

Power of Print: Why Should You Care About Climate Change?

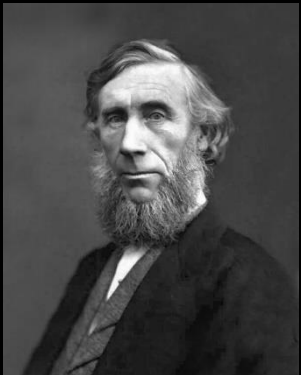


Professor Mark Maslin
University College London

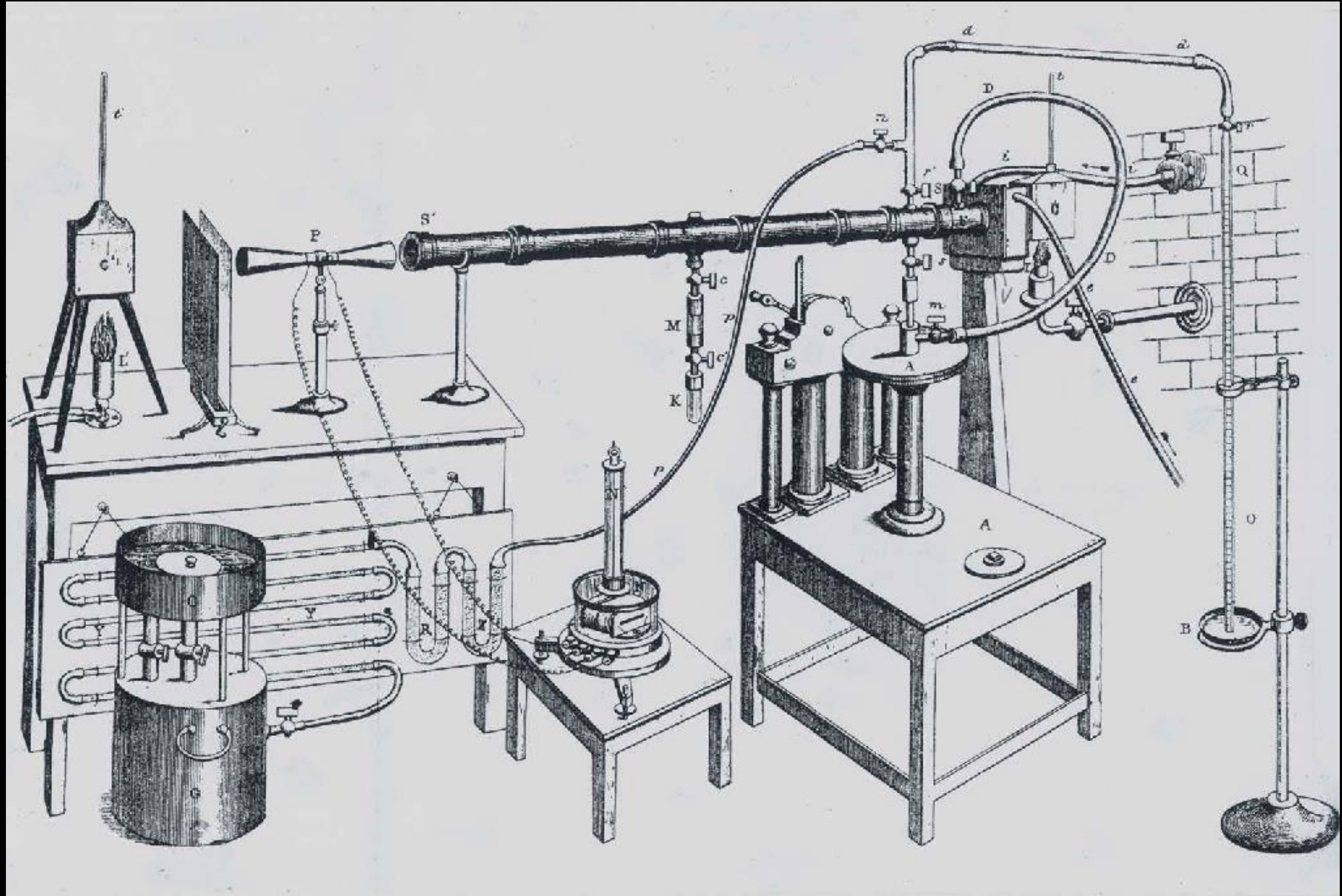
Tyndall explained the physics of the greenhouse effect in 1850s



Eunice Foote
(1819-1888)



John Tyndall
(1820-1893)



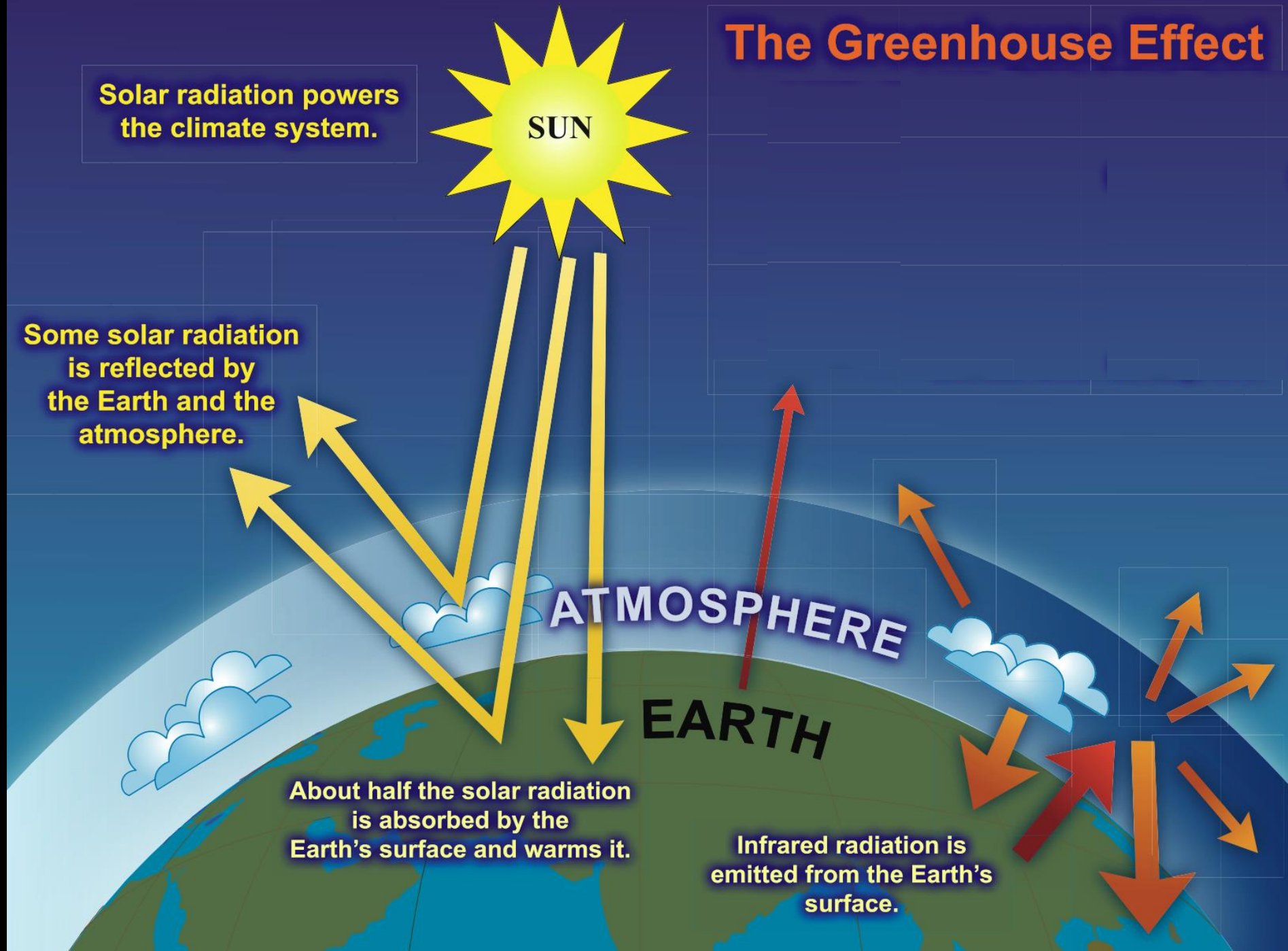
The Greenhouse Effect

Solar radiation powers the climate system.

