SOUTHWEST AREA
FIRE WEATHER
ANNUAL OPERATING PLAN

2008

Arizona
New Mexico
West Texas
Oklahoma Panhandle

2008 SOUTHWEST AREA FIRE WEATHER ANNUAL OPERATING PLAN

I. INTRODUCTION

This document serves as the Interagency Fire Weather Annual Operating Plan (AOP) for the Southwest Geographic Area. The general relationship between NWS and the interagency fire management community is set forth in the National Interagency Agreement for Meteorological Services. The AOP provides specific procedural and policy information regarding the delivery of meteorological services to the fire management community in the Southwest Area, as allowed under the umbrella of the National Agreement. References include:

- National Weather Service NWSI 10-4: Fire Weather Services
- Interagency Agreement for Meteorological Services
  (Referred to as the National MOA, or "National Agreement")
- Southwest Area and National Mobilization Guides

II. SIGNIFICANT CHANGES SINCE LAST YEAR

A. Increased digital weather forecast information for smoke dispersal has been added to Appendix E.

B. Several sections in the AOP have been condensed, placed in a tabular format and hyperlinked.

III. SERVICE AREA AND ORGANIZATIONAL DIRECTORY

A. Fire weather services are provided by SWA Predictive Services and the NWS forecast offices listed below and depicted within Appendix C. Local NWS office fire management liaisons are listed below and their general responsibilities highlighted in Section V.C. Additional contact information can be found in the Southwest Area Mobilization Guide, Chapter 50 – Directory.

NWS Forecast Office	Fire Management Liaison
Las Vegas, NV - VEF	Tim Duck – BLM AZ, FMO, Colorado River District Office: (928) 05-1234 Cell: N/A E-mail: Tim_Duck@blm.gov
Flagstaff, AZ - FGZ	Ed Hiatt – USFS, FMO, Kaibab NF - North Kaibab RD Office: (928) 643-8108 Cell: N/A E-mail: erhiatt@fs.fed.us
Tucson, AZ - TWC	Russ Babiak – FWS, Fuels, Buenos Aires NWR Office: (520) 823-4292 x-103 Cell: (520) 349-650 E-mail: Russ_Babiak@fws.gov
Phoenix, AZ - PSR	Helen Graham – BLM AZ, Asst. State FMO Office: (602) 417-9307 Cell: (602) 903-8626 E-mail: Helen_Graham@blm.gov
Albuquerque, NM - ABQ	David Isackson – USFS, AFMO, Santa Fe NF - Cuba RD Office: (575) 289-3264 Cell: (575) 4701741 E-mail: dwisackson@fs.fed.us
Amarillo, TX - AMA	Steve Fisher – NPS, GIS Specialist, Lake Meredith NRA Office: (806) 865-3360 x-29 Cell: N/A Steve_Fisher@nps.gov
Lubbock, TX - LUB	TBA (AMA liaison Steve Fisher in interim)
Midland, TX - MAF	James Villard – USFS, AFFMO, Lincoln NF Office: (575) 434-7332 Cell: (575) 430-1250 E-mail: jvillard@fs.fed.us
El Paso, TX - EPZ	James Villard (same as MAF)

B. Participating Agencies

1. DOC/NOAA/National Weather Service – Western and Southern Regions
2. USDA Forest Service – Southwest Region
3. DOI Bureau of Land Management – Arizona & New Mexico State Offices
4. DOI National Park Service – Intermountain Region
5. DOI US Fish and Wildlife Service – Southwest Region
6. DOI Bureau of Indian Affairs – Units of the Southwest, Navajo, and Western Regions that fall within the Southwest Geographic Area
7. New Mexico State Forestry Division
8. Arizona State Land Department
9. Texas Forest Service — Areas west of 100° W longitude

IV. NATIONAL WEATHER SERVICE SERVICES AND RESPONSIBILITIES

A. Basic Services – The following constitute the current operational fire weather forecast products provided by NWS. Any non-operational forecast products will be clearly labeled as "Experimental" or "Prototype".

1. Fire Weather Planning Forecasts (FWF)

Fire Weather Planning forecasts are issued by all NWS offices serving the Southwest Area. The intent is to provide general, zone-based information for daily preparedness and planning purposes.

a.) Issuance times - At least once daily by 0830 LST on a year round basis. Afternoon forecasts are issued by some offices on a year round basis, and by others on a seasonal basis, no later than 1530 LST. Beginning and ending dates of seasonal afternoon forecasts will be coordinated through Predictive Services.

Forecasts will be updated when a Fire Weather Watch or a Red Flag Warning is issued, the current forecast does not adequately represent current or expected weather conditions, or a typographical/format error is detected.

b.) Access – Primary method to retrieve forecasts will be directly from websites of NWS Forecast Offices serving the Southwest Area, or via SWCC Fire Operations and the NWS National Fire Weather website.

c.) Content and Format – Forecasts will conform to either the national standard narrative, or national standard tabular format, per NWSI 10-401. Each forecast will begin with a headline(s), if applicable, followed by a non-technical weather discussion. Individual zone forecasts follow the discussion and contain the following elements:

MANDATORY ELEMENTS

- Headline(s) as appropriate
- Sky/weather
- Temperature and 24 hour trend
- Humidity and 24 hour trend
- Winds - 20 foot RAWS Standard (slope/valley)
  10,000 Ft. MSL Wind (ridgetop)

OPTIONAL ELEMENTS

- Probability of Precipitation (replaces qualifying weather descriptor)
- Lightning Activity Level (LAL)
- Haines Index
- Mixing Level
- Transport Winds

OPTIONAL ELEMENTS (continued)

- Ventilation (kt-ft) and/or Ventilation/Dispersion Category

  Important: Ventilation/Dispersion is a State-defined parameter and is required for daytime periods only. Ventilation information is not provided for every zone in AZ or TX.

- Extended Outlook to at least day 5 (may appear at end of product)

Descriptions of Forecast Parameters can be found in Appendix A, and Fire Weather Planning Forecast (FWF) examples in Appendix B.

2. Spot forecasts (FWS)

a.) Criteria - 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 of day, week or season. Spot forecasts are available to any federal, state or municipal agency.

Site-specific forecasts are considered one-time requests, and are not routinely updated. Spot forecasts will be updated when representative observations are available to the forecaster and/or the forecaster deems the current forecast does not adequately represent current or expected weather conditions. Priority for the update of spot forecasts is as follows:

- Wildfires
- Prescribed burns, or Wildland Fire Use (WFU)
- All other requests

Land management personnel should contact the appropriate WFO for a spot update if forecast conditions appear unrepresentative of the actual weather conditions.

The spot forecast will be corrected when a typographical/format error is detected. Corrections should be delivered to users in the same manner as the original spot forecast if possible.

NWS Western Region offices will offer automatic 7-day FARSITE weather support with all wildfire spot forecast issuances. For prescribed burn spot forecasts, FARSITE data will be produced at the request of the agency. Please refer to Experimental Digital Services from the NWS in Appendix E for product description and information.

b.) Content and Format – See NWS Forecast Examples of a Spot Forecast (FWS) in Appendix B. Spot forecasts will contain the required minimum elements listed below, unless otherwise specified upon request:

- Headline (required when Red Flag Warning / Fire Weather Watch)
- Discussion
- Sky/weather (including chance of rain)
- Temperature
- Relative humidity
- 20 foot winds

Optional elements may be included upon request, including site-specific ventilation for smoke management purposes. The following conditions apply to the provision of ventilation data in spot forecasts in New Mexico and Arizona:

1.) Ventilation for the nearest forecast reference point in the fire weather planning forecast rates *POOR* in New Mexico, or *MARGINAL* or *POOR* in Arizona.

2.) Elevation-adjusted ventilation for a specific site, based on the information in the fire weather planning forecast, rates *POOR* in New Mexico, or *MARGINAL* or *POOR* in Arizona.

3.) The fire weather planning forecast rating is *FAIR*, but unusual, extenuating circumstances make additional information essential for accomplishment of management objectives (e.g. particularly sensitive downwind receptor). In these unusual cases, the requester is encouraged to call/consult with the fire weather meteorologist on duty prior to submitting a spot request.

The valid time will be determined at the time of the request. Most spots contain three periods, usually “TODAY”, “TONIGHT”, and “NEXT DAY”, e.g., “TODAY”, “TONIGHT”, and “THURSDAY”.

c.) Procedures – Internet-based spot forecast programs are the standard for requesting and retrieving spot forecasts and should be used when available. They are accessible from the individual websites of various NWS Forecast Offices serving the Southwest Area, or via the SWCC Fire Operations website.

When internet access is not available, spot forecasts may be requested via phone, or fax machine using the Backup Spot Forecast Request Form in Appendix F. Spot forecasts should be available within 60 minutes from the time the appropriate NWS office receives the request. NWS should be contacted immediately by telephone if a spot forecast is not available within this time frame.

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 with the spot request(s). NWS Spot and the backup form will provide blocks to fill this data in and will indicate which are absolutely essential to receive a spot forecast.

d.) Spot Forecast Feedback Requirement -- Responsibility for providing fireline observations for the validation of forecast accuracy rests with the fire management agencies, as outlined under, "Fireline Observations and Spot Forecast Feedback" on page 14.

