

CALIFORNIA FIRE WEATHER ANNUAL OPERATING PLAN



2004



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CALIFORNIA ANNUAL OPERATING PLAN 2004

INTRODUCTION

California is at the forefront of an effort to upgrade weather information provided for fire management and fire fighting purposes. All agencies involved in providing and using weather intelligence have committed to working together to enhance all phases of this process. Several cooperative ventures are planned and some duties and responsibilities are being changed or shifted in an effort to improve fire weather services.

This document serves as the California Fire Weather Annual Operating Plan (AOP) for the National Weather Service (NWS) and the interagency fire management community operating under the California Wildfire Coordinating Group (CWCG). The general relationship between the NWS and the interagency fire management community is set forth in the following documents:

Interagency Agreement for Meteorological Services (National MOA or National Agreement)
Interagency Agreement Between the California Wildfire Coordinating Group and the National Weather Service
National Weather Service NWSI 10-4: Fire Weather Services
2003 California and National Mobilization Guides

The AOP provides specific procedural and policy information regarding the delivery of meteorological services to the fire management community in California.

SIGNIFICANT CHANGES SINCE LAST YEAR

[Red Flag warning criteria](#) throughout California were revised based on agency comments. A description is found in the Fire Weather Watches and Red Flag Warnings section.

[CANSAC](#) products will begin in June. More on CANSAC and the MM5 can be found under the What's New for Fire Weather Centers section.

A [Daily Fire Potential Product](#) has been added and [other FWC services have changed](#). See What's New for Fire Weather Centers section.

New NFDRS trend stations added. Changes were made to who produces NFDRS trends for selected RAWs stations and Panamint has been added. A [complete list of trend sites and responsible offices](#) is found in Appendix F.

New Incident Meteorologists (IMETs) have been trained. See the list under [Incident Response](#) in the Joint Responsibilities section.

Details have been added about which courses can be taught by each NWS office and fire weather center. These are listed under [Training](#) in the Joint Responsibilities section.

A [table](#) showing which land management agency areas fall within each NWS office's forecast area. This is found in the Service Areas for NWS Offices and Fire Weather Centers section.

This document has been rearranged and condensed to make it easier to use.

SERVICE AREAS FOR NWS OFFICES AND FIRE WEATHER CENTERS

Fire weather forecast services are provided by forecasters at National Weather Service offices and in interagency Fire Weather Centers at the Redding and Riverside Geographic Area Coordination Centers. All Red Flag Warnings and Fire Weather Watches, all spot forecasts for wildfires, and all forecasts used to develop National Fire Danger Rating System 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. Details on these services are contained in the plan.

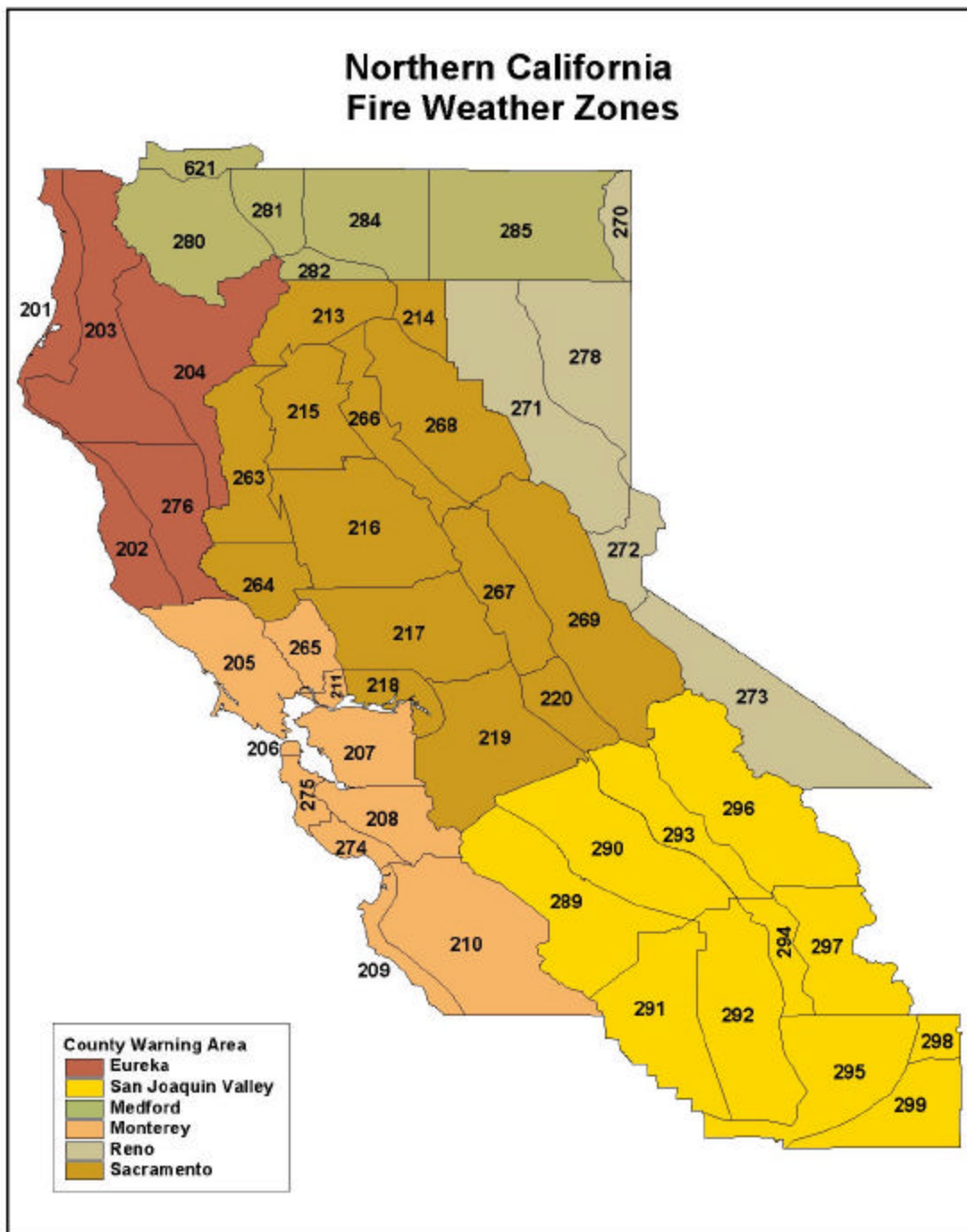
A. NWS Weather Forecast Offices (WFOs) Serving California (Bolding indicates start of shared counties.)

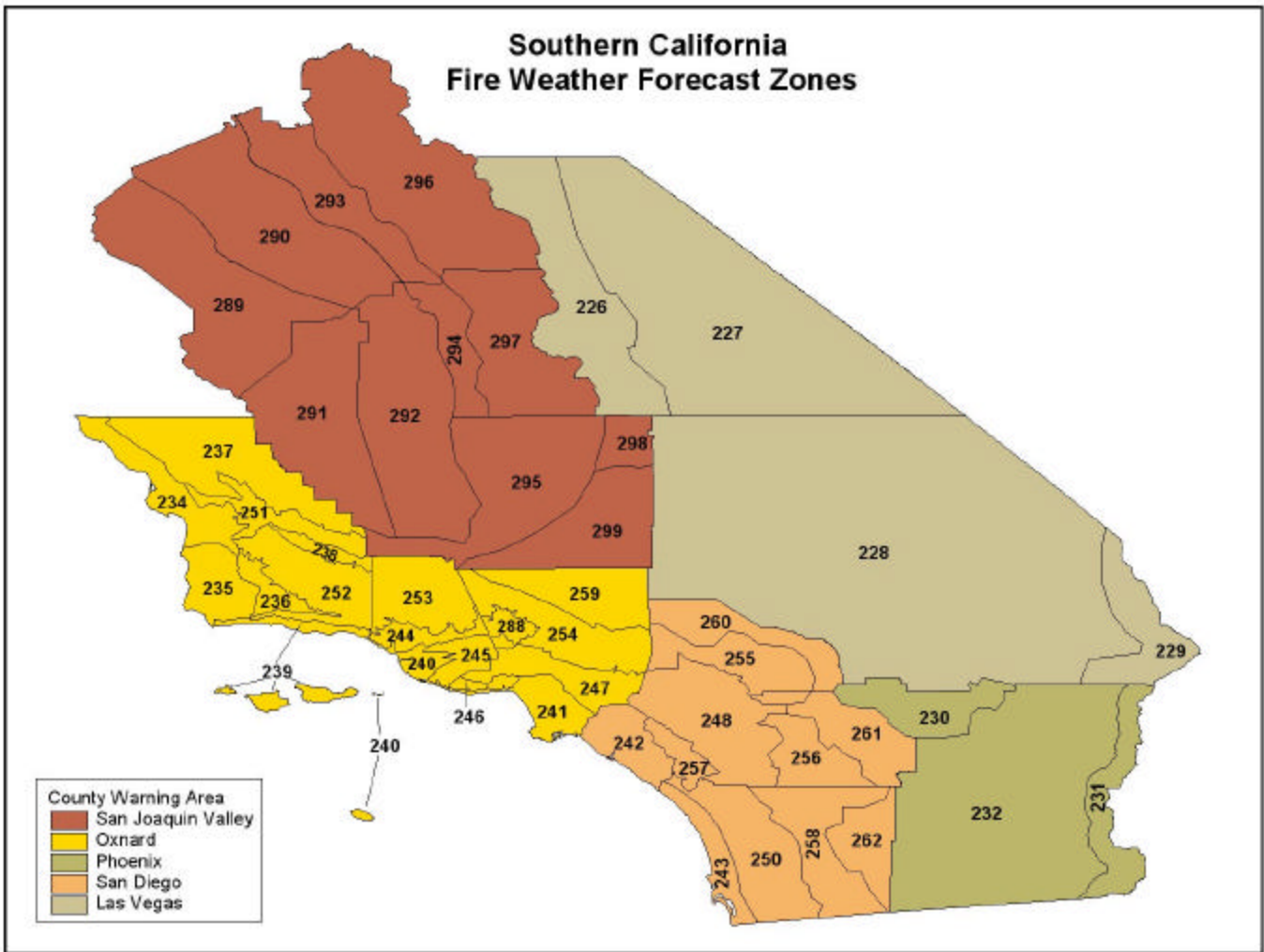
WEATHER FORECAST OFFICE	COUNTIES WITHIN THE FIRE WEATHER FORECAST DISTRICT	FEDERAL AND STATE AGENCIES USING THE FIRE WEATHER FORECASTS
Medford WFO http://www.wrh.noaa.gov/medford	Siskiyou, Modoc	CDF Siskiyou Unit North CDF Lassen-Modoc Unit Klamath NF Modoc NF Lava Beds NM Lower Klamath Basin Refuge North NorCal BLM North Shasta-Trinity NF
Eureka WFO http://www.wrh.noaa.gov/eureka	Del Norte, Humboldt, Trinity, Mendocino	CDF Humboldt-Del Norte Unit CDF Mendocino Unit Six Rivers NF West Shasta-Trinity NF West Mendocino NF West NorCal BLM Redwood NP Hoopa Valley Tribe
Sacramento WFO http://www.wrh.noaa.gov/sacramento	Shasta, Tehama, Glenn, Colusa, Butte, Yuba, Sutter, Lake, Yolo, Sacramento, Calaveras, Amador, San Joaquin, Solano, Stanislaus Western Portions of: Plumas, Sierra, Nevada, Placer, El Dorado, Tuolumne, Alpine	South Shasta-Trinity NF East Mendocino NF West Lassen NF West Plumas NF West Tahoe NF El Dorado NF Stanislaus NF South NorCal BLM North CenCal BLM Lassen NP Whiskeytown NRA North Central Valley Refuges CDF Shasta-Trinity Unit West CDF Lassen-Modoc Unit CDF Butte Unit East CDF Sonoma-Lake-Napa Unit CDF Tehama-Glenn Unit CDF Amador-El Dorado Unit CDF Tuolumne-Calaveras Unit West CDF Nevada-Yuba-Placer Unit

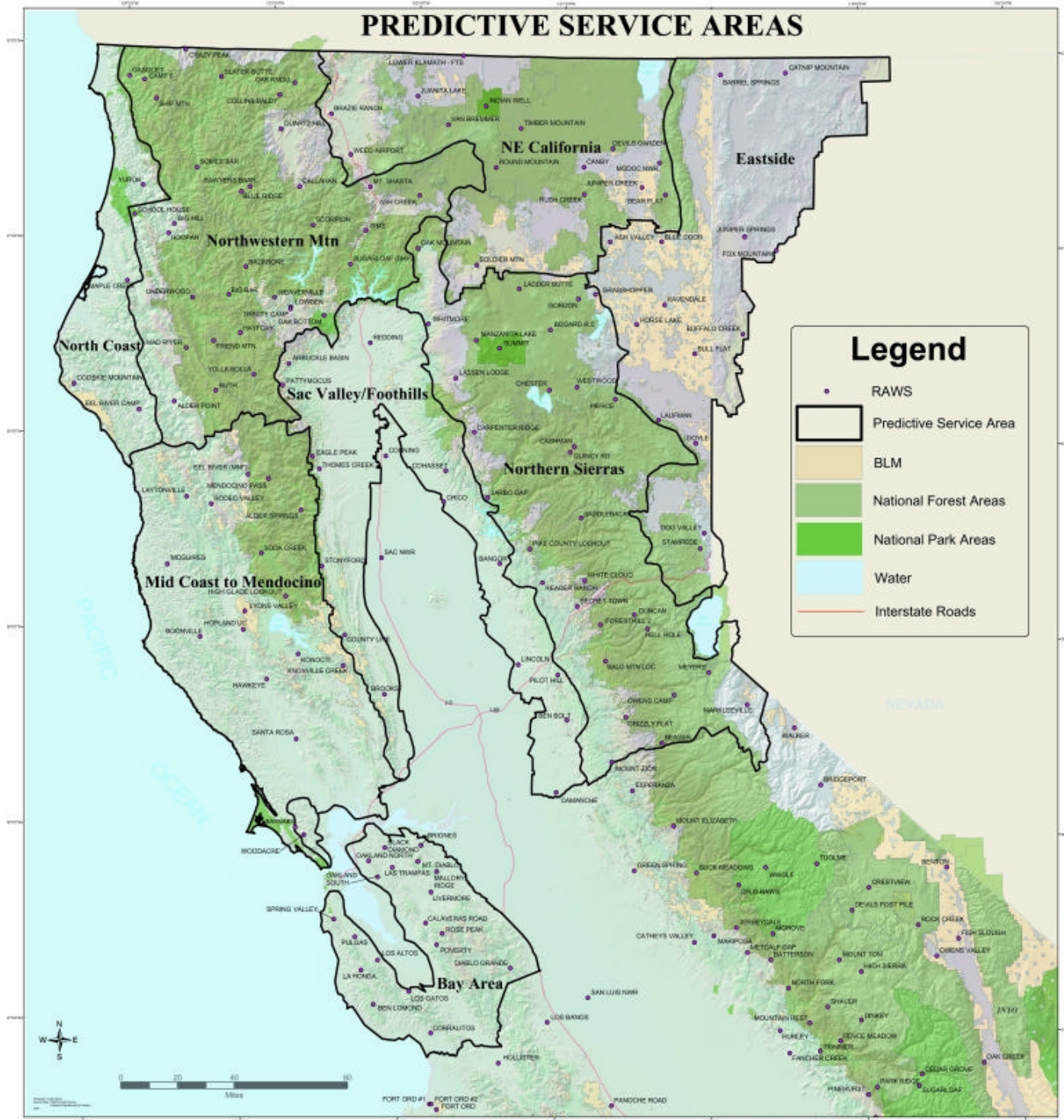
<p>Reno WFO http://www.wrh.noaa.gov/reno</p>	<p>Lassen, Mono</p> <p>Eastern Portions of: Modoc, Plumas, Sierra, Nevada, Placer, El Dorado, Alpine</p>	<p>NE and East NorCal BLM Northeast CenCal BLM East Lassen NF East Plumas NF East Tahoe NF Humboldt-Toiyabe NF Northern Inyo NF Tahoe Basin Management Unit (USFS) East CDF Lassen-Modoc Unit East CDF Nevada-Yuba-Placer Unit</p>
<p>San Francisco Bay Area/Monterey WFO http://www.wrh.noaa.gov/monterey</p>	<p>Sonoma, Napa, Marin, Contra Costa, Alameda, San Mateo, Santa Clara, Santa Cruz, Monterey, San Benito</p>	<p>West CDF Sonoma-Lake-Napa Unit CDF San Benito-Monterey Unit CDF Santa Clara Unit CDF San Mateo-Santa Cruz Unit Point Reyes NRA Golden Gate NRA Pinnacles NM North Los Padres NF Marin County Fire East Bay Regional Parks Ft Hunter-Liggett</p>
<p>Hanford WFO http://www.wrh.noaa.gov/hanford</p>	<p>Mariposa, Merced, Madera, Fresno, Kings, Tulare, Kern</p> <p>SE Tuolumne Co in Yosemite NP</p>	<p>Yosemite NP Sequoia/Kings NP Western CenCal BLM South Central Valley Refuges Sierra NF Sequoia NF CDF Tulare Unit CDF Madera-Mariposa-Merced Unit CDF Fresno-Kings Unit Kern County Fire</p>
<p>Los Angeles/Oxnard WFO http://www.nwsla.noaa.gov/</p>	<p>San Luis Obispo, Santa Barbara, Ventura, Los Angeles</p>	<p>CDF San Luis Obispo Unit Los Angeles County Fire Dept. Santa Barbara County Fire Dept. Ventura County Fire Dept. Channel Islands NP Santa Monica Mountains NRA Vandenberg AFB Angeles NF South Los Padres NF Southern California Refuges</p>

