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The Paris Agreement – where are
we now?

New evidence, a new call for action

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#CabotLecture2018

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What happened in Paris?

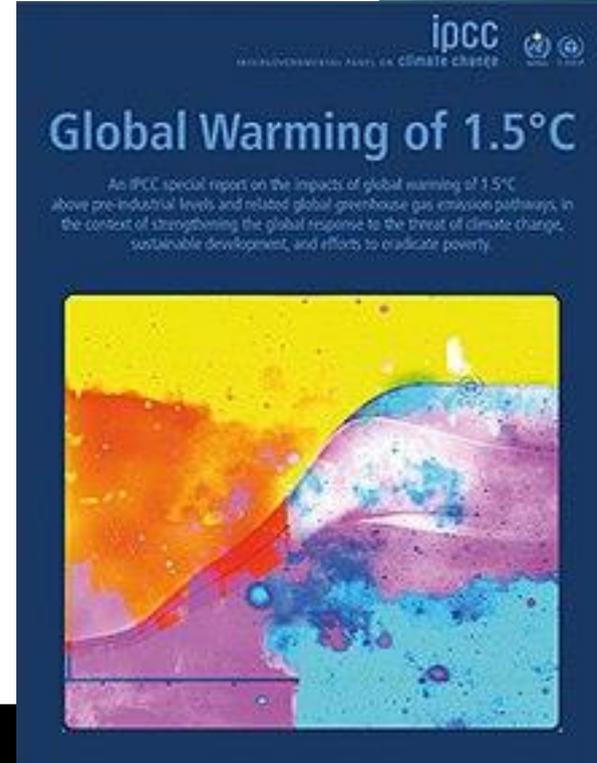
- December 2015 – world leaders met at the 21st United Nations Framework Convention on Climate Change
- Agreed to keep mean global temperature rise to below 2 °C, and pursue efforts to limit warming to < 1.5 °C



3 years on...

- Direct response to government request in Paris - Intergovernmental Panel on Climate Change Special Report on Global Warming of 1.5 °C
- What are the impacts of limiting warming to 1.5 °C (and compared to 2 °C)? What is required to achieve this?

91 authors, 40 countries, 6000 references



Bristol researchers involved in IPCC



*Prof.
Tony
Payne*



*Dr Jo
House*



*Prof.
Dani
Schmidt*



*Prof.
Andy
Ridgwell*



*Prof.
Dan
Lunt*



*Prof.
Jon
Bamber*



*Dr
Dann
Mitchell*



*Prof. Pierre
Friedling-
stein*

Tonight

- The Paris Agreement: Where are we now?
- **Why** does limiting to 1.5C matter?
- **What** will the world look like?
- **How** do we achieve this?



*Prof. Tony
Payne*



*Dr Jo
House*



*Dr Dann
Mitchell*



*Dr Alix
Dietzel*



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Future climate change

Dr Dann Mitchell

 @ClimateDann

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Why did we write this report?

