

LARSEN C AND THE A68 ICEBERG

Royal
Geographical
Society
with IBG



6,000

Larsen C is an ice shelf in the Weddell Sea of Antarctica. An ice shelf is a thick layer of ice that is floating on the sea. They are fed from the land by glaciers. Due to global warming, the Larsen ice shelf has been disintegrating since 1995. In July 2017 a vast 6,000 km² block of ice broke away producing an iceberg the size of Luxembourg known as 'A-68'.

THE WARMEST DECADE

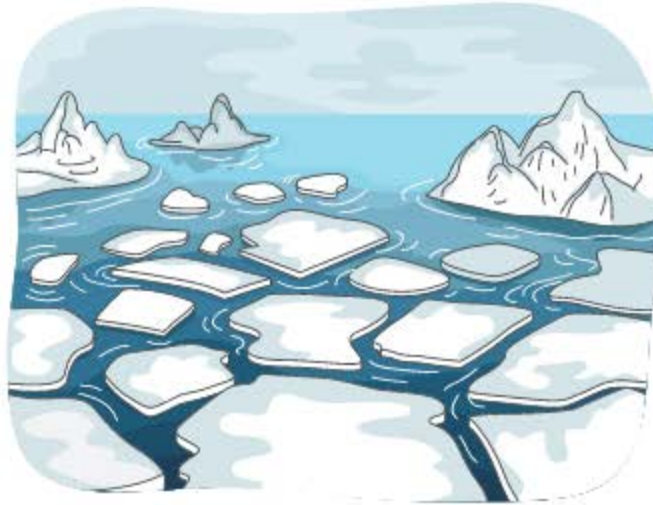
Royal
Geographical
Society
with IBG



2011 to 2020 was the warmest decade on record.

THWAITES

Royal
Geographical
Society
with IBG



65cm

The Twaites glacier is on the edge of the Western Antarctic Ice Sheet. If the 'doomsday glacier' melts it could raise sea levels by 65cm.

There is even greater concern that once the glacial 'stopper' is removed other ice will start draining into the ocean too. This will lead to a catastrophic sea level rise of 2-3m.

GLOBAL SEA LEVEL RISE

Royal
Geographical
Society
with IBG



Global sea level rose about 20cm throughout the 20th century. However the rate over the last two decades is already nearly *double* that of the last century – and is accelerating slightly every year.

20cm



MARINE PLASTIC

Royal
Geographical
Society
with IBG

Plastics, including microplastics, are now ubiquitous. They are a marker of the Anthropocene, the current geological era, and are becoming part of the Earth's fossil record.

An illustration of various pieces of plastic waste floating in blue, wavy water. The items include a red plastic chair, a white plastic bottle, a green plastic bottle, a yellow plastic bottle, a red plastic straw, and a yellow plastic cup. The text '199M' is overlaid in large black font across the center of the illustration.

199M

The amount of plastics in the oceans has been estimated to be around 75-199 million tons.

Source: UNEP From Pollution to Solution, a global assessment of marine litter and plastic pollution

POLAR BEAR



579,000

The movie Polar Bear was entirely shot in Svalbard, a remote archipelago completely surrounded by Arctic sea ice every winter. In 2021 the annual sea ice summer minimum was 579,000 miles² smaller than the 1981-2010 average. Consequently, the 3,000 local polar bears increasingly suffer habitat fragmentation and isolation.

NUCLEAR REACTORS

Royal
Geographical
Society
with IBG

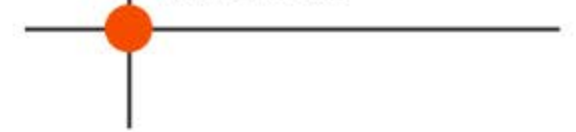
The country with the most nuclear reactors is the USA (with 93), followed by France (56), and then China (51). In 2021, American nuclear capacity was 95GW (19% of electricity generation).



The UK government plans to significantly accelerate nuclear, with an ambition of up to 24GW by 2050 (25% of projected electricity).

400PPM

Royal
Geographical
Society
with IBG



In 2013 CO₂ in the Earth's atmosphere exceeded 400ppm (parts per million) and rose to the highest level since the Pliocene Era – when sea levels were higher and the Earth was warmer.

