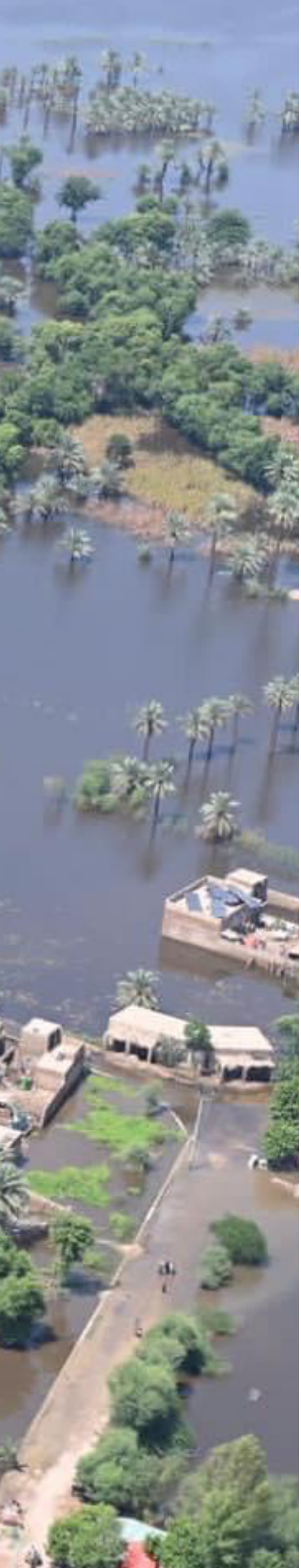
NO PLACE TO HIDE: TRACKING CLIMATE IMPACTS IN 2022



About Climate Trends

Climate Trends is a research-based consulting and capacity building initiative that aims to bring greater focus on issues of environment, climate change and sustainable development. We specialise in developing comprehensive analyses of complex issues to enable effective decision making in the private and public sector.

Introduction

"Climate change is happening now and to all of us. No country or community is immune," UN secretary-general António Guterres said in 2019. Since then, the truth of this statement has become ever more apparent, with 2022 proving a case in point.

Exceptional heat and droughts have broken records, wilted crops and caused deaths worldwide. Flooding has also led to thousands of deaths, and swept away homes and infrastructure. Some countries such as Brazil and Pakistan have suffered at both ends of this scale, with little time to recover from one event before being hit by the next.

Though the impacts are global, they hit the poorest hardest. People in low-and lower-middle-income countries are around five times more likely than people in high-income countries to be displaced by sudden extreme weather disasters, according to Oxfam.

Poor housing is more likely to be damaged and destroyed by hurricanes and floods. People in vulnerable communities are more likely to be exposed to extreme heat as outdoor workers, and less likely to have access to cooling, or live near cooler green spaces to protect them from extreme heat.

In fact, countries with lower GDP per head are at greater risk of permanent impacts from climate change – losses and damages – than richer nations, due to existing poverty, disease prevalence, gender inequality and the state of infrastructure.

The science is clear that climate change is increasing the risk from extreme weather. The Intergovernmental Panel on Climate Change (IPCC)'s latest round of reports stresses that extreme weather will become more frequent, and more intense.

Heatwaves that would once have had a chance of one in ten to occur in any given year in the pre-industrial climate will now occur 2.8 times more frequently and be 1.2°C hotter, according to a recent paper by climate attribution scientists.

High temperatures drive increased evaporation, which combined with other factors such as low rainfall has made multiple areas of the world more prone to drought, including California, the Pacific Northwest, parts of China, western North America and the Mediterranean.

Incidences of intense downpours and storms are also increasing, with each increase of temperature by 1°C leading to a 6-7% increase in moisture held in the atmosphere. What would previously have been a one-in-ten year rainfall event currently occurs 1.3 times in ten years, and is 6.7% wetter. The risk rises to 1.7 times per year, and 14% wetter at 2°C of warming, the scientists say.

This year's extreme weather has hit major global food-producing countries such as China, India and the US especially badly. Poor harvests caused by extreme weather have compounded the impacts on food security of the war in Ukraine, which has limited the supply of grain and sunflower oil worldwide, causing prices to soar earlier in the year.