3. Fire Weather Watches and Red Flag Warnings (RFW) – A Red Flag event is a critical combination of dry fuels and weather conditions that support extreme fire behavior. Red Flag Warnings are issued to identify Red Flag events which are highly likely, or imminent, usually within the following 24 hour period. Fire Weather Watches are issued to identify the elevated threat of similar conditions during the following 72-hour period. Specific objective criteria for Red Flag events are listed below. Fire management may also request that Red Flag Warnings or Fire Weather Watches be issued under extenuating circumstances (i.e., fuel conditions are so severe that marginally windy and dry conditions would lead to extreme fire behavior).

   a.) Criteria – Standardized criteria for issuance of Fire Weather Watches and Red Flag Warnings in the Southwest Area are a combination of weather and fire danger ratings. In the absence of overriding input from fire management personnel, a Red Flag event is defined by the following conditions occurring simultaneously for three or more hours across any portion of a fire weather zone:

      1.) 20-foot winds sustained at 20 mph or greater, or gusting to 35 mph or greater
      2.) Relative humidity of 15% or lower
      3.) NFDRS adjective fire danger rating of "High" or higher

   The following are assumed:

      - Sustained winds are considered relative to the midpoint of a forecast range (i.e. 15 to 25 mph meets criteria, 15 to 20 mph does not)
      - RH is considered relative to the minimum value in a given forecast

range. (i.e. 13 to 23% forecast for a zone meets criteria for those locations in the zone expected to be 15% or less)

- Wind forecasts are for the 20-foot level/10 minute time average and apply to RAWS properly sited and maintained, per NWCG National Fire Danger Rating System (NFDRS) Weather Station Standards.

b.) Product Format and Contents – Warnings and watches will conform to either the national standard per NWSI 10-401. See NWS Forecast Examples of a Red Flag Warning and a Fire Weather Watch (RFW) in Appendix B.

1.) Headline including description of watch/warning, description of valid location and time period for which watch/warning is valid.
2.) List of fire weather zones impacted
3.) Short discussion detailing causes and nature of event

c.) Procedures and Access - When Fire Weather Watches and Red Flag Warnings are issued they will be headlined in spot forecasts, the fire weather narrative and the appropriate zone sections where the conditions are expected. The headline will be in the same descriptive format as on the RFW product. 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 SWCC Predictive Services as soon as possible. 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 from websites of the NWS Forecast Offices serving the Southwest Area, or via SWCC Fire Operations and the NWS National Fire Weather websites.

4. NFDRS Forecasts (FWM) – The National Weather Service role in NFDRS is to provide 24 hour forecasted weather information that allows the NFDRS software to predict the next day's fire danger indices.

a.) Criteria for Issuance – NFDRS observations must be complete and available in WIMS by 1350 LST (1450 LDT) to be received in time for the NWS to produce a forecast. When NFDRS observations are received, the appropriate NWS office will issue forecasts for use by the NFDRS on a year-round basis. NFDRS stations that are not on time in WIMS will not have next day fire danger indices available.

b.) Content and Format – Complies with NWSI 10-4 and is outlined in Appendix A – NWS Forecast Examples: NFDRS for reference. Required meteorological elements for NFDRS forecasts are: State of Weather, Temperature, Humidity, Lightning Activity Level, Wind speed, and Precipitation Duration. The actual NWS NFDRS forecast product is used only by WIMS and is not viewed directly by fire management.

c.) 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, and may be a combination of zone trend, station trend or station specific forecasts. Zone and station trend forecasts will be favored over station specific forecasts. Where station specific point forecasts are issued, NWS will be responsible for taking reasonable actions to ensure forecasted values do not conflict with the historical possibility for those stations.

5. Interagency Participation - NWS offices within the Southwest Area are expected to provide representation at the annual regional AOP meeting, with proxy representation acceptable, and will be invited to serve as technical advisors on the Southwest Area Predictive Services Committee as appropriate. 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.

B. Special Services – NWS will provide and maintain a cadre of trained IMETs. A sufficient number of IMETs should be available from Southwest Area offices to support multiple incidents in May and June. At least one IMET from the offices that serve the Southwest Area should be available for dispatch between March 1st and August 1st.

C. 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 NWSI 10-405.

D. Individual Forecast Office Information

Northwest Arizona - Las Vegas, NV	http://www.wrh.noaa.gov/vef/fire.php
FIRE ZONES	AZ 101 and 102
SPOT FORECAST REQUEST	http://spot.nws.noaa.gov/cgi-bin/spot/spotmon?site=vef
NFDRS ZONES	301 and 311

Northern Arizona - Flagstaff, AZ	http://www.wrh.noaa.gov/fgz/fwx/fwx.php?wfo=fgz
FIRE ZONES	AZ 104 through 118, and AZ 137 through 140
SPOT FORECAST REQUEST	http://spot.nws.noaa.gov/cgi-bin/spot/spotmon?site=fgz
NFDRS ZONES	302, 303, 304, and 308

Southeast Arizona - Tucson, AZ	http://www.wrh.noaa.gov/twc/firewx.php
FIRE ZONES	AZ 146, 147 and 148
SPOT FORECAST REQUEST	http://spot.nws.noaa.gov/cgi-bin/spot/spotmon?site=twc
NFDRS ZONES	305 and 306

South-Central and Southwest Arizona - Phoenix, AZ	http://www.wrh.noaa.gov/psr/fire/index.php?wfo=psr

FIRE ZONES	AZ 131, 132, and 133 (also CA 230, 231, and 232)
SPOT FORECAST REQUEST	http://spot.nws.noaa.gov/cgi-bin/spot/spotmon?site=psr
NFDRS ZONES	307, 309, 310

North and Central New Mexico - Albuquerque, NM	http://www.srh.noaa.gov/abq/firewx/fw-3.php
FIRE ZONES	NM 101 through 109
SPOT FORECAST REQUEST	http://spot.nws.noaa.gov/cgi-bin/spot/spotmon?site=abq
NFDRS ZONES	351 through 359

South-Central and Southwest NM and Far West Texas - El Paso, TX	http://www.srh.weather.gov/epz/misc/firewx.php
FIRE ZONES	NM 110 through 113, and TX 055 and 056
SPOT FORECAST REQUEST	http://www.noaa.gov/cgi-bin/spot/spotmon?site=epz
NFDRS ZONES	360 through 363

Southeast New Mexico and Southwest Texas - Midland, TX	http://www.srh.noaa.gov/maf/Fire/index.php
FIRE ZONES	New Mexico Zones, and West Texas Zones
SPOT FORECAST REQUEST	http://spot.nws.noaa.gov/cgi-bin/spot/spotmon?site=maf
NFDRS ZONES and STATIONS	NM 364 and 365, portion of TX 364, points in Big Bend NP

West-Central Texas - Lubbock, TX	http://www.srh.noaa.gov/lub/fire/index.html
FIRE ZONES	West Texas Zones
SPOT FORECAST REQUEST	http://spot.nws.noaa.gov/cgi-bin/spot/spotmon?site=lub
NFDRS STATIONS	Caprock (418901) and Matador (418902)

Texas and Oklahoma Panhandles - Amarillo, TX	http://www.srh.noaa.gov/ama/fire_weather/index.htm
FIRE ZONES	West Texas and Panhandle Zones
SPOT FORECAST REQUEST	http://spot.nws.noaa.gov/cgi-bin/spot/spotmon?site=ama
NFDRS STATIONS	Cedar (Lake Meredith NP) and Bootleg (Deaf Smith County)
OTHER PRODUCTS	Fire Danger Statements

V. WILDLAND FIRE AGENCY SERVICES AND RESPONSIBILITIES

Wildland Fire Agency 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 – Interagency fire meteorologists at SWCC 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 produce integrated fire weather/fire danger assessments for the entire Southwest Area. The intent of Predictive Services is to provide strategic, regional and sub-regional information to assist in the preparedness, movement and allocation of firefighting resources. SWCC Predictive Services is the provider of fire danger and potential forecasts within the Southwest Area beyond the next day NFDRS forecasts provided by the NWS.

Predictive Services Products – All products and services are available from the SWCC Website.

1. Day 1 and Day 2 Area-Wide Fire Weather & Behavior Outlooks - Fire weather outlooks combine information from FCAMMS/Rocky Mountain Center, NWS and Predictive Services meteorologists into a day 1 and day 2 graphic of significant fire weather parameters. When the Fire Behavior Service Center is functioning at SWCC (Preparedness Level 3-4+), daily reports and maps of general fire behavior potential will be produced as well.

   Issuance Schedule: 1700 MST for the next day (primary), with updates as necessary by 1000 MST the following morning from April 1 – July 15, or as fire danger or activity warrants. Occasionally, products are issued upon request before and after peak season to support prescribed fires.

2. 7-Day Significant Fire Potential Outlook - Integrates fuel dryness, weather triggers and resource capability into statistically based large fire potential by Predictive Services Area (PSA). Includes general weather synopsis, fire potential discussion, resource discussion and anticipated resource demand outlook.

   Issuance Schedule: Daily by 1000 MST April 1 – July 15, or as fire danger or activity warrants, Monday through Friday by 1030 during the remainder of the year.

3. Monthly and seasonal fire potential outlooks - Utilizes all available weather, climate and fire danger information to make longer-term predictions of fire business potential. Monthly outlooks highlight the potential for significant fire activity and resource utilization relative to normal. Seasonal outlooks cover the following three months and highlight the trends relative to Above Normal significant fire potential only.

   Issuance Schedule (Monthly): Year round, issued around the first of each month and valid for that month. (i.e. outlook issued around January 1 is valid for January)

Issuance Schedule (Seasonal): Year round, issued concurrently with the monthly outlook and valid for the following three months. (i.e. outlook issued around January 1 is valid for February through April)

B. Program Management - Management of federal land management and fire agency fire weather programs and responsibilities.

1. RAWS/NFDRS - Regional RAWS Coordinator at SWCC will manage the interagency RAWS program for the Southwest Area. This includes regular monitoring of data quality, assisting with station maintenance and acquisition and development of appropriate training.
2. Liaison - Predictive Services Group Leader/Fire Weather Program Manager will be a liaison between field fire managers and various service providers including NWS, the private sector and the research community.

C. Monitoring, Feedback and Improvement of Fire Weather Information – SWCC meteorologists and designated fire management liaisons (listed in Section III) will monitor all sources of fire weather information to ensure consistency, quality and applicability. Where issues arise, data will be archived and brought to the attention of the provider to enhance awareness and work towards improvement. Some priorities include:

- NFDRS forecast consistency with station climate histories.
- General forecast parameter consistency across the Southwest Area, especially across forecast area and land management unit boundaries.
- Accuracy and applicability of Red Flag Warnings.
- Quality of fireline observations and spot forecast feedback.
- Overall adherence to policies and procedures set forth in AOP.