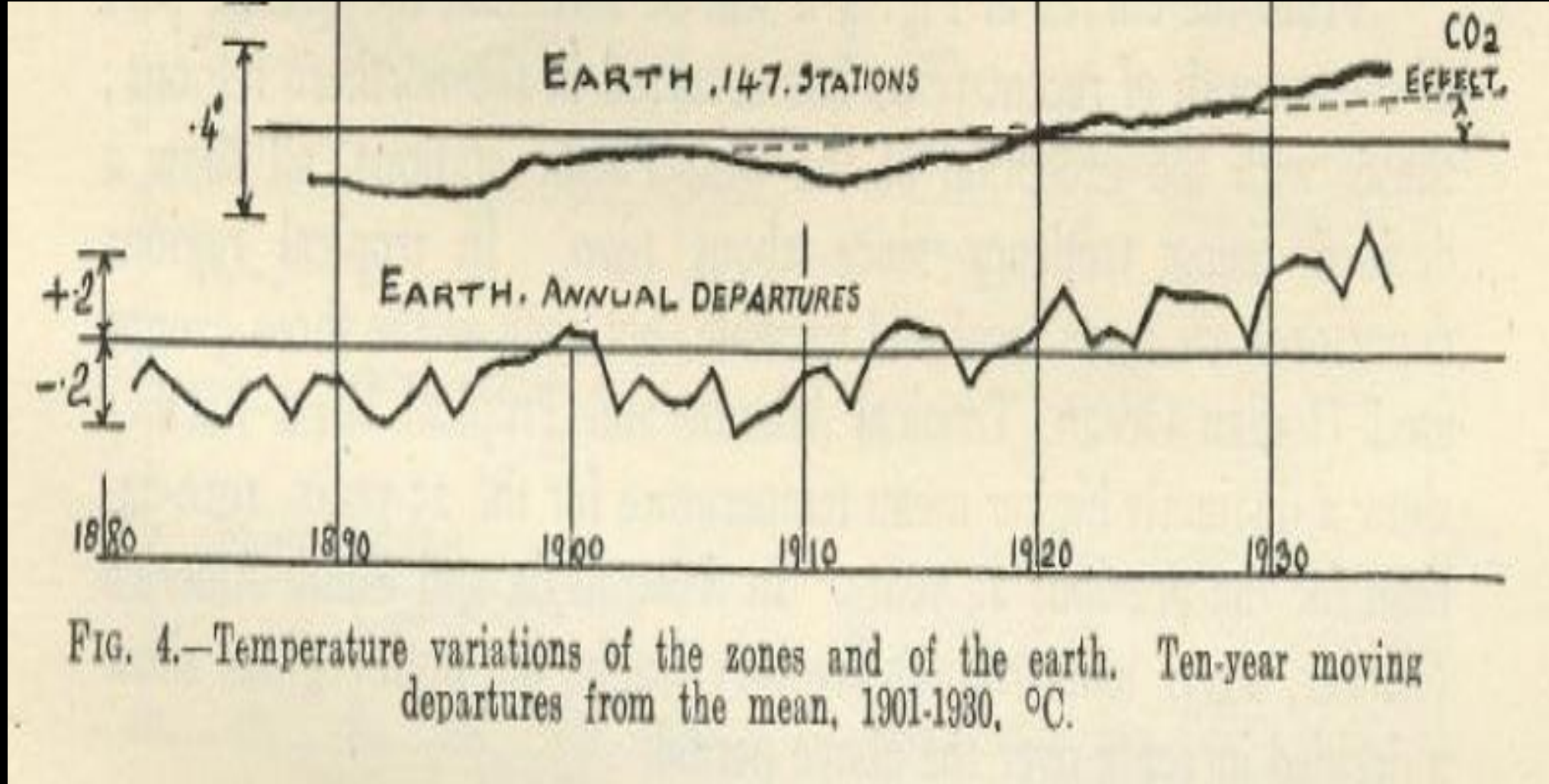
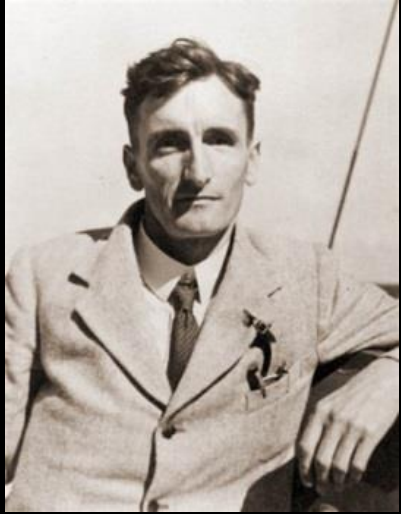
Some solar radiation is reflected by the Earth and the atmosphere.

About half the solar radiation is absorbed by the Earth's surface and warms it.

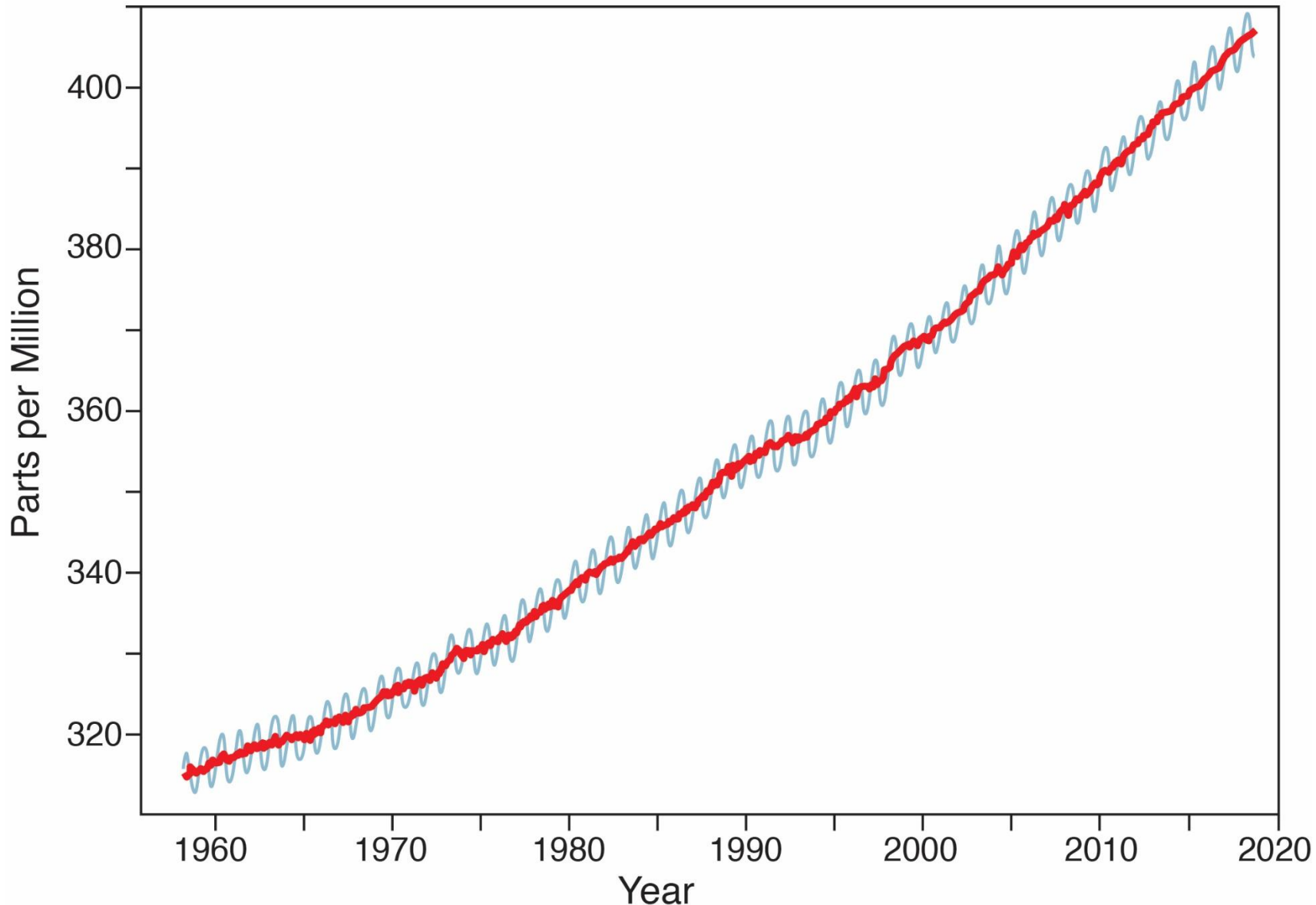
Infrared radiation is emitted from the Earth's surface.



Guy Callendar was first to discover the world was warming in 1938



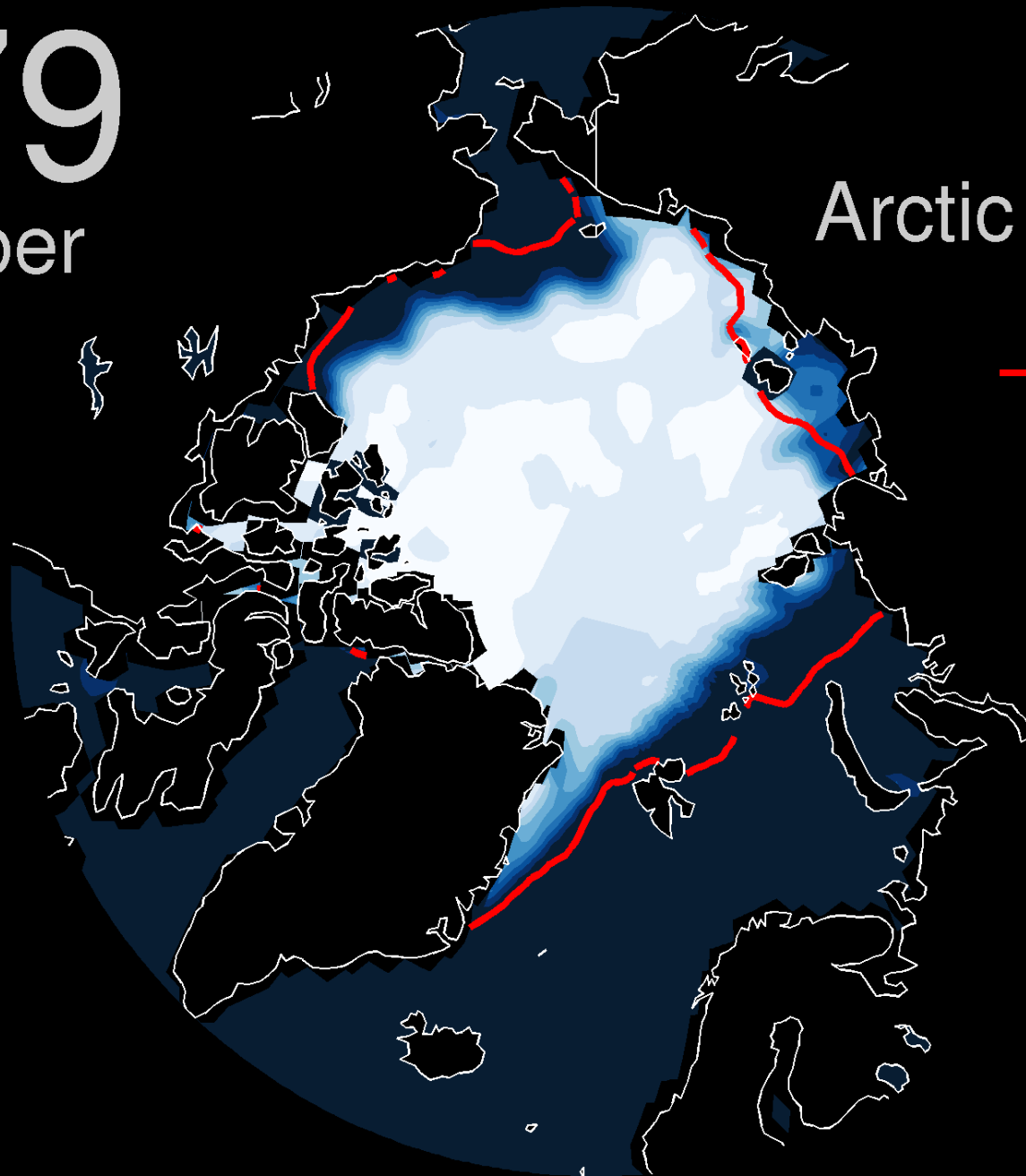
Atmospheric CO₂ at Mauna Loa Observatory



