



RMetS

Royal Meteorological Society

Advance the understanding of weather and climate and its application for the benefit of all



British Antarctic Survey

NATURAL ENVIRONMENT RESEARCH COUNCIL

Climate Change Communication Training

Communicating and acting about climate change

Ella Gilbert (BAS) and
Ellie Highwood (RMetS)

@RMetS



Welcome and introductions



Ella Gilbert

Climate scientist,
communicator and activist



Ellie Highwood

Visiting Professor at University of Reading,
Consultant working on behalf of RMetS

Learning objectives – at the end of this session you will:

- Feel more confident talking about basic climate change information;
- Know more about how local and global scales are linked for three consequences of climate change protection – heatwaves, sea-level rise and flooding from extreme rainfall;
- Have some suggestions as to how to communicate about climate change in your context;
- Have some options for collective and individual actions to protect against climate change.



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Starting points...

Importance of communicating climate change

- Climate change is one of the biggest issues (and news stories) of our time
- Reducing the amount of climate change, and protecting ourselves against it requires behavioural and societal changes – need to engage all audiences
- There are interested and motivated people out there, but there are also disengaged groups (audience fatigue / anxiety / apathy)
- Messages need to be relevant to the audience and have some achievable practical steps that can be taken.
- The increased focus on sustainability is an opportunity to communicate, educate and develop actions around climate change



Communicating for behavioural change



Poll: where are you... be honest!

Myths v Facts

MYTH 1: Younger people are more worried about climate change than older people

- concern is high across all generations
- however younger people are angrier and a little more fatalistic with 1 in 5 under 35s believing it is too late to fix climate change versus 1 in 10 over 50s
- 89% of young people feel concerned about climate change but only a third are talking about it with their friends

MYTH 2: People know what to do but aren't willing to pull their weight :‘Say-do’ challenge

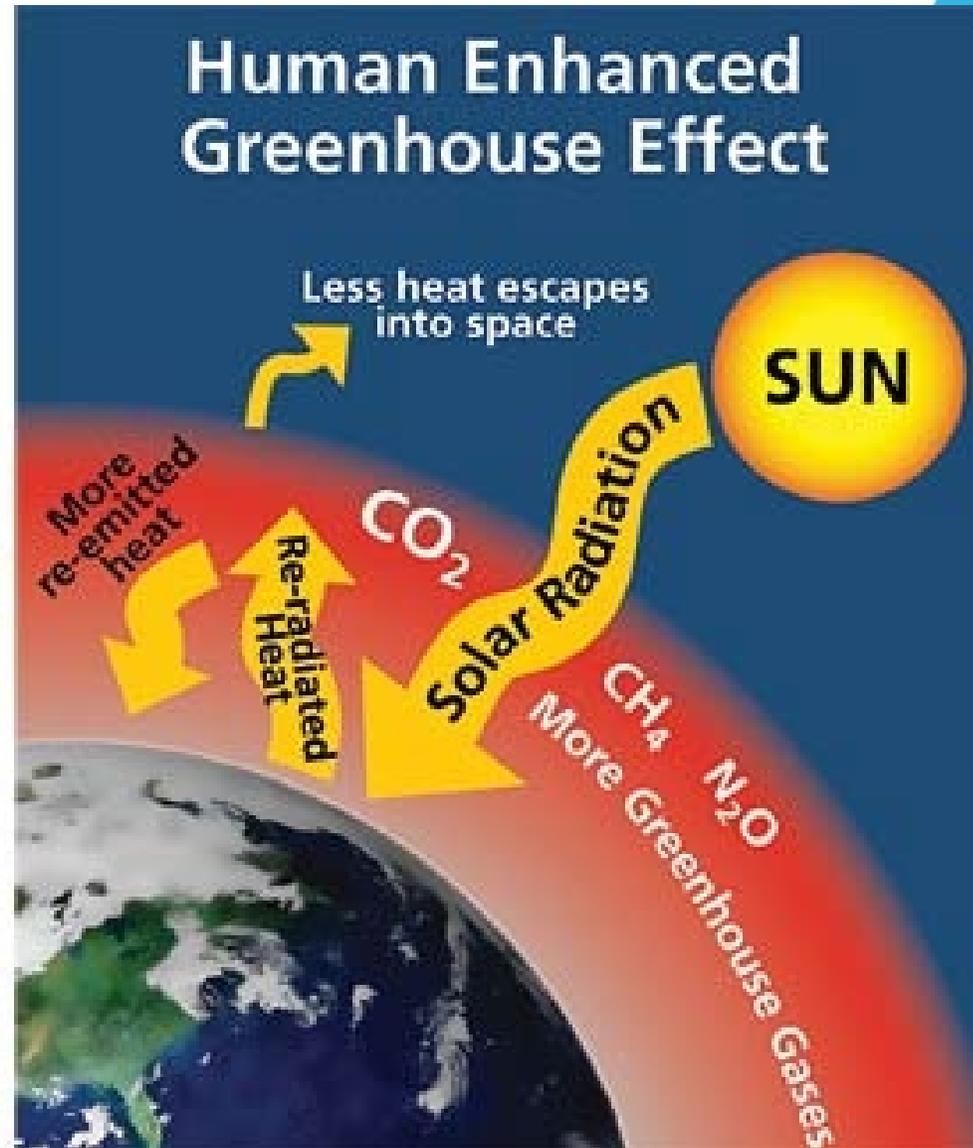
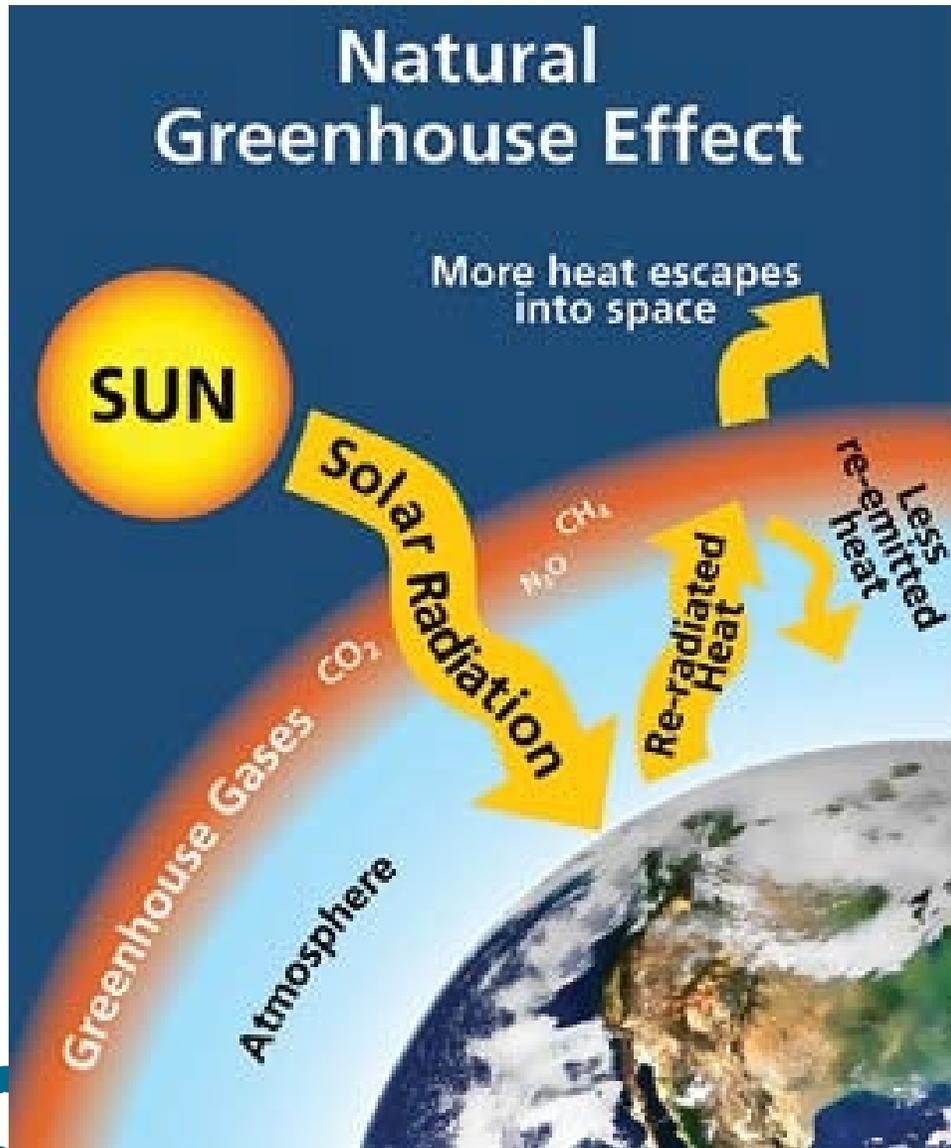
- actually people think they are doing enough already – little change in behaviour over last 7 years
- people overestimate the value of low impact changes and underestimate that of high impact changes.



Climate is what you expect, weather is what you get.

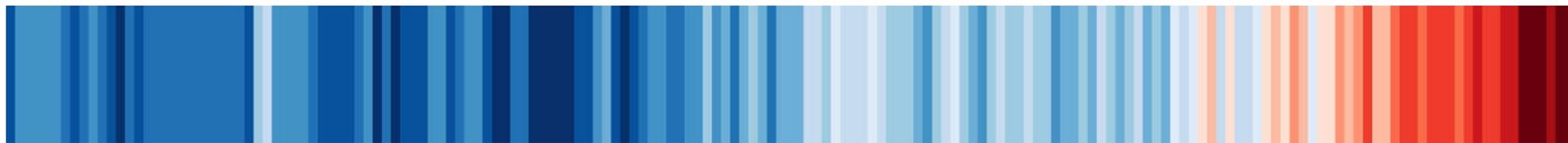
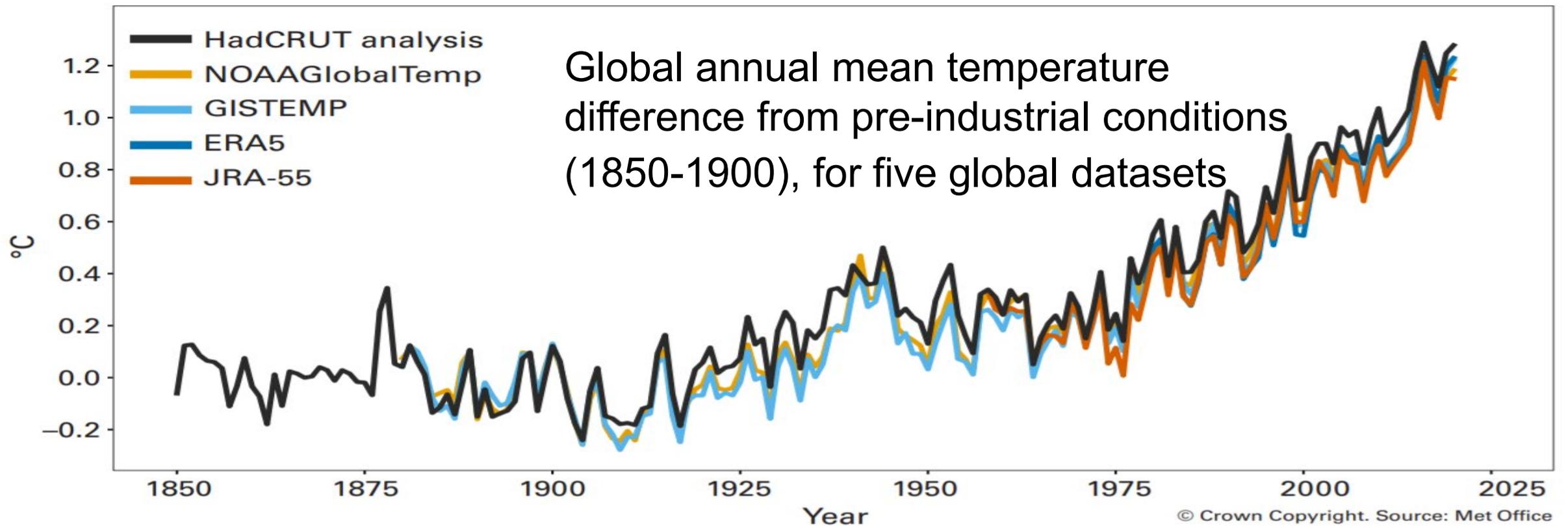
- **Weather** describes the conditions of the atmosphere at a certain place and time
- **Climate** describes the average weather over a period of time (30 years by World Meteorological Organisation)
- When the **climate changes**, this can also impact the weather