Science

Environmental

Human



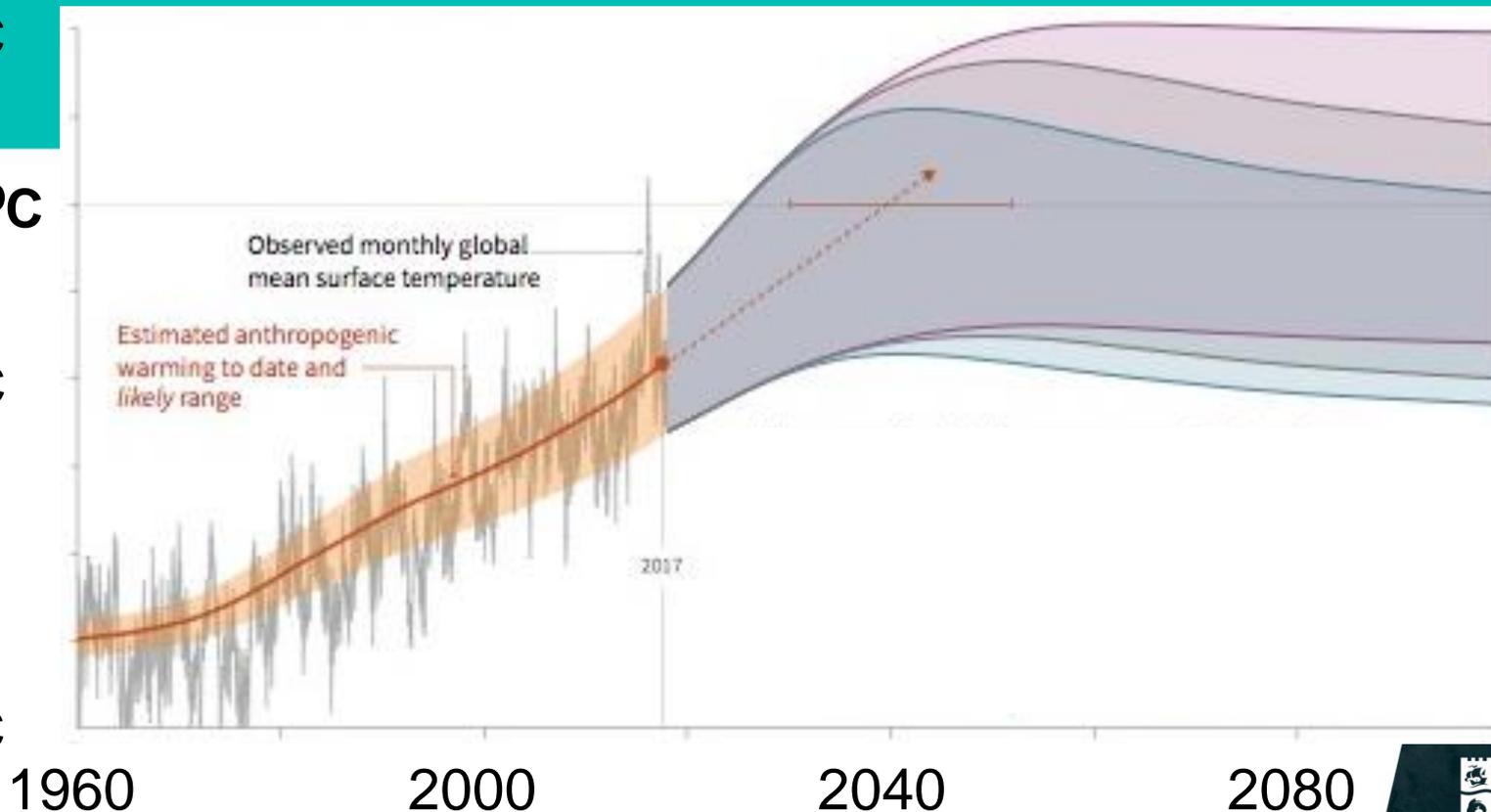
Global Mean Temperature

2 °C

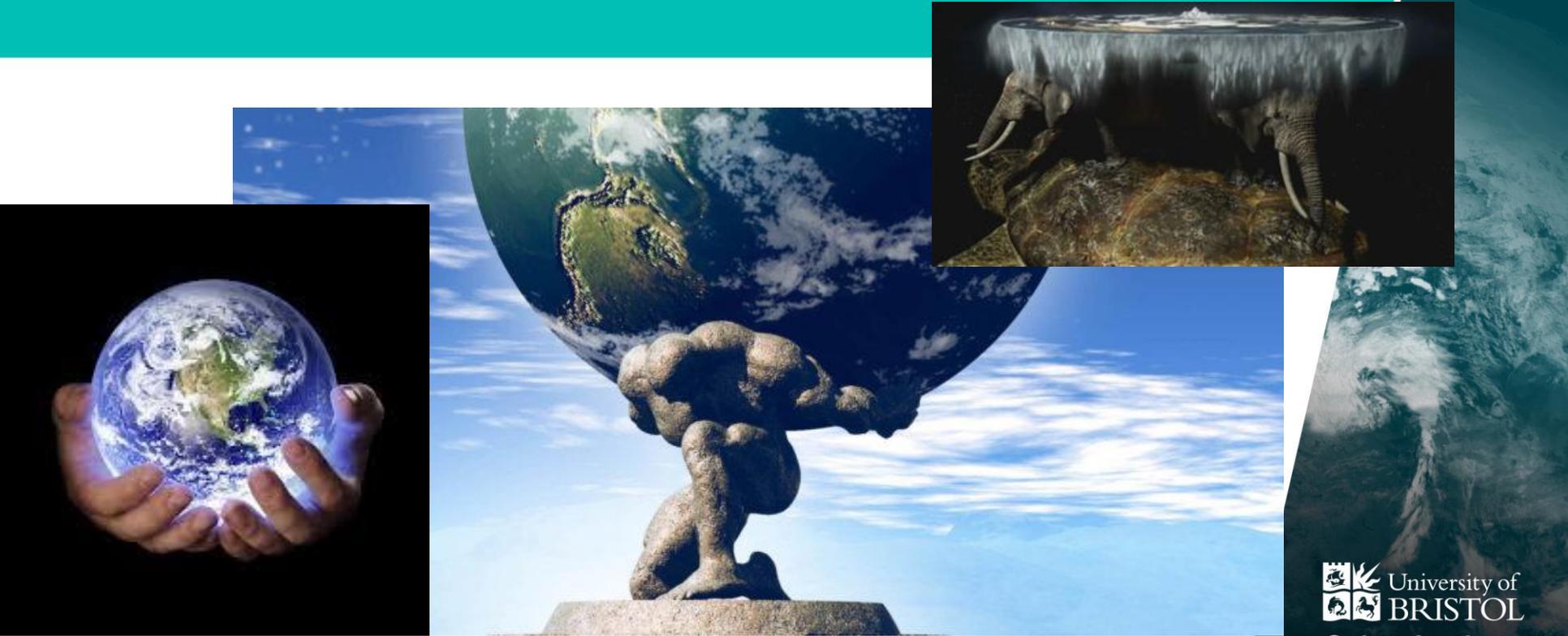
1.5 °C

1 °C

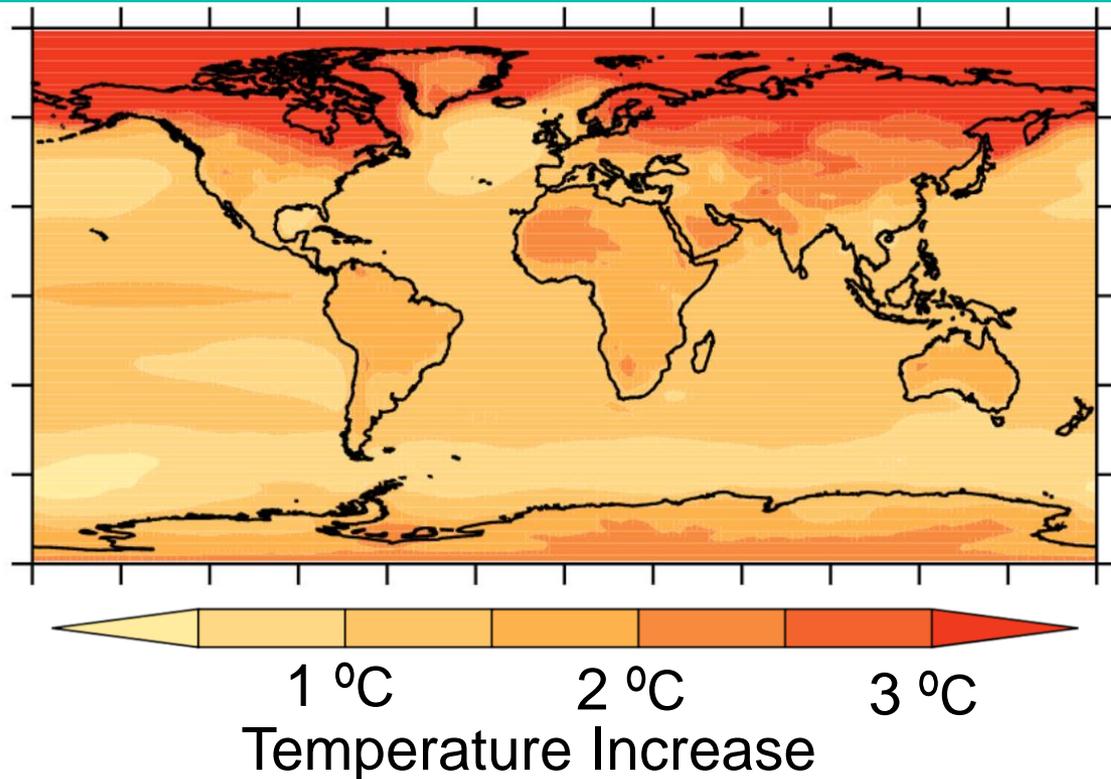
0 °C



Who cares about the global mean?



Regional temperatures at 1.5C



2 °C

Almost every year

1.5 °C

Every 2 years

Current

Every 5 years



How can the global temperature impact us locally?

