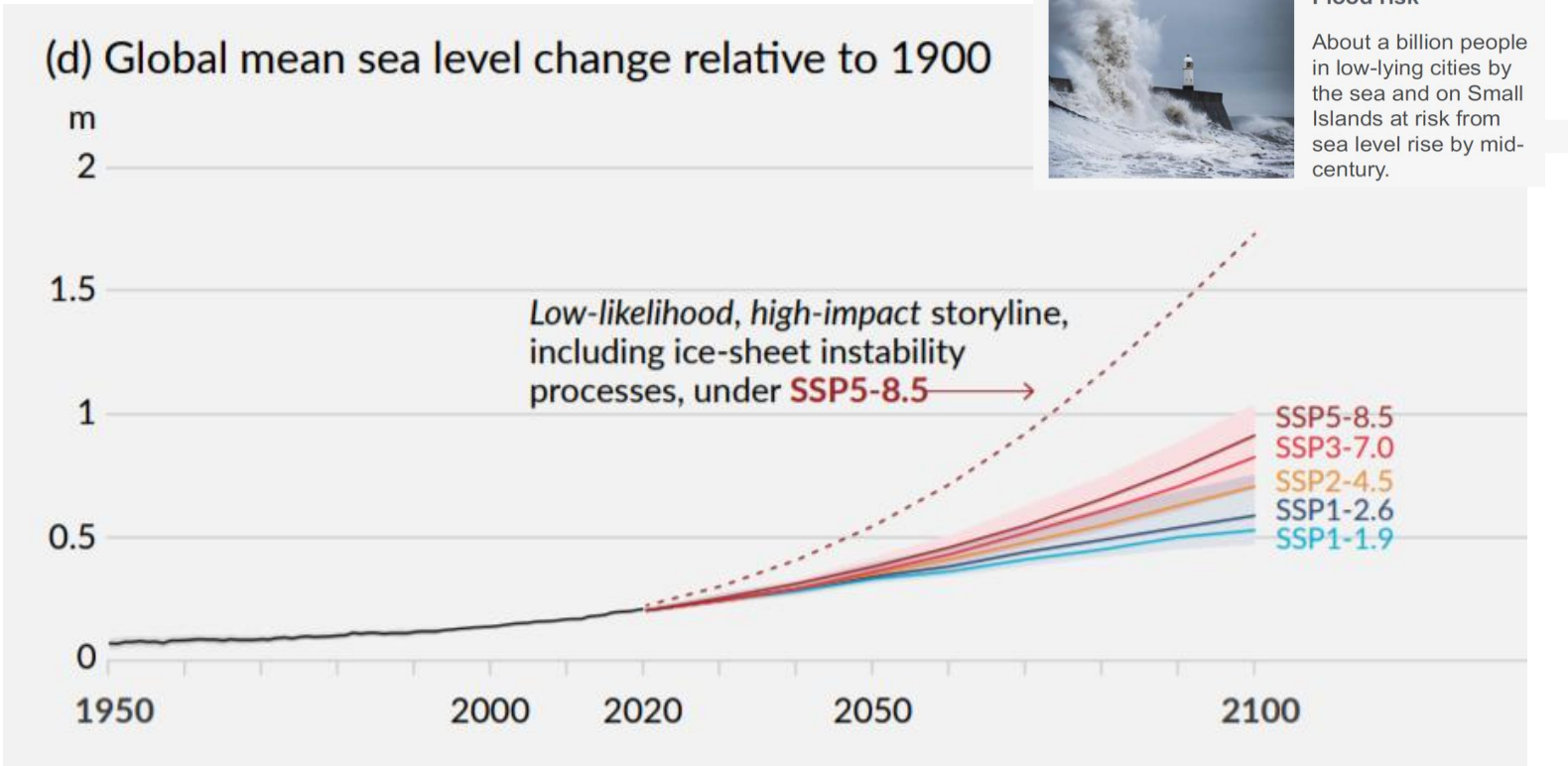
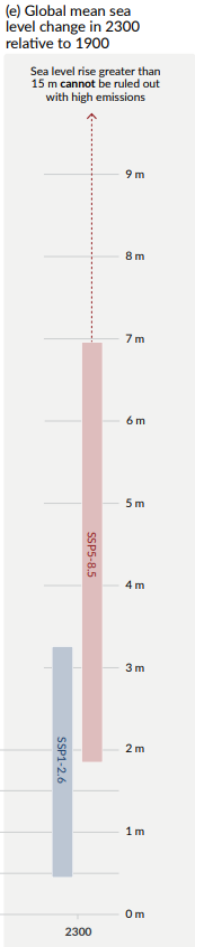
Future sea level



Flood risk

About a billion people in low-lying cities by the sea and on Small Islands at risk from sea level rise by mid-century.



From IPCC AR6 WG1

Climate Change 2021: The Physical Science Basis

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Global climate change risks

	Heat stress risk (No. of people exposed to extreme heat)	**River flooding** (No. of people affected)	**Drought** (% time cropland experiencing drought)	**Wildfires** (% land area exposed to ‘very high’ fire risk)	**Biodiversity range loss**
Present day	**68 million**	**54 million**	**7%**		
2°C warming	**1 billion**	**97 million**	**16%**	**36%**	**19%**
4°C warming	**3.5 billion**	**211 million**	**30%**	**50%**	**46%**
Impacts at 4°C vs 2°C	***3.5x worse***	***~1.2x worse***	***~0.9x worse***	***~0.4x worse***	***~1.4x worse***

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What will the UK face in the future?

