Extreme Wildfires

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It “was like fighting a hundred years of wildfire in one night,” a Canadian firefighter commented (Wallace-Wells, 2023). The magnitude and intensity of such an event was unprecedented. In the summer of 2023, record-shattering Canadian wildfires ravaged through 15 million hectares of land, destroying over seven times that of the yearly average (Jain et al., 2024). Approximately 4% of the total Canadian forest burned down, setting a new record for the most expansive Canadian Wildfire–and doubling the previous record set in 1989 (Jain et al., 2024). The extremity of the situation was demonstrated when embers were able to jump the two-mile wide Okanagan Lake (Byrne et al., 2024). In total, the fires displaced over 200,000 people and killed eight (Crownhart, 2024). These disasters caused irreversible harm, negatively affecting many aspects of people’s lives.

Much of this destruction can be attributed to climate change, which is triggered by the emission of greenhouse gasses. According to a 2024 study by Piyush Jain, the mean temperature in Canada has risen 1.7 degrees Celsius since 1948. The study notes that this increase has led to 2023’s especially warm winter and early snowmelt; thus, in the following months, a significant moisture deficiency occurred from the melted snow drying up earlier in the year. Coupled with drought and record-breaking temperatures, the report concludes that the area became increasingly dry and prone to light on fire, creating the perfect conditions for wildfires to ignite. A lengthened wildfire season also emerged from these parched conditions, leading to a longer period of destruction (Jain et al., 2024).

The wildfires have had devastating impacts on both global and local communities. Particle pollution, a combination of solid and liquid particles suspended in air, is produced from these fires and can be extremely detrimental to public health, especially to young children and the elderly (American Lung Association, n.d.). The Association continues to explain that when breathed in, the particles become implanted in the lungs and can trigger numerous respiratory complications including wheezing, asthma, and bronchitis. The particles have also been shown to cause heart problems such as strokes and heart attacks. A study found that wildfire smoke could lead to 70% more out-of-hospital cardiac arrests

(D'Evelyn et al., 2022). Additionally, the extent of the impact had become widespread, even crossing international borders. Strong winds carried smoke and ash to areas as far as Greenland, Spain, and California (Wallace-Wells, 2023).

The situation is projected to get worse from here. Wildfires fuel a feedback chain in which climate change triggers a chain reaction of multiple warming events. For instance, forests serve as important carbon sinks, absorbing CO_2 from the atmosphere and mitigating the effects of climate change, as concluded by a 2024 report by Brendan Byrne et al. The study says that as a result of the burning of the forests, approximately 647 million metric tons of carbon have been released. This amount is comparable to the carbon emissions of large nations, exceeding the annual total emissions from Russia and Japan. These gasses feed the greenhouse cycle again, which will in turn amplify global warming even more and cause more wildfires down the road (Byrne et al., 2024). Furthermore, Byrne's research finds that the area's capacity to store carbon has greatly decreased, fueling the vicious cycle once more. However, it is pertinent to mention that not all wildfires are harmful. Some tree seeds, including jack and lodgepole pines, depend on these blazing temperatures to germinate (Mulverhill et al., 2024). The situation only becomes problematic when there is excessive wildfire activity. At this rate, it has been predicted that by 2050, wildfire events like this one will become the yearly norm (Byrne et al., 2024).

Although the case may seem grim, new inventions are evolving to decrease damage. Satellite technology is being used and developed to track and collect data before, during, and after a wildfire, and this information can be used to direct relief efforts and safe evacuations (Mulverhill et al., 2024b). Similarly, drones can be used to scan areas of forest using lidar technology in which lasers are emitted and returned to a sensor (Mulverhill et al., 2024b). A map is created, and the data helps post-wildfire regeneration attempts and firefighter direction (Mulverhill et al., 2024b). With innovation and creative approaches, there is still hope to preserve our beautiful planet for future generations.

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