400ppm

Reaching 400ppm doesn't mean much in itself, but the steady increase in atmospheric greenhouse gases is a stark reminder of the the spiralling climate crisis.

Despite the economic slowdown due to COVID-19, atmospheric carbon dioxide continues to rise. In May 2021 it was 419ppm.

BLACK SUMMER

Royal
Geographical
Society
with IBG



1.8m ha

The 2019-2020 Australian bushfire season is called Australia's Black Summer when a staggering 1.8 million hectares burned in high-severity fires.

Source: The Conversation, A staggering 1.8 million hectares burned in 'high-severity' fires

2021 YOUGOV POLL

Royal
Geographical
Society
with IBG

64% of respondents replied saying "geography" or "geology" when asked: which subject is best suited for someone who wishes to gain employment in the green economy?

64%



Source: YouGov poll commissioned by the Royal Geographical Society (with IBG)

THE AMAZON

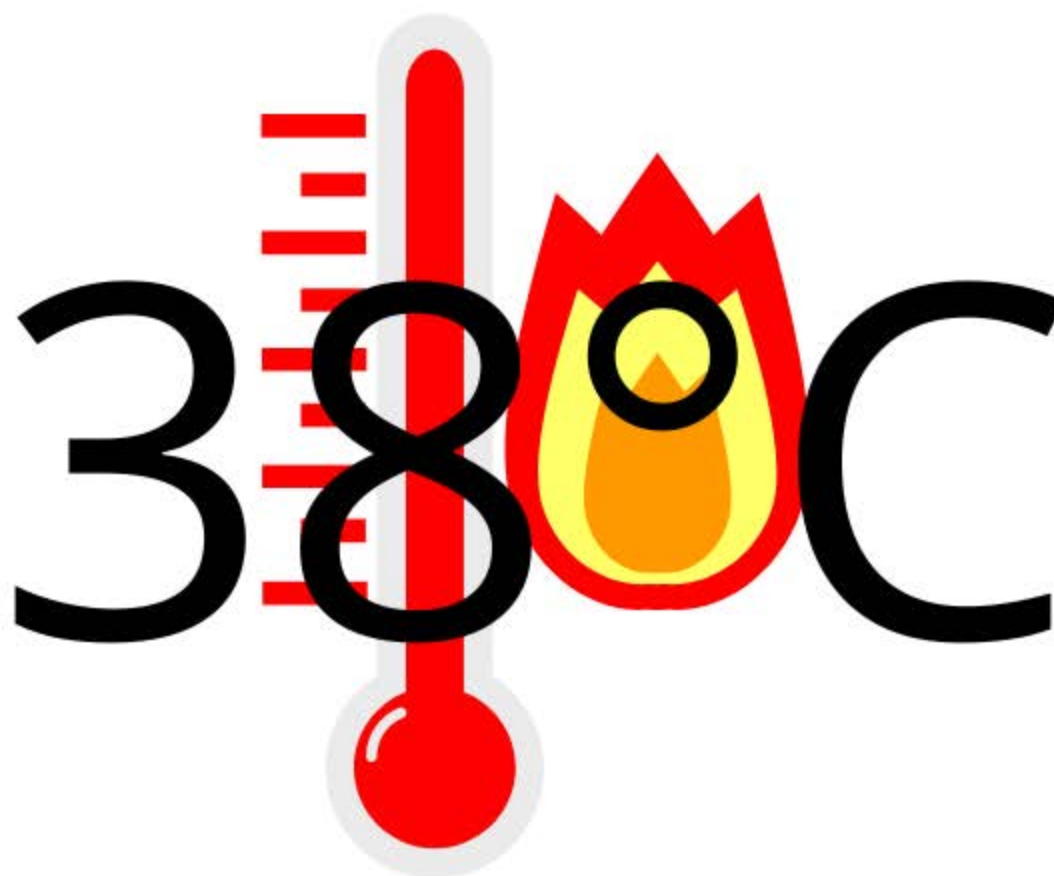
Royal
Geographical
Society
with IIG

17%

17% of the Amazonian rainforest has been destroyed over the past 50 years, with losses recently rising.