<p>San Diego WFO http://www.wrh.noaa.gov/sandiego</p>	<p>Orange, San Diego SW San Bernardino Co. Western Riverside Co.</p>	<p>San Bernardino NF CDF San Diego Unit Western CDF San Bernardino Unit Western CDF Riverside Unit California State Parks LD Orange County Fire Authority Riverside County Fire San Bernardino County Fire San Diego County South Coast BLM Southern California Refuges Cleveland NF</p>
<p>Phoenix WFO http://www.wrh.noaa.gov/phoenix</p>	<p>Eastern Riverside Co.</p>	<p>California Desert BLM Southern California Refuges Joshua Tree NP</p>
<p>Las Vegas WFO http://www.wrh.noaa.gov/lasvegas</p>	<p>San Bernardino (except Southwest) Inyo</p>	<p>Northern CDF San Bernardino Unit Eastern CDF Riverside Unit Southern Inyo NF San Bernardino County Fire California Desert BLM Mojave National Preserve Death Valley NP Southern California Refuges</p>

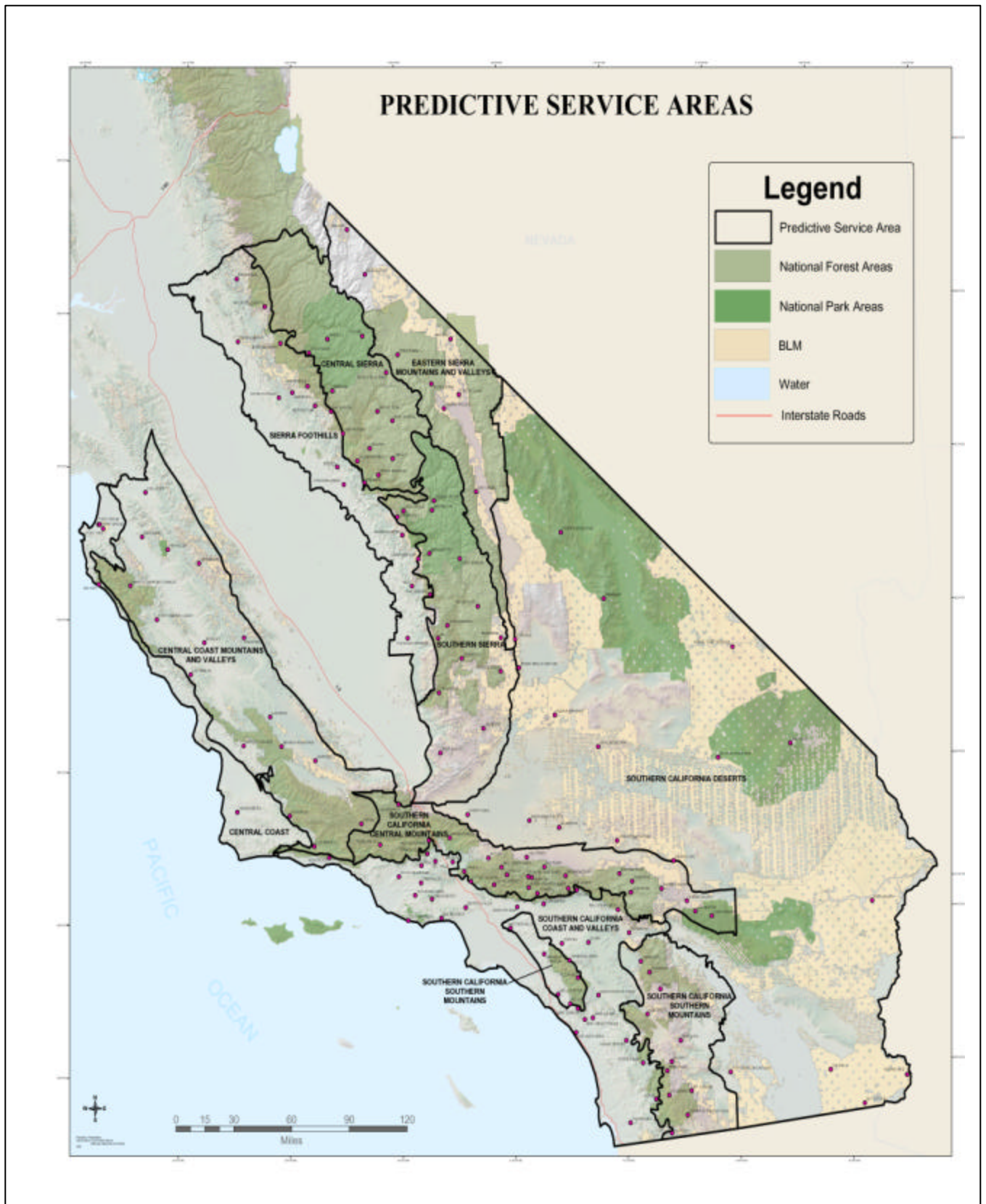
National Weather Service Fire Weather Zones







Map of Riverside PSAs



B. Fire weather services are provided by the following Interagency Fire Weather Centers

Northern California GACC at Redding
Southern California GACC at Riverside

C. Participating Agencies

DOC/NOAA/National Weather Service
USDA Forest Service – Pacific Southwest Region (except Hawaii)
DOI Bureau of Land Management – California State Offices
DOI National Park Service – Pacific West Region
DOI US Fish and Wildlife Service – Pacific Region
DOI Bureau of Indian Affairs – Pacific Region
California Department of Forestry and Fire Protection
California Wildfire Coordinating Group (including contract counties and city fire departments)

NWS SERVICES AND RESPONSIBILITIES

Information on current operational NWS fire weather forecast products follows. Significant changes to these forecast services or deployment of new operational forecast services will be coordinated through the California Wildfire Coordinating Group (Reference NWSI 10-403). Any non-operational forecast products will be clearly labeled as “Experimental” or “Prototype”.

A. Individual Forecast Office Information

Weather Forecast Office	High Fire Season	Morning Forecast	Afternoon Forecast	Low Season Forecasts	NWS Forecast Zones
Extreme Northern California – Medford	Customer specified – usually June 1 – October 31	7:30 a.m.	3:30 p.m.	Daily 3:30 p.m.	280, 282, 284, 285
Northwest California – Eureka	Customer specified – usually late May – October 15	7:30 a.m.	3:30 p.m.	M-F 3:30 p.m. also M at 8 a.m.	201-204, 276
North Central California – Sacramento	Customer specified – usually late May – November 15	7:30 a.m.	3:30 p.m.	M-F 3:30 p.m. also M at 8 a.m.	213-220, 263, 264, 266-269
Extreme Eastern California – Reno	Customer specified – usually May 15 – October 15	7:30 a.m.	3:30 p.m.	Daily 7 a.m.	270-273, 278
Central Coast California – San Francisco Bay Area/Monterey	Customer specified – usually May 15 – November 15	7:00 a.m.	3:00 p.m.	M-F 3 p.m. also M at 7 a.m.	205-211, 265, 274, 275
Central California Interior – Hanford	Customer specified – usually May 15 – November 15	7:00 a.m.	3:30 p.m.	M-F 3p.m. (PST) or 3:30(PDT) also M at 7 a.m.	289-299
Southwest California – Los Angeles/Oxnard	Customer specified – usually May 15 – December 1	9:30 a.m.	3:30 p.m.	M-F 3:30 p.m. also M at 9:30 a.m.	234-241, 244-247, 254, 259, 288
Extreme Southwest California – San Diego	Customer specified – usually May 15 – December 1	9:00 a.m.	2:30 p.m.	Daily 7:30 a.m and 2:30 p.m.	234-238, 242, 243, 248, 250-253, 255-258
Southeast California – Phoenix	Customer specified – usually April 15 – November 15	7:30 a.m.	3:30 p.m.	Daily 7:30 a.m.	230-232
Southeast California – Las Vegas	Customer specified – usually May 15 – November 1	7:00 a.m.	3:30 p.m.	Daily 7 a.m.	226-229

B. Routine Fire Weather Planning Forecasts

These provide general, zone-based information for daily preparedness and planning purposes. They are not to be used in lieu of spot forecasts.

Issuance times – During high fire season, routine pre-suppression forecasts will be issued twice daily – once in the morning and once in the afternoon - seven days per week. During low fire NWS offices serving California issue routine fire weather planning/pre-suppression forecasts based on local customer requirements. See the [Individual Forecast Office Information table](#) for specific issuance times for each NWS office. The beginning and ending dates of high fire season forecasts vary by year and are based on customer feedback.

Update /Corrected forecasts - Forecasts will be 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 – Forecasts are transmitted automatically through the NWS AWIPS computer system and made available within minutes via WIMS, the NWS offices web sites, and Predictive Services web sites. NWS office web pages may be linked from the [Individual Forecast Information Table](#). Links to forecasts and NWS office web pages also can be found on the National Fire Weather Page at:
<http://fire.boi.noaa.gov/>

Content and Format – Forecasts will conform to the national standard narrative, per NWS Directive 10-401. Morning forecasts will focus on the following 36 hours and afternoon forecasts on the following 48 hours, with general extended outlooks in both cases out to at least five days. Forecasts are subdivided into meteorologically similar forecast areas called zones.

Each forecast will begin with pertinent headlines and a non-technical weather discussion. Headlines are required for Red Flag Warnings and Fire Weather Watches. Headlines are recommended for other situations where increased awareness is desired, such as for record heat, potential severe weather, possible season-ending storms, etc.

Short-term forecast for the first 36 or 48 hours - Short-term forecasts are highly detailed and emphasize information which is 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 will appear:

- Headline(s) as appropriate
- Sky/Weather
- Temperature
- Relative Humidity
- Wind – 20-foot RAWs standard (slope/valley and ridgetop, as appropriate)
- 24-hour Trends (of temperature and relative humidity)
- Chance of Rain or Chance of Wetting Rain (CWR)
- Lightning Activity Level (LAL)

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

- Haines Index
- Mixing Level or Mixing Height
- Marine Layer
- Transport Wind
- 10,000-foot Wind
- Ventilation Category (or numeric value)

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

An example of a morning issuance is available in [Appendix B1](#).

Extended Outlook to at least day five - Beyond 36-48 hours, the 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.

C. NWS Spot Forecasts

Spot forecasts are site-specific forecast products issued for wildfires, 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. (When smoke dispersion/smoke management is a concern, prescribed burn spot forecasts can be requested from the Fire Weather Centers (FWCs) 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. 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.

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

Wildfire or HAZMAT spots - Forecasts for the original issuance or unscheduled updates will be made available as soon as possible and no longer than two hours 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 spots - 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 deems the current forecast does not adequately represent current or expected weather conditions which might affect the burn, and the meteorologist has been made aware that monitoring is desired,
- 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 which is detected which prevents correct interpretation of the forecast. Corrections should be delivered to users in the same manner as the original spot forecast when possible.

Access – Internet-based programs are the standards for requesting and retrieving NWS spot forecasts and should be used when available. These programs are accessible via the web sites of the NWS forecast offices serving California. 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](#).

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, will provide blocks to fill these data in and will indicate which are absolutely essential to receive a spot forecast.

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 or Eye-Level Winds

Unless otherwise requested, wind forecasts will be of the same type as given in the request, i.e., if eye-level wind observations are provided in the request, then eye-level wind forecasts will be provided in the spot forecast - and similar for 20-foot winds.

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

When information for several days in the future, rather than a near-term forecast, is needed, the routine planning/pre-suppression forecast should be consulted. If it is determined from this that a longer-range spot forecast is desired, a spot for a general weather outlook for specific days may be requested.

The basic format of a spot forecast is shown in [Appendix B2](#).

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. 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 Section V, page 53](#).

D. Fire Weather Watches and Red Flag Warnings

NWS offices issue Fire Weather Watches and Red Flag Warnings for those critical fire weather patterns that will contribute to extreme fire danger and/or fire behavior.

A **Red Flag Warning** is used to inform agencies of the imminent or actual occurrence of Red Flag conditions. A Red Flag Warning will be issued immediately 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.