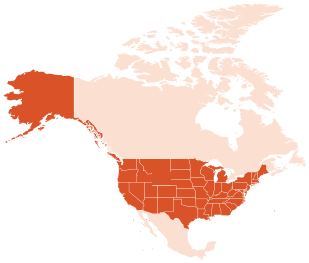
Though some prices have since fallen, the UN is still warning of uncertainties ahead such as high fertiliser prices that could cause prices to rise again. The World Bank has similarly warned of food security risks from high inflation, while the World Food Programme and the Food and Agriculture Organization warned that acute food insecurity could worsen in 20 countries or areas during June to September 2022.

Global impacts

The 14 extreme weather events from 2022 detailed below illustrate starkly the risks climate scientists have warned of for years. From Australia to South Africa, these events demonstrate the impacts of climate change across continents, sparing no country in their ferocity.

Few in the G20 have been spared this year. The majority of the Group of Twenty - the intergovernmental forum of the world's major developed and developing economies – are reeling from impacts that have wiped billions off global GDP.

This is all the more significant given this group is responsible for over 80% of global greenhouse gas emissions, 75% of international trade and two-thirds of the world population. Not only does this make it the premier forum for international economic cooperation, it also underlines how the bloc – which meets in Bali, Indonesia this November – has a strong self-interest in tackling the climate crisis.



US

The US is among those countries suffering from extreme low rainfall in 2022, continuing a trend from the past two decades, and what scientists have called the most extreme megadrought in at least 1,200 years.

By mid-July, 45% of the country was categorised as in drought, according to government data. In early September 2022, a heat dome settled over the US West and brought record high temperatures, fuelling wildfires and stressing the power grid.

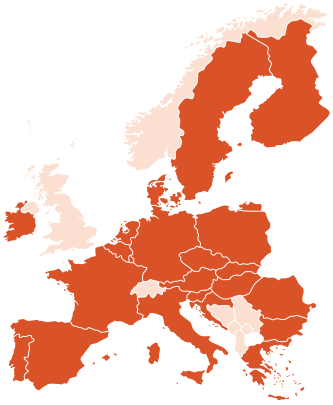
On September 7, 2022, more than 61 million people were under active extreme heat advisories, watches, and warnings, according to the National Weather Service. Excessive heat warnings were issued for much of California and parts of western Arizona and southern Nevada. Temperatures reached more than 37°C (100F), with some areas exhibiting record-high nighttime lows and relatively high dew points, both of which exacerbate the impacts of heat on human health.

China

China has experienced its most severe heatwave in six decades this year. Temperatures over 40 degrees Celsius (104 Fahrenheit) were sustained for a run of more than 70 days, affecting around 900 million people in at least 17 provinces, from southwestern Sichuan to coastal Jiangsu and Zhejiang provinces in the east.

The drought was worst along the Yangtze River basin, where hydropower plants were severely disrupted. Officials in the industrial city of Chongqing ordered business to temporarily suspend operations to conserve power as temperatures reached 45°C (113 Fahrenheit), and electricity rationing was mandated in the city of Dazhou.

High temperatures in July inflicted losses of 2.73 billion yuan ($391m) and affected 5.5 million people across 185,000 hectares (457,500 acres) of land, according to data from China's Ministry of Emergency Management.



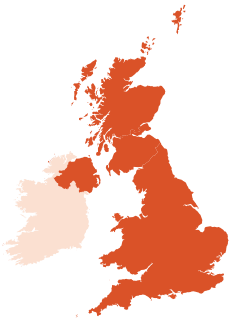
European Union

Europe experienced its worst drought in at least 500 years this summer, according to the European Drought Observatory. The hot and dry conditions sparked wildfires, slashed crop yields and impacted electricity generation, it said. Almost half (47%) of Europe was under warning conditions, while 17% of the continent is under a state of alert, the organisation said.

In Germany, commercial traffic was nearly halted due to very low water levels on the Rhine, one of Europe's key waterways. Italy's Po river was completely dry in some places, with a state of emergency called in five northern regions following the worst drought in 70 years.