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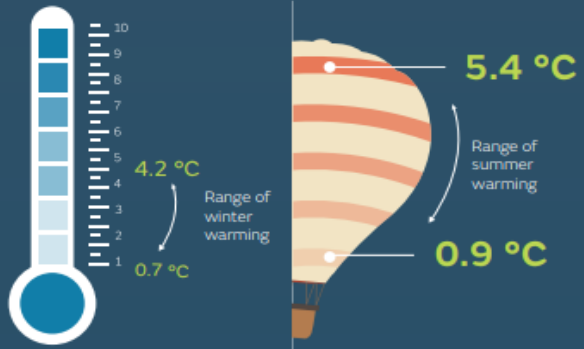
FUTURE TEMPERATURE CHANGE

PROBABILISTIC PROJECTIONS

RISING SEASONAL TEMPERATURES*

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

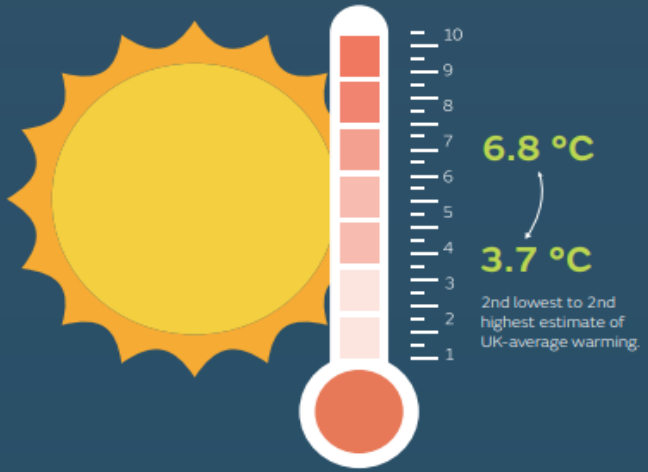


WINTER SUMMER

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.

Department for Environment Food & Rural Affairs

Department for Business, Energy & Industrial Strategy

Met Office Hadley Centre

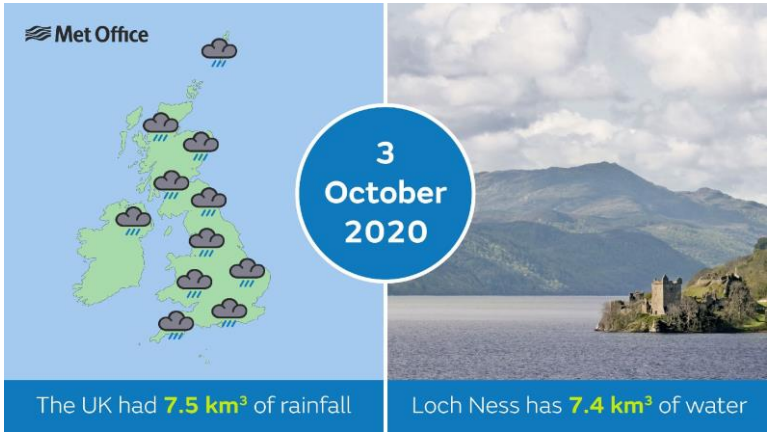
Environment Agency

Working together on

UK Climate Projections

Extreme UK rainfall becomes more likely and intense with human-induced climate change.

The wettest day on record:



Currently, such an event would happen every 100 years and this may decrease to every 30 years by the end of the century.

Natural climate	**2020** has become…	**2100** and could become…
	2.5x more likely	10x more likely.

Christidis *et al.*, (2021).

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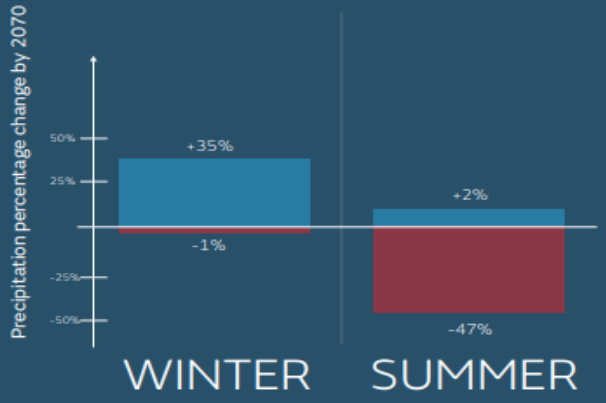
FUTURE PRECIPITATION CHANGE

PROBABILISTIC PROJECTIONS

WETTER WINTERS, DRIER SUMMERS*

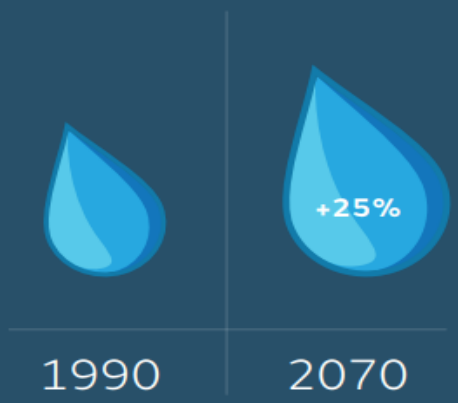
UKCP Probabilistic (25km) projections show that by 2070, under a high emission scenario, average winter precipitation is projected to increase, whilst average summer rainfall is projected to decrease.



UKCP LOCAL (2.2KM)

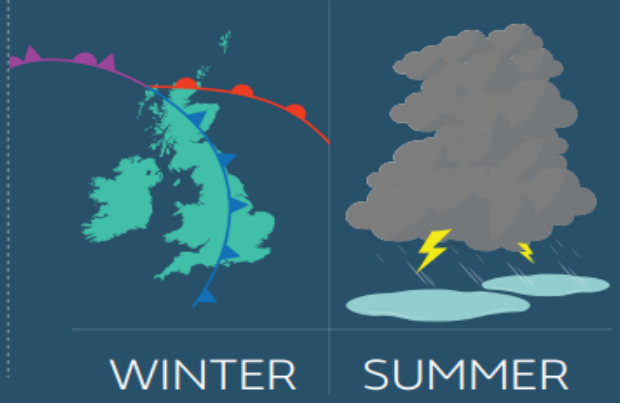
FUTURE INCREASES IN EXTREME HOURLY RAINFALL INTENSITY

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.