How we (humans) warm the Earth



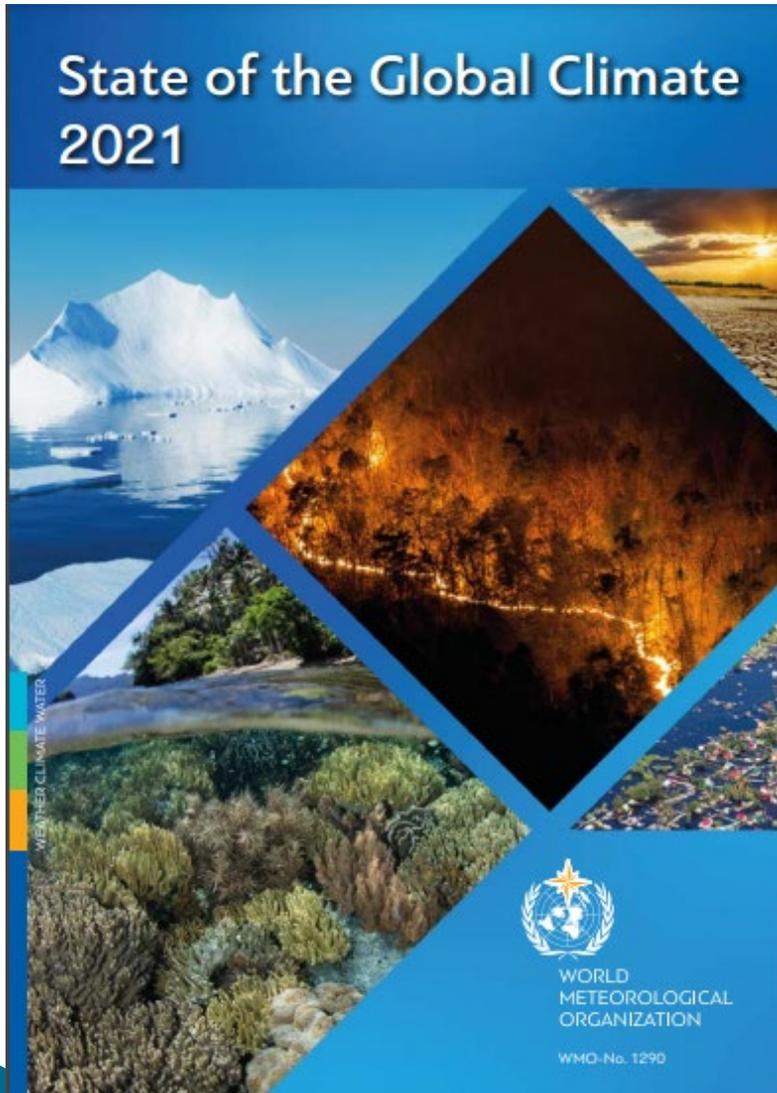
+ feedbacks

Surface temperature



Relative to average 1971- 2000
<https://showyourstripes.info/s/globe>

The story so far?



Global mean surface temperature **$1.2 \pm 0.1^\circ\text{C}$** above baseline of 1850-1900

7 most recent years 2015-2021 **warmest on record**

2011-2020 **warmest decade** on record

First ever rainfall over Greenland ice sheet

Ice losses from glaciers & ice sheets accelerating – **8/10 highest ice loss years since 2010**

2020: **2nd warmest year, 2nd lowest minimum Arctic sea ice extent**



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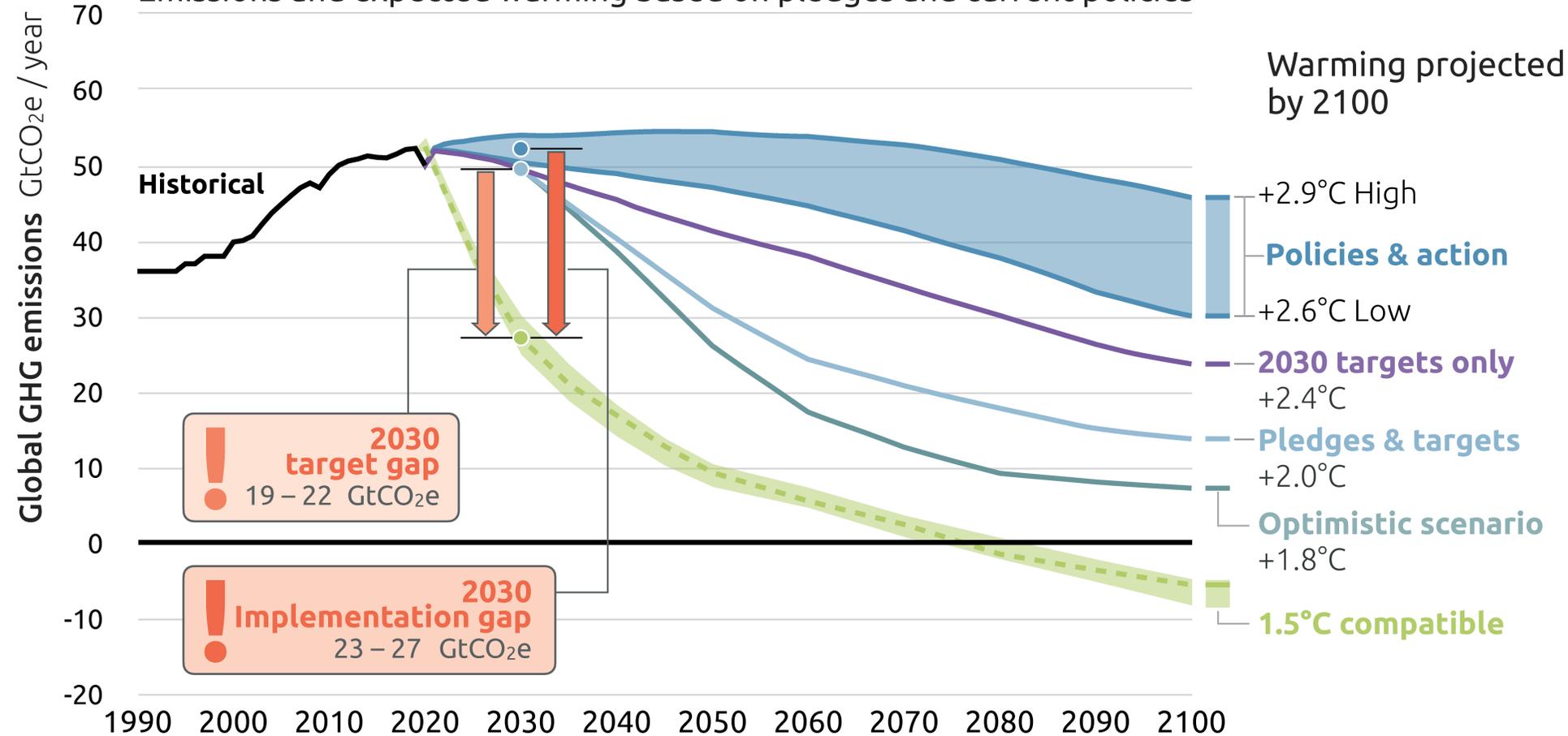
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And the future?

2100 WARMING PROJECTIONS

Emissions and expected warming based on pledges and current policies

Climate Action Tracker Nov 2022 Update



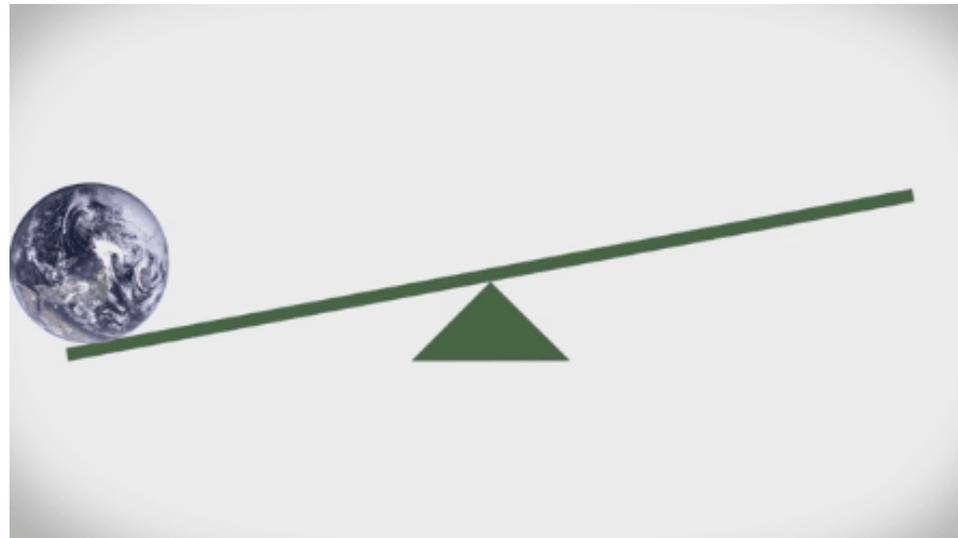
What is “Net Zero”?

Greenhouse gas emissions going into the atmosphere are balanced by removal of greenhouse gases from the atmosphere

- Point at which no longer increasing the duvet thickness
- Maybe more achievable than absolute zero carbon emissions

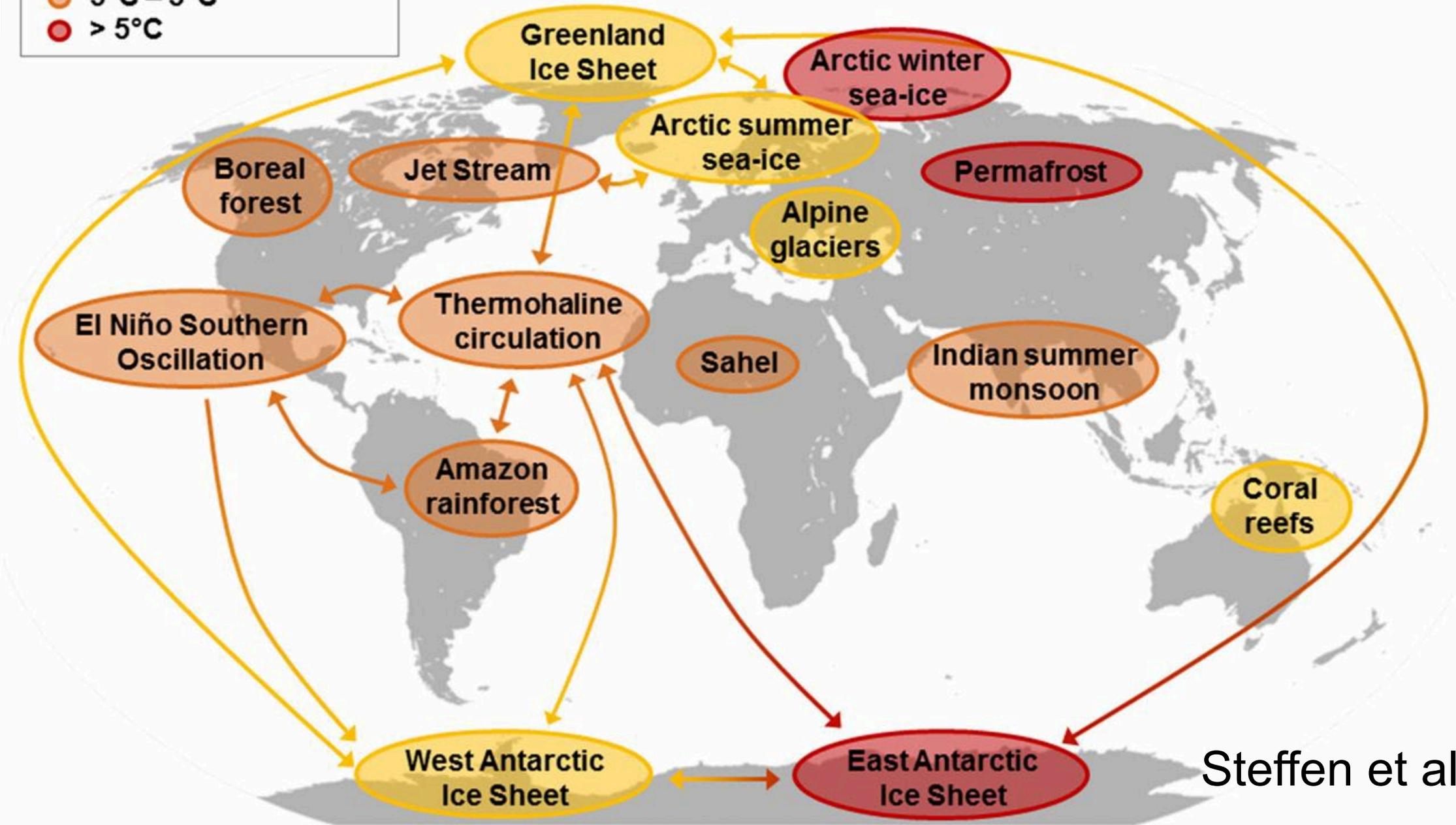
“Tipping points”

- Tipping points are parts of the climate system that we think may undergo a rapid change once the temperature reaches a certain amount.
- Often driven by feedback loops (e.g. the world warms, more water evaporates into the atmosphere, water vapour is part of the planetary “duvet” therefore planet continues to warm).