A **Fire Weather Watch** is used to alert agencies to the high potential for development of a Red Flag event in the 24-72 hour time frame. The Watch may be issued for all, or selected, portions within a fire weather zone or region. A watch may be issued in the first 12 hour time period, only for an expected dry thunderstorm event.

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.

Watches and warnings will be issued when dry lightning is expected to be widespread. 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](#).

Red Flag warning/fire weather watches in discussions and headlines - In the discussion portion of the Fire Weather Planning Forecast (FWF), NWS offices will mention critical weather patterns that might lead to conditions approaching or exceeding Red Flag criteria through Day 6. This will assist fire agencies in their allocating and moving resources in anticipation of increased fire activity. When watches or warnings exist, a headline will be included about the watch/warning.

Collaboration with agencies - Fire Weather Watches and Red Flag Warnings normally will be issued only after conferring with the affected agencies or a representative subset of affected agencies, to include the Redding and Riverside FWCs. This will allow for input on fuel conditions and local concerns. However, the ultimate responsibility for the issuance of a watch/warning rests with the NWS forecaster.

Red Flag warning/fire weather watch access - Fire Weather Watches and Red Flag Warnings will be headlined in spot forecasts, the fire weather narrative, and appropriate zone sections within the fire weather forecast. The headline will be in the same descriptive format as on the RFW product itself. If issuance of a Red Flag Warning or Fire Weather Watch requires an update of the general forecast, the NWS office will verbally notify the affected zone dispatch centers and the Redding or Riverside FWC as soon as possible.

Wind/Humidity Table

Area Description	NWS Fire Weather Zones	Criteria	
<i>Southern California desert areas except along the Colorado River Valley</i>	226-228, 230, 232, 256, 259, 260-262, 298, 299	Relative Humidity less than or equal to 15% and sustained (20-foot) winds greater than or equal to 25 mph for a duration of 8 hours or more	
<i>Colorado River Valley</i>	229, 231	Relative Humidity less than or equal to 15% and sustained (20-foot) winds greater than or equal to 20 mph for a duration of 3 hours or more	
<i>Southern California from mountains westward</i>	234-255, 257, 258, 288-297	Either Relative Humidity 15% or lower with either <u>sustained</u> winds 25 mph or greater or <u>frequent gusts</u> 35 mph or greater. (duration of 6 hours or more)	Or Relative Humidity 10% or lower (duration of 10 hours or more) regardless of wind
<i>Northern California East of Sierra Crest and Western Great Basin</i>	270, 272, 273, 278	Tahoe Management Basin: Three hours of wind gusts ≥ 30 mph and Relative Humidity of $\leq 20\%$	Rest: Three hours of wind gusts ≥ 30 mph and Relative Humidity of $\leq 15\%$.
<i>Modoc Plateau</i>	214, 271, 285, Eastern 284	Four hours duration of sustained winds 15 mph+, combined with Relative Humidity 15% or less	
<i>Northern California West of the Sierra Crest</i>	201-211, 213-220, 263-269, 274-276, 280, 281, 282, Western 284	See matrix below	

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

Matrix assumes 10-hour fuel moisture of less than 6%, annual grasses are cured, and that no wetting rain (greater than 0.10 inch) has fallen in the last 24 hours.

Sustained 20-foot Wind Speed (Note: the wind event should be expected to last at least 8 hours). W indicates 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

Red Flag Warnings and Fire Weather Watches will remain in effect through the expiration time noted in the forecast, or until canceled or upgraded

Red Flag Warnings and Fire Weather Watches are available within minutes of issuance via WIMS and the web site of the issuing NWS office. Links to all forecasts and NWS office web pages can be found on the National Fire Weather Page at <http://fire.boi.noaa.gov/>

Red Flag warning/fire weather watch format and contents - A short message (RFW) will be used for issuing, updating, and canceling all Fire Weather Watches and Red Flag Warnings, an example is in [Appendix B3](#). That message will include:

- 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.

Red Flag warning/fire weather watch verification – Four items are verified for Red Flag Warnings:

- **Probability of Detection (POD)** = correct warnings / (correct warnings + missed warnings). If every event that should have been warned, was warned, then the verification score would be 1.0
- **False Alarm Rate (FAR)** = $1 - (\text{correct warnings} / (\text{correct} + \text{incorrect warnings}))$. Perfect verification would be zero, indicating that every warning verified.
- **Critical Success Index (CSI)** = correct warnings / (correct + incorrect + missed warnings). Perfect verification would be 1.0. The 1999-2000 baseline for California was .60
- **Lead Time** = Number of hours between issuance of warning and occurrence of the event. The 1999-2000 baseline for California was 8.2 hours. Lead time for dry lightning Red Flag Warnings tends to be much shorter than other Red Flag Warnings.

2004 Goals

POD = 0.91

FAR = 0.27

CSI = 0.68

Lead Time = 10 hour

Fire Weather Watches: At the end of the calendar year, the NWS will provide a list of the number of the fire weather watches issued and indicate how many resulted in warnings. These will differentiate between dry lightning watches and watches for other fire weather parameters.

Feedback on Red Flag Warnings and Fire Weather Watches is appreciated.

E. NFDRS Forecasts

The NWS provides weather forecasts for parameters that permit the NFDRS software to predict the next day's fire danger indices.

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. NFDRS observations from land management agencies must be complete and available in WIMS by 1330 LST/1430 LDT. These must be made available to the NWS from WIMS in collectives before 1400 LST/1500 LDT. NFDRS stations that do not have valid observations in WIMS on time will not have next day fire danger indices available.

Content and Format – Complies with NWSI 10-401 and is outlined in [Appendix B.4](#) for reference. The NWS NFDRS forecast product is used only by WIMS and is not viewed directly by fire management.

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 or station trend forecasts. Regardless of the forecast methodology, NWS will take appropriate measures to ensure that forecast values for NFDRS stations do not unduly deviate from historical possibility for those stations. Towards this end, zone and station trend forecasts will be favored over station specific forecasts.

Verification Goals – The goal is to improve on the standards set by the 1996 National Fire Weather Working Team. The following have been agreed to for California as a “strive to meet goal”.

Temperature = 5 degrees Fahrenheit
Relative Humidity = 8 %
Wind Speed = 4 miles per hour
Fuel Moisture = 2 % (June through September)

10-Hour Fuel Moisture Trends - The U.S Forest Service Region 5 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. The Emergency Command Centers will give this trend to private contractors that are using their own weather stations. In order for this to occur, the NFDRS trend forecast should make no entries in the trend forecast for max and min temperature or max and min humidity, but instead 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 a RAWIS 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.

Project Activity Level (PAL), which uses forecast Energy Release Component and Ignition Component, may replace SAL in Region 5 contracts in the future. PAL does not require a 10 hour fuel stick trend.

F. Participation in Interagency Groups

NWS offices providing service within California are expected to provide representation at the regional AOP meeting held 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.

G. Additional Services

NWS will provide and maintain a cadre of trained IMETs.

H. Forecaster Training

The NWS recognizes the need for specialized training in fire weather meteorology for forecasters. Any NWS meteorologist producing fire weather products will have met the requirements set forth in NWS Directive 10-405 and augmented by local agreement. These include:

- Meeting initial proficiency or currency standards, as defined below.
- Annually documenting proficiency and currency.

- Completing fire weather forecaster training requirements defined in NWSI 10-405 and on the Internet at: <http://www.nws.noaa.gov/directives/010/pd01004005a.pdf>. WFO Fire Weather Program Leader and appropriate WFO Meteorologist-In-Charge concur and sign-off on proficiency.

Currency is met by the following:

- Preparing and issuing at least 15 fire weather forecasts in the past 12 months at the current duty station, **and**
- Preparing and issuing the lesser of at least 10% of office spots or at least 5 spots in the past 12 months, or by completing an IMET assignment, **and**
- Participating in annual fire weather drills and/or training seminars conducted by the Science Operations Officer, WFO Fire Weather Program Leader or knowledgeable individuals.

Proficiency Renewal (required if currency is not met):

- Forecaster works no less than three (3) shifts with a forecaster who is current, handling all fire weather duties, or successfully completes drill(s), which includes key aspects of the local fire weather program.
- WFO Fire Weather Program Leader and WFO Meteorologist-In-Charge concur and sign-off on proficiency.

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. Some specific responsibilities of Wildland Fire Agencies are listed below:

A. Operational Support and Predictive Services – GACC meteorologists at the FWCs in Redding and Riverside combine forecast information from NWS and other sources into area-wide summaries and briefings. These meteorologists work in conjunction with Fire Intelligence to form the Predictive Services group, which produces integrated fire weather / fire danger 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.

The Predictive Service units at Redding and Riverside provide fire danger and fire potential forecasts within California beyond the "next day" NFDRS forecasts provided by the NWS. All products are available online, and can be obtained from either the North Ops FWC web site at <http://www.fs.fed.us/r5/fire/north/fwz> or the South Ops FWC web site at <http://www.fs.fed.us/r5/fire/south/fwz>.

Predictive Services Products – (Examples provided in [Appendix C](#))

1. What's new at the Fire Weather Centers for 2004

a. CANSAC

The California and Nevada Smoke and Air Consortium (CANSAC) is the southwest U.S. member of Fire Consortia for Advanced Modeling of Meteorology and Smoke (FCAMMS). It has as its primary goals: the production of high-resolution meteorological output for use in operational fire weather and smoke transport prediction, air quality monitoring, and BlueSky-type applications (see www.blueskyrains.org/ from Pac NW for an example).

CANSAC has moved past some 2003 delays relating to transfer of funds. The current 13 consortium member agencies include USDA Forest Service Regions 4 and 5, the Pacific SW Research Station (i.e. Riverside Fire Lab), BLM California, BLM Nevada, US Fish and Wildlife Service, National Park Service, HRMET/Naval Postgraduate School, California Air Resources Board, California Dept of Forestry and Fire Protection, CA contract counties, San Joaquin Valley Unified Air Pollution Control District, and the Nevada Division of Forestry. A Board of Directors is chaired by Tom Hatcher of the USFS, and is composed of one representative each from the various members. There are two working groups: the Operational Applications Group (OAG) and the Technical Advisory Group (TAG). The National Weather Service now has a representative on each Group.

During the first half of the 2004 fire season, users can expect to see the first products from the MM5 mesoscale meteorological model posted to the Website, (which is housed at DRI/ CEFA, <http://www.cefa.dri.edu/COFF/coffframe.html>) An approximate time table for 2004 includes:

Month	Actions
Feb-April	Computing system purchased, assembled, tested
May	CANSAC dedication and kickoff event
June	First products available at 36 and 12 km resolution
later in year	First 4-km products available
late in year	Use 4-km output to initialize diagnostic 1-km res. wind model

b. Daily Fire Potential Product

This is a large comprehensive project with the goal of providing daily outlooks of Fire Potential for Days 1-10. It is modeled after the pioneering work done at the Pacific NW Predictive Services Unit. There are several main phases to the project:

- The correlation of historic fire weather from RAWS stations with fire occurrence data to establish Dryness Levels.
- Development of regression equations (at DRI /CEFA) to correlate meteorological model data (GFS) with NFDRS weather conditions and indices at selected RAWS stations. This will include RAWS MOS equations in CA.
- Association of predicted weather (trigger events) and daily dryness levels to focus in on days of heightened potential for large fires (i.e.critical fire potential days).

c. Other Ongoing or New Projects

The Fire Weather Centers at Redding and Riverside are also involved in the following:

- Drawdown levels for resource decision-making / prioritization
- Preparedness Levels (i.e. monitoring and associated required actions)
- Use of the MM5 to provide weather streams for Farsite runs and other planning products to the GACC/ incidents (this was tested in 2003)
- Financing Phase II of the Hourly Fire Danger rating project, which involves an hourly FD climatology for each Fire Danger Rating Area (FDRA) and a 24-hour FD looping capability
- Bring the RAWS quality controlled (QC) data disk up to date through 2003
- Make historical lightning data more available

2. Daily Product - Fire Weather Discussion / Fire Danger Forecast: one each for the Northern and Southern California Geographic Areas. This text product is written at Redding for the North and at Riverside for the South. Its purpose is to take the large quantity of forecast information provided by the five NWS forecast offices in each Geographic Area, and meld it along with Fire Danger and any other necessary information into a single forecast product for Geographic Area. These forecasts are sub-divided into the Predictive Service Areas (PSAs) of the fire agencies. They have only one weather discussion and a larger scope, which combined with shorter text length, make them a suitable alternative for dispatchers disseminating weather information to field operations. The "meteorology of the day" is coordinated between the FWCs and the NWS offices in a daily conference call at 0830 local time.

Issuance Schedule: 0930 and 1530 local time, daily during high fire season and M-F during low fire season.

3. 10-day Fire Weather/Danger Outlook: Issued once a week, it contains current and forecast weather, fire danger highlights, and trends for each PSA over the coming ten days. The weather section seeks to highlight three areas: Major changes in the weather pattern during the next 10 days, large departures from normal, and potential for coming red flag or other significant events beyond the short (1-3 day) range. Fire Danger information is portrayed numerically in terms of NFDRS Energy Release Components (ERC), with graphs available for easy comparison to normal and extreme values. There is also a text statement on fire danger, highlighting expected changes or trends over the 10-day period. [Note: The FWCs are working to develop a system in California such as that currently used in the Pacific Northwest. In this system, past gridded forecast data have been correlated with observed RAWS weather, then equations developed, so that future gridded forecast weather data could be used to predict RAWS observations out through 10 days. Fire Danger predictions can then be based on these data.]

Issuance Schedule: High fire season only, issued every Tuesday morning.

4. **Monthly Assessments of Fire Potential:** These combine all available weather, climate, fuels, and fire danger information in order to make a prediction of fire business across the Geographic Area for the coming month. The assessments try, when possible, to highlight the periods and potential for large fire activity and resource utilization, relative to normal.

Issuance Schedule: Year around, a few days before the end of each month.

5. **Seasonal Assessments:** These are estimates of fire potential for longer periods, ranging from three months to an entire high fire season in duration. A nationwide collaboration of meteorologists, climatologists, and fuels-and-fire danger experts takes place in the late winter or early spring. This is where season-to-date precipitation, snow pack, temperature and fuels information is amalgamated and a consensus climate forecast is produced by the experts, extending well into the high fire season. It is expected that the assessments will be updated as needed back at the Geographic Areas – see below for California.

Issuance Schedule: Pre-season assessment (preliminary) done at the national gathering in March. In California, the first update will commonly come between late April and mid-May, with a second one in early to mid fire-season.

B. Prescribed Burn Spot Forecasts - The Fire Weather Centers will provide site-specific prescribed burn (spot) forecasts, for any requesting agency, where smoke dispersion and/or smoke management are concerns. The FWCs have an increasing role in helping the fire agencies accomplish their prescribed burn acreage targets, while minimizing impacts on air quality. Along with this program, the FWCs will work closely with the California Air Resources Board (CARB), the Air Districts, and Air Pollution Control officers. The FWCs will sponsor daily conference calls at 1300 local time, 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 Title 17.

