



MULTI-AGENCY COORDINATION SYSTEM PUBLICATION

**CALIFORNIA FIRE WEATHER PROGRAM
RISK PREPAREDNESS GUIDE**

MACS 410-3

August 26, 2013

California Fire Weather Program Risk Preparedness Guide

Table of Contents

Introduction	1
Objective	1
Elements of the California Fire Weather Program Risk Preparedness Guide	1
Definitions	1
Criteria.....	2
Coordination.....	2
Notification Procedure	2
Predictive Services/National Weather Service.....	2
Geographical Area Coordination Centers.....	2
Local Dispatch Centers	2
Post-Notification Activities	3
Appendix A – Predictive Services High Risk Criteria	A-1
North Ops.....	A-1
South Ops	A-1
Appendix B – National Weather Service Red Flag Criteria.....	B-1
Abundant and/or Dry Lightening.....	N-1
Wind and Humidity	B-2
Wind/RH RFW Decision Matrix for Northern CA West of the Cascade/Sierra Crest	B-3
Additional Qualifying Fuels Information	B-4

INTRODUCTION

The California Fire Weather Program Risk Preparedness Guide is designed to alert and to provide early notification to the Fire Service of critical weather conditions that may lead to a large fire, significant growth on existing fires, and/or extreme fire danger/behavior. Major elements of the program may include, but are not limited to, media notifications, increased public awareness, and fire prevention/detection activities.

OBJECTIVE

The Objective is to ensure timely notification of the California Fire Service of a High Risk Day from Predictive Services, and/or a Red Flag Warning, Fire Weather Watch, or Cancellation issued by a National Weather Service Forecast Office.

ELEMENTS OF THE CALIFORNIA FIRE WEATHER PROGRAM RISK PREPAREDNESS GUIDE

The California Fire Weather Program Risk Preparedness Guide consists of a High Risk Day, Fire Weather Watch, Red Flag Warning, or Cancellation.

Definitions:

1. High Risk Day – Notice issued by the Predictive Services Units located in Redding and Riverside when there is a 20% chance or higher of either a new large fire occurring, or significant growth on existing fires. High Risk Days are displayed in the 7-Day Significant Fire Potential Product which incorporates fuel dryness and weather triggers to display Significant Fire Potential during the next seven days across the Geographic Area by Predictive Service Areas. The product can be found at:
For South Ops – <http://psgeodata.fs.fed.us/7day/action/forecast/8>
For North Ops – <http://psgeodata.fs.fed.us/7day/action/forecast/10>
2. Fire Weather Watch – Notice issued by the National Weather Service usually 24 to 72 hours in advance of a Red Flag Event (i.e., critical weather conditions that may result in extreme fire danger/behavior). Fire Weather Watches, however, can be issued for the first 12 hours of a forecast period for dry lightning.
3. Red Flag Warning – Notice issued by the National Weather Service usually 24 hours in advance of a Red Flag Event.
4. Cancellation – When the National Weather Service terminates a Fire Weather Watch or a Red Flag Warning, or it expires.

Criteria:

- 1) High Risk Days – The 7-Day Significant Fire Potential product has an explanation page which describes the product in more detail and lists the established criteria (See Appendix A in this document) for the Predictive Service Areas across the state. For the North Ops version of this document, click [here](#) and for South Ops, click [here](#)
- 2) Fire Weather Watch or Red Flag Warning - A complete listing of Red Flag Criteria for each National Weather Service Forecast Office in California can either be found in appendix B in this document or in the California Annual Operating Plan located [here](#)

Coordination:

The National Weather Service will coordinate all Fire Weather Watches, Red Flag Warnings, and Cancellations with Predictive Services/local fire agencies as time permits. Predictive Services will notify the National Weather Service of the issuance of any High Risk Days.

NOTIFICATION PROCEDURE

Predictive Services/National Weather Service

Upon issuing a High Risk Day, Fire Weather Watch, Red Flag Warning, Red Flag Warning or Cancellation, the issuing office will notify the Geographical Area Coordination Center(s) (GACC) that is affected.

Geographical Area Coordination Centers

The affected Geographical Area Coordination Center (GACC) will use their procedures to notify regional state offices and local dispatch centers.

Local Dispatch Centers

The affected local dispatch centers will implement notifications as dictated by their current Fire Danger Rating Operating Plan.


POST-NOTIFICATION ACTIVITIES

Entities may wish to establish and implement various activities that may include but are not limited to the following:

- Fire patrols
- Road or area closures
- Arson watch
- Additional Staffing
- Reconnaissance flights
- Upgraded dispatch levels
- Pre-deployment of resources
- Equipment use restrictions

APPENDIX A – PREDICTIVE SERVICES HIGH RISK CRITERIA

North Ops

Symbol	Criteria	Description
H	Hot and Dry	High temperatures 10 degrees above seasonal normal values with minimum humidity generally 12% or less
W	Windy	Sustained 10 minute wind speeds of 15 mph or greater
	Lightning	Dry lightning (LAL 6) or any lightning following an extended dry period

South Ops

Lightning ():

SC01 Eastern Sierras – Two Day Dryness Level* of 2.5 or higher with 250 or more lightning strikes.

SC03 Southern Sierra – Two Day Dryness Level* of 2 or higher with 250 or more lightning strikes.

SC09 Western Mountains – Two Day Dryness Level* of 3 with 50 or more lightning strikes.

SC11 Southern Mountains – Two Day Dryness Level* of 3 with 100 or more lightning strikes.