1. Heating up the atmosphere

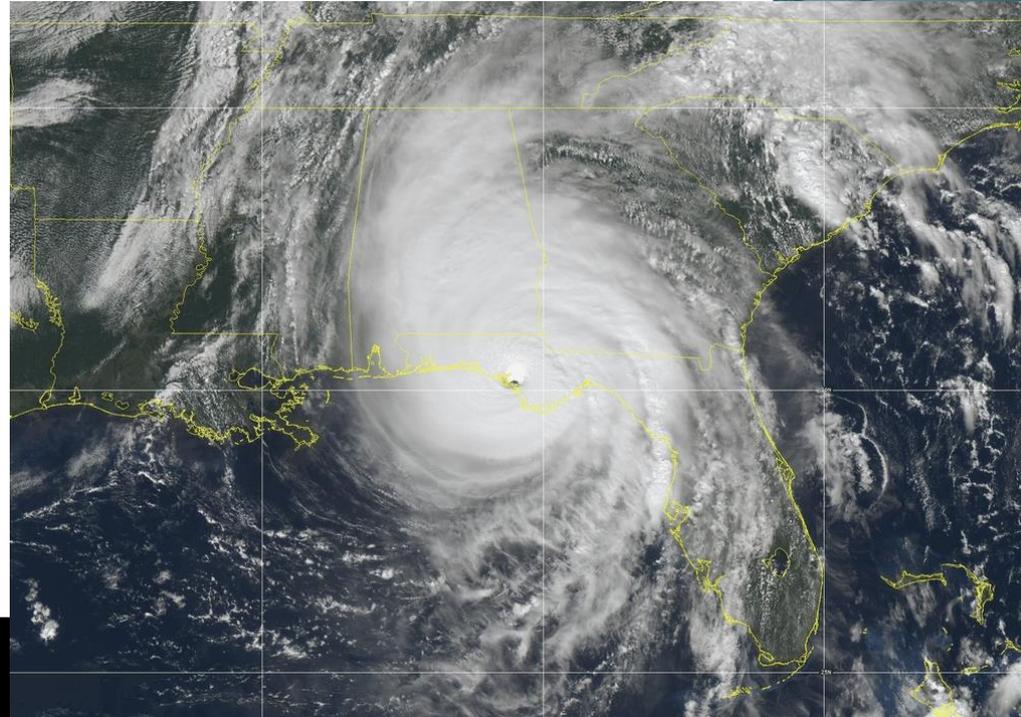
➤ **It expands**

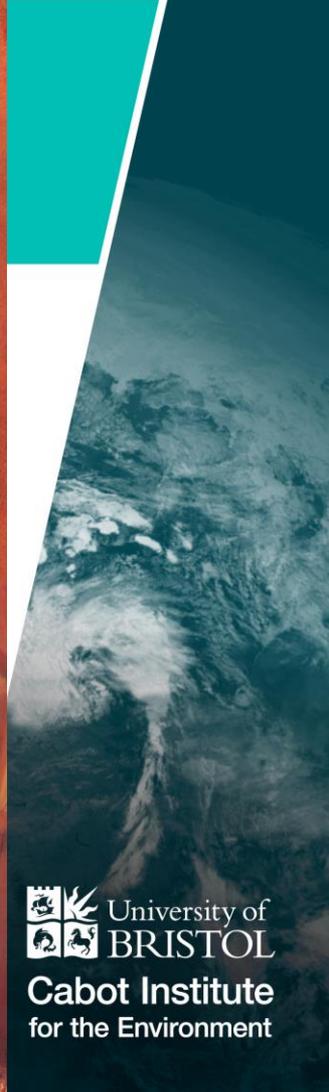
2. Stretching storm systems

➤ **More intense**

3. More intense storms

➤ **Last longer**





University of
BRISTOL

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What might a 1.5C world be like?

Tony Payne

School of Geographical Sciences

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Who am I?

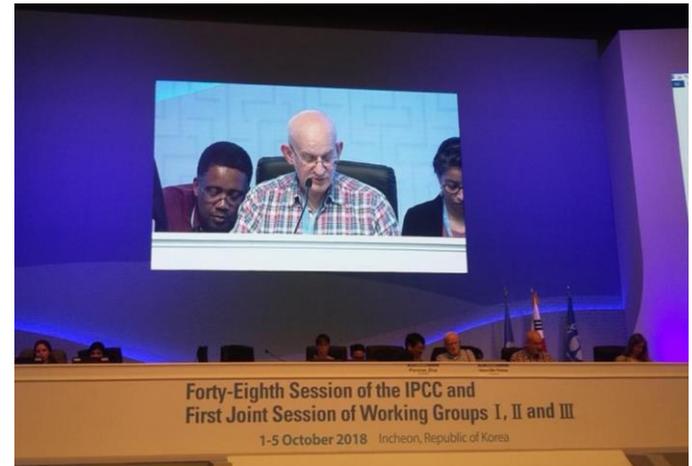
Main area of expertise in Greenland and Antarctic ice sheets, and future sea level rise

Lead Author on Sea level chapter 5th Assessment Report of the IPCC (2013)

Lead Author on Impacts chapter of 1.5C Special Report

Approval session of *Summary for Policy Makers*, Korea October 2018

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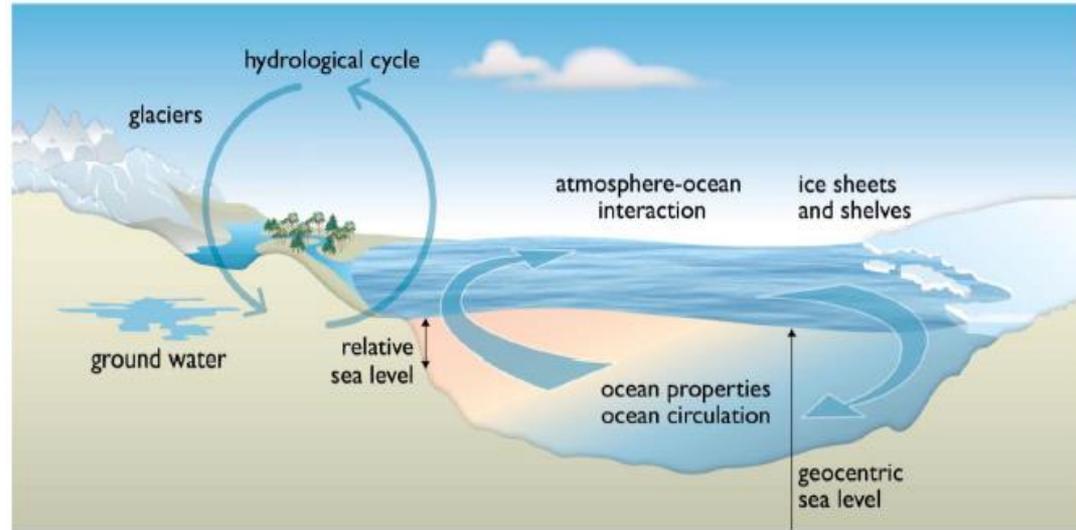


How important is the extra 0.5 °C?