C. Program Management - Management of federal land management and fire agencies’ fire weather programs and responsibilities.

1. **RAWS/NFDRS** – 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	Beth Little	(530) 226-2710
BLM	Art Porter	(530) 252-5326
NPS	Corky Conover	(559) 565-3129
CDF	vacant	(916) 653-6608

2. **Liaison** – The Fire Weather Center Team Leader at each Geographic Area (North and South) will be the primary liaison between field fire managers and various service providers including the NWS, the private sector, and the research community.

D. FWCs 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. This includes the preparation and issuance of:
 - Daily morning Fire Weather / Fire Danger product
 - Afternoon update to above morning product
 - Smoke Transport and Stability Forecast
 - All Site-specific (spot) forecasts requested, for burns where smoke dispersion or smoke management is a concern
- c) Conduct at least 2 each and 10 total of the following:
 - Daily coordination calls with other GACC office (Redding or Riverside)
 - 0830 PDT conference call with the NWS
 - 1030 PDT Briefing for Ops/ECC personnel
 - 1300 PDT CARB/burners conference calls
 - Special briefings and conference calls for CDF 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:
 - Weekly Outlook, issued Tuesdays
 - Monthly Weather Assessments, issued by late in the prior month
 - Seasonal Weather and High fire season Assessments, before early-to-mid high fire season
- e) The FWC Team Leader 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 IMET qualified, must maintain proficiency in accordance with NWCG Technical Specialist standards.

E. Technology Transfer – GACC meteorologists will work to integrate advanced technology analytical and prediction systems into fire management planning and operations. Some efforts will include:

- Regional numerical modeling of weather and smoke dispersion. The FWCs are integral players in the CANSAC (California and Nevada Smoke and Air Consortium) project, which will develop and run an MM5 meso-scale weather model across CA and NV. CANSAC operational products from the MM5 model at CAFF will begin appearing online in June 2004.
- Proper use of RAWs and NFDRS.
- Research and development to advance fire meteorology.

F. 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.

G. Fire Weather Observations

1. RAWS and NFDRS Observations

Fire weather observations for stations that desire next-day forecasts will be entered into WIMS no later than 1:30 pm PST (2:30 pm PDT). Observations from Remote Automated Weather Stations (RAWS) sites will be the latest data available from the satellite interrogation. RAWS and NFDRS stations are expected to be sited and maintained according to 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 should be adhered to strictly.

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 project/need. Distance is not the only factor in determining whether an observation site is considered representative. Observations taken only half a mile from the burn site, but beyond a ridgetop and in another drainage, may not be representative for a variety of reasons (e.g. changes in aspect, elevation, local wind direction, vegetative cover, etc.). On the other hand, observations from a fixed RAWS three miles away from the project site could still be quite representative, if it is similar in elevation, aspect, local wind flow, vegetative cover, etc.

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 not otherwise be apparent, such as variations in humidity in a large and complex site, when winds switched from upslope to downslope, and similar items which will enhance the quality of the resulting spot forecast.

Spot Forecast Feedback and Validation – Feedback on spot forecasts is requested to validate forecasts and improve accuracy; it should be provided to the appropriate weather office (NWS or FWC) within 12-24 hours of the issuance of any spot forecast for prescribed burn or wildland fire use purposes. Feedback on forecasts issued for wildfires is encouraged. The effort to provide feedback applies mainly to Belt Weather Kit or Kestral observations, since RAWS data are more readily available to the forecaster via the Internet for feedback.

Spot Feedback: The character of temperature, humidity, and wind affecting the burn period. Information made available to the NWS within 24 hours of forecast issuance or before issuance of the next spot forecast, whichever is first.

At a minimum, the following must be included (assuming daytime burn):

- Maximum temperature
- Minimum relative humidity
- Significant afternoon winds (speed and direction)

In the event of nighttime burning, conditions affecting the burn period could include minimum temperature and maximum relative humidity.

Acceptable Methods of Providing Feedback:

- a) Phone call to appropriate NWS or FWC office
- b) Faxed copies of fireline (belt weather) observations
- c) Submission of information (see example) via "Feedback" section of Internet spot forecast
- d) Faxed or electronically transmitted copies of hourly weather data from an on-site portable weather station
- e) Notification of deployment of a portable GOES telemetered RAWS onsite, so NWS can download data from the Internet

H. Reimbursement for NWS Provided On-site Support and Training Assistance – Federal agencies will reimburse the NWS for all costs incurred by the agency for IMET support and training assistance, per the procedures set forth in the National Agreement. The State of California has an agreement with the NWS, which is used for cost reimbursement.

JOINT RESPONSIBILITIES

A. Training - Meteorological training assistance can be provided by either NWS or GACC meteorologists. The NWS forecast offices primarily handle the numerous local courses that occur within their County Warning Areas. The FWCs' 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 FWC. Each NWS office and FWC should have at least one person qualified to teach courses up through Intermediate Fire Behavior (S-290/390).

Requests for training from NWS offices should be directed to that office's Fire Weather Program manager or Meteorologist-In-Charge. If the called 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 FWCs should be directed to either the Training Coordinator or Team Leader of the FWC. In all cases, sufficient advance notice 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 FWC instructors are covered in their annual budget, without need for reimbursement. Below is a table outlining the weather instructor availability for 2004:

Name Of Office	Instructors qualified to teach S-290	Other Classes that at least one meteorologist from this office is qualified to instruct (*S-390 did not have a weather section at the time of AOP issuance.)
Redding FWC	Brenda Graham John Snook Steve Leach Chris Fontana	S-190, S-390*, S-490, S-491, S-590, RX-300, RX-410 WIMS, S-144, ECCO, NFDRS
Riverside FWC	Tom Rolinski Ron Hamilton	S-190, S-390*, S-490, S-491, RX-300, WIMS, NFDRS
Eureka	Nancy Dean Jeff Tonkin	S-190, S-390*, S-490, S-590
Hanford	Cindy Bean	S-190, S-390*, RX-300
Las Vegas NV	Jim Harrison Andy Bailey	S-190
Medford	Frederic Bunnag Michael Stavish Dennis Gettman Rick Holtz	S-190, S-490
Monterey	Ryan Walbrun Shawn Weagle	S-190
Oxnard	Rich Thompson (in training)	None
Phoenix	Bob Berkowitz	S-190, S-390*, S-490, S-590
Reno	Rhett Milne Wendell Hohmann James Wallmann	S-190, S-390*
Sacramento	Basil Newmerzhicky Mike Smith	S-190, S-390*, S-490, S-590, RX-300
San Diego	Mike Lavis (in training) Rob Balfour	S-190, S-390*, S-490

B. Incident Response – The procedures for requesting IMETs will follow the guidelines outlined in the National MOA, the current National Mobilization Guide, the current California Mobilization Guide, and CDF Procedure No. 302. 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.

Below 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	Jeff Tonkin	NWS	CA-EKAW
Eureka, CA	Nancy Dean	NWS	CA-EKAW
Hanford, CA	Cindy Bean	NWS	CA-HNXW
Hanford, CA	Mark Burger (T)	NWS	CA-HNXW
Las Vegas, NV	Jim Harrison	NWS	NV- VEFW
Medford, OR	Frederic Bunnag	NWS	OR-MFRW
Monterey, CA	Ryan Walbrun	NWS	CA-MTRW
Monterey, CA	Shawn Weagle (T)	NWS	CA-MTRW
Oxnard, CA	Rich Thompson (T)	NWS	CA-LOXW
Phoenix, AZ	Bob Berkovitz	NWS	AZ-PSRW
Phoenix, AZ	Mike Fowler (T)	NWS	AZ-PSRW
Reno, NV	Rhett Milne	NWS	NV-REVV
Reno, NV	Wendell Hohmann	NWS	NV-REVV
Reno, NV	James Wallmann	NWS	NV-REVV
Sacramento, CA	Basil Newmerzhicky	NWS	CA-STOW
Sacramento, CA	Mike Smith	NWS	CA-STOW
San Diego, CA	Rob Balfour	NWS	CA-SGXW
San Diego, CA	Mike Lavis (T)	NWS	CA-SGXW

FWC Technical Specialists:

Redding, CA	John Snook	USFS	CA-NZF
Redding, CA	Brenda Graham	USFS	CA-NZF
Redding, CA	Steve Leach (T)	BLM	CA-NZF
Riverside, CA	Tom Rolinski	BLM	CA-OSC
Riverside, CA	Matt Shameson	USFS	CA-OSC

Northern and Southern California Area ATMUs (theodolite component):

<u>Cache</u>	<u>ID</u>
Redding, CA	CA-01, CA-03, CA-05, CA-07
Riverside, CA	CA-02, CA-04, CA-06

AMRS Cache Sites

Each NWS office serving California has at least one AMRS.

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

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

E. Monitoring, Feedback and Improvement of Fire Weather Information – Through the User Assessment Team, plans for monitoring forecast services by all meteorologists will be developed and tested. For 2004 the emphasis will be on NWS forecasts for selected forests and CDF units.

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 FWCs 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 FWCs will work with local and regional NWS offices to obtain appropriate six-digit ID's and will notify the NWS of any new or relocated NFDRS stations. This function will be delegated to the GACCs in 2005.

EFFECTIVE DATES OF THE AOP

This AOP shall be effective on the date the last signature is placed on the signature section and it will remain in effect until the date the last signature is placed on the signature page the following year. Updates or amendments may be added in the interim upon agreement of all signatories. Usually the effective dates are May 1 through May 1 the following year.

AGENCY SIGNATURES

James Wright Chair, California Wildfire Coordinating Group	Date
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Elizabeth Morse NWS, State Liaison Official	Date
--	------

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/Sunny	6% or less cloud cover
Mostly Clear/Mostly Sunny	7% - 31% cloud cover
Partly Cloudy/Partly Sunny	32% - 69% cloud cover
Mostly Cloudy	70% - 94% cloud cover
Cloudy/Overcast	95% 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 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 areal coverage of 0.01" or greater liquid equivalent precipitation.

Haines Index – A numerical means to indicate the potential for existing large wildfires to experience 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 Southwest Area, 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>
4	Low
5	Moderate
6	High

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

2. **Lightning Activity Level (LAL)**

LIGHTNING ACTIVITY LEVEL GUIDE FOR FIRE WEATHER OBSERVERS					
LAL	Cloud and Storm Development	Areal Coverage	Individual storm cell cloud to ground lightning discharges		
			Counts ¹ cg/5 min	Counts ¹ cg/15 min	Average ¹ 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 %	----	----	----

¹ Cloud-to-ground lightning discharges

APPENDIX B - NWS Forecast Examples

1. NWS Fire Weather Planning Forecast – Morning Issuance Example

FNUS56 KSTO DDHHMM
FWFSTO

FIRE WEATHER PLANNING FORECAST (FOR name of area, optional)
NATIONAL WEATHER SERVICE SACRAMENTO CA
730 AM PDT WED MAY 1 2004

...HEADLINE...(Required for Red Flag Warnings and Fire Weather Watches and significant features at other times)

.DISCUSSION...(Concise, clear, non-technical explanation of the current/forecasted fire weather)

FWZ213-214-DDHHMM-
EASTERN TRINITY AND SHASTA NF-
FIRE WX ZONES 213 214
TIME-DATE (example: 730 AM PDT WED MAY 1 2004)

.TODAY...
SKY/WEATHER.....
MAX TEMPERATURE.....
 24 HR TREND.....(optional)
MIN HUMIDITY.....
 24 HR TREND.....(optional)
WIND (definition).....(include definition of wind, e.g. 20-ft/10-min avg, slope/valley/ridge)
LOCAL OPTIONAL ELEMENTS..(transport winds, mixing heights, LAL, CWR, Haines Index, etc.)

.TONIGHT...
SKY/WEATHER.....
MIN TEMPERATURE.....
 24 HR TREND.....(optional)
MAX HUMIDITY.....
 24 HR TREND.....(optional)
WIND (definition).....(include definition of wind, e.g. 20-ft/10-min avg, slope/valley/ridge)
LOCAL OPTIONAL ELEMENTS..(transport winds, mixing heights, LAL, CWR, Haines Index, etc.)

.TOMORROW...
SKY/WEATHER.....
MAX TEMPERATURE.....
 24 HR TREND.....(optional)
MIN HUMIDITY.....
 24 HR TREND.....(optional)
WIND (definition).....(include definition of wind, e.g. 20-ft/10-min avg, slope/valley/ridge)
LOCAL OPTIONAL ELEMENTS..(transport winds, mixing heights, LAL, CWR, Haines Index, etc.)
(forecast for next geographical descriptor and fire weather zone group)

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.FORECAST DAYS 3 THROUGH 5...(winds must be included days 3-5; other elements per locally-established policy)
.DAY 3...(days can be combined, e.g., .FRIDAY THROUGH SUNDAY)
.DAY 4...
.DAY 5...

.OUTLOOK FOR DAY MONTH DATE THROUGH DAY MONTH DATE (optional per locally-established policy: for example, days 6-14, 30 and 90 day outlooks when issued)

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\$\$

NAME (optional)

2. **NWS Spot Forecast**

THE FOLLOWING IS AN EXAMPLE ONLY:

FNUS76 KHNX DDHHMM
FWSHNX

SPOT FORECAST FOR (NAME) BURN.....USFS
NATIONAL WEATHER SERVICE SAN JOAQUIN VALLEY
830 AM PST MON NOV 4 2003

IF CONDITIONS BECOME UNREPRESENTATIVE PLEASE CONTACT YOUR NWS FORECAST OFFICE DISCUSSION...A LOW PRESSURE SYSTEM NEAR THE CALIFORNIA-NEVADA BORDER WILL MOVE SLOWLY INTO SOUTHERN NEVADA MONDAY AFTERNOON. ALTHOUGH THIS WILL ALLOW SOME DRYING TO OCCUR OVER THE BURN...THE AIRMASS WILL REMAIN UNSTABLE THROUGH THE DAY WITH ENOUGH MOISTURE LINGERING TO PRODUCE PARTLY CLOUDY SKIES. WIND WILL ALSO REMAIN LIGHT THROUGH THE DAY BUT FAVOR AN EASTERLY DIRECTION AS THE LOW DEPARTS.