VERKHOYANSK, RUSSIA

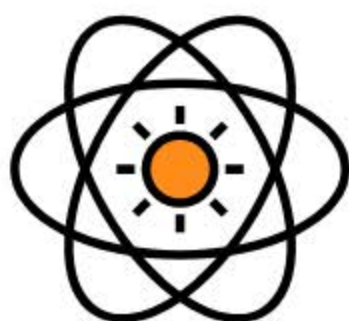
Royal
Geographical
Society
with IBG



The Arctic is among the fastest warming regions in the world. In 2020 Siberia recorded its warmest ever temperature on record – a staggering 38°C – in the Russian town of Verkhoyansk.

NUCLEAR TECHNOLOGY

Royal
Geographical
Society
with IBG



£210m

In November 2021 the UK announced £210 million funding for new small modular reactors, called SMRs, to create affordable, low-carbon nuclear energy.

This signals a continued commitment to the technology. Each SMR will be capable of powering 1 million homes (equivalent to a city the size of Leeds).

CO₂

Royal
Geographical
Society
with IBG

Carbon dioxide (CO₂) from human activity is increasing more than 250 times faster than it did from natural sources after the last Ice Age.

x250



COP26

Royal
Geographical
Society
with IBG



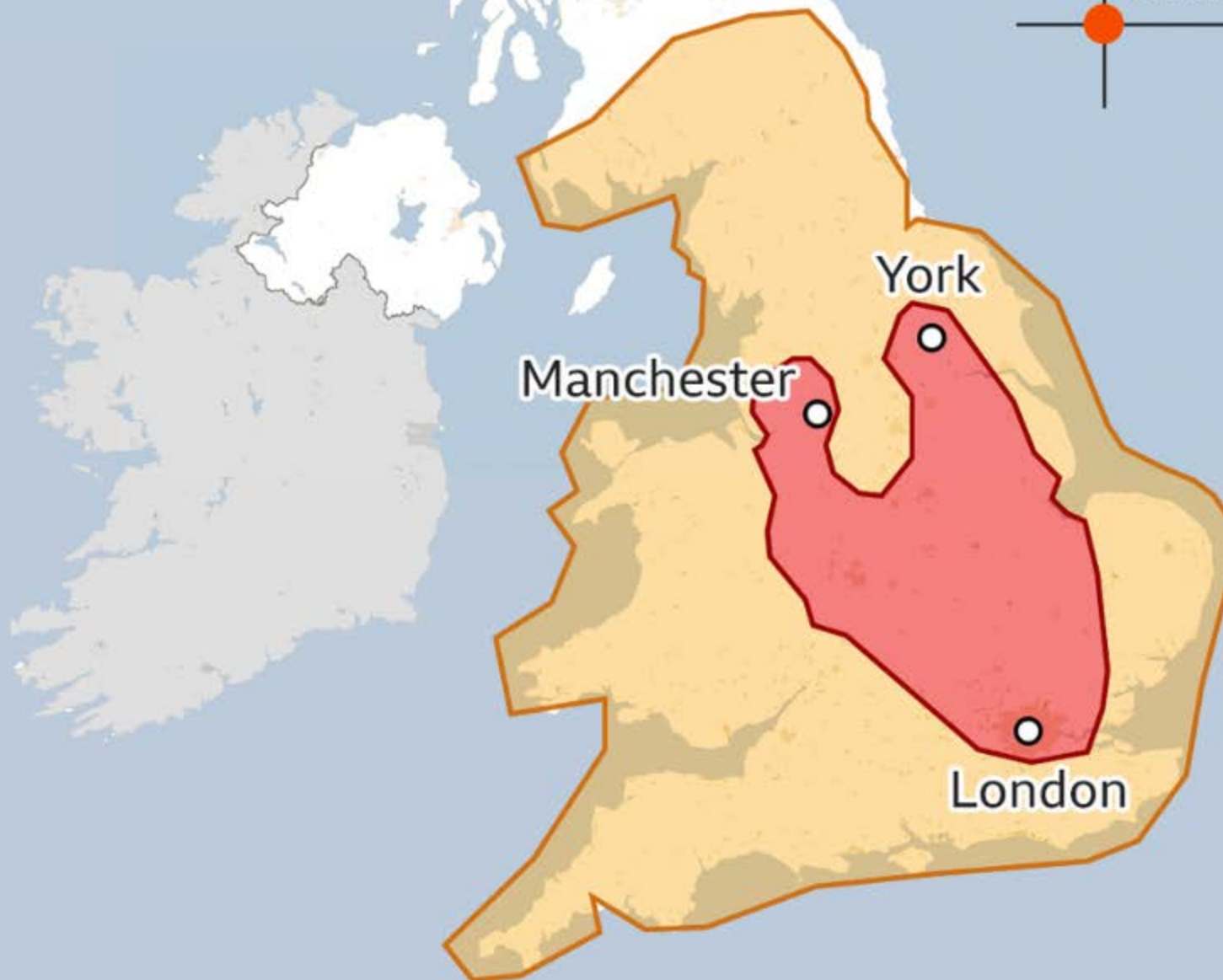
40,000

The illustration features two orange speech bubbles at the top, each containing three small circles. Below them are three purple outlines of people's heads and shoulders, arranged in a row. The large number '40,000' is centered over the people icons.

COP26 was the largest ever climate conference with over 40,000 registered participants. Crucially, there was representation across the board from big and small countries to observer organisations.

Red warning

Royal
Geographical
Society
with IBG



The UK climate is changing. Today is the first time the Met Office have issued a red weather warning. This indicator level warns of 'population-wide adverse health effects', particularly affecting the most vulnerable (young and old). There is a serious risk of illness and danger to life. A national emergency has been declared.

Temperatures are forecast to possibly surpass 40°C.

FORESTS

Royal
Geographical
Society
with IBG

Forests still cover about 30% of the world's land area, but they are disappearing at an alarming rate. Since 1990, the world has lost 420 million hectares of forest.

420m



THE WARMING WEDDELL SEA

Royal
Geographical
Society
with IBG

The top 700 metres of water have not warmed much in the Antarctic Weddell Sea. However...

x5