Tipping elements at risk:

- 1°C – 3°C
- 3°C – 5°C
- > 5°C



Steffen et al. 2018

Climate change consequences impacting the UK

3 examples

Global changes – local impacts

Three consequences of climate change that have big impacts on the UK

- Extreme temperatures and heatwaves
- Sea level rise
- Flooding due to extreme rainfall

How do each of these influence/impact your context?

What are the opportunities to engage around these topics (especially as they tend to be reported in media)

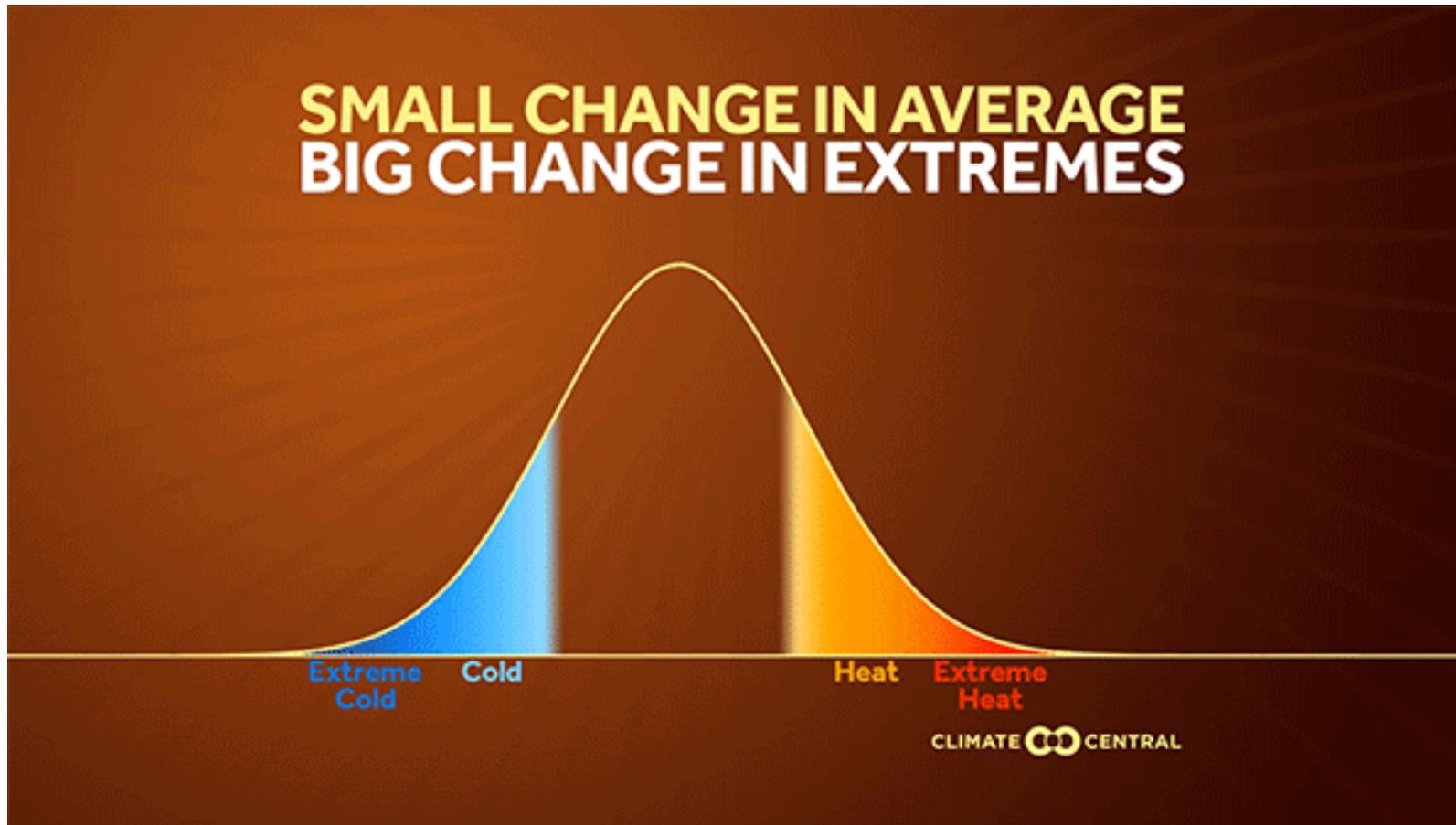


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Consequence 1: Heat waves

Heat waves - the new normal?



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The hottest ten years (since records began in 1884) have all been since 2000

Top ten UK's hottest years all since 2002

Met Office: UK's 10 hottest years on record occurred since 2002

Science & Environment

Climate change: UK's 10 warmest years all occurred since 2002



National Oceanic and Atmospheric Administration
U.S. Department of Commerce

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July 2020 was record hot for N. Hemisphere, 2nd hottest for planet

Arctic sea ice melted to record lows



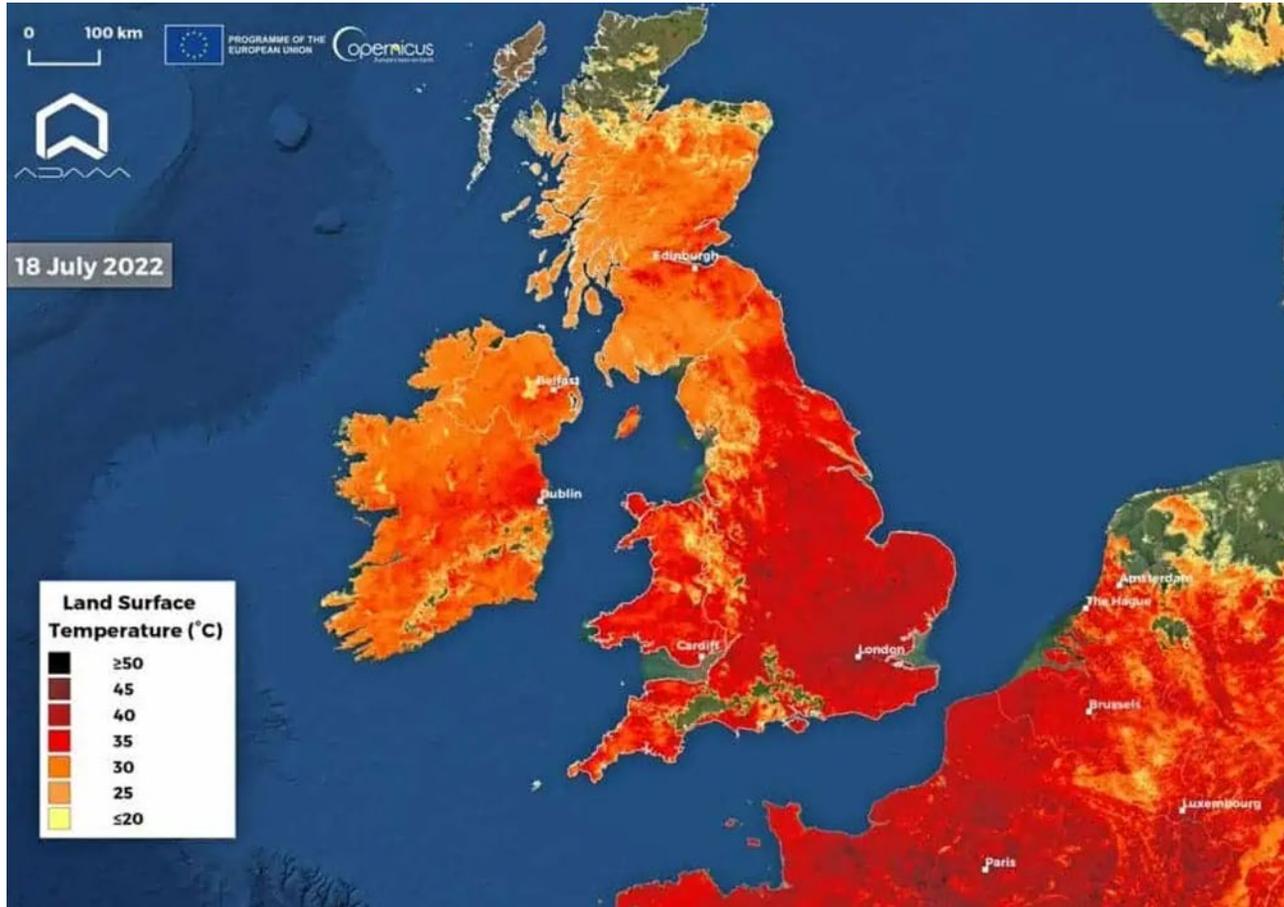
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European heatwave July 2022



Record-breaking European heatwave of July 2022

First 40°C in UK history
2800 excess deaths in over 65s (England)

