

# CALIFORNIA FIRE WEATHER ANNUAL OPERATING PLAN



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# CALIFORNIA ANNUAL OPERATING PLAN 2010

## I. INTRODUCTION

- A. The California Fire Weather Annual Operating Plan (AOP) constitutes an agreement between the California Wildfire Coordinating Group (CWCG) comprised of State, local government and Federal land management agencies charged with the protection of life, property and resources within the State of California from threat of wildfire; and the National Weather Service (NWS), National Oceanic and Atmospheric Administration, U.S. Department of Commerce, charged with providing weather forecasts to the Nation for the protection of life and property.

The AOP provides specific procedural and policy information regarding the delivery of meteorological services to the fire management community in California. It is the objective of the NWS and CWCG to ensure that quality of service is maintained through a mutual analysis of services provided. The NWS and CWCG work closely in all phases of the fire weather forecast and warning program to resolve concerns and avoid potential inconsistencies in products and services prior to delivery to fire agency customers. The goal of all agencies is to maximize firefighter and public safety through a coordinated delivery of consistent services.

Fire protection within California is made efficient by the statewide exchange among Federal, State, and local agencies of their responsibilities for the protection of certain lands. Non-federal wildland fire management agencies are by agreement protecting Federal lands, and therefore, require NWS fire weather forecasts and warnings. Due to this practice, it is essential that all fire protection agencies receive a coordinated fire weather and fire danger forecast.

- B. Roles and responsibilities of the NWS and the interagency fire management community are set forth in the following reference documents:

- [Interagency Agreement for Meteorological Services Among the Bureau of Land Management, Bureau of Indian Affairs, U.S. Fish and Wildlife Service, and National Park Service of the U.S. Dept. of Interior, the Forest Service of the U.S. Dept. of Agriculture, and the National Weather Service of the U.S. Dept. of Commerce \(National MOA or National Agreement\)](#);
- 
- CWCG – NWS California Fire Weather Program Assessment Team Charter;
- 
- [National Weather Service NWSI 10-4: Fire Weather Services](#) ;
- 
- [2010 National Mobilization Guide](#) ;
- 
- [2010 California Mobilization Guide](#) ;
- 
- [National Predictive Services Handbook](#); and
- 
- [NWCG Glossary](#)

C. Participating agencies include the following:

- Federal, State and local fire agencies comprising the [California Wildfire Coordinating Group \(CWCG\)](#);
- The NOAA/National Weather Service offices serving California ;
- And representatives from independent city/county fire agencies.

## II. CHANGES AND UPDATES FOR 2010

- A new NWS national fire weather web page is available at: [weather.gov/fire](http://weather.gov/fire). User comments and suggestions via the link on this page are strongly encouraged.
- Changes to the Red Flag Criteria have occurred for the Oxnard and San Diego National Weather Service Offices. See page 19.
- The national Predictive Services program has reorganized this year. It is no longer organized as two Working Groups (Meteorologist and Intel). Rather, it is now divided into three Functional Areas, which are Research and Development, Operations and Support, and Outreach and Training. The primary goals of the change are to increase collaboration and teamwork between Meteorologists and Intel personnel, and to increase efficiency of the organization, resulting in improved products, services, and response to user needs.
- The Riverside Predictive Services' Unit has begun issuing a daily webcast. For more information on this new product, see page 26.
- Most NWS offices serving California will test a bulleted format of Fire Weather Watches and Red Flag Warnings this season. This is an effort to make the products more readable and easy to use. Details on this format may be found here: [http://products.weather.gov/PDD/Bulleterd\\_WSW\\_NPW\\_RSW.pdf](http://products.weather.gov/PDD/Bulleterd_WSW_NPW_RSW.pdf).
- The NFDRS will begin using the Nelson model, which can incorporate RAWS solar radiation data to help automate State of the Weather (SOW) calculation. For more information regarding this transition, please see Section V.D, Technology Transfer)

## III. SERVICE AREAS FOR NWS OFFICES AND PREDICTIVE SERVICE UNITS

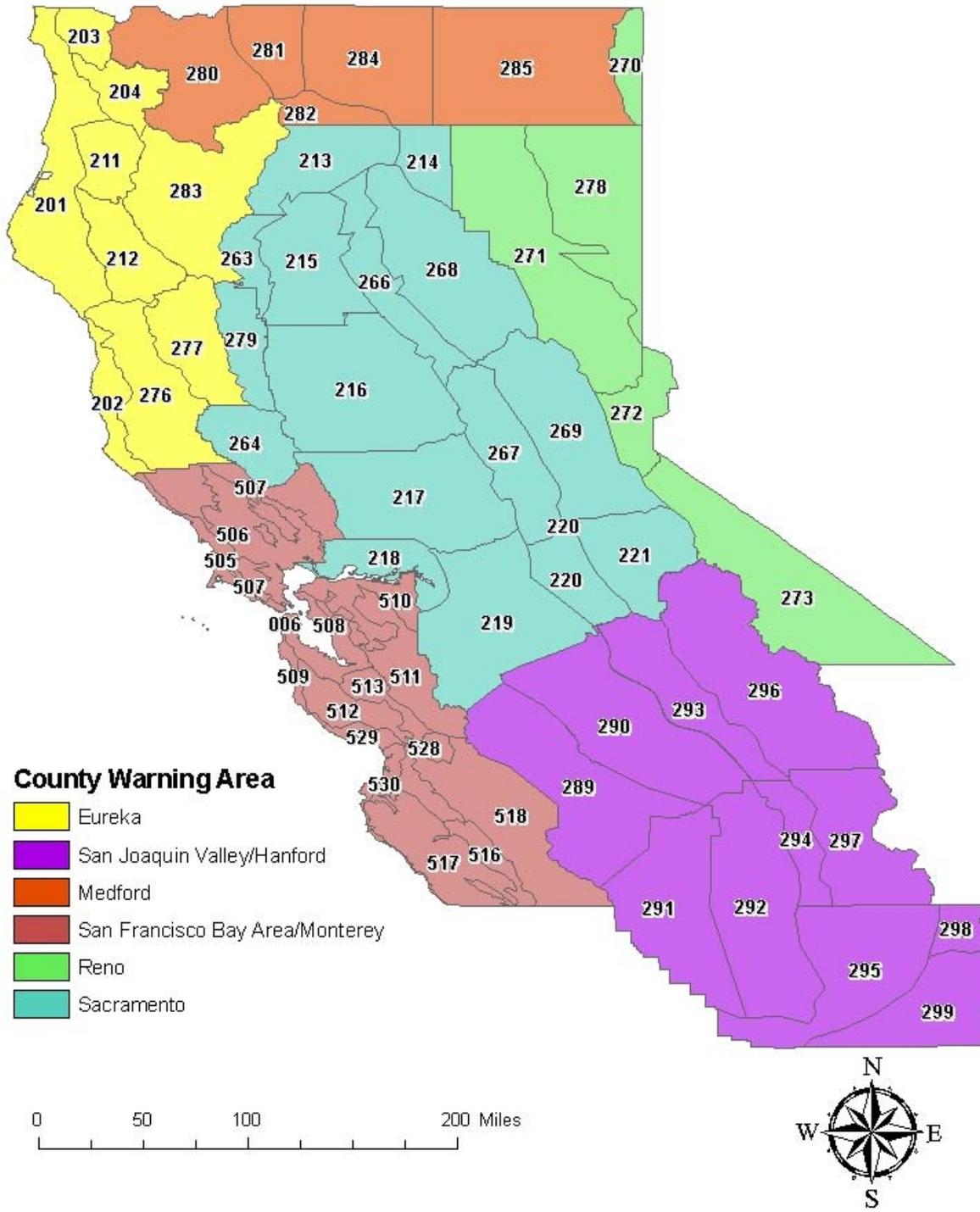
Fire weather forecast services are provided by forecasters at NWS offices and in Predictive Services Units at the Redding and Riverside GACCs. All Red Flag Warnings and Fire Weather Watches, all spot forecasts for wildfires, and all forecasts used to develop National Fire Danger Rating System (NFDRS) indices, are issued by the NWS. Both groups provide spot forecasts for prescribed burns, narrative and/or graphical forecasts for planning purposes, and have trained Incident Meteorologists (NWS) or Technical Specialists (PSU). Details on these services are contained in the plan.

A. NWS Weather Forecast Offices (WFOs) Serving California (*bold indicates shared counties*)

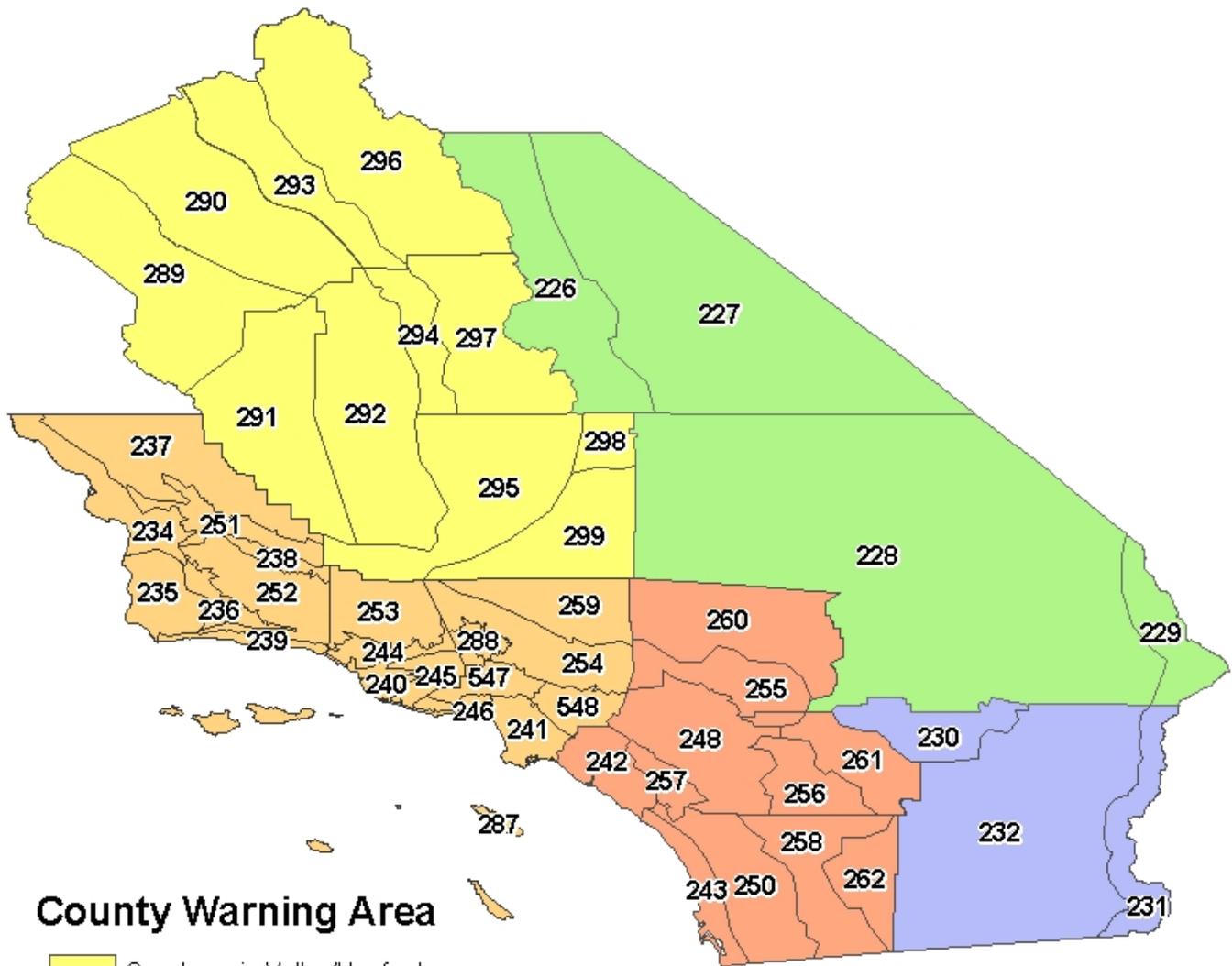
WEATHER FORECAST OFFICE	COUNTIES (including local fire depts.) WITHIN THE FIRE WEATHER FORECAST DISTRICT	FEDERAL AND STATE FIRE AGENCY CUSTOMERS
Medford WFO <a href="http://www.weather.gov/medford">http://www.weather.gov/medford</a>	Siskiyou, Modoc	<u>CALFIRE</u> : Siskiyou and Lassen-Modoc Units <u>USFS</u> : Klamath, Modoc, North Shasta Trinity NFs <u>NPS</u> : Lava Beds NM <u>USFWS</u> : Lower Klamath Basin Refuge <u>BLM</u> : North NorCal BLM
Eureka WFO <a href="http://www.weather.gov/eureka">http://www.weather.gov/eureka</a>	Del Norte, Humboldt, Trinity, Mendocino	<u>CALFIRE</u> : Humboldt-Del Norte and Mendocino Units <u>USFS</u> : Six Rivers, West Shasta-Trinity, West Mendocino NFs <u>BLM</u> : West NorCal BLM <u>NPS</u> : Redwood NP <u>BIA</u> : Hoopa Valley Tribe
Sacramento WFO <a href="http://www.weather.gov/sacramento">http://www.weather.gov/sacramento</a>	Shasta, Tehama, Glenn, Colusa, Butte, Yuba, Sutter, Lake, Yolo, Sacramento, Calaveras, Amador, San Joaquin, Solano, Stanislaus  <b>Western Portions of:</b> Plumas, Sierra, Nevada, Placer, El Dorado, Tuolumne, Alpine	<u>USFS</u> : South Shasta-Trinity, East Mendocino, West Lassen, West Plumas, West Tahoe, El Dorado, Stanislaus NFs <u>BLM</u> : South NorCal and North CenCal BLM <u>NPS</u> : Lassen NP, Whiskeytown NRA <u>USFWS</u> : North Central Valley Refuges <u>CALFIRE</u> : Shasta-Trinity, West Lassen-Modoc, Butte, East Sonoma-Lake-Napa, Tehama-Glenn, Amador-El Dorado, Tuolumne-Calaveras and West Nevada-Yuba-Placer Units
Reno WFO <a href="http://www.weather.gov/reno">http://www.weather.gov/reno</a>	Lassen, Mono  <b>Eastern Portions of:</b> Modoc, Plumas, Sierra, Nevada, Placer, El Dorado, Alpine	<u>BLM</u> : NE and East NorCal and Northeast CenCal BLM <u>USFS</u> : East Lassen, East Plumas, East Tahoe, Humboldt-Toiyabe, Northern Inyo NFs and Tahoe Basin Management Unit (USFS) <u>CALFIRE</u> : East Lassen-Modoc Unit and East Nevada-Yuba-Placer Units
San Francisco Bay Area WFO <a href="http://www.wrh.noaa.gov/mtr/">http://www.wrh.noaa.gov/mtr/</a>	Sonoma, Napa, Marin, Contra Costa, Alameda, San	<u>BLM</u> : Hollister BLM (Fort Ord) <u>CALFIRE</u> : West Sonoma-Lake-Napa, San Benito-Monterey,