Sea level

At 2100, around 10cm less in a 1.5C world compared to 2.0C (~20%)

Roughly 10 million fewer people exposed to risk

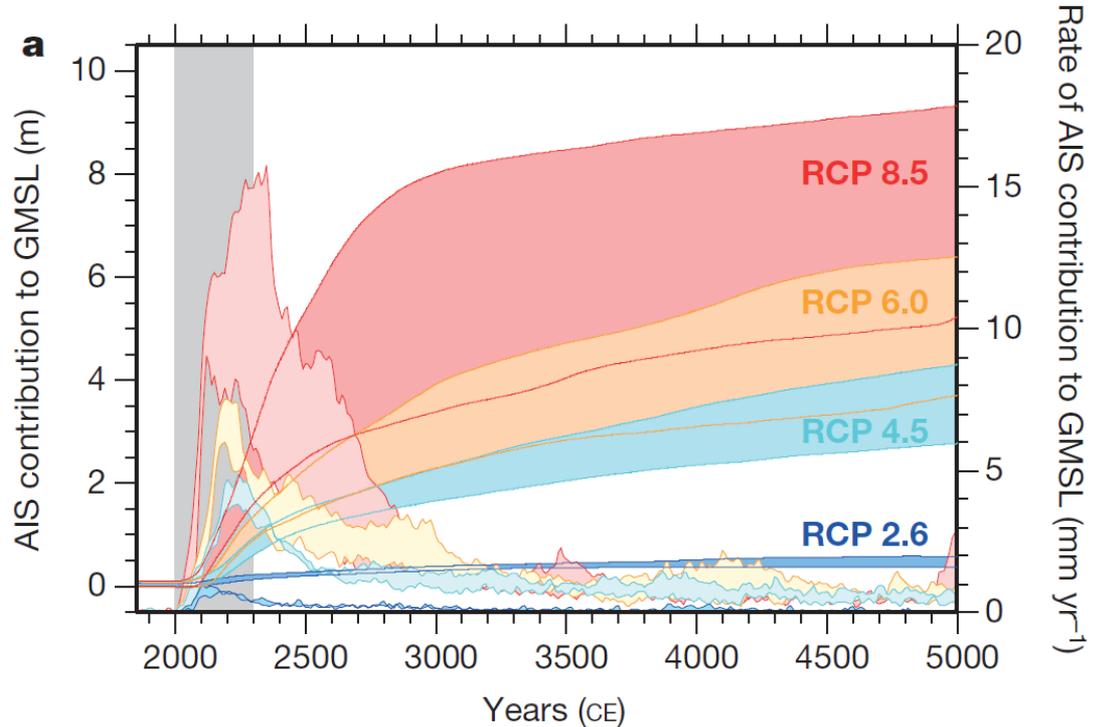


How important is the extra 0.5 °C?

Sea level

Melting Greenland and Antarctic ice sheets could raise by many meters over 100s-1000s years

Existential threat to many small island states and coastal cities

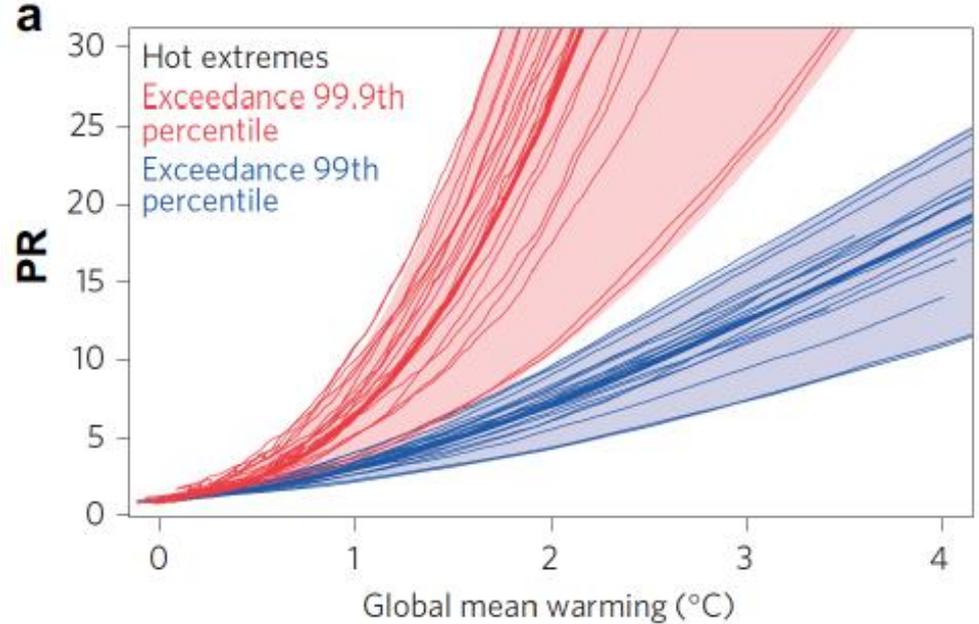


How important is the extra 0.5 °C?

Extremes of weather

Number and severity of days increase far more than mean

Reduced food availability in the Sahel, southern Africa and the Mediterranean

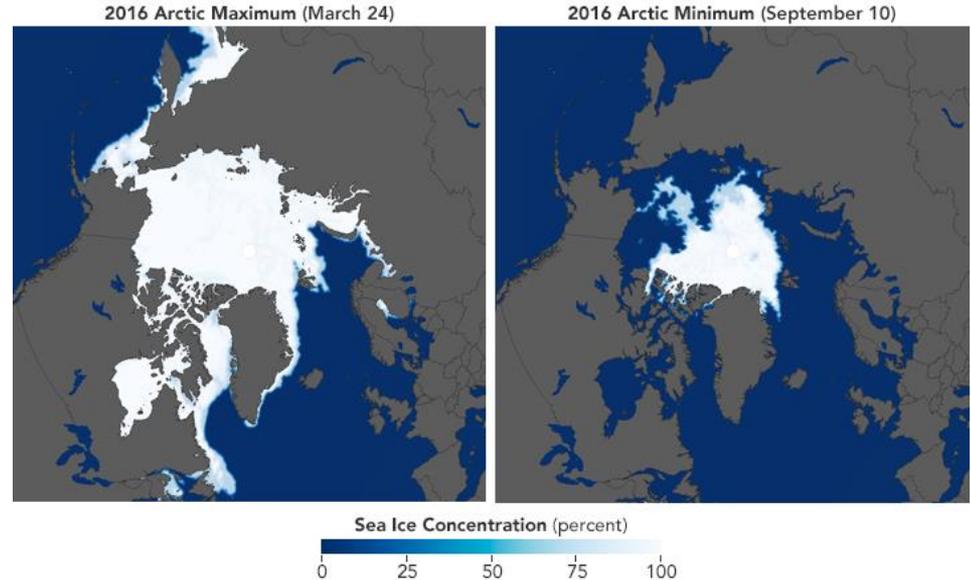


How important is the extra 0.5 °C?

Sea ice and the Arctic

Chance of a sea-ice free Summer increases from one per century (1.5C) to one per decade (2.0C)

Arctic ecosystems (tundra, permafrost) at particularly high risk of degradation



How important is the extra 0.5 °C?

Coral reefs and the oceans

Coral reefs all but disappear at 2.0C, 10-30% survive at 1.5C

Ocean warming, increased acidity and declining oxygen levels affect biodiversity and fisheries.