Made 10 x more likely by climate change

Interesting shift from “lovely hot weather” to “danger” in media presentation



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Wildfires



Photo: REUTERS/Florion Goga

Burned area equivalent to
a fifth of Belgium

2022 burned area twice the
size of last 15 years'
average burned area



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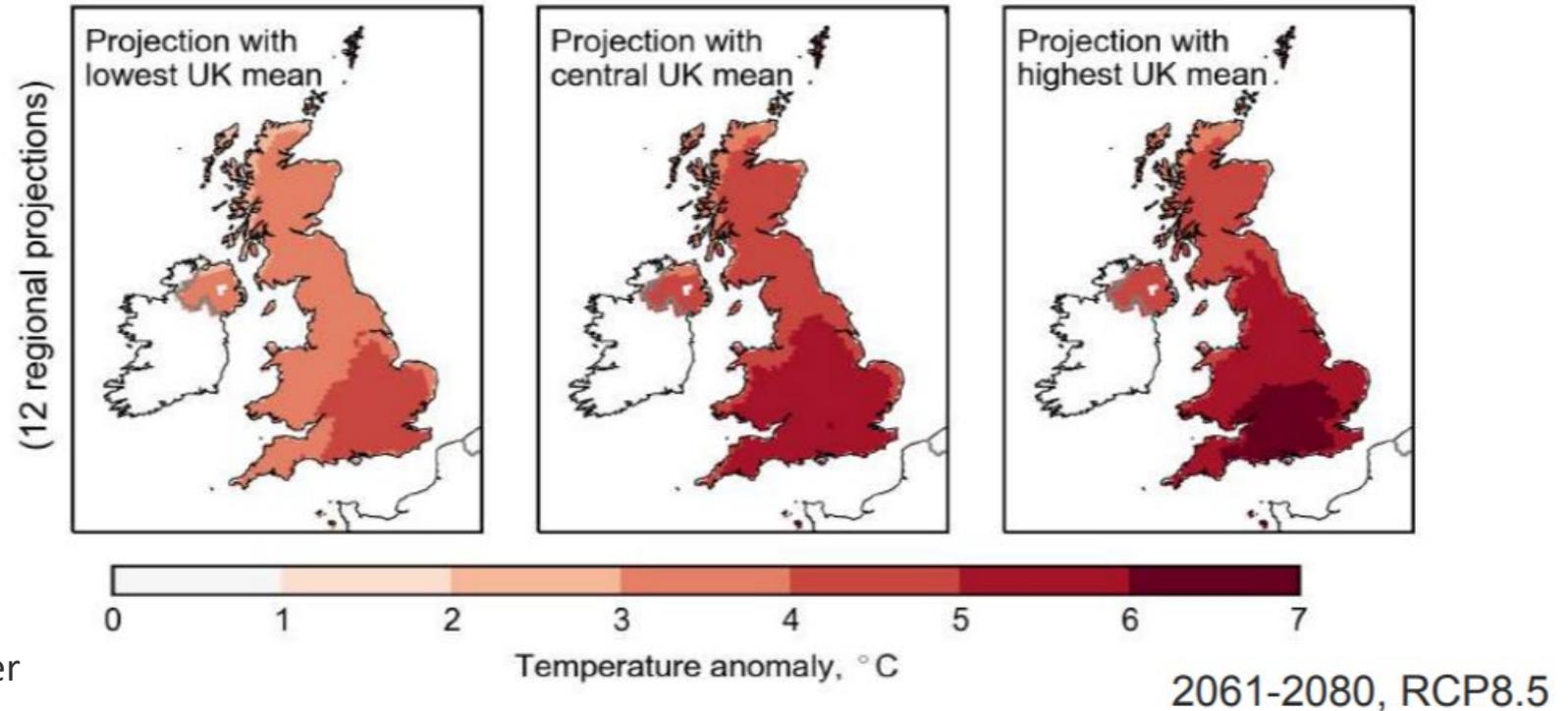
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UK climate projections

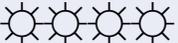
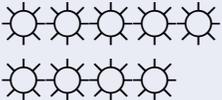
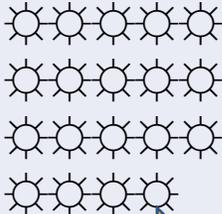
Headline Result:

“All areas of the UK are projected to warm, with a greater chance of warmer, wetter winters and hotter, drier summers”

- Winter will be between 1 and 4.5°C warmer and up to 30% wetter
- Summer will be between 1 and 6°C warmer and up to 60% drier



Local heatwaves – England (Reading)

	Current (2019)	+ 2 C global T change	+4 C global T change
Hottest summer day	35.5	37.3	42.6
			
Average number of days per month warmer than 25 deg C			
			
Average number of summer rainy days per month			
			

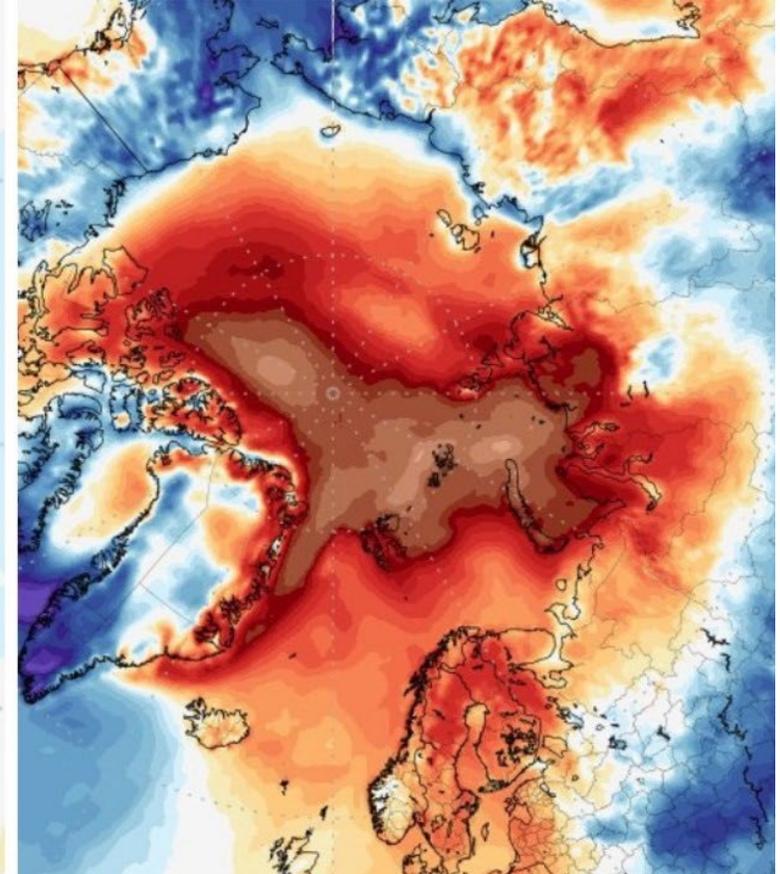
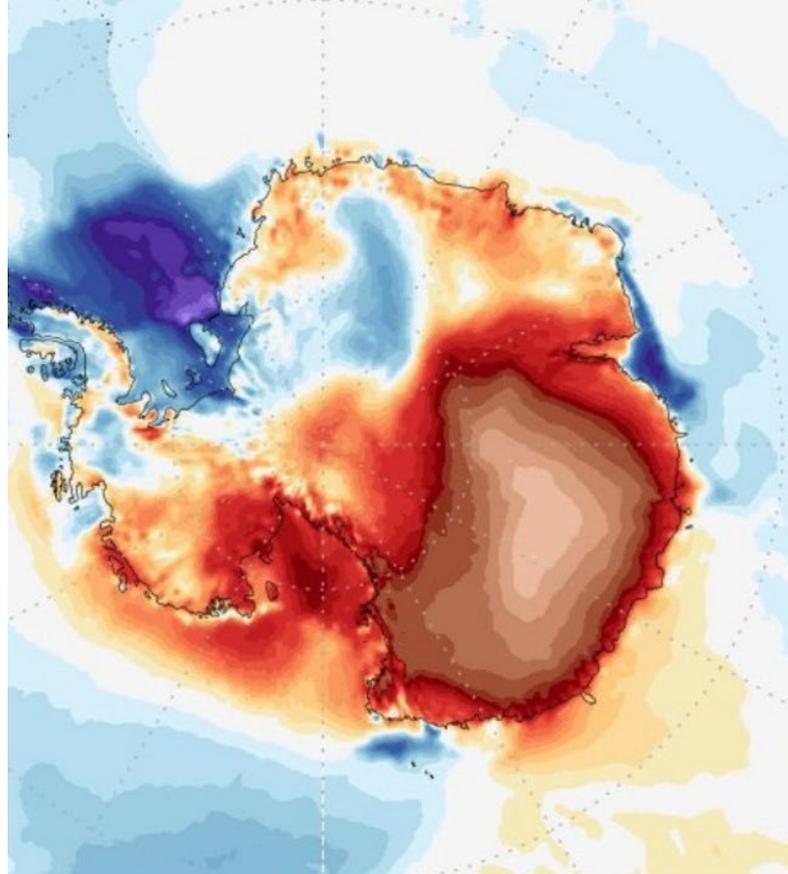
<https://www.bbc.co.uk/news/resources/idt-d6338d9f-8789-4bc2-b6d7-3691c0e7d138>

Polar heatwaves

March 2022:
simultaneous
heatwaves in the
Arctic and Antarctic

Antarctic: **+40°C**

Arctic: **+30°C**



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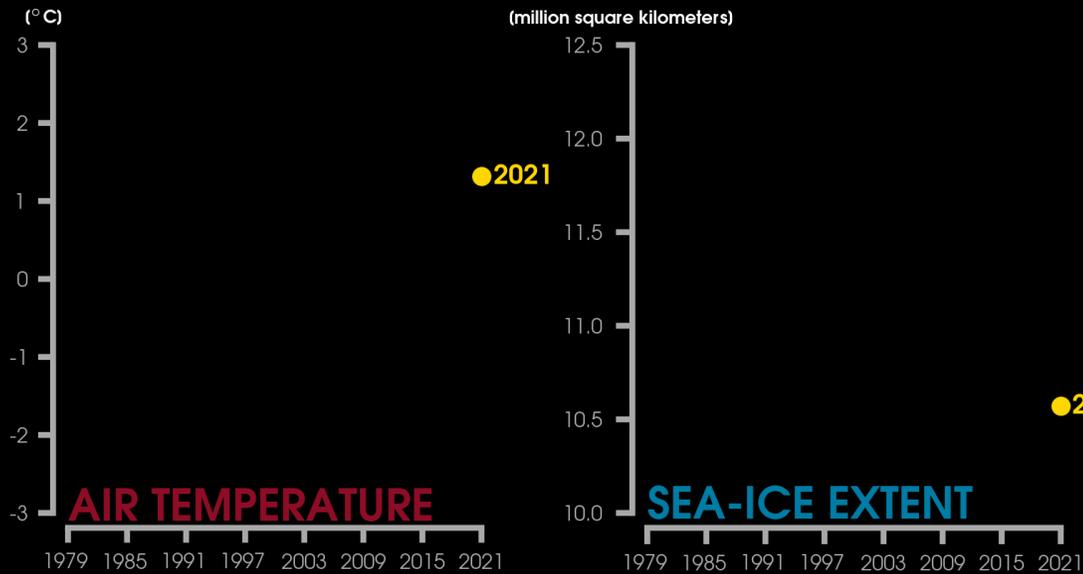
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Image: NSIDCc



Arctic sea ice loss

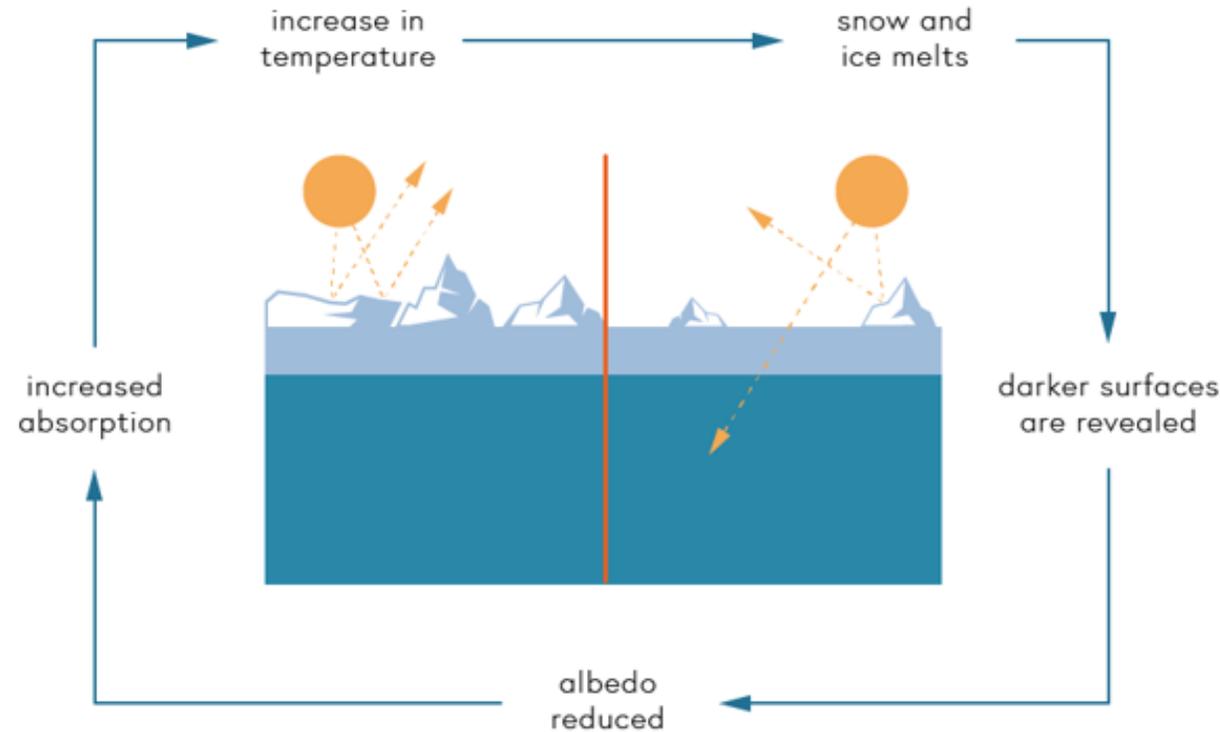
ARCTIC CLIMATE



DATA: Berkeley Earth Data using NOAA/ESRL (WRIIT Tool; +67° N)
SOURCE: <https://www.esrl.noaa.gov/psd/cgi-bin/data/testdap/timeseries.pl>
BASELINE: Temperature anomalies computed from 1981-2010