FOR PLANNED IGNITION TIME OF 1100 PST 11/4/03

SKY/WEATHER.....PARTLY CLOUDY
TEMPERATURE.....40-45 AT IGNITION TIME...RISING TO A MAX OF 52-56.
RELATIVE HUMIDITY..60-70% AT IGNITION TIME...LOWERING TO A MIN 53-58%
WIND (20-FOOT).....VARIABLE LESS THAN 5 MPH AT IGNITION TIME. WINDS WILL REMAIN LIGHT AND VARIABLE THROUGHOUT THE DAY.
WIND (RIDGE LVL)...NORTHEAST TO EAST 4-8 MPH.
OPTIONAL ELEMENTS..(PER REQUEST)

FOR MONDAY NIGHT

SKY/WEATHER.....PARTLY CLOUDY EARLY...BECOMING CLEAR OVERNIGHT.
TEMPERATURE.....MIN 34-38
RELATIVE HUMIDITY..MAX 90-100%
WIND (20-FOOT).....VARIABLE LESS THAN 5 MPH. WINDS WILL FAVOR A LIGHT EAST DIRECTION IN THE EARLY EVENING.
WIND (RIDGE LVL)...EAST 4-8 MPH IN THE EVENING...BECOMING VARIABLE LESS THAN 5 MPH OVERNIGHT.
OPTIONAL ELEMENTS..(PER REQUEST)

OUTLOOK FOR TUESDAY

SKY/WEATHER.....MOSTLY SUNNY.
TEMPERATURE.....MAX 58-63
RELATIVE HUMIDITY..MIN 45-50%
WIND (20-FOOT).....BECOMING UPSLOPE TO UPCANYON 4-6 MPH BY NOON WITH BRIEF GUSTS TO 10 MPH IN THE AFTERNOON.
WIND (RIDGE LVL)...NORTHEAST 5-10 MPH IN THE MORNING...BECOMING SOUTHWEST 10-15 MPH IN THE AFTERNOON.
OPTIONAL ELEMENTS..(PER REQUEST)

3. **NWS Red Flag Warning / Fire Weather Watch**

THE FOLLOWING IS AN EXAMPLE ONLY:

WWUS86 KHNX DDHHMM
RFWHNX

FIRE WEATHER WATCH
NATIONAL WEATHER SERVICE SAN JOAQUIN VALLEY – HANFORD CA
1010 AM PDT TUE JUL 2 2003

FWZ296-297-030200-

...FIRE WEATHER WATCH FOR SCATTERED DRY THUNDERSTORMS FOR THE SOUTHERN SIERRA NEVADA FROM YOSEMITE SOUTHWARD THROUGH SEQUOIA NATIONAL FOREST THIS AFTERNOON THROUGH 7PM TONIGHT...

FIRE WEATHER ZONES AFFECTED:

ZONE 296 SIERRA NEVADA FROM YOSEMITE TO KINGS CANYON NATIONAL PARK
ZONE 297 TULARE COUNTY MOUNTAINS

DISCUSSION: THE NATIONAL WEATHER SERVICE HAS ISSUED A FIRE WEATHER WATCH FOR DRY LIGHTNING. SOUTH TO SOUTHEAST FLOW ALOFT WILL ALLOW MONSOONAL MOISTURE TO BEGIN WORKING ITS WAY INTO THE SOUTHERN SIERRA NEVADA TODAY. THIS MOISTURE ALONG WITH INCREASED INSTABILITY WILL RESULT IN SCATTERED THUNDERSTORMS OVER THE SIERRA THIS AFTERNOON AND EARLY EVENING...MAINLY OVER THE HIGHER ELEVATIONS. HOWEVER...THE LOWER LEVELS OF THE ATMOSPHERE REMAIN DRY AND SOME OF THE THUNDERSTORMS MAY CONTAIN LITTLE OR NO RAIN. THUS A FIRE WEATHER WATCH FOR DRY LIGHTNING HAS BEEN ISSUED. PLEASE ADVISE THE APPROPRIATE OFFICIALS OR FIRE CREWS IN THE FIELD OF THIS FIRE WEATHER WATCH.

\$\$

4. NFDRS

a. **ZONE/FCST** Shows whether this forecast is 24-hour trend (ZONE) or specific forecast values (FCST). 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 sleet
 - 8 showers (in sight or at the station)
 - 9 thunderstorm
- (Categories 5, 6, or 7 sets NFDRS index to 0)

- f. **TEMP** Temperature in deg F valid at 13 LST for FCST or temperature trend + or - for ZONE
- g. **RH** Relative humidity in % valid at 13 LST for FCST or RH trend + or - for ZONE
- h. **LAL1** Lightning Activity Level 1400 LST to 2300 LST
- i. **LAL2** Lightning Activity Level 2300 LST to 2300 LST
- j. **WIND** Wind speed in mph valid at 13 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 13 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 13 LST. **(Use with caution - a "Y" will set all the NFDRS indices to zero!)**

The NFDRS 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,RH,LAL1,LAL2,WIND,10HR,TX,TN,RHx,RHn,PD1,PD2,WETFLAG

An example of the product, formatted for transmission into AWIPS, is displayed below:

FNUS85 KBOI DDHHMM
FWMBOI

ZONE,403,011027,13,1,-3,0,1,1,0,0,,,,,0,0,N Zone trend (zone 403)
ZONE,404,011027,13,0,3,0,1,1,0,0,,,,,0,0,N Zone trend (zone 404)
ZONE,102708,011027,13,0,4,-5,1,1,,,,,0,0,N Station trend **(WIMS cannot handle these for California)**
FCST,102709,011027,13,0,84,15,1,1,12,5,87,60,50,12,0,0,N Station specific - **This must FOLLOW the ZONE forecasts.**

Note: Tx, Tn, RHx, and RHn are not necessary in ZONE forecasts but must be used if an individual station which is normally part of a zone group is pulled out of the zone.

APPENDIX C – Predictive Services Product Examples

1. Daily FWC Product

NORTHERN CALIFORNIA FIRE WEATHER DISCUSSION AND FIRE DANGER FORECAST
0930 PDT TUESDAY MAY 6, 2003
REDDING FIRE WEATHER CENTER

*** THIS WEATHER PRODUCT CONSOLIDATES THE FIRE WEATHER FORECASTS OF THE NATIONAL WEATHER SERVICE (NWS) INTO A GEOGRAPHIC AREA PRODUCT. SIGNIFICANT DISCREPANCIES ARE COORDINATED WITH THE NWS. ***

CURRENT NATIONAL WEATHER SERVICE FIRE WEATHER WATCHES/ RED FLAG WARNINGS: [Click here](#)

Discussion: Clouds are increasing across the area a low pressure trough nears the central California coast. This system will bring isolated light showers to the southern sections of the area with only a slight chance north. A colder stronger system is due in by Thursday, with more rain, and unseasonably low snow levels of 3500 to 4000 feet. This system will be out of the area by late Saturday. Another weak system will brush the far north end of the state Monday.

HAINES Index	LOW	MID	HIGH
Medford	3	3	2
Oakland	4	5	5
Reno	N/A	M	2

Confidence factors are defined as follows: 5- 90-100%...4-80-89%...3-70-79%...2-60-69% ...1-50-59%

North Coast PSAFDRAs 100 and 105

TODAY: Confidence Factor...4

Weather: Cloudy with isolated light showers mainly south. Showers will end tonight.

Max Temps: 50s and 60s.

Humidity: Minimums 35 to 45% which will occur this morning.

Winds: Valleys and lower slopes: West to northwest 3 to 6 mph.

Upper slopes and ridges: West to northwest 4 to 11 mph.

LAL: 1

FIRE DANGER: Available during high fire season.

WEDNESDAY AND THURSDAY: Confidence Factor... 5

Weather: Increasing clouds late Wednesday with rain Thursday. Snow level 3500 to 4500 feet.

Max Temps: 50s and 60s Wednesday. Cooling Thursday, with the higher elevations in the 40s and lower elevations in the 50s to lower 60s.

Humidity: Minimums 33 to 46% Wednesday and above 50% Thursday.

Winds: Valleys and lower slopes: South to southwest 6 to 12 mph, shifting to northwest to north 7 to 15 mph Thursday afternoon.

Upper slopes and ridges: South to southwest increasing to 12 to 18 mph gusts 24 mph Wednesday afternoon shifting to northwest to north 14 to 24 mph gusts 30 mph Thursday afternoon.

LAL: 1

FIRE DANGER: Available during high fire season.

And similar forecast sections for the following seven PSAs:

Mid Coast PSAFDRAs 140, 150, 154, 162, 175, 180, and 185:

Bay Area PSAFDRAs 185, 190, 490, 518, 520, 530, 540, and 553:

Northwestern Mtns PSAFDRAs 110, 112, 113, 115, 120, 130, 165, 200, 202, 204, 208, 230, 238, 240, 241, and 243:

Sacramento Valley and Surrounding Foothills PSAFDRAs 170, 177, 245, 246, 247, 270, 280, 300, and 305:

Northeastern California PSAFDRAs 210, 214, 216, 220, 249, 255, and 258:

Northern Sierras PSAFDRAs 244, 248, 250, 262, 282, 285, 290, 293, 330, 335, 340, 345, and 350:

Eastside PSAFDRAs 260, 265, 268, 295, 380, and 383:

***FRIDAY, SATURDAY, and SUNDAY for all PSAs:

Confidence Factor... 3***

Weather: Showers Friday over the entire area. Scattered showers Saturday over the northern mountains and along and east of the Sierra Cascade Crest. Partly cloudy Sunday.

Max Temps: Continued below normal.

Humidity: Minimums above 50%

Winds: West to northwest 8 to 15 mph with higher gusts over the ridges.

LAL: 1

7-10 day outlook (May 12, 2003 through May 15, 2003):

Confidence Factor...3 Partly cloudy at times in the north, otherwise mostly fair and a little warmer.

Days 10 through 30 (Rest of May 2003): Temperatures and precipitation near normal.

Days 30 through 90 (June and July 2003): Temperatures above normal and precipitation near to slightly above normal

End...

2. Weekly FWC Product

Northern California Interagency Fire Weather Center (FWC)
 Predictive Services Branch
 Geographical Area Coordination Center for Northern California
 Redding, California

Weekly Outlook Issued: 1630 PDT Tuesday, Oct. 21, 2003
 VALID FOR: **Wednesday, October 22 through Tuesday, October 28**

***** POTENTIAL FOR A STRONG NORTHEAST WIND EVENT THURSDAY P.M. THROUGH SUNDAY A.M. (DAYS 2-4) *****

A review of weather conditions for Northern California over the past 7-Days (Oct 15 - Oct 21): A large-scale high pressure ridge dominated northern CA weather. Two weak weather systems brushed far northern CA – one late on Oct. 14th, and a second one on Oct. 19th. Precipitation was light, confined to areas northwest of Cape Mendocino- Cecilville- Macdoel. Temperatures averaged 2-7° F above normal with humidity below normal. The most significant gradient winds were Southwesterly gusts 25-40 mph, surfacing on several afternoons over higher exposed terrain of Siskiyou Co. See <http://www.wrcc.dri.edu/cacanom/images/txdep07.gif> and <http://www.wrcc.dri.edu/cacanom/images/ppct07.gif> for recent max temp anomalies, and precipitation percent-of-normal.

SYNOPTIC DISCUSSION FOR ALL AREAS: The week will start out with high pressure over the western U.S. interior. The weather maps indicate the passage of a weak weather system across far northern Calif on Thursday (Day 2). Following that, pressure gradients tighten for a 3-day period of north to east winds over much of the North Ops area.

FORECAST HIGHLIGHTS: A weak frontal passage on Day 1 p.m. into Day 2 a.m. hours. (Wed.-Thurs). Only a little light precipitation expected in the NW corner of Calif. Post-frontal surface high pressure and an increased Northerly component aloft will combine to produce a moderate or stronger North to East wind pattern over much of North Ops. These winds will start out NW to North Thursday p.m., and shift to mainly NNE to east by Friday p.m., continuing to about Sunday morning.

***** NORTH COAST PSA *****FDRAs: 100 and 105

DAY	FUEL CONDITIONS	WEATHER	MAXIMUM TEMPS	MINIMUM HUMIDITY	20-FT WINDS
WED	ERC- 42 1000hr-17	Mostly cloudy, with a 40-60% chance of rain in p.m. hours Del Norte Co., but just a 10-20% chance to the south.	56-70	70%-plus at the coast and 45-65% inland areas	South to SW 4-12 mph, except 8-18 mph ridge levels
THU	ERC- 44 1000hr-17	Mostly cloudy in the morning, w/ a slight chance (20% north to 10% south) of showers, then partly sunny in afternoon	60-72	35-50%, locally 60-70% near the coast	NW to North, increasing in the afternoon to 7-15 mph, with 20-25 mph gusts near coast
FRI	ERC- 45 1000hr-17	Clear skies both coast and inland (moderate to strong offshore flow)	66-79	22-38%, locally 45-55% near coast	North to ENE 10-20 mph with local ridge gusts 25-35 mph
SAT	ERC- 47 1000hr-16	Clear skies both coast and inland Poor overnight RH recovery	70-84	17-35%	North to ENE 10-20 mph with local ridge gusts 25-35 mph
SUN	ERC- 50 1000hr-16	Clear skies both coast and inland Poor overnight RH recovery	71-85	15-35%	NE to East 8-18 mph, w/ local a.m. ridge gusts 22-30 mph
MON	ERC- 51 1000hr-16	Mostly clear skies	71-85	15-35%	NE to SE 5-15 mph, with a few higher a.m. ridge gusts
TUE	ERC- 52 1000hr-15	Mostly sunny, with improved nighttime RH recovery	67-82	18-38%	NE to SE to 15 mph

SIMILAR SECTIONS FOR REST OF FORECAST AREA

 RESOURCES INFORMATION: The GACC has adequate resources at this time.

End...

- [Latest ERC's](#)
- [Latest 1000-Hour Dead Fuel Moisture](#)
- [Latest 100-Hour Dead Fuel Moisture](#)
- [Latest Burning Index \(BI's\)](#)
- [Los Angeles County Live Fuel Measurements \(average for all areas\)](#)
- [USFS Region 5 INTEL Section](#)

3. MONTHLY FIRE WEATHER / FIRE DANGER OUTLOOK

April 2004

1. REPORTING UNIT: Northern California Geographic Area

2. DATE: **March 26, 2004**

3. POTENTIAL FOR SERIOUS/CRITICAL FIRE PROBLEMS:

The trend is for normal fire activity in the GACC as spring begins.

THIS COMING MONTH	BELOW NORMAL		NORMAL	X	ABOVE NORMAL	
THIS SEASON	BELOW NORMAL		NORMAL	X	ABOVE NORMAL	

A REVIEW OF RECENT WEATHER IN NORTHERN CALIFORNIA:

While March usually has highly variable weather, 2004 saw a persistent high pressure ridge lock in for over three-quarters of the month. This produced a March that might prove to be the warmest on record inland, though coastal areas were much closer to normal. **Figure 1** illustrates how maximum temperatures compared to normal in the four weeks ending March 25th. As an example of the warmth, Redding had maximum temps of at least 80° F for an unprecedented 11 consecutive days, including 6 in a row at 84° or above. Each day from Mar. 6-22 had max temperatures from 13-22 degrees above normal for the date. This warmth was typical of most of the inland portions of North Ops. The warm temperatures led to considerable drying of dead fuels at low elevations, and to significant snowmelt in the lower mountain areas. The combination allowed for prescribed burning to increase tremendously after mid-month, where smoke-dispersion conditions would allow.

