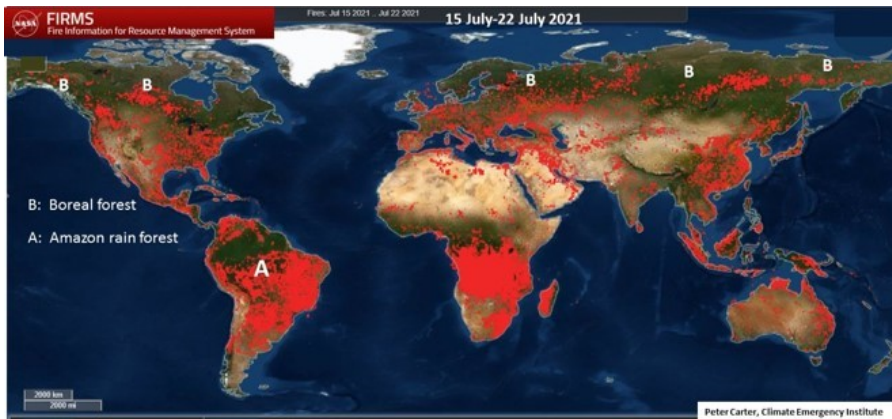


## Global Wildfire Threats to Water Supply



In recent decades, wildfires created substantial and devastating impacts on water supply, ecohydrological systems, and sociohydrosystems.

Globally, wildfires affect surface water supplies, but fire-related natural and social interactions are often unknown. Interactions between water domains ecohydrology, hydrological services, society and water risks, and global water resources are complex

Future assessments of wildfire threats to water supply resilience must acknowledge impacts on these water domain interactions. The implications of wildfire and water resource risk for the sustainability of surface freshwater supplies are not well understood, even though millions of people depend on water production in wildfire affected basins. The UN Report "State of the World's Forests " highlights that some 420 million hectares of forest have been lost through conversion to other land uses since 1990,

although the rate of deforestation has decreased over the past three decades. Forests are the most important elements of ecosystem balance. In the last period, increasing number of fires have increased in this imbalance.

The increase in forest fires creates adverse effects on water resources. Fires cause changes in vegetation-soil-water balance of water resources.

In summary, forest fires bring many environmental changes.

As the risk for wildfires increases it's important to recognize the potential resultant issues with water quality, and to take appropriate steps to maintain the efficient supply of clean drinking water.

Best Regards

Dursun Yıldız

President





## The World Has Been On Fire For the Past Month.

Countries across the northern hemisphere this summer are experiencing the worst wildfires in years of recorded history, with large swaths of land and entire towns in Europe, North America and Russia consumed by flames since the start of July.

Though many of these countries are used to summer fire seasons, climate change is making the hot, dry conditions that allow fires to catch and spread more common and more intense.

In parts of the western U.S., a summer of intense heat waves has arrived on the back of a weak rainy season, as a two-year-long drought stretches on. In mid-July, fires broke out in parts of Oregon and California, together consuming more than 230,000 hectares, part of a nationwide toll of over 1 million hectares burned so far in wildfires this year.

In early July, the Canadian province of British Columbia became an icon for the extremes of destruction that wildfires can bring: the small town of Lytton briefly became one of the hottest places on earth, obliterating Canada's heat records with temperatures topping 49.5°C (121.1°F). Then a fierce wildfire tore through town, destroying 90% of its buildings and leaving residents minutes to escape.

Last month, southern Europe's Mediterranean countries are sweltering under one of the worst heat waves to hit the region in decades. The temperature in one town in northern Greece reached 47.1°C (116.8°F) on Aug. 4, not far below Europe's all-time record of 48°C (118.4°F). Fires in the south of the country hit residential areas on the outskirts of the capital, Athens, forcing people to flee into the city center as huge smoke plu-



In Turkey, the most severe fires on record have burned through more than 11,000 hectares of forest, killing eight people, most of them in the southern town of Manavgat.

In Italy, where some 800 fires burned this week across multiple regions, tourist resorts on the eastern coastal town of Pescara rushed from a resort beach as a nearby wood went up in flames on Aug. 1.

