

# Is Climate Change Increasing Disaster Risk?

 [worldwildlife.org/resources/explainers/is-climate-change-increasing-the-risk-of-disasters](https://www.worldwildlife.org/resources/explainers/is-climate-change-increasing-the-risk-of-disasters)



From deadly wildfires in California to devastating floods in North Carolina, disasters have wreaked havoc across the US over the past year, the world's hottest on record. They shook millions of lives<sup>1</sup> and caused billions of dollars in damage.<sup>2</sup> As [climate change](#) intensifies, there is no question that the intensity and frequency of extreme weather—often resulting in disasters—is increasing.

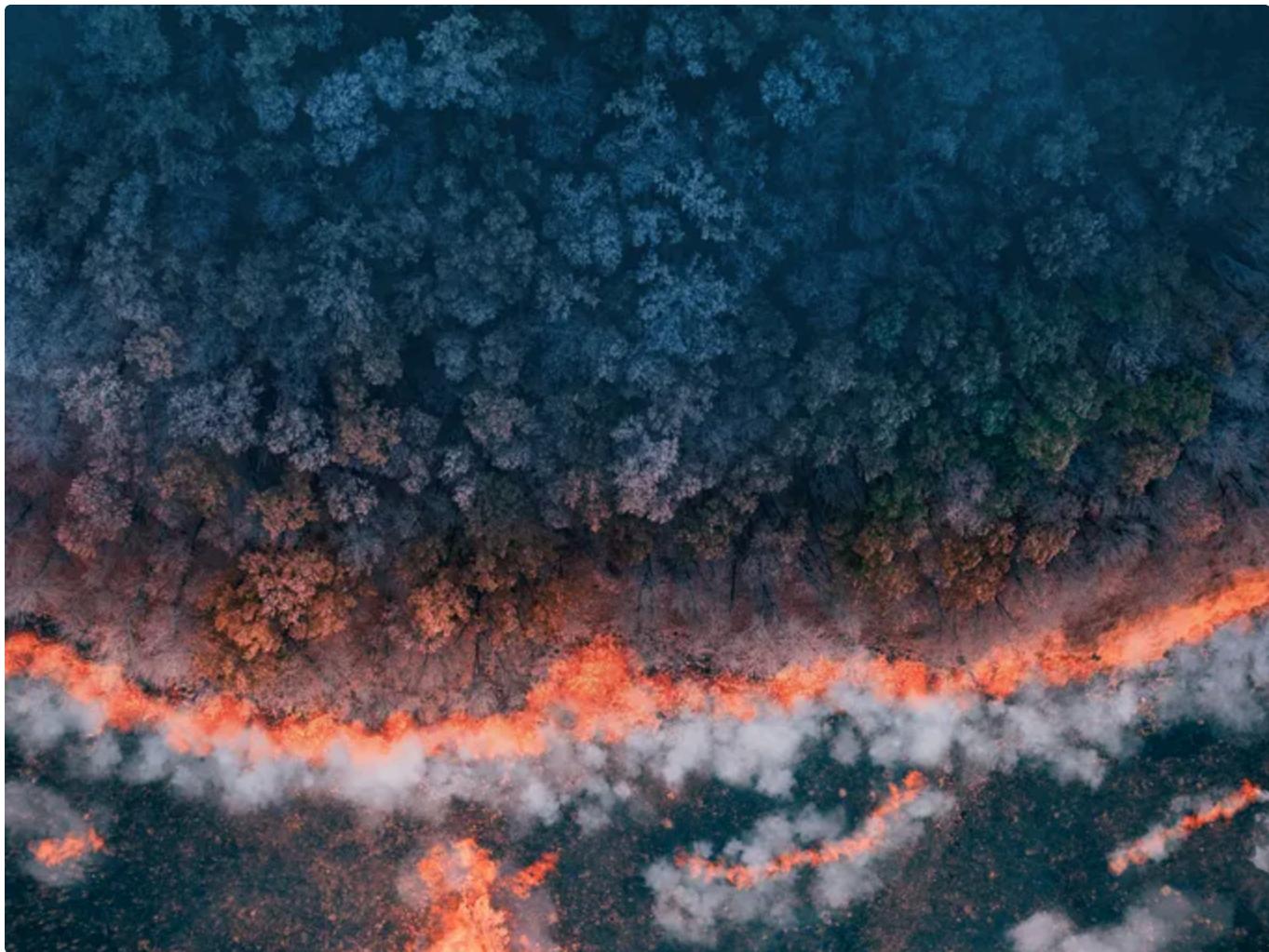
According to the IPCC's most recent report on climate adaptation, disasters fueled by climate change are already worse than scientists originally predicted. And now, the scientists have presented evidence that additional warming is locked in. That means disaster risk will grow, even if the world does succeed in limiting the greenhouse gas emissions that drive the changing climate.