In France, water had to be delivered by truck in more than 100 municipalities. More than 60,000 hectares of land have burned in the first eight months of 2022, more than double that burned in 2021, and about 4.6 times the average of the past decade.

The drought also affected energy production. Generation from run-of-river hydroelectric plants at the beginning of July was lower than the 2015-2021 average for many European countries, notably in Italy, France and Portugal. Hydropower reservoir levels were also low, affecting countries such as Norway, Spain, Romania, Montenegro and Bulgaria.



UK

The UK experienced a prolonged heatwave and drought in 2022, with July declared as the driest in England in more than a century. Two days in particular saw temperatures in the high 30s – and the country's first recorded temperature of 40°C and above – an event so rare it was classed as "*exceptional*" by meteorologists.

Daytime temperature records were broken in 46 stations across the country, while nighttime temperatures hit 25.8°C in the south of the country. Health authorities issued a threat to health warning for even fit people due to the severity of the heatwave. Scientists estimated that temperatures would have been 2°C lower without the influence of climate change.

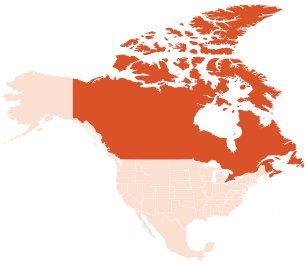
The hardened ground caused by prolonged dry conditions then led to flash flooding when rain finally came in August, with floods in large parts of the south of the country, the midlands and Wales. The midlands town of Worksop recorded 93mm of rainfall in three hours in mid-August, almost twice the average monthly rainfall of 54mm.

Australia

Torrential rains led to widespread flooding in Australia early in 2022, with Southern Queensland and northern New South Wales receiving more than a year's worth of rainfall in a week in March. Just weeks later, further heavy rains came to Australia's east coast, forcing thousands to flee their homes again. In April, Sydney received nearly a month's rain overnight.

A new record was set for flood losses in the country at close to US3.5 billion, one of the costliest natural catastrophes ever in the country, and the costliest event for insurers globally in the first half of 2022, according to reinsurer Swiss Re.

Australians have been warned to brace themselves for more severe storms in the coming months, as the country's Bureau of Meteorology has forecast flooding as the major natural disaster risk over coming months, particularly in the eastern states.



Canada

Scarred by heatwaves and huge floods in 2021, Canadians baked in record temperatures in August. Last year's North American heat dome led to an estimated 600+ deaths, underlining the risks faced by citizens in one of the world's wealthiest countries.

Data from Canada's CIFFC National Fire Situation Report reveals that by 14 September 2022 the country had experienced nearly 5000 fires across 1,467,071 hectares of land. Newfoundland and Labrador were badly hit this year after a summer of intense, dry heat.

Smoke from wildfires in British Columbia forced the evacuation of some workers on the $16.50bn Trans Mountain oil pipeline expansion project on 12 September, leaving Vancouver with the worst air quality in the world, according to the World Air Quality Index.

India

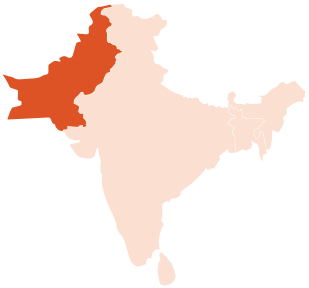
This year, India experienced its hottest March since records began 122 years ago. The month was also extremely dry, with rainfall 71% below normal in the country. The heatwave reached a peak towards the end of April, by which time 70% of the country was affected.

Climate change is estimated to have boosted the probability of the extreme heat by a factor of around 30. Climate attribution scientists have also projected that such a heatwave would become 2-20 times more likely and 0.5-1.5C hotter compared to 2022 if global mean temperatures rise by 2°C compared with pre-industrial times. Erratic monsoons are taking their toll on India's farmers, impacting rice sowing season and threatening food supplies in a year where prices are already rising due to the war in Ukraine. "*Climate change-induced surprises are making [inflation] more volatile and harder to forecast,*" warned HSBC's chief India economist in July. "*It is therefore no surprise that inflation forecasting errors have risen.*"

Indonesia

In January, torrential rain over the Indonesian island of Sumatra left more than 30,000 people homeless, and two children dead, according to the country's National Board for Disaster Management (BNPB). An official state of emergency was called in North Aceh as a result of floods.