D. Technology Transfer – SWCC 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
- Proper use of RAWS and NFDRS
- Research and development to advance fire meteorology

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

F. WIMS ID's for NFDRS Stations – All NFDRS observation stations are assigned a 6-digit NWS station identification number for use in WIMS. The SWCC RAWS Coordinator must be contacted for assignment of a 6-digit number for any new station, or for any changes in location made to existing stations that already have an NWS ID number. The RAWS Coordinator will obtain appropriate 6-digit ID's and will notify NWS, the Arizona Department of Environmental Quality

and other appropriate entities of any new or relocated NFDRS stations. A listing of Current NFDRS stations and IDs is included in the Appendices.

G. Fire Weather Observations

1. RAWS & NFDRS Observations

Fire weather observations for stations that desire next day forecasts will be entered into WIMS no later than 1350 LST (1450 LDT). 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 proper siting of all stations is a goal in the Southwest Area. Any new or relocated stations will be correctly sited in a long-term effort to address this issue. Regardless of station age or location, annual RAWS maintenance requirements will be strictly adhered to.

2. Fireline Observations & Spot Forecast Feedback

Fireline Observations – Fireline observations are required when requesting a spot forecast. Fire management agency personnel will take standard fireline observations of temperature, humidity, wind speed and direction and weather/sky condition consistent with guidance provided in NFES 2140, "Weather Station Handbook - an Interagency Guide for Wildland Managers".

Spot Forecast Feedback and Validation - Feedback on spot forecasts is required to validate forecasts and improve accuracy. The following observational information is required to be made available to the appropriate NWS office the same day any spot forecast is issued for prescribed burn or wildland fire use (WFU) purposes.

Feedback on forecasts issued for wildfires is essential.

Requirement - the character of temperature, humidity and wind affecting the burn period. Information made available to NWS within 24 hours of forecast issuance or before issuance of next spot forecast, whichever is first. At a minimum, the following must be included (assuming daytime burn):

a.) Maximum temperature

b.) Minimum Relative Humidity

c.) 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.

Example of Minimum Required Feedback for Daytime Period:
Maximum temp = 61
Minimum RH = 18 %
Afternoon winds = South 2-4G8, shifting to west at 1500 hours

Acceptable Methods of Providing Feedback:

a.) Faxed copies of fireline (belt weather) observations.
b.) Phone call to appropriate NWS office
c.) Submission of required information via "remarks" section of internet spot forecast (feedback example).
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 so NWS can download the data from the Internet.

H. Liaisons to Southwest Area Predictive Services Committee – The Predictive Services Committee of the Southwest Area Coordinating Group will identify fire management agency contact points for each NWS Weather Forecast Office (WFO). These persons will act as primary liaisons between each NWS office, the fire management units they serve, and the Predictive Services Committee. Liaisons will provide single points of contact to aid in communication, organization of local customer meetings and the elevation of local issues to the Predictive Services Committee, as appropriate. Predictive Services Committee liaisons are listed in the organizational directory.

VI. JOINT RESPONSIBILITIES

A. Training – Meteorological training assistance for NWCG and other courses will be provided jointly. NWS has priority for training conducted by local units while SWCC meteorologists have priority for training conducted on a sub-regional or regional basis. Requests for training from NWS offices should be directed to that office's Meteorologist-in-Charge. Requests for training from SWCC meteorologists should be directed to the Predictive Services Group Leader/Fire Weather Program Manager. In all cases, sufficient advance notice should be given to allow for scheduling and proper preparation.

The following conditions must be met in order for NWS to provide training for non-federal agencies:

- Sufficient lead-time to schedule an instructor must be given to an NWS office's Meteorologist-in-Charge.
- The NWS instructor must be the only one available to provide the training. (i.e., there are no land management agencies or private meteorologists who are ready, willing and able to provide the training.) The Southwest Area Predictive Services Group Leader will be the contact concerning the availability of non-NWS fire weather instructors.
- NWS must be able to be reimbursed for associated overtime and travel costs.

B. Incident Response - The NWS is the provider of Incident Meteorologists (IMETs). In general,

Southwest Area NWS IMETs will be requested to respond to all incidents within the Southwest Area. Costs incurred by NWS in providing IMET support will be borne by the requesting agency. Predictive Services meteorologists can respond to incidents when the NWS cannot provide a certified IMET within 24-hours of request receipt by the National Fire Weather Operations Coordinator (NFWOC). In these instances, and when requested by incident command staff, Predictive Services meteorologists will provide forecast support as a Technical Specialist until the arrival of a certified NWS IMET. Technical Specialists will not be used as a substitute for NWS IMETs. Forecast support will revert to the NWS IMET after reasonable transition period. Through coordination with the NWS National Fire Weather Operations Coordinator (NFWOC) at NIFC, certified fire management agency IMETs may be utilized under special circumstances.

All requests for IMETs will be processed through SWCC and the following information will be provided to the requested IMET:

1. Name of fire
2. Location of fire
3. Directions to location where the IMET is to report and Fire Camp Location
4. Name of Incident Commander, Plans Chief and Fire Behavior Analyst if available.
5. Request and Resource Order number for IMET
6. Verification that "Special Needs" section on Resource Order should include authorization for use of a rental vehicle, cell phone, computer equipment and the All Hazards Meteorological Response System (AMRS).

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 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.

C. Briefings – Either NWS or SWCC meteorologists will conduct briefings upon request, time and resources permitting. SWCC meteorologists will provide briefings for strategic planning purposes and will refer the requesting entities to the local NWS office(s) for specific, operationally oriented information.

D. Fire Weather Conference Calls

1. Fire Weather Conference Calls (FWCCs) will be hosted by Southwest Area Predictive Services to enhance situational awareness and increase communication.
2. FWCCs will be held daily during peak fire season, periods of enhanced fire activity or potential, and other critical fire weather situations as appropriate.
3. WFOs, NWS western and southern regional and national fire weather program personnel, SPC, and deployed IMETs will be invited and encouraged to participate, though participation is entirely optional for all parties.
4. Initiation and cancellation of daily FWCCs will be accomplished through phone or e-mail notification of above parties by Predictive Services. It will be the responsibility of the WFOs to pass along the information to any IMETs deployed within their CWAs.

5. Once initiated, calls will be held daily at 11:45 am MDT (1745 UTC) until cancelled.
6. Calls will be run by Predictive Services and will follow the format below. All attempts will be made to keep the calls to 15 minutes or less and address the following:

    - Overview of fire activity and fire potential situation by Predictive Services
    - Regional synopsis of current and expected fire weather situation by Predictive Services, focusing on Critical Fire Weather patterns and/or other pertinent forecast concerns from a Geographic Area perspective.
    - Round robin where all participants will have the opportunity to ask questions and share information regarding forecast concerns, forecast differences, etc.

7. Recordings of daily FWCCs will be available for playback via the Internet.
8. Details on logistics regarding access to the conference calls and the call recordings will be provided when the FWCCs are initiated by Predictive Services.

VII. EFFECTIVE DATES OF THE AOP

Roughly May 1, 2008 to April 15, 2009.

Strictly, 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.

VIII. AGENCY SIGNATURES (*On file*)

_____ _____

Chair, Predictive Services Committee — Date
Southwest Area Coordinating Group

_____ _____

Fire Weather Program Manager — Date
NWS Western Region Headquarters

_____ _____

Manager, Regional Fire and Aviation Programs — Date
NWS Southern Region Headquarters

IX. APPENDICES

A. APPENDIX - FORECAST PARAMETER DEFINITIONS

1. General Parameters

Sky/weather – Cloud cover (day or night) expressed as a percentage, and weather descriptors that include rain, snow, showers, thunderstorms, etc. Cloud cover is defined as follows:

Sunny (day), Clear (night) – less than 6% cloud cover
Sunny (day), Mostly clear (night) - 6% to 25% cloud cover
Mostly sunny (day), Partly cloudy (night) - 26% to 50% cloud cover
Partly sunny (day) / Mostly cloudy (night) - 51% to 69% cloud cover
Mostly cloudy to Overcast (day or night) - greater than 70% 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 (altered by local terrain and surface roughness) that is measured by instrumentation and adheres to standards set by NWCG for the RAWS program and NFDRS. In practice, any surface wind forecast 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.

10,000 foot MSL Wind – Synoptic scale wind speed and direction representative of winds at roughly 10,000 feet above mean sea level, which are generally unaltered by surface frictional effects. Equivalent to “ridgetop wind”, “wind aloft”, “free-air wind” and “general wind”.

Chance of Rain – Probability of occurrence of 0.01” or greater liquid equivalent precipitation. In the case of convective cells, this will pertain to the areal coverage of cells producing rainfall.

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 **does not** include the effects of wind on fire spread.

HAINES INDEX POTENTIAL FOR LARGE FIRE GROWTH

2 or 3	Very Low
4	Low
5	Moderate
6	High

A. APPENDIX - FORECAST PARAMETER DEFINITIONS

2. Ventilation

Basic ventilation information is used by the states of Arizona and New Mexico in considering the potential for smoke impacts from wildland fires. The following are terms and definitions necessary to understanding ventilation data and values:

Mixing height or mixing depth: The height to which relatively vigorous mixing occurs due to heating. Units are in feet above ground level (AGL), with ground level being the elevation above mean sea level (MSL) of the upper-air site. It is important that wildland fire managers note the difference in elevations between the burn site and the referenced upper-air sight, and then modify the provided mixing depths accordingly.

Transport winds: A measure of the average rate of the horizontal transport of air within the mixing layer. Units are in knots (1 knot = 1.15 mph). An average wind direction (the direction from which the wind is blowing) is provided. If winds are light and variable as they likely will be in a critical situation, then it may be best to consider the normal drainage winds.