...due to changes in wind pattern and ocean current, the sea has absorbed 5 times as much heat at depths *below* 2,000 metres (compared to the rest of the Southern Ocean). Deeper regions are seeing a consistent temperature rise.



Source: Oceanographic. Depths of the Weddell Sea are warming five times faster than elsewhere

THE UK GREEN ECONOMY

Royal
Geographical
Society
with IBG

In a 2021 YouGov poll, when people were asked to estimate the value of the UK green economy, 49% of respondents answered "don't know" with only 2% replying correctly (it is worth £205bn+).

49%



Source: YouGov poll, commissioned by the Royal Geographical Society (with IBG)

GREENLAND ICE LOSS

Royal
Geographical
Society
with IBG

Data from NASA's Gravity Recovery and Climate Experiment shows Greenland lost an average of 279 billion tons of ice per year between 1993 and 2019.

279bn



THE ICE AGE

Royal
Geographical
Society
with IBG



11,700

The ice age ended ~11,700 years ago. Ice extent peaked around ~20,000 years ago. During this epoch, called the Pleistocene, thick ice sheets and glaciers covered vast areas of the world. In the UK ice scoured the ground in the Lake District, Scotland, and North Wales.

We are now in the Anthropocene with the global average temperature rising at a rate of 1.7°C per century.

COP26

Royal
Geographical
Society
with IBG

95% of the food served at COP26 was seasonal and from the UK, with at least 80% of it coming from Scotland. The event was carbon neutral.

95%

THE LOW CARBON UK ECONOMY

Royal
Geographical
Society
with IBG

The UK's Low Carbon and Environmental Goods and Services (LCEGS) sector consists of products and services which actively enable a shift towards a green economy. It is a growing sector. In 2020/21 it was worth £205.7bn to the UK economy.

£205bn



Source: kMatrix data services "Where we were, where we are, and where we're going" report 2021

IAATO VISITORS

Royal
Geographical
Society
with IBG



74,401

A record 74,401 IAATO tourists visited Antarctica for 2019/20. This figure continues the upwards trend in tourist numbers to the continent. In 2018/19, 55,489 visitors were recorded.

In 2020 the New York Times reported that travel to the most remote part of the planet is booming, and is "edging toward the (risky) mainstream".