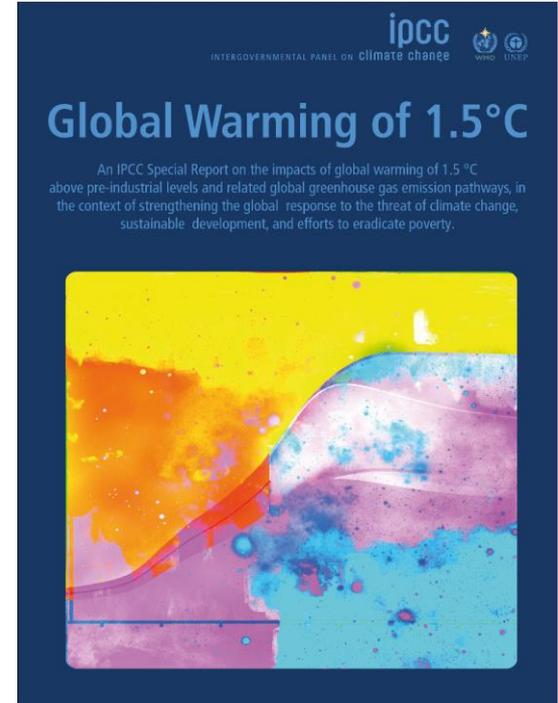
How important is the extra 0.5 °C?

Summary

Limiting warming to 1.5C substantially reduces ecosystem and biodiversity loss, as well as impacts on health, water and food security ...

how to achieve it?

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How can we achieve a 1.5
degree world?

Dr Jo House

Cabot Co-Chair: Environmental Change

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The Solutions – key messages

- There is lots that can be done and is being done, **but we need to ramp it up**
- Some is already affordable and could save you money
- It has other co-benefits so we might want to do it anyway



Nations Unies

Conférence sur les Changements Climatiques 2015

COP21/CMP11

Paris, France



- 196 countries signed up to Paris Agreement
- Country pledges “Nationally Determined Contributions”

Well below
2 °C

Pursue
efforts
1.5 °C

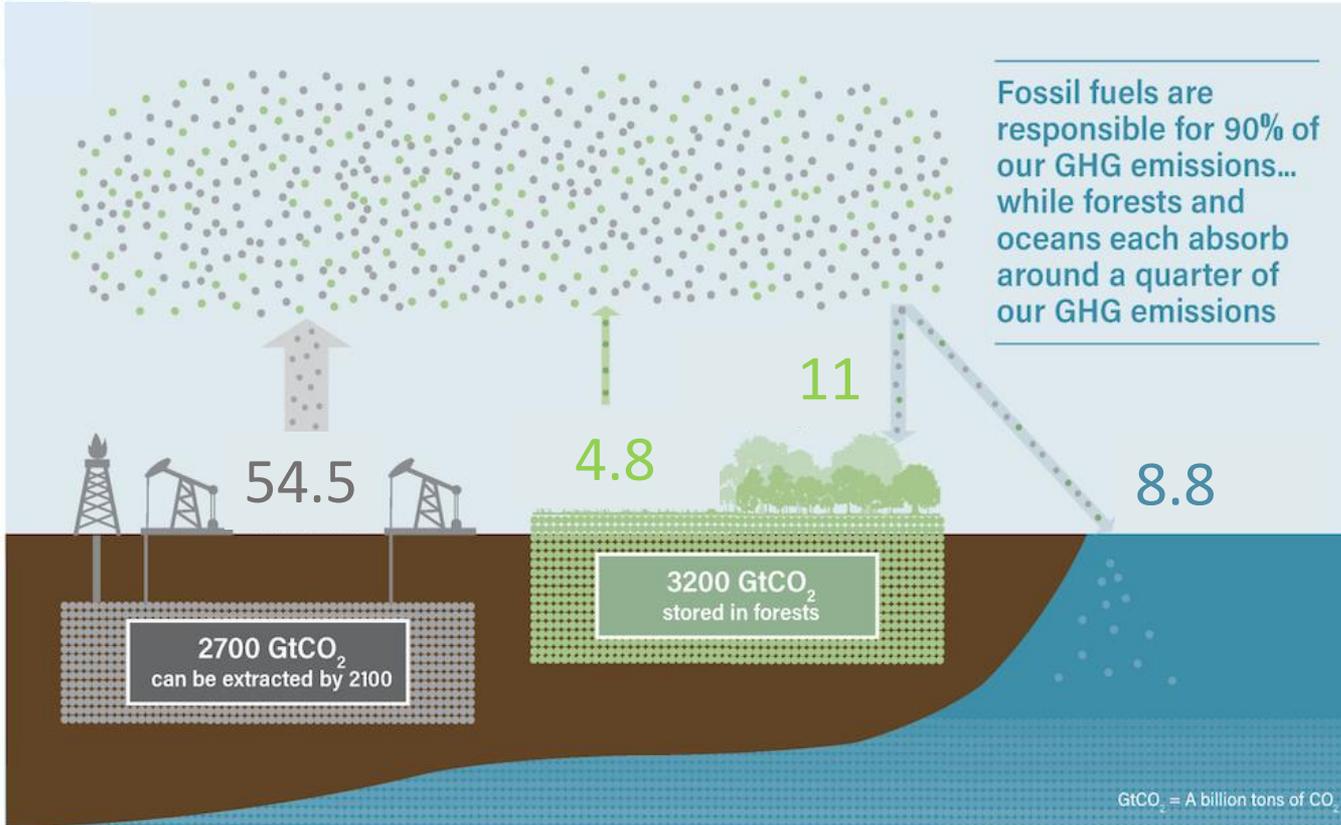
Balance of
emissions
& removals

What do we need to do?

Main Greenhouse Gasses:

- Carbon dioxide
- Methane
- Nitrous oxide

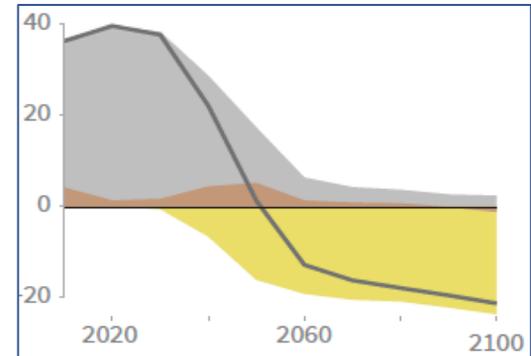
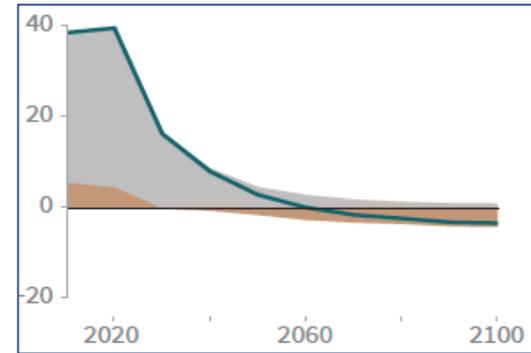
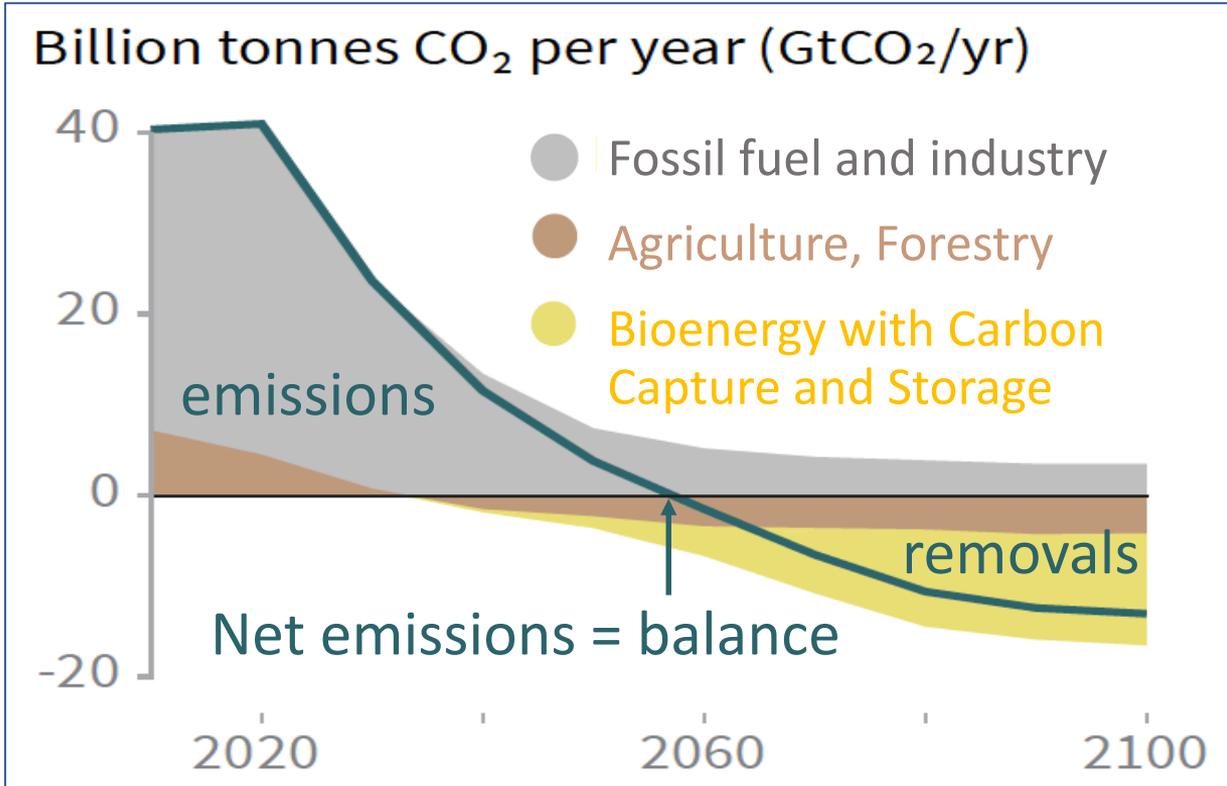
We can only put 750 GtCO₂ into the atmosphere to limit warming to 1.5 degrees – around 15 years or current emissions



Emissions GtCO₂ per year = a billion tonnes of carbon dioxide per year

How do we get to 1.5 degrees?

There are multiple different pathways that can limit warming to 1.5 °C



What can we do with energy and industrial emissions?

Reduce

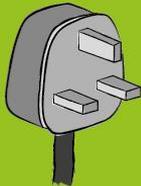
Replace

Remove

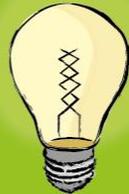
ENERGY SAVING



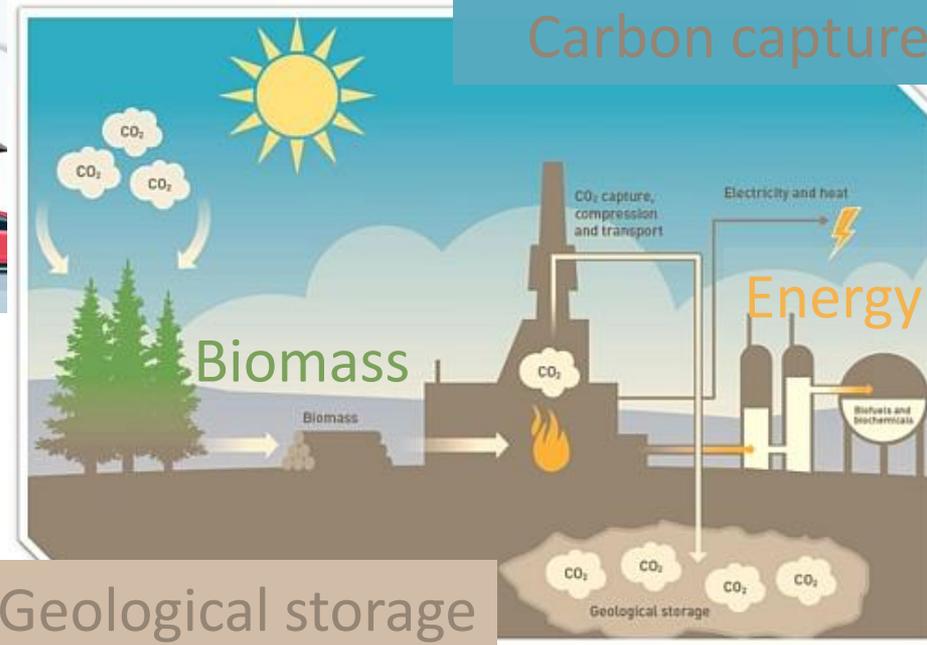
SWITCH IT OFF



UNPLUG IT



SAVE POWER



Carbon capture

Geological storage

What else can we do on the land?