Department for Environment Food & Rural Affairs

Department for Business, Energy & Industrial Strategy

Met Office Hadley Centre

Environment Agency

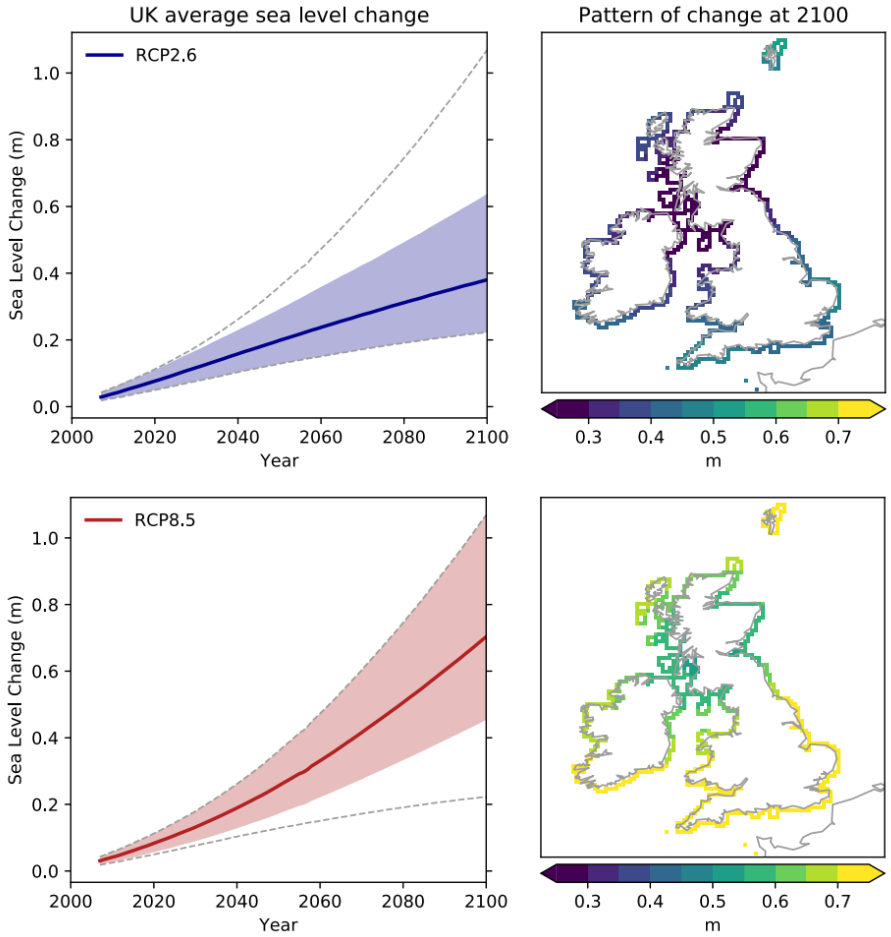
Working together on

UK Climate Projections

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

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UK climate change risks

	Heat related deaths (per year)	**Flooding** (annual damages)	**Water availability** (low river flows)	**Wildfires** (% days with 'very high' fire risk)
Present day	**2,000**	**£2 billion**		**9%**
2°C warming	**7,000**	**£2.7 - £3 billion**	**20% decrease**	**26%**
4°C warming	**13,000**	**£3.5 - £3.9 billion**	**50% decrease**	**50%**
Impacts at 4°C vs 2°C	***~86% worse***	***~30% worse***	***30% worse***	***~92% worse***

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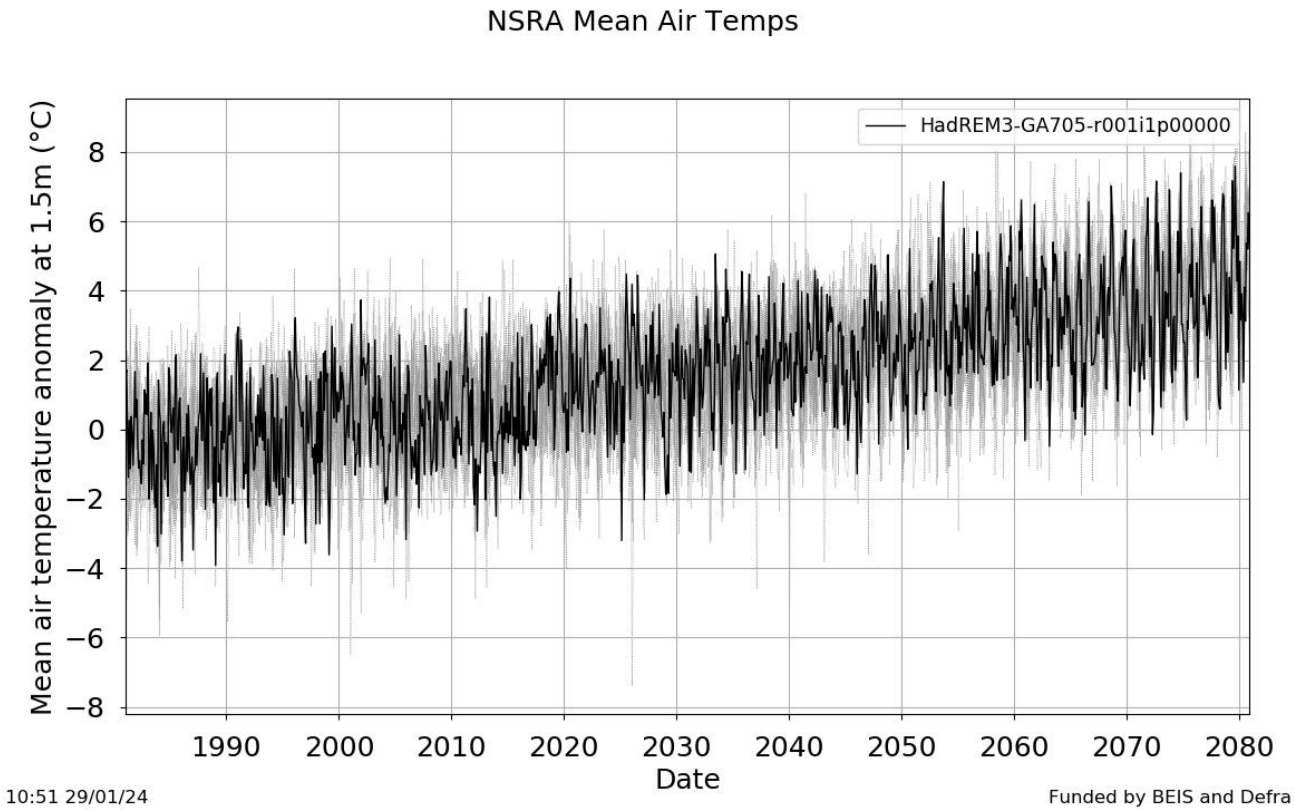
Essex annual mean temperature increase