ANTARCTIC TEMPERATURE

Royal
Geographical
Society
with IBG



18.3°C

On 6 February 2020, the highest temperature in Antarctica **ever recorded** was registered at the northern-most tip of the Antarctic Peninsula at the Esperanza Station.

The temperature reached 18.3°C.

HURRICANE IAN

Royal
Geographical
Society
with IBG

Hurricane Ian is one of the five most powerful hurricanes in recorded US history, with sustained wind speeds of 155mph.

155mph

The climate crisis is making storms more powerful. Climate disruption has changed the background conditions in which all weather occurs: the oceans and air are warmer, there's more water vapor in the atmosphere and sea levels are higher.

JULY 2022

Royal
Geographical
Society
with IBG

The most common causes of death are most likely hastened by extreme heat. During the 3 July heatwaves the death rate was 7% higher than the daily average across the rest of the month.

^ 7%

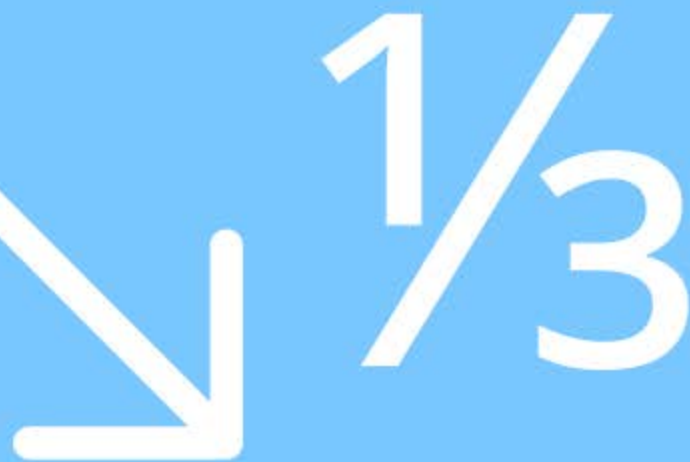


Source: The ONS, how many people died in the UK's recent heatwave

THE ANTARCTIC WEDDELL SEA

Royal
Geographical
Society
with IBG

The Weddell Sea lost one million square kilometres of summer sea ice between 2015 and 2020.



$\frac{1}{3}$

In the summer the Weddell Sea now has roughly one-third less sea ice, which will have implications for ocean circulation and the marine wildlife which depend on it for their survival



CRYPTOCURRENCY CLIMATE IMPACT

Royal
Geographical
Society
with IBG

The climate damage of producing the digital currency Bitcoin has averaged 35% of its market value over the past five years.

35%



This is a disproportionate climate impact, likened to "digital beef" in how damaging it is to our planet.