DATA: NSIDC Sea Ice Index v3.0 (ANNUAL, Satellite)
SOURCE: <ftp://sidacs.colorado.edu/DATASETS/NOAA/G02135>
GRAPHIC: Zachary Labe (@ZLabe)

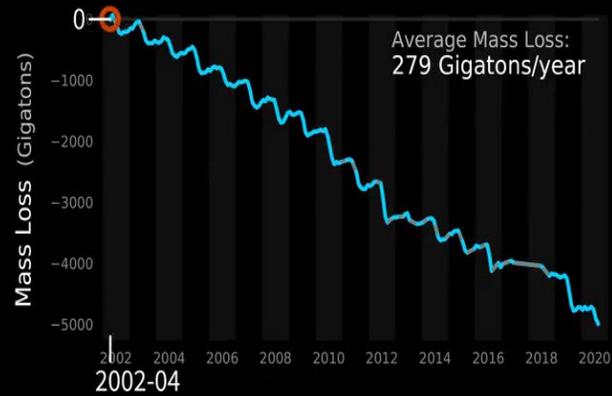
Source: Zack Labe



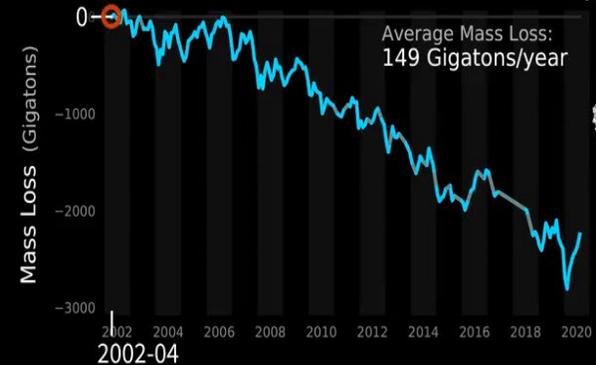
Source: Open University / Met Office

Ice loss from ice sheets

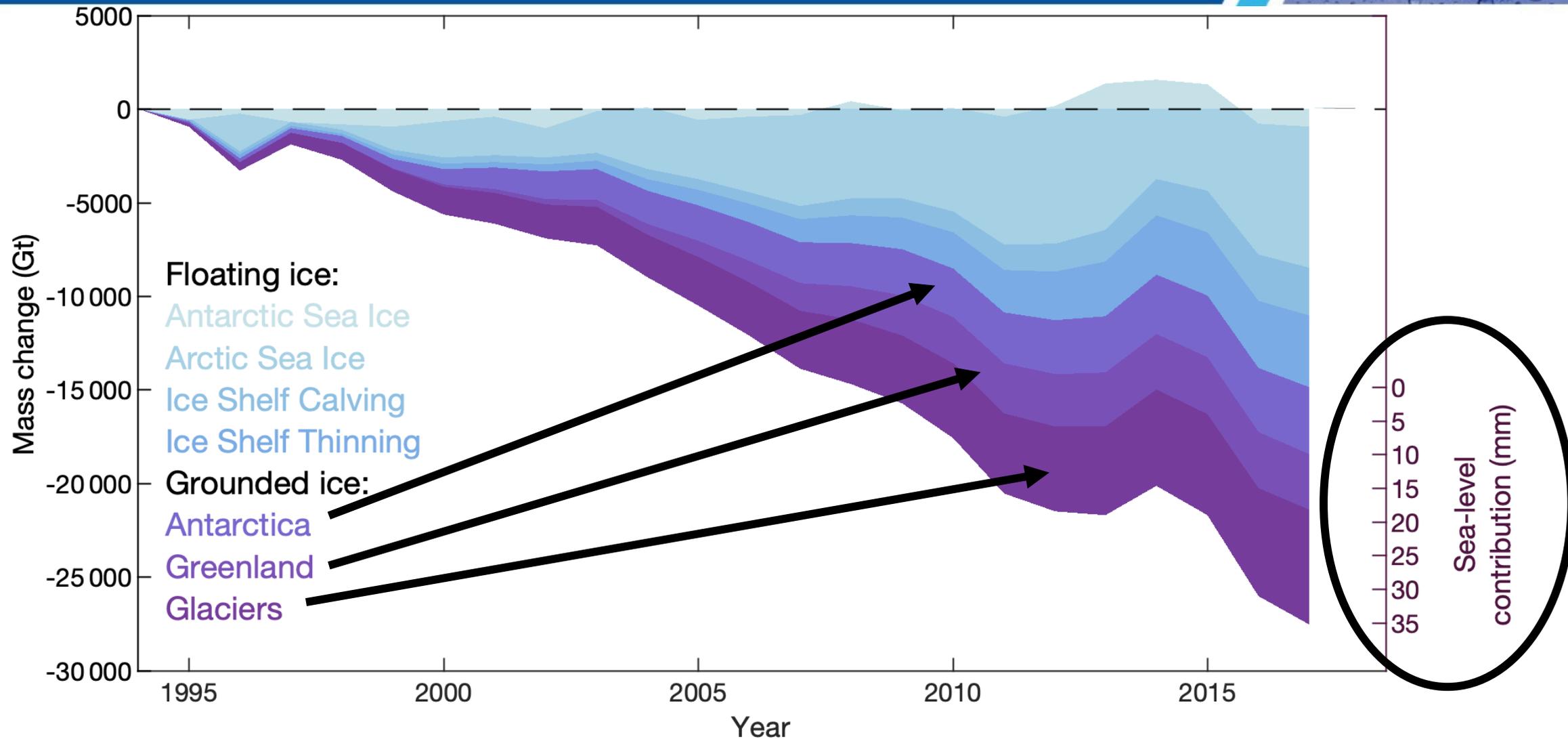
GRACE AND GRACE-FO
Observations of Greenland Ice Mass Changes



GRACE AND GRACE-FO
Observations of Antarctic Ice Mass Changes



Ice melt and sea level



Consequence 2: Sea level rise

Global sea level rise



2 metres

1.2 metres

0.3 metres
(30 centimetres)
1 “long” ruler
Approx 1 page A4

UK sea level rise projections

Sea-level rise

Increase will generally be greater in the south than in the north

■ Range in low emission scenario ■ Range in high emission scenario

(by 2100 relative to 1981-2000)



Source: UK Climate Projections / MetOffice

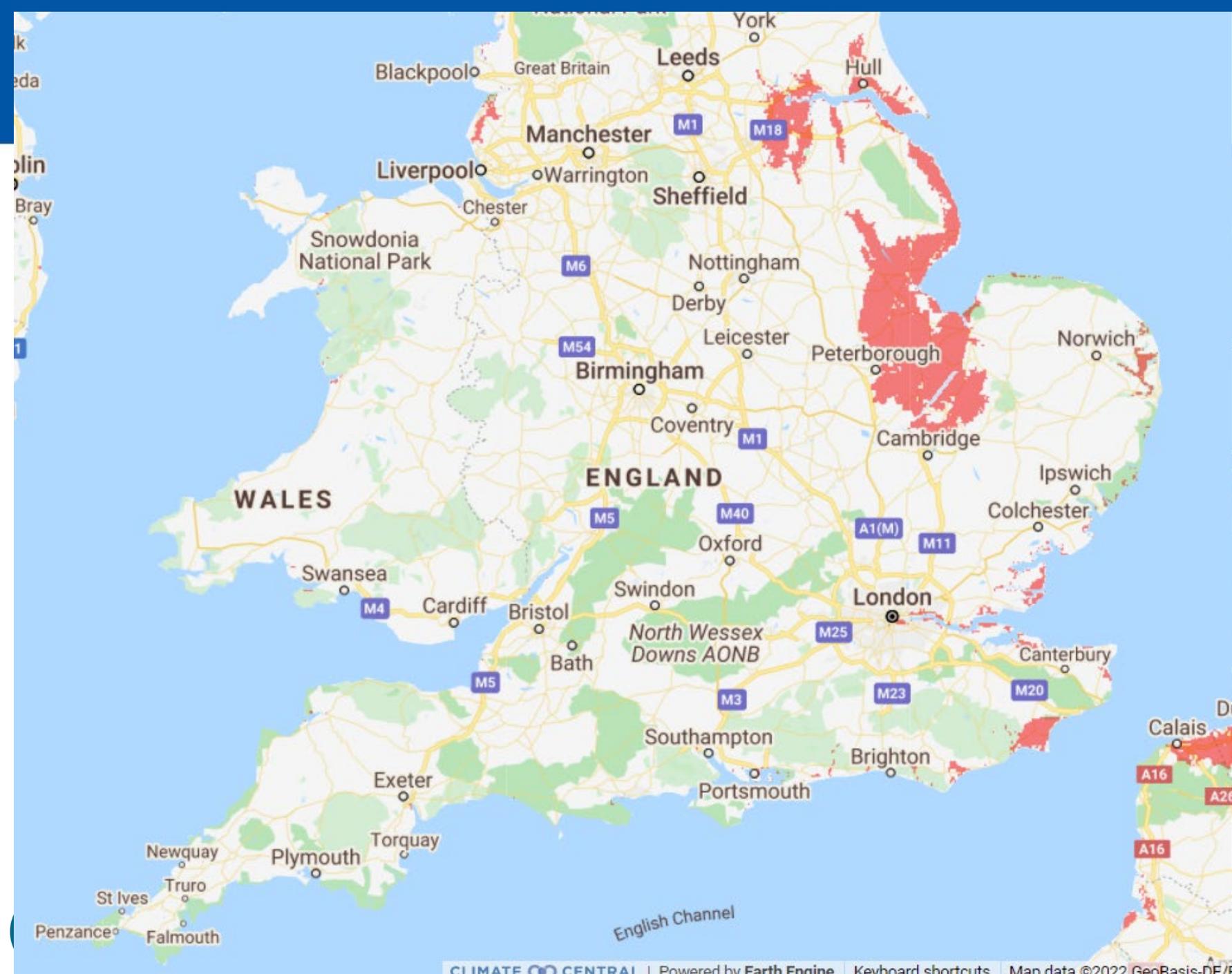
Land projected to be below tideline in 2100 with 2C warming

<https://coastal.climatecentral.org/>



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ario

Coastal erosion

By 2050:

1M properties at risk
Some nuclear power stations at risk of annual flood

By 2100:

1600km of major roads
650 km of railway line
92 railway stations
55 historic landfill sites
Agricultural land



Fairbourne, Wales – the UK's first climate refugees?