	Francisco, San Mateo, Santa Clara, Santa Cruz, Monterey, San Benito	Santa Clara and San Mateo-Santa Cruz Units <u>NPS</u> : Point Reyes NRA, Golden Gate NRA, Pinnacles NM <u>USFS</u> : North Los Padres NF <u>DOD</u> : Ft Hunter-Liggett <u>California State Parks</u>
Hanford WFO <a href="http://www.weather.gov/hanford">http://www.weather.gov/hanford</a>	Mariposa, Merced, Madera, Fresno, Kings, Tulare, Kern  <b>SE Tuolumne</b> in Yosemite NP	<u>NPS</u> : Yosemite and Sequoia/Kings NP <u>BLM</u> : Western CenCal BLM <u>USFWS</u> : South Central Valley Refuges <u>USFS</u> : Sierra and Sequoia NFs <u>CALFIRE</u> : Tulare, Madera-Mariposa-Merced and Fresno-Kings Units
Los Angeles/Oxnard WFO <a href="http://www.weather.gov/losangeles">http://www.weather.gov/losangeles</a>	San Luis Obispo, Santa Barbara, Ventura, Los Angeles	<u>CALFIRE</u> : San Luis Obispo Unit <u>NPS</u> : Channel Islands NP, Santa Monica Mountains NRA <u>DOD</u> : Vandenberg AFB <u>USFS</u> : Angeles and South Los Padres NF <u>USFWS</u> : Southern California Refuges
San Diego WFO <a href="http://www.weather.gov/sandiego">http://www.weather.gov/sandiego</a>	Orange, San Diego  <b>SW San Bernardino Western Riverside</b>	<u>USFS</u> : San Bernardino and Cleveland NFs <u>CALFIRE</u> : San Diego, SW San Bernardino and Western Riverside Units <u>BLM</u> : South Coast BLM <u>USFWS</u> : Southern California Refuges <u>DOD</u> : Camp Pendleton & Miramar <u>BIA</u> : Southern California Agency
Phoenix WFO <a href="http://www.weather.gov/phoenix">http://www.weather.gov/phoenix</a>	Imperial  <b>Eastern Riverside</b>	<u>BLM</u> : California Desert BLM <u>USFWS</u> : Southern California Refuges <u>NPS</u> : Joshua Tree NP
Las Vegas WFO <a href="http://www.weather.gov/lasvegas">http://www.weather.gov/lasvegas</a>	Inyo  <b>San Bernardino</b> (except SW corner)	<u>CALFIRE</u> : Northern San Bernardino and Eastern Riverside Units <u>USFS</u> : Southern Inyo NF <u>BLM</u> : California Desert BLM <u>NPS</u> : Mojave National Preserve, Death Valley NP <u>USFWS</u> : Southern California Refuges

# Northern California Fire Weather Zones



# Southern California Fire Weather Zones



## County Warning Area

- San Joaquin Valley/Hanford
- Los Angeles/Oxnard
- Phoenix
- San Diego
- Las Vegas

0 50 100 200 Miles

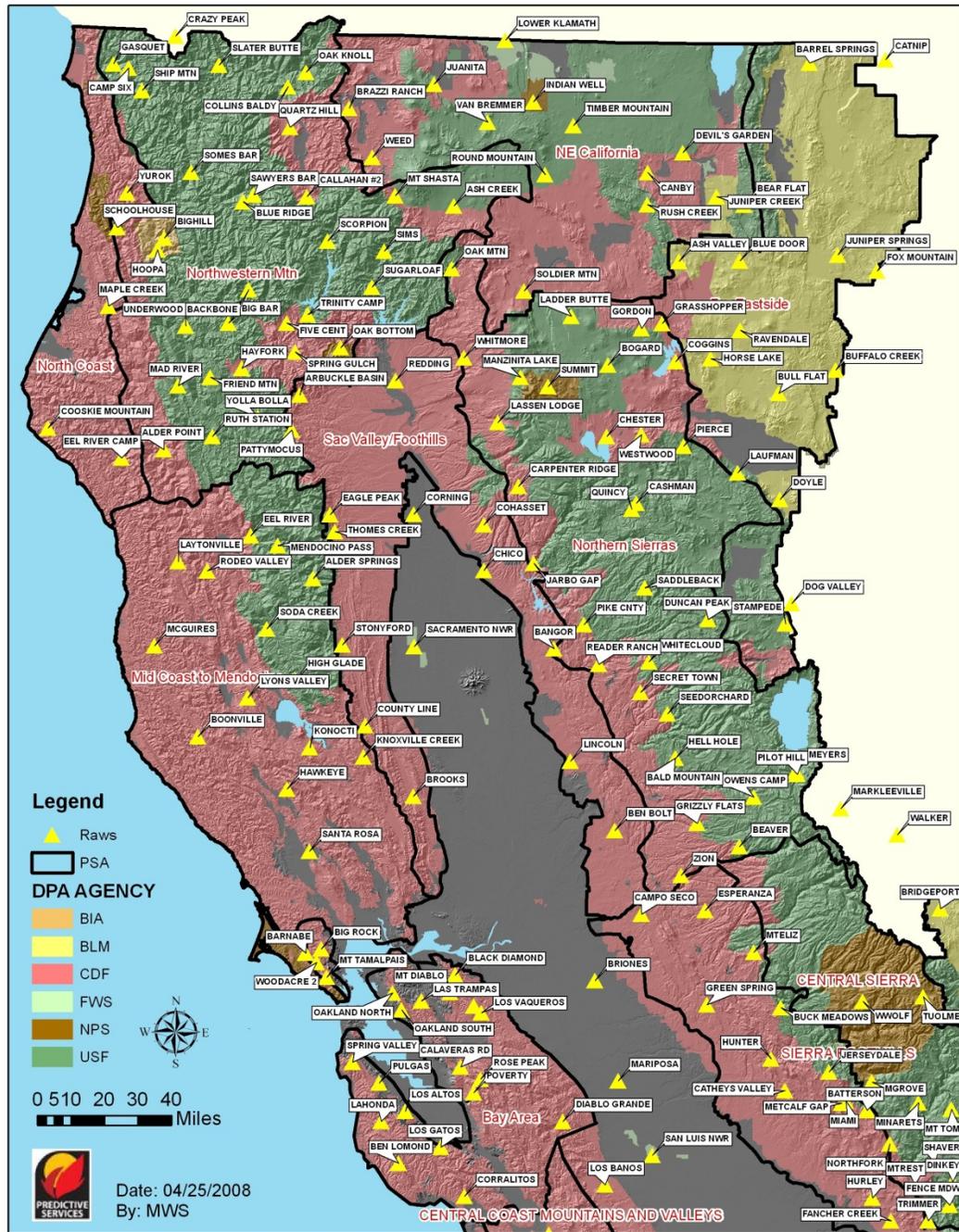


C. Predictive Services Units (PSU) Serving California

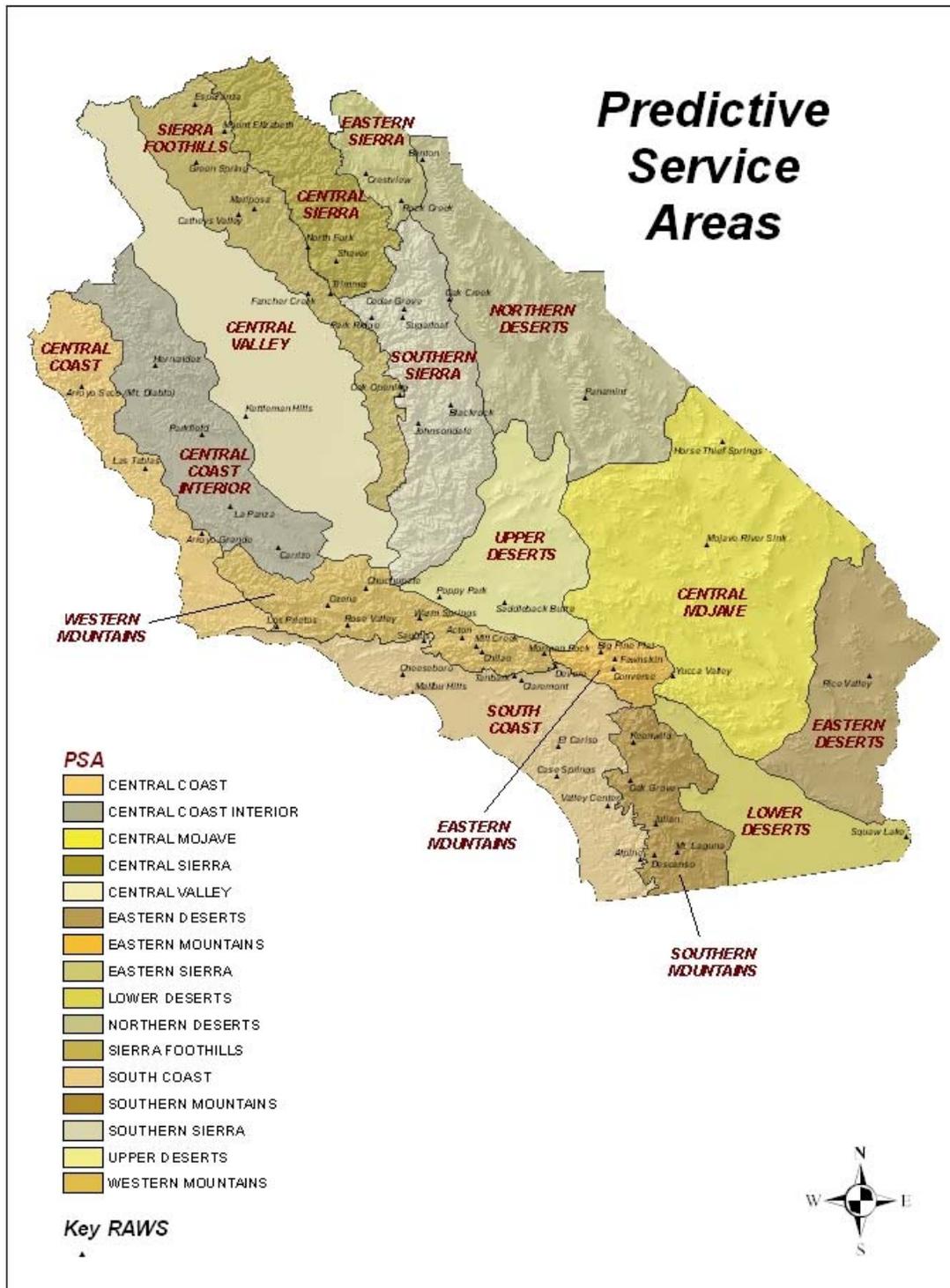
Predictive Service Unit	Predictive Service Areas within this PSU
<p><b>Redding</b>  <a href="http://gacc.nifc.gov/oncc/predictive/weather/index.htm">http://gacc.nifc.gov/oncc/predictive/weather/index.htm</a></p>	<p>North Coast PSA            Mid Coast to Mendocino PSA            Bay Area PSA            Northwestern Mtn PSA            Sacramento Valley / Foothills PSA            NE California PSA            Northern Sierra PSA            Eastside PSA</p>
<p><b>Riverside</b>  <a href="http://gacc.nifc.gov/oscc/predictive/weather/index.htm">http://gacc.nifc.gov/oscc/predictive/weather/index.htm</a></p>	<p>SC01 - Eastern Sierra            SC02 - Central Sierra            SC03 - Southern Sierra            SC04 - Sierra Foothills            SC05 - Central Valley            SC06 - Central Coast Interior            SC07 - Central Coast            SC08 - South Coast            SC09 - Western Mountains            SC10 - Eastern Mountains            SC11 - Southern Mountains            SC12 - Lower Deserts            SC13 - Eastern Deserts            SC14 - Central Mojave            SC15 - Upper Deserts            SC16 - Northern Deserts</p>

D. Predictive Service Area Maps

Northern California Predictive Service Areas



# Southern California Predictive Service Areas



#### IV. NWS SERVICES AND RESPONSIBILITIES

The NWS supplies meteorological services as outlined in the National Agreement, and informs CWCG of policies, guidelines, and instructions that may impact these services. Information on current operational NWS fire weather forecast products follows. Significant changes to NWS forecast services or deployment of new operational forecast services will be coordinated with CWCG. Any experimental forecast products will be clearly labeled as such.

- A. NWS Fire Weather Planning Forecasts provide general, information for daily preparedness and planning purposes. Forecasts are subdivided into meteorologically and topographically similar forecast areas called zones. They are not to be used in lieu of spot forecasts. The table below outlines issuance times of planning forecasts for each NWS office. The beginning and ending date of high season forecast issuances vary by year, depending on weather and fuel conditions.

Weather Forecast Office	High Season Narrative Forecasts	Morning Narrative Forecast NLT	Afternoon Narrative Forecast NLT	Low Season Narrative Forecasts NLT	NWS Forecast Zones
Extreme Northern California – <b>Medford</b>	<i>Usually by June 1 to November 1 #</i>	7:30 a.m.	3:30 p.m.	Daily 3:30 p.m.	280-282, 284, 285
Northwest California – <b>Eureka</b>	<i>Usually by June 1 to November 1 #</i>	7:30 a.m.	3:30 p.m.	Daily 3:30 p.m.	201-204, 211, 212, 276,277, 283
North Central California – <b>Sacramento</b>	<i>Usually by June 1 to November 1 #</i>	7:30 a.m.	3:30 p.m.	Daily 3:30 p.m.	213-221, 263, 264, 266-269
Extreme Eastern California – <b>Reno</b>	<i>Usually by June 1 to November 1 #</i>	7:30 a.m.	3:30 p.m.	Daily 7:00 a.m.	270-273, 278
Central Coast California – <b>San Francisco Bay Area/Monterey</b>	<i>Usually by June 1 to November 1 #</i>	7:00 a.m.	3:00 p.m.	Daily 3:00 p.m.	006, 505-513, 516-518, 528-530
Central California Interior – <b>San Joaquin Valley/Hanford</b>	<i>Usually May 15 to November 15 #</i>	7:00 a.m.	3:30 p.m.	Daily 3:00 p.m. PST or 3:30 p.m. PDT	289-299
Southwest California – <b>Los Angeles/Oxnard.</b>	<i>Usually May 15 to December 1 #</i>	9:30 a.m.	3:30 p.m.	M-F 3:30 p.m. also M at 9:30 a.m. *	234-241, 244-246, 251-254, 259, 288, 547,548
Extreme Southwest California – <b>San Diego</b>		7:00 a.m.	2:30 p.m.	Daily 7:00 a.m.	242, 243, 248, 250, 255-258 260-262
Southeast California – <b>Phoenix</b>		7:30 a.m.	3:30 p.m.	Daily 7:30 a.m.	230-232
Southeast California – <b>Las Vegas</b>		7:00 a.m.	3:30 p.m.	Daily 7:00 a.m.	226-229

\* excludes Federal holidays

# Customer coordinated depending on weather/fuels; two weeks notice preferred for NWS WFOs

*Update/Corrected forecasts* – Planning Forecasts are updated or corrected upon issuance of a Fire Weather Watch or a Red Flag Warning, when the current forecast does not adequately describe significant weather expected in the future, or when typographical/format errors prevent proper interpretation of the forecast.

*Access* – Planning Forecasts are widely available from the California Fire Weather Page (<http://www.wrh.noaa.gov/sto/cafww/>), NWS office web sites and Predictive Services web sites (see Section III above). All NWS fire weather information can also be accessed from the NWS National Fire Weather Page at: [www.weather.gov/fire](http://www.weather.gov/fire). Forecasts are also available via WIMS.

*Content and Format* – Forecasts follow the national standard narrative format, per NWS Directive 10-401. Morning forecasts focus on the next 36 hours and afternoon forecasts on the next 48 hours, with general extended outlooks in both cases out to at least five days.

Planning Forecast begin with pertinent headlines and a non-technical weather discussion. Headlines are included as needed for Red Flag Warnings and Fire Weather Watches. Headlines for critical fire weather conditions that do not meet Red Flag criteria are also included. Discussions should normally be no more than 8 lines in length. A more detailed, technical weather discussion is available in the [Area Forecast Discussion \(AFD\)](#) product which can be found on each forecast office website.

