



What is? **WEATHER**

Weather describes short-term variations in the atmosphere from hot to cold, wet to dry, calm to stormy, clear to cloudy.

Weather is the most variable component in the [fire behavior triangle](#) and has a tremendous effect on fire behavior. Weather can influence how hot a fire burns, how much and what is killed, and how large it grows. Some fires can also create their own weather, under extreme fire behavior conditions.

The basic principles and concepts of fire weather as they relate to wildland fire behavior include: wind, air temperature and relative humidity, precipitation, and atmospheric stability.

Wind

Wind increases the supply of oxygen to the fire. Wind dries fuels, and also influences the direction and speed at which a fire spreads. Wind can carry embers ahead of the main fire causing new spot fires.

Air temperature and relative humidity

Rising temperatures result in higher heat and decreasing relative humidity and fuel moisture. Warm temperatures add to fuel drying, and when exposed to direct sunlight fuels can ignite more easily and quickly. Smaller fuels in particular, like dead needles and grasses, gain and lose moisture quickly with changes in temperature and relative humidity. Fluctuations in temperature and relative humidity in time and location impact how hot a fire is and how quickly it moves.

Precipitation

Precipitation influences the moisture content of fuels. A large amount of rainfall in a short time moves more quickly through an area and has less effect on fuel moisture than a lower amount over a longer time. Fuel size matters too - smaller fuels (dead needles and grasses) gain or lose moisture usually within one hour and are affected by precipitation more drastically than larger fuels like logs. Fuels that are wet are less likely to ignite and will burn slower, or will go out.

Atmospheric stability

A stable atmosphere is defined as an atmosphere that resists upward air motion. An unstable atmosphere can contribute to increased fire activity

**FIRE
FACTS**

by increasing the lofting of embers, increasing the occurrence of dust devils and fire whirls, and increasing the potential for gusty surface winds. Wildfires burn hotter and with more intensity when the air is unstable.

Weather conditions that can lead to rapid fire growth and a [Red Flag Warning](#) includes: wind speeds greater than 20 miles per hour at slightly above ground level, temperatures at 80 degrees Fahrenheit or greater, and relative humidity less than 20%. A Red Flag Warning is issued by the National Weather Service (NWS) to alert land management agencies about the onset, or possible onset, of critical weather and fuel moisture conditions that could lead to rapid or dramatic increases in wildfire activity.



Fire whirl. Photo credit: NOAA

For more information:

For more information on Fire Behavior, Fuels, Topography, Types of Fire, Parts of a Fire, Measures of Fire Behavior and Fire Regime visit the [Northwest Fire Science Consortium's website](#).

[Introduction to Wildland Fire Behavior](#), S-190. National Wildfire Coordination Group.

[Fire Science Core Curriculum](#). 2017. OSU Extension Service, EM 9172: 197p.

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