Here's the thing—a natural hazard, such as a flood or wildfire, does not have to become a disaster. By proactively taking measures to reduce the risk posed by hazards, the impacts can be managed while strengthening resilience. WWF is working to integrate [environmentally responsible practices into disaster response, recovery, reconstruction, and risk reduction programs and policies.](#)

Here are four natural hazards that are impacted by our changing climate, along with ways to reduce risk for each.



© 2014 Dave Weaver/Shutterstock



© Andrii Chagovets / iStock

## Wildfires

---

In some landscapes, fire is a natural element of the ecosystem—and forests and wildlife depend on it. [But wildfires are growing in scale, frequency, and intensity, wreaking devastating consequences on an ever-larger number of communities.](#) The flames are claiming lives, incinerating homes, and pushing some animal species to the brink of extinction.

With climate change intensifying, hotter temperatures, more intense and longer dry seasons, earlier snowmelt, and stronger winds damage nature's ability to resist fire. Fuel accumulates as more intense wet periods lead to rapid vegetation growth, and longer heat waves dry it out. On top of that, increasingly frequent lightning strikes provide more opportunities for ignition. The result of these interwoven drivers is a tinderbox. The fire season is starting earlier and ending later—and the wildfires are more destructive.

Humans are responsible for the vast majority of out-of-control wildfires in the US. That means solutions are also in our hands. For years, governments have spent massive amounts of money to extinguish fires, but the amount of area burnt continues to increase.

To address the root causes of fire risk, governments should continue to reform fire management policies. In addition to tackling the greenhouse gas emissions at the core of climate change, updated fire risk management approaches using prescribed burns, making buildings fire-resistant, regulating land-use change to avoid development in high-risk areas, and rebuilding after fires with environmentally responsible methods are critical. These methods include appropriate land use and environmentally and socially responsible building materials and construction practices. By reforming fire management policies, we can limit fires' worst impacts.

## Floods

---

In some landscapes, flooding can be a natural part of a yearly cycle, providing ecosystem services—the direct and indirect benefits that natural resources provide to people—and supporting livelihoods. But when communities and infrastructure are unable to cope with inundation, the resulting flood disaster impacts can be devastating. In fact, floods impact more people worldwide than any other disaster, and the economic, social, and environmental impacts are getting worse. By 2050, one study projects the cost of flooding to rise by 11 billion dollars.<sup>3</sup>

Several factors are contributing to the increase in flood risk. These include changes in rainfall, storms, and temperatures, driven by climate change, as well as societal factors such as changes in land use and the development of floodplains.

Hard engineering, such as dams and seawalls, is often the default flood management method. But these structural measures cannot adapt to changing conditions, can be expensive to build, and can lead to negative social and environmental impacts. Nature-based flood management methods can maximize the benefits of floodwaters while managing and minimizing negative consequences. These methods can be used independently or in combination with hard engineering methods.

Wetlands, for example, can absorb water and reduce the risk of a flood disaster. But in many places, wetlands are paved over or filled in, often with impervious surfaces such as concrete, meaning that water can't pass through.<sup>4</sup> Restoring and managing wetlands can help communities adapt and reduce disaster risk. Healthy wetlands also deliver additional benefits such as cooling effects and better water quality. Plus, they offer recreational opportunities such as walking paths, bird watching, fishing, and boating! [The WWF Flood Green Guide provides tools and guidance around the use of natural and nature-based methods for flood management.](#)

## Hurricanes

---

Hurricanes are large and intense storms that form over warm ocean waters. The hurricanes that develop over the Western Pacific Ocean are called "typhoons," and those born in the South Pacific and Indian Ocean are named "cyclones."<sup>5</sup> Hurricanes are a product of the evaporation of ocean waters of 80 degrees Fahrenheit or higher, creating warm and moist air that rises into the

atmosphere. As the air rises, it cools and condenses, forming storm clouds. Winds begin to blow in a circle and gather a cluster of clouds, and as the wind speed increases, the storm reaches the status of hurricane.<sup>6</sup>

Hurricanes can be accompanied by intense winds, heavy rain, storm surges, coastal erosion, landslides, and tornadoes, causing damage in the coastal areas where they make landfall and beyond. Climate change is increasing ocean and atmospheric temperatures and causing higher sea levels, which in turn can increase the frequency, duration, and intensity of hurricanes, along with their peak winds, storm surge, and rainfall rates.<sup>7</sup> Nature can help reduce the damage caused by those impacts. For example, conserving and managing wetlands and marshes can help absorb flood waters, while mangroves, sand dunes, and coral reefs can reduce wave impact.<sup>8</sup>

It is also important to note that nature itself is impacted during storms and cyclones. This is particularly true for coastal ecosystems, which can suffer from severe damage due to beach erosion, dune destruction, and saltwater intrusion. These changes sometimes lead to a loss of habitat for endangered species.<sup>9</sup>

Following a hurricane, it's important to build back safer and greener with improved land use plans along with climate-informed environmental restoration and infrastructure. For example, in a dry area, it would be helpful to plant native desert species that are adapted to local conditions, rather than non-native species that require a lot of water.