In July, floods again struck the country, this time in the province of Maluku. Heavy rain caused a river to overflow, triggering a landslide that killed six people and severely damaged roads. Floods and landslides also hit the provincial capital city of Ambon, where flood waters were up to 80cm deep. The city recorded 245 mm of rain in 24 hours in early July.

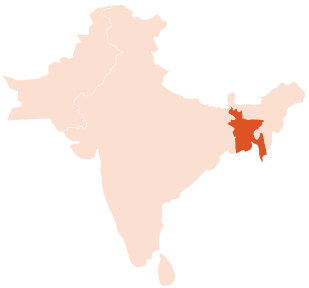


Pakistan

Extreme flooding has left one third of Pakistan under water have killed nearly 1,500 people, according to the country's National Disaster Management Authority. Around 33 million of the population of 220 million have been impacted, with homes, vehicles, crops and livestock submerged. Damage has been estimated at $30 billion.

One third of those killed are children. Aid agency Unicef estimates that more than three million children are in need of urgent humanitarian help and protection from waterborne diseases, drowning and malnutrition. Some 17,566 schools have been damaged or destroyed, it said.

The floods came just months after the country suffered from extreme heat, with temperature records broken country-wide in March, and 62% less rain than normal.



Bangladesh

The Delta nation was hit by record-breaking flooding in June, impacting more than 7.2 million people. Torrential rain almost completely submerged the town of Sunamganj and most of Sylhet districts, in northeastern Bangladesh, bordering the Indian state of Meghalaya.

Aid agency the Red Crescent Society said the region had not experienced such extensive flooding in living memory. Around four million people had to flee their homes, while large areas were completely cut off due to severe disruption of roads and power, it said.

Flooding in the area is projected to increase by 24% even if global temperature rise is kept within 2C, while an increase of 4C could see it rise by more than 60%.

Brazil

Brazil suffered from both extreme floods and drought in 2022. In February, flash floods and mudslides killed more than 170 people in the city of Petrópolis, and left 900 homeless. In May and June, exceptionally heavy rainfall caused catastrophic floods and landslides in Eastern Northeast Brazil.

In the Brazilian state of Pernambuco, more than 70% of the rain that usually falls in all of May fell in just 24 hours. More than 133 people died, and at least 25,000 people had to flee their homes. Eighty municipalities across the states of Pernambuco and Alagoas declared a state of emergency.

Meanwhile, a severe drought in the country's south saw the nation's agricultural GDP fall by 8%, according to federal government data. More than half of the total 2021 soy harvest was lost in Rio Grande do Sul, the nation's southernmost state. More than 195,000 farmers reported crop losses, with damage exceeding $9.2 billion, according to a survey by the Technical Assistance and Rural Extension Company of Rio Grande do Sul.

South Africa

Two days of exceptional rainfall in April on the coast of Eastern South Africa led to floods so severe they were labelled "*the biggest tragedy we have ever seen*" by the country's president Cyril Ramaphosa, who declared a national state of disaster. The inundation caused the death of 448 people, displaced over 40,000 people and completely destroyed over 12,000 houses in the south-east part of South Africa. It also severely damaged infrastructures: roads, health centres, schools.

The flooding came just a couple of months after temperatures in Cape Town soared to 45.2°C, beating its previous record by almost 3°C.

South Korea

In August South Korea endured its worst flooding in 80 years after torrential rains fell around the capital Seoul. While heavy rains are common at this time of year, the total of 525mm of rainfall was double typical levels. The capital's plight and death of a family of three in a basement flat led President Yoon Suk-yeol to call for an overhaul of planning laws and disaster provisions

"*It's certainly true that it is abnormal weather, but we can no longer call such abnormal weather abnormal,*" he said. "*We could see new record levels at any time. This shows that we can no longer respond based on past cases. We must respond with worse-than-expected scenarios in mind.*"

According to the Fitch ratings agency, projected damages are estimated at just over $100 million [KRW150 billion]. In its assessment of the Seoul floods, Fitch warns major insurers they need to be better equipped to model and assess climate disasters. "*The increased frequency of natural disasters has led to a notable increase in the number and size of claims related to changes in climate patterns across the globe.*"

Weeks later, Typhoon Hinnamnor ripped across South Korea's industrial south, rattling the southeastern industrial cities of Pohang, Gyeongju and Ulsan and stopping production in the country's main shipbuilding ports. Reported damages across South Korea and neighbouring countries was $1.4bn, according to the Yonhap News Agency.