Most precipitation occurred on just a few days, with only March 1st and 25th having widespread rain or mountain snow events. **Figure 2** shows precipitation percent-of-normals for the cool season (i.e. Oct. 1 to date). It indicates that most of northern CA has been within 15% (+ or -) of normal precipitation this winter, with the driest areas in the south part of the Geographic Area. Regarding wind, moderate north wind patterns developed several times during March. This is more often than climatologically normal, but not surprising this year considering the prevalence of high pressure.

DISCUSSION FOR APRIL 2004:

Present indications are that the north-Pacific jet stream will see splitting action during at least the first half of April. The position of the split will vary with time, from about 500 miles west of the Pacific states, to right over eastern Pacific NW. This will likely make April's weather more changeable than in the unusually stable March we are now finishing. No major temperature or precipitation anomalies are foreseen at this time. One to two significant foehn (north to east) wind patterns may develop in April, especially when high pressure affects the north state, and low pressure in the south.

NORTHERN CALIFORNIA FORECAST FOR APRIL 2004:

April 1-15: Temperatures in northern CA are expected to average near normal to 3 degrees F above normal. Precipitation will likely be at or below normal (confidence 70%). [Note- closed lows that drop south in the southern branch of split jet stream patterns may make southern CA a little wetter compared to their normals for April, than here in the north]. Expect one to two light to moderate northeast wind events, and perhaps one stronger one, each of 1-2 ½ days duration.

April 16-30: Look for temperatures within two degrees of normal across northern CA, with near-normal precipitation. Climatologically, the frequency of south wind patterns decreases in April, as the storm track works its way northward. The latter half of April should continue to see period NW to NE wind patterns. For additional input regarding April 2004 weather, see the NWS 30- and 90-day temp and precip maps for the month. The recently updated forecasts can be found at this URL:

http://www.cpc.ncep.noaa.gov/products/predictions/multi_season/13_seasonal_outlooks/color/page2.gif

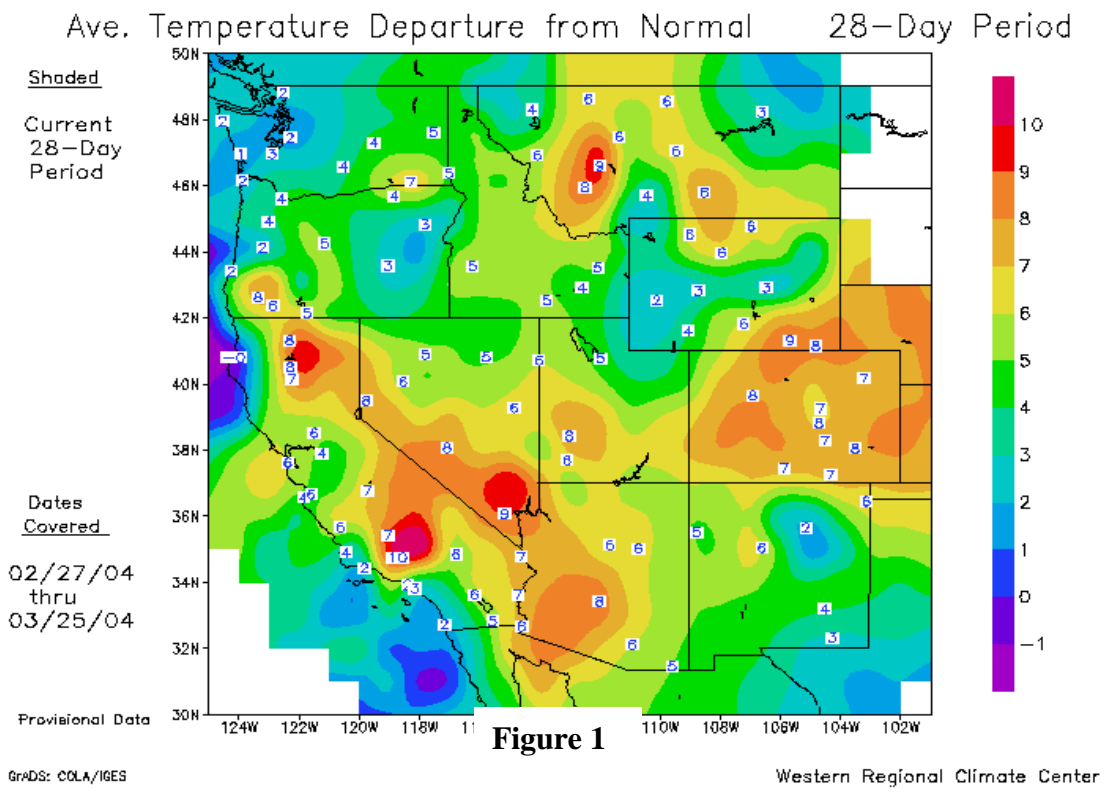
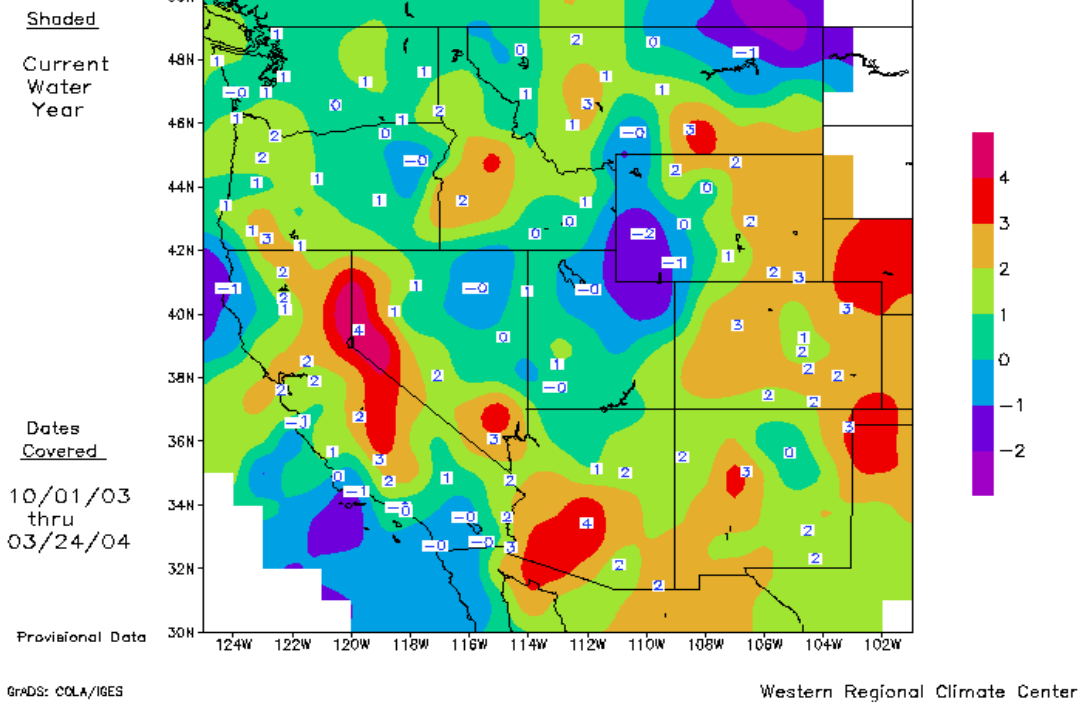


Figure 1, above

Figure 2, below

Ave. Temperature Departure from Normal Water Year



5. FUELS

FINE - GRASS STAGE	GREEN	X	CURED			
NEW GROWTH	SPARSE		NORMAL		ABOVE NORMAL	X

LIVE FUEL MOISTURE (sage, deciduous, conifer):

NA Current Critical

1000 HOUR DEAD FUEL MOISTURE:

Current Critical
NA

6. Ten year average Fires and Acres all agencies through:

Fires _____ Acres

7. Actual Occurrence/Acres Burned year to date:

Fires _____ Acres

8. WRITTEN SUMMARY: Present indications are that the north-Pacific jet stream will see splitting action during at least the first half of April. The position of the split will vary with time, from about 500 miles west of the Pacific states, to right over eastern Pacific NW. This will likely make April's weather more changeable than in the unusually stable March we are now finishing. No major temperature or precipitation anomalies are foreseen at this time. One to two significant foehn (north to east) wind patterns may develop in April, especially when high pressure affects the north state, and low pressure in the south. Large fire potential is expected to be minimal.

4. SEASONAL OUTLOOKS

The seasonal assessment can be found at the following URL:
<http://www.fs.fed.us/r5/fire/north/fw/SeasonAssessment.htm>

5. 10-DAY FIRE POTENTIAL

This is a “work in progress.” It is expected to become available early in the high fire season of 2004.

APPENDIX D – High Season Coordination Calls

Fire Weather Center and National Weather Service Coordination Calls

Coordination conference calls will be conducted, as needed, between the Fire Weather Centers (FWCs) and the National Weather Service (NWS) Weather Forecast Offices (WFOs) during high fire season. The purpose of the call is to produce seamless products between WFOs and also between the FWC and WFOs. Calls should be brief and to the point.

Calls will be at 0830 PDT during the high fire season.

The Fire Weather Center meteorologist will facilitate the call.

Normally, there will be two calls. One will be for the north and the other for the south. There are 3 WFOs that have forecast areas in both the north and the south. Routinely, Monterey will be on the south call, and Reno and Sacramento will be on the north call. In some instances, one statewide call will be conducted.

Deployed IMETs should be included in the calls.

The FWCs will place an unpublished message on their Internet web page by 0820 PDT to inform the WFOs if a call is necessary, and which WFOs need to be on it. It would be desirable to have a self-refreshing web page.

The main focus of the calls will be in the shorter term time periods.

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.
- The FWCs forecasts do not agree with the WFOs forecasts, or there is a conflict between adjoining WFO forecasts. The FWCs will use the NWS IFPS “trigger points” for guidance. (However, coordination may be appropriate at lower thresholds.)
 - MaxT/MinT 5 deg F except 7 deg F in complex terrain
 - RH 5% except 10% in complex terrain
 - Prob. Of Precip 20%
 - Wind Speed (2 min) 12 MPH except 18 MPH in complex terrain
 - Wind Direction 45 deg except 60 deg in complex terrain.
 - LAL 2 except for a valid discrepancy between wet and dry thunderstorms
 - Haines Index 2 except for 3 in complex terrain.

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

WS FORM D-1 (12-86) Pres. By WSOM D-41	FIRE WEATHER SPECIAL FORECAST REQUEST <i>(See reverse for instructions)</i>	U.S. DEPARTMENT OF COMMERCE NOAA NATIONAL WEATHER SERVICE				
I. REQUESTING AGENCY WILL FURNISH:						
1. NAME OF FIRE OR OTHER PROJECT	2. CONTROL AGENCY	3. REQUEST MADE				
		TIME † _____ DATE _____				
4. LOCATION <i>(By 1/4 Sec - Sec - Twp - Range)</i>		5. DRAINAGE NAME				
6. EXPOSURE <i>(NE, E, SE, etc.)</i>						
7. SIZE OF PROJECT <i>(Acres)*</i>	8. ELEVATION*	9. FUEL TYPE				
	TOP _____ BOTTOM _____					
		10. PROJECT ON: <input type="checkbox"/> GROUND <input type="checkbox"/> CROWNING				
11. WEATHER CONDITIONS AT PROJECT OR FROM NEARBY STATIONS <i>(See example on reverse)</i>						
PLACE	ELE-VATION	OB TIME †	WIND DIR.-VEL.	TEMP	☼ <i>(Lu Blank)</i>	REMARKS
			20 FT. EYE LEVEL	DRY WET	RH DP	<i>(Indicate rain, thunderstorms, etc. Also wind conditions and 10ths of cloud cover.)</i>
12. SEND FORECAST TO:		PLACE	VIA		ATTN: <i>(Name, if applicable)</i>	
II - FIRE WEATHER FORECASTER WILL FURNISH:						
13. FORECAST AND OUTLOOK: <i>(Specify Wind - 20 foot or Eye Level)</i>				TIME † AND DATE: _____		
NAME OF FIRE WEATHER FORECASTER				FIRE WEATHER OFFICE		
III - REQUESTING AGENCY WILL COMPLETE UPON RECEIPT OF FORECAST						
IV - FORECAST RECEIVED:			TIME †	DATE	NAME	
Explanation of Symbols		† Use 24-hour clock to indicate time. Example: 10:15 p.m. = 2215; 10:15 a.m. = 1015 * For concentrations (as groups of lightning fires) specify "concentration"; then give number of fires and size of largest. If concentrations are in more than one drainage, request special forecast for each drainage. ‡ No entry necessary. To be completed by the Fire Weather Forecaster.				

WS FORM D-1

SUPERSEDES PREVIOUS EDITIONS

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

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

Name	NFDRS ID	Agency	Unit	WFO	Trend Zone Number	Latitude	Longitude	Elevation
Acton	045438	Local	LAC	LOX	506	34.44583	-118.212	2600
Alder Point	040423	CDF	HUU	EKA	556	40.1866666	-123.5902777	923
Alder Springs	041101	USFS	MNF	STO	595	39.65	-122.725	4475
Alpine	045701	USFS	CNF	SGX	509	32.8336111 1	-116.7391667	2041
Ammo Dump	045738	Local	MVU	SGX	508	33.3813888	-117.2856667	1068
Anza	045616	CDF	RRU	SGX	513	33.555	-116.6730555	3920
Arbuckle Basin	040632	CDF	SHU	STO	595	40.398333	-122.8116666	1900
Arroyo Grande	044915	CDF	SLU	LOX	500	35.1919965	-120.4317199	600
Arroyo Seco	044301	USFS	LPF	MTR	522	36.23	-121.492	980
Ash Creek	040244	USFS	SHF	MFR	584	41.278	-121.978	3200
Ash Mountain	044701	NPS	KNP	HNX	529	36.491	-118.824	1700
Ash Valley	040726	BLM	SUD	REV	572	41.058	-120.706	5090
Backbone	040513	USFS	SHF	EKA	591	40.8891667	-123.1422222	4700
Bald Mountain	042603	USFS	ENF			38.903	-120.698	4613
Bangor	041201	CDF	BTU	STO	596	39.380877	-121.38621	840
Barnaby	042308	NPS	MRN	MTR	559	38.03	-122.75	1240
Batterson	044207	USFS	SNF	HNX	528	37.378	-119.628	3100
Bear Peak	044730	BLM	BBD	HNX	530	35.884	-118.051	8228
Bear Valley	045007	CDF	KRN	MTR	562	35.2160	-118.62495	4936
Beaumont	045617	CDF	RRU	SGX	510	33.9304166 7	-116.949833	2611
Beaver	042601	USFS	ENF	STO	538	38.488	-120.325	5000
Bell Canyon	045735	Local	ORC	SGX	509	33.541666	-117.591666	700
Ben Bolt	042612	CDF	AEU	STO	552	38.6013889	-120.929722	1500
Ben Lomond	043809	CDF	CZU	MTR	549	37.132	-122.17	2630
Benton	043708	BLM	BBD	REV	518	37.843	-118.478	5450
Beverly Hills	045442	Local	BHL	LOX	501	34.125	-118.412	1260
Big Bar	040501	USFS	SHF	EKA	591	40.743	-123.25	1500
Big Hill	040402	BIA	HIA			41.1	-123.633	3570
Big Pine Flat	045102	USFS	BDF	SGX	511	34.3194444	-117.0078333	6861
Big Pines	045401	USFS	ANF	LOX	507	34.3788889	-117.6919444	6917
Big Rock	042310	Local	MRN	MTR	559	38.0483	-122.57	1500