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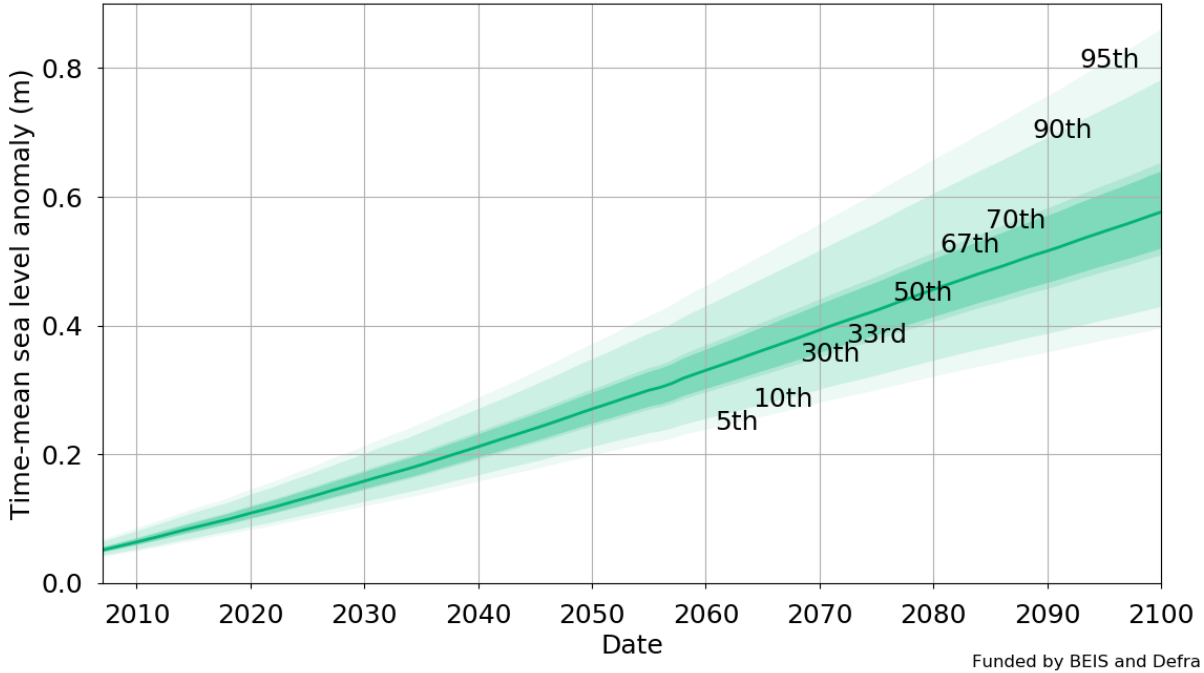
Essex coast and sea level rise

Met Office Hadley Centre

Time-mean sea level anomaly (m) for years 2007 up to and including 2100, for grid square 52.83°, 1.58°, using baseline 1981-2000, and scenario RCP 4.5, showing the 5th, 10th, 30th, 33rd, 50th, 67th, 70th, 90th and 95th percentiles



Funded by BEIS and Defra

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Where to access Climate projections

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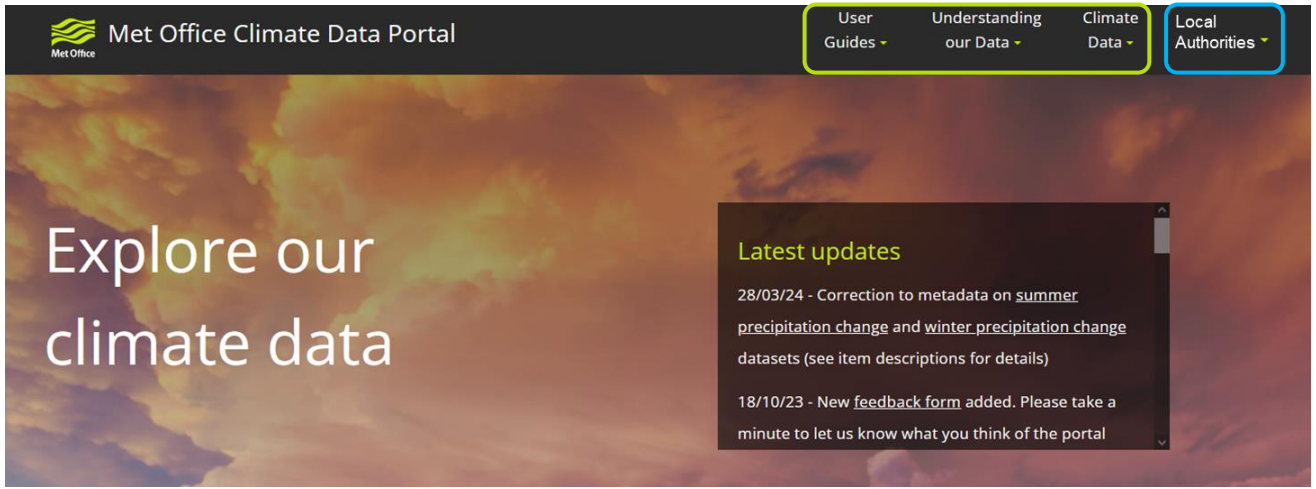
Climate Data Portal (●CDP)
Local Authority Climate Service (●LACS)