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Consequence 3: flooding due to extreme rainfall

Extreme rainfall

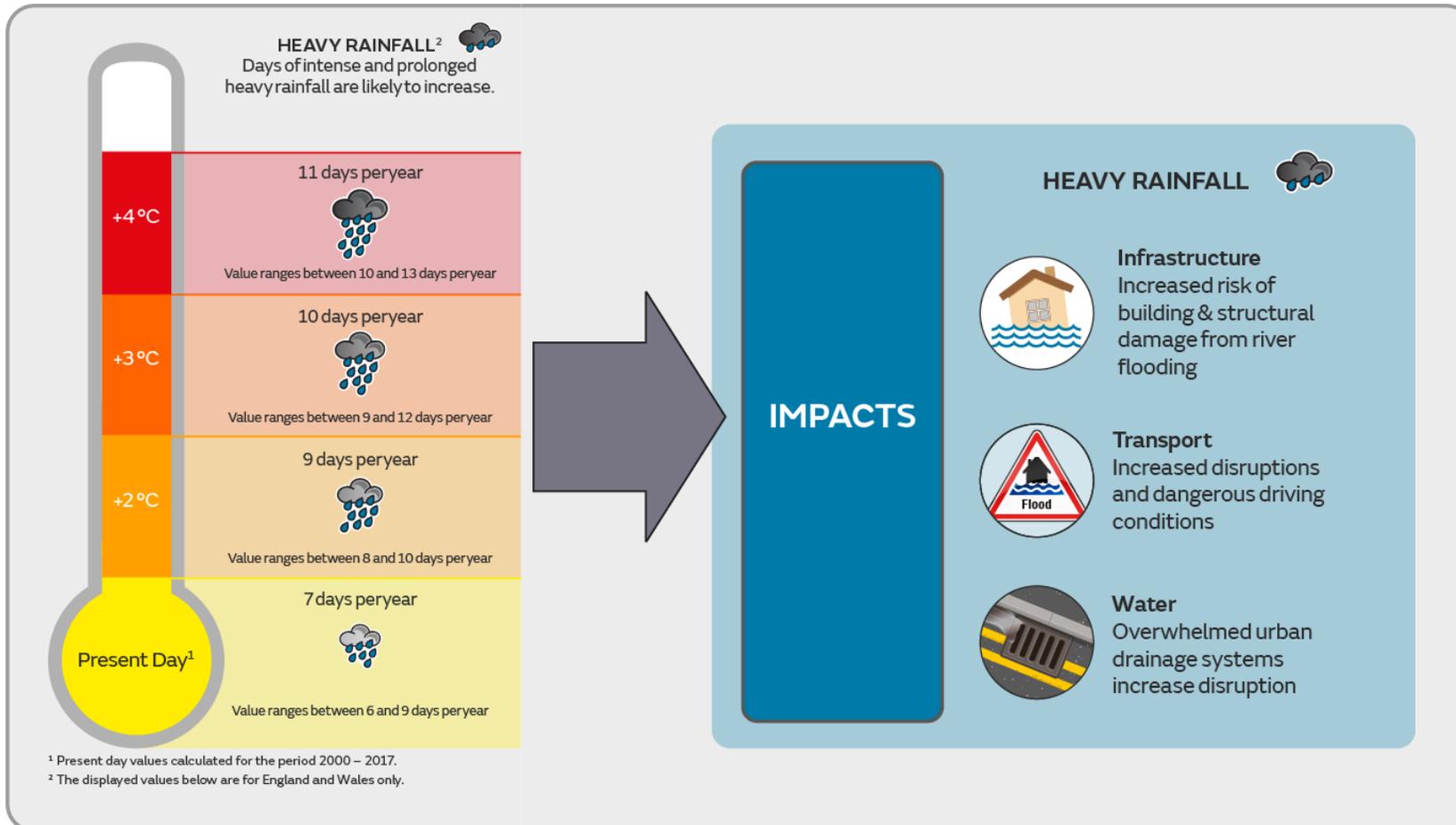
- A warmer atmosphere holds more water - ~7% for each 1 degree C
- More water in the atmosphere also means more energy which can mean storms are more severe
- Frequency of storms at any location can also be influenced by climate change as well as year to year variability
- The impact of extreme rainfall also depends on land characteristics AND previous rainfall (if already waterlogged OR extremely dry, then rainfall may lead to flooding)



Heavy rainfall projections



Global warming and future high-impact weather in the UK



Winter rainfall – Storm Desmond – river flooding

4-6 December 2015

- New record for greatest 24h rainfall (341.1mm in Honister, Cumbria)
- Biggest flood in 600 years
- 5000 homes and businesses flooded in Cumbria and Scottish Borders
- 60,000 people without power
- Some still unable to return 1 year later



Appleby – picture from BBC

Study comparing risk of this type of event with and without climate change suggests this storm was made 40% more likely by climate change

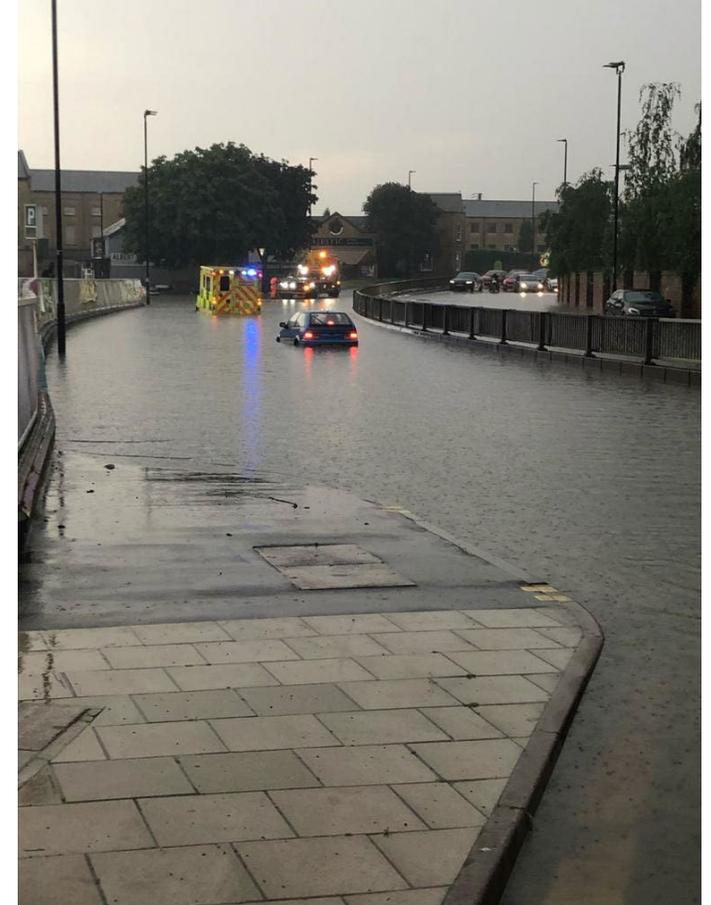
Summer rainfall – convective rainfall

In summer, extreme rainfall is usually due to short-term downpours

More intense downpours is consistent with more energy in the warmer atmosphere

Warmer land surface can produce more intense upward movement of air which can lead to more localised thunderstorms

Short-term downpours can cause local surface flooding – especially in urban areas – flash floods



Flash flooding in Peterborough July 2021 Photo Cambridgeshire Fire and Rescue service

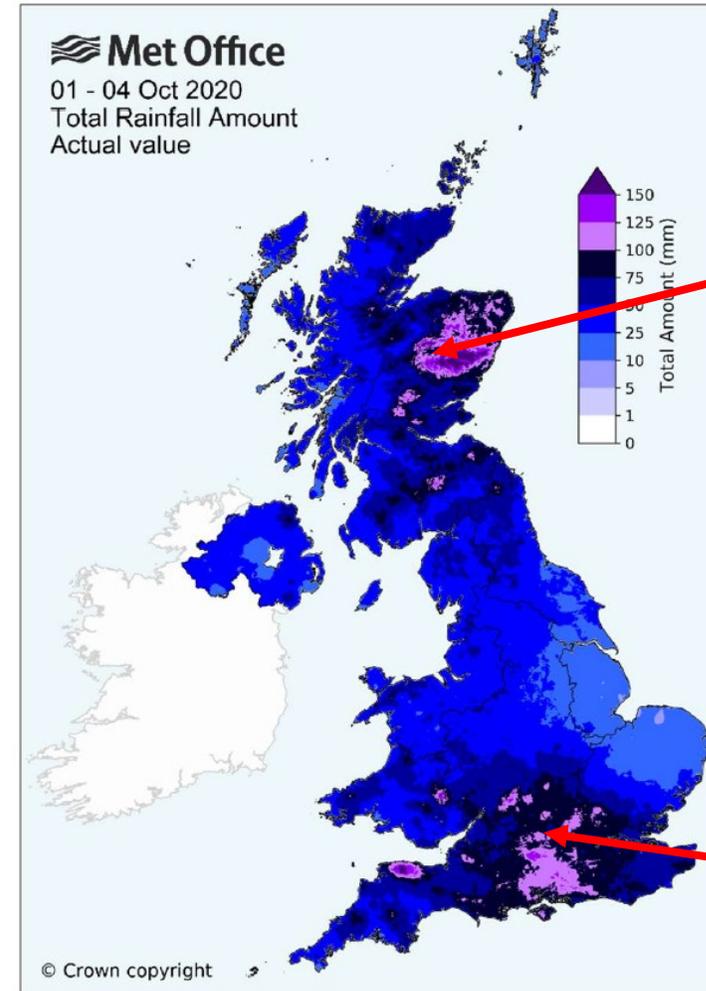


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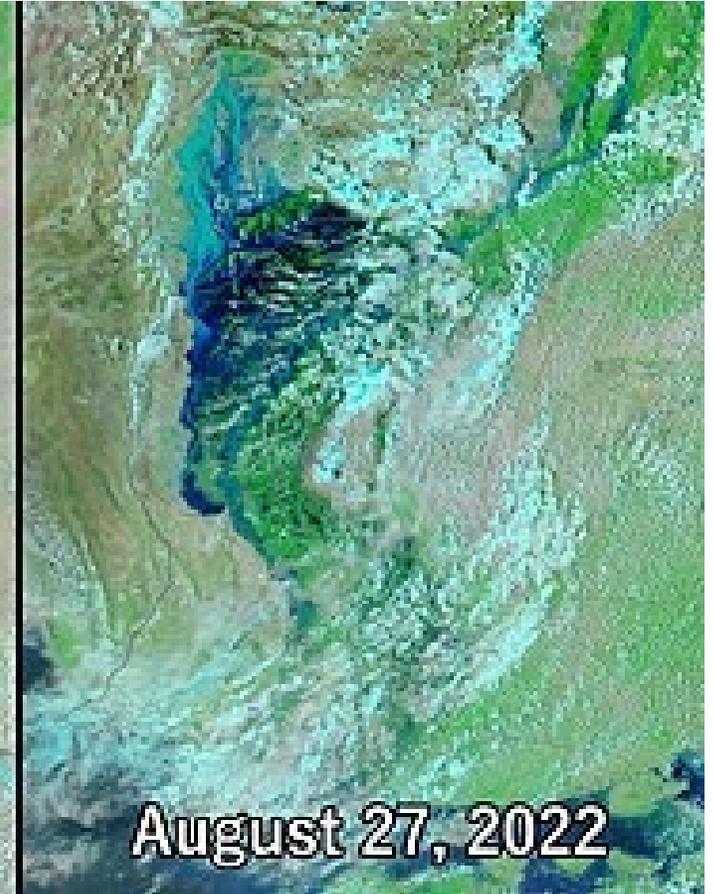
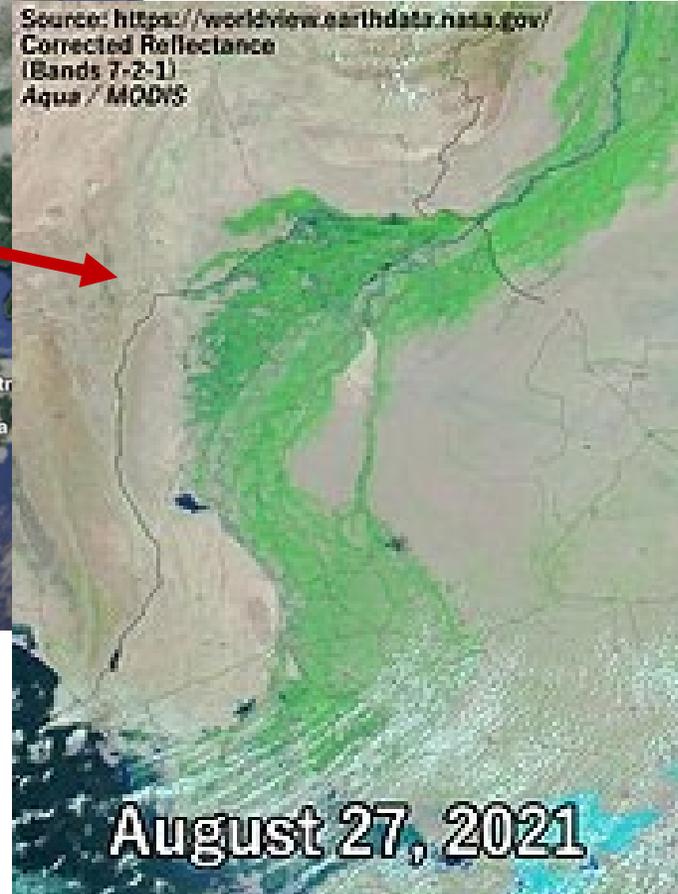
Storm Alex 2020 – wettest day on record since 1891

- Parts of central Southern England and eastern Scotland recorded totals of 100mm or more in the first 4 days of October.
- Strong winds over Southern half of UK – disruption to power supply
- Flooding relatively low due not being already waterlogged and the steady nature of the rain giving time for water to be absorbed by soil.
- Extreme flooding in south-east France and north-west Italy washing away buildings and roads).