Big Sur	044302	USFS	LPF	MTR	521	36.2355556	-121.785	450
Black Diamond	043008	Local	EBY	MTR	547	37.95	-121.88444	1600
Blackrock	044722	USFS	SQF	HNX	534	36.093	-118.2613889	8200
Blue Door	040725	BLM	SUD	REV	572	41.056	-120.336	5615
Blue Ridge	040203	USFS	KNF	MFR	586	41.273	-123.19	5956
Bogard RS	040703	USFS	LNF	REV	598	40.59	-121.08	5680
Booneville	041001	CDF	MEU	EKA	557	38.98745	-123.3474	840
Bradley	044303	CDF	BEU	MTR	523	35.88725	-120.92385	443
Branch Mountain	044901	USFS	LPF	LOX	525	35.184	-120.083	3773
Brazie Ranch	040242	CDF	SKU	MFR	588	41.6852778	-122.5941667	3000
Breckenridge Lookout	045009	USFS	SQF	HNX	534	35.451	-118.581	7548
Bridgeport	043702	USFS	HTF	REV	576	38.246667	-119.2197222	6480
Briones	043010	Local	EBY	MTR	547	37.934166	-122.11777	1450
Brooks	042202	CDF	LNU	STO	558	38.7194444	-122.142222	360
Buck Meadows	043603	USFS	STF			37.823	-120.098	3200
Bull Flat	040728	BLM	SUD	REV	572	40.481	-120.114	4395
Burns Canyon	045125	BLM	CDD	SGX	516	34.208	-116.621	6000
Buttercup		BLM	CDD			32.7397222 2	-114.8838889	217
Cahuilla		BLM	CDD			32.9736111	-115.1736111	278
Calaveras Rd	043405	Local	SCU	MTR	547	37.5531	-121.8441	1230
Callahan	040204	USFS	KNF	MFR	587	41.315	-122.8	3136
Cameron	045704	USFS	CNF	SGX	513	32.721	-116.463	3443
Camp 9	045440	Local	LAC	LOX	506	34.3619	-118.421667	4000
Campo Seco	043102	Local	AEU			38.2236111	-120.8663889	399
Canby	040303	USFS	MDF	MFR	589	41.434	-120.868	4312
Carpenter Ridge	041213	CDF	BTU	STO	597	40.06875	-121.58374	4812
Carrizo	044916	BLM	BBD	LOX	525	35.096	-119.773	2490
Case Mountain	045733	BLM	BBD	HNX	529	36.4108333	-118.8091667	6450
Case Springs	045731	Local	MCP	SGX	508	33.445	-117.418	2320
Cashman	040916	USFS	PNF	STO	599	40.01	-120.91611	4520
Casitas	045308	USFS	LPF	LOX	504	34.4080555 6	-119.3702778	640
Catheys Valley	044114	CDF	MMU	HNX	528	37.465	-120.077	1200
Cedar Grove	044719	NPS	KNP	HNX	534	36.78778	-118.65916	4720
CFLO	044195	NPS	YNP	HNX	531	37.77	-119.82	6644
Cheeseboro	045313	NPS	CNP	LOX	505	34.1902777	-118.717222	1650
Chester	040904	USFS	LNF	STO	597	40.287	-121.237	4525
Chico	041210	CDF	BTU	STO	596	39.71191	-121.78174	230
Chilao	045436	USFS	ANF	LOX	507	34.333	-118.033	5450
Chimney Peak	044721	BLM	BBD	HNX	530	35.90	-118.0	6240

Chuchupate	045302	USFS	LPF	LOX	503	34.808	-119.0125	4900
Claremont	045443	Local	LAC	SGX	509	34.137	-117.707	1645
Clark	045624	CDF	RRU	SGX	509	33.8266667	-117.303333	1720
Clear Creek	045405	USFS	ANF	LOX	506	34.271111	-118.1525	3000
Cohasset	041211	CDF	BTU	STO	596	39.87124	-121.7696667	1670
Collins Baldy	040237	USFS	KNF	MFR	587	41.777	-122.948	5493
Converse	045105	USFS	BDF	SGX	511	34.189	-116.917	5618
Cooskie Mountain	040422	BLM	UKD			40.258	-124.25	2950
Corning	040814	CDF	TGU	STO	595	39.939	-122.169866	294
Corona	045618	USFS	CNF	SGX	509	33.8744444	-117.5491667	640
Corralitos	043802	CDF	CZU	MTR	550	36.9911111	-121.7977777	450
County Line	041410	BLM	UKD			39.019	-122.412	2085
Crane	044102	NPS	YNP	HNX	531	37.766	-119.816	6644
Cranston	045603	USFS	BDF	SGX	512	33.74027778	-116.8413889	1950
Crazy Peak	040106	USFS	SIF	MFR	621	41.59	-123.37	3970
Crestview	043709	USFS	INF	REV	518	37.745	-118.983	7600
Del Valle	045445	Local	LAC	LOX	505	34.431	-118.666	1278
Delilah	044512	USFS	SQF	HNX	529	36.80	-119.103	5156
Democrat	045002	USFS	SQF	HNX	530	35.531667	-118.630	2356
Descanso	045707	USFS	CNF	SGX	513	32.856667	-116.63927	3480
Devils Garden	040309	CDF	LMU	MFR	590	41.522	-120.668	5022
Devils Postpile	044208	USFS	INF			37.63	-119.093	7560
Devore	045113	CDF	BDU	SGX	510	34.221224	-117.4030556	2080
Diablo Grande	043502	CDF	SCU			37.329	-121.301667	1850
Dinkey	044521	USFS	SNF	HNX	533	37.066667	-119.15	5668
Dog Valley	043102	USFS	TYF	REV	541	39.56194444	-120.04777	5976
Doyle	040724	BLM	SUD	REV	572	40.022	-120.106	4240
Duncan	041901	USFS	TNF	STO	536	39.143889	-120.50889	7100
Eagle Peak	040802	USFS	MNF	STO	595	39.929	-122.646	3713
Eel River	041005	USFS	MNF	EKA	557	39.833	-123.083	1500
Eel River Camp	040421	CDF	HUU	EKA	556	40.18316667	-123.8237333	470
El Cariso	045619	USFS	CNF	SGX	509	33.652	-117.407	3038
El Mirage	NA	BLM	CDD			34.634	-117.55	2880
Esperanza	043208	CDF	TCU	STO	539	38.243055	-120.51444	2512
Fancher Creek	044516	CDF	FKU	HNX	528	36.88416	-119.466944	920
Fawnskin	045101	USFS	BDF	SGX	511	34.266	-116.899	6900
Fence Meadow	044503	USFS	SNF	HNX	532	36.966	-119.183	5048
Figuroa	045201	USFS	LPF	LOX	500	34.7347	-120.04	3200
Fish Creek Mountains	045802	BLM	CDD			32.983	-116.058	760

Five Mile	044308	BLM	CDD			35.87166667	-117.9183333	4150
Foresthill 2	041908	USFS	TNF	STO	535	39.09138889	-120.7316667	4277
Fort Hunter Ligget	044317	USFS	LPF	MTR	522	36.011667	-121.2383333	1100
Fort Ord	109692	BLM	BEU			36.5994444	-121.7525	768
Fountain Springs	044731	CDF	TUU	HNX	529	35.891	-118.916	791
Fremont Canyon	045736	Local	ORC	SGX	509	33.78	-117.67	1781
Friend Mtn	040512	USFS	SHF	EKA	591	40.505	-123.343	4000
Gasquet	040102	USFS	SRF	EKA	560	41.84583333	-123.9791667	500
Golden	45119			LAS	312			
Goose Valley	045724	USFS	CNF	SGX	509	33.07055	-116.8427	1530
Gordon	040730	USFS	LNF	REV	598	40.7586111	-120.8961111	6200
Granite Mountain	045124	BLM	CDD			34.536	-117.026	4720
Grasshopper	040721	CDF	LMU	REV	598	40.78	-120.778333	6050
Green Springs	043613	CDF	TCU	STO	539	37.83306665	-120.49666	1020
Grizzly Flat	042613	USFS	ENF	STO	539	38.61872222	-120.5613889	3760
Hastings	044319	CDF	BEU			36.3888	-121.5514	1824
Hawkeye	042010	CDF	LNU	MTR	559	38.734286	-122.83808	2000
Hayfork	040503	USFS	SHF	EKA	591	40.548	-123.165	2323
Hell Hole	042608	USFS	ENF	STO	538	39.078	-120.418	5240
Hernandez	044409	CDF	BEU	MTR	524	36.383055	-120.853889	3752
High Glade	041402	USFS	MNF	STO	595	39.205	-122.805	4840
High Sierra	044520	USFS	SNF	HNX	533	37.31472222	-119.03925	7403
Hollister	044406	CDF	BEU	MTR	523	36.84222222	-121.362222	423
Hoopla	040408	BIA	HIA	EKA	555	41.048	-123.673	400
Horse Lake	040727	BLM	SUD	REV	572	40.631	-120.503	5100
Horse Thief Springs	045129	BLM	CDD			35.771	-115.909	5000
Hunter Mountain	NA	NPS	DVP			36.563	-117.474	6720
Hurley	044517	CDF	FKU	HNX	529	37.00	-119.60	1260
Indian Well	040233	NPS	BNP	MFR	590	41.75	-121.5	4770
Indian Wells Canyon	045016	BLM	CDD			35.685	-117.8894444	4000
Jarbo Gap	041214	CDF	BTU			39.74222222	-121.4630556	1700
Jawbone	045013	BLM	CDD			35.295	-118.226	4300
Jerserydale	044105	USFS	SNF	HNX	528	37.544	-119.835	3600
Johnsondale	044707	USFS	SQF	HNX	534	35.9717	-118.545	4700
Juanita Lake	040240	USFS	KNF	MFR	589	41.484	-122.066	5400
Julian	045708	CDF	MVU	SGX	513	33.0760022	-116.6075	4240
Juniper Creek	040308	BLM	SUD	REV	572	41.332	-120.473	4372

Keenwild	045604	USFS	BDF	SGX	513	33.667	-116.767	4920
Kernville	045005	USFS	SQF	HNX	530	35.755	-118.416	2720
Kettleman Hills	044602	BLM	BBD	HNX	526	36.033	-120.056	801
Klamath NWR		FWS	SKU			41.9533333 3	- 121.5819444	4531
Knoxville Creek	041409	BLM	UKD			38.888	-122.411	2200
Konocti	041411	CDF	LNU	STO	558	38.918333	-122.71667	2100
La Honda	043304	CDF	CZU	MTR	549	37.3052776 6	- 122.2538888	425
La Panza	044914	CDF	SLU	LOX	525	35.38111	-120.1875	1630
Ladder Butte	040723	USFS	LNF	STO	597	40.808	-121.305	5750
Las Flores	045733	Local	MCP	SGX	508	33.289	-117.439	100
Las Tablas	044904	CDF	SLU	LOX	520	35.6505556	-120.915	950
Las Trampas	043009	Local	EBY	MTR	547	37.833889	-122.066944	1760
Lassen Lodge	040815	CDF	TGU	STO	597	40.3430556	-121.719444	4000
Laufman	040709	USFS	PNF	REV	572	40.137	-120.345	4858
Laural Mountain	045015	BLM	CDD			35.4783333 3	- 117.6988889	4390
Laytonville	041019	CDF	MEU			39.6975	- 123.4538889	1500
Leo Carrillo	045447	Local	LAC	LOX	501	34.04556	-118.93583	50
Lincoln	041907	CDF	NEU			38.8825	-121.268333	200
Little Tujunga	045411	USFS	ANF	SGX	509	34.2936111	- 118.2405556	1390
Livermore	043406	CDF	SCU	MTR	547	37.711944	-121.8136	800
Los Altos	043912	Local	SCU			37.355	-122.142	645
Los Banos	044003	CDF	MMU	HNX	526	37.052	-121.048	350
Los Gatos	043913	Local	SCC	MTR	549	37.203	-121.943	800
Los Prietos	045203	USFS	LPF	LOX	500	34.536	-119.783	1020
Los Vaqueros	043013	Local	SCU	MTR	524	37.83333	- 121.6666667	200
Lost Horse	045614	NPS	JTP	LAS	312	34.018	-116.188	4200
Lowden	NA	BLM	BLM			40.6897222 2	- 122.8313889	3120
Lower Klamath	040310	FWS	SKU			41.9991666 7	- 121.7002778	4098
Lyons Valley	041408	BLM	UKD			39.125	-123.125	3200
Lytle Creek	045108	USFS	BDF	SGX	510	34.2338888 9	- 117.4820778	2792
Malibu Hills	045433	Local	LAC	LOX	501	34.05833	-118.63333	1575
Mallory Ridge	043011	Local	SCU	MTR	547	37.817	-121.779	2040
Manzanita Lake	040609	USFS	LNF	STO	597	40.543	-121.582	5750
Maple Creek	040424	CDF	HUU	EKA	560	40.796	-123.937	1680
Marin	042306			MTR	559	37.911	-122.613	20
Mariposa	044106	CDF	MMU	HNX	528	37.502	-120.985	2100
Mariposa Grove	044113	NPS	YNP	HNX	531	37.514	-119.604	6400
Markleeville	042802	USFS	TOF	REV	576	38.6833	-119.76667	5501
McGuires	041017	CDF	MEU	EKA	557	39.35267	-123.601167	400

