

Drought in the West

Interactions with Wildfire

Droughts do not cause wildfires, but they can contribute to conditions that make wildfires more likely or more severe. In general, droughts interact with wildfire by increasing the availability and flammability of fuels.

Drying fuels

Droughts contribute to wildfire by drying fuels. Drier fuels tend to burn more easily; it takes less ignition energy to begin burning, and these fuels release energy more quickly as they burn. This encourages more frequent and larger fires when there is a high fuel load (as in overly dense or fire-excluded forests, or after a wet spring, which encourages the growth of fine fuels like grasses and understory plants). In severe cases, droughts may also cause higher tree mortality. Dead trees can be a more volatile fuel source and drive more severe fires.

However, extended droughts can reduce fire occurrence, as vegetation growth (and thus fuel availability) declines under protracted water stress.

Reduced environmental moisture

Severe hydrological droughts dry more than just vegetation. They also reduce soil moisture through direct evaporation and increased water demand from vegetation.

High soil moisture can help slow fire spread and reduce intensity, and streams, rivers, and lakes can be both natural fire breaks as well as fire-management resources. Reductions in these water sources allow fires to spread farther and more quickly.

Stressed water infrastructure

There are many demands for, and user of, water. Long-term droughts may affect municipal water supplies or put stress on socioeconomic or agricultural uses. In some cases, local water sources may be unavailable for fire response, forcing managers to use expensive and resource-intensive equipment to transport water from farther away.



Fires with dry fuels may be more likely to develop into damaging crown fires. [USDA Forest Service photo.](#)

Climate change effects on drought

The effects of climate change add to the complex relationship between fire and drought by magnifying existing interactions.

- Climate change is projected to change precipitation patterns in the Western U.S., making some dry areas drier and contributing to long-term meteorological droughts.
- The warming effect of climate change across much of the West will also make fire weather more likely and increases both fire season length and drought likelihood and severity. This combination of conditions contributes to drier fuels that stay flammable for longer and present more opportunities for ignition during high-severity fire conditions.

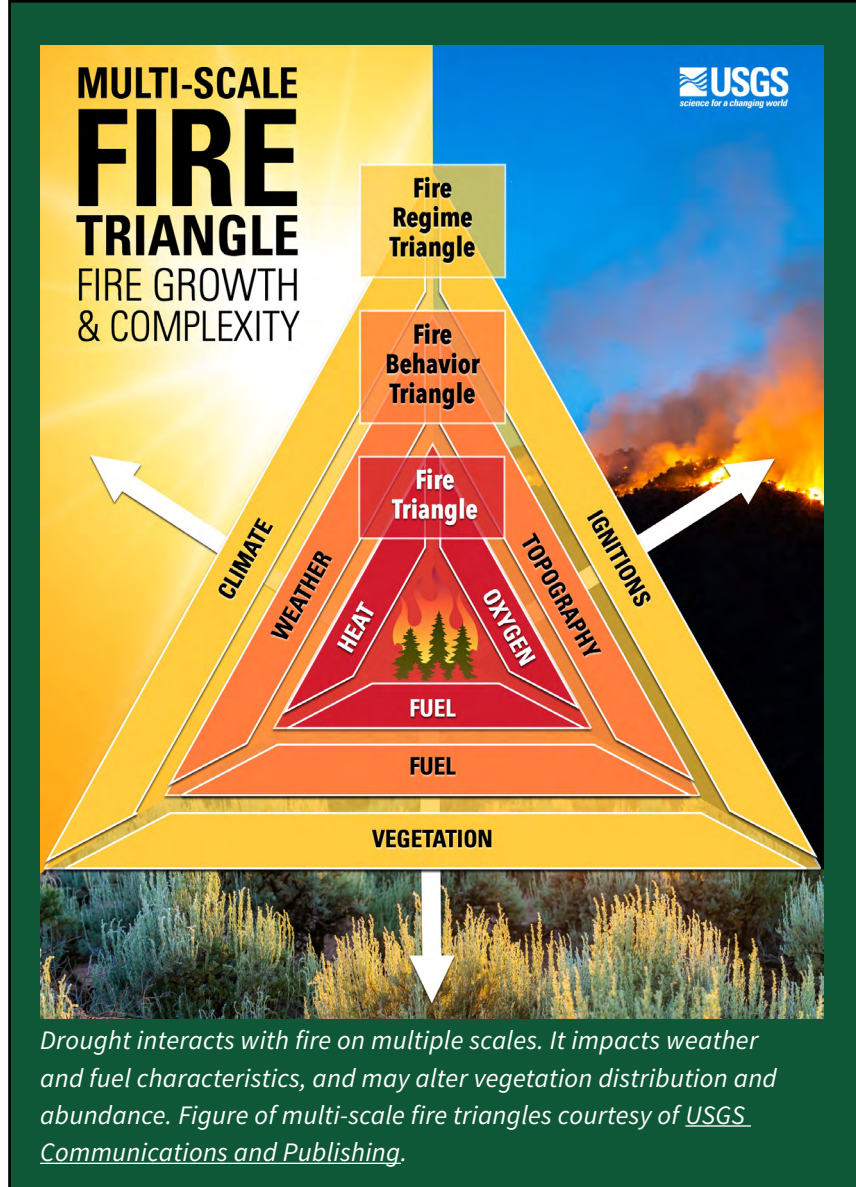
Monitoring and management

Severe droughts that follow a wet, productive growing seasons can lead to conditions that support high-severity fires. The National Interagency Coordination Center monthly outlooks can help highlight these patterns.

There are also many measures of soil moisture available that can help gauge when forest and grassland conditions are particularly susceptible to severe fires. The monthly fire outlooks include soil moisture as a metric.

Resources

- More region-specific measures and outlooks of soil moisture are available at the National Oceanic and Atmospheric Administration's [National Integrated Drought Information System](#) dashboard.
- The [National Interagency Coordination Center](#) produces monthly fire danger outlook maps and reports for the contiguous U.S. as well as daily fire danger forecasts for the upcoming week.
- The National Integrated Drought Information System's [Drought and Wildland Fire Nexus Strategy](#) offers in-depth discussions about how fire managers can effectively use drought information.
- [National Interagency Fire Center](#) is a major source of fire information and predictive services.
- Use [this link](#) for more information about drought interactions and updates.



The Western Wildland Environmental Threat Assessment Center (WWETAC) develops and communicates the latest scientific understanding of environmental threats to the Western United States. We conduct applied science and provide tools and information to help land managers assess and respond to environmental threats, leading to more resilient landscapes. To learn more, visit <https://research.fs.usda.gov/pnw/centers/wwetac>.

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