Look Up, Down, and Around

Fire Environment Factor: Weather

Indicators

Wind

- Speeds above 10 mph
- Lenticular clouds
- Fast moving clouds
- Cold frontal passage indicated by weak vortices and changing temps
- Cumulonimbus clouds
- Dust clouds approaching
- Battling or shifting winds

Temp/RH

- Above normal temperatures
- Critically low humidity based on local thresholds

Atmospheric Instability

- Instability concerns reported in the forecast or observed in the field
- Good visibility
- Dust devils
- Cumulus clouds
- Castellanus clouds in the morning
- Smoke rising straight up
- Inversion begins to lift

Start with the forecast. Review headlines and discussions for mention of critical weather factors, indicators, and patterns.

Anticipate what you will find while en route. Visually estimate windspeed and direction. Read sky for visibility, haze, and breaking inversions, cloud cover, and cloud types, dust devils, and other instability factors for wind changes.

Validate the forecast with the situation on scene and current weather observations. Request updated forecast as needed.

Fire Environment Factor: Topography

Indicators

- Steep slopes (>45%)
- Chutes/chimneys/passes/saddles
- Box and narrow canyons
- Slope reversals
- Critical aspects and times on sunny days
- Thermal belts

Steep slopes, enhanced by drainages, draws, chutes, and chimneys, can produce instability over your fire and extreme upslope spread events.

Gap winds (saddles and passes) can be gusty and erratic.

Box and narrow canyons can hold heat, funnel winds, and support rapid increase in fire activity when inversion breaks.

Slope reversals in narrow canyons can change backing fire to head fire. Be mindful of spotting potential and sunny aspects on the other side.

Critical south and west aspects are in the sun during the peak burning conditions. Will fire be burning there then?

Thermal belts should be factored into night operations. Learn the elevation of concern and when they set up.

Dry fuels to burn intensely, wind to push them, instability factors from the sky, from the terrain, or from the fire itself. If they seem to align and raise your concerns, say something.

Fire Environment Factor: Fuel Characteristics

Indicators

- Cured or curing grasses and leaves
- Continuous loads of dead fine fuels
- Heavy dead and down fuel loads
- Tight crown spacing (<20')
- Tall (deep) grass and shrub fuel beds
- Unusually low dead and live fuel moisture estimates (locally defined)

Special Conditions

- Efficient firebrand sources
- Numerous snags
- Ladder fuel loads
- Flammable needle and leaf foliage
- Fire damage and preheated canopy
- Frost damage and bug-kill
- Blowdown and slash accumulations

Scout your assignment for where most burnable fuels are.

What will carry the fire? Grass/shrub/litter/slash, its continuity, and how dry (drought, Energy Release Component (ERC), snap of sticks, crackle of litter, pop vs crumble of leaves, dust in duff).

Is crown fire possible? Will fire in shrubs and trees breach your line and can surface/ladder fuels torch them?

What damage do you see? Frost, scorch, slash, bug-kill.

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Fire Environment Factor: Plume Dynamics

Indicators

- Well developed, near vertical column
- Pyrocumulus or ice cap on column
- Thunder/lightning flashes
- Sprinkles of rain
- Sudden calm
- Becoming hazy, smoke at your feet
- Changing column, alternating and strengthening inflows, and outflows

First view of the fire is of the column while en route. Look for plume factors as indicators of instability, critical winds such as downdrafts and outflows. Read smoke column for what is burning, how intensely it is burning.

On-scene factors (thunder/lightning, sprinkles, sudden calm, smoke at your feet) mean imminent wind changes.

Fire Environment Factor: Rapidly Changing Fire Behavior

Indicators

- Smoldering fires pick up
- Trees begin to torch
- Firewhirls beginning
- Leaning or sheared column
- Increased frequency of spot fires

Be mindful of critical burn period between 1400 and 1700.

Monitor fire activity for notable changes. When does smoldering become spreading? First torching tree, first dust devil, first spot discovered. Increasing flame length.

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