Japan

In June, central Tokyo recorded nine consecutive days when temperatures hit 35°C or above - the longest streak since record-keeping began in 1875, and unexpectedly high for so early in the summer.

Hundreds of deaths were attributed to the heat, and nearly 5,000 people went to the hospital seeking treatment for heat stroke and exhaustion over just a couple of days. In the eastern Japanese city of Isesaki, the mercury hit 40.2°C on 25 June, the first time in the country that the temperature has exceeded 40°C in that month.

The heatwave was made 240 times more likely by climate change, according to data from a Japanese research team. The Japan Meteorological Agency (JMA)'s Meteorological Research Institute showed that the average temperatures in late June were 4°C higher than normal years in east Japan, and 3.2°C higher in west Japan.

Food security

The global food system relies on a relatively low variety of crops, with production dominated by a small number of countries. For example, five countries account for more than two-thirds of the global wheat and beef exports, according to the OECD. For soybeans the share exceeds 90%.

Even for commodities where the share of the five main exporters is more modest, a single country often dominates. This is the case of sugar, where Brazil accounts for 45% of global exports, and oilseeds, with 54% of global exports come from Canada.

Extreme weather events in these major exporting, or "*bread basket*", countries can therefore have huge knock-on effects across the globe, particularly in countries dependent on food imports to meet their needs. Many of these countries are developing nations, whose people are already vulnerable to food insecurity due to poverty.

In the US, the extensive drought impacted agriculture in particular. The dry conditions extended from California to the eastern side of the Mississippi River, a vast area that produces most of the nation's food, including three-quarters of its beef cattle and 70% of its vegetables, fruits and nuts.

A survey by the American Farm Bureau Federation revealed desperate conditions for farmers and ranchers, with 74% reporting an expected reduction in harvest yields, while 66% said they had liquidated parts of their livestock herd. The corn harvest is expected to be the smallest since 2019. The US is the world's top corn producer and the largest cereal exporter.

Food production in the EU has been affected by the water and heat stress, with corn yields this year expected to be 16% below the five-year average. Forecasts for grain maize, soybean and sunflowers across the bloc have been significantly reduced, at 16%, 15% and 12% below the average of the previous five years, respectively, the bloc's drought observatory noted.

Grain production in large producer countries such as France and Romania could see losses of up to 14 and 35%, respectively. In Italy, drought and low water levels for irrigation are affecting rice production, with an estimated 30% decrease in yields this year. The EU produced 286.5 million tonnes of cereals in 2020, making the region the world's 4th largest producer.

In India, extreme temperatures starting in March and extending over several weeks damaged crops and reduced yields. The rice farming area is 8% smaller than last season due to lack of rainfall in some places. India is responsible for 40% of the world's rice trade and the world's biggest exporter.

In addition to the heatwave, the country also experienced decreased rains, with rainfall levels 71% below average. Vegetable yields in Himachal Pradesh and Jammu and Kashmir were reduced by 40-50%. The states of Haryana, Uttar Pradesh and Punjab, have suffered an estimated 10-35% reduction in crop yields.

In China, this year's drought has led the government to issue emergency orders to preserve water in order to protect crops. This comes on top of last year's floods, which the government warned in March would see 2022 harvests being the worst ever.

While China consumes most of the food it produces, reduced yields in the country this year could add pressure to international trade and drive food prices up. Rice and corn are the most affected crops, not just from extreme heat but also from heavy rains in the northeast part of the country.

The ongoing floods in Pakistan will also hit food production. Rice harvests are expected to fall about 31%, which will have international consequences, as the country is the world's 4th-largest exporter of the grain. Key vegetables, like onions and tomatoes, have also been hit.