

What is climate change? The definition, causes and effects

Climate change is one of the biggest crises facing humanity. Let's all get a grip on exactly what it is

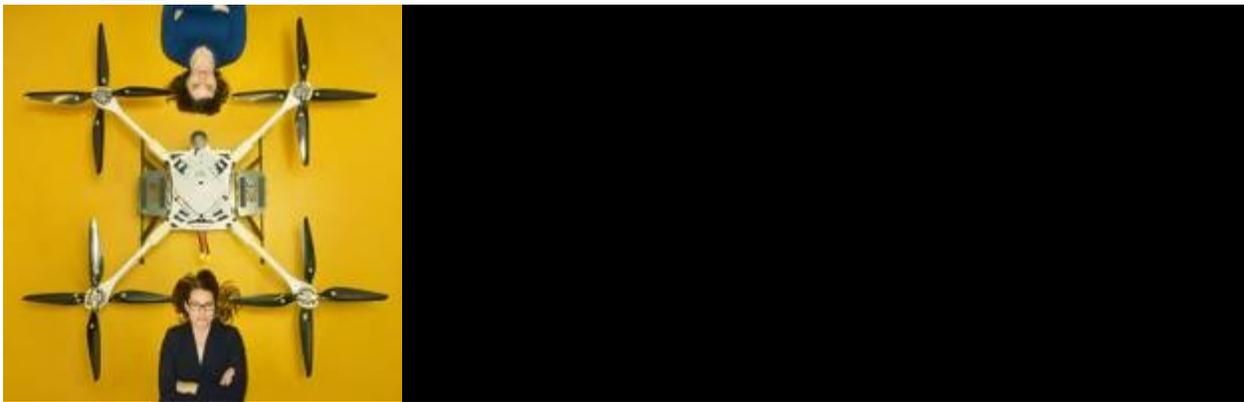
Climate change is the catch-all term for the shift in worldwide weather phenomena associated with an increase in global average temperatures. It's real and temperatures have been going up around the world for many decades.

Reliable temperature records began in [1850](#) and our world is now [about one degree Celcius hotter](#) than it was in the period between 1850 and 1900 – commonly referred to as the "pre-industrial" average.

The change is even more visible over a shorter time period – [compared to average temperatures between 1961 and 1990](#), 2017 was 0.68 degrees warmer, while 2016 was 0.8 degrees warmer, thanks to an extra boost from the naturally-occurring El Niño weather system.

While this temperature increase is more specifically referred to as global warming, climate change is the term currently favoured by science communicators, as it explicitly includes not only Earth's increasing global average temperature, but also the climate effects caused by this increase.

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Tropical forests are dying. Seed-slinging drones can save them

[Global efforts](#) are now focussed on keeping temperatures from increasing more than [two degrees](#) above that pre-industrial average, and ideally no more than 1.5 degrees. That goal may still be possible if the international community pulls together.

What are the effects of climate change?



Worsening drought conditions are having a major impact on farmers in South Africa's Western Cape region

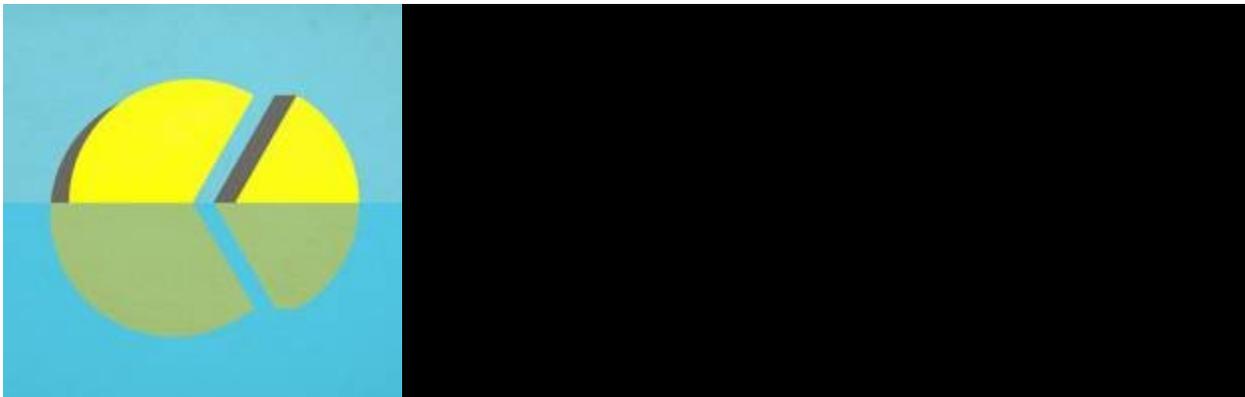
Morgana Wingard/Getty Images

The effects of anthropogenic – human-caused – climate change range from more frequent and severe droughts to snowstorms and extreme winter weather in [temperate regions](#) as a result of warming Arctic weather fronts.