Ventilation: The product of the mixing height and the transport wind speeds. It is a measure of the volume rate of horizontal transport of air within the mixing layer per unit distance normal to the winds. Units are in knot-feet, though some regulatory entities use meters²/second. Ventilation values are established at a state level and used as breakpoints for general Ventilation or Dispersion Categories that are used for smoke management or regulatory purposes.

Ventilation (Dispersion) Categories and Values		
Adjective Category	Knot - Feet	Meters²/Second
ARIZONA		
Excellent	> 100,000	> 15,700
Very Good	70,000 – 99,999	11,000 – 15, 699
Good	40,000 – 69,000	6,300 – 10,999
Fair	20,000 – 39,999	3,100 – 6,299
Marginal	8,500 – 19,999	1,300 – 3,099
Poor	< 8,500	< 1,300
NEW MEXICO		
Excellent	> 150,000	> 23,500
Very Good	100,000 – 149,999	15,700 – 23,499
Good	60,000 – 99,999	9,400 – 15,699
Fair	40,000 – 59,999	6,300 – 9,399
Poor	< 40,000	< 6,300

A. APPENDIX – FORECAST PARAMETER DEFINITIONS

3. Lightning Activity Level (LAL)

LIGHTNING ACTIVITY LEVEL GUIDE

[1] Individual storm cell cloud-to-ground lightning discharges

LAL	Cloud and Storm Development	Areal Coverage	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 %	----	----	----

B. APPENDIX – NWS FORECAST EXAMPLES

The most current products issued by the NWS forecast offices can be viewed by clicking on the appropriate office and product identifier in the table below. This table can also be accessed and bookmarked by going to the SWCC Fire operations website at the following web address: http://gacc.nifc.gov/swcc/predictive/weather/wx_links/NWSmatrix.htm

1. Fire Weather Planning Forecast (FWF) (Click on link for information)
2. Area Forecast Discussion (AFD)
3. Red Flag Warning / Fire Weather Watch (RFW) (Click on link for information)
4. Spot Forecast (FWS) (Click on link for information)
5. Internet Spot Forecast Request Site (Click on link for information)

VEF Las Vegas	**FGZ** Flagstaff	**PSR** Phoenix	**TWC** Tucson	**ABQ** Albuquerque	**EPZ** El Paso	**MAF** Midland	**LUB** Lubbock	**AMA** Amarillo
FWF	FWF	FWF	FWF	FWF	FWF	FWF	FWF	FWF
AFD	AFD	AFD	AFD	AFD	AFD	AFD	AFD	AFD
RFW	RFW	RFW	RFW	RFW	RFW	RFW	RFW	RFW
FWS	FWS	FWS	FWS	FWS	FWS	FWS	FWS	FWS
SPOT REQ	SPOT REQ	SPOT REQ	SPOT REQ	SPOT REQ	SPOT REQ	SPOT REQ	SPOT REQ	SPOT REQ

B. APPENDIX – NWS FORECAST EXAMPLES

6. NFDRS Forecast (FWM)

a. **ZONE/FCST*** Shows whether this forecast is 24 hour trend (ZONE) or specific forecast values (FCST). Trend forecasts can apply to either NFDRS zones or individual stations. Specific point forecast values apply only to individual NFDRS stations and are done where only a few observations are available.
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*** State of Weather valid at 1300 LST tomorrow. Valid entries are:

0 clear
1 scattered clouds (1/8 to 4/8)
2 broken clouds (5/8 to 7/8)
3 overcast clouds (more than 7/8)
4 foggy
5 drizzle
6 raining
7 snowing or sleeting
8 showers (in sight or at the station)
9 thunderstorm
(Categories 5, 6, or 7 sets NFDRS index to 0)

f. **TEMP*** Temperature in deg F valid at 13 LST (or temperature trend + or -)
g. **RH*** Relative humidity in percent valid at 13 LST (or RH trend + or -)
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 (or wind speed trend + or -, 20 ft level/10 minute average)
k. **10HR** 10 hour timelag fuel moisture in percent valid at 13 LST (or trend + or -)
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!)

*** = Required forecast element for NFDRS # = Required forecast element for select NWS offices only**

The NFDRS Forecast will follow the comma delimited format as shown:

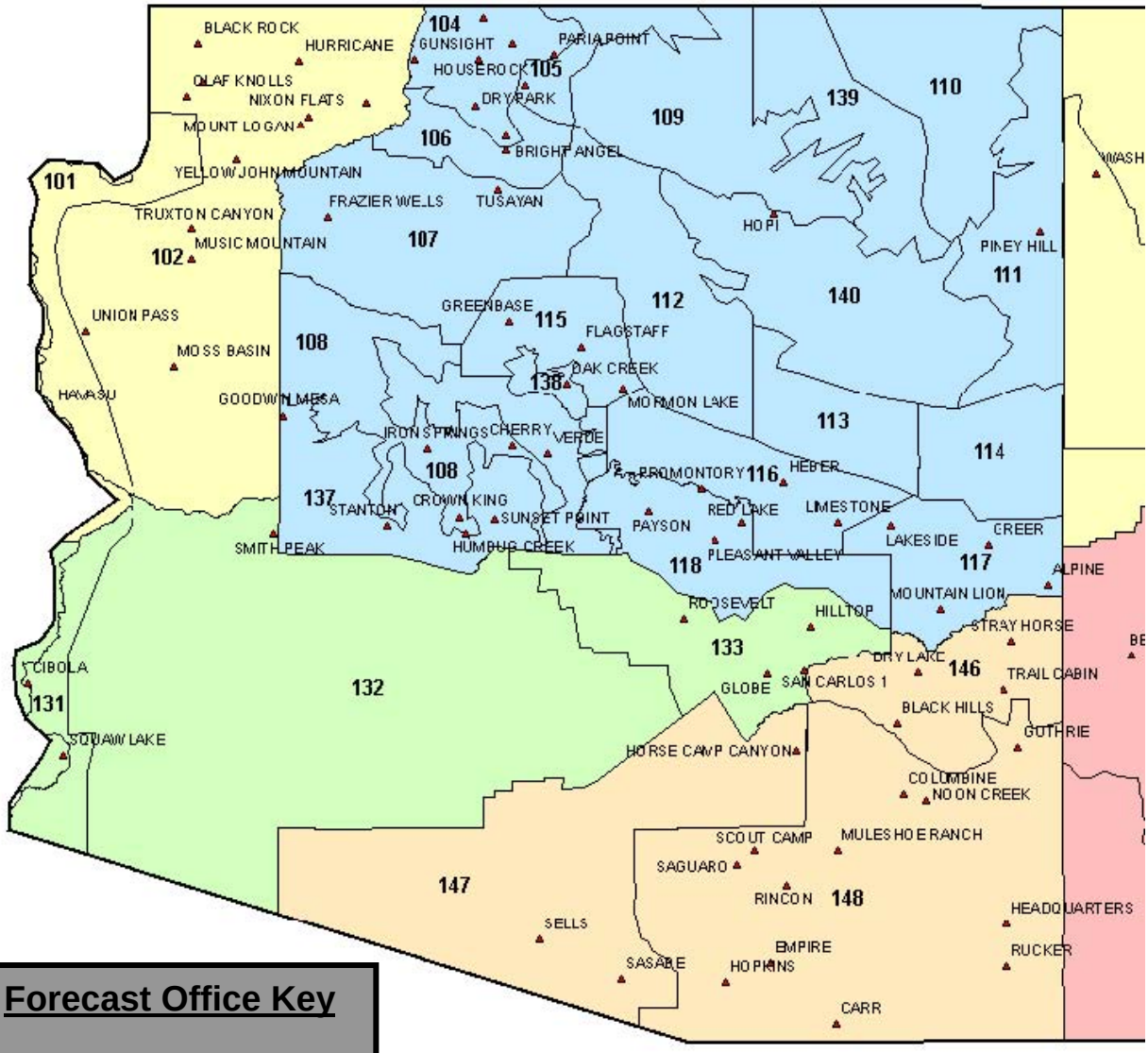
ZONE/FCST,NO,YYMMDD,13,WX,TEMP,RH,LAL1,LAL2,WIND,10HR,TX,TN,RHx,RHn, PD1, PD2,WETFLAG

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

FNUS85 KBOI DDHHMM
FWMBOI

ZONE,404,011027,13,0,3,0,1,1,0,0,,,,,0,0,N **Zone trend**
ZONE,102708, 011027,13,0,4,-5,1,1,,,,,0,0,N **Station trend**
FCST,102709,011027,13,0,84,15,1,1,12,5,87,60,50,12,0,0,N **Station specific**

C. APPENDIX – NARRATIVE FIRE WEATHER ZONE MAPS (Arizona)



Forecast Office Key

WFO Las Vegas, NV
WFO Flagstaff, AZ
WFO Phoenix, AX
WFO Tucson, AZ

Southwest Area Red Flag Criteria

The following conditions occurring simultaneously for three or more hours across any portion of a fire weather zone:

- 20 ft. winds sustained at 20 mph or greater OR gusting to 35 mph or greater
- Relative humidity 15% or lower
- NFDRS adjective fire danger rating of “High” or higher