Carbon dioxide levels in the atmosphere have increased by 45% since the industrial revolution

Highest in 3 million years

1979
September



Arctic sea ice

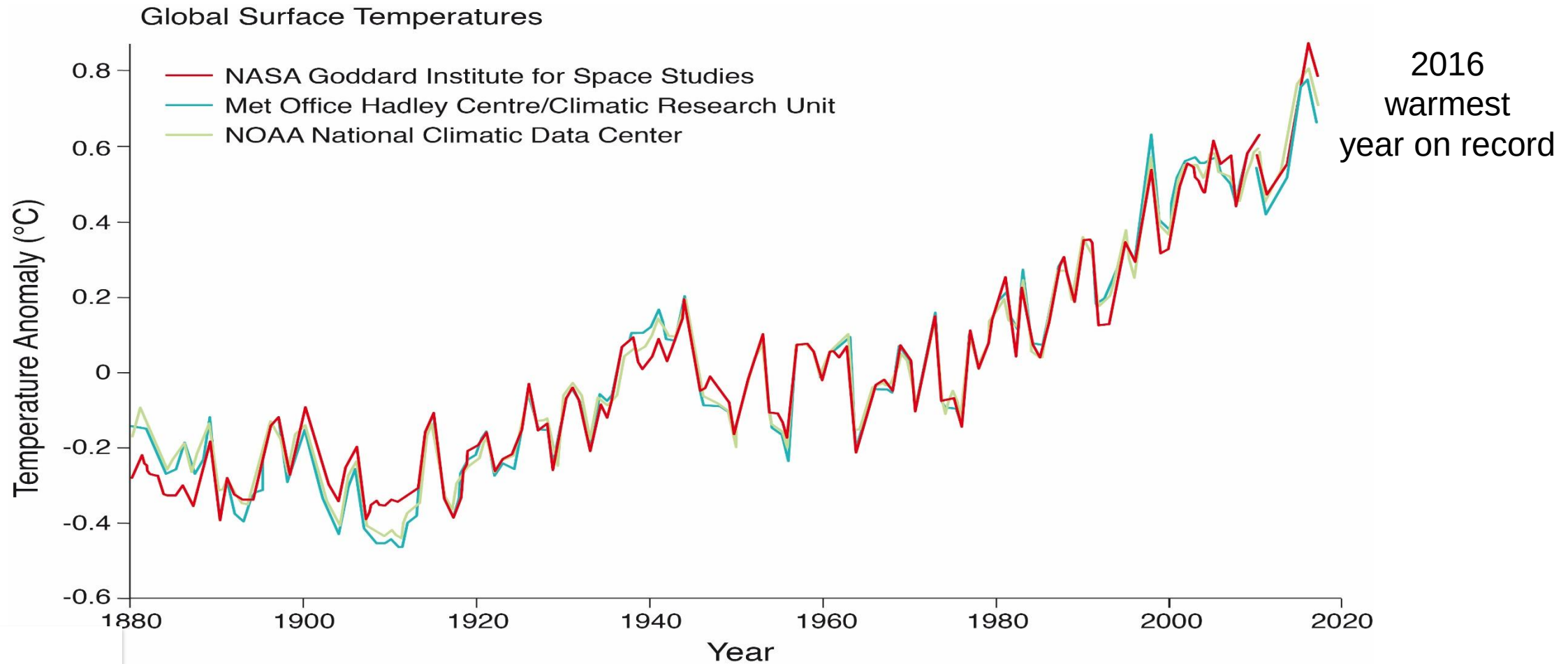
— Edge in 1980s

Global sea level rise 1881

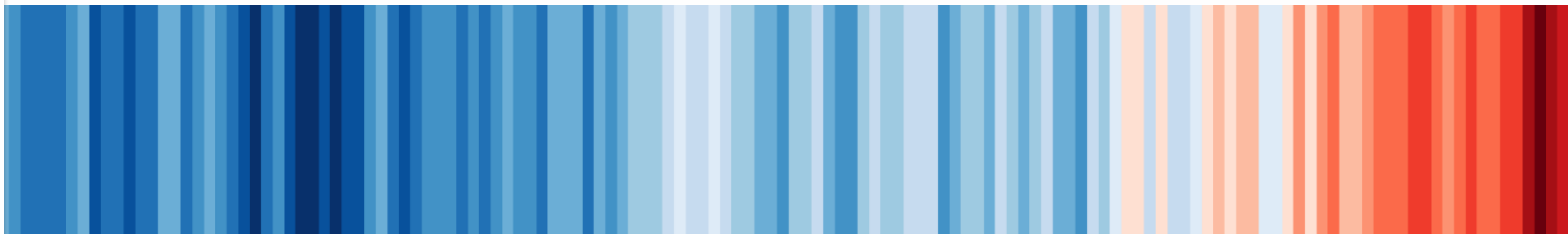


Graphic:
Kevin Pluck

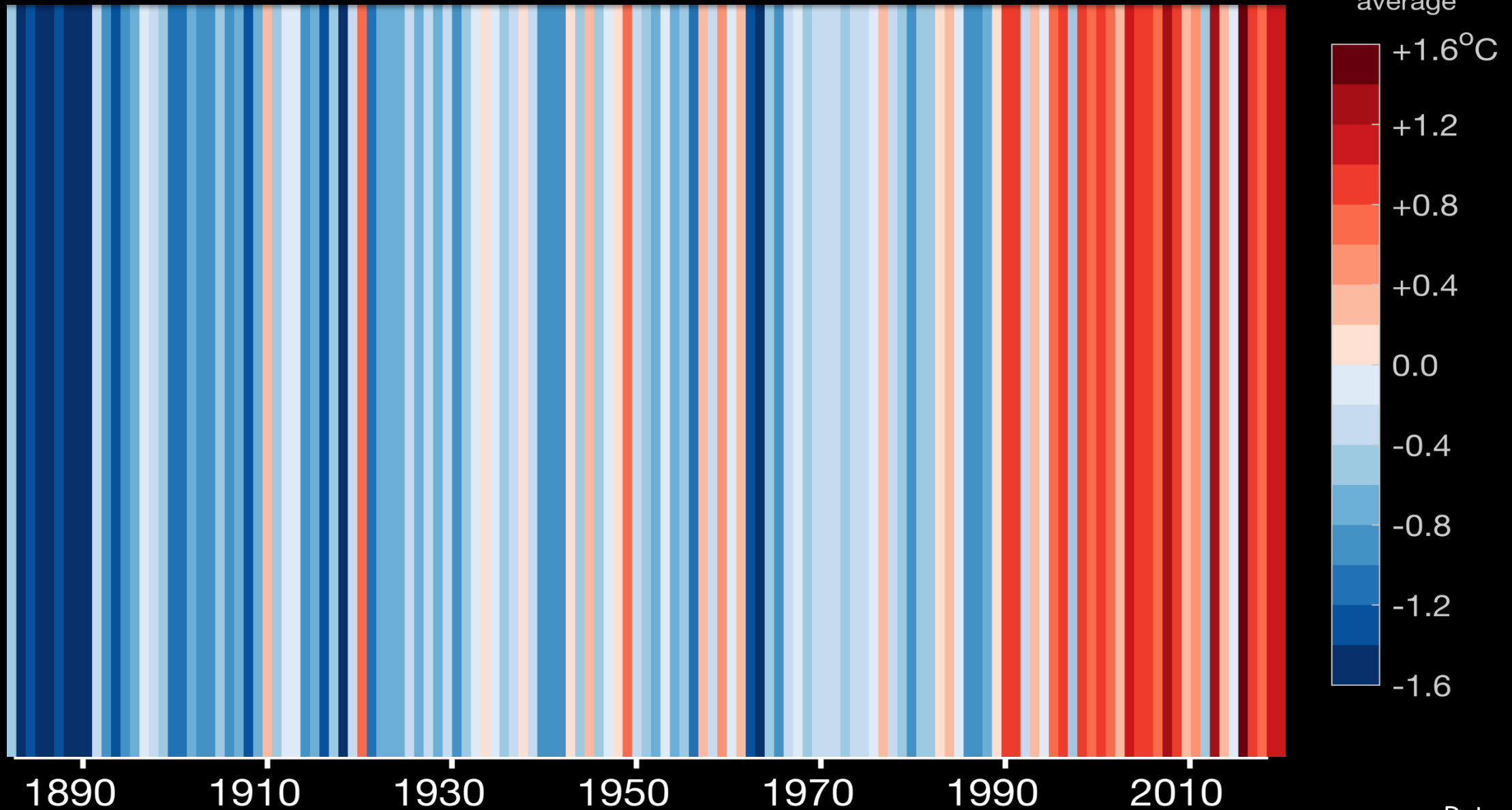
Annual global temperatures (1880-2018)