## Tornadoes

---

Primarily occurring in the US, tornadoes are rotating columns of air that extend from certain thunderstorms to the ground. Climate change is increasing the frequency and strength of severe thunderstorms, which in turn produces atmospheric conditions that can develop even more intense tornadoes.

To reduce the risk of destructive impacts, cities and towns can implement stronger building codes.<sup>10</sup> Roof straps and wind-resistant construction materials, for example, can help strengthen resilience. And when responding to a tornado, efforts should be implemented equitably, such as by ensuring that shelters are accessible to people with disabilities.



© Chip Somodevilla / Getty Images News / Getty Images



© Russ Allison Loar / Flickr Creative Commons

## Community resilience

---

Disasters don't affect communities equally. The impacts of extreme weather events are disproportionately felt by Indigenous peoples, communities of color, and low-income communities. Take fires, which can exacerbate structural inequities such as air quality disparities, chemical exposure, heat-related illnesses, and unsafe working conditions. It is important to channel resources to the communities that are most impacted.

The same structural inequalities are seen in flooding. Over 80% of people at risk of displacement by floods live in or around cities,<sup>11</sup> and people of color and people with lower incomes are particularly likely to live in flood zones. According to an NAACP and Columbia University study, Black communities "are far more frequently and severely impacted by flood events."<sup>12</sup> Following Hurricane Katrina, for example, the worst flood damage occurred in Black neighborhoods.<sup>13</sup>

And people who live in housing not built to withstand tornadoes, who are typically lower income or in a location where zoning does not require protective measures, often suffer more damage and need more support to rebuild. People of color tend to live in the worst tornado zones, and in turn, tornadoes can worsen racial inequities.<sup>14</sup>

It's clear that communities of color and low-income communities have less access to preparedness resources and tend to experience a more difficult and slow recovery.<sup>15</sup> Therefore it is crucial to incorporate racial and social equity into disaster management policies.

## Managing disasters amid intensifying climate change

---

As climate change worsens, it is important to adapt how we manage risk and respond to extreme events. Natural hazards are deeply intertwined, and if managed separately, can feed off of each other to drive more extreme damage. That's because climate change acts as a threat multiplier. A drought may parch vegetation, increasing the amount of tinder available to spark a wildfire, which incinerates a forested area, releasing CO<sub>2</sub> and further increasing climate change in a negative feedback loop. When rainfall events occur—which climate change is making increasingly intense—the lack of plants may mean that water shifts more of the soil, leading to landslides and destructive flooding. To save as many lives as possible, it's important to account for the impacts of more than one extreme event at a time.

Environmentally responsible disaster management can't come fast enough. As climate change intensifies extreme weather events worldwide, the coming years are a critical time to get disaster risk reduction right. Communities must adapt and reduce disaster risk now. Lives depend on it, and nature can help.

Learn more about the [WWF Environment and Disaster Management program](#).

## References

---

- [1] <https://www.washingtonpost.com/climate-environment/2023/11/02/climate-un-adaptation-gap-report/>
- [2] <https://www.ncei.noaa.gov/access/billions/#:~:text=In%202023%20>
- [3] <https://doi.org/10.1038/s41558-021-01265-6>
- [4] <https://greatriverslaw.org/2020/01/28/missouri-wetlands-our-unsung-resource/>
- [5] <https://www.nationalgeographic.org/article/super-typhoon-hurricane-whats-difference/>
- [6] <https://scijinks.gov/hurricane/>
- [7] <https://www.ipcc.ch/assessment-report/ar6/>
- [8] <https://www.nature.org/en-us/what-we-do/our-insights/perspectives/nature-can-help-communities-defend-against-future-storms/>
- [9] <https://www.hurricanescience.org/society/impacts/environmentalimpacts/terrestrialimpacts/>
- [10] <https://www.c2es.org/content/tornadoes-and-climate-change/>
- [11] <https://www.internal-displacement.org/sites/default/files/publications/documents/2019-IDMC-GRID.pdf>
- [12] <https://naacp.org/resources/turning-tide-advancing-racial-justice-federal-flood-infrastructure-projects>
- [13] <https://www.scientificamerican.com/article/flooding-disproportionately-harms-black-neighborhoods/>
- [14] <https://journalistsresource.org/environment/tornado-racial-segregation/>
- [15] <https://www.liebertpub.com/doi/epdf/10.1089/env.2020.0039> / <https://www.spqlawfirm.com/news/perfect-storm-environmental-inequality/>

## In this story

- [Climate](#)
- [Adapting to climate change](#)
- [Effects of Climate Change](#)