Means Lake	NA	BLM	CDD			34.39055555	-116.5169444	2900
Mendocino Pass	041018	USFS	MNF	EKA	557	39.80444444	-122.945	5420
Metcalf Gap	044209	CDF	MMU	HNX	528	37.40972	-119.766944	3300
Meyers	042607	USFS	TMU	REV	542	38.845	-120.015	6310
Miami	044110	USFS	SNF	HNX	532	37.419	-119.744	4327
Mid Hills	045128	BLM	CDD			35.166	-115.415	5413
Middle Peak	042311	Local	MRN	MTR		37.927	-122.587	2440
Mill Creek - ANF	045435	USFS	ANF	LOX	507	34.383	-118.067	4970
Mill Creek - BDF	045109	USFS	BDF	SGX	510	34.083	-117.035	2950
Milo	044708	CDF	TUU	HNX	529	36.23245	-118.8705333	1960
Minarets	044203	USFS	SNF	HNX	532	37.409	-119.348	5180
Modoc NWR		FWS	LMU			41.458889	-120.3536111	4380
Mojave River Sink	045122	BLM	CDD			35.058	-116.083	950
Montecito	045218	USFS	LPF	LOX	500	34.452	-119.635	1500
Mormon Rock	045114	USFS	BDF	SGX	511	34.316667	-117.502222	3300
Mount Elizabeth	043605	USFS	STF	STO	539	38.057	-120.241	4933
Mount Tom	044511	USFS	SNF	HNX	533	37.3816667	-119.1694444	9018
Mount Zion	042701	CDF	AEU	STO	552	38.389444	-120.651111	2960
Mountain Rest	044505	USFS	SNF	HNX	529	37.053	-119.3711111	4100
Mt. Diablo	043012	Local	SCU			37.8733333	-121.91	3649
Mt. Laguna	045709	USFS	CNF	SGX	513	32.87972222	-116.4202778	5760
Mt. Shasta	040217	USFS	SHF	MFR	584	41.315	-122.316667	0
North Fork	044204	USFS	SNF	HNX	528	37.233	-119.506	2733
Oak Bottom	040636	NPS	WRA	STO	595	40.650556	-122.605556	1326
Oak Creek	043705	BLM	BBD	LAS	517	36.843	-118.259	4855
Oak Grove	045710	USFS	CNF	SGX	513	33.393	-116.795	2752
Oak Knoll	040218	USFS	KNF	MFR	587	41.852	-122.846	1940
Oak Mountain	040635	USFS	SHF	STO	593	41.012	-121.983	1700
Oak Opening	044717	USFS	SQF	HNX	529	36.175	-118.701	3240
Oakland North	043402	Local	OKL	MTR	550	37.875	-122.21666	1300
Oakland South	043403	Local	OKL	MTR	550	37.788333	-122.1616666	1000
Ojai	045315	Local	VNC			34.44833333	-119.2302778	765
Opal Mountain	045127	BLM	CDD			35.157	-117.177	3240
Owens Camp	042611	USFS	ENF	STO	538	38.733	-120.245	5240
Owens Valley	044803	CDF	BDU	LAS	517	37.39	-118.550556	4640
Ozena	045310	USFS	LPF	LOX	503	34.68194	-119.353889	3670
Panamint	044806			LAS	312			
Panoche Rd	044514	CDF	FKU	HNX	524	36.63	-120.63833	500
Park Ridge	044713	NPS	KNP	HNX	532	36.724	-118.942	7540

Parkfield	044310	CDF	BEU	MTR	524	35.898889	-120.4319444	1535
Pattymocus	040812	USFS	SHF	EKA	594	40.288	-122.87	3500
Peppermint	044726	USFS	SQF	HNX	534	36.072	-118.534	7167
Pierce	040992	USFS	PNF	REV	598	40.133	-120.95	5700
Pike County Lookout	041701	USFS	PNF	STO	599	39.475	-121.202	3714
Pilot Hill	042609	CDF	AEU	STO	552	38.83167	-121.0116667	1200
Pine Hills	045711	USFS	CNF	SGX	513	33.01638889	-116.6338889	1000
Pinehurst	044508	USFS	SNF	HNX	529	36.68527778	-119	4060
Pinnacles	044410	NPS	PNP	MTR	524	36.47083333	-121.1472222	1322
Piru	045319	Local	VNC			34.4044444	-118.81	624
Pole Mountain	042008			MTR	562	38.50	-123.12	2204
Poppy Park	045439	Local	LAC	LOX	519	34.7325	-118.38333	2760
Potrero	045730	CDF	MVU	SGX	513	32.6091645	-116.6080556	2350
Poverty	043914	Local	SCU			37.443	-121.771	2067
Pulgas	043309	Local	CZU	MTR	549	37.475	-122.298	644
Quartz Hill	040239	CDF	SKU	MFR	587	41.5997222	-122.9327778	4238
Quincy Rd	040910	USFS	PNF	STO	599	39.967	-120.934	3500
Ranchita	045729	CDF	MVU	SGX	513	33.21222	-116.5052778	4180
Rattlesnake	044728	NPS	KNP	HNX	534	36.412	-118.425	8600
Ravendale	040714	BLM	SUD	REV	572	40.731	-120.316	5298
Reader Ranch	041809	CDF	NEU			39.30458333	-121.1182667	1967
Redding	040611	USFS	SHU	STO	595	40.5158	-122.290556	500
Rice Valley	045620	BLM	CDD			34.062	-114.707	820
Rock Camp	045111	USFS	DBF	SGX	511	34.28805556	-117.2125	4900
Rock Creek	043710	USFS	INF	REV	518	37.551	-118.667	7040
Rock Springs	042301			MTR	559	37.911	-122.613	1972
Rodeo Valley	041015	CDF	MEU	EKA	557	39.666667	-123.32167	2425
Rose Peak	043404	Local	EBP	MTR	547	37.5019444	-121.735555	3060
Rose Valley	045314	USFS	LPF	LOX	502	34.536	-119.184	3331
Round Mountain	040221	CDF	LMU	MFR	590	41.42	-121.4583333	5258
Rush Creek	040312	USFS	MDF	MFR	590	41.294	-120.864	4800
Ruth	040508	USFS	SRF	EKA	555	40.2505556	-123.3158333	3360
Sac NWR	041102	FWS	LNU	STO	595	39.417222	-122.1825	120
Saddleback	041304	USFS	TNF	STO	536	39.6375	-120.8652778	6670
Saddleback Butte	045444	Local	LAC	LOX	519	34.668	-117.8208	2590

Salt Wells	45120			LAS	312			
San Clemente Island		Local	Local			32.84	-118.3875	935
San Luis NWR	044004	FWS	MMU	HNX	526	37.1822222	-120.7938889	65
San Miguel	045737	FWS	NWR	SGX	509	32.685	-116.966736	425
Santa Barbara Island	NA	NPS	CNP			33.483	-119.033	176
Santa Cruz Island	045216	NPS	CNP			33.996	-119.75	250
Santa Fe Dam	045437	Local	LAC	LOX	501	34.12083	-117.94583	500
Santa Rita	044408	BLM	BBD	MTR	524	36.348	-120.598	5000
Santa Rosa	042009	CDF	LNU	MTR	559	38.478889	-122.711944	560
Santa Rosa Island	045217	NPS	CNP			33.968	-120.072	1298
Santa Rosa Plateau	045623	CDF	RRU	SGX	513	33.5033333	-117.2302778	1980
Saugus	045412	Local	LAC	LOX	505	34.425	-118.525	1450
Sawyers Bar	040222	USFS	KNF	MFR	586	41.3	-123.129	2192
School House	040425	NPS	RNP	EKA	560	41.1383333	-123.9055556	2640
Scorpion	040502	USFS	SHF	EKA	591	41.112	-122.698	4400
Secret Town	041808	CDF	NEU			39.1837	-120.8847	2720
Shadequarter	044724	CDF	TUU	HNX	534	36.567222	-118.9555	4069
Shaver	044522	CDF	FKU	HNX	528	37.144444	-119.2581	5800
Ship Mtn	040198	USFS	SRF	EKA	556	41.7358333 3	-123.792778	2200
Simi Valley	045317	Local	VNC			34.2911111	-118.814444	914
Sims	040618	USFS	SHF	STO	593	41.073	-122.373	2400
Sky Oaks	042307			MTR	559	37.968	-122.603	700
Slater Butte	040225	USFS	KNF	MFR	585	41.847	-123.354	4670
Soda Creek	041406	USFS	MNF	EKA	557	39.433	-122.983	1773
Soldier Mtn	040630	CDF	SHU	STO	593	40.9263888 9	-121.5813889	3760
Somes Bar	040231	USFS	KNF	MFR	586	41.379	-123.479	920
South Fork	045012	BLM	BBD	HNX	530	35.983	-118.583	3000
Spring Valley	043309	Local	CZU			37.562	-122.436	1075
Squaw Lake	045801	BLM	CDD			32.9083333 3	-114.4944444	300
Squaw Springs	045012	BLM	CDD			35.37	-117.568	3620
Stampede	041804	USFS	TNF	REV	541	39.483	-120.054	6600
Sugarloaf (KNP)	044729	NPS	KNP	HNX	534	36.727	-118.675	8120
Summit	040633	NPS	LNP	STO	597	40.5022	-121.423611	6922
Talega	045739	Local	PDF	SGX	508	33.4780556	-117.485833	1203
Tanbark	045421	USFS	ANF	SGX	509	34.167	-117.767	2600
Target Range	045732	Local	MCP			33.372	-117.359	918
Temescal - CNF	045611	USFS	CNF	SGX	509	33.7625	-117.4827778	1125
Temescal - LPF	045307	USFS	LPF	LOX		34.4805556	-118.75556	1140

Thomes Creek	040816	CDF	TGU	STO	595	39.855833	-122.609722	1040
Thousand Oaks	045328	Local	VNC			34.21	-118.87	795
Timber Mountain	040306	USFS	MDF			41.629444	-121.2980556	4960
Trimmer	044510	USFS	SNF	HNX	529	36.9	-119.3	1540
Trinity Camp	040516	CDF	SHU	EKA	591	40.678889	-122.8330556	3350
Tuolumne Meadows	043611	NPS	YNP	HNX	531	37.868	-119.319	9200
Uhl	044712	USFS	SQF	HNX	529	35.89	-118.633	3720
Underwood	040519	USFS	SRF	EKA	555	40.72194444	-123.4952778	2600
Valley Center	045734	CDF	MVU	SGX	509	33.2261111	-116.992222	1370
Valyermo	045423	USFS	ANF	SGX	514	34.44555556	-117.85111	3780
Van Bremmer	040243	USFS	KNF	MFR	590	41.634	-121.784	4928
Vandenberg	045220	USFS	SBC	LOX	500	34.75861	-120.4861111	1050
Vincent	045425	Local	LAC	LOX	506	34.49	-118.14	
Walker	043707	USFS	TYF	REV	576	38.56527778	-119.4591667	5440
Walker Pass	045014	BLM	BBD	HNX	530	35.664	-118.056	5572
Warm Springs	045426	USFS	ANF	LOX	506	34.583	-118.55	4930
Wawona	044109	NPS	YNP	HNX	531	37.533	-119.65	3960
Weaverville	040510	USFS	SHF	EKA	591	40.735	-122.9433	2100
Weed Airport	040228	CDF	SKU	MFR	588	41.478889	-122.458	2930
Westwood	040719	CDF	LMU	STO	597	40.298889	-120.8916667	6200
Whitaker Peak	045448	Local	LAC	LOX	506	34.6	-118.73	4120
White Cloud	041806	USFS	TNF	STO	536	39.302	-120.842	4320
White Wolf	043612	NPS	YNP	HNX	531	37.851	-119.65	8000
Whitmore	040615	CDF	SHU	STO	596	40.6202777	-121.90388	2450
Whittier Hills	045446	Local	LAC	LOX	501	33.983888	-118.006	950
Wiley Ridge	045335	CDF	VNC			34.371667	-118.839722	1665
Wolverton	044732	NPS	KNP	HNX	534	36.445	-118.701	5240
Woodacre	042309	Local	MRN	MTR	559	37.9905556	-122.6447222	1400
Yosemite Valley	044111	NPS	YNP	HNX	531	37.75	-119.583	4000
Yucca Valley	045112	CDF	BDU	SGX	516	34.123333	-116.407778	3260
Yurok		USFS	HUU			41.2897222	-123.8575	495

APPENDIX G - Contact Information for WFOs and FWCs

NORTHERN CALIFORNIA FWC/ PREDICTIVE SERVICES UNIT

6101 Airport Road, Redding, CA 96002-9423

FAX Number: (530) 226-2742

Web Site Address: <http://www.fs.fed.us/r5/fire/north/fwz>

Office E-mail: redding.fwx@fire.ca.gov

Office Hours: late March to mid November: 7am – 5pm daily; rest of year: 7am – 5pm M-F

SOUTHERN CALIFORNIA FWC/ PREDICTIVE SERVICES UNIT

2524 Mulberry Street, Riverside, CA 92501-2200

FAX Number: (909) 276-6439

Web Site Address: <http://www.fs.fed.us/r5/fire/south/fwz>

Office E-mail: riverside.fwx@fire.ca.gov

Office Hours: High fire season: 7am – 5pm daily. Low fire season: 7am – 5pm M-F

EUREKA NWS WEATHER FORECAST OFFICE

300 Startare Drive, Eureka, CA 95501-6000

FAX Number: (707) 443-6195

Web Site Address: <http://www.wrh.noaa.gov/Eureka>

Backup Offices: WFO Monterey and WFO Medford

HANFORD/ SAN JOAQUIN VALLEY NWS WEATHER FORECAST OFFICE

900 Foggy Bottom Road, Hanford, CA 93230-5236

FAX Number: (559) 584-1152

Web Site Address: <http://www.wrh.noaa.gov/Hanford>

Backup Office: WFO Sacramento

LAS VEGAS NWS WEATHER FORECAST OFFICE

7851 Industrial Rd., Las Vegas, NV 89139-6628

FAX Number: (702) 263-9759

Web Site Address: <http://www.wrh.noaa.gov/Lasvegas>

Backup Offices: WFO Reno and WFO Elko

LOS ANGELES/ OXNARD NWS WEATHER FORECAST OFFICE

520 N. Elevar Street, Oxnard, CA 93030

FAX Number: (805) 988-6613

Web Site Address: <http://www.nwsla.noaa.gov>

Backup Office: WFO San Diego

MEDFORD NWS WEATHER FORECAST OFFICE

4003 Cirrus Drive, Medford, OR 97504

FAX Number: (541) 776-4333

Web Site Address: <http://www.wrh.noaa.gov/Medford>

Backup Office: WFO Eureka

PHOENIX NWS WEATHER FORECAST OFFICE

PAB 500, P.O. Box 52025, Phoenix, AZ 85072-2025

FAX Number: (602) 267-8051

Web Site Address: <http://www.wrh.noaa.gov/Phoenix>

Backup Office: WFO Tucson

RENO NWS WEATHER FORECAST OFFICE

2350 Raggio Parkway, Reno, NV 89512-3900

FAX Number: (775) 673-8110

Web Site Address: <http://www.wrh.noaa.gov/Reno>

Backup Office: WFO Elko

SACRAMENTO NWS WEATHER FORECAST OFFICE
3310 El Camino Ave, Room 227, Sacramento, CA 95821
FAX Number: (916) 979-3052
Web Site Address: <http://www.wrh.noaa.gov/Sacramento>
Backup Office: WFO San Joaquin Valley/Hanford

SAN DIEGO NWS WEATHER FORECAST OFFICE
11440 W. Bernardo Ct, Ste 230, San Diego, CA 92127
FAX Number: (858) 675-8717
Web Site Address: <http://www.wrh.noaa.gov/sandiego/index.shtml>
Service Backup Office: WFO Los Angeles/Oxnard

SAN FRANCISCO BAY AREA NWS WEATHER FORECAST OFFICE
21 Grace Hopper Ave, Stop 5, Monterey, CA 93943
FAX Number: (831) 656-1747
Web Site Address: <http://www.wrh.noaa.gov/Monterey>
Service Backup Office: WFO Los Angeles/Oxnard