Almost 2,000 miles north of the Mediterranean Sea, in northern Finland—where wildfires are rare—flames consumed 300 hectares of forest in the remote Kalajoki River basin in the last week of July, the worst wildfire recorded in the country since 1971.

Some of the world's most worrying fires, in terms of managing climate change, have happened a few thousand of miles east of Finland, in eastern Russia's Siberian Yakutia region. There, more than 4.2 million hectares have burned so far this year, and scientists fear they are destroying wetlands and causing layers of permafrost to melt—which could release large amounts of methane, a powerful greenhouse gas. On Aug. 4, the E.U.'s Copernicus Atmosphere Monitoring Service said fires in the area had unleashed 505 megatonnes of carbon dioxide equivalent into the atmosphere—already surpassing 2020's record for emissions released in an entire fire season, 450 megatonnes.

All of this could put us at risk of falling into a devastating cycle: as the greenhouse gases released by fires like these—and by other human activities including the burning of fossil fuels—continue to drive up global temperatures over the coming years, conditions will likely become even

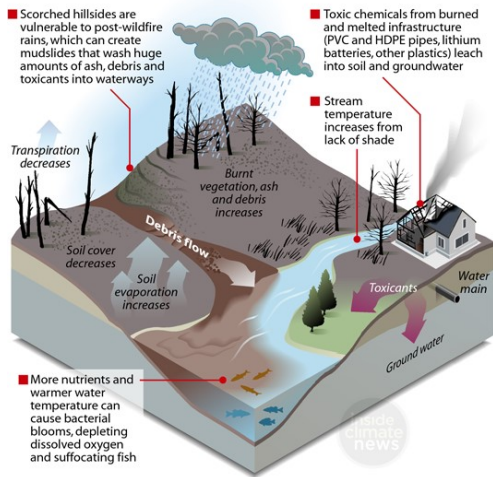
more favorable for fires, which in turn could keep driving up temperatures. If we can manage to rapidly cut our emissions, set up programs to restore natural ecosystems and get much better at preventing and controlling wildfires, we could, possibly, put a stop to that cycle some day. But between now and then, there may be many more fire seasons like this.

Source : BY CIARA NUGENT AUGUST 5, 2021  
<https://time.com/6087748/wildfires-around-the-world-photos/>



## How Wildfires Can Negatively Impact Water Quality

Intense fires cause chemical reactions that release metals, nutrients and other toxicants into the soil. Subsequent rains can wash these contaminants into rivers and reservoirs, which can negatively affect wildlife, agriculture and humans. Here are some examples:



## How wildfire impact water quality

Wildfires are a natural part of many ecosystems, but recently these fires have become more severe, burning more acres and causing destruction in the western parts of the U.S. These wildfires destroy trees, vegetation, wildlife, and infrastructure. The fires have taken a toll in human life, but also in the health of those exposed to the smoke. EPA has been exploring the impacts of both short-term and long-term exposure to wildfire smoke on human health. More recently, EPA researchers have begun to look at a less understood area of research—the impact of these fires on our water supply, the natural resource we depend on for drinking, irrigation, fishing and recreation.

Just as wildfires impact air quality, they can also affect the quantity and quality of water available. Water supplies can be adversely affected during the active burning of a wildfire and for years afterwards. During active burning, ash and contaminants associated with ash settle on streams, lakes and water reservoirs. Vegetation that holds soil in place and retains water is burned away. In the aftermath of a large wildfire, rainstorms flush vast quantities of ash, sediment, nutrients and contaminants into streams, rivers, and downstream reservoirs. The absence of vegetation in the watershed can create conditions conducive to erosion and even flooding, and naturally occurring and anthropogenic substances can impact drinking water quality, discolor recreational waters, and may potentially contribute to harmful algal blooms.

Due to the unpredictable nature of wildfires, drinking-water utilities face a considerable challenge to develop plans and strategies for managing floods and treating polluted water. Information and tools are needed to help water storage and treatment managers better prepare for wildfire impacts.