*Short-term forecast for the first 36 or 48 hours* - Short-term forecasts emphasize information needed for initial attack and day-to-day fire management. Each forecast zone or zone grouping contains the following elements, listed in the order they appear:

- Headline(s) as appropriate
- Sky/Weather
- Temperature
- Relative Humidity
- Wind – 20-foot, 10 minute average RAWs standard (slope/valley and ridgetop, as appropriate)
- Chance of Wetting Rain (CWR)
- Lightning Activity Level (LAL)

Forecasts may include the following optional elements based on local customer requirements:

- Haines Index
- Mixing Level or Mixing Height
- Marine Layer
- Transport Wind
- 10,000-foot Wind
- Ventilation Category (or numeric value)
- 24-hour Trends (of temperature and relative humidity)

Descriptions of forecast parameters can be found in [Appendix A](#).

*Extended Outlook* - Beyond 36-48 hours, planning forecasts are used for resource planning. They contain general guidance information, keying on significant changes

in temperature, humidity, wind, or weather needed for decision-making purposes.

Examples of NWS Fire Weather Planning Forecasts (FWF) can be found in [Appendix B](#) by clicking on the FWF header under the desired issuing office.

- B. NWS Spot Forecasts are site-specific forecast products issued for wildfires, wildland fire use (WFU) events, prescribed burns, search and rescue operations, aerial spraying, etc., and are available upon request at any time. Spot forecasts are available to any federal, state, or municipal agency as described in [NWSI 10-401](#). When smoke dispersion/smoke management is a concern, prescribed burn spot forecasts may be requested from the PSU at Redding or Riverside.

Spot forecast information is highly perishable. Using up-to-date spot forecasts is important. With this in mind, the NWS expects that the requested issuance time for spot forecasts will be within a few hours of when the requestor will begin using the forecast. NWS Spot forecasts are normally not produced more than 48 hours in advance. If a significant delay occurs – particularly if there is anything in the forecast or in observed conditions which raises concern – it is recommended that the requestor call the NWS office and discuss the forecast with a meteorologist. It is critical to have a working phone number from the requesting agency so they can be contacted.

*Issuance Times* - Priority for the issuance and desired lead time is as follows:

Wildfire or All-Hazards Incidents - Forecasts for the original issuance or unscheduled updates will be made available as soon as possible and no longer than one hour after the request is received, unless a longer lead time is negotiated. Requests for scheduled updates for ongoing spots (such as for a shift briefing) should be submitted to the issuing office with as much lead time as possible and at least two hours before needed.

Prescribed burn Forecasts - Forecasts for original issuances or scheduled updates should be made with as much lead time as possible, with requests made in the afternoon or evening for delivery of a prescribed burn spot the next morning being the recommended lead time.

Forecasts for unscheduled updates for prescribed burn spots, either due to a specific request based on weather at the site or due to monitoring invoked by the phrase, “Request Priority Monitoring” or similar in the remarks section of the spot forecast request, will be issued as soon as possible and no longer than two hours after it is recognized that an update is desirable.

All remaining spot forecasts - Forecasts for original issuances and routine or unscheduled updates will be issued as soon as possible, as negotiated with the requestor.

*Updated Forecasts* - Site-specific forecasts are considered one-time requests and are not routinely updated. However, if determined necessary, updates will be done within 24 hours of requested issuance time of the spot if the following occurs:

- Representative observations are available, the meteorologist has been made aware that

monitoring is desired, and the meteorologist deems the current forecast does not adequately represent current or expected weather conditions which might affect the burn

- OR -

- The meteorologist is specifically asked for a verbal or written update, such as when forecast conditions appear unrepresentative of the actual weather conditions.

*Corrections* - The spot forecast will be corrected when a typographical or format error is detected that prevents correct interpretation of the forecast. Corrections should be delivered to users in the same manner as the original spot forecast when possible.

*Access* – Use of the Internet is the standard for requesting and retrieving NWS spot forecasts and should be used when available. Spot forecasts can be accessed from the California Fire Weather Web page (<http://www.wrh.noaa.gov/sto/cafw/>), all NWS office fire weather web pages and PSU web pages. When Internet access is not available, spot forecasts may be requested and disseminated via phone or fax using the backup spot forecast request form found in [Appendix E](#). Since the fax is a backup means of requesting a Spot forecast, it is important that the requester follow up the fax with a phone call to the responsible NWS office to ensure that the fax was received and is readable.

At or before the time of a spot request, the requesting agency should provide information about the location, topography, fuel type(s), elevation(s), size, ignition time, and a contact name(s) and telephone number(s) of the responsible land management personnel. Also, quality representative observation(s) at, or near, the site of the planned prescribed burn, or wildfire, should be available to the responsible WFO along with the request for a spot forecast(s). Internet-based spot request programs and the backup form both provide blocks to fill in these data.

Upon completion, spot forecasts are posted to the appropriate Fire Weather Page of the NWS forecast office web site that received the request. NWS web sites may be linked from the [Individual Forecast Information Table](#).

*Content and Format* – Exact content depends on user request. Headlines are always included if a Red Flag Warning or Fire Weather Watch is in effect at the time of issuance.

The forecast period is based on user request and will contain up to three periods, such as “TODAY”, “TONIGHT”, and “FRIDAY.” If requested and if enough weather information is received to make it feasible, a more specific first period such as “AT 11 A.M. IGNITION” may be used. In these cases, the meteorologist will not just forecast for the planned ignition time, but will include significant changes expected in the forecast parameters for the rest of the usual period, e.g., 11 AM temperature and the expected daytime maximum temperature.

When requested, an outlook for a longer duration will be appended, such as “OUTLOOK FOR WEDNESDAY THROUGH FRIDAY” for a spot requested on Monday.

The most commonly requested forecast parameters are the following:

- Discussion
- Sky/Weather (including chance of rain)
- Maximum/Minimum Temperature
- Maximum/Minimum Relative Humidity
- 20-Foot Winds

Other elements, such as transport winds, mixing depth, LAL, etc., may be included upon request.

The basic format of a Fire Weather Spot (FWS) request can be found in [Appendix B](#) by clicking on the FWS header under the desired issuing office.

*Spot Forecast Feedback Requirement* - Agencies will follow-up requests for spot forecasts with a telephone call to the appropriate NWS forecast office to ensure receipt of the request. It is critical that agencies have accurate NWS phone number information for this purpose. Requesting agencies are also highly encouraged to provide fire-line weather observations for the validation of weather forecast accuracy. For further explanation of the Feedback process, see [Fire Weather Observations](#).

Beyond 48 hours, the fire weather planning forecast should be consulted along with user-driven “point and click” planning products available from all NWS office web pages. These products can be used for planning up to seven days out to identify time periods during which weather for a prescribed burn or other project is favorable. Included in this service is weather forecast data for FARSITE (FIREPRO or FSPRO). For more information or a demonstration of these web-based fire weather planning services, please contact your servicing NWS office.

- C. Fire Weather Watches and Red Flag Warnings are issued for critical fire weather patterns that contribute to 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 12-96 hour time frame. The Watch may be issued for all or selected portions of a fire weather zone or zones. A Watch will only be issued (or continued) in the first 12-hour time period for dry thunderstorm events.

A Red Flag Warning is used to inform agencies of the imminent or actual occurrence of Red Flag conditions. A Red Flag Warning is issued when there is high confidence that Red Flag criteria will be met within the next 24 hours or if those criteria are already being met.

Fire Weather Watch and/or Red Flag Warning headlines are included in affected spot forecasts and in both the overview and affected zone(s) sections of planning forecasts.

*Red Flag Warning/Fire Weather Watch format and contents* - A text message (RFW) is used for issuing, updating, and canceling all Fire Weather Watches and Red Flag Warnings. The RFW text includes:

- A headline including description of watch/warning, description of valid location, and time period for which watch/warning is valid;
- Short discussion detailing causes and nature of the event;
- Note that several WFO's will be experimenting with a bulleted format of the RFW bulletin this season;

RFW product examples can be found in [Appendix B](#).

Red Flag Warnings and Fire Weather Watches are widely available on the Internet via the California Fire Weather web page (<http://www.wrh.noaa.gov/sto/cafw/>), the web site(s) of the issuing NWS office(s) and the National Fire Weather Page ([www.weather.gov/fire](http://www.weather.gov/fire)), and also from WIMS.

Fire Weather Watches and Red Flag Warnings are normally issued only after 1) An accurate assessment of fuel conditions has been determined (see "Qualifying Fuels Information" section), and 2) Conferring with the affected agencies or a representative subset of affected agencies, to include the GACC Predictive Services Units. This is normally accomplished via morning conference calls hosted by the GACCs. It is to be understood that there may be times when full coordination cannot be accomplished due to schedule and workload issues, and that the ultimate responsibility for the issuance of a watch/warning rests with the NWS forecaster.

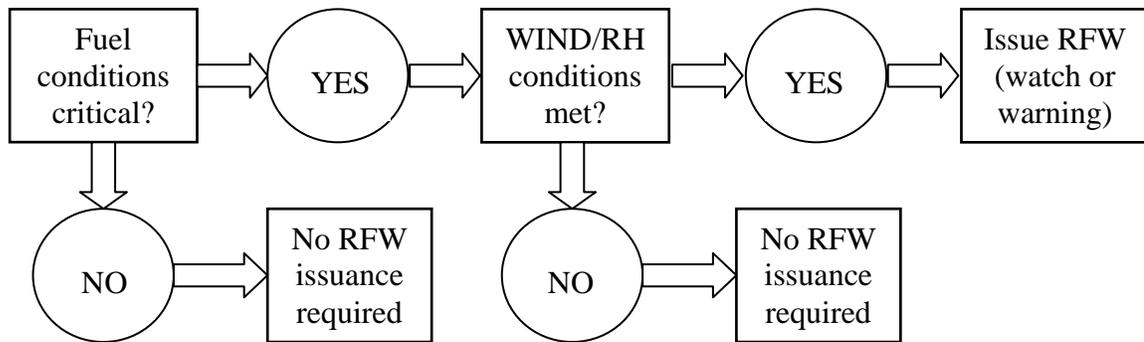
If issuance of a Red Flag Warning or Fire Weather Watch requires an update of the forecast, the NWS office will verbally notify the Redding and Riverside PSUs as soon as possible. During non-duty hours for the PSUs, contact the GACC Coordinator on Duty (COD) as available.

#### 1) California Criteria for Red Flag Warnings/Fire Weather Watches

**Dry Lightning** - 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 on the next page.

The normal Red Flag Warning decision process is as follows:



a) California RFW Criteria Planning Matrices and Guidance:

**Wind/Humidity Table**

Area Description	NWS Fire Weather Zones	Criteria
<b>Southern California desert area excluding the Lower Colorado River Valley</b>	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.
<b>Lower Colorado River Valley</b>	229,231	Relative Humidity $\leq$ 15% with sustained winds $\geq$ 20 mph or wind gusts $\geq$ 35 mph for 3 hours or more.
<b>Antelope Valley and SE Kern County Deserts</b>	298, 299, 259	Relative Humidity $\leq$ 15% and sustained (20-foot) winds $\geq$ 25 mph for a duration of 8 hours or more.
<b>Central California Interior (WFO Hanford)</b>	289-297	Relative Humidity $\leq$ 15% with sustained winds $\geq$ 25 mph and/or frequent gusts $\geq$ 35 mph for a duration of 6 hours or more.  OR Relative Humidity $\leq$ 10% for a duration of 10 hours or more regardless of wind.
<b>Southern California Excluding the Antelope Valley (WFO Los Angeles)</b>	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.
<b>Extreme Southern California (WFO San Diego)</b>	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.
<b>Northern California West of the Cascade/Sierra Crest</b>	006, 201-204, 211-213, 215-221, 263, 264, 266-269, 276, 277, 280-282, 505-513, 516-518, 528-530	Refer to <a href="#">Wind/RH RFW Decision Matrix for Northern California West of the Cascade/Sierra Crest.</a>

**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  $\leq 6\%$ , 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 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 Southern California Qualifying Fuels Information**

- In order to determine whether fuel conditions warrant Red Flag considerations for a given day, the Predictive Services Unit in Riverside will produce a written discussion on the fuel status across southern California on a bi-monthly basis. This discussion, updated on Thursdays, 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.

- 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://72.32.186.224/nfmd/public/index.php>, but may look at other sources for fuels information.

NWS WFOs whose areas of responsibility include portions of Southern California should also refer to the matrix portion of the “*Southern California 7-Day Significant Fire Potential*” product which is produced by the Southern California GACC Predictive Services Unit ([http://gacc.nifc.gov/oscc/predictive/outlooks/Fire\\_Potential.html](http://gacc.nifc.gov/oscc/predictive/outlooks/Fire_Potential.html)).

When a fuel condition of “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) or “Dry” (yellow).

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.

- 2) Red Flag Warning/Fire Weather Watch verification (Reference NWS Verification Directive [NWSI 10-1601](#) and [Western Region Supplement 4-2005](#))

By January 15<sup>th</sup> of each year, every NWS office issues a fire weather annual summary for the previous season that includes Fire Weather Watch and Red Flag Warning verification. These reports are available from the fire weather web page of each NWS office.

Agency feedback on the accuracy and quality of Fire Weather Watches and Red Flag Warnings is strongly encouraged.

WFO San Diego is evaluating use of a wind potential index forecasting tool that assists forecasters with wind events in the San Diego CWA. Contact WFO San Diego for more information.

#### D. National Fire Danger Rating System (NFDRS) Forecasts

The NWS provides weather forecasts for parameters that permit the NFDRS software to predict the next day’s fire danger indices *that the land management agencies utilize for fire management decision support.*

*Criteria for Issuance* – NWS will issue daily forecasts for use by the NFDRS during periods determined in consultation with land management agencies. Dates during which these forecasts are needed vary by year and by office.

NWS NFDRS trend or point forecasts are usually available to fire agencies by 1500

LST/1600 LDT/2300 Z. *The goal of the land management agencies is to provide quality observations in a timeframe that provides the NWS an hour to review the NFDRS observations and publish the forecasts. In order to meet these goals, the daily NFDRS fire weather observations must be made available to the NWS from WIMS in collectives by 1400 LST/1500 LDT/2200Z. NFDRS stations that do not have valid observations available in WIMS on time will not have next day fire danger indices available.*

The observation data that the land management agencies utilize for NFDRS outputs is typically available to the agencies between 1300 LST/1400 LDT/ 2100 Z and 1340 LST/1440 LDT/2140 Z. To facilitate timely delivery of the NFDRS observations to the NWS, the agencies must strive to have their local quality control and data entry completed in WIMS by 1340 LST/1440 LDT/2140 Z. Collectives are run at 10-minute intervals beginning at 1330 LST/1430 LDT/ 2130 Z, with the last collective run at 1410 LST/1510 LDT/2210 Z. Depending on local needs, these times can vary. *It is important that land management agencies and their supporting WFO discuss and mutually agree to the timeframes that best meet their collective needs.*

Users who fail to meet the last collective, and want an NFDRS forecast for the following day, must coordinate with their local WFO to try and arrange for an updated forecast. Solutions to on-going timeliness problems should be coordinated between the local user, WFO and GACC Predictive Services Unit.

NWS forecasters should contact USFS Fire & Aviation Management Helpdesk (24/7) in Boise, ID (1-800-253-5559) for assistance in dealing with WIMS issues.

*Content and Format* – Complies with NWSI 10-401 and is outlined in [Appendix B4](#) for reference.

