

Red Flag Program

Fire Weather Watches and Red Flag Warnings are issued when the combination of fuels and weather conditions support extreme fire danger and/or fire behavior.

A *Fire Weather Watch* is used to alert agencies to the high potential for development of a Red Flag event in the 18-96 hour time frame. The Watch may be issued for all or selected portions of a fire weather zone or zones.

A *Red Flag Warning* is used to inform agencies of the impending or occurring Red Flag conditions. A Red Flag Warning is issued when there is high confidence that Red Flag criteria will be met within the next 48 hours or less or criteria are already being met. Longer lead times are allowed when confidence is very high or the fire danger situation is critical. The Warning may be issued for all or selected portions of a fire weather zone or zones.

Fire Weather Watch and/or Red Flag Warning headlines are included in all affected forecasts. All NWS fire weather web pages also highlight any watch and/or warning issuances.

Format and Contents - A bullet format text message (RFW) is used for issuing, updating, and cancelling all Fire Weather Watches and Red Flag Warnings. Complete information regarding the format, content and examples of Fire Weather Watches and Red Flag Warnings can be found here: <http://www.nws.noaa.gov/directives/sym/pd01004001curr.pdf>

NWS offices normally call affected dispatch offices when Red Flag Warnings and Fire Weather Watches are issued or updated. Watches and Warnings are also available on the internet via the California Fire Weather web page, the web site(s) of the issuing NWS office(s), the NWS National Fire Weather Page and (www.weather.gov/fire) and from WIMS.

If the issuance of a Red Flag Warning or Fire Weather Watch requires an update of the forecast, the NWS office will verbally notify the Redding and Riverside PSUs as soon as possible. During non-duty hours for the PSUs, a voice mail message should be provided by the NWS.

Fire Weather Watches and/or Red Flag Warnings from NWS offices are normally issued only after, 1) an accurate assessment of fuel conditions has been determined (see "Qualifying Fuels Information" section), and 2) conferring with affected agencies, including the GACC Predictive Services Units. The final authority for the issuance of a watch/warning rests with the NWS forecaster.

Watch/Warning Fuel Requirements:

Live and/or dead fuels are sufficiently receptive (dry) so that fire starts from any cause may become an initial attack problem for fire agencies in the Fire Weather Zone(s) impacted. Fuel dryness/receptiveness should be determined by the following methods, in ranking level of importance:

- The local Fuels Management Officer (FMO) determines fuels are dry enough in the (portions of) Fire Weather Zone(s) to constitute an initial attack problem.
- High to Extreme Fire Danger as determined by the local fire management agency.
- The Fuel Dryness Level of the Geographical Area Coordination Center (GACC):

Northern California - The Fuel Dryness Level 7 Day Fire Potential Matrix in a brown or yellow category for the (portions of) Fire Weather Zone(s) expected to be impacted. If the fuel dryness level in the chart is green, the forecaster must determine if there will be an initial attack concern due to fuel dryness over all or part of the Fire Weather Zone or Zones. In rare cases, fuels may be or, may be becoming, too wet for an imminent large fire concern for the GACC, but are still dry enough, or dry enough for long enough, to be an initial attack concern.

Southern California – In addition to the 7 Day Fire Potential Matrix, the Predictive Services Unit in Riverside produces a written discussion on fuel status across southern California every other Thursday.. This discussion is based on input from the fire community and includes a brief description of the current status of the live and dead fuel moistures, including green-up/curing information, as well as expected fuel conditions over the next seven days. The Fuels Discussion can be found at: http://gacc.nifc.gov/os_cc/predictive/fuels_fire-danger/myfiles/Fuels_Discussion.pdf

- **Non-Desert:** When a fuel condition of “Dry” (yellow) or “Very Dry” (brown) is displayed on the matrix for any Predictive Service Area (PSA), the “fuels switch” will be considered “on” for that day. A RFW is NOT recommended for any PSA designated as “Moist” (green).
- **Desert** (excluding the lower Colorado River Valley): During dry winters and the spring curing season, fuel moistures **over the deserts** may be quite low without initiating serious concerns about the potential for large fire growth. Reasons include light fuel loading and/or discontinuous fuel, or the existence of dry fine fuels when larger live fuels remain relatively green. The Southern California GACC PSU will coordinate with affected WFOs to clearly communicate fuel conditions, and provide updates regarding spatial trends and changes in large fire potential, despite a “Very Dry” (brown) display on the associated PSA matrix.

The NWS should refer to this online document as the primary source of fuels information along with the National Fuel Moisture Database located at:

<http://www.wfas.net/index.php/national-fuel-moisture-database-moisture-drought-103>,

Watch/Warning Criteria for Abundant or Dry Lightning:

Northern California Zones:

Abundant lightning (scattered [25%] areal thunderstorm coverage or greater) in conjunction with sufficiently dry fuels. Fuels must remain dry or critically dry during and immediately following a lightning event. Warnings may be issued for isolated events (< 25% areal coverage) when little or no precipitation is expected to reach the ground.

Areal Description	NWS Fire Weather Zones
Northern California West of the Cascade / Sierra Crest	006, 201-204, 211-213, 215-221, 263, 264, 266-269, 276, 277, 279-283,
Eastern Sierra, Northeast CA	214, 270-271, 273, 278, 284-285
Lake Tahoe Basin	272

Southern California Zones:

A lightning event that is not accompanied by enough precipitation to significantly wet fuels that have been identified as critically dry. Significant precipitation is defined as ranging from 0.05 inches for grass or brush to 0.15 inches for closed-canopy timber and heavy fuels. Fire Weather Watches and Red Flag Warnings will be issued for high impact lightning events in receptive fuels. Isolated events or events of short duration (i.e., events which start dry but become wet within 1-2 hours) do not need warnings but may be headlined in the forecast.