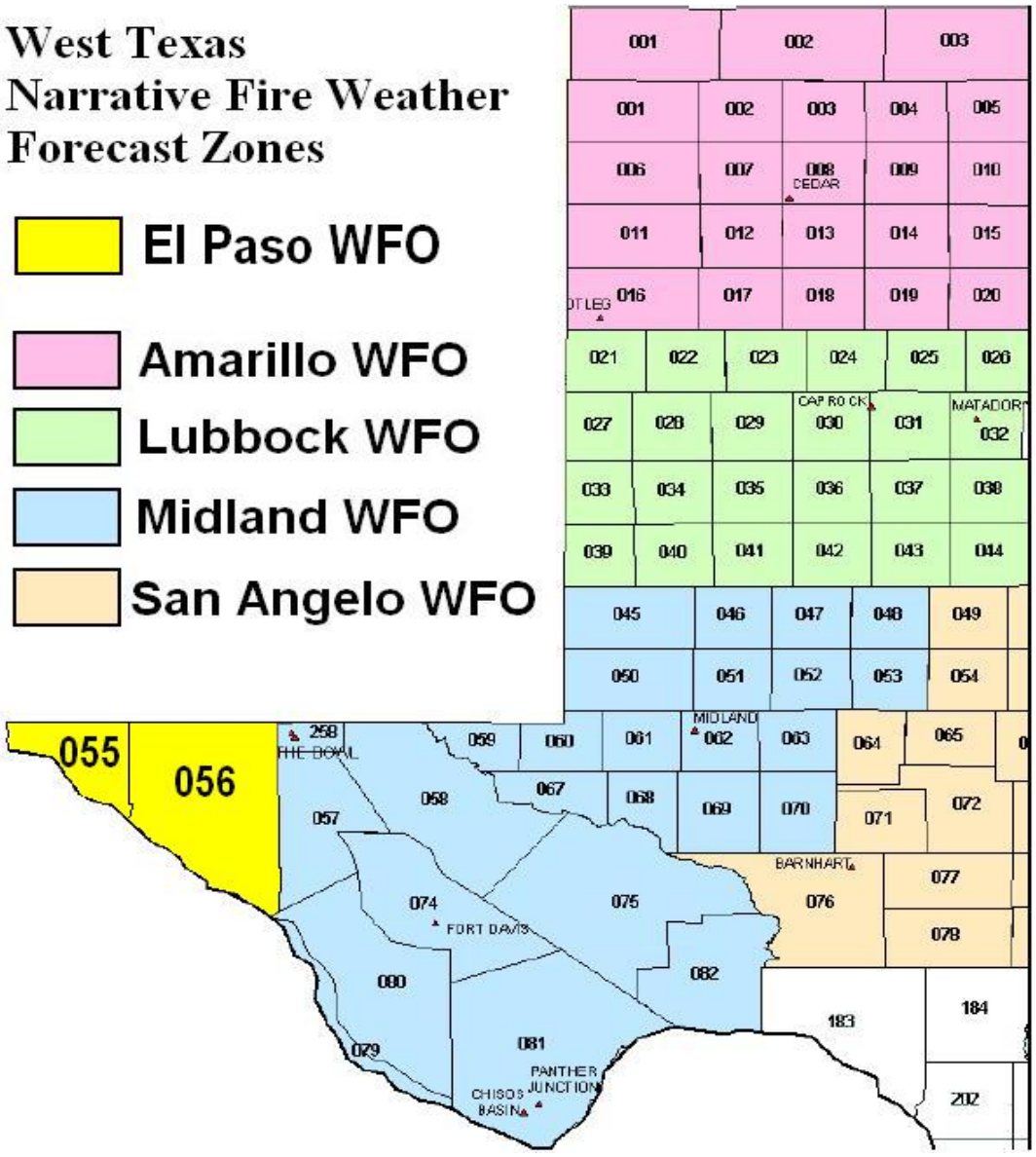
C. APPENDIX – NARRATIVE FIRE WEATHER ZONE MAPS (New Mexico Only)

Southwest Area Red Flag Criteria

The following conditions occurring simultaneously for three or more hours across any portion of a fire weather zone:

- 20 ft. winds sustained at 20 mph or greater OR gusting to 35 mph or greater
- Relative humidity of 15% or lower
- NFDRS adjective fire danger rating of “High” or higher

C. APPENDIX – NARRATIVE FIRE WEATHER ZONE MAPS (West Texas Only)

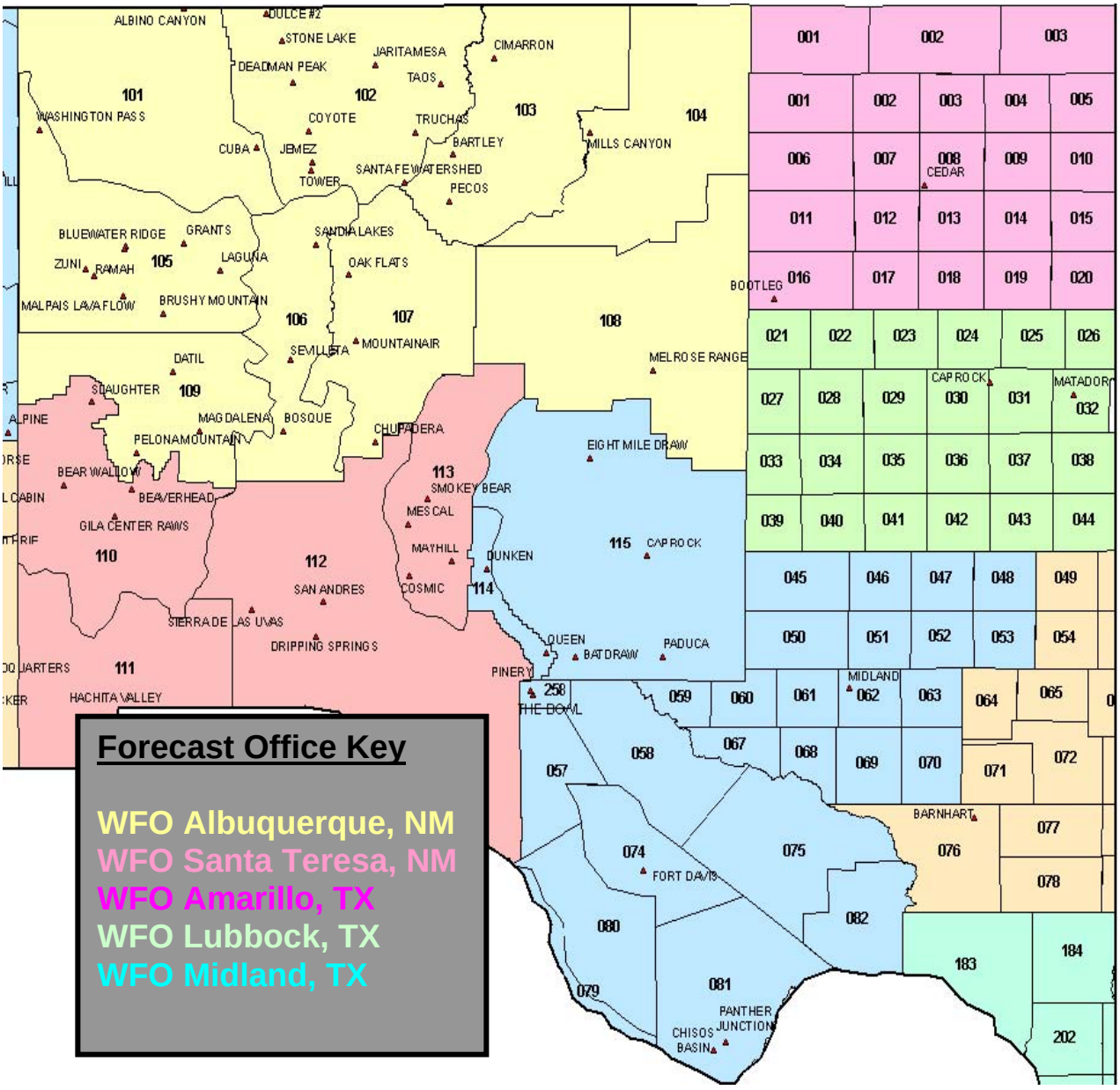


Southwest Area Red Flag Criteria

The following conditions occurring simultaneously for three or more hours across any portion of a fire weather zone:

- 20 ft. winds sustained at 20 mph or greater OR gusting to 35 mph or greater
- Relative humidity of 15% or lower
- NFDRS adjective fire danger rating of “High” or higher