*Procedures* – For every NFDRS observation received from WIMS at the 1400 LST (1500 LDT) collective, forecast weather parameters for 1300 LST (1400 LDT) the next day will be produced. This will occur through zone trend, station trend, or station specific (point) forecasts. Regardless of the forecast methodology, forecast values for NFDRS stations should not unduly deviate from historical possibility for those stations. For this reason, zone and station trend forecasts are usually favored over station specific (point) forecasts.

*10-Hour Fuel Moisture Trends* – The U.S Forest Service Region 5 (California) uses the Sale Activity Level (SAL) Program to regulate timber sales and other contracts on public lands. SAL uses forecast 10-minute wind speed trend and forecast 10-hour fuel stick trend. As a result, a 10-hour fuel moisture trend should be provided by the NWS. In order for this to occur, the NFDRS trend forecast should make no entries in the trend forecast for maximum and minimum temperature or maximum and minimum relative humidity, but instead it should include a 10-hour fuel moisture trend.

If no entry is made for the forecast 10-hour fuel moisture trend, WIMS will use computed 10-hour fuel moisture from an algorithm and will determine a trend. Problems arise with this approach since the trend varies from station to station and the computed value is lower than what would be provided from a weighed stick. This results in a higher SAL number and more restrictions.

## NFDRS Collective and Bulletin Times (local variations allowed depending on need)

WFO	GATEWAY Routine	Header	1st OBS Collective	2nd OBS Collective	Forecast Observations	GATEWAY Routine	Header	Observed NFDRS Indices Bulletin #1	Observed NFDRS Indices Bulletin #2	Forecast NFDRS Indices Bulletin
Eureka	SENDOBS	SHUS66	2130	2215	2245	SENDNFDR	FNUS46	2130	2205	2245
Hanford	SENDOBS	SHUS66	2130	2205	2245	SENDNFDR	FNUS46	2145		2245
Las Vegas	SENDOBS	SHUS65	2115	2145	2245	SENDNFDR	FNUS45	2100		2145
Los Angeles	SENDOBS	SHUS66	2130	2200	2245	SENDNFDR	FNUS46	2130	2200	2245
Medford	SENDOBS	SHUS66	2155	2155	2305	SENDNFDR	FNUS46	2200		2245
Monterey	SENDOBS	SHUS66	2130	2200	2245	SENDNFDR	FNUS46	2130	2200	2245
Phoenix	SENDOBS	SHUS65	2115	2200	2245	SENDNFDR	FNUS45	2115	2155	2245
Reno	SENDOBS	SHUS65	2145	2145	2255	SENDNFDR	FNUS45	2145		2245
Sacramento	SENDOBS	SHUS66	2145	2205	2301	SENDNFDR	FNUS46	2145		2245
San Diego	SENDOBS	SHUS66	2130	2200	2245	SENDNFDR	FNUS46	2130	2200	2245

### E. Participation in Interagency Groups

NWS offices providing service within California are expected to provide representation at the regional AOP meeting held at least annually. Proxy representation is acceptable. NWS offices are also expected to host at least one meeting per year with local fire management units to strengthen the customer relationship and address local concerns.

### F. Additional Services

NWS will provide and maintain a cadre of trained Incident Meteorologists (IMETs).

### G. Forecaster Training

Any NWS meteorologist producing fire weather products must meet the requirements set forth in [NWS Directive 10-405](#) and the following currency requirements set forth by the CWCG:

- Prepare and issue at least 15 fire weather planning forecasts in the last 12 months at the current duty station; and
- Prepare and issue the lesser of at least 10% of office spots or at least 5 spots in the past 12 months; and
- Successful completion of all WFO fire weather drills and/or training seminars in the past 12 months.

If fire weather currency lapses, the forecaster must work no less than three (3) shifts with a forecaster who is current, handling all fire weather duties.

## V. WILDLAND FIRE AGENCY SERVICES AND RESPONSIBILITIES

Wildland Fire Agencies' programs provide Geographic Area and national products for the strategic role of resource prioritization and utilization. The Redding and Riverside GACC are the two focal points within California for the mobilization, demobilization, and pre-positioning of personnel and resources for all wildland fire management agencies within California. Fuels management is a priority for all wildland fire agencies within California. The California GACCs are charged by CWCG with the coordination and oversight of personnel and resources for accomplishing these projects.

PSUs in Redding and Riverside provide fire weather and fire potential predictions and assessments to fire managers through the Predictive Services Program. PSU meteorologists are also liaisons with the California Air Resources Board (CARB) and Air Quality District officials.

More information on Predictive Services is available at:

[http://www.predictiveservices.nifc.gov/NPSG/npsg\\_pdf/PSHandbook\\_2009Update.pdf](http://www.predictiveservices.nifc.gov/NPSG/npsg_pdf/PSHandbook_2009Update.pdf)

### A. Operational Support and Predictive Services

GACC meteorologists at the PSUs in Redding and Riverside combine forecast information from the NWS and other sources into area-wide summaries and briefings. These meteorologists work in conjunction with Fire Intelligence staff to form the Predictive Services group, which produces integrated fire weather/fire potential assessments for California. The intent of Predictive Services is to provide strategic, regional, and sub-regional information to assist in preparedness, movement, and allocation of fire-fighting resources. All products are available online, and can be obtained from either the North Ops PSU web site:

<http://gacc.nifc.gov/oncc/predictive/weather/index.htm>

or the South Ops PSU web site:

<http://gacc.nifc.gov/oscc/predictive/weather/index.htm>.

#### 1. Routine Predictive Services Products (Examples provided in [Appendix C](#))

*a. Daily Weather Outlook-* This product provides fire personnel with a quick-briefing tool for obtaining weather highlights of Days 1 and 2 weather in their Geographic Area. The GIS-based graphics in this product combines three elements from the NWS' national gridded database, including predicted minimum RH, wind speed and wind direction. The Predictive Services meteorologists produce the graphics, write a weather synopsis, add appropriate weather symbols to the map, and write a 3 to 7 Day Outlook section which highlights any anticipated significant fire weather for that period.

Issuance Schedule: South Ops 0930 LT and North Ops 0945 LT. Issued daily during fire season, and M-F during the off season.

*b. 7-Day Significant Fire Potential Product:* This product forecasts the potential for significant fires through the next seven days. The "large fire" definition, which varies by Predictive Service Area, is used to define "significant". The product table consists of:

##### 1) Fuel Dryness

- Moist Fuels (Green) – Little if any threat for large fires.
- Dry Fuels (Yellow) – Low threat for large fires when a Significant Weather Trigger is absent.
- Very Dry Fuels (Brown) – Moderate threat for large fires when a Significant Weather Trigger is absent.

## 2) Significant Weather Triggers

- Lightning
- Wind
- Unseasonably Hot and Dry

## 3) High Risk Day

High Risk Days are rare occasions when conditions exist that historically have yielded in a significantly higher than normal chance for a new large fire or for significant growth to occur on existing fires. On average, days in this category have about a 20% or better chance of having either one of these two situations occur. There are two conditions that would lead to the issuance of a High Risk Day: 1) A Critical Burn Environment or, 2) An Ignition Trigger.

- (Red) – Occurs when “Dry” or “Very Dry” Fuel Dryness conditions coexist with a Significant Weather Trigger. The combination of these two factors will create conditions that historically have resulted in large fires across California.
- (Orange) – Occurs when environmental conditions support a high likelihood of fire ignition or significant fire growth on existing fires absent a specific ignition trigger.

The product also contains a narrative section consisting of a Weather Synopsis, a Fire Potential discussion, and a Resource Capability summary as defined in the California Mobilization Guide.

Issuance Schedule: By 1030 local time daily during fire-season. Predictive Services will notify the appropriate National Weather Service office(s) of the issuance of any High Risk Days.

*c. Monthly and Seasonal National Fire Weather/Fire Danger Outlooks:* These Outlooks combine all available weather, climate, fuels, and fire danger information in order to make a prediction of fire activity across the country for the next 30 days (monthly), and the next 90 days (seasonal). These outlooks try, when possible, to highlight the periods and potential for large fire activity and resource utilization, relative to normal. The Redding Predictive Services' Unit produces a local version of the Monthly Outlook, while the Riverside Predictive Services' Unit produces a local version of both the Monthly and Seasonal Outlooks.

Issuance Schedule: Year round, prepared a few days prior to start of the new month and posted on the website on the 31<sup>st</sup> or 1<sup>st</sup>.

*d. Fire Season Assessments:* These are estimates of fire potential for longer periods, ranging from three months to an entire fire season in duration. A nationwide collaboration of meteorologists, climatologists, and fuels and fire danger specialists takes place in spring. Season-to-date precipitation, snow pack, temperature and fuels information is melded with a consensus climate forecast to predict fire season severity.

Issuance Schedule: The pre-season assessment (preliminary) is done at a national workshop in April. In California the main seasonal assessment is issued in late May or June, containing any necessary updates and added detail from the earlier preliminary. A second adjustment is done about mid fire season, if necessary.

## 2. Other Predictive Services Products, Projects and Services

*a. Prescribed Burn Spot Forecasts* - The PSUs provide site-specific prescribed burn (spot) forecasts, for any requesting agency, when smoke dispersion and/or smoke management are concerns. Along with this program, the PSUs work closely with the California Air Resources Board (CARB), the Air Districts, and Air Pollution Control officers. The PSUs sponsor daily conference calls at 1300LT, with prescribed burn managers, CARB, and the air districts. These calls help coordinate burning, especially during “marginal burn days” as outlined in the most recent version of Title 17. If agreed upon with the NWS, Predictive Service Units can also provide spot forecasts for a where the strategy does not include pursuing full perimeter control. (i.e. “Monitor/ Confine/ Contain” strategies)

*b. CANSAC Update* – California and Nevada Smoke and Air Consortium (CANSAC). The website for the matrix of operational products (graphics) is found at [http://www.cefa.dri.edu/COFF/cansac\\_output.php](http://www.cefa.dri.edu/COFF/cansac_output.php). CANSAC's three goals are: high-resolution meteorological output for use in operational fire weather, California ARB and Air District use in support of burn decisions and air quality monitoring, and smoke transport/ BlueSky applications.

CANSAC changes for 2010 include:

- Trent Procter of the USFS is replacing Susie Stingley as the Board chair-person.
- New CANSAC hardware was purchased in early 2010 enabling faster model runs, as well as supporting higher resolution modeling within existing time frames.
- The MM5 meso-scale weather model is no longer supported, and will be replaced at the with the Weather Research and Forecasting model (WRF).
- A much anticipated capability is now (April 2010) being refined – that of CANSAC graphic users being able to customize product menus. This feature, which will require a user-specific login and PW, will save time and improve efficiency, for heavy product users. Further word on access and use of this capability will be available later this year.

### *c. Other Ongoing or New Projects* -

- A wind study utilizing 5 portable RAWS stations (equipped with 20-ft masts) and existing NFDRS network RAWS, will be conducted in the Burney Basin (NWS FWF Zone 214) from June to October. A major goal is to determine wind variations (speed and direction) around the FW Zone, especially during strong South to WSW gradient wind events.
- Daily Webcast – Issued by the Riverside Predictive Services’ Unit. This is a 3 to 5 minute audio/ visual briefing describing weather, fuel conditions, and fire potential for the next 5 days across the Geographic Area.
- Participation in regional and national (NPSG) committees and workgroups
- Leadership in the FIRESCOPE Predictive Specialists Group and co-leadership along with the NWS of the California Fire Weather Program Assessment Team
- Providing continued support for Wildland Fire Decision Support System (WFDSS).

## B. Program Management

1. RAWS – The Regional RAWS Coordinators of the various agencies manage the interagency RAWS program within California. This includes regular monitoring of data quality and assisting with station maintenance and acquisition issues. It also involves development of and assistance in providing RAWS training classes. Current agency RAWS coordinators in California include:

USFS	Russ Gripp	(530) 841-4439
	John Snook	(530) 226-2730
	Matt Shameson	(951) 782-4850
BLM North	Steve Leach	(530) 226-2730
NPS	Corky Conover	(559) 565-3129
CALFIRE	Doug Forrest	(916) 653-6608

2. Liaison – The PSU Program Managers at each Geographic Area serve as a liaison between field fire managers and various service providers including the NWS, the private sector, and the research community.

## C. PSU Meteorologists Proficiency and Currency

### 1. Proficiency

- a) Completion of S-190, S-290, and S-390
- b) Work no less than five (5) shifts handling all operational products as listed above.
- c) Conduct at least 2 each, and 10 total, of the following:
  - Daily coordination calls with other GACC office (Redding or Riverside)
  - 0830 PDT (South Ops) or 0845 PDT (North Ops) conference call with the NWS
  - 1030 PDT Briefing for Ops/ECC personnel
  - 1300 PDT Smoke coordination conference calls
  - Special briefings and conference calls for CALFIRE and Federal agencies
- d) Work with Intel Officer and be able to produce all Predictive Services products (using in-office guidelines or help sheets, as necessary). Included in this are the:
  - Monthly/Seasonal Outlooks issued by the end of the prior month
  - Seasonal Weather and Fire Season Assessments, before early-to-mid high fire season
- e) The PSU Program Manager will sign-off on proficiency

### 2. Currency

- a) The forecaster has prepared and issued at least 12 of the operational products (listed in 1.b.) during the past three months. At least 3 of the 12 should be site-specific (spot) forecasts.
- b) If qualified, must maintain proficiency in accordance with NWCG Technical Specialist standards.

## D. Technology Transfer

GACC meteorologists help integrate advanced technology analytical and prediction systems into fire management planning and operations. Some efforts include:

- Incorporation of CANSAC data into other current weather products, such as Smoke Transport/ Stability text product, the Daily Weather Outlook, etc.
- Continue use of FireFamily-plus in briefing fire Managers/ECC on fuels conditions and fire danger.
- Proper use of RAWS and NFDRS, and assistance with WIMS
- Research and development to advance fire meteorology

**Nelson Dead Fuel Moisture Model Implementation in WIMS:** In 2010, the Nelson model will progress out of the WIMS development environment and into the TEST environment, as a prelude to the Production environment.

Some highlights related to changing to use of the Nelson Model in NFDRS:

- There will be a **parallel integration in Production for at least a year** where both the traditional and the new (Nelson) dead fuel moistures and associated indexes will be computed.
- **Only the Nelson 1-hr and 10-hr dead fuel moistures will be used initially.** 100-hr, 1000-hr, and live fuels moistures will be computed as always
- A **new NFDR observation type (N) will allow for comparison** between the Nelson derived and traditional "O" NFDR records.
- Most of the processing is done in the RAWS data ingest program.
- "N" records will be created initially at the Station's Regular Scheduled Observation time **and at 6-hour intervals throughout the 24-hr day (i.e. 1300, 1900, 0100, 0700).** We envision station managers being able to select the frequency and times, by the time this is moved to Production.
- Hourly data will be used to generate these records, so essentially, every six hours the model is run for 6 hours and only the final hour NFDR "N" observation is stored at this point.

**WIMS will** use hourly observations to **pre-fill the State of Weather and Wet Flag**, which will be seen by the daily person editing via the EOBS screen. These will be set by Solar Radiation (percent of possible for the latitude and date & time) and precipitation amount and duration for the current hour, the previous 3 hours, and the past 24 hours..

