

# SOUTHWEST AREA FIRE WEATHER ANNUAL OPERATING PLAN

## 2022-2026



Arizona  
New Mexico

## 2022-2026 SOUTHWEST AREA FIRE WEATHER ANNUAL OPERATING PLAN

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## I. INTRODUCTION

This document serves as the Interagency Fire Weather Annual Operating Plan (AOP) for the Southwest Geographic Area. The general relationship between the National Weather Service (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:

- A. [National Weather Service NWSI 10-4: Fire Weather Services](#)
- B. [Interagency Agreement for Meteorological Services \(Referred to as the National MOA, or “National Agreement”\)](#)
- C. [Southwest Area](#) and National Mobilization Guides

Participating Agencies cooperating in this AOP are:

- 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

## II. EFFECTIVE DATES OF THE AOP

- A. Approximately May 1, 2022, through December 31, 2026.
- B. This AOP shall be specifically effective on the date the last signature is placed on the signature section and it will remain in effect until December 31, 2026, unless updates or amendments dictate otherwise.
- C. Regardless of the intended multi-year effective validity, the AOP will be reviewed annually and updated or amended as needed with concurrence of all signatories or their designates.

## III. SIGNIFICANT CHANGES SINCE 2021

- A. The Southwest Area no longer includes Texas. SWA GACC & PSA boundaries now clipped to Arizona and New Mexico. (*Appendix D, page 19*)
- B. New Red Flag Warning paradigm that provides more options for higher severity, low return interval events. (*Fire Weather Watches and Red Flag Warnings, page 2*)
- C. 7-Day NFDRS forecasts now issued for all stations year-round (*NFDRS forecasts, page 6*)

#### IV. SERVICE AREAS AND ORGANIZATIONAL DIRECTORIES

- A. Fire environment related decision support services are provided by SWA Predictive Services and the NWS forecast offices depicted within [Appendix C](#). Contact information for both fire management and NWS can be found in the [Southwest Area Mobilization Guide](#).

#### V. NATIONAL WEATHER SERVICE SERVICES AND RESPONSIBILITIES

- A. Basic Services – The following constitute the current operational fire weather forecast products provided by NWS. Experimental products for evaluation are clearly labeled as such.
  - 1. Core Forecast Grids and Web-based Fire Weather Decision Support – National Digital Forecast Database ([NDFD](#)) grids are used to produce a wide variety of products and services for fire weather support.

The NWS digital database provides several decision support tools accessible via NWS fire weather web pages. For more information on these tools, please see [Appendix E](#) or contact your local NWS office (see [Appendix K](#)).
  - 2. 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 12–48-hour period. Fire Weather Watches are issued to identify the elevated threat of similar conditions during the following 18–96-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 so severe that marginally windy and dry conditions would lead to extreme fire behavior).

**NWS Weather Forecast Offices now have the option to use the phrase “Particularly Dangerous Situation”, also known as a PDS, within Red Flag Warning (RFW) products. The objective is to heighten public and fire agency awareness for fire weather situations considered exceptionally rare or impactful to the public and firefighting community. NWS offices have or will develop objective guidelines for when to include this language in Red Flag Warnings.**

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 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 NFDRS Standards.
- Refer to local NWS Office criteria for more specific information, *including usage of the RFTI (Red Flag Threat Index).*

\* Format – See the Fire Weather Watch/Red Flag Warning section of [National Weather Service Instruction \(NWSI\) 10-401](#) for details on product format and contents.

### 3. Spot Forecasts (FWS)

- a) Criteria - Spot forecasts are detailed site-specific forecasts 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.

Spot forecasts will be updated when extreme fire behavior is expected. These circumstances should include consideration of the following factors.

- 1) The relative severity and changeability of the ongoing or expected fire weather conditions (thunderstorm winds, cold fronts, high instability, etc.).
- 2) The viability of the current, valid spot forecast.

The primary mechanism for informing users of spot forecast updates includes both:

- 1) A written update to the forecast, specifying the start and end times of any updated and critical forecast conditions; and
- 2) Confirmation, through verbal communication, of the receipt of written update by the dispatch office or individual listed on the spot form as the user contact point.

If time is of the essence and responder safety is at risk, a forecaster can choose to provide an immediate verbal update to the spot forecast requestor and/or servicing dispatch center.