C. APPENDIX - NARRATIVE FIRE WEATHER ZONE MAPS (NM, TX and OK)

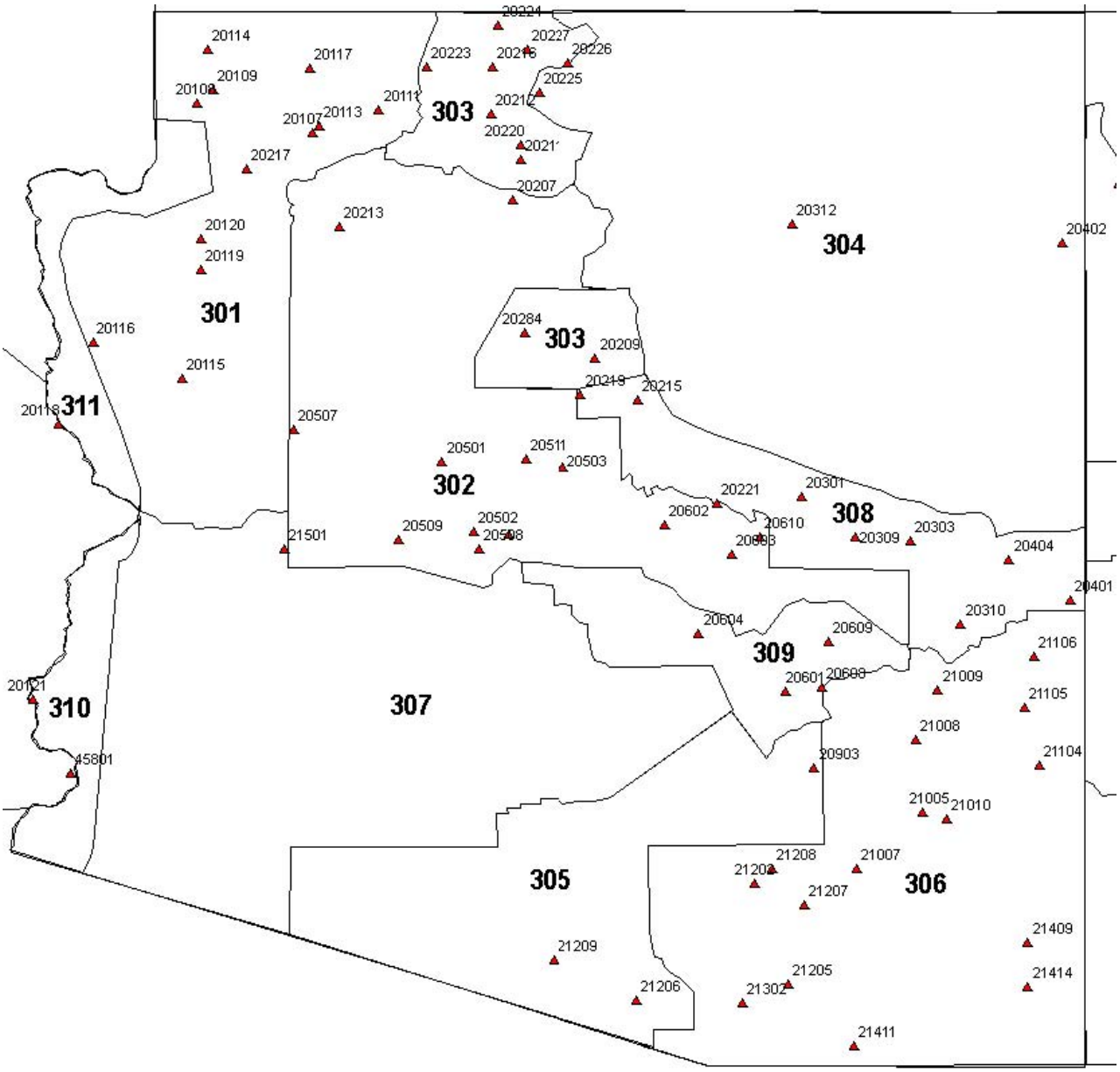


Southwest Area Red Flag Criteria

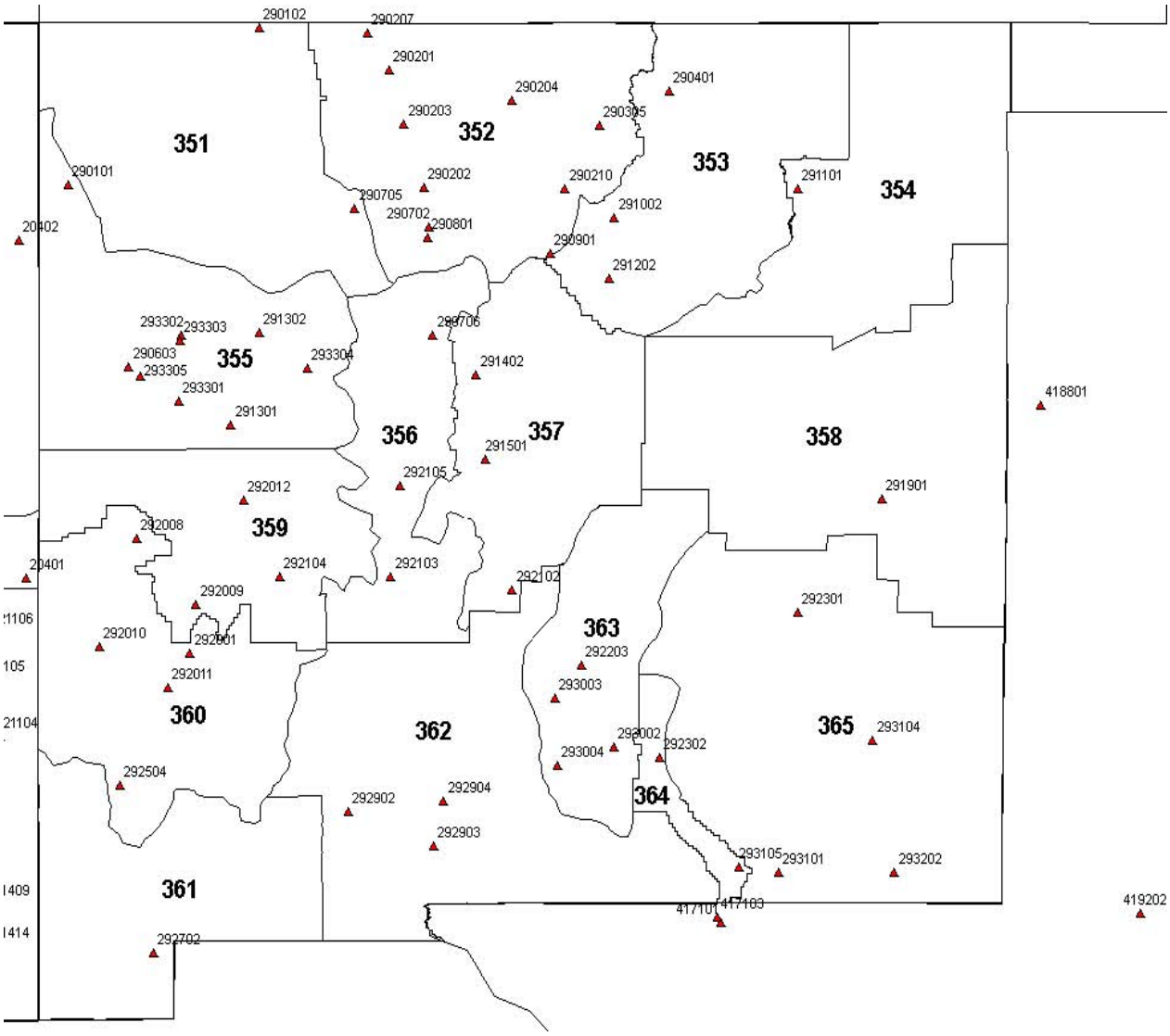
The following conditions occurring simultaneously for three or more hours across any portion of a fire weather zone:

- 20 ft. winds sustained at 20 mph or greater OR gusting to 35 mph or greater
- Relative humidity of 15% or lower
- NFDRS adjective fire danger rating of “High” or higher

D. APPENDIX – NFDRS ZONE MAPS (Arizona)



D. APPENDIX – NFDRS ZONE MAPS (New Mexico)



E. APPENDIX – Experimental Digital Services from the National Weather Service

Gridded Weather Input for Fire Area Simulation Model - (FARSITE)

Availability – FARSITE data will be generated upon request by a fire agency official, usually concurrent with a spot forecast request. When a forecaster creates a spot forecast, FARSITE weather and wind data files will be automatically generated and sent to the appropriate WFO fire weather web page. If a user does not need a full spot forecast, they can call the WFO responsible for the geographic area of the request. The forecaster can then produce FARSITE data by entering fire location and name. Again, the data is produced and sent to the web automatically.

Example: National Weather Service - NWS Phoenix, Arizona

http://www.wrh.noaa.gov/firewx/farsite/farsite.php?wfo=psr

Digital Weather Elements in GIS Format

All of the NWS Offices in Region 3 will provide increased digital weather forecast information in 2008. This information will include smoke dispersion elements including Mixing Height, Transport Winds and Ventilation Index. This information will be available in the "Graphical Forecast" section of the office web pages. The information is also available in GIS-friendly format. Please contact your NWS office or SWCC for more information.

Fire Weather Point Forecast Matrix Product (PFM)

1. Graphical map for generating a PFM from various sites will be found on each NWS office fire weather web site. SWCC will also provide a Region III wide graphical map to which the product will be linked.

   Example of NWS link: http://www.wrh.noaa.gov/firewx/fwpfm/fwpfm.php?wfo=psr

   SWCC link: Under development to be placed on SWCC Weather Page (http://gacc.nifc.gov/swcc/predictive/weather/weather.htm)

2. Some format differences within the product may be found across Region III.

   Example: http://www.wrh.noaa.gov/vef/firematrix.php?loc=orientalwash

   Example: http://www.srh.noaa.gov/maf/Fire/getpfw.php?loc=midland

3. Forecasts will be based on a 2.5 or 5 square km grid box for which the RAWS site is located.

F. APPENDIX – BACKUP SPOT FORECAST REQUEST FORM AND INSTRUCTIONS

(click on hyperlink above to access and print form)

WS FORM D-1 (1-2005) (Supersedes Previous Editions)

SPOT REQUEST

(See reverse for instructions)

U.S. Department of Commerce
NOAA
National Weather Service

Please call the NWS Weather Forecast Office (WFO) when submitting a request and also after you receive a forecast to ensure request and forecast were received.
Please provide feedback to WFO on forecast.

1. Time†	2. Date	3. Name of Incident or Project	4. Requesting Agency

5. Requesting Official	6. Phone Number	7. Fax Number	8. Contact Person

9. Ignition/Incident Time and Date

10. Size (Acres)

11. Type of Incident
- ☐ Wildfire
- ☐ Prescribed Fire
- ☐ Wildland Fire Use (WFU)
- ☐ HAZMAT
- ☐ Search And Rescue (SAR)

12. Reason for Spot Request (choose one only)
- ☐ **Wildfire**
- ☐ **Non-Wildfire** Under the Interagency Agreement for Meteorological Services (USFS, BLM, NPS, USFWS, BIA)
- ☐ **Non-Wildfire** State, tribal or local fire agency working in coordination with a federal participant in the Interagency Agreement for Meteorological Services
- ☐ **Non-Wildfire** Essential to public safety, e.g. due to the proximity of population centers or critical infrastructure.