Protect

Enhance

Reduce

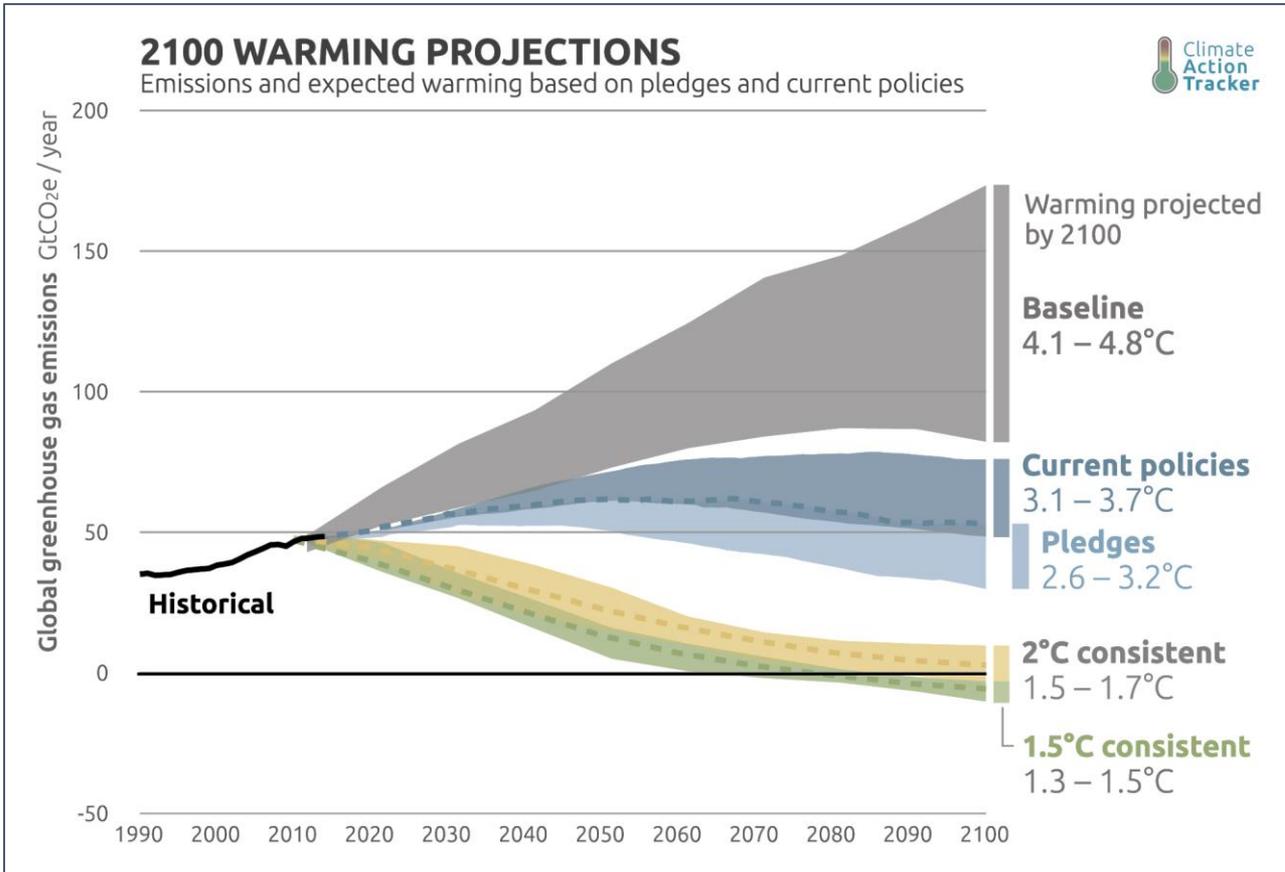


BBC NEWS

Tree planting 'can reduce flooding'



Where have we got to so far?



Climate pledges so far will limit global warming ... but not enough.

(Climate Action Tracker)

Forests expected to provide a quarter of pledged mitigation by 2030.

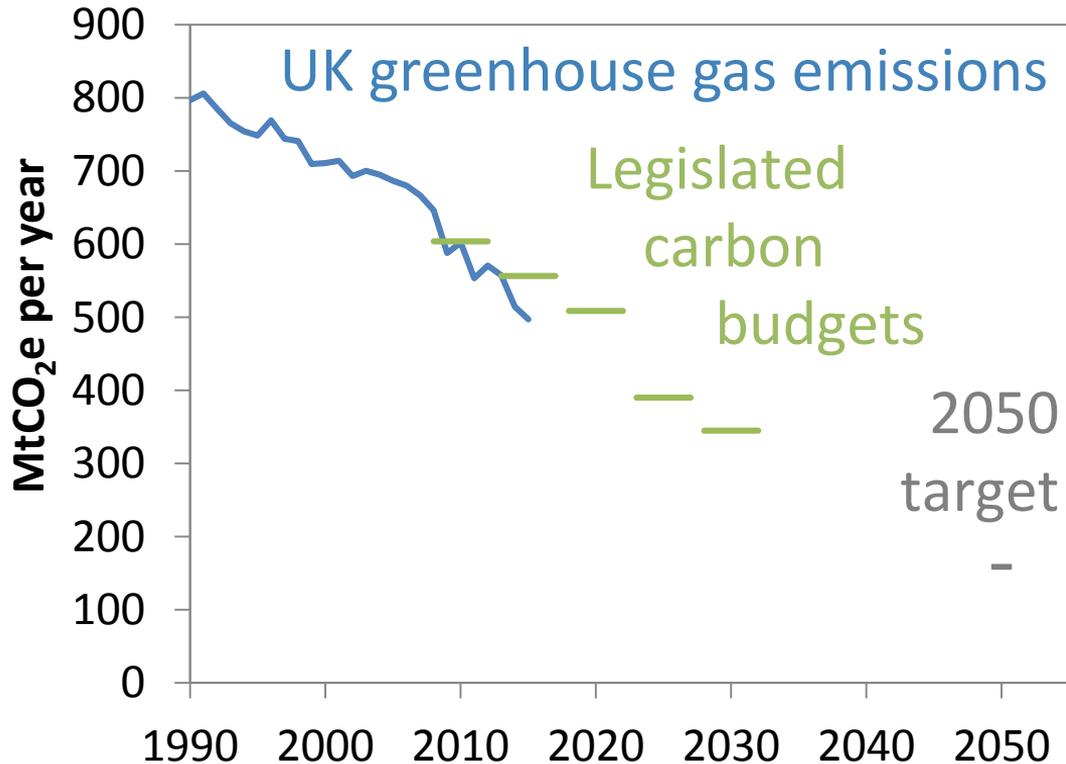
(Grassi, et.al. 2017)

What is the UK government doing ... and not doing?



Climate Change Act 2008

80% reduction in UK greenhouse gas emissions for 2050 compared to levels in 1990



What about Bristol?

Target: Reduce carbon dioxide emissions 80% by 2050 compared to 2005

So Far: reduced energy use by almost 20% and carbon dioxide emissions by almost 18% between 2005 and 2013



The Solutions – key messages

- There is lots that can be done and is being done, **but we need to ramp it up**
- Some is already affordable and could save money
- It has other co-benefits so we might want to do it anyway

How can we make it happen?





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How Can We Achieve a 1.5
Degree World?

Dr Alix Dietzel
Lecturer in Global Ethics
@alixdietzel

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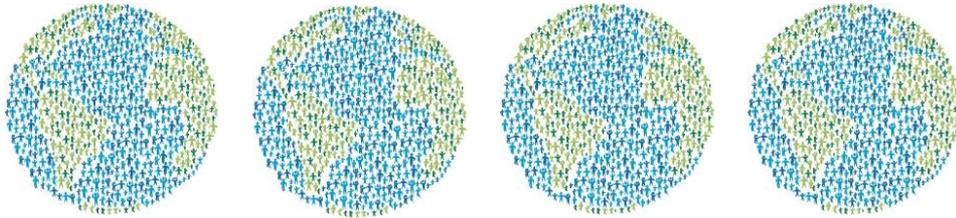


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My Research

Climate change justice – ethics, fairness, responsibility, human rights.