It's not only humans that are affected. Warming ocean temperatures are increasing the frequency of [coral reef bleaching](#); warmer, drier weather means that forests in some regions are no longer recovering from wildfires and wildlife habitats around the world are becoming less hospitable to animals.

Climate change is having economic and socio-political effects, too. [Food security](#) is already being impacted in a number of African countries and researchers are studying suggestive links between climate change and an increased likelihood of military conflict.

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We can only fight climate change if we also focus on the mundane

We're already seeing the first climate refugees as people are [displaced](#) by rising sea levels, melting Arctic permafrost and other extreme weather.

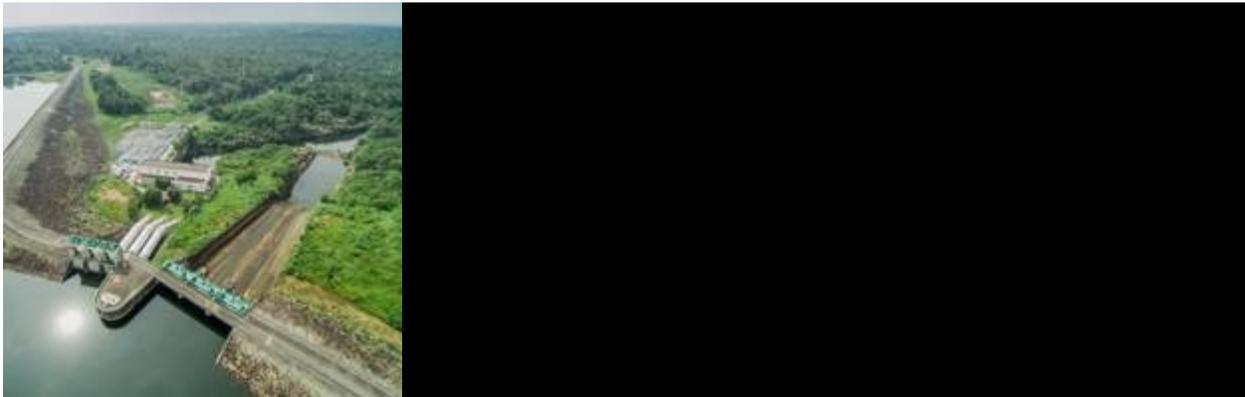
What are the causes of climate change?

We are. While a wide range of natural phenomena can radically affect the climate, [publishing climate scientists overwhelmingly agree](#) that global warming and resultant climate effects that we're witnessing are the result of human activity.

Life on Earth is dependent on an atmospheric "greenhouse" – a layer of gasses, primarily water vapour, in the lower atmosphere that trap heat from the sun as it's reflected back from the Earth, radiating it back and keeping our planet at a temperature capable of supporting life.

Human activity is currently generating an [excess](#) of long-lived greenhouse gasses that – unlike water vapour – don't dissipate in response to temperature increases, resulting in a continuing buildup of heat.

Key greenhouse gasses include carbon dioxide, methane and nitrous oxide. Carbon dioxide is the best-known, with natural sources including decomposition and animal respiration. The main source of excess carbon dioxide emissions is the burning of fossil fuels, while deforestation has reduced the amount of plant life available to turn CO₂ into oxygen.



This floating solar farm is a dam clever climate change weapon

By **SAQIB RAHIM**

Methane, a more potent but less abundant greenhouse gas, enters the atmosphere from farming – both from animals such as cattle and arable farming methods including [traditional rice paddies](#) – and from [fossil fuel exploration](#) and abandoned oil and gas wells.

[Chlorofluorocarbons and hydrofluorocarbons](#) – once widely used in industrial applications and home appliances such as refrigerators – were key greenhouse gasses released during the 20th century, but are now heavily regulated due to their severe impact on the atmosphere, which includes ozone depletion, as well as trapping heat in the lower atmosphere.

Our warming climate is also creating a feedback loop as greenhouse gasses trapped in Arctic [permafrost](#) are released.

Why is climate denial a thing?



August 29 2017: People wade along a flooded street as cars become stuck during heavy rain in Mumbai

Imtiyaz Shaikh /Anadolu Agency/Getty Images

For many years, oil companies were heavily invested in pushing the [narrative](#) that fossil fuels did not have an impact on climate change. To this end, they bought advertising and funded organisations to cast doubt on climate change, [even while their own research conclusively showed](#) that fossil fuels are a major contributing cause of climate change.

This is still playing out in [ongoing lawsuits](#) against oil companies, but even giants such as Chevron now publicly acknowledge the role that fossil fuel use has played in changing our climate. Now, their key defence is that it's the fault of fossil fuel consumers for using it, rather than of the companies that extracted, marketed and profited from oil.

Definition of Climate Change

[Nasa](#) defines climate change as: "a broad range of global phenomena created predominantly by burning fossil fuels, which add heat-trapping gases to Earth's atmosphere. These phenomena include the increased temperature trends described by global warming, but also encompass

changes such as sea level rise; ice mass loss in Greenland, Antarctica, the Arctic and mountain glaciers worldwide; shifts in flower/plant blooming; and extreme weather events."