



## Climate Change Topic Overview

Climate change is an [extended change in temperature and weather](#) and can happen naturally or from human activities. Since the Industrial Revolution, humans have been increasing the amount of greenhouse gases released into the atmosphere by burning fossil fuels. Greenhouse gases, like carbon dioxide and methane, trap heat in the atmosphere and cause the Earth's temperature to warm. The Earth is now over 1 degree Celsius hotter than it was at the end of the 1800s, and the amount of [carbon dioxide in the atmosphere is the highest it has been for the past 2 million years](#).

This change in climate is impacting Earth's systems and living things all over the world. Extreme weather events and changing annual climates have increased the amount of energy we use to warm or cool our homes. Households in the United States now use almost [double the amount of electricity](#) than they did 50 years ago. Changing weather patterns have altered the location of where crops can be grown. Farmers are battling extreme droughts, increased desertification, and inhospitable climates for growing their traditional crops. [Warmer climates also lead to more disease](#), as disease-carrying species are migrating to more favorable climates. This will impact crops, livestock, our health, and so much more.

As we continue to rely on fossil fuels for transportation, heating and cooling, and manufacturing, more and more greenhouse gases will be released into the atmosphere, causing the Earth's temperature to increasingly rise. Other human activities like deforestation, unsustainable livestock production/factory farming, and decomposition in our ever-expanding landfills also contribute to an increase in greenhouse gases.

[Climate change is an environmental justice issue](#), and often those that emit the least amount of greenhouse gases are the most vulnerable to the impacts of climate change. These communities may also have the [least amount of resources](#) to help them adapt, receive the health care they need, or migrate from their homes if necessary.

## Possible Climate Change Subtopics

Climate change is a broad topic. Rather than taking on the entire topic, consider focusing on just one part of it (a subtopic). We've put together a list of subtopic angles you could take, and linked to a variety of credible sources, below. But remember, there are many other climate change subtopics, and tons of other sources, so no need to limit yourself to what's included here!

**Click on the colored tiles to navigate to resources about each subtopic.**



### Energy Use

As temperatures rise, more and more energy is required to keep us cool throughout the year. Increases in energy use equal a higher use or dependence on fossil fuels. As we are burning more fossil fuels to regulate the temperatures in our homes, we are releasing more carbon dioxide into the air. We are also overloading our power grids, which depend primarily on fossil fuels and need to be modernized to accommodate renewable sources of energy.

- The amount of energy used by people in the U.S. has continued to increase over the last 50 years. (Source: [United States Environmental Protection Agency](#))
- Increased droughts caused by climate change impact hydropower plants, a significant power source in Europe. (Source: [BBC](#))
- The increased use of electricity to deal with extreme heat could overload the United States' electrical grid. (Source: [Vox](#))
- Extreme weather events are the main cause of power outages and a constant hazard to the U.S. energy system. (Source: [U.S. Climate Resilience Toolkit](#))
- We will need nine times the amount of renewable energy than we currently produce in order to replace energy from fossil fuels. (Source: [The Nature Conservancy](#))

## **Farming, Livestock, and Fishery Resources**

Climate change impacts all parts of agriculture and livestock farming. With an increase in temperature, some crops are no longer able to be grown in certain climates, while some other crops may thrive with the increase of carbon dioxide in the atmosphere. Hotter and wetter climates may increase the growth of weeds and fungi, removing essential nutrients from the soil. Parasites may also thrive in hotter climates, harming agriculture and livestock. Fisheries could experience acidification from the increased amount of carbon dioxide, and the decrease of oxygen in their habitats can lead to dead zones.

- Climate change impacts what crops we can grow and what animals we can raise, which disrupts food availability worldwide. (Source: [United States Environmental Protection Agency](#))
- Because of climate change, we may see an increase in wheat crops and a significant decrease in maize or corn production. (Source: [NASA](#))
- Farmers in the Northeast U.S. have already experienced increased rainfall, flooding, rising sea levels, coastal erosion, and are now experiencing droughts because of climate change. (Source: [ABC News](#))
- Climate change is creating excessively hot days, droughts and disease, which is impacting the production of tomatoes. (Source: [National Geographic](#))
- The oceans are absorbing more carbon dioxide, leading to acidification, which impacts the world's fish supply. (Source: [National Oceanic and Atmospheric Administration \(NOAA\) Fisheries](#))

## Deforestation

Forests are important for regulating the Earth's climate. Trees absorb greenhouse gases and release oxygen, which is essential for life. As more land is being cleared for homes, agriculture and industry, we are losing an increasing amount of forests. About [1/3 of all forests have been lost](#) and another 1/5 of the world's forests are severely damaged. Trees are essential to climate mitigation and can account for ["almost 1/4 of the goals set in the Paris Agreement in 2015."](#)