●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.

climatedataportal.metoffice.gov.uk

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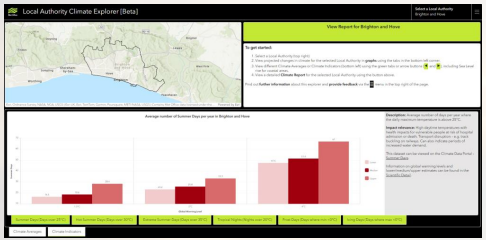
Local Authority Climate Service

Local Authority Community Site

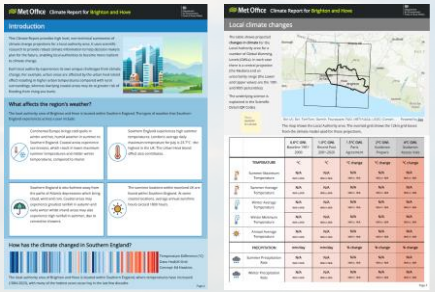
Helpful resources and further support for adaptation planning

Local Authority Climate Explorer



Ready-to-use climate information for your local area

Local Authority Climate Report



Summary of key results

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Climate Explorer

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Climate Explorer

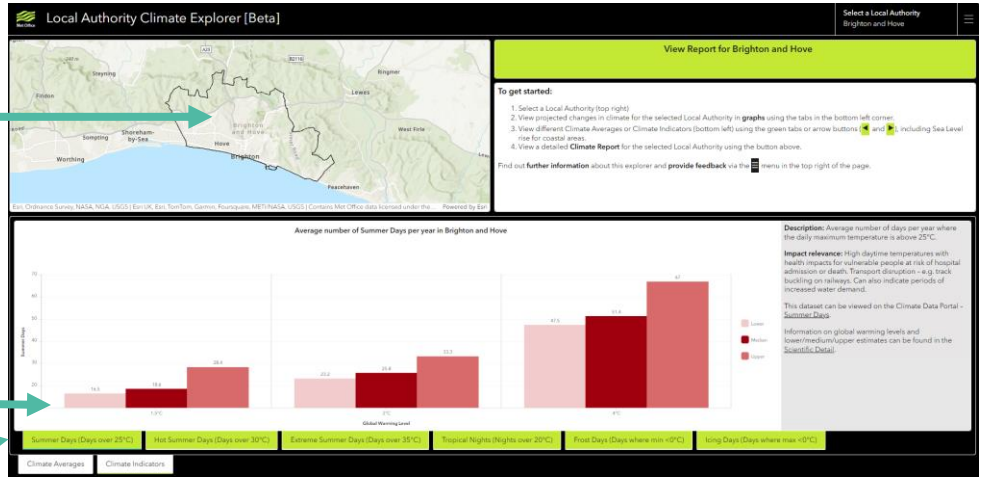
- Key climate variables calculated over your Local Authority area:
  - **Climate Averages:** e.g. summer average temperatures, winter rainfall, sea level rise.
  - **Impact relevant indicators:** e.g. Summer Days (Days over 25°C).

- Information presented for a range of global warming levels consistent with adaptation guidance.

- View data as a graph.

- Based on UKCP Regional (12km resolution) data.

*Local authority level information will be available at launch. Sub-local authority level information will be provided in future iterations.



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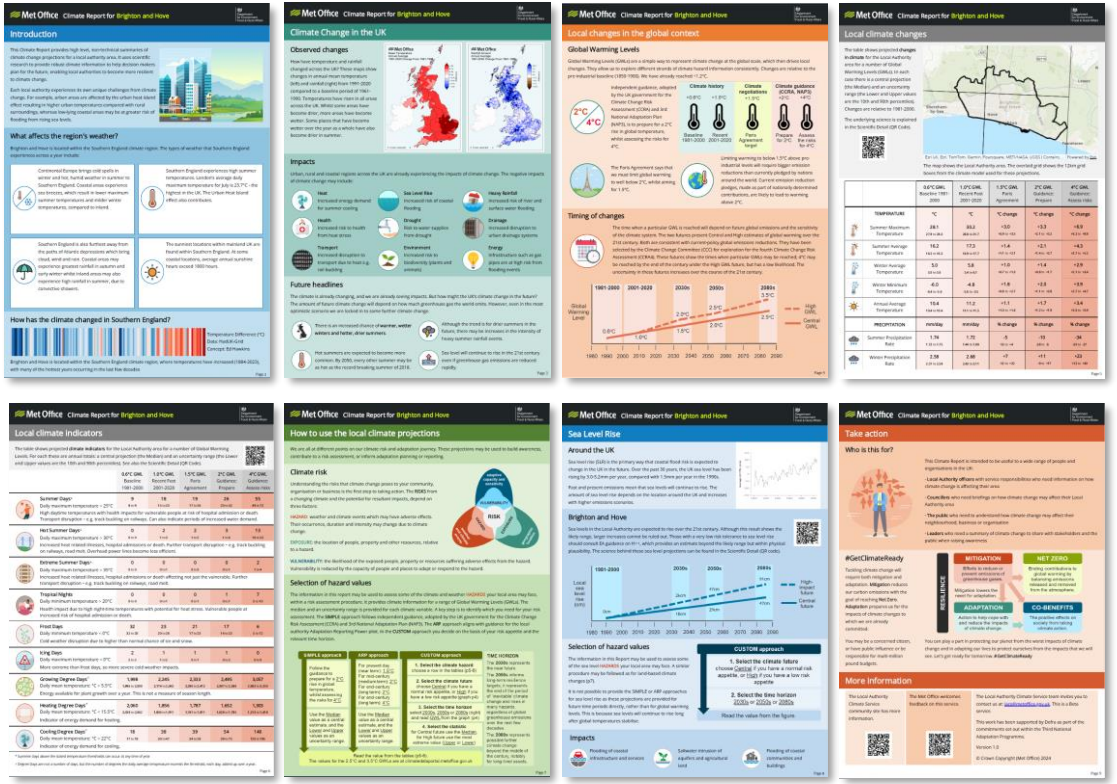
Local Authority Climate Report