13. Latitude/Longitude:

14. Elevation (ft, Mean Sea Level)
Top: **Bottom:**

15. Drainage

16. Aspect

17. Sheltering
- ☐ Full
- ☐ Partial
- ☐ Unsheltered

18. Fuel Type: __Grass __Brush __Timber __Slash __Grass/Timber Understory __Other_____
Fuel Model: 1,2,3 4,5,6,7 8,9,10 11,12,13 2,5,8

19. Location and name of nearest weather observing station (distance & direction from project):

20. Weather Observations from project or nearby station(s): (Winds should be in compass direction e.g. N, NW, etc.)

Place	Elevation	†Ob Time	20 ft. Wind Dir	20 ft. Wind Speed	Eye Level Wind. Dir	Eye Level Wind. Speed	Temp. Dry	Temp. Wet	Moisture RH	Moisture DP	Remarks *(Relevant Weather, etc)*

21. Requested Forecast Period Date

Start _____

End _____

Forecast needed for:
- ☐ Today
- ☐ Tonight
- ☐ Day 2
- ☐ Extended

22. Primary Forecast Elements (Check all that are needed) *(for management ignited wildland fires, provide prescription parameters):*

	Needed:
Sky/Weather	☐
Temperature	☐
Humidity	☐
20 ft Wind	☐
Valley	☐
Ridge Top	☐
Other (Specify in #23)	☐

23. Remarks (other needed forecast elements, forecast needed for specific time, etc.)

24. Send Forecast to:
ATTN:

25. Location:

26. Phone Number:
Fax Number:

27. Remarks (Special requests, incident details, Smoke Dispersion elements needed, etc.):

EXPLANATION OF SYMBOLS: † Use 24-hour clock to indicate time. Example: 10:15 p.m. = 2215; 10:15 a.m. = 1015
Indicate local standard time or local daylight time

WS FORM D-1, January 2005 INSTRUCTIONS:

I. Incident Personnel:

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

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

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

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

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

G. APPENDIX – CATALOG OF RAWS AND NFDRS OBSERVATION LOCATIONS
Permanent Stations and Locations Sorted by NFDRS Zone

Name	NWS ID	Agency	Latitude	Longitude	Elev	NESSID	PSA	CWA	FWF_Zone	NFDRS_Zone
MOUNT LOGAN	20107	BLM	36.3472	-113.1989	7605	3258C0E0	SW01	VEF	AZ102	301
OLAF KNOLLS	20108	BLM	36.5072	-113.8161	2900	3258F57A	EB13	VEF	AZ102	301
TWEEDS POINT	20109	BLM	36.5819	-113.7319	5200	32595778	EB13	VEF	AZ102	301
ROBINSON TANK	20111	BLM	36.4706	-112.8414	5560	32591472	SW01	VEF	AZ102	301
NIXON FLATS	20113	BLM	36.3883	-113.1581	6500	327C4220	SW01	VEF	AZ102	301
BLACK ROCK	20114	BLM	36.7944	-113.7567	7080	3257E09E	EB13	VEF	AZ102	301
MOSS BASIN	20115	BLM	35.0336	-113.8925	5920	3258B670	SW02	VEF	AZ102	301
UNION PASS	20116	BLM	35.2247	-114.3747	3520	32596200	SW02	VEF	AZ102	301
HURRICANE	20117	BLM	36.6992	-113.2072	5445	325883EA	EB13	VEF	AZ102	301
MUSIC MOUNTAIN	20119	BLM	35.6147	-113.7939	5420	3258E60C	SW02	VEF	AZ102	301
TRUXTON CANYON	20120	BIA	35.7825	-113.7942	5350	327C873E	SW02	VEF	AZ102	301
YELLOW JOHN MOUNTAIN	20217	BLM	36.1550	-113.5494	6160	325FB444	SW01	VEF	AZ102	301
TUSAYAN	20207	USFS	35.9900	-112.1200	6697	328305AC	SW01	FGZ	AZ107	302
FRAZIER WELLS	20213	BIA	35.8456	-113.0550	6770	5212A5E6	SW01	FGZ	AZ107	302
IRON SPRINGS	20501	USFS	34.5853	-112.5019	5000	32832340	SW02	FGZ	AZ108	302
CROWN KING	20502	USFS	34.2083	-112.3333	5900	325E30AA	SW02	FGZ	AZ108	302
VERDE	20503	USFS	34.5539	-111.8492	3100	326C2058	SW06N	FGZ	AZ137	302
GOODWIN MESA	20507	BLM	34.7575	-113.2969	4200	32581688	SW02	FGZ	AZ137	302
HUMBUG CREEK	20508	BLM	34.1164	-112.3006	5250	3258736E	SW02	FGZ	AZ108	302
STANTON	20509	BLM	34.1667	-112.7333	3600	3259329E	SW02	FGZ	AZ137	302
SUNSET POINT	20510	BLM	34.1953	-112.1417	2960	3259440E	SW02	FGZ	AZ137	302
CHERRY	20511	USFS	34.5964	-112.0481	5100	3233B7EA	SW02	FGZ	AZ108	302
PAYSON	20602	USFS	34.2431	-111.3028	4975	3260F7AC	SW06N	FGZ	AZ118	302
PLEASANT VALLEY	20603	USFS	34.0869	-110.9419	5050	32338270	SW06N	FGZ	AZ118	302
RED LAKE	20610	USFS	34.1814	-110.7892	6200	3331504E	SW05	FGZ	AZ118	302
FLAGSTAFF	20209	USFS	35.1414	-111.6719	7000	3283D3C4	SW05	FGZ	AZ115	303
BRIGHT ANGEL	20211	NPS	36.2047	-112.0789	8134	FA4520F4	SW01	FGZ	AZ106	303
DRY PARK	20212	USFS	36.4500	-112.2400	8706	32390536	SW01	FGZ	AZ104	303
WARM SPRINGS CANYON	20216	USFS	36.7000	-112.2300	8010	32401B62	EB13	FGZ	AZ104	303
LINDBERGH HILL	20220	NPS	36.2856	-112.0786	8800	FA45156E	SW01	FGZ	AZ104	303
GUNSIGHT	20223	BLM	36.7044	-112.5833	5280	32582312	EB13	FGZ	AZ104	303
BUCKSKIN MTN	20224	BLM	36.9306	-112.1997	6400	32590704	EB13	FGZ	AZ104	303
PARIA POINT	20226	BLM	36.7278	-111.8219	7235	32500158	EB13	FGZ	AZ104	303
FOUR SPRINGS	20227	BLM	36.7939	-112.0422	6560	324FF0D0	EB13	FGZ	AZ104	303
GREENBASE	20284	USFS	35.2742	-112.0597	6923	323923DA	SW05	FGZ	AZ115	303
HOUSEROCK	20225	BLM	36.5644	-111.9781	5400	32586018	EB13	FGZ	AZ105	304
HOPI	20312	BIA	35.8625	-110.6150	5602	327CE2D8	SW04	FGZ	AZ140	304
PINEY HILL	20402	BIA	35.7608	-109.1678	8102	327A01E4	SW04	FGZ	AZ111	304
HORSE CAMP CANYON	20903	BLM	32.9375	-110.4961	4040	32585582	SW06S	TWC	AZ147	305
SASABE	21206	FWS	31.6908	-111.4500	3500	83712434	SW06S	TWC	AZ147	305
SELLS	21209	BIA	31.9100	-111.8975	2366	327C64CC	SW03	TWC	AZ147	305
COLUMBINE	21005	USFS	32.7039	-109.9139	9521	326B91E2	SW06S	TWC	AZ148	306
MULESHOE RANCH	21007	BLM	32.4000	-110.2708	4560	3258D396	SW06S	TWC	AZ148	306