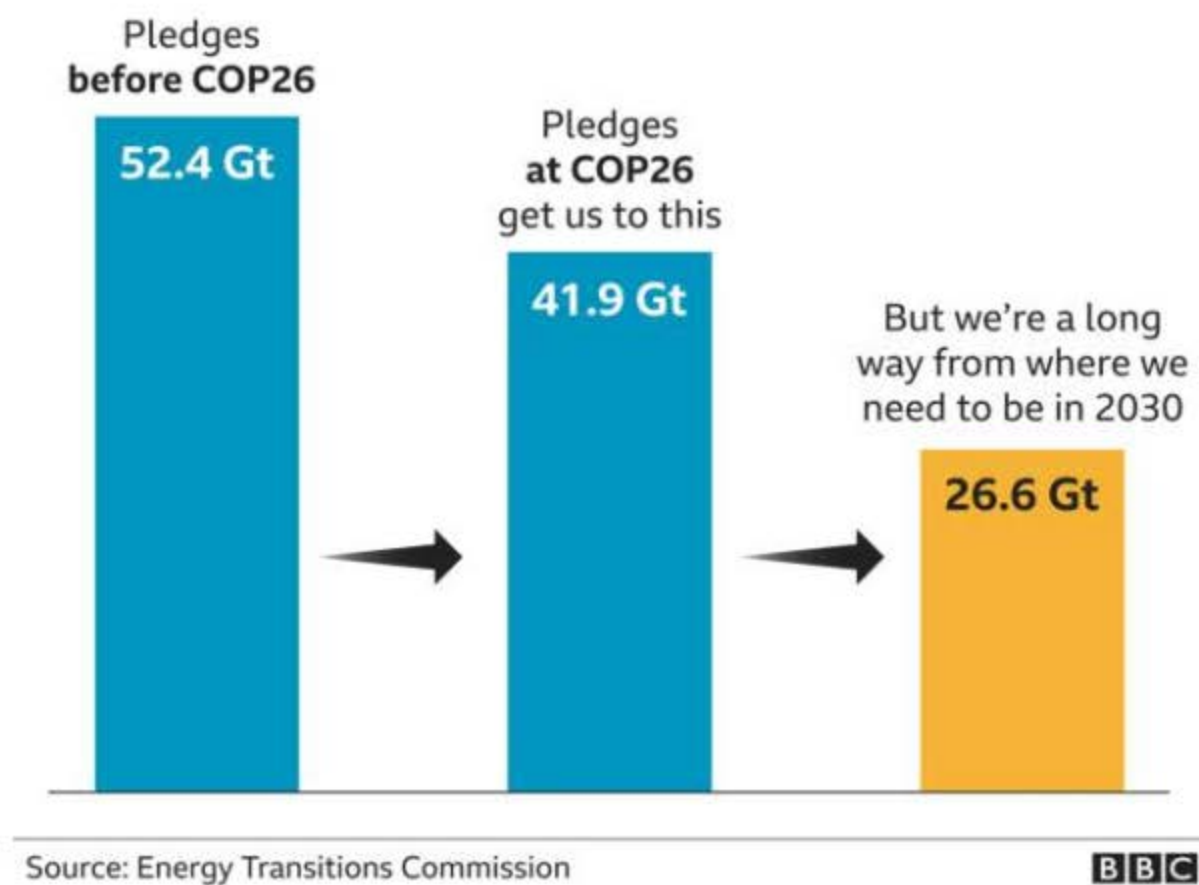
DID YOU KNOW?

Seagrass grows in underwater meadows. The UK's biggest seagrass restoration project is underway off the Llŷn Peninsula, in North Wales.

COP27 IN EGYPT

Royal
Geographical
Society
with IBG

The graph below shows the projected greenhouse gas emissions for 2030. Big cuts to emissions are required.



If we carry on as we are, with the current policies, we are on track for a 2.7C increase by the end of the century.

COP27

Royal
Geographical
Society
with IBG



Egyptian ambassador Wael Aboulmagd has warned the war in Ukraine is an unacceptable "pretext for backsliding" on environmental goals for the COP27 climate talks in November.

THE PARIS AGREEMENT

Royal
Geographical
Society
with IBG

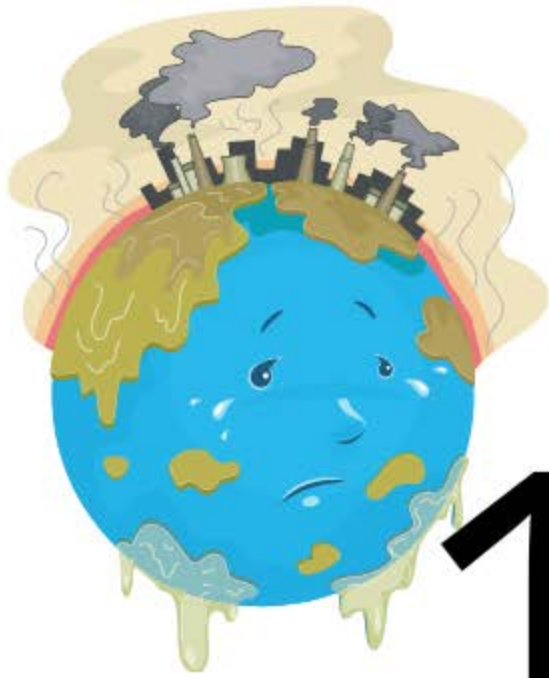


In 2015 the Paris Agreement created a legally binding international treaty on climate change.

It was adopted by 196 countries and stipulated a goal "to limit global warming to well below 2, preferably to 1.5°C".

ANTÓNIO GUTERRES

Royal
Geographical
Society
with IBG



1.5C

“Emissions remain at dangerous and record highs and are still rising. We must close the emissions gap before climate catastrophe closes in on us all.”

António Guterres, UN secretary general in 2022