



FOREST FIRES originally developed by Charlotte Woolliscroft

How Wildfires Work

In just seconds, a spark or even the Sun's heat alone sets off an inferno. A wildfire quickly spreads, consuming the thick, dried-out vegetation and almost everything else in its path. What was once a forest becomes a virtual powder keg of untapped fuel. In a seemingly instantaneous burst, the wildfire, in forests, grasslands or moorlands, overtakes thousands of acres of surrounding land, threatening the homes and lives of many in the vicinity.

Over 7 million acres burned in 2022 in the United States alone, causing millions of dollars in damage. Once a fire begins, it can spread at a rate of up to 23 km per hour, consuming everything in its path. As a fire spreads over brush and trees, it may take on a life of its own -- finding ways to keep itself alive, even spawning smaller fires by throwing embers on the wind.



On a hot summer day, when drought conditions peak, something as small as a spark from a train car's wheel striking the track can ignite a raging wildfire. Sometimes, fires occur naturally, ignited by heat from the Sun or a lightning strike.

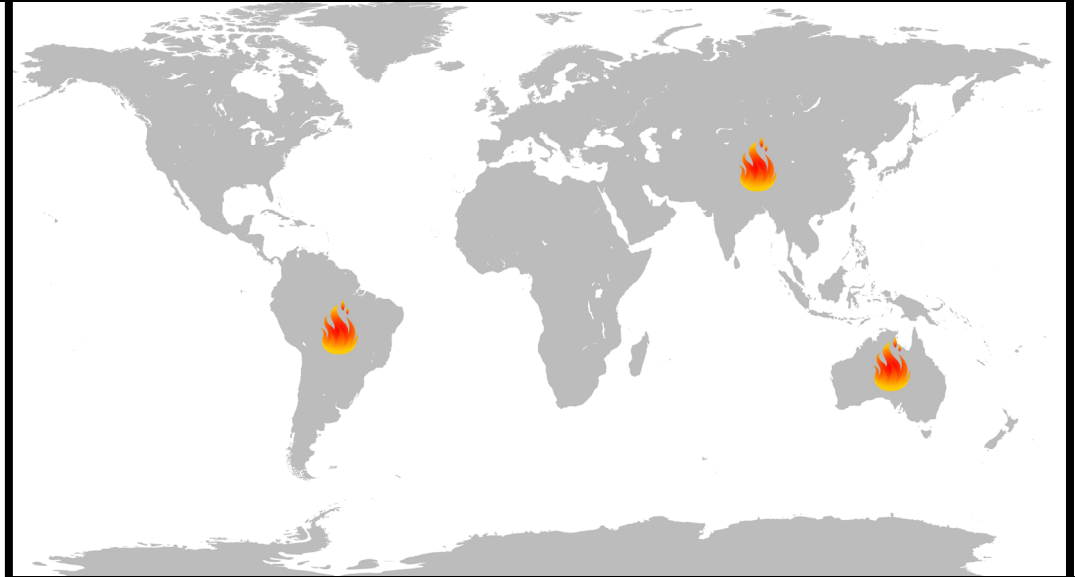
However, the majority of wildfires are the result of human carelessness—a glass bottle, left as litter, can focus the Sun's light enough to cause a fire, as can abandoned cigarettes and barbecues.

In some parts of the world, fire is used to clear land for farming—these can get out of control.

Everything has a temperature at which it will burst into flames. This temperature is called a material's **flash point**. Wood's flash point is 300 °C. When wood is heated to this temperature, it releases hydrocarbon gases that mix with oxygen in the air, combust and create fire.

There are three components needed for ignition and combustion to occur. A fire requires **fuel** to burn, air to supply **oxygen**, and a **heat** source to bring the fuel up to ignition temperature. Heat, oxygen and fuel form the **fire triangle**. Fire-fighters often talk about the fire triangle when they are trying to put out a blaze. The idea is that if they can take away any one of the pillars of the triangle, they can control and ultimately extinguish the fire.

After combustion occurs and a fire begins to burn, there are several factors that determine how the fire spreads. These three factors include **fuel**, **weather** and **topography**. Depending on these factors, a fire can quickly fizzle or turn into a raging blaze that scorches thousands of acres. As the climate warms and temperature and rainfall patterns change, we are seeing more wildfires every year.

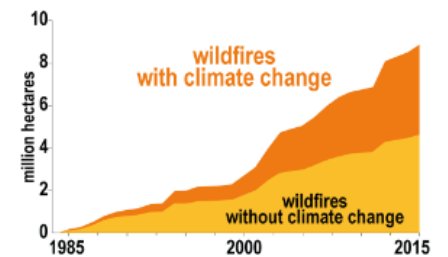


FUTURE PREDICTIONS (below)

- Fire danger in Australia to increase
 - Increased fire intensity
 - Reduced interval between fires
 - Fire danger days set to increase 4-25% by 2020 and 15-70% by 2050

Figure: IPCC AR6 WG2

(above) DISTRIBUTION OF HAZARD



(Left) Fire-fighters attempt to put out a large forest fire. (Centre) A Hercules jet drops fire retardant on a blaze in Colorado (Right) A blaze spreads into an urban area, endangering homes