Name	NWS ID	Agency	Latitude	Longitude	Elev	NESSID	PSA	CWA	FWF_Zone	NFDRS_Zone
BLACK HILLS	21008	BLM	33.0867	-109.9506	3300	327D40DA	SW06S	TWC	AZ146	306
DRY LAKE	21009	BIA	33.3597	-109.8331	7428	5210B364	SW06S	TWC	AZ146	306
NOON CREEK	21010	USFS	32.6678	-109.7881	4925	32330464	SW06S	TWC	AZ148	306
GUTHRIE	21104	BLM	32.9500	-109.2833	6340	32583064	SW06S	TWC	AZ148	306
TRAIL CABIN	21105	USFS	33.2667	-109.3683	6279	324747F8	SW08	TWC	AZ146	306
STRAY HORSE	21106	USFS	33.5406	-109.3169	7020	327FF6A0	SW08	TWC	AZ146	306
SAGUARO	21202	USFS	32.3167	-110.8133	3100	3282F7D2	SW06S	TWC	AZ148	306
EMPIRE	21205	BLM	31.7806	-110.6347	4650	325805FE	SW06S	TWC	AZ148	306
RINCON	21207	NPS	32.2056	-110.5481	8240	FA60D65E	SW06S	TWC	AZ148	306
SCOUT CAMP	21208	USFS	32.3981	-110.7250	7554	3233A49C	SW06S	TWC	AZ148	306
HOPKINS	21302	USFS	31.6753	-110.8800	7120	327FB5AA	SW06S	TWC	AZ148	306
HEADQUARTERS	21409	NPS	32.0000	-109.3500	5400	FA61A234	SW06S	TWC	AZ148	306
CARR	21411	USFS	31.4450	-110.2800	5400	3238F748	SW06S	TWC	AZ148	306
RUCKER	21414	USFS	31.7611	-109.3486	5700	3242F3B6	SW06S	TWC	AZ148	306
SMITH PEAK	21501	BLM	34.1158	-113.3472	2500	327D7540	SW02	PSR	AZ132	307
MORMON LAKE	20215	USFS	34.9139	-111.4428	7400	32339106	SW05	FGZ	AZ115	308
OAK CREEK	20219	USFS	34.9417	-111.7517	4924	326326CA	SW05	FGZ	AZ138	308
PROMONTORY	20221	USFS	34.3617	-111.0200	7800	326BD2E8	SW05	FGZ	AZ118	308
HEBER	20301	USFS	34.3978	-110.5644	6635	326F2756	SW05	FGZ	AZ116	308
LAKESIDE	20303	USFS	34.1600	-109.9800	7000	32840798	SW05	FGZ	AZ117	308
LIMESTONE CANYON	20309	BIA	34.1789	-110.2736	6800	5211D478	SW05	FGZ	AZ116	308
MOUNTAIN LION	20310	BIA	33.7125	-109.7097	5483	327C012A	SW08	FGZ	AZ117	308
ALPINE	20401	USFS	33.8417	-109.1222	8031	326F12C	SW08	FGZ	AZ117	308
GREER	20404	USFS	34.0600	-109.4500	8200	326BC19E	SW08	FGZ	AZ117	308
GLOBE	20601	USFS	33.3503	-110.6519	3560	3283E65E	SW06N	PSR	AZ133	309
ROOSEVELT	20604	USFS	33.6628	-111.1158	2180	326BA478	SW06N	PSR	AZ133	309
SAN CARLOS 1	20608	BIA	33.3714	-110.4550	2840	327C34B0	SW06N	PSR	AZ133	309
HILLTOP	20609	BIA	33.6183	-110.4200	5290	5212C000	SW06N	PSR	AZ133	309
CIBOLA	20121	FWS	33.3039	-114.6933	250	8378C19A	SW03	PSR	AZ131	310
SQUAW LAKE	45801	BLM	32.9083	-114.4944	300	32598110	SW03	PSR	CA231	310
HAVASU	20118	BLM	34.7872	-114.5617	475	325846F4	SW02	VEF	AZ101	311
ALBINO CANYON	290102	BLM	36.9700	-107.6700	7160	324BF5EA	SW04	ABQ	NM101	351
CUBA	290705	BLM	35.9419	-107.0772	6172	325B84E4	SW07	ABQ	NM101	351
STONE LAKE	290201	BIA	36.7314	-106.8647	7440	3268F30A	SW07	ABQ	NM102	352
COYOTE	290202	USFS	36.0667	-106.6472	8800	3232D0F6	SW07	ABQ	NM102	352
DEADMAN PEAK	290203	USFS	36.4231	-106.7719	8450	326EB0CE	SW07	ABQ	NM102	352
JARITA MESA	290204	USFS	36.5558	-106.1031	8803	32814352	SW07	ABQ	NM102	352
DULCE #2	290207	BIA	36.9350	-107.0000	6793	52146036	SW07	ABQ	NM102	352
TRUCHAS	290210	USFS	36.0589	-105.7694	8340	328383B8	SW10	ABQ	NM102	352
TAOS	290305	BIA	36.4153	-105.5581	7050	3279707A	SW10	ABQ	NM102	352
JEMEZ	290702	USFS	35.8411	-106.6189	7999	328390CE	SW07	ABQ	NM102	352
TOWER	290801	NPS	35.7792	-106.6267	6500	FA6362DE	SW07	ABQ	NM102	352
SANTA FE WATERSHED	290901	USFS	35.6869	-105.8603	7674	324172AC	SW10	ABQ	NM102	352
CIMARRON	290401	USFS	36.6061	-105.1203	8744	3333A53E	SW10	ABQ	NM103	353
BARTLEY	291002	USFS	35.8939	-105.4619	8339	32881572	SW10	ABQ	NM103	353
PECOS	291202	USFS	35.5458	-105.4944	8600	3246E5FA	SW10	ABQ	NM103	353
MILLS CANYON	291101	USFS	36.0544	-104.3244	5856	328904FE	SW13	ABQ	NM104	354
WASHINGTON PASS	290101	BIA	36.0750	-108.8578	9370	3279F66E	SW04	ABQ	NM105	355
ZUNI	290603	BIA	35.0444	-108.4819	6320	327B25F2	SW07	ABQ	NM105	355
BRUSHY MOUNTAIN	291301	BIA	34.7194	-107.8475	8789	5210D682	SW07	ABQ	NM105	355
GRANTS	291302	USFS	35.2417	-107.6700	8449	3283B622	SW07	ABQ	NM105	355
MALPAIS LAVA FLOW	293301	BLM	34.8517	-108.1744	7514	324B837A	SW07	ABQ	NM105	355

BLUEWATER CREEK	293302	USFS	35.2228	-108.1553	7624	3286A294	SW07	ABQ	NM105	355
Name	NWS ID	Agency	Latitude	Longitude	Elev	NESSID	PSA	CWA	FWF_Zone	NFDRS_Zone
BLUEWATER RIDGE	293303	USFS	35.1942	-108.1631	8289	3333B648	SW07	ABQ	NM105	355
LAGUNA	293304	BIA	35.0394	-107.3731	5773	5213A71C	SW07	ABQ	NM105	355
RAMAH	293305	BIA	34.9947	-108.4128	7038	5213F760	SW07	ABQ	NM105	355
SANDIA LAKES	290706	BIA	35.2300	-106.5906	5000	327AE216	SW09	ABQ	NM106	356
BOSQUE	292103	FWS	33.8517	-106.8517	4500	837141D2	SW09	ABQ	NM106	356
SEVILLETA	292105	FWS	34.3769	-106.7978	4789	837933E4	SW09	ABQ	NM106	356
OAK FLATS	291402	USFS	35.0042	-106.3217	7575	323372F4	SW11	ABQ	NM107	357
MOUNTAINAIR	291501	USFS	34.5206	-106.2614	6500	3283A554	SW11	ABQ	NM107	357
CHUPADERA	292102	BLM	33.7728	-106.0983	6520	325B376A	SW11	ABQ	NM107	357
MELROSE RANGE	291901	USAF	34.3000	-103.8000	4350	AF100680	SW13	ABQ	NM108	358
PELONA MOUNTAIN	292009	BLM	33.6925	-108.0631	8080	324BE69C	SW08	ABQ	NM109	359
DATIL	292012	USFS	34.2897	-107.7664	8300	3283F528	SW08	ABQ	NM109	359
MAGDALENA	292104	USFS	33.8511	-107.5431	8500	32336182	SW08	ABQ	NM109	359
BEAVERHEAD	292001	USFS	33.4183	-108.1000	6700	3276130E	SW08	EPZ	NM110	360
SLAUGHTER	292008	USFS	34.0667	-108.4333	8680	3233D20C	SW08	EPZ	NM110	360
BEAR WALLOW	292010	USFS	33.4550	-108.6650	9953	326C15C2	SW08	EPZ	NM110	360
GILA CENTER RAWS	292011	USFS	33.2233	-108.2400	5600	3232F61A	SW08	EPZ	NM110	360
HACHITA VALLEY	292702	BLM	31.7200	-108.3300	4291	3243D7A0	SW09	EPZ	NM111	361
SIERRA DE LAS UVAS	292902	BLM	32.5200	-107.1200	5000	326335BC	SW09	EPZ	NM112	362
DRIPPING SPRINGS	292903	BLM	32.3233	-106.5867	6172	324B900C	SW09	EPZ	NM112	362
SAN ANDRES	292904	FWS	32.5800	-106.5250	6138	83709540	SW09	EPZ	NM112	362
SMOKEY BEAR	292203	USFS	33.3508	-105.6667	6900	32340650	SW12	EPZ	NM113	363
MAYHILL	293002	USFS	32.8858	-105.4683	6558	3283C0B2	SW12	EPZ	NM113	363
MESCAL	293003	BIA	33.1667	-105.8333	6627	5212B690	SW12	EPZ	NM113	363
COSMIC	293004	USFS	32.7789	-105.8194	9100	326FF13E	SW12	EPZ	NM113	363
DUNKEN	292302	BLM	32.8256	-105.1806	5500	325B41FA	SW12	MAF	NM114	364
QUEEN	293105	USFS	32.2036	-104.6903	5605	3287C588	SW14N	MAF	NM114	364
EIGHT MILE DRAW	292301	BLM	33.6511	-104.3217	3697	327CA1D2	SW14N	MAF	NM115	365
BATDRAW	293101	NPS	32.1786	-104.4406	4425	FA623058	SW14N	MAF	NM115	365
CAPROCK	293104	BLM	32.9278	-103.8567	4210	325B241C	SW14N	MAF	NM115	365
PADUCA	293202	BLM	32.1797	-103.7217	3510	325B6716	SW14N	MAF	NM115	365
PINERY	417101	NPS	31.8944	-104.7978	5381	FA40D7B0	SW14N	MAF	TX258	N/A
THE BOWL	417103	NPS	31.9250	-104.8253	7755	FA61E13E	SW14N	MAF	TX258	N/A
FORT DAVIS	417201	S&PF	30.6006	-103.8867	4764	8841B602	SW14S	MAF	TX074	N/A
PANTHER JUNCTION	417401	NPS	29.3275	-103.2075	3750	FA63D150	SW14S	MAF	TX081	N/A
CHISOS BASIN	417403	NPS	29.2708	-103.3014	5400	FA635744	SW14S	MAF	TX081	N/A
CEDAR	418701	NPS	35.6667	-101.5667	3052	FA62C0DC	SW13	AMA	TX008	N/A
BOOTLEG	418801	S&PF	34.8280	-102.8090	4058	8841F508	SW13	AMA	TX016	N/A
CAPROCK	418901	S&PF	34.2100	-101.0300	2561	8841E67E	SW14N	LUB	TX031	N/A
MATADOR	418902	S&PF	34.1175	-100.3444	1900	884252FE	SW14N	LUB	TX032	N/A
BARNHART	419201	S&PF	30.9856	-101.1578	2562	8841731C	SW14S	SJT	TX076	N/A
MIDLAND	419202	S&PF	31.9431	-102.1897	2802	8841C092	SW14N	MAF	TX062	N/A

H. APPENDIX – VERIFICATION

1. National Digital Forecast Database: http://www.weather.gov/forecasts/graphical/sectors/
2. Rocky Mountain Center (RMC): http://fireweather.sc.egov.usda.gov/verification_main.htm
3. NFDRS: (Under development. Web address will be provided at a later date.)
4. SWCC Products: (To be implemented. Web address will be forwarded upon service launch.)