Upon request from land management personnel, the appropriate WFO will update the forecast. Spot forecasts may also be updated when the forecaster deems the current forecast does not adequately represent current or expected weather conditions. Updated forecasts will be disseminated to the original spot forecast requesting agency, verbally or in writing.

- b) Content and Format – See NWS Forecast Examples of a Spot Forecast (FWS) in [National Weather Service Instruction \(NWSI\) 10-401](#). Spot forecasts will contain the required minimum elements listed below, unless otherwise specified upon request:

- 1) Headline (required when Red Flag Warning / Fire Weather Watch)
- 2) Discussion
- 3) Sky/weather (including chance of rain)
- 4) Temperature
- 5) Relative humidity
- 6) 20-foot winds

**FOR ALL SOUTHWEST AREA OFFICES:** 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 - Web based “NWS Spot” is the standard for requesting and retrieving spot forecasts and should be used when available. Individual websites of the various NWS Forecast Offices serving the Southwest Area, the [SWCC Fire Operations website](#) and the [NWS National Fire Weather webpage](#) can all be used to request a spot forecast.

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.

**HYSPLIT Trajectories are available as an optional spot forecast element via request using NWS Spot. [Click here for additional guidance.](#)**

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 included 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 12.
- 4) 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. Offices issue afternoon forecasts either on a year-round or a seasonal basis no later than 1530 LST. Beginning and ending dates of seasonal afternoon forecasts will be coordinated through Predictive Services.

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



- b) Access – Planning forecasts can be retrieved from the websites of NWS Forecast Offices serving the Southwest Area, [SWCC Fire Operations](#), 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:

- 1) Headline(s) as appropriate
- 2) Sky/weather
- 3) Temperature and 24-hour trend
- 4) Humidity and 24-hour trend
- 5) Winds – 20-foot RAWs Standard (slope/valley)
- 6) 10,000 Ft. MSL Wind (ridgetop)
- 7) Mixing Level (Daytime. Mandatory for NM offices only)
- 8) Transport Winds (Daytime. Mandatory for NM offices only)
- 9) Ventilation (Daytime. Mandatory for NM offices only)

d) OPTIONAL ELEMENTS:

- 1) Probability of Precipitation (replaces qualifying weather descriptor)
- 2) Lightning Activity Level (LAL)
- 3) Haines Index
- 4) Mixing Level
- 5) Transport Winds
- 6) Ventilation (kt-ft) and/or Ventilation/Dispersion Category

e) Miscellaneous

- 1) **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.
- 2) Extended Outlook to at least day 5 (may appear at end of product)

- 5) NFDRS Forecasts (FWM) – The National Weather Service (NWS) provides daily, numeric 7-day forecasts that allow code within the Weather Information Management System (WIMS) to calculate forecast daily fire danger indices for all NFDRS stations out to 7-days. These forecasts are sent directly to WIMS and are in the proper format to support NFDRSv4.

The forecast weather elements can be viewed within WIMS by using the ‘DFCST’ FastPath. The forecast fire danger indices and fuel moisture values can be viewed by using the ‘DIDX’ FastPath, choosing Type ‘F’, and selecting a date for which there is a valid forecast. Additional information on accessing data in WIMS can be obtained by contacting the IIA Help Desk at 1-866-224-7677.

- 6) Fire Weather Area Forecast Discussion – The Area Forecast Discussion (AFD) focuses on the most significant weather issues affecting an NWS office’s forecast area over the next seven days.
- a) Issuance times – Twice daily around 0330 and 1530 LT during the year. NWS offices may issue intermediate AFDs around 0930 and 2130 LT, or as deemed appropriate by the office.
  - b) Access – Primary method to retrieve forecasts will be directly from websites of NWS forecast Offices serving the Southwest Area, or via SWCC Forecast Operations website.
  - c) Content and Format – The AFD is a free text format product. Multiple sections exist in this product discussing significant weather issues affecting an NWS office’s area of responsibility. During heightened fire activity, a “FIRE WEATHER...” section is included containing weather information of interest to fire managers.
- B. Special Services – NWS maintains a cadre of trained IMETs per [NWSI 10-405](#). A sufficient number of IMETs should be available from Southwest Area offices to support multiple incidents in May and June. IMETs serving R3 are placed in IROC prior to the beginning of the main R3 fire season.