- Summarises data for the Local Authority area in a PDF printable, shareable and easy to understand format.
- Summarises change and impact indicators in tables.
- Sea level rise page for coastal LA's



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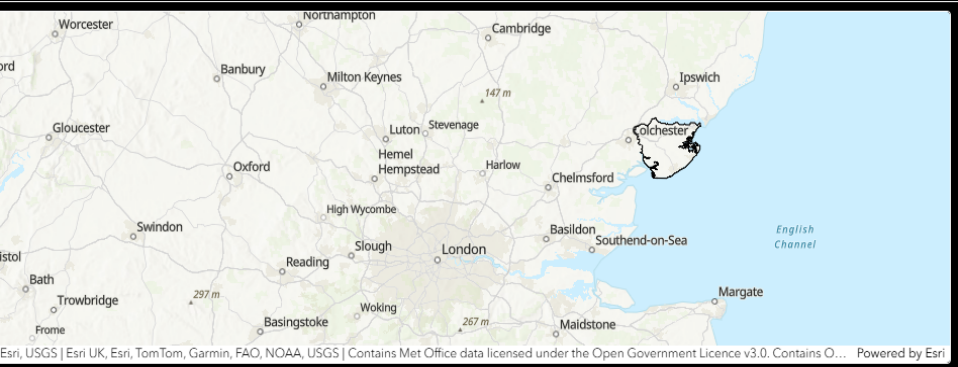
Climate Explorer - Tendring

Local Authority Climate Explorer [Beta, V1.0]

Select a Local Authority
Tendring



Generate Report for Tendring

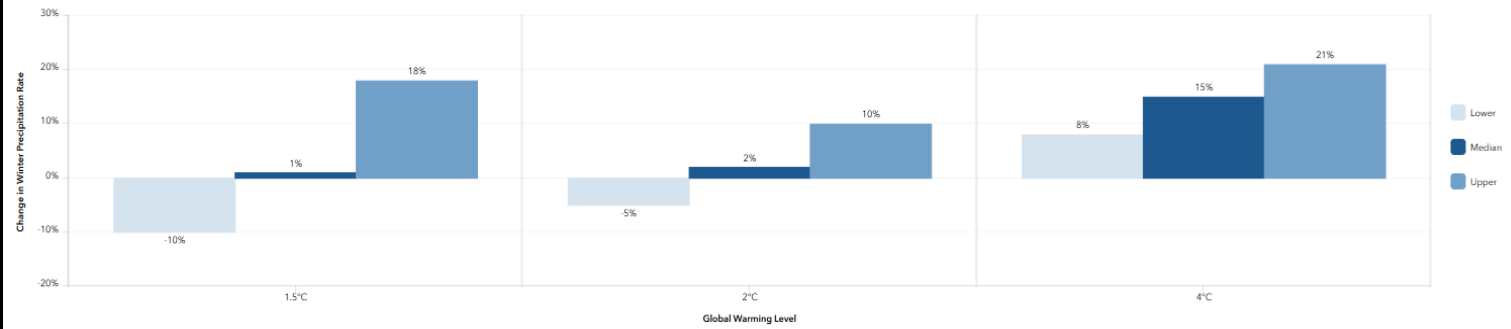
To get started:

1. Select a Local Authority (top right)
2. View projected changes in climate for the selected Local Authority in **graphs** using the tabs in the bottom left corner.
3. View different Climate Averages or Climate Indicators (bottom left) using the green tabs or arrow buttons (◀ and ▶), including Sea Level rise for coastal areas.
4. View a detailed **Climate Report** for the selected Local Authority using the button above.

Find out **further information** about this explorer and **provide feedback** via the ☰ menu in the top right of the page.

Change in Winter Precipitation Rate in Tendring

Changes are relative to 1981-2000 when the local winter precipitation rate was 1.46mm/day. In the most recent decades, 2001-2020, modelled local winter precipitation rate was 1.48mm/day.



Description: Projections of local changes (% change) in winter in the precipitation rate for three future Global Warming Levels. Changes are relative to a 1981-2000 baseline when global warming was 0.6°C above the pre-industrial period. winter: December, January, February.

This dataset can be viewed on the Climate Data Portal - Winter Precipitation Rate Change.

Information on global warming levels and lower/median/upper estimates can be found in the Scientific Detail.

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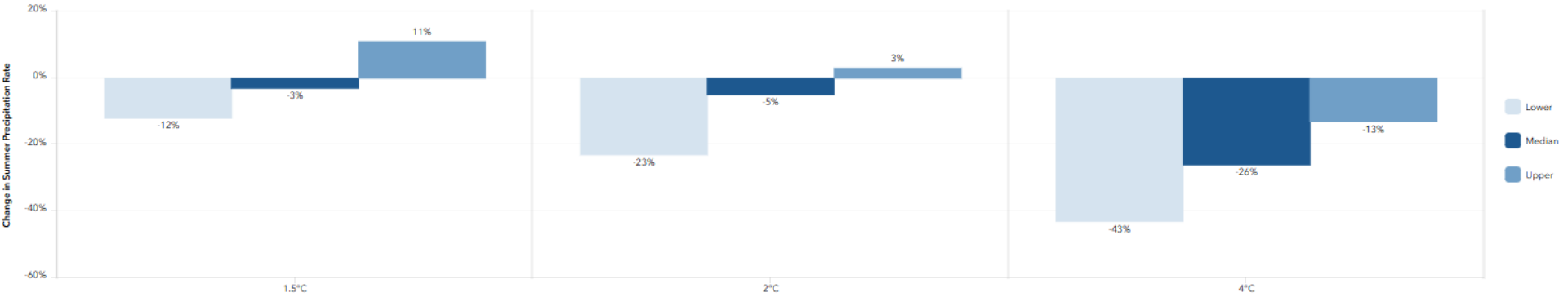
Climate Explorer - Tendring

Change in Summer Precipitation Rate in Tendring

Changes are relative to 1981-2000 when the local summer precipitation rate was 1.48mm/day. In the most recent decades, 2001-2020, modelled local summer precipitation rate was 1.46mm/day.