Climate change policy analysis – states, sub-state actors, individuals.



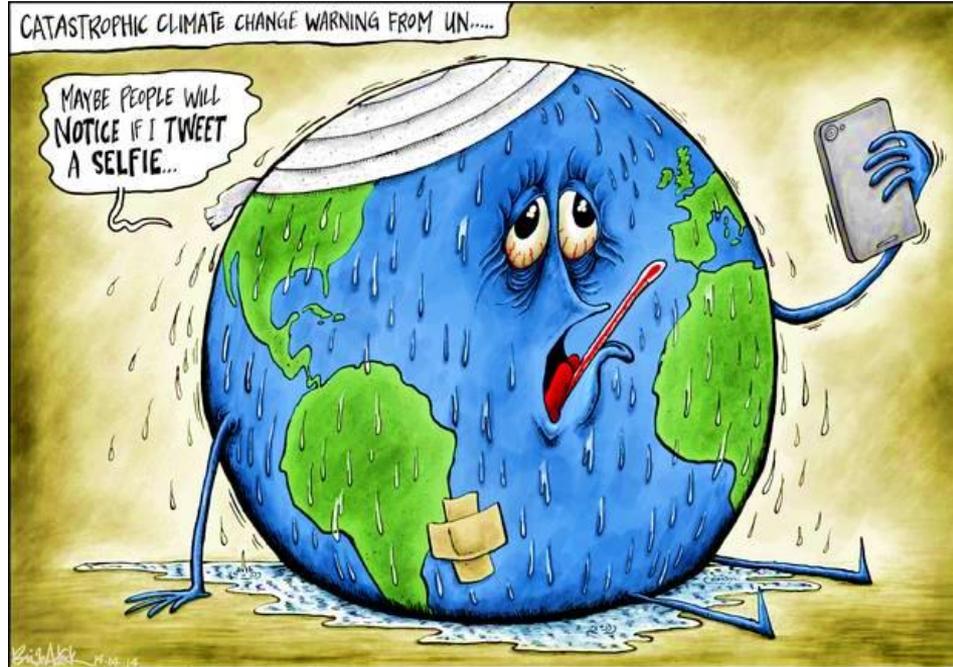
The Global Political Response: The UNFCCC (Kyoto Protocol, Paris Agreement)



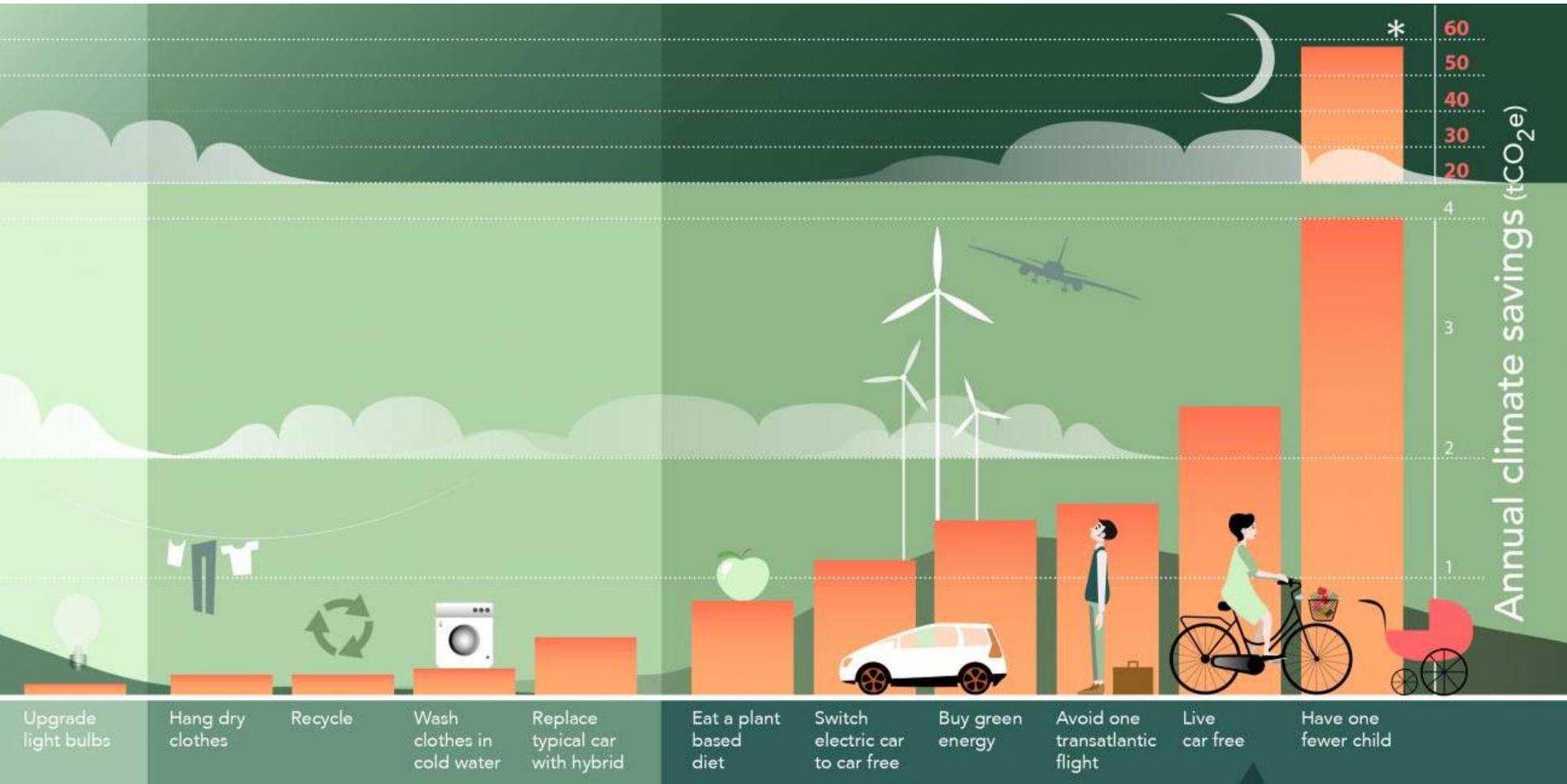
The Global Political Response: Sub-State Actors (Corporations, NGOs, Cities)



Who is Responsible for Acting on Climate Change?



What Should Individuals Do?



What Should Individuals Do?





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Q&A

Prof Jemma Wadham - @jemmawadham

Dr Dann Mitchell - @ClimateDann

Prof Tony Payne - @BristolGlac

Dr Jo House - @drjohouse

Dr Alix Dietzel - @alixdietzel

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