- A corresponding NFDR record will have already been computed for their regular Observation time. Both the weather and the NFDR record types are "R" at this point. So, **without user intervention there will be two NFDR records at 1300**, the pure Nelson (N) and the pre-computed (R) types. Both the (N) and (R) NFDR records will be available to user groups as soon and they are generated.
- **The person editing the (R) Weather Observation can modify any of the fields, like SOW/ Wet Flag.** When they Save, the NFDR record is recomputed with the updated inputs, and the record type is automatically converted to type "O". Or, they may accept the current values and *Publish* the record(s). In this case, the NFDR type R is automatically

converted to 'O' without recomputation. Either way, once the 'O' NFDR record is created, it is then exposed to the general user community, as is the case now.

- Any user changes to the SOW and Wetflag will be stored in the Stations Change archive.
- The user ID and date / time the observation was published or edited will be captured.
- A Station Level Snow Flag should allow for winter operations to continue with minimal intervention.
- There is a **new interface Module, Display Nelson Solar Radiation (DNSR)** that will aid in tracking and comparing the (O) and (N) NFDR records.
  1. Within DNSR, the 'NFDR Type' field has "O" and "N". You can select to see either just "N" (= 4 per day), or "O&N" (which matches the standard NFDR observation type "O" type with the "N") or "ALL" which has the 4 x N plus the matched "O" type.
  2. Shows rain gauge, Solar Radiation (RD) and percent possible (SR%) for that date/hour/latitude.
    - SOW/WF for "N" types are computed from hourly data
    - SOW/WF for "O" types are from the user edited observation for comparison.
  3. 1 and 10 hr FM vary by hour, and between the N and O types, while the 100- and 1000-hour values are the same between types.

## E. Agency Computer Systems

Where fire management computer systems like WIMS are locally available, access to the systems will be granted to the NWS to provide or develop services, as needed. Costs will be borne by the Interagency Wildland Fire Agencies for requirements that are beyond the distribution of weather information through a central communications gateway.

## F. Fire Weather Observations

*1. RAWS and NFDRS Observations* - Fire weather observations for stations that desire next-day forecasts should be entered into WIMS no later than 1340 PST (1440 PDT). **Local quality control is a critical element in the data entry process.** Observations from Remote Automated Weather Stations (RAWS) sites will be the observation that is closest to 1300 LST/1400 LDT. In WIMS this can be either a 12xx or 13xx RAWS observation.

RAWS utilized for NFDRS stations, and manual stations utilized for NFDRS are expected to be sited and maintained to the standards published in NWCG PMS 426-3 "National Fire Danger Rating System Weather Station Standards". The website to view this document, and any recent updates to it, is <http://www.fs.fed.us/raws/standards/>.

Proper siting of weather stations has always been a high priority in California. The GACC meteorologists are available to assist land or fire managers in selecting proper sites. Annual RAWS maintenance requirements will be strictly adhered to.

### *2. Fireline Observations and Spot Forecast Feedback* -

Fireline Observations – Representative observations are required when requesting a spot forecast, whether for a wildfire, prescribed burn, or other need. Distance is not the only factor in determining whether an observation site is considered representative. Fire agency personnel will take standard fireline observations of temperature, relative humidity, wind direction and speed, and weather/sky condition consistent with guidance

provided in NFES 2140 “Weather Station Handbook – An Interagency Guide for Wildland Managers.”

Fire agency personnel are encouraged to discuss the fire or burn with the meteorologist preparing the spot forecast to alert the forecaster to details which would otherwise not be apparent, such as variations in humidity in a large and complex site, the time at which winds switched from upslope to downslope, etc.

Spot Forecast Feedback and Validation – When providing manual observations (i.e. from a belt weather kit or Kestrel) for use in spot forecasts, prescribed burners should proactively provide feedback to their forecast providers, whether PSU or NWS. This feedback should be made available within 24 hours of forecast issuance, or before issuance of the next spot forecast, whichever is first. Be sure to include the following:

- Sky cover and/or precipitation verification
- Relative humidity
- Wind speed and direction
- Temperature

## **VI. JOINT RESPONSIBILITIES**

The NWS and CWCG use a joint Fire Weather Program Assessment Team to evaluate fire weather products and services in California ([Appendix H](#)) and recommend improvements. The assessments include products and services from both the NWS and the PSUs.

NWS offices and the PSUs are committed to providing collaborated forecasts and products. When operationally significant differences or inconsistencies between adjacent WFO forecasts are identified, or between the two PSUs’ products, they will be updated in order to provide a collaborated forecast. Although the WFOs and PSUs have different forecasts and products, in areas where overlap exists both sides agree it is important to work together to ensure that services reflect similar forecast thinking. Options for collaboration are detailed in this AOP.

CWCG and NWS are committed to working together to resolve problems in near-real time. Issues from either party will be brought to the attention of the appropriate management level immediately for resolution. Fire managers should first work with their local NWS office for resolution, then the Sacramento Meteorologist-in-Charge and closest PSU, and then the Western Regional Office, Division of Meteorological Services and CWCG representative.

### **A. California Fire Weather Web Page and Emergency Communication Center Dispatch Area (ECCDA) Forecast Summaries**

An interagency fire weather web page for California available at <http://www.wrh.noaa.gov/sto/cafw/>. Emergency Communication Center Dispatch Area (ECCDA) Forecast Summaries are available from this web site. These simplified fire weather summaries are meant to be used for fire agency radio broadcasts while at the same time providing the most essential daily weather information. Any Red Flag Warning or Fire Weather Watch headlines shown in the ECCDA Forecast Summaries are linked to the actual watch or warning product. All forecast segments within an ECCDA are listed at the beginning of the forecast and can be mouse clicked to jump immediately to that segment.

ECCDA Forecast Summaries are normally available daily by 9:45 a.m. and 4:00 p.m. during high fire season and once per day Monday through Friday (excluding holidays) during the low season. ECCDA Forecast Summaries are not normally updated. Therefore, fire agency personnel should consult the latest FWF and/or RFW issuances for updated information at other times and are directed to do so on the California Fire Weather web page.

## B. Training

Meteorological training can be provided by both NWS and GACC PSU meteorologists. The NWS forecast offices primarily handle local courses that occur within their County Warning Areas. The PSU's primary role is with regional and national level courses. Requests for these (regional and national) courses should be directed to either the Redding or Riverside PSU. Each NWS office and PSU should have at least one person qualified to teach courses up through Intermediate Fire Behavior (S-290).

Requests for training from NWS offices should be directed to that office's Fire Weather focal point or Meteorologist-In-Charge. If the office is not able to provide an instructor for a course, that office will assume the responsibility for finding an instructor. Requests for training from the PSUs should be directed to either the Training Coordinator or Team Leader of the PSU. In all cases, sufficient advance notice (≥ six weeks whenever possible) should be given to allow for scheduling and proper preparation.

Costs incurred by NWS in providing training assistance (other than salary costs for a normal non-holiday weekday) will be borne by the requesting agency. Costs incurred by PSU instructors are covered in their annual budget, without need for reimbursement. Below is a table outlining the weather instructor availability for 2010:

Name Of Office	Instructors qualified to teach S-190, S-290	<u>Other Classes</u> that at least one meteorologist from this office is qualified to instruct
Redding PSU	Brenda Belongie John Snook Steve Leach Basil Newmerzhycky	S-390, S-490, S-491, S-590, RX-410 WIMS, S-144, ECC, NFDRS
Riverside PSU	Tom Rolinski Rob Krohn	S-390, S-490, S-491, WIMS, NFDRS
Eureka	Jeff Tonkin Mark Burger Nancy Dean	S-390, S-490, S-590
Hanford	Cindy Bean Dan Harty	S-390, RX-300
Las Vegas	Jim Harrison Mike Staudenmaier	S-390
Medford	Frederic Bunnag Dennis Gettman Brett Lutz	S-390, S-490
Monterey	Ryan Walbrun Matt Mehle Dan Gudgel	S-390, S-490

Oxnard	Rich Thompson Dave Gomberg	S-390, S-490
Phoenix	Valerie Meyers	
Reno	Alex Hoon Rhett Milne James Wallmann	S-390
Sacramento	Mike Smith Jason Clapp	S-390, S-490, S-590, RX-300
San Diego	Rob Balfour	S-390, S-490

### C. Incident Response

In addition to following direction in the National Mobilization Guide, the following direction is clarification for Command Centers in California:

When an IMET is requested for an incident, **the request will be placed to the GACC.** The GACC will notify the National Fire Weather Operations Coordinator (NFWOC) at NIFC. Priority will be given to IMET requests. (Larry Van Bussum or his acting: Office 208-334-9862 or Cell 877-323-4638).

The GACCs will maintain a list of qualified IMETs and trainees in the Resource Ordering and Staffing System (ROSS) by Weather Forecasting Office identifier, and provide dispatching services for the NWS in California. This list will be updated annually based on the list that is published in the CA Fire Weather Annual Operating Plan. IMETs will be dispatched by the GACCs in California just as if they are GACC employees.

When the NFWOC determines who will fill the incident request, the information will be relayed back to the GACC. If the IMET is within the requesting Geographic area, the IMET will be mobilized using ROSS.

If the IMET is in the California GACC that is not hosting the incident, the request will be placed through Selection Area to the other GACC.

If the identified IMET is not in a California Weather Forecast Office, the IMET request will be edited to add a Name Request and placed up to NICC who will place the request to the appropriate GACC.

The following list designates which California GACC will status and dispatch personnel for the California Weather Forecasting Offices. Status can be maintained Available/Local until requested to reduce work:

#### **North Ops**

Eureka WFO  
Sacramento WFO  
San Francisco/Monterey WFO

#### **South Ops**

Hanford WFO  
Los Angeles/Oxnard WFO  
San Diego WFO

IMET personnel from Medford WFO, Reno WFO, Phoenix WFO and Las Vegas WFO shall be requested through NICC to their respective GACC using Name Request.

The procedures for requesting IMETs will follow the guidelines outlined in the National Interagency Agreement, Administrative Procedures section of the current National Mobilization Guide, Personnel section of the current California Mobilization Guide, and CALFIRE Procedure No. 302. Note that for non-Federal incidents, such as a CALFIRE or local government fire, the requesting agency may order either an NWS IMET or a Predictive Services Technical Specialist (THSP) to support their Incident meteorological needs.

The following information will be provided to the requested IMET:

- Name of fire
- Location of fire
- Directions to location where the IMET is to report and location of Incident Base.
- Name of Incident Commander, Plans Chief, and Fire Behavior Analyst, if available.
- Request and Resource Order number for IMET

Additionally, the user agency is responsible for providing adequate shelter to allow the equipment and fire weather meteorologist to function efficiently. This would include a location that is free of excessive dust, heat and moisture, protection from wind and other elements, table, and chair. Transportation and shelter arrangements should be made at the time of request; 120 volt AC power is desirable.

The following is a list of IMETs, Technical Specialists, and All-hazard Meteorological Response System (AMRS) in the Northern and Southern California Area:

**Northern and Southern California Area IMETs and Technical Specialists:**

(T) designates a trainee

**NWS IMETs:**

<u>Location</u>	<u>Name</u>	<u>Agency</u>	<u>ROSS Unit ID</u>
Eureka, CA	Mark Burger	NWS	CA-EKAW
Eureka, CA	Jeff Tonkin	NWS	CA-EKAW
Hanford, CA	Cindy Bean	NWS	CA-HNXW
Hanford, CA	Dan Harty	NWS	CA-HNXW
Las Vegas, NV	Jim Harrison	NWS	NV-VEFW
Medford, OR	Frederic Bunnag	NWS	OR-MFRW
Medford, OR	Dennis Gettman	NWS	OR-MFRW
Medford, OR	Brett Lutz	NWS	OR-MFRW
Monterey, CA	Ryan Walbrun	NWS	CA-MTRW
Monterey, CA	Matt Mehle	NWS	CA-MTRW
Oxnard, CA	Rich Thompson	NWS	CA-LOXW
Phoenix, AZ	Valerie Meyers	NWS	AZ-PSRW
Reno, NV	Alex Hoon (T)	NWS	NV-REVV
Reno, NV	Jim Wallmann	NWS	NV-REVV
Reno, NV	Edan Lindaman (T)	NWS	NV-REVV
Reno, NV	Katie LaBelle (T)	NWS	NV-REVV
Reno, NV	Steve Vanderburg (T)	NWS	NV-REVV
Sacramento, CA	Jason Clapp	NWS	CA-STOW
Sacramento, CA	Steve Goldstein (T)	NWS	CA-STOW
Sacramento, CA	Mike Smith	NWS	CA-STOW
San Diego, CA	Rob Balfour	NWS	CA-SGXW
San Diego, CA	Stefanie Sullivan (T)	NWS	CA-SGXW

**PSU Technical Specialists:**

Redding, CA	John Snook	USFS	CA-NZF
-------------	------------	------	--------

Redding, CA	Basil Newmerzhucky	USFS	CA-NZF
Redding, CA	Brenda Belongie	USFS	CA-NZF
Redding, CA	Steve Leach (T)	BLM	CA-NZF
Riverside, CA	Tom Rolinski	USFS	CA-OSC
Riverside, CA	Matt Shameson	USFS	CA-OSC
Riverside, CA	Rob Krohn	USFS	CA-OSC

**AMRS Cache Sites**

Each NWS office serving California has at least one AMRS.

**D. Briefings**

Either NWS or GACC meteorologists will conduct briefings upon request, time and resources permitting.

**E. Coordination Conference Calls**

Coordination conference calls will be conducted, as needed, between the PSUs and the WFOs during fire season. See [Appendix D](#) for further details on these calls.

**F. WIMS IDs for NFDRS Stations**

All NFDRS observation stations are assigned a six-digit station identification number for use in WIMS. The Northern California or Southern California Predictive Services Units must be contacted for assignment of a six-digit number for any new station, or for any changes in location made to existing stations that already have a WIMS ID number. The PSUs will notify the NWS of any new or relocated NFDRS stations.

## VII. AGENCY SIGNATURES / EFFECTIVE DATES OF THE AOP

This AOP shall be effective on the date the last signature is placed on this page and will remain in effect until the date the last signature is placed on this page the following year. Updates or amendments may be added in the interim upon agreement of all signatories. Usually the effective dates are May 15 through May 15 the following year.

### Agency Signatures

*Dated signature on file*

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Craig Barnes	Date
Chair, California Wildfire Coordinating Group	

*Dated signature on file*

---

Dan Keeton	Date
NWS State Liaison Northern California Official	

*Dated signature on file*

---

Mark Jackson	Date
NWS State Liaison Southern California Official	

## APPENDIX A - Forecast Parameter Definitions

### 1. General Parameters

Sky/weather – Cloud cover and weather. Weather could include rain, snow, showers, thunderstorms, etc. Cloud cover is as follows:

Clear	5% or less cloud cover
Mostly Clear	6% - 25% cloud cover
Partly Cloudy	26% - 50% cloud cover
Mostly Cloudy	51% - 69% cloud cover
Cloudy/Overcast	70% or greater cloud cover

Temperature and 24 hour trend – Dry bulb temperature extreme, either daytime or nighttime, and trend of extreme from previous 24 hours.

Humidity and 24 hour trend – Relative humidity extreme, either daytime or nighttime, and trend of extreme from previous 24 hours.

Wind - 20 foot (10-min) RAWS standard – Surface wind speed and direction as altered by local terrain and surface roughness and measured per instrumentation and siting standards set by NWCG for the RAWS program and NFDRS. In practice, surface wind forecasts produced based on the ASOS standard will be reduced by 20% to obtain 20 ft. winds, except in cases where wide open rangeland or desert is predominant. This same comparison will be used in considering stations other than RAWS to validate forecasts.

Ridgetop winds – Synoptic scale wind speed and direction at or just above mean ridgetop level.

Chance of Rain – Probability of occurrence or aerial coverage of 0.01” or greater liquid equivalent precipitation.