#warmingstripes
Data Met Office
from Ed Hawkins



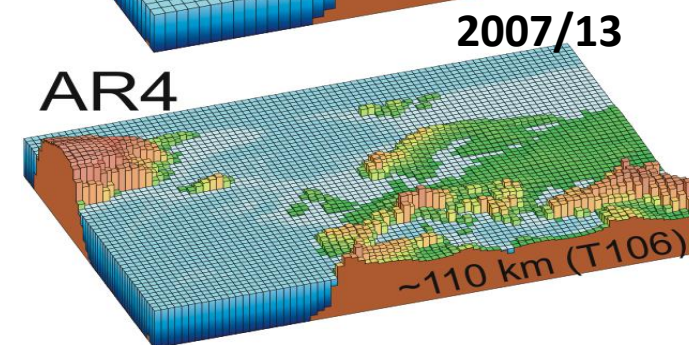
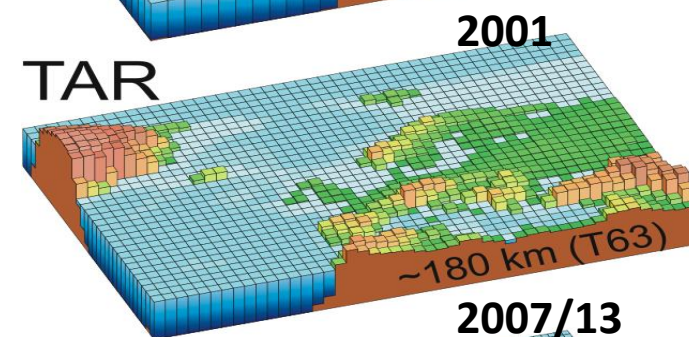
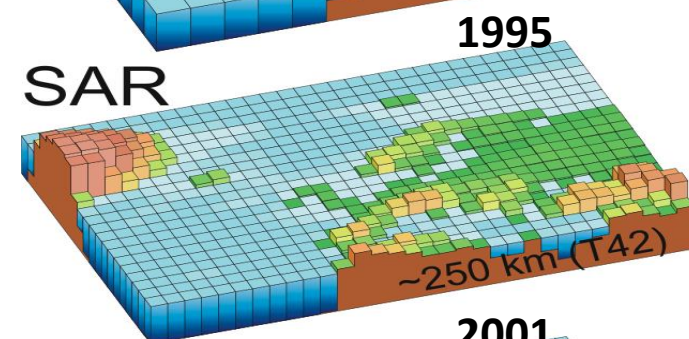
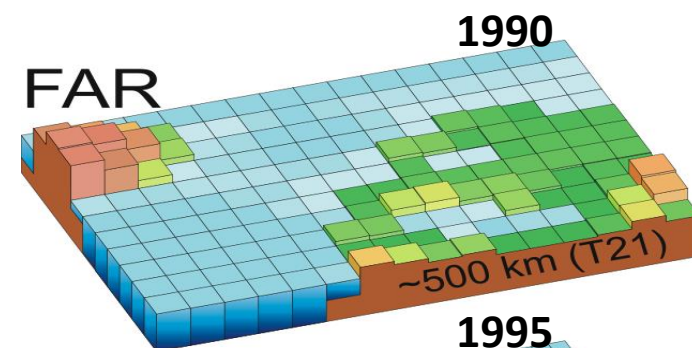
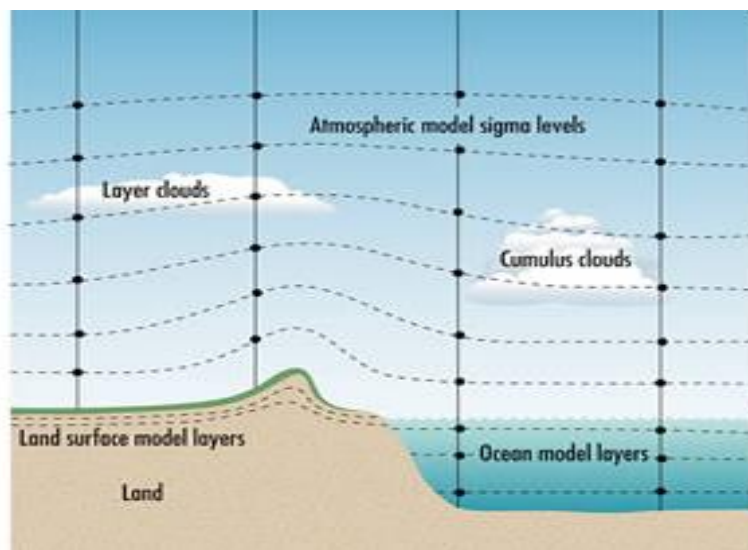
London temperatures (1850-2018)