By 2100 this level of rainfall will be made 10 times more likely by human climate change

Sometimes things combine – Pakistan 2022



Heatwave in April – May
Glacier meltwater + stronger than usual
monsoon rains + more frequent than
usual large scale storms

33 million people displaced

Actions

Actions to reduce and protect

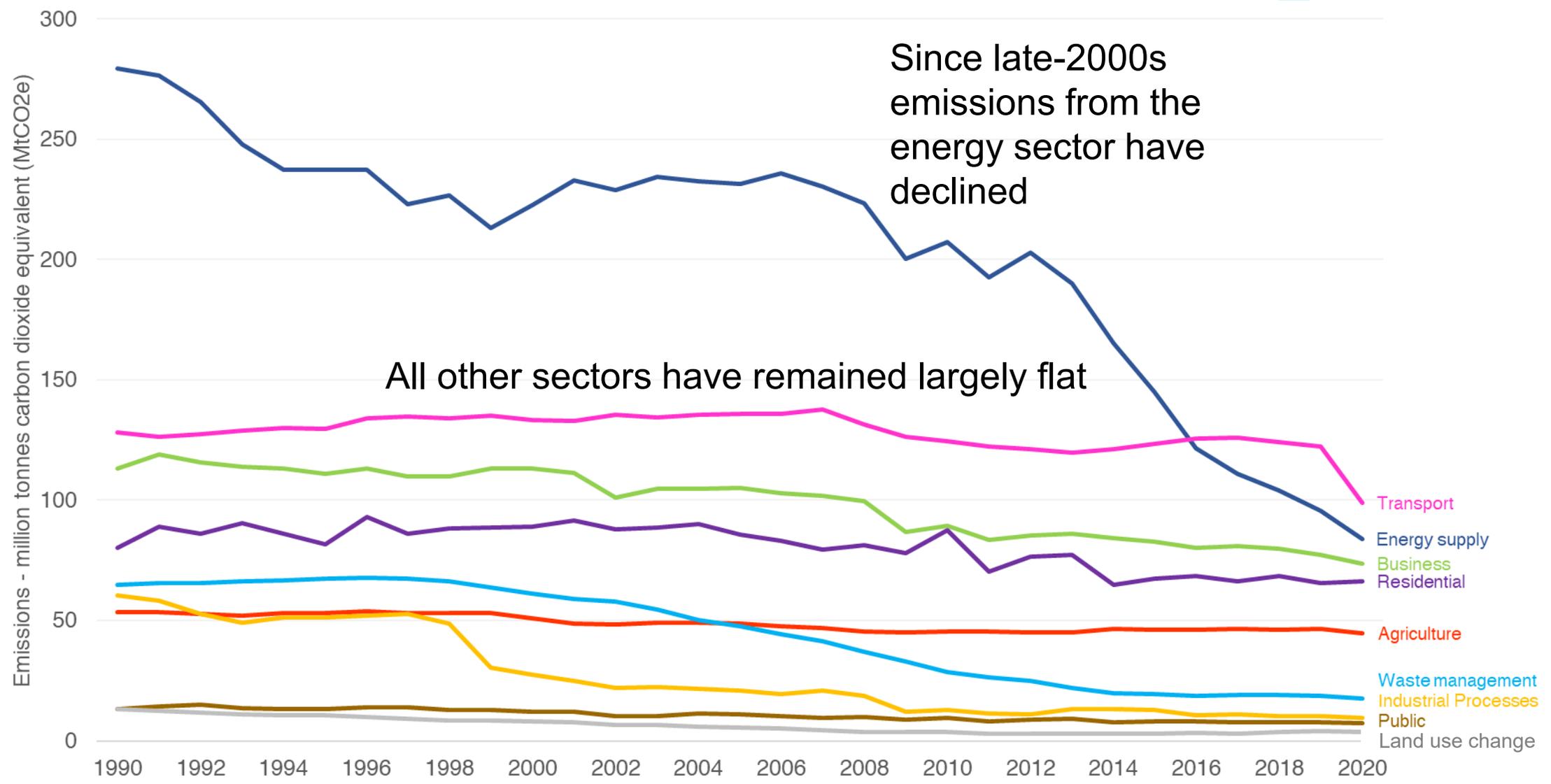


I can.. we know what to do to reduce emissions

- Save energy
- Electrify + decarbonise
- Waste less
- Protect and invest in nature
- Remove carbon with technology



UK emissions by sector, 1990-2020



Source: Final UK greenhouse gas emissions national statistics 1990-2020, BEIS, February 2022

UK pathways to net-zero

Aviation & Shipping

Transport

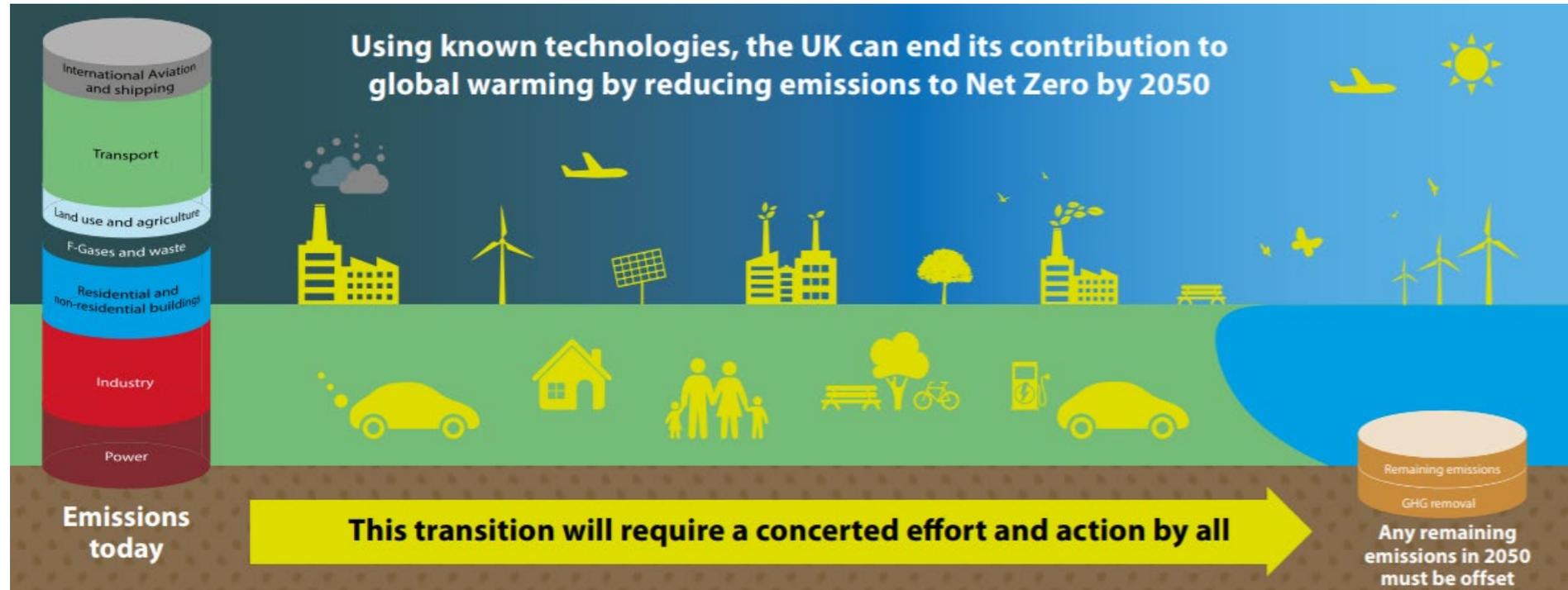
Land use and agriculture

F-gases and waste

Buildings

Industry

Power



Committee on Climate Change 2019

Decarbonisation across all sectors

UK climate policy dashboard

Tracking government progress to deliver net zero



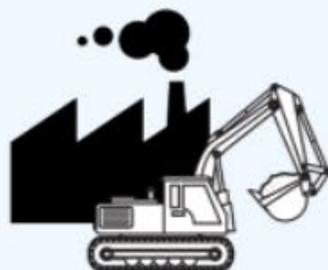
7/10

Power
Sector



5/10

Transport
Sector



4/10

Manufacturing
and Construction



4/10

Agriculture
and Land Use



5/10

Buildings
Sector



2/10

Waste
Sector



4/10

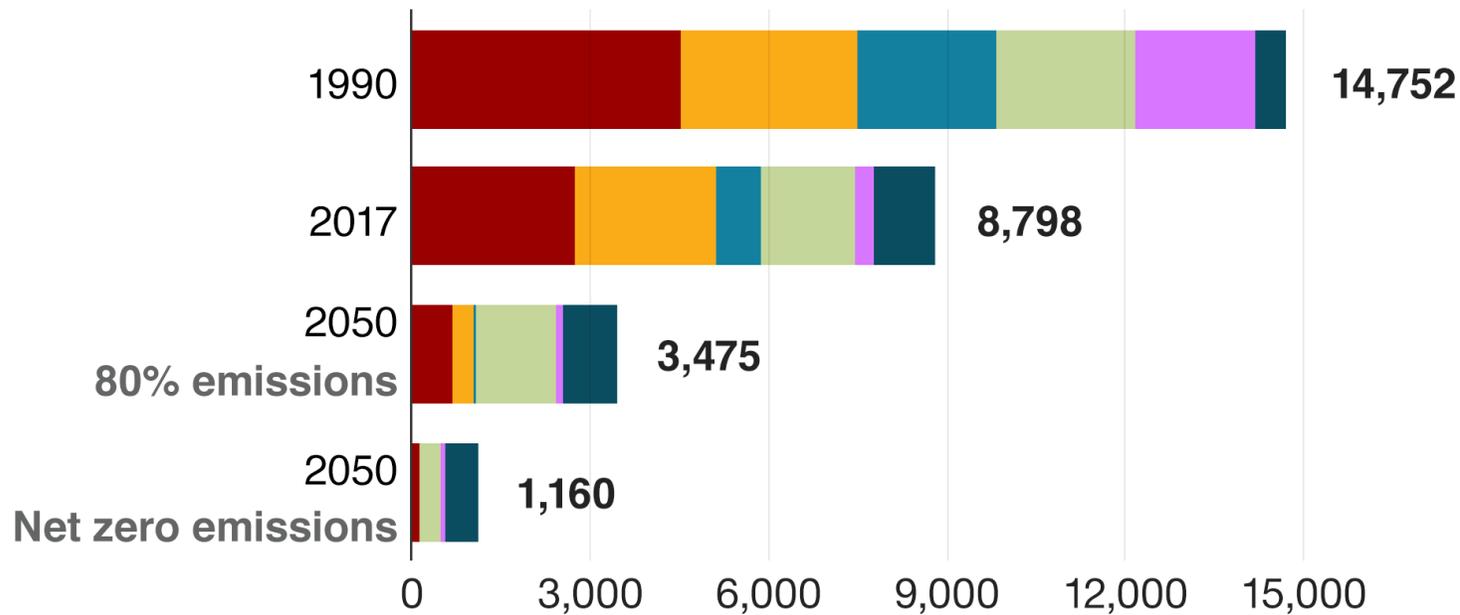
Adaptation
Area

<https://www.policyconnect.org.uk/sustainability/climate-policy-dashboard>

... on a personal level

UK Household emissions in 1990, 2017 and 2050

Annual emissions, kilogrammes of CO₂



Source: Climate Change Committee/BEIS (2019)