- Forests help regulate climate by absorbing the greenhouse gas carbon dioxide but are being cut down at a startling rate. (Source: [National Geographic](#))
- About 30% of forests have disappeared globally, and another 20% are degraded to the point that they no longer provide climate-critical benefits. (Source: [Bloomberg](#))
- Trees provide additional cooling benefits for the Earth beyond absorbing carbon dioxide because of the way they distribute water and sunlight. (Source: [World Economic Forum](#))
- Study shows that the Amazon rainforest is now releasing more carbon than it can store. (Source: [National Geographic](#))

## Extreme Weather Events

Changes in climate have impacted the habitats of animals and caused migration patterns of animals to change drastically. From dangerous heat waves, to devastating flooding, extreme weather events have started to feel like the norm. The dry conditions create favorable conditions for wildfires. Increased temperatures are causing sea ice to melt [which can be linked to extremely cold winters](#). Warming temperatures also cause more water to evaporate into the air which can lead to periods of immense rainfall and dangerous flooding.

- "The Arctic is warming nearly four times faster than the rest of the world," amplifying global climate change. (Source: [PBS NewsHour](#))
- Check out these maps which show how extreme weather events were impacted by climate change around the world. (Source: [Carbon Brief](#))
- Hotter air can hold more moisture than cooler air, which can cause excessive rainfall, flooding, and landslides. (Source: [National Geographic](#))
- Climate change is causing heat waves, droughts, wildfire conditions, and extreme rainfall events. (Source: [BBC](#))
- 40°C heatwaves could happen every few years because of climate change. (Source: [Natural History Museum](#))

- Dry conditions, droughts, and extreme temperatures are fueling a dangerous amount of wildfires worldwide. (Source: [PBS NewsHour](#))
- Arctic animals' movement patterns are shifting in different ways as the climate changes. (Source: [NASA](#))

## Environmental Justice

The communities that release the least amount of carbon dioxide emissions globally bare the brunt of the impacts of climate change. Communities of color in the United States and around the world are disproportionately exposed to extreme weather events like flooding, excessively hot days, and low air quality. Years of discriminatory practices (like [redlining in the U.S.](#)) have placed many marginalized neighborhoods in areas with lower-priced real estate that are more vulnerable to devastating weather events. These include low-lying areas prone to flooding and “heat islands” in urban areas. The harm is amplified because these communities are often under-resourced and don't have the necessary infrastructure to withstand extreme weather, access to transportation to leave if they need to, or an appropriate health care system to combat the numerous health-related challenges caused by a changing climate.

- Climate change is a threat to everyone's physical health, mental health, air, water, food, and shelter, but some groups — socially and economically disadvantaged ones — face the greatest risks. (Source: [Columbia Climate School](#))
- The socially vulnerable populations in the U.S. are disproportionately at risk from the effects of climate change. (Source: [United States Environmental Protection Agency](#))
- People of color across the Global South are those who will be most affected by the climate crisis, even though their carbon footprints are generally very low. (Source: [BBC](#))
- The poorest people in the world do not have the money or resources to adapt or migrate when facing climate change, leaving them the most vulnerable to its impacts. (Source: [Carbon Brief](#))
- The racial wealth gap and other systemic inequities, like pre-existing health conditions and poor living conditions, amplify the harm that climate change is having on communities of color. (Source: [Forbes](#))

## Disease Evolution

Increased temperatures, excessive rainfall, floods, droughts, and storms can all create favorable conditions for disease-causing pathogens to thrive. Mosquitos and other disease vectors are traveling to new areas and reaching new human populations. Increased temperatures in the oceans and other bodies of water cause dangerous bacteria to multiply. Flooding often brings harmful pathogens into drinking water supplies. Also, mental health can suffer for communities exposed to constant extreme weather events caused by climate change.

- Between 2030 and 2050, climate change is expected to cause approximately 250,000 additional deaths per year from malnutrition, malaria, diarrhea, and heat stress. (Source: [World Health Organization](#))
- Climate change impacts like rising temperatures, floods, droughts, storms, fires, heatwaves, etc. worsen diseases. (Source: [Nature](#))
- Disease-carrying insects' geographical ranges are increasing as they migrate to better climates, expanding their reach and impact worldwide. (Source: [TIME](#))
- Animal migrations to new habitats will create more viral outbreaks as different species meet for the first time. (Source: [Nature](#))