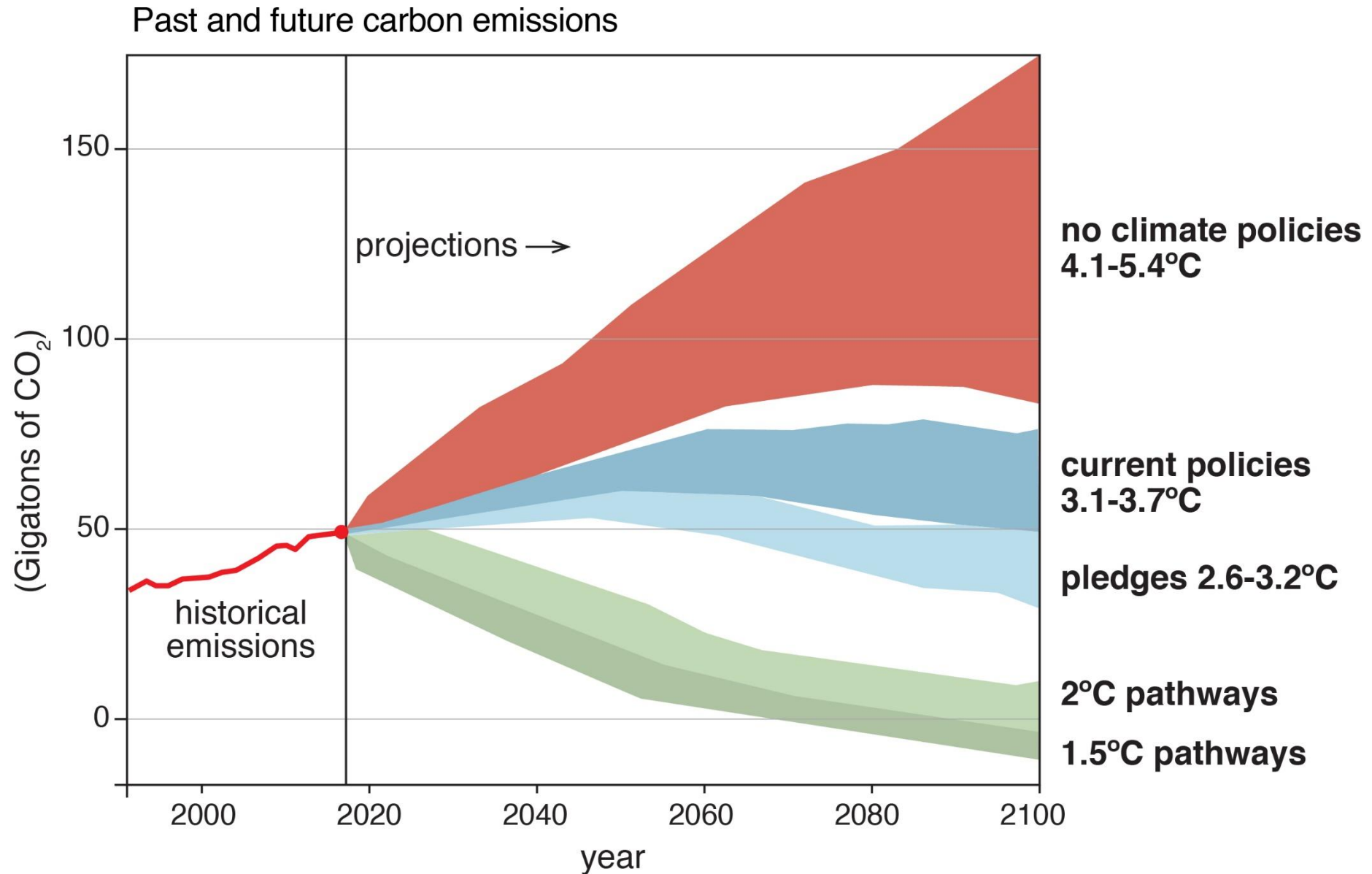
Data: Met Office



Supercomputer models provide visions of the future

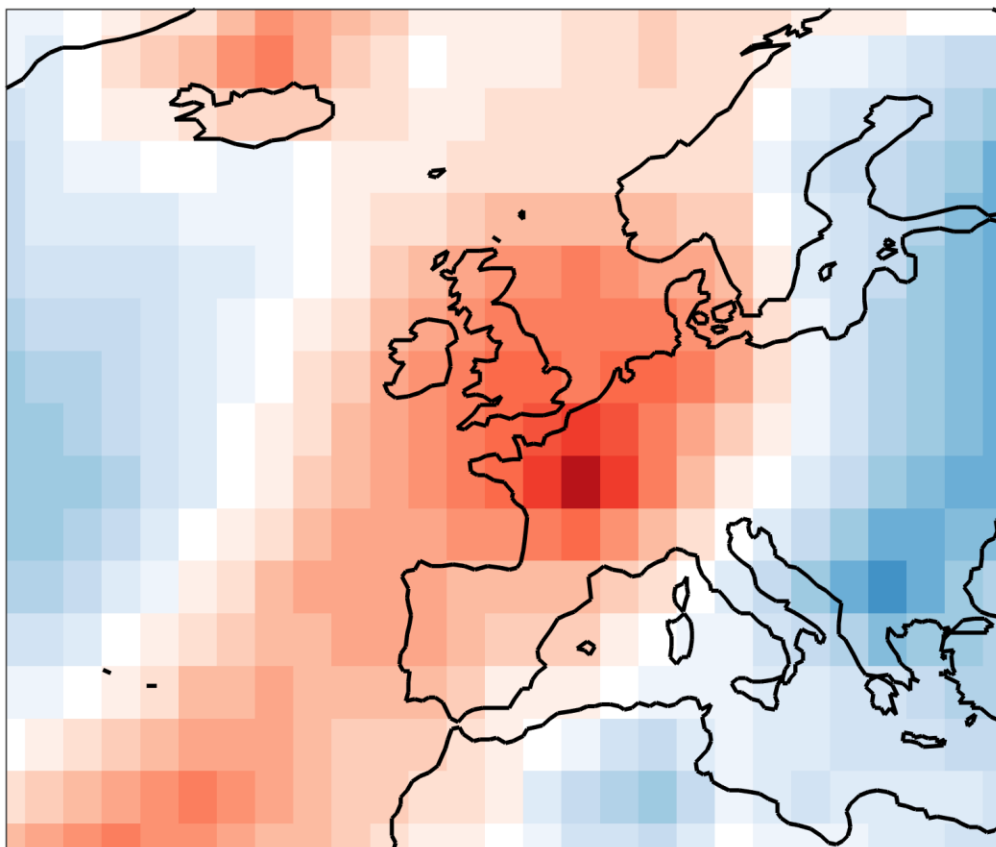


Future warming will depend on our choices about carbon emissions

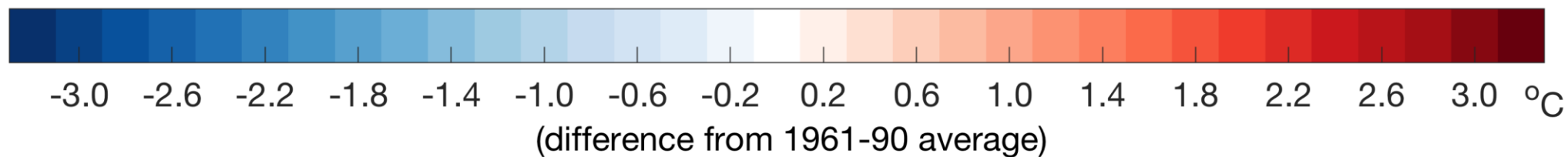
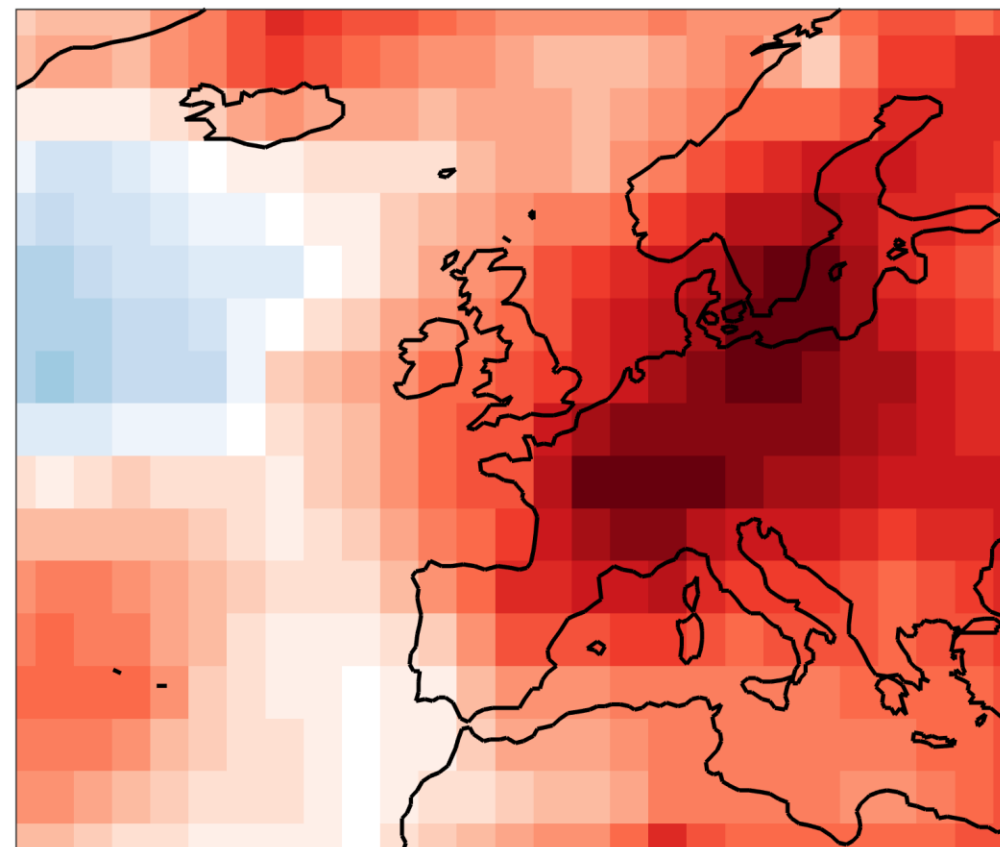


Warmer than normal?

Summer 1976

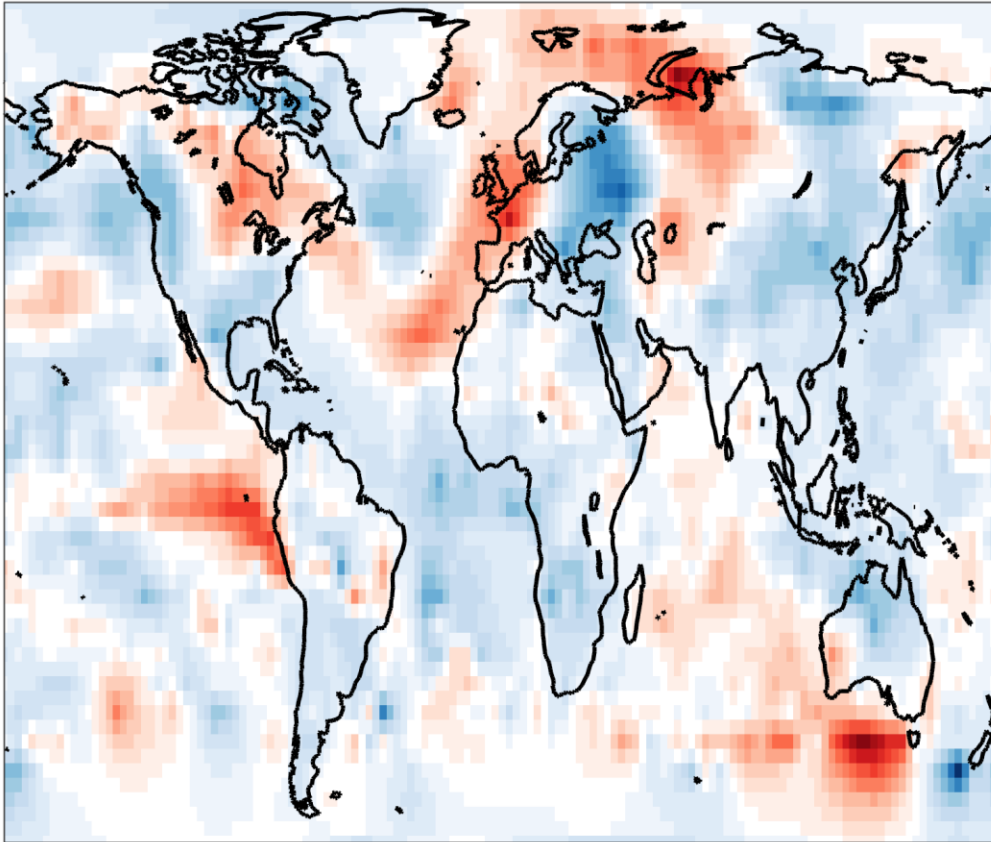


Summer 2018

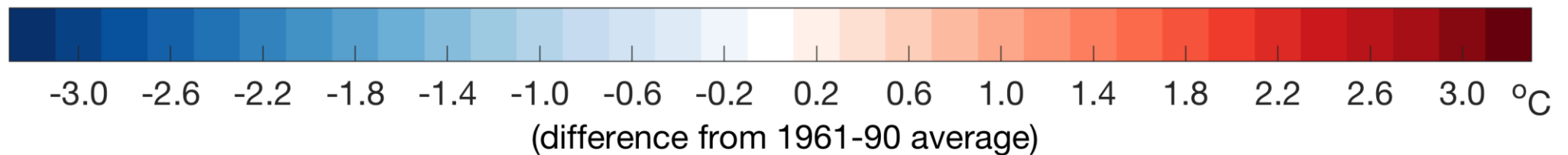
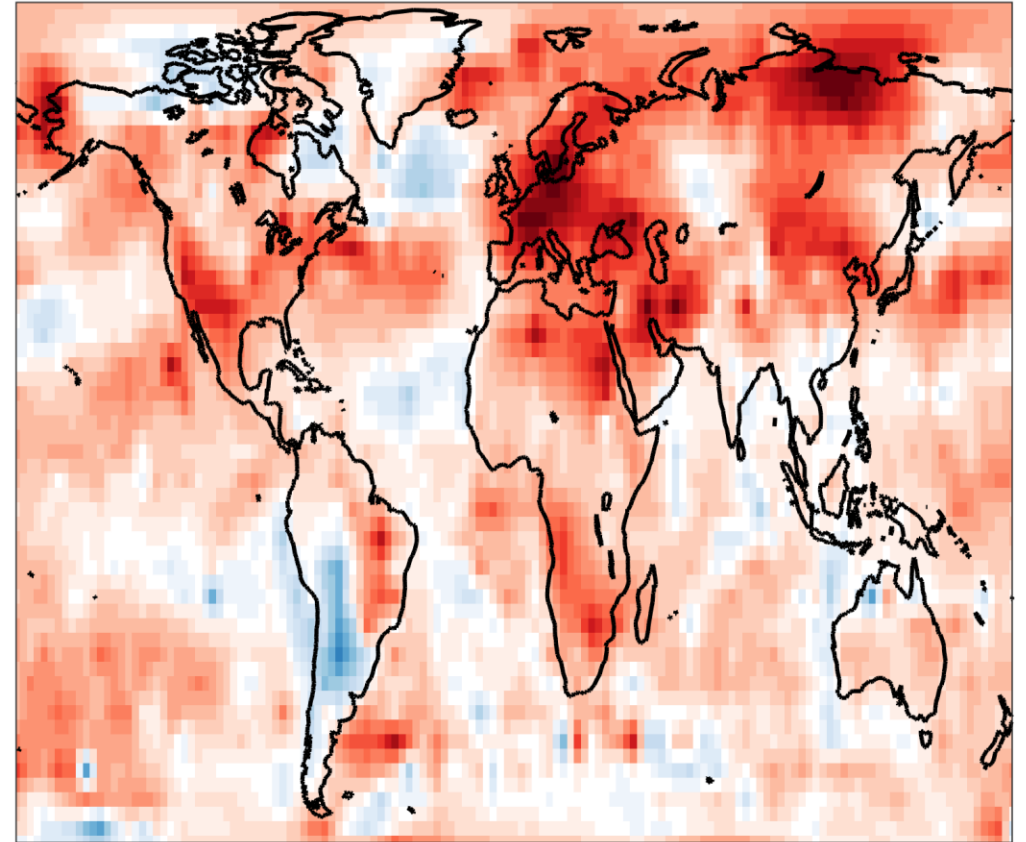


Warmer than normal?