Chance of Wetting Rain (CWR) – Probability of occurrence or aerial coverage of 0.10” or greater liquid equivalent precipitation.

Haines Index – A numerical means to indicate the potential for existing wildfires to experience large growth and or extreme fire behavior (i.e. crowning, spotting, and rapid rates of spread). The Index combines both the instability and dryness of the air by examining the lapse rate between two pressure levels in the atmosphere and the dryness at the lower level. For most of the western United States, the levels used are 700 mb (about 10,000 ft) and 500 mb (about 18,000 ft). The drier and more unstable the atmosphere, the higher the Haines Index and the potential for extreme fuel driven fire behavior. Haines Index values vary from 2 to 6 and classifications are shown below:

<u>HAINES INDEX</u>	<u>POTENTIAL FOR LARGE FIRE GROWTH</u>
2-3	Very Low
4	Low
5	Moderate
6	High

(Haines Index does not include the effects of wind on fire spread.)

## 2. Lightning Activity Level (LAL)

<b>LIGHTNING ACTIVITY LEVEL GUIDE FOR FIRE WEATHER OBSERVERS</b>					
LAL	Cloud and Storm Development	Areal Coverage	Individual storm cell cloud to ground lightning discharges		
			Counts <sup>1</sup> cg/5 min	Counts <sup>1</sup> cg/15 min	Average <sup>1</sup> cg/min
1	No thunderstorms	None	----	----	----
2	Cumulus clouds are common but only a few reach the towering stage. A single thunderstorm must be confirmed in the rating area. The clouds mostly produce virga but light rain will occasionally reach ground. Lightning is very infrequent.	<15 %	1-5	1-8	<1
3	Cumulus clouds are common. Swelling and towering cumulus cover less than 2/10 of the sky. Thunderstorms are few, but 2 to 3 occur within the observation area. Light to moderate rain will reach the ground, and lightning is infrequent.	15-24 %	6-10	9-15	1-2
4	Swelling cumulus and towering cumulus cover 2-3/10 of the sky. Thunderstorms are scattered but more than three must occur within the observation area. Moderate rain is commonly produced, and lightning is frequent.	25-50 %	11-15	16-25	2-3
5	Towering cumulus and thunderstorms are numerous. They cover more than 3/10 and occasionally obscure the sky. Rain is moderate to heavy, and lightning is frequent and intense.	>50 %	>15	>25	>3
6	Dry lightning outbreak. (LAL of 3 or greater with majority of storms producing little or no rainfall.)	>15 %	----	----	----

<sup>1</sup> Cloud-to-ground lightning discharges

## APPENDIX B - NWS Forecast Examples

The most current products issued by the NWS forecast offices can be viewed by clicking on the appropriate office and product identifier in the table below.

1. Fire Weather Planning Forecast (FWF)
2. ECCDA Forecast
3. Activity Planner (PLAN)
4. NFDRS Forecast (see accompanying text for interpretation)
5. Area Forecast Discussion (AFD)
6. Red Flag Warning/Fire Weather Watch (RFW)
7. Spot Forecast (FWS)
8. Internet Spot Request Site (SPOT REQ)

<b>MFR</b> Medford	<b>EKA</b> Eureka	<b>STO</b> Sacramento	<b>REV</b> Reno	<b>MTR</b> Monterey	<b>HNX</b> Hanford	<b>VEF</b> Las Vegas	<b>LOX</b> Oxnard	<b>SGX</b> San Diego	<b>PSR</b> Phoenix
<a href="#">FWF</a>									
<a href="#">ECCDA</a>									
<a href="#">PLAN</a>									
<a href="#">NFDRS</a>									
<a href="#">AFD</a>									
<a href="#">RFW</a>									
<a href="#">FWS</a>									
<a href="#">SPOT REQ</a>									

## NFDRS Forecast Interpretation

- a. ZONE/FCST - Shows whether this forecast is a zone trend (ZONE) or station trend (FCST) forecast. Trend forecasts (ZONEs) show how parameters will change over the next 24 hours for a group of stations contained in a given NFDRS trend zone. Note that a trend zone consists of several points rather than an area. The NFDRS trend forecast applies to every station within the trend zone. The WIMS catalogue determines which stations are within a trend zone. Occasionally a station within an NFDRS trend zone is not expected to trend the same way as the rest of the stations in the zone. In those cases, specific point forecast values (FCST) should be made for that station while a zone trend forecast is done which applies to the rest of the stations in the zone group. Specific forecast values (FCST) always are placed after the trend forecasts (ZONEs).
- b. **YYMMDD** Year, month, and day valid forecast time.
- c. **NO** NFDRS Zone Number (or individual NFDRS station number)
- d. **13** Always 1300 LST
- e. **WX** Weather valid at 1300 LST tomorrow. Valid entries are:
- 0 clear
  - 1 scattered clouds (1/8 to 4/8)
  - 2 broken clouds (5/8 to 7/8)
  - 3 overcast clouds (more than 7/8)
  - 4 foggy
  - 5\* drizzle
  - 6\* raining
  - 7\* snowing or sleeting
  - 8 showers (in sight or at the station)
  - 9 thunderstorm
- \*(Categories 5, 6, or 7 sets NFDRS components and indices to 0...use only with widespread precipitation)**
- f. **TEMP** Temperature in deg F valid at 1300 LST for FCST or temperature trend + or - for ZONE
- g. **RH** Relative humidity in % valid at 1300 LST for FCST or RH trend + or - for ZONE
- h. **LAL1** Lightning Activity Level 1300 LST to 2300 LST
- i. **LAL2** Lightning Activity Level 2300 LST to 2300 LST (next day)
- j. **WIND** Wind speed in mph valid at 1300 LST for FCST or wind speed trend + or - for ZONE (**20 ft level/10 min avg**)
- k. **10HR** 10-hour time lag fuel moisture in % valid at 1300 LST for FCST or trend + or - for ZONE
- l. **Tx** Max temperature from 1300 LST to 1300 LST tomorrow
- m. **Tn** Min temperature from 1300 LST to 1300 LST tomorrow
- n. **RHx** Max relative humidity from 1300 LST to 1300 LST tomorrow
- o. **RHn** Min relative humidity from 1300 LST to 1300 LST tomorrow
- p. **PD1** Precipitation duration in hours 1300 LST to 0500 LST
- q. **PD2** Precipitation duration in hours 0500 LST to 1300 LST
- r. **WETFLAG** Y or N. Indicates whether liquid water will be on the fuels at 1300 LST. **(Use with caution – a “Y” will set all the NFDRS indices to zero!)**

The NFDRS trend forecast will follow the comma delimited format as shown:

ZONE,NO,YYMMDD,13,WX,TEMP(trend),RH(trend),LAL1,LAL2,WIND(trend),10HR(trend),PD1,PD2,WETFLAG  
 FCST,NO,YYMMDD,13,WX,TEMP(trend),RH(trend),LAL1,LAL2,WIND(trend),10HR(trend),PD1,PD2,WETFLAG

In California, the station specific point forecast is not normally used. The format for station specific point forecasts is:

FCST,NO,YYMMDD,13,WX,TEMP(specific),RH(specific),LAL1,LAL2,WIND(specific),10HR(specific),TX(specific),  
 TN(specific),RHx(specific),RHn(specific),PD1,PD2,WETFLAG

## APPENDIX C – Predictive Services Product Examples

The most current products issued by the Predictive Services offices can be viewed by clicking on the appropriate office and product identifier in the table below:

<b>North Ops</b> Redding	<b>South Ops</b> Riverside
<a href="#"><u>Daily Weather Outlook</u></a>	<a href="#"><u>Daily Weather Outlook</u></a>
<a href="#"><u>7-Day Significant Fire Potential</u></a>	<a href="#"><u>7-Day Significant Fire Potential</u></a>
<a href="#"><u>Monthly Outlook</u></a>	<a href="#"><u>Monthly Outlook</u></a>
<a href="#"><u>Seasonal Assessment</u></a>	<a href="#"><u>Seasonal Assessment</u></a>

## **APPENDIX D – High Season Coordination Calls**

### **Predictive Services Units and National Weather Service Coordination Calls**

Coordination conference calls will be conducted as needed (see bullets below) between the Predictive Services Units (PSUs), the National Weather Service (NWS) Weather Forecast Offices (WFOs), and any affected fire agencies. Deployed IMETs should be included in the calls.

The purpose of the call is to produce seamless products between WFOs and also between the Predictive Services Units and WFOs, and to discuss fuel conditions within the targeted area. Calls should be brief and to the point. A Predictive Services Unit meteorologist will facilitate the calls, and the focus of the calls will be in the short term (72 hours).

Calls will be conducted when one or more of the following is occurring:

- Fire Weather Watch/Red Flag Warning is in effect.
- A critical fire weather pattern is expected to develop.
- Large wildfires or wildfires with IMETs deployed
- California is in Planning Level IV or V.

Normally, there will be two calls, one for the north and one for the south. There are three WFOs that have forecast areas in both the north and the south. Routinely, Monterey will be on the north and south calls, and Reno and Sacramento will be on the north call. In some instances, one statewide call will be conducted. Calls will be at 0830 LT (South) and 0845 LT (North) during fire season.

Predictive Services will place an unpublished message on the Internet by 0800 PDT to inform the WFOs if a call is necessary, and which WFOs need to be on it.

**APPENDIX E – Backup Spot Forecast Request Form (WS FORM D-1)**

WS FORM D-1 (1-2005) (Supersedes Previous Editions)		<b>SPOT REQUEST</b> (See reverse for instructions)		U.S. Department of Commerce NOAA National Weather Service											
Please call the NWS Weather Forecast Office (WFO) when submitting a request and also after you receive a forecast to ensure request and forecast were received. Please provide feedback to WFO on forecast.															
1. Time†		2. Date		3. Name of Incident or Project											
4. Requesting Agency		5. Requesting Official		6. Phone Number											
7. Fax Number		8. Contact Person		9. Ignition/Incident Time and Date											
10. Size (Acres)		11. Type of Incident <input type="checkbox"/> Wildfire <input type="checkbox"/> Prescribed Fire <input type="checkbox"/> Wildland Fire Use (WFO) <input type="checkbox"/> HAZMAT <input type="checkbox"/> Search And Rescue (SAR)		12. Reason for Spot Request (choose one only) <input type="radio"/> Wildfire <input type="radio"/> Non-Wildfire Under the Interagency Agreement for Meteorological Services (USFS, BLM, NPS, USFWS, BIA) <input type="radio"/> Non-Wildfire State, tribal or local fire agency working in coordination with a federal participant in the Interagency Agreement for Meteorological Services <input type="radio"/> Non-Wildfire Essential to public safety, e.g. due to the proximity of population centers or critical infrastructure.		13. Latitude/Longitude:									
14. Elevation (ft, Mean Sea Level) Top:                      Bottom:															
15. Drainage															
16. Aspect		17. Sheltering <input type="checkbox"/> Full <input type="checkbox"/> Partial <input type="checkbox"/> Unsheltered		18. Fuel Type: <input type="checkbox"/> Grass <input type="checkbox"/> Brush <input type="checkbox"/> Timber <input type="checkbox"/> Slash <input type="checkbox"/> Grass/Timber Understory <input type="checkbox"/> Other _____ Fuel Model: 1,2,3    4,5,6,7    8,9,10    11,12,13    2,5,8											
19. Location and name of nearest weather observing station (distance & direction from project):															
20. Weather Observations from project or nearby station(s): (Winds should be in compass direction e.g. N, NW, etc.)															
Place		Elevation		†Obs Time		20 ft. Wind Dir    Speed		Eye Level Wind Dir    Speed		Temp Dry    Wet		Moisture RH    DP		Remarks (Relevant Weather, etc)	
21. Requested Forecast Period Date		Start _____ End _____		Forecast needed for: <input type="checkbox"/> Today <input type="checkbox"/> Tonight <input type="checkbox"/> Day 2 <input type="checkbox"/> Extended		22. Primary Forecast Elements (Check all that are needed) (for management ignited wildland fires, provide prescription parameters):  Needed: Sky/Weather <input type="checkbox"/> Temperature <input type="checkbox"/> Humidity <input type="checkbox"/> 20 ft Wind <input type="checkbox"/> Valley <input type="checkbox"/> Ridge Top <input type="checkbox"/> Other (Specify in #23) <input type="checkbox"/>		23. Remarks (other needed forecast elements, forecast needed for specific time, etc.)							
24. Send Forecast to: ATTN:		25. Location:		26. Phone Number: Fax Number:											
27. Remarks (Special requests, incident details, Smoke Dispersion elements needed, etc.):															
EXPLANATION OF SYMBOLS: † Use 24-hour clock to indicate time. Example: 10:15 p.m. = 2215; 10:15 a.m. = 1015 Indicate local standard time or local daylight time															

WS FORM D-1  
**WS FORM D-1, January 2005 INSTRUCTIONS:**

**I. Incident Personnel:**

1. Complete items 1 through 27 where applicable.
  - a. Example of weather conditions on site:

13. Weather Observations from project or nearby station(s):

Place	Elevation	↑Ob Time	20 Ft. Wind		Eye Level Wind		Temp.		Moisture		Remarks (Relevant Weather, etc.)
			Dir	Speed	Dir	Speed	Dry	Wet	RH	DP	
Unit G-50	1530'	0830	NW	6-8	NW	3-5	32		72		Observations from unit RAWS station, 50% cloud cover.

- b. If the incident (HAZMAT, SAR) involves marine, put the wave/swell height and direction in the Remarks section.
2. Transmit in numerical sequence or fax to the appropriate Weather Forecast Office. (A weather forecaster on duty will complete the special forecast as quickly as possible and transmit the forecast and outlook to you by the method requested)
3. Retain completed copy for your records.
4. **Provide feedback to NWS utilizing separate page.** Be sure to include a copy of the spot forecast with any feedback submission including forecaster's name. Feedback to NWS personnel is imperative to assist with future forecasts. **Remember, feedback on correct forecasts is equally as valuable as feedback on incorrect forecasts!** If spot forecast is significantly different than conditions on site, a second forecast may be required.