C. Individual Forecast Office Information - (Click [blue typeface](#) for hyperlink)

<b>Northwest Arizona - Las Vegas, NV</b>	<a href="https://www.weather.gov/wrh/fire?wfo=vef">https://www.weather.gov/wrh/fire?wfo=vef</a>
FIRE ZONES	AZ 101 and 102
SPOT FORECAST REQUEST	<a href="#">Spot Forecast Request</a>
NFDRS ZONES	301 and 311
<b>Northern Arizona - Flagstaff, AZ</b>	<a href="https://www.weather.gov/wrh/fire?wfo=fgz">https://www.weather.gov/wrh/fire?wfo=fgz</a>
FIRE ZONES	AZ 104 through 118, and AZ 137 through 140
SPOT FORECAST REQUEST	<a href="#">Spot Forecast Request</a>
NFDRS ZONES	302, 303, 304, and 308
<b>Southeast Arizona - Tucson, AZ</b>	<a href="https://www.weather.gov/wrh/fire?wfo=twc">https://www.weather.gov/wrh/fire?wfo=twc</a>
FIRE ZONES	AZ 150, 151, 152 and 153
SPOT FORECAST REQUEST	<a href="#">Spot Forecast Request</a>
NFDRS ZONES	305 and 306
<b>South-Central and Southwest Arizona - Phoenix, AZ</b>	<a href="https://www.weather.gov/wrh/fire?wfo=psr">https://www.weather.gov/wrh/fire?wfo=psr</a>
FIRE ZONES	AZ 131, 132, and 133 (also CA 230, 231, and 232)
SPOT FORECAST REQUEST	<a href="#">Spot Forecast Request</a>
NFDRS ZONES	307, 309, 310
<b>North and Central New Mexico - Albuquerque, NM</b>	<a href="https://www.weather.gov/abq/forecasts-fireweather">https://www.weather.gov/abq/forecasts-fireweather</a>
FIRE ZONES	NM 101 through 109
SPOT FORECAST REQUEST	<a href="#">Spot Forecast Request</a>
NFDRS ZONES	351 through 359
<b>South-Central and Southwest NM - El Paso, TX</b>	<a href="https://www.weather.gov/epz/fireweather">https://www.weather.gov/epz/fireweather</a>
FIRE ZONES	NM 110 through 113 and TX 055 and 056
SPOT FORECAST REQUEST	<a href="#">Spot Forecast Request</a>
NFDRS ZONES	360 through 363
<b>Southeast New Mexico - Midland, TX</b>	<a href="https://www.weather.gov/maf/top_fire">https://www.weather.gov/maf/top_fire</a>
FIRE ZONES	<a href="#">Southeast New Mexico Zones</a>
SPOT FORECAST REQUEST	<a href="#">Spot Forecast Request</a>
NFDRS ZONES and STATIONS	NM 364 and 365,
OTHER PRODUCTS	<a href="#">Fire Danger Statement</a>

## VI. WILDLAND FIRE AGENCY SERVICES AND RESPONSIBILITIES

- A. Predictive Services – Information provided here is synopsised from more comprehensive content in Chapter 60 of both the [Southwest Area](#) and [National](#) Mobilization Guides.

Predictive Services is a decision support unit for federal, state, and local land management agencies for operational management of and strategic planning for wildland fire management resources. Predictive Services accomplishes this through analysis of weather and climate, fuels, fire danger, fire activity and behavior. The products and services from Predictive Services support the proactive management of wildland fire with an eye toward safety, cost containment, efficiency and ecosystem health.

Predictive Services at SWCC consists of two full-time fire weather meteorologists and additional seasonal support staff as necessary. Primary products are described below, and can be found on the [‘Outlooks’ section of the SWCC Website](#):

1. [7-Day Significant Fire Potential Outlook](#) - The Southwest 7-day Significant Fire Potential Outlook is a tabular/graphical product that is issued daily by 1000 MST/MDT during fire season (usually from mid-April through July) and on weekdays by 1100 MST/MDT during the remainder of the year. The product depicts the risk for significant fire activity for each Predictive Services Area (PSA) through the next 7 days, with brown/orange/red colors indicating a moderate/high risk and green indicated near zero risk. The product is intended to depict when and where fire activity is likely to require a level of response beyond the capabilities of local suppression forces and, therefore, require the use of nationally or regionally shared resources.
2. [National Fire Potential Outlook](#) - The National Significant Wildland Fire Potential Outlook is prepared and distributed by NICC Predictive Services on the first day of each month. The Outlook is a composite of outlooks prepared by the individual Geographic Area Predictive Services units and national discussions prepared by NICC Predictive