Research conducted by Dr. Mussie Beyene, an EPA postdoctoral researcher working with EPA ecologist Dr. Scott Leibowitz, has examined pre- and post-wildfire data on streams in the western United States to understand how wildfires change the daily flow of sediment and water in streams. One of the reasons he focused on the western states is because 65% of fresh water supply in the region originates from forested watersheds, which, depending on conditions, can be highly susceptible to forest fires.

“How do wildfires change the amount of water and sediment flowing into a stream?” asks Beyene. “If you are a municipal water supply manager, you are most concerned with changes in the magnitude, frequency and timing of extreme water discharge and sediment—what are the highest and lowest amounts of water and sediment that flow into a stream after a wildfire—because your water treatment plants and your water storage systems may not be built to accommodate them.”

Beyene found that there is a possible increase in stream water discharge following a wildfire. For streams in the northwest, this can be followed by fewer episodes of very low water levels. In contrast, for streams in the southwest, the increase in discharge is followed by more episodes of very high water levels. Additionally, the timing of peak flood events shifted towards late winter-early spring for regions that receive the majority of their water from winter snowpack. In terms of water quality,

Beyene also found a significant increase in the amount of suspended sediments in streams after a wildfire event.

Beyene’s research is just one aspect of EPA’s larger investigation into the impact of wildfires on water resources. Researchers are working to determine whether pollutants, like mercury and lead left over from the 20th century mining boom and other old industries, more easily find their way into water after wildfires. They are also exploring ways to protect water quality from wildfires through watershed management. Information generated from these studies will be used to protect the quality of our water supplies and the essential benefits they provide.

Source : <https://www.epa.gov/sciencematters/wildfires-how-do-they-affect-our-water-supplies>

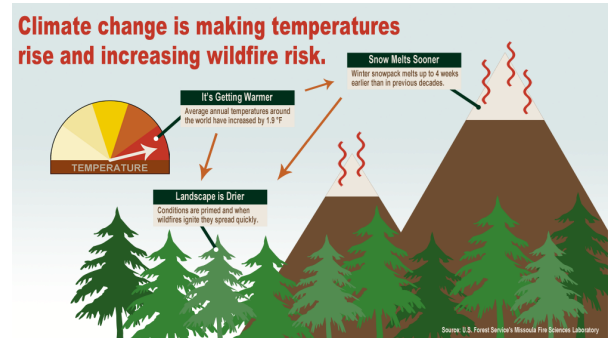
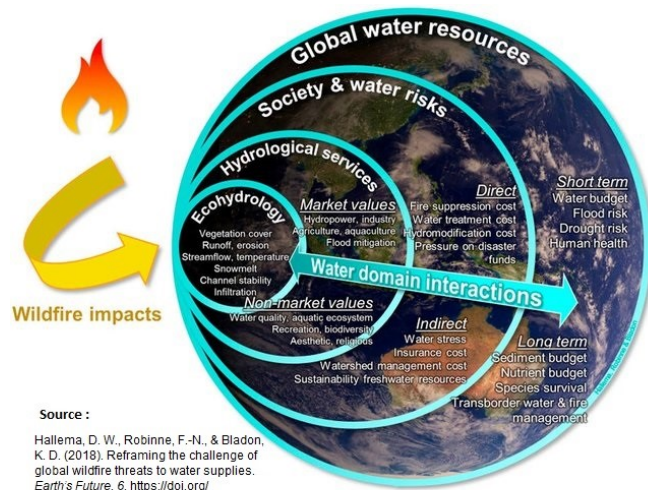




## Wildfire trends are expected to continue

The number of large forest fires and the length of the wildfire season have both increased globally in the past few decades. Wildfire trends are expected to continue due to increasing occurrence of drought and denser forests associated with historical forest management and fire suppression. This development has raised concerns for water supplies because most water used for irrigation,

industry, hydropower, recreation, and community drinking water comes from rivers draining watersheds that are prone to wildfires. As such, it is critical to improve our understanding of the capacity of watersheds and downstream communities to absorb or mitigate fire impacts. In this commentary, we emphasize the need for new continental and global scale indices to assess the full range of wildfire hazards to water supply and society. This will ultimately contribute to sustainable policies and land management plans for safeguarding water supplies and community health.



We need to build a future,  
Where people live in harmony with nature

# HPA

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