**II. ALL RELAY POINTS should use this form to insure completeness of date and forecast. A supply of this form should be kept by each dispatcher and all others who may be relaying requests for forecasts or relaying completed forecasts to field units.**

**III. Forms are available from your local National Weather Service Weather Forecast Office. They may also be reproduced by other agencies as needed, entering the phone number and radio identification if desired.**

***NOTICE: Information provided on this form may be used by the National Weather Service for official purposes in any way, including public release and publication in NWS products. False statements on this form may be subject to prosecution under the False Statement Accountability Act of 1996 (18 U.S.C. § 1001) or other statutes.***

## APPENDIX F - NFDRS Table - Site Information, Owners, and NWS Responsibilities

EKA = NWS Eureka, HNX = NWS Hanford, VEF = NWS Las Vegas, LOX = NWS Oxnard, MFR = NWS Medford, MTR = NWS Monterey, REV = NWS Reno, STO = NWS Sacramento, SGX = NWS San Diego

### NWS Eureka

STATION NAME WIMS	WIMS ID	AGENCY	UNIT	FCST_ZONE	LATITUDE	LONGITUDE	ELEV
ALDER POINT	40423	State	HUU	556	40.1866667	-123.0097222	923
BACKBONE	40518	FS	SHF	591	40.8887340	-123.1420380	4700
BIG BAR	40501	FS	SHF	591	40.7421640	-123.2489610	1722
BIGHILL	40402	BIA	HIA	555	41.0975000	-123.0105556	3570
BOONVILLE	41001	State	MEU	557	38.9872222	-123.0058333	940
BRUSH MTN L.O.	40404	FS	SRF	555	40.9138750	123.6683710	3942
CAMP SIX LOOKOUT	40101	FS	SRF	556	41.8309220	-123.8764870	3698
COOKSIE MOUNTAIN	40422	State	HUU	560	40.2569440	-124.0041667	2950
EEL RIVER (MNF)	41005	FS	MNF	557	39.8252778	-123.0011111	1500
EEL RIVER CAMP	40421	State	HUU	556	40.1383333	-123.0136111	470
FIVE CENT	40520	FS	SHF	591	40.7565560	-122.9241160	2508
FRIEND MTN	40512	FS	SHF	591	40.5050000	-123.0055556	4000
GASQUET	40102	FS	KNF	556	41.8453750	-123.9669250	366
HAYFORK	40503	FS	SHF	591	40.5484440	-123.165167	2332
HOOPA	40408	BIA	HIA	555	41.0477778	-123.0111111	375
KNEELAND	40429	State	HUU	560	40.7200000	-123.9269444	2737
LAYTONVILLE	41019	State	MEU	557	39.7022222	-123.0080556	1838
MAD RIVER	40507	FS	SRF	555	40.4633333	-123.0086111	2775
MCGUIRES	41017	State	MEU	557	39.3522222	-123.0097222	1040
MENDOCINO PASS	41018	FS	MNF	557	39.8070970	-122.9458820	5328
PATTYMOCUS	40812	FS	SHF	594	40.2883333	-122.0144444	3500
RODEO VALLEY	41015	State	MEU	557	39.6683333	-123.0052778	2425
RUTH STATION	40508	FS	SRF	555	40.2505556	-123.0050000	2732
SCHOOLHOUSE	40425	NPS	RNP	560	41.1383333	-123.0150000	2640
SCORPION	40517	FS	SHF	591	41.1116667	-122.0113889	4400
SHIP MTN L.O.	40105	FS	SRF	556	41.7278040	-123.7953670	5280
SODA CREEK	41406	FS	MNF	557	39.4250000	-122.0161111	1725
TRINITY CAMP	40516	State	SHU	591	40.6788889	-122.0136111	2100
UNDERWOOD	40519	FS	SRF	555	40.7219444	-123.0080556	2600
WESTSIDE	40428	NPS	RNP	560	41.2233333	-124.0008333	1291
YUROK	40427	BIA	YIA	556	41.2897222	-123.0141667	495

### NWS San Joaquin Valley/Hanford

STATION NAME WIMS	WIMS ID	AGENCY	UNIT	FCST_ZONE	LATITUDE	LONGITUDE	ELEV
ASH MOUNTAIN	44701	NPS	KNP	529	36.4913889	-118.0136111	1730
BATTERSON	44207	FS	SNF	528	37.3780556	-119.0102778	3160
BEAR PEAK	44730	BLM	BBD	530	35.8819444	-118.0011111	8228
BEAR VALLEY	45007	State	KRN	562	35.1397222	-118.0102778	4995
BLACKROCK	44722	FS	SQF	534	36.0936111	-118.0041667	8100
BRECKENRIDGE	45009	FS	SQF	534	35.4505556	-118.0097222	7548
CAMPO SECO	43209	State	TCU	539	38.2236111	-120.0141667	399
CASE MOUNTAIN	44733	BLM	BBD	529	36.4108333	-118.0133333	6450
CATHEYS VALLEY	44114	State	MMU	528	37.4680556	-120.0016667	1200
CEDAR GROVE	44719	NPS	KNF	534	36.7877778	-118.0108333	4720
CHIM PK	44721	BLM	BDD	530	35.9000000	-118.0000000	6240
CRANE	44102	NPS	YNP	531	37.7667000	-119.8167000	6644
DEMOCRAT	45002	FS	SQF	530	35.5316667	-118.0102778	2380

DINKEY	44521	FS	SNF	533	37.0664280	-119.1572080	5728
FANCHER CREEK	44516	State	FKU	528	36.9000000	-119.0083333	920
FENCE MDW	44503	FS	SNF	532	36.9613889	-119.0027778	5256
FOUNTAIN SPRINGS	44731	State	TUU	529	35.8922222	-118.0150000	210
HIGH SIERRA	44520	FS	SNF	533	37.3147222	-119.0005556	7403
HURLEY	44517	State	FKU	529	37.0155556	-119.0091667	1225
INDIAN WELLS CANYON	45015	FS/BLM	CDD	530	35.6850000	-117.0147222	4000
JAWBONE	45013	FS/BLM	CDD	530	35.2947222	-118.0036111	4300
JERSEYDALE	44105	FS	SNF	528	37.5436111	-119.0138889	3900
JOHNSONDALE	44707	FS	SQF	534	35.9705556	-118.0088889	4700
KETTLEMAN HILLS	44602	BLM	BBD	526	36.0333333	-120.0008333	810
LOS BANOS	44003	State	MMU	526	37.0547222	-121.0008333	350
MARIPOSA	44106	State	MMU	528	37.5011111	-119.0163889	2275
METCALF GAP	44209	State	MMU	528	37.4155556	-119.0127778	3300
MGROVE	44113	NPS	YNP	531	37.5127778	-119.0100000	6400
MIAMI	44110	FS	SNF	532	37.4191667	-119.0122222	4334
MILO	44708	State	TUU	529	36.2319444	-118.0144444	2002
MINARETS	44203	FS	SNF	532	37.4072222	-119.0055556	5340
MT TOM	44511	FS	SNF	533	37.3761111	-119.0027778	9018
MTREST	44505	FS	SNF	529	37.0541667	-119.0061111	4100
NORTHFORK	44204	FS	SNF	528	37.2330556	-119.0083333	2663
OAK OPENING	44717	FS	SQF	529	36.1753210	-118.7017250	3087
PANOCHÉ	44514	State	FKU	524	36.6300000	-120.0105556	500
PARK RIDGE	44713	NPS	KNP	532	36.7241667	-118.0155556	7540
PEPPERMINT	44726	FS	SQF	534	36.0720000	-118.5340000	7167
PINEHURST	44508	FS	SNF	529	36.6973220	-119.018596	4062
PIUTE	45017	FS	SQF	534	35.4455556	-118.0044444	6440
RATTLESNAKE	44728	NPS	KNP	534	36.4069444	-118.0069444	8600
RIVER KERN	45016	FS	SQF	530	35.7775000	-118.0072222	3000
SAN LUIS NWR	44004	FWS	SLR	526	37.1822222	-120.0130556	65
SFORK	45012	BLM	BBD	530	35.9833000	-118.5833000	3000
SHADE QUARTER	44724	State	TUU	534	36.5672222	-118.0158333	4089
SHAVER	44522	State	FKU	528	37.1352778	-119.0041667	5800
SUGARLOAF	44729	NPS	KNP	534	36.7266667	-118.0111111	7950
TRIMMER	44510	FS	SNF	529	36.9111111	-119.0050000	1540
TUOLME	43611	NPS	YNP	531	37.8683333	-119.0052778	9200
UHL/HOT SPRINGS	44712	FS	SQF	529	35.8866730	-118.6481600	3764
VALLEY	44111	NPS	YNP	531	37.7500000	-119.5833000	4000
WALKER PASS	45014	BLM	BBD	530	35.6658333	-118.0008333	5572
WAWONA	44109	NPS	YNP	531	37.5333000	-119.6500000	3960
WOLVERTON	44732	NPS	KNP	534	36.4450000	-118.0116667	5240
WWOLF	43612	NPS	YNP	531	37.8511111	-119.0108333	8000

**NWS Los Angeles/Oxnard**

STATION NAME WIMS	WIMS ID	AGENCY	UNIT	FCST_ZONE	LATITUDE	LONGITUDE	ELEV
ACTON	45438	L Gov	LAC	506	34.4458333	-118.0033333	2600
ARROYO GRANDE	44915	State	SLU	500	35.1919444	-120.0069444	615
BEVERLY HILLS	45442	L Gov	LAC	501	34.1250000	-118.0066667	1260
BIG PINES	45401	FS	ANF	507	34.3788889	-117.0113889	6917
BRANCH MOUNTAIN	44901	FS	LPF	525	35.1888889	-120.0013889	3770
CAMP 9	45441	L Gov	LAC	506	34.3616667	-118.0069444	4000
CARRIZO	44916	BLM	BBD	525	35.0963889	-119.0127778	2490
CASITAS	45308	FS	LPF	504	34.4081760	-119.3712440	645
CHEESEBORO	45313	NPS	SAMO	505	34.1847222	-118.0119444	1650
CHILAO	45436	FS	ANF	507	34.3316667	-118.0002778	5450

CHUCHUPATE	45302	FS	LPF	503	34.8063680	-119.0136250	5283
CLAREMONT	45443	L Gov	LAC	509	34.1369444	-117.7069440	1645
CLEAR CREEK	45405	FS	ANF	506	34.2711111	-118.0025000	3000
DEL VALLE	45445	L Gov	LAC	505	34.4311111	-118.0111111	1278
FIGUEROA	45201	FS	LPF	500	34.7344410	-120.0065730	3179
GRASS MOUNTAIN	45449	FS	ANF	506	34.6408333	-118.0066667	4626
HENNINGER FLATS	45439	L Gov	LAC	509	34.1930555	-118.0869444	2530
LA PANZA	44914	State	SLU	525	35.3811111	-120.0030556	1630
LAKE PALMDALE	45450	L Gov	LAC	519	34.5372222	-118.0016667	2980
LAS TABLAS	44904	State	SLU	520	35.6555556	-120.0152778	1300
LEO CARRILLO	45447	L Gov	LAC	501	34.0455556	-118.0155556	50
LOS PRIETOS	45203	FS	LPF	500	34.5443980	-119.7912850	981
MALIBU	45433	L Gov	LAC	505	34.0583333	-118.0105556	1575
MALIBU CANYON	45452	L Gov	LAC	505	34.0997222	-118.0116667	640
MONTECITO	45218	FS	LPF	501	34.4613310	-119.6490320	1616
NEWHALL PASS	45454	L Gov	LAC	505	34.3369444	-118.0086111	2135
OZENA	45303	FS	LPF	503	34.6817790	-119.3537320	3690
POPPY PARK	45440	L Gov	LAC	519	34.7325000	-118.0063889	2760
ROSE VALLEY II	45314	FS	LPF	503	34.5433830	-119.1849320	3328
SADDLEBACK BUTTE	45444	L Gov	LAC	519	34.6847222	-117.0136111	2590
SAN RAFAEL HILLS	45451	L Gov	LAC	505	34.1941667	-118.0033333	1770
SANTA CRUZ ISLAND	45216	NPS	CNP	501	33.9958333	-119.0119444	250
SANTA FE	45437	L Gov	LAC	501	34.1208333	-117.0155556	500
SANTA ROSA ISLAND	45217	NPS	CNP	501	33.9777778	-120.0011111	1298
SAUGUS	45412	L Gov	LAC	505	34.4250000	-118.0086111	1450
TANBARK	45421	FS	ANF	509	34.2069444	-117.0125000	2600
TEMESCAL	45307	FS	LPF	505	34.4739440	-118.7615640	1122
TONNER CANYON	45453	L Gov	LAC	509	33.9475000	-117.0136111	1340
VANDENBERG	45220	FS	LPF	500	34.7586510	-120.4858670	1017
WARM SPRINGS L.O.	45426	FS	ANF	506	34.5958333	-118.0094444	4930
WHITAKER	45448	L Gov	LAC	506	34.5686111	-118.0122222	4120
WHITTIER HILLS PARK	45446	L Gov	WIT	501	33.9838889	-118.0000000	950

### NWS Medford

STATION NAME WIMS	WIMS ID	AGENCY	UNIT	FCST_ZONE	LATITUDE	LONGITUDE	ELEV
ASH CREEK	40244	FS	SHF	584	41.2769444	-121.0161111	3700
BLUE RIDGE (KNF)	40203	FS	KNF	586	41.2694444	-123.0030556	5880
BRAZZI RANCH	40242	State	SKU	588	41.6852778	-122.0097222	3000
CALLAHAN #2	40245	FS	KNF	587	41.2997222	-122.0136111	3911
COLD SPRINGS	40314	FS	MDF	590	41.7816666	-120.3183333	6313
COLLINS BALDY LO	40237	FS	KNF	587	41.7750000	-122.0158333	5493
CRAZY PEAK	40106	FS	SIF	621	41.9763889	-123.0100000	3970
DEVIL'S GARDEN	40309	State	LMU	590	41.5300000	-120.0111111	5022
INDIAN WELL	40233	NPS	BNP	590	41.7347222	-121.0088889	4770
JUANITA	40240	FS	KNF	589	41.8019444	-122.0016667	5400
LOWER KLAMATH	40310	FWS	LKR	589	41.9991667	-121.0116667	4098
MODOC NWR	40311	FWS	MDR	590	41.4588889	-120.0086111	4380
MT SHASTA	40217	FS	SHF	584	41.3155556	-122.0050000	3591
OAK KNOLL	40218	FS	KNF	587	41.8386111	-122.0138889	1940
QUARTZ HILL	40239	State	SKU	587	41.5997222	-122.0152778	4238
ROUND MOUNTAIN	40221	FS	MDF	590	41.4272222	-121.0075000	5258
RUSH CREEK	40312	FS	MDF	590	41.2880556	-120.0144444	4800
SAWYERS BAR	40222	FS	KNF	586	41.3011111	-123.0019444	2192
SLATER BUTTE	40225	FS	KNF	585	41.8586111	-123.0058333	4670
SOMES BAR	40231	FS	SRF	586	41.3900000	-123.0080556	920

TIMBER MOUNTAIN	40306	FS	MDF	590	41.6294444	-121.0047222	4960
VAN BREMMER	40243	FS	KNF	589	41.6430556	-121.0130556	4928
WEED	40228	State	SKU	588	41.4788889	-122.0075000	2930