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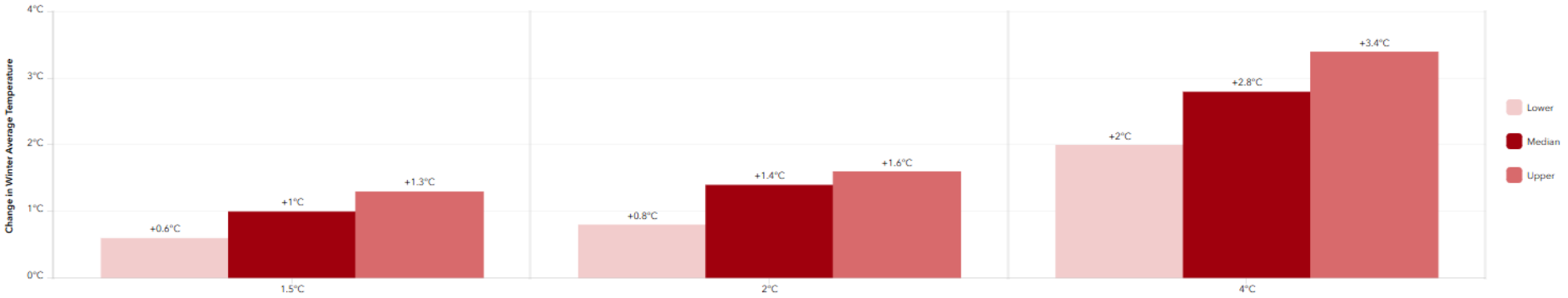
Climate Explorer - Tendring

Change in Winter Average Temperature in Tendring

Changes are relative to 1981-2000 when the local winter average temperature was 4.4°C. In the most recent decades, 2001-2020, modelled local winter average temperature was 5.2°C.



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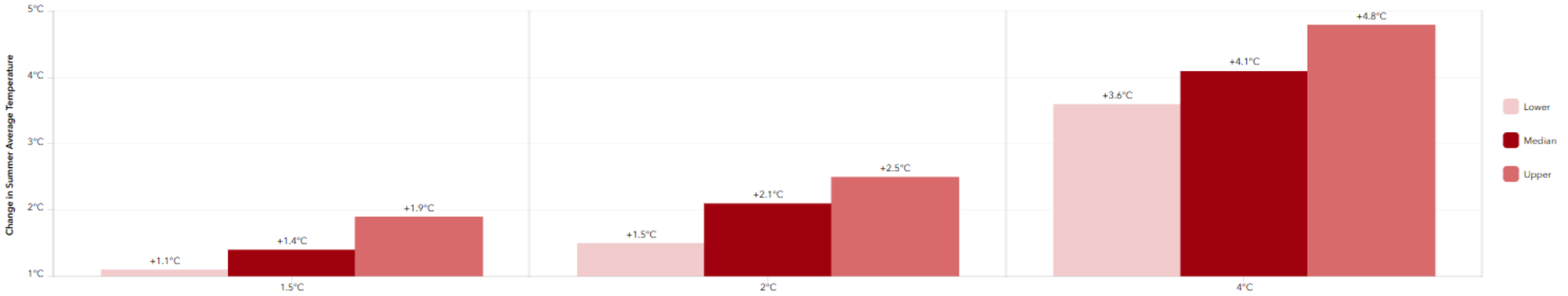
Climate Explorer - Essex

Change in Summer Average Temperature in Tendring

Changes are relative to 1981-2000 when the local summer average temperature was 16.5°C. In the most recent decades, 2001-2020, modelled local summer average temperature was 17.6°C.



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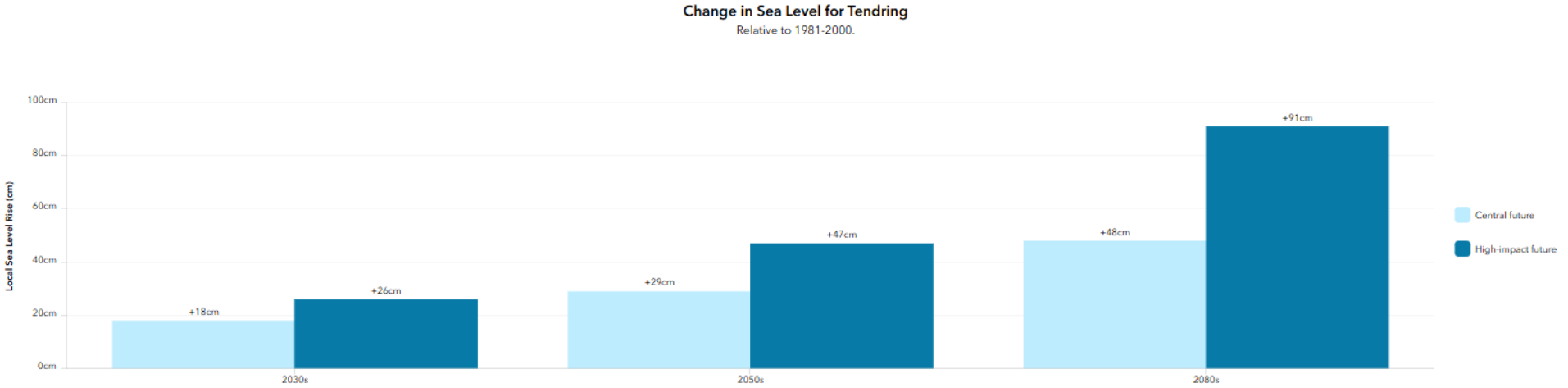
Climate Explorer - Tendring