Areal Description	NWS Fire Weather Zones
Southern California desert area excluding the Lower Colorado River Valley	226-228, 230, 232, 260-262
Lower Colorado River Valley	229, 231
Antelope Valley and SE Kern County Deserts and Central CA Interior	298-299, 259, 289-297
Southern California Excluding the Antelope Valley	234-241, 244-246, 251-254, 288, 547-548
Extreme Southern California	243, 248, 250, 255-258, 260-262, 265, 552, 554

Watch/Warning Criteria for Wind and/or Low Relative Humidity

Northern California Zones:

Areal Description	NWS Fire Weather Zones	Criteria
Northern California West of the Cascade / Sierra Crest	006, 201-204, 211-213, 215-221, 263- 264, 266-269, 276-277, 279, 283, 505-513, 516-518, 528-530	Refer to Wind/RH RFW Decision Matrix on next page.
Northern California West of the Cascade / Sierra Crest	280, 282 (WFO Medford Zones)	4 or more hours: - For dry cold fronts: RH < 15%, sustained wind >= 10mph with gusts >= 20 mph. - East winds: RH < 25%, sustained wind >= 15mph with gusts >= 25 mph.or more.

Areal Description	NWS Fire Weather Zones	Criteria
Northern California West of the Cascade / Sierra Crest	280, 282 (WFO Medford Zones)	4 or more hours: - For dry cold fronts: RH < 15%, sustained wind >= 10mph with gusts >= 20 mph. - East winds: RH < 25%, sustained wind >= 15mph with gusts >= 25 mph.or more.
Eastern Sierra, Northeast CA	214, 270-271, 273, 278	RH ≤ 15% with wind gusts ≥ 30 mph for 3 hours or more.
Northeastern CA excluding Surprise Valley	284, 285, 281	≤ 15% with wind gusts ≥ 30 mph for 3 hours or more. OR Daytime Min RH ≤ 10% with wind gusts ≥ 20 mph for 3 hours or more. (Note: Zone 281 must be 6 hours or longer).
Lake Tahoe Basin	272	Relative Humidity ≤ 20% with wind gusts ≥ 30 mph for 3 hours or more. If fuels are at extreme levels: wind gusts ≥ 30 mph for 3 hours or more, regardless of Humidity.

Southern California Zones:

Area Description	NWS Fire Weather Zones	Criteria
Southern California desert area excluding the Lower Colorado River Valley	226-228, 230, 232, 260-262	Relative Humidity ≤ 15% and wind gusts ≥ 35 mph for 6 hours or more, assuming fuel conditions are critical.
Lower Colorado River Valley	229, 231	Relative Humidity ≤ 15% with sustained winds ≥ 20 mph or wind gusts ≥ 35 mph for 3 hours or more.
Antelope Valley and SE Kern County Deserts	298, 299, 259	Relative Humidity ≤ 15% and sustained (20-foot) winds ≥ 25 mph for a duration of 8 hours or more.
Central California Interior (WFO Hanford)	289-297	RAWS sustained winds ≥ 25 mph or frequent gusts ≥ 35 mph AND Relative Humidity ≤ 15% for a duration of 6 hours or more. OR Relative Humidity ≤ 10% for a duration of 10 hours or more regardless of wind.
Southern California Excluding the Antelope Valley (WFO Los Angeles)	234-241, 244-246, 251-254	RH ≤ 10% with sustained wind ≥ 15 mph or with gusts ≥ 25 mph for 6 hours or more.
	288, 547,548	RH ≤ 15% with sustained wind ≥ 25 mph or with gusts ≥ 35 mph for 6 hours or more.
Extreme Southern California (WFO San Diego)	243, 248, 250, 255-258, 260-262, 265, 552, 554	RH ≤ 15% with sustained wind ≥ 25 mph or with gusts ≥ 35 mph for 6 hours or more.

Wind/RH Decision Matrix for Northern California West of the Cascade/Sierra Crest

- Matrix assumes daytime 10-hour fuel moisture (NFDRS obs time) is $\leq 6\%$, annual grasses have cured, and no wetting rain (greater than 0.10 inch) has fallen in the past 24 hours.
- The sustained wind refers to the standard 20-foot, 10 minute average fire weather wind speed.
- The wind event should be expected to last for at least 8 hours to qualify for a Red Flag warning. [This guidance was developed for Foehn wind events, which normally exceed 12 hours duration, and may last as long as 3-5 days].
- A 'W' in the matrix indicates that a Watch or Warning should be considered.

Relative Humidity	Sustained Wind 6-11 mph	Sustained Wind 12-20 mph	Sustained Wind 21-29 mph	Sustained Wind 30+
Daytime Minimum RH 29-42% and/or Nighttime Maximum RH 60- 80%				W
Daytime Minimum RH 19-28% and/or Nighttime Maximum RH 46- 60%			W	W
Daytime Minimum RH 9-18% and/or Nighttime Maximum RH 31- 45%		W	W	W
Daytime Minimum RH < 9% and/or Nighttime Maximum RH < 31%	W	W	W	W