### NWS San Francisco Bay Area/Monterey

STATION NAME WIMS	WIMS ID	AGENCY	UNIT	FCST_ZONE	LATITUDE	LONGITUDE	ELEV
ALTAMONT	43407	State	SCU	511	37.6931000	-121.6094000	1436
ARROYO_SECO	44301	FS	LPF	522	36.2354920	-121.4798940	879
BARNABY	42308	L Gov	MRN	559	38.0280556	-122.0116667	810
BEN LOMOND	43809	State	CZU	549	37.1316667	-122.0027778	2630
BIG ROCK	42310	L Gov	MRN	559	38.0394444	-122.0094444	1500
BIG SUR	44302	FS	LPF	521	36.2453690	-121.7801450	353
BLACK DIAMOND	43008	L Gov	EBY	547	37.9500000	-121.0147222	1600
BRADLEY	44303	State	BEU	523	35.8644444	-120.0133333	540
BRIONES	43010	L Gov	EBY	547	37.9341667	-122.0019444	1450
CALAVERAS RD	43405	L Gov	SCU	547	37.5530556	-121.0138889	1230
CORRALITOS	43802	State	CZU	550	36.9911111	-121.0130556	450
DIABLO GRANDE	43502	State	SCU	546	37.3291667	-121.0047222	1850
FORT ORD 2	44321	BLM	BBD	521	36.6269444	-121.0130556	490
HASTINGS	44319	State	BEU	522	36.3888889	-121.0091667	1824
HAWKEYE	42010	State	LNU	559	38.7816667	-122.0152778	2000
HERNANDEZ	44409	State	BEU	524	36.3830556	-120.0141667	3752
HOLLISTER	44406	State	BEU	523	36.8422222	-121.0058333	423
HUNTER LIGGET	44317	FS	LPF	522	36.0118120	-121.2417280	1116
LAHONDA	43304	State	CZU	549	37.3052778	-122.0041667	425
LAS TRAMPAS	43009	L Gov	EBY	547	37.8338889	-122.0011111	1760
LOS ALTOS	43912	L Gov	SCU	549	37.3580556	-122.0022222	645
LOS VAQUEROS	43013	L Gov	SCU	547	37.7883333	-121.0122222	1100
MALLORY RIDGE	43011	L Gov	SCU	547	37.8172222	-121.0127778	2040
MIDDLE PEAK	42312	L Gov	MRN	507	37.9278000	-122.5872000	2339
MT DIABLO	43012	L Gov	SCU	547	37.8672222	-121.0150000	3849
OAKLAND NORTH	43402	L Gov	EBY	550	37.8652778	-122.0036111	1300
OAKLAND SOUTH	43403	L Gov	EBY	550	37.7836111	-122.0025000	1000
PARKFIELD	44310	State	BEU	524	35.8988889	-120.0069444	1535
PINNACLES	44410	NPS	PIP	524	36.4708333	-121.0022222	1322
POLE_MTN	42008	State	SNU	562	38.5000000	123.1199999	2204
POVERTY	43914	L Gov	SCU	550	37.4430556	-121.7705560	2350
PULGAS	43309	L Gov	CZU	549	37.4750000	-122.0047222	644
ROSE PEAK	43404	L Gov	EBY	547	37.5019444	-121.0122222	3060
SAN JOSE	43915	L Gov	SCU	511	37.3983000	-121.8069000	675
SANTA RITA	44408	BLM	BBD	524	36.3477778	-120.0097222	5000
SANTA ROSA	42009	State	LNU	559	38.4788889	-122.0116667	560
SPRING VALLEY	43308	L Gov	CZU	549	37.5625000	-122.0072222	1075
WOODACRE 2	42309	L Gov	MRN	559	37.9905556	-122.0105556	1400
ALTAMONT	43407	State	SCU	511	37.6931000	-121.6094000	1436
ARROYO_SECO	44301	FS	LPF	522	36.2354920	-121.4798940	879

### NWS Phoenix

STATION NAME WIMS	WIMS ID	AGENCY	UNIT	FCST_ZONE	LATITUDE	LONGITUDE	ELEV
FISH CREEK MTN.	45802	BLM	CDD	310	32.9902778	-116.0011111	760
RICE VALLEY	45620	BLM	CDD	232	34.0608333	-114.0119444	820
SQUAW LAKE	45801	BLM	CCD	310	32.9077778	-114.0077778	300

**NWS Reno**

STATION NAME WIMS	WIMS ID	AGENCY	UNIT	FCST_ZONE	LATITUDE	LONGITUDE	ELEV
ASH VALLEY	40726	BLM	SUD	572	41.0519444	-120.0113889	5100
BEAR FLAT	40313	FS	MDF	590	41.2952778	-120.0050000	5889
BENTON	43708	FS	INF	518	37.8430556	-118.0077778	5450
BLUE DOOR	40725	BLM	NOD	572	41.0547222	-120.0055556	5615
BOGARD	40703	FS	LNF	598	40.5980556	-121.0011111	5686
BRIDGEPORT	43702	FS	HTF	576	38.2719444	-119.0047222	6650
BULL FLAT	40728	BLM	NOD	572	40.4808333	-120.0016667	4395
CRESTVIEW	43709	FS	INF	518	37.7374420	-118.9966350	7600
DOG VALLEY	41302	FS	TYF	450	39.5619444	-120.0005556	5976
DOYLE	40724	BLM	CDD	450	40.0266667	-120.0016667	4240
GORDON	40730	FS	LNF	598	40.7586111	-120.0147222	6200
GRASSHOPPER	40721	State	LMU	598	40.7827778	-120.0127778	6050
HORSE LAKE	40727	BLM	NOD	572	40.6305556	-120.0083333	5100
JUNIPER CREEK	40308	BLM	NOD	572	41.3322222	-120.0077778	4372
LAUFMAN	40709	FS	PNF	599	40.1416667	-120.0058333	4800
MARKLEEVILLE	42802	FS	TOF	576	38.6833333	-119.0127778	5501
MEYERS	42607	FS	TMU	542	38.8488889	-120.0002778	6310
PIERCE	40915	FS	PNF	598	40.2461111	-120.0105556	5811
RAVENDALE	40714	BLM	NOD	572	40.7308333	-120.0050000	5298
ROCK CREEK	43710	FS	INF	518	37.5598360	-118.6784090	7095
STAMPEDE	41310	FS	TNF	541	39.4833333	-120.0011111	6600
WALKER	43707	FS	TYF	576	38.5652778	-119.0075000	5440

**NWS San Diego**

STATION NAME WIMS	WIMS ID	AGENCY	UNIT	FCST_ZONE	LATITUDE	LONGITUDE	ELEV
ALPINE FIRE STATION	45701	FS	CNF	509	32.8342340	-116.7401580	2044
AMMO DUMP	45738	DOD	MCP	508	33.3813889	-117.0047222	1068
ANZA	45616	State	RRU	513	33.5550000	-116.0111111	3920
APPLE VALLEY	45117	BLM	CDD	514	34.6000000	-117.1666666	3100
BANNING	45601	FS	BDF	510	33.9734340	-116.9125170	3605
BEAUMONT	45617	State	RRU	510	33.9305556	-116.0155556	2680
BELL CANYON	45735	L Gov	ORC	509	33.5518030	-117.5729660	764
BIG PINE FLAT	45102	FS	BDF	511	34.3194444	-117.0000000	6861
BURNS CANYON	45125	BLM	CDD	516	34.2083333	-116.0102778	6000
CAMERON FIRE STA	45704	FS	CNF	513	32.7211930	-116.4646710	3262
CAMP ELLIOTT	45741	DOD	MFD	508	32.8591667	-117.0016667	539
CASE SPRINGS	45731	DOD	MCP	508	33.4452778	-117.0069444	2320
CLARK TRN CTR	45624	State	RRU	509	33.8766667	-117.0050000	1720
CMP TARGET RANGE	45732	DOD	MPC	508	33.3722222	-117.3589000	917
CONVERSE	45105	FS	BDF	511	34.1940590	-116.9131120	5618
CORONA FIRE STATION	45618	FS	CNF	509	33.8755940	-117.5508570	624
CRANSTON	45603	FS	BDF	512	33.7374580	-116.8381580	1930
DESCANSO FIRE STA	45707	FS	CNF	513	32.8573920	-116.6224030	3563
DEVORE	45113	State	BDU	510	34.2211111	-117.0066667	2080
EL CARISO FIRE STA	45619	FS	CNF	509	33.6470880	-117.4119980	2728
FAWNSKIN	45101	FS	BDF	511	34.2663580	-116.8990270	6936
FREMONT CANYON	45736	L Gov	ORC	509	33.8111640	-117.7083680	1783
GOOSE VALLEY_FIRE	45724	FS	CNF	509	33.0735290	-116.8448520	1539
JULIAN	45708	State	MVU	513	33.0758333	-116.0097222	4240
KEENWILD	45604	FS	BDF	513	33.7083360	-116.7169660	4710
KENWORTHY	45605	FS	BDF	513	33.6171240	-116.6217130	4562
LAS FLORES	45733	DOD	MCP	508	33.2888889	-117.0072222	100

LITTLE TUJUNGA	45411	FS	ANF	509	34.2936111	-118.0058333	1390
LYTLE CREEK	45108	FS	BDF	510	34.2338889	-117.0077778	2792
MILL CREEK	45109	FS	BDF	510	34.0798320	-117.0467610	2511
MORMON ROCKS	45114	FS	BDF	511	34.3175000	-117.0083333	3300
MT LAGUNA	45709	FS	CNF	513	32.8812370	-116.4288860	5730
OAK GROVE FIRE STA	45710	FS	CNF	513	33.3861580	-116.7914540	2767
PALOMAR	45740	FS	CNF	513	33.3520650	-116.8627270	5482
PINE HILLS FIRE STA	45711	FS	CNF	513	33.0166560	-116.6354070	3645
PINYON CANYON	45615	BLM	CDD	513	33.5778000	-116.4539000	4060
POTRERO	45730	State	MVU	513	32.6061111	-116.0100000	2350
RANCHITA	45729	State	MVU	513	33.2122222	-116.0083333	4180
ROCK CAMP	45111	FS	BDF	511	34.2880556	-117.0033333	4900
SAN MIGUEL	45737	FWS	TSR	509	32.6850000	-116.0161111	425
SANTA ROSA PLATEAU	45623	State	RRU	513	33.5286111	-117.0036111	1980
STRAWBERRY	45110	FS	BDF	511	34.2410000	-117.2470000	6150
TALEGA	45739	DOD	MCP	508	33.4780556	-117.0080556	1203
TEMESCAL FIRE STA	45611	FS	CNF	509	33.7628050	-117.4836580	1123
VALLEY CENTER	45734	State	MVU	509	33.2261111	-116.0163889	1370
VALYERMO	45423	FS	ANF	514	34.4455556	-117.0141667	3780
VISTA GRANDE	45612	FS	BDF	513	33.8360920	-116.8112500	4906
YUCCA VALLEY	45112	State	BDU	516	34.1233333	-116.0066667	3260

**NWS Sacramento**

STATION NAME WIMS	WIMS ID	AGENCY	UNIT	FCST_ZONE	LATITUDE	LONGITUDE	ELEV
ALDER SPRINGS	41101	FS	MNF	595	39.6518020	-122.7241230	4538
ARBUCKLE BASIN	40632	State	SHU	595	40.4377778	-122.0136111	1900
BALD MOUNTAIN	42603	FS	ENF	538	38.9055556	-120.0113889	4613
BANGOR	41201	State	BTU	596	39.3983333	-121.0066667	840
BEAVER	42601	FS	ENF	538	38.4883333	-120.0052778	5000
BEN BOLT	42612	State	AEU	552	38.6013889	-120.0155556	1500
BLUMTN	43203	FS	STF	540	38.3400000	-120.3750000	6067
BROOKS	42202	State	LNU	558	38.7194444	-122.0022222	360
BUCK MEADOWS	43603	FS	STF	539	37.8231220	-120.0983250	3160
CARPENTER RIDGE	41213	State	BTU	597	40.0686111	-121.0094444	4812
CASHMAN	40916	FS	PNF	599	40.0016667	-120.0150000	4447
CHESTER	40904	FS	LNF	597	40.2925000	-121.2439000	4525
CHICO	41210	State	BTU	596	39.7119444	-121.0127778	230
COHASSET	41211	State	BTU	596	39.8700000	-121.0127778	1670
COLBY MTN	40801	FS	LNF	597	40.1500000	-121.5330000	6004
CORNING	40814	State	TGU	595	39.9388889	-122.0027778	294
COUNTY LINE	41410	BLM	NOD	557	39.0188889	-122.0066667	2085
DUNCAN PEAK	41901	FS	TNF	536	39.1438889	-120.0083333	7100
EAGLE PEAK	40802	FS	MNF	595	39.9277778	-122.0108333	3713
ESPERANZA	43208	State	TCU	539	38.2430556	-120.0083333	2512
GREEN SPRING	43613	State	TCU	539	37.8330556	-120.0083333	1020
GRIZZLY FLATS	42613	FS	ENF	538	38.6197222	-120.0091667	3760
HELL HOLE	42608	FS	ENF	538	39.0716667	-120.0069444	5240
HIGH GLADE LOOKOUT	41402	FS	MNF	595	39.2083333	-122.0133333	4840
JARBO GAP	41214	State	BTU	599	39.7358333	-121.0080556	2490
KONOCTI	41411	State	LNU	558	38.9136111	-122.0116667	2100
LADDER BUTTE	40723	FS	LNF	597	40.8072222	-121.0047222	5750
LASSEN LODGE	40815	State	TGU	597	40.3441667	-121.0116667	4100
LINCOLN	41907	State	NEU	554	38.8825000	-121.0044444	200
MANZANITA LAKE	40609	FS	LNF	597	40.5400000	-121.0094444	5660

MOUNT ZION	42701	State	AEU	552	38.3894444	-120.0108333	2960
MTELIZ	43605	FS	STF	539	38.0626190	-120.2476410	4915
OAK BOTTOM	40636	NPS	YNP	595	40.6505470	-122.6067370	1405
OAK MTN	40635	FS	SHF	593	41.0063350	-121.9844140	2643
OWENS CAMP	42611	FS	ENF	538	38.7333333	-120.0038889	5240
PIKE CNTY LO	41701	FS	PNF	599	39.4750000	-121.0033333	3714
PILOT HILL	42609	State	AEU	552	38.8325000	-121.0000000	1200
PINCRS	43606	FS	STF	540	38.1888888	-120.0002777	5600
QUINCY	40910	FS	PNF	599	39.9733333	-120.0155556	3652
READER RANCH	41809	State	NEU	535	39.3036111	-121.0019444	2025
REDDING	40611	FS/State	SHU	595	40.5157910	-122.2921810	499
SACRAMENTO NWR	41102	FWS	MNF	595	39.4172222	-122.0027778	120
SADDLEBACK	41304	FS	SHF	536	39.6375000	-120.0141667	6670
SECRET TOWN	41808	State	NEU	535	39.1836111	-120.0147222	2720
SEEDORCHARD	41908	FS	TNF	536	39.0915750	-120.7319650	4304
SIMS	40618	FS	SHF	593	41.0713030	-122.3699570	2534
SMITH PEAK	40911	FS	PNF	599	39.8630000	-120.5260000	7688
SOLDIER MTN	40630	State	SHU	593	40.9258333	-121.0097222	3710
STONYFORD	41503	FS	MNF	595	39.3672850	-122.5728900	1263
SUGARLOAF (SHF)	40614	FS	SHF	592	40.9166667	-122.0072222	3214
THOMES CREEK	40816	State	TGU	595	39.8644444	-122.0100000	1100
WESTWOOD	40719	State	LMU	597	40.3066667	-120.0150000	5800
WHISKEYTOWN HQ	40628	NPS	WNP	595	40.6191666	-122.5341666	1311
WHITECLOUD	41806	FS	TNF	536	39.3194650	-120.8420930	4296
WHITMORE	40615	State	SHU	596	40.6202778	-121.0150000	2454
YOLLA BOLLA	40511	FS	SHF	594	40.3383333	-123.0008333	4768
ZION	42701	State	AEU	552	38.3910000	-120.6517500	2960

### NWS Las Vegas

STATION NAME WIMS	WIMS ID	AGENCY	UNIT	FCST_ZONE	LATITUDE	LONGITUDE	ELEV
GOLDEN	45119	BLM	CDD	543	35.0000000	-115.6666666	4100
GRANITE MTN.	45124	BLM	CDD	543	34.5355555	-117.0258333	4720
HORSE THIEF SPRING	45129	BLM	CDD	543	35.7705556	-115.0150000	5000
LOST HORSE	45614	NPS	JOTR	543	34.0177778	-116.0030556	4200
MID HILLS	45128	BLM	CDD	543	35.1230556	-115.0066667	5413
MOJAVE RIVER SINK	45122	BLM	CDD	543	35.0530556	-116.0011111	950
OAK CREEK	44804	FS	INF	517	36.8425000	-118.0041667	4855
OPAL MOUNTAIN	45127	BLM	CDD	543	35.1541667	-117.0027778	3240
OWENS VALLEY	44803	FS	INF	517	37.3900000	-118.0091667	4640
PANAMINT	44806	BLM	CDD	543	36.1202778	-117.0013889	6880
SALT WELLS	45120	BLM	CDD	543	35.8333333	-117.5833333	2540