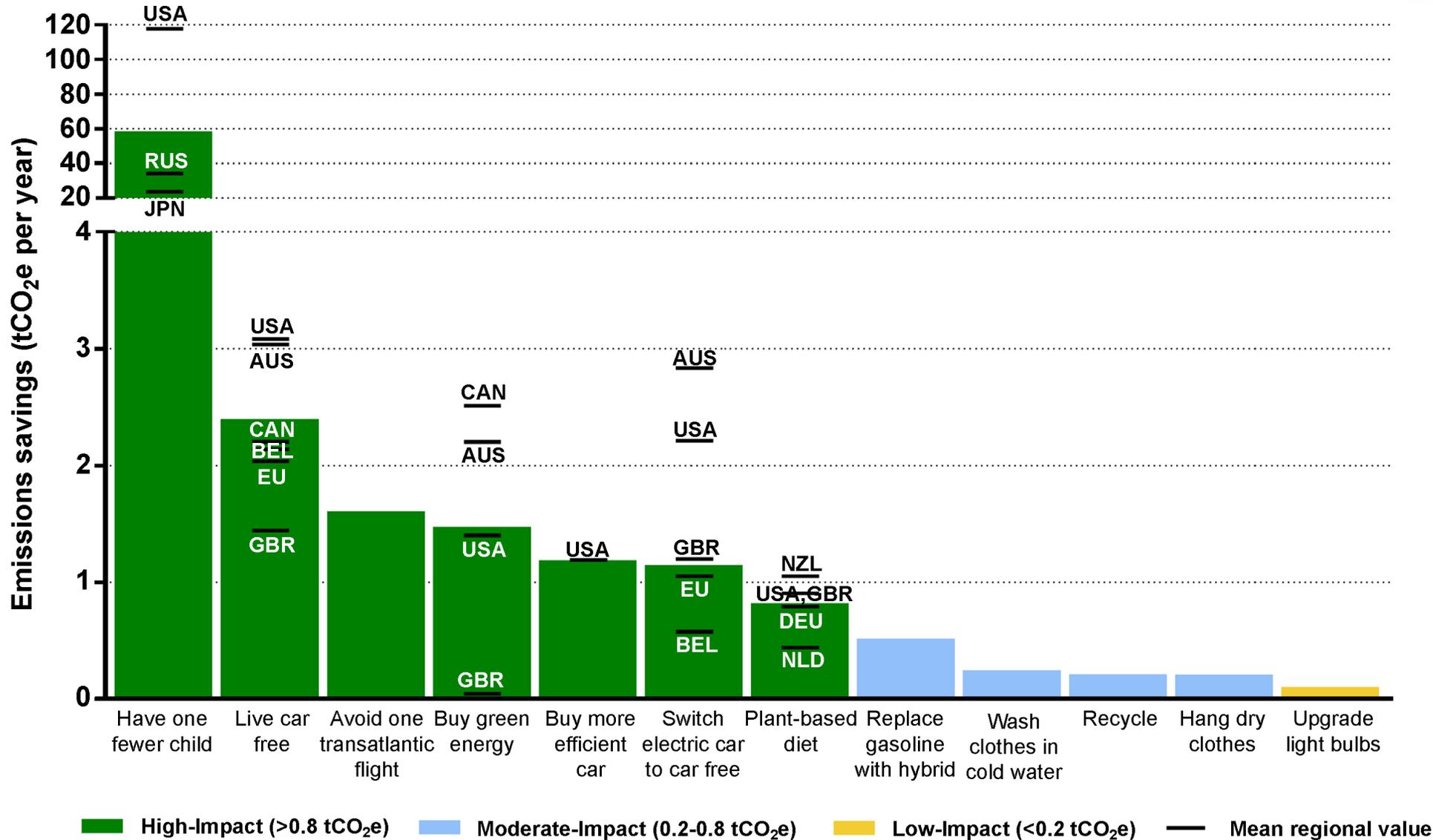
What can we do on a personal level about emissions?

1. Make your voice heard by those in power
2. Eat less meat and dairy
3. Cut back on flying
4. Leave the car at home
5. Reduce your energy use – save energy
6. Respect and protect green spaces
7. Invest your money wisely
8. Cut consumption and waste
9. Talk about the changes you make

Reducing your carbon footprint may also:

- Save you money
- Benefit your health and that of those around you
- Improve air quality

Most impactful actions



Starting Conversations

Top Tips

- Use topical conversation starters (like documentaries you've seen, news articles, social media posts) to ask your friends about their feelings towards climate change.
- Actively listen to what your friends have to say without passing judgement.
- Ask lots of questions and really listen to the answers.
- Be curious, ask about their feelings, express empathy.
- Aim to enjoy the conversation. If people feel connected with you over the conversation, you've planted a seed.
- Consider the language you use... Greta Thunberg's "climate destabilisation", or use analogies

Might be worth **avoiding**:

- Battering people with arguments and interject while they're talking about their feelings.
- Setting out to persuade people to take action. They'll make their own decisions about that anyway.
- Feeling like you need to have all the answers before you start a conversation.
- Feeling like the goal is to change someone's mind.

<https://www.globalactionplan.org.uk/knowledge-hub/how-to-supercharge-the-climate-conversation>

Opportunities to start conversations about / take action to protect against consequences of climate change

Building design:

- saving energy,
- natural ventilation and cooling, shading,
- materials used,
- solar and wind energy generation/supply

Green spaces:

- Cool urban areas and reduce extreme heat
- Managing rainwater
- Health and wellbeing
- Improve air quality
- Mental health and wellbeing
- Wildlife
- Food resilience?

Planning decisions:

- coastal erosion,
- flood plains / marshland
- Rainwater management
- Nature/wildlife conservation - rewilding

Community Activities and events:

- Heat exhaustion,
- Travel to and from event locations,
- Impact on environment
- Waste management
- Energy efficiency (or generation)

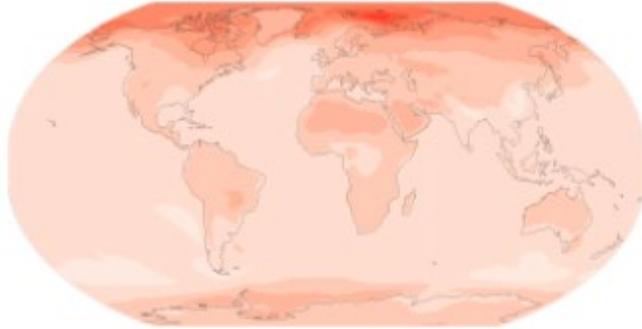
Every day activities:

- Travel and transport planning (disrupted journeys)
- Clothes choice

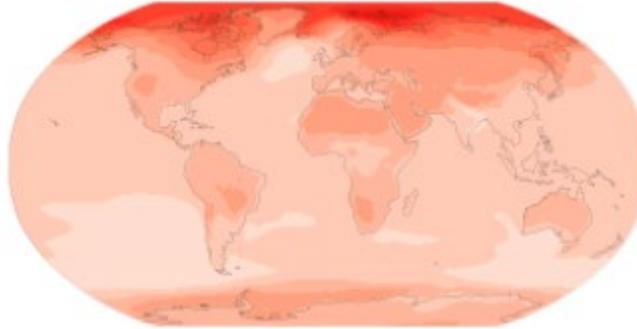


It's worthwhile... every gram matters

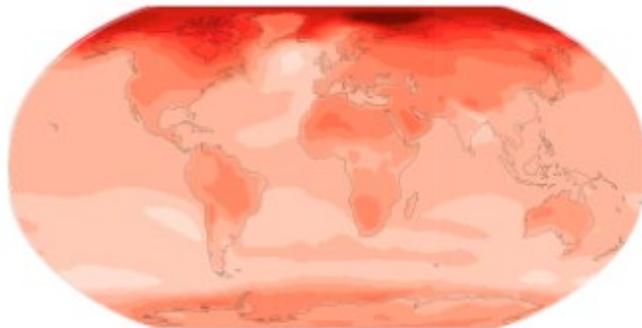
Change at 1C global warming



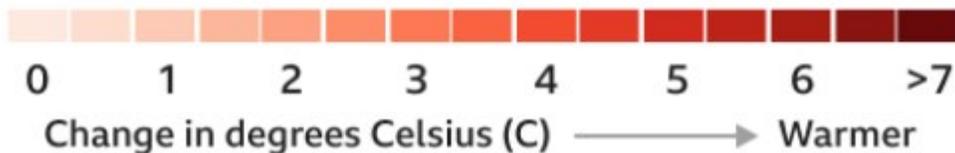
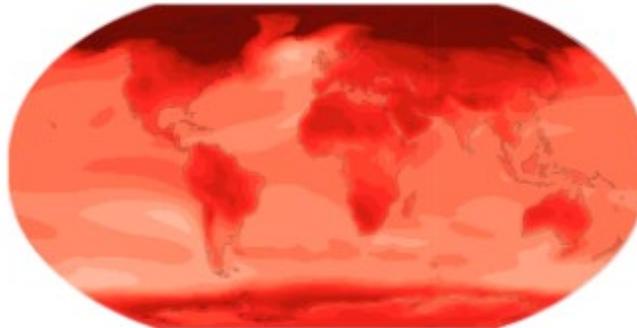
Change at 1.5C global warming



Change at 2C global warming



Change at 4C global warming



Remember also the tipping points...

It's worthwhile... it works



Source: FT/Reuters

**Shell pulls out of a U.K. oil field
by climate activists.**

NEWS

Shell pulls out of Cambo

Shell pulls out of Cambo oil project in UK's North Sea

Shell pulls out of Cambo oilfield project

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The "Attenborough effect"

53% of people report using less plastic since Blue Planet II aired



Source: Greenpeace

It's easy ..

- Every gram matters
- Lots of options from small to large, public and private
- Many of the actions that protect against climate change or its impacts have other benefits too
 - e.g. more walking, wheeling and public transport – health benefits to individuals from exercise, and to self and others from better air quality
 - E.g. more green space – lower urban heat effect, better rainfall management, better mental health and wellbeing

Lower cost ways to take action

- Write a letter or sign a petition
- Start a conversation
- Make one more meal a week plant based
- Unplug electronic devices when not in use
- Take 1 minute off shower time or run less water into your bath
- Join a clean up of your nearest green space, or turn a brown space into a greenspace (local organisations/businesses can help with this)
- Potentially walk or use public transport rather than use a car

I'm joining in... (1)

- Petitions
- Social media groups
- Collective activism



Source: The Ecologist



Reaching different audiences ?

I'm joining in (2)

- Reward schemes for recycling, walking to school etc
- Discussion / education events
- Creative/craft events

Reaching different audiences?



Beat the Streets, national events

READING CLIMATE FESTIVAL

24th September to 4th October 2022

Join our Q&A at a special screening of this movie on Friday 23rd September at Reading Biscuit Factory

PROGRAMME OF EVENTS

See following pages for over a week of free events to inspire and encourage positive action on climate change
www.readingcan.org.uk/festival #ReadingClimateFestival

Plus the events below run throughout the Festival:

INTRODUCTION TO NET ZERO Free online training from IEMA Available throughout the Climate Festival Who for: Organisations	READING RESCUE Rivers and Environmental Spaces Clean-up Event Various dates and times Who for: Anyone
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READING CLIMATE FESTIVAL 2022 | **R·E·D·A**™
Reading's Economy & Destination Agency | **THE GREAT BIG GREEN WEEK**



Your examples and questions

Reflection – what have we learnt

What is one thing you will take away from today?

What's your next step?



RMets

Royal Meteorological Society

Promoting meteorology as a
science, profession and interest

Thank you!
Please stay in touch!
www.rmets.org
liz.bentley@rmets.org

@RMets