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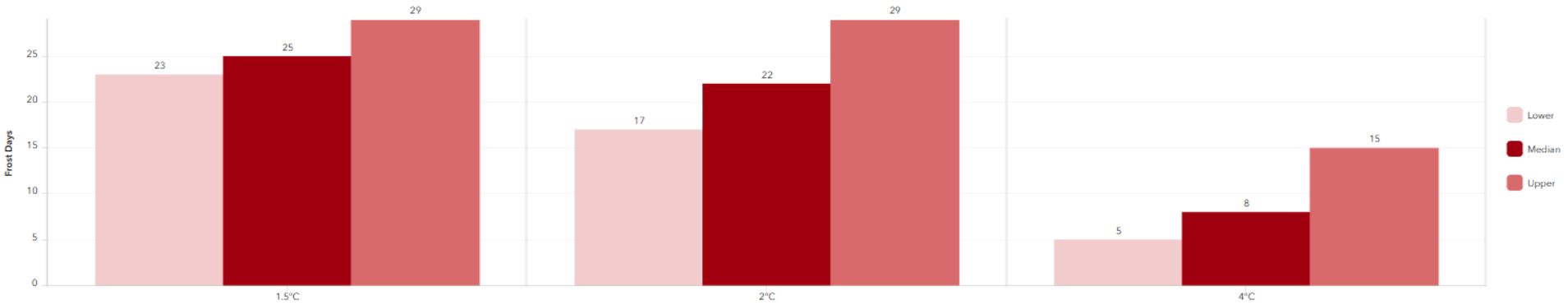
Climate Explorer - Tendring

Average number of Frost Days in Tendring

The average number of frost days per year modelled in 1981-2000 was 39. In the most recent decades, 2001-2020, the average number of frost days modelled per year was 28.



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Thank you…

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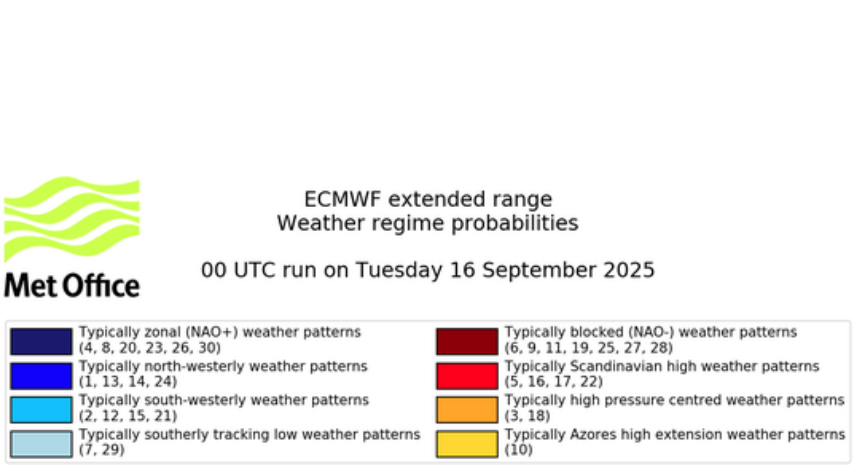
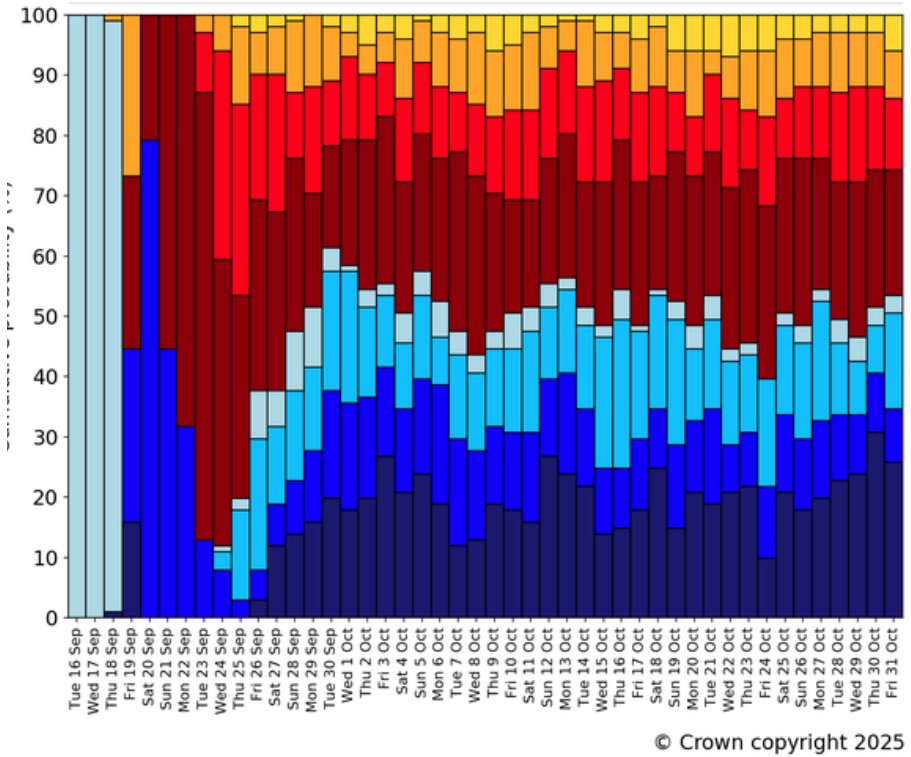
Forecast Probabilities





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