Summer 1976



Summer 2018



Summers like those of 1976, 2003,
2007 and 2018 will be normal



Dungeness 2018

Temperature distribution in London, August 2003

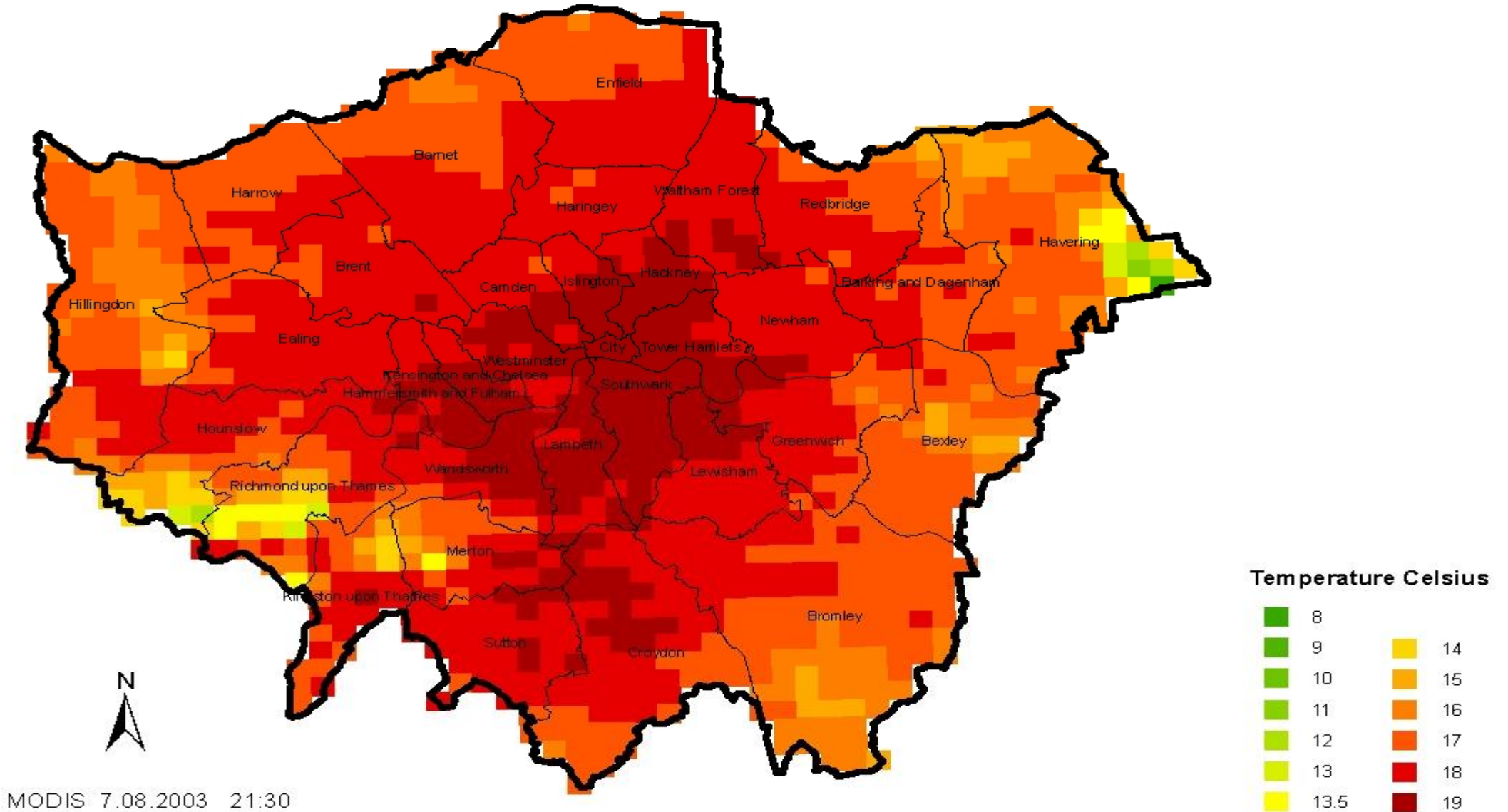
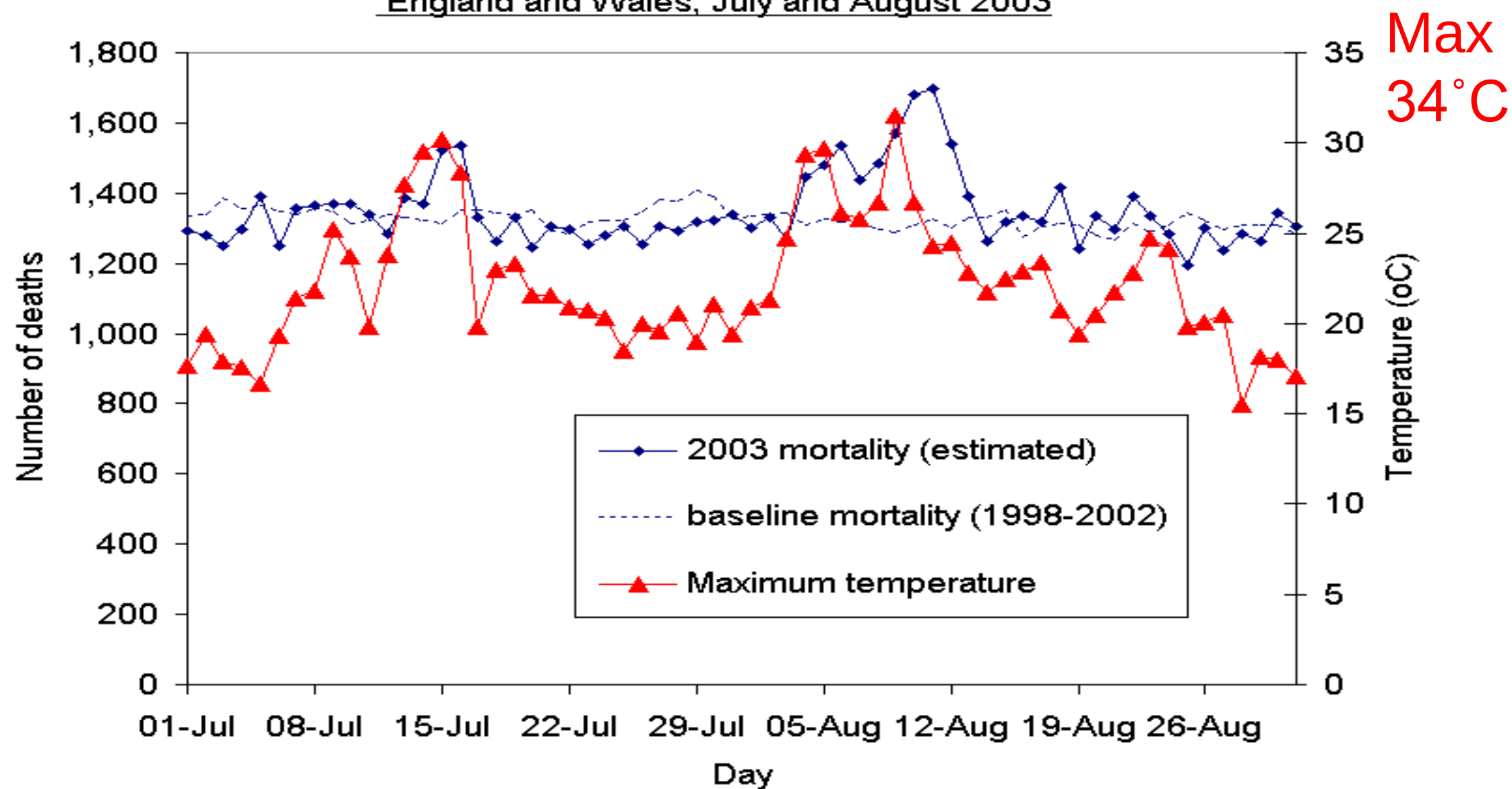
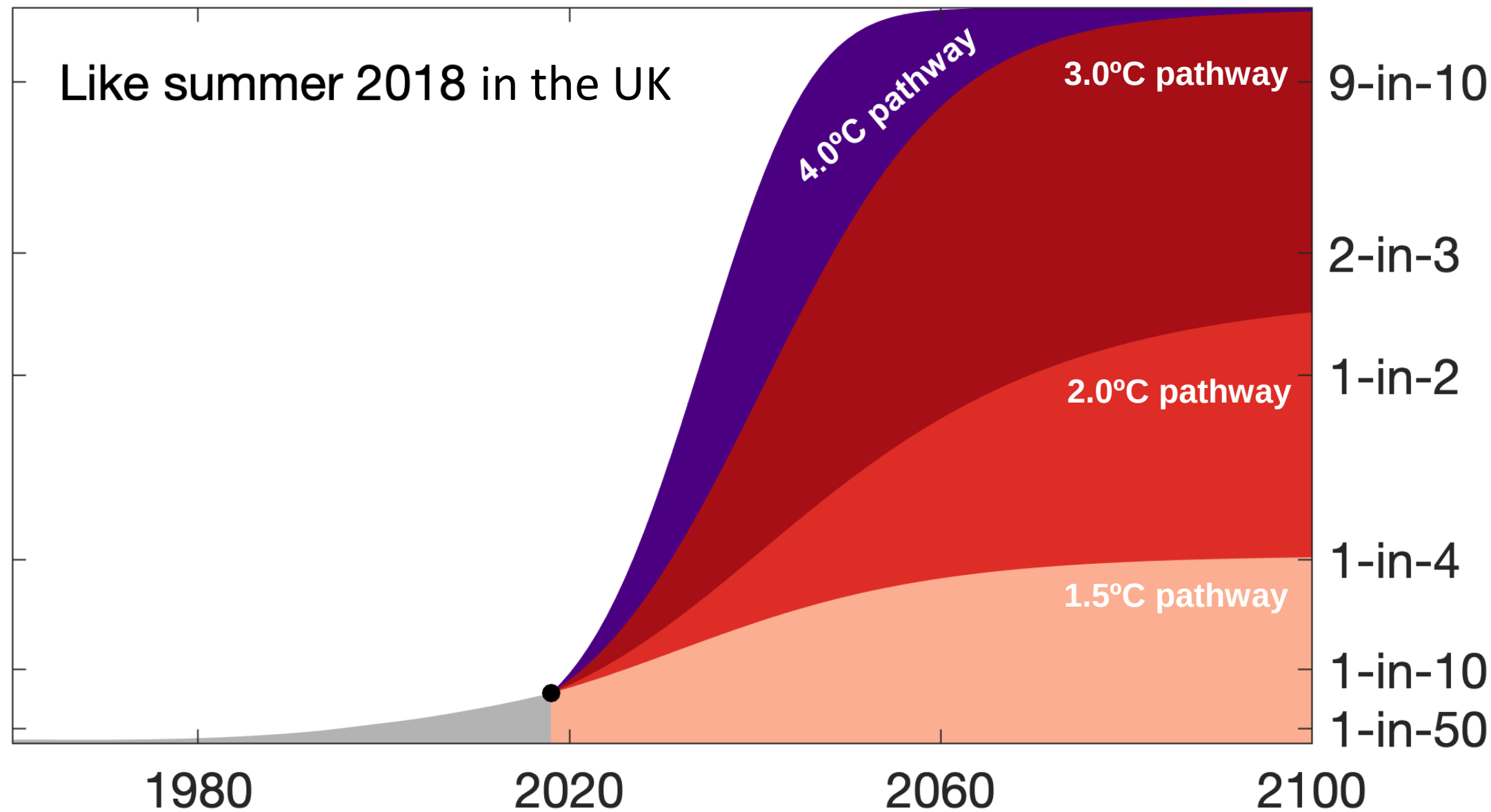


Figure1: Maximum Central England Temperature and Daily Mortality,
England and Wales, July and August 2003

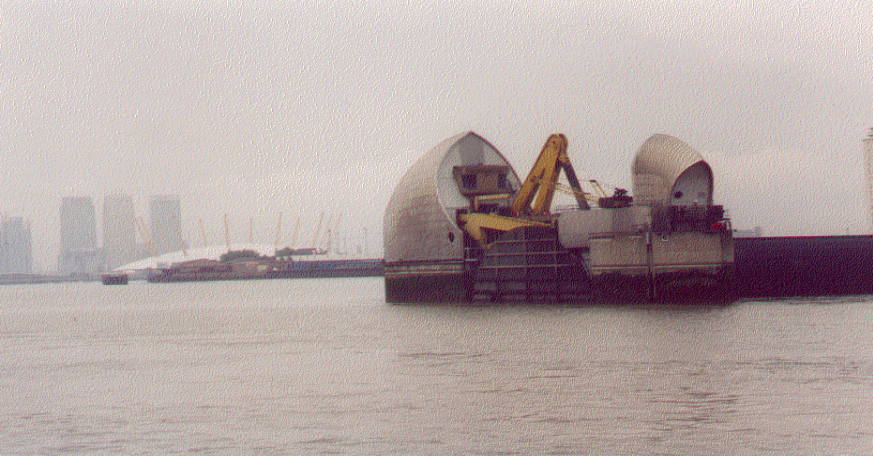


RISK OF EXTREME SEASON



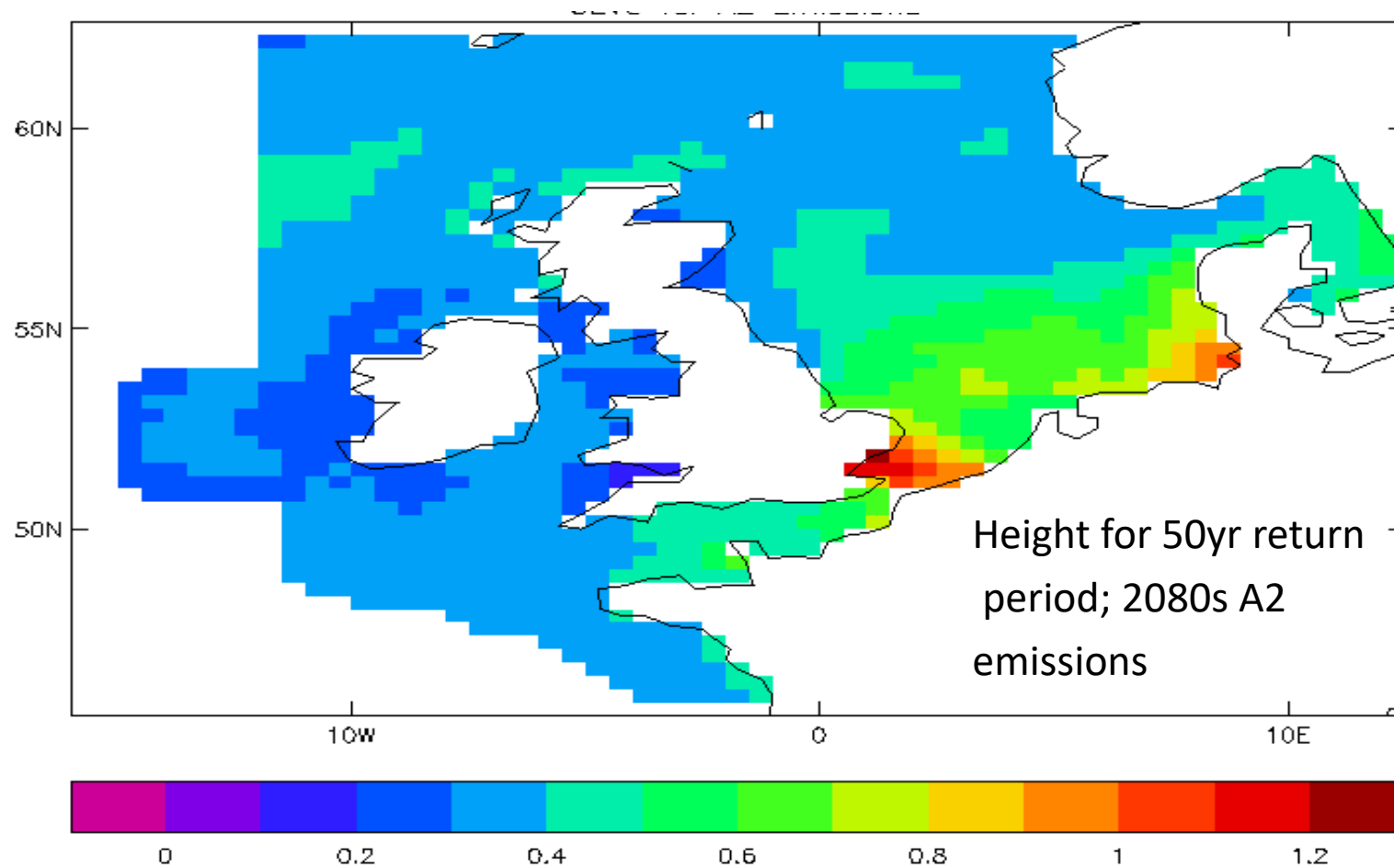
Extreme rainfall events
will be more frequent





Flood risk

Change in storm surge height



If London floods huge damage to the property market



We will still get sharp cold snaps
like the “Beast from the East”





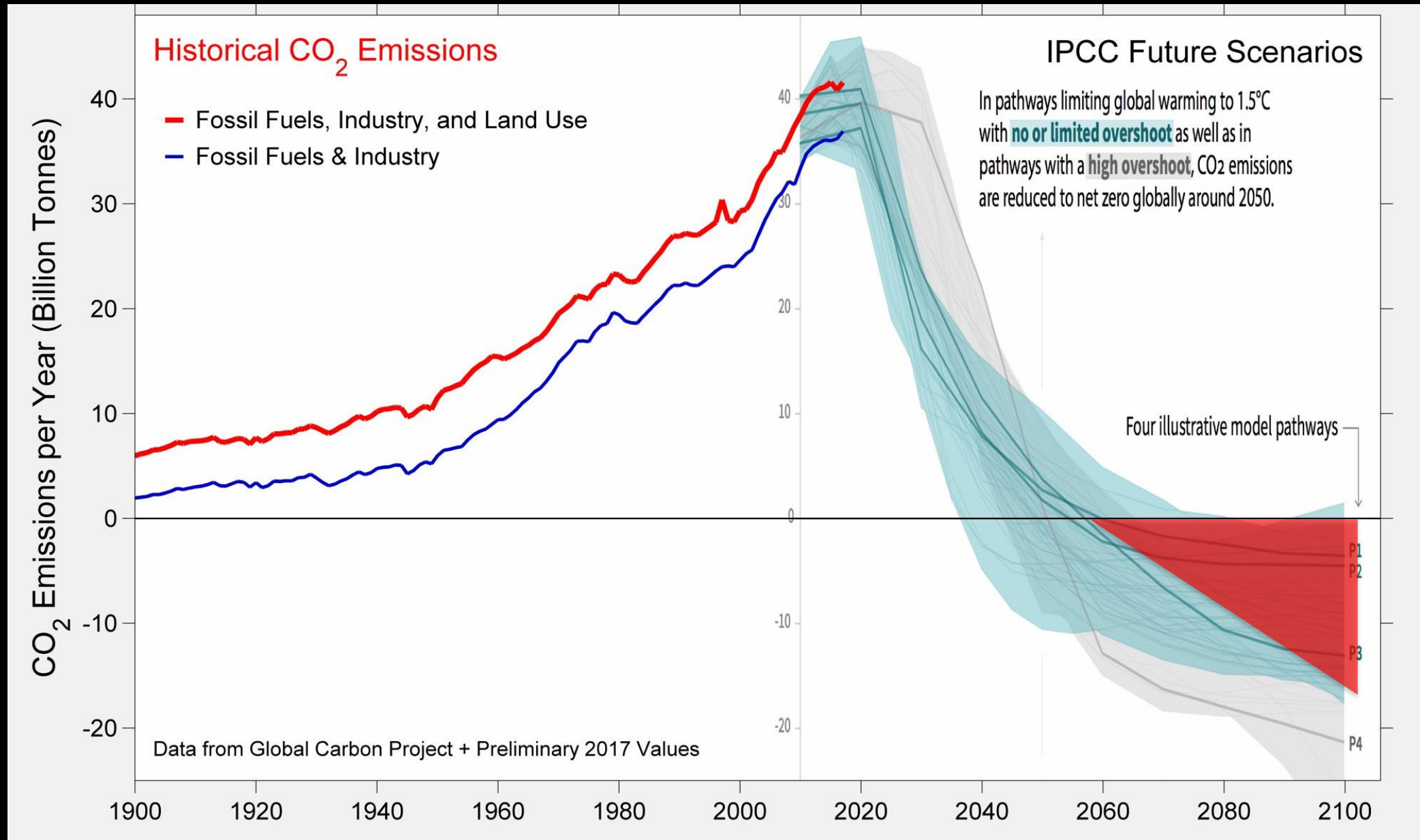
We will probably need to adapt or rebuild the Thames Barrier and Dawlish railway line due to sea level rise and storm surges



The UN Paris Agreement aims to avoid the worst risks by cutting global CO₂ emissions to 'net zero' during the 21st century.

Achieving this will require a complete transformation of energy generation, industry, infrastructure, and personal behaviours.

90 possible pathways to 1.5°C – ‘technically feasible’



transport international agreements
geoengineering afforestation land use
tradeoffs energy generation
flying
win-win solutions
heating CO₂ removal economy
diet biodiversity
waste population poverty
protests

Possible government actions to achieve 'net zero' carbon emissions

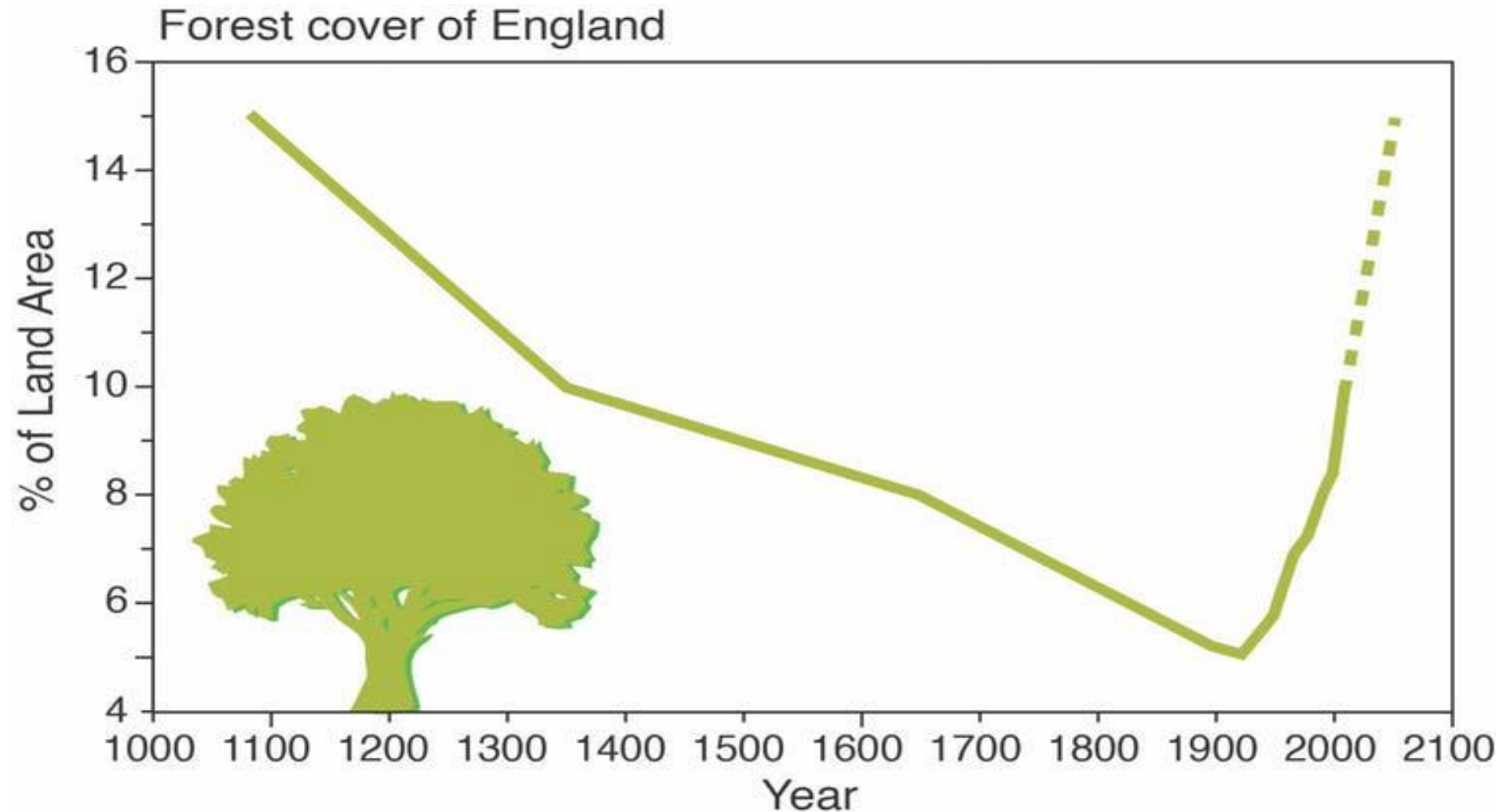
- Support renewable energy
- Cut fossil fuel subsidies
- Reforest and Rewild the UK – see slides
- Promote low emission farming and diet
- Tax fossil fuel use (including aviation fuel)
- Support 'electric' cars and public transport
- Enforce building regulations & support retrofitting
- Support the EU Emissions Trading Scheme

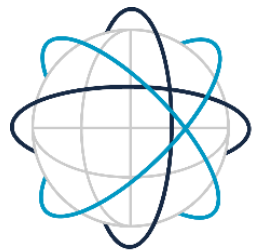


Reforestation:
Humans have cut down 3 trillion trees



UK 18% woodland = 25% of UK cuts to zero emissions





Rezatec

Analyzing Earth Data



Forestry data products

Forest Mensuration



Forest Species Mapping



Windthrow Damage



Forest Disturbance



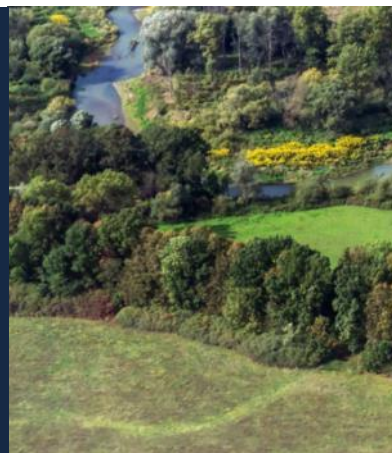
Fire Damage



Forest Health

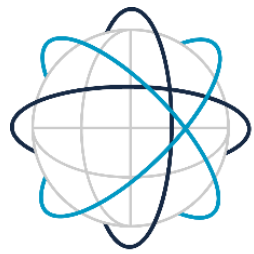


Habitat & Connectivity



Forest Biomass & Carbon Stock

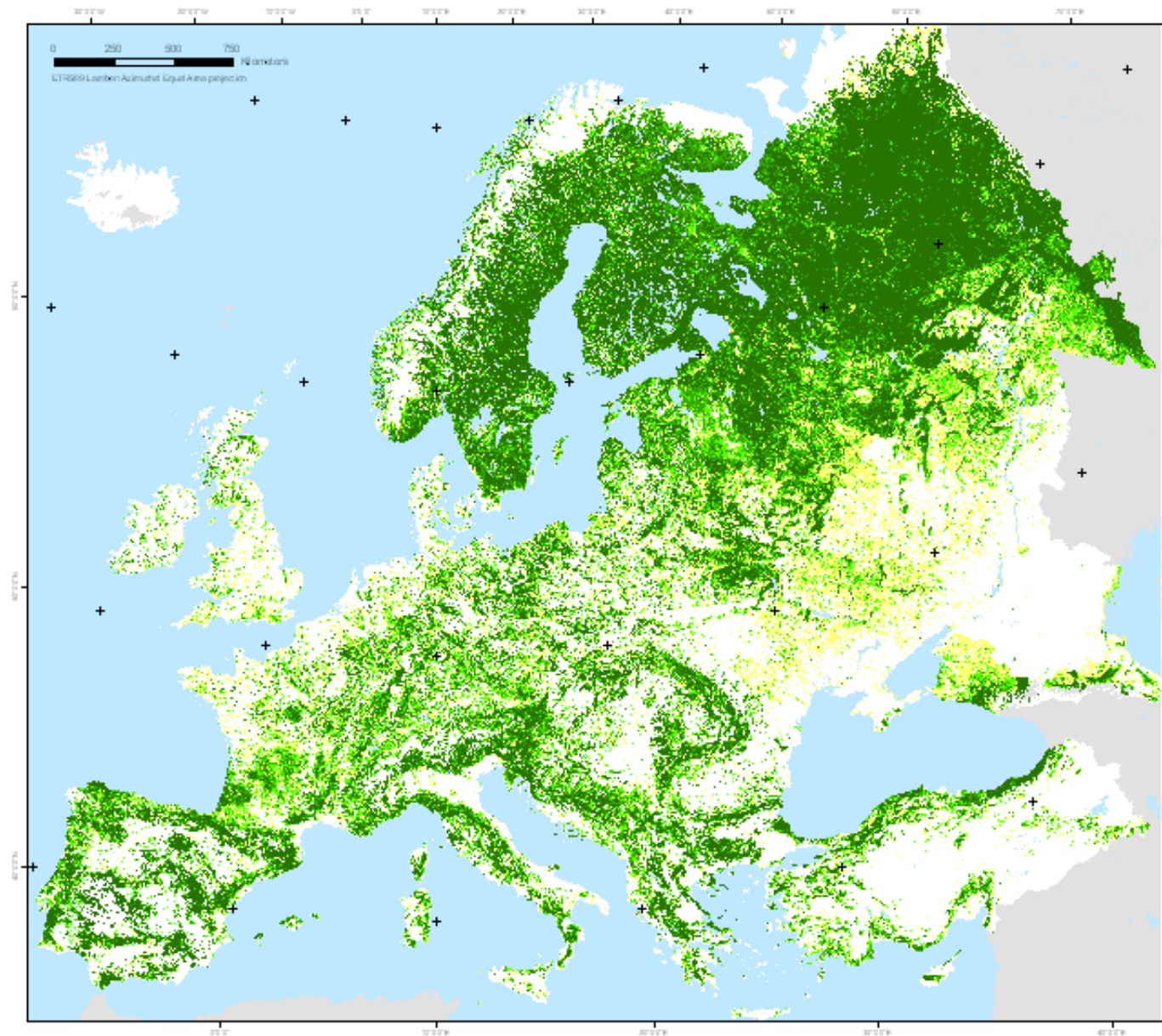




Rezatec

Analyzing Earth Data

DEFRA project
to count and identify
the species of every
tree in the UK



Possible individual climate change actions

- Talk about it, to everyone
- Switch to a more vegetarian or vegan diet
- Switch to renewable energy supplier
- Reduce, reuse and recycle more
- Use your car less and/or get an electric/hybrid car
- Stop flying – if you must, then offset
- Divest your pensions from fossil fuels
- Protest and vote