SC14 Central Mojave – Two Day Dryness Level* of 3 with 100 or more lightning strikes

SC16 Northern Deserts – Two Day Dryness Level* of 2.5 or higher with 450 or more lightning strikes.

*Two Day Dryness Levels are calculated by taking the Fuel Dryness Level from the first day with lightning and adding the Fuel Dryness Level of the next day and dividing by two.
 Example: SC01 is in the brown category on day 1 (Brown = 3) and drops into the yellow category (2) on day 2 so 3 + 2 = 5 and 5 divided by 2 = 2.5. This takes into account of whether or not the lightning activity is becoming wetter over time.

Wind/Humidity (W):

SC08 South Coast – Sustained winds of 20 mph combined with humidity of less than 15%.

SC09-SC16 – Sustained winds 30 mph combined with humidity of 15% or less.

APPENDIX B – NATIONAL WEATHER SERVICE RED FLAG CRITERIA

Abundant and/or Dry Lightning – 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 an hour or two) do not need warnings but will be headlined in the forecast.

Area Description	NWS Fire Weather Zones	Criteria
Northern California West of the Cascade/Sierra Crest Eastern Sierra, Northeast CA Lake Tahoe Basin	006, 201-204, 211-213, 215-221, 263, 264, 266-269, 276, 277, 279-283, 284, 505-513, 516-518, 528-530 214, 270-271, 273, 278, 284, 285 272	Abundant lightning scattered [25%] areal thunderstorm coverage or greater) in conjunction with sufficiently dry fuels (fuels 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.
Southern California desert area excluding the Lower Colorado River Valley Lower Colorado River Valley Antelope Valley and SE Kern County Deserts Central California Interior Southern California Excluding the Antelope Valley Extreme Southern California	226-228, 230, 232, 260-262 229, 231 298, 299, 259, 289-297 234-241, 244, 245, 246, 251-254, 288, 547, 548 242, 243, 248, 250, 255-258, 260, 261, 262	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 .05 inches for grass or brush fuels to .15 inches for closed canopy timber/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 an hour or two) do not need warnings but will be headlined in the forecast.

Wind and Humidity – Wind and humidity criteria are geared toward those situations which may result in rapid spread of wildfires. Because topography and vegetation play a big role in this, several sets of criteria are used across California. Where possible, issuance criteria have been meshed with those used in adjacent states to meet the needs of agencies whose jurisdictions cross state lines. Criteria are listed in the Wind/Humidity Table below:

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 \leq 15% and wind gusts \geq 35 mph for 6 hours or more, assuming fuel conditions are critical.
Lower Colorado River Valley	229, 231	Relative Humidity \leq 15% with sustained winds \geq 20 mph or wind gusts \geq 35 mph for 3 hours or more.
Antelope Valley and SE Kern County Deserts	298, 299, 259	Relative Humidity \leq 15% and sustained (20 foot) winds \geq 25 mph for a duration of 8 hours or more.
Central California Interior (WFO Hanford)	289-297	OR Relative Humidity \leq 10% for a duration of 10 hours or more regardless of wind.
Southern California Excluding the Antelope Valley (WFO Los Angeles)	234, 235, 236, 237, 238, 239, 240, 241, 244, 245, 246, 251, 252, 253, 254, 288, 547, 548	RH \leq 10% with sustained wind \geq 15 mph or with gusts \geq 25 mph for 6 hours or more. RH \leq 15% with sustained wind \geq 25 mph or with gusts \geq 35 mph for 6 hours or more.
Extreme Southern California (WFO San Diego)	242, 243, 248, 250, 255, 256, 257, 258, 260, 261, 262	RH \leq 15% with sustained wind \geq 25 mph or with gusts \geq 35 mph for 6 hours or more.
Northern California West of the Cascade/Sierra Crest	006, 201, 204, 211-213, 215-221, 263. 264, 266-269, 276, 277, 279-283, Western 284, 505-513, 516-518, 528-530	Refer to Wind/RH RFW Decision Matrix for Northern California West of the Cascade/Sierra Crest on next page.

Eastern Sierra, Northeast California (WFO Reno)	214, 270-271, 273, 278	RH \leq 15% with wind gusts \geq 30 mph for 3 hours or more.
Northeast California excluding Surprise Valley (WFO Medford)	Eastern 284, 285	\leq 15% with wind gusts \geq 30 mph for 3 hours or more, OR Daytime Min RH \leq 10% with wind gusts \geq 20 mph for 3 hours or more.
Lake Tahoe Basin	272	If fuels are extreme levels: wind gusts \geq 30 mph for 3 hours or more, regardless of RH.

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

- Matrix assumes daytime 10-hour fuel moisture (NFDRS obs time) is <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 much as 3-5 days]. A 'W' in the matrix indicates that the forecaster should consider a warning.

Relative Humidity	Sustained Wind 6-11 mph	Sustained Wind 12-20 mph	Sustained Wind 21-29 mph	Sustained Wind 30+ mph
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

Additional Qualifying Fuels Information

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 one(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 – Fuel dryness levels in the brown or yellow category from the 7-Day Significant Fire Potential product indicate that fuels are dry and will be receptive to new ignitions which could potentially lead to a large fire. In general, a fuel dryness level in the green category typically indicates that fuels are too wet to support large fire activity within the GACC. However, there may be rare cases when fuels in this green category may still be marginally dry enough to pose local initial attack concerns, thus, justifying the issuance of a watch or warning.

Southern California – In addition to the 7-Day Fire Potential Matrix, the Predictive Services Unit in Riverside will produce a written discussion on fuel status across southern California every other Thursday during fire season. This discussion will be based on input from the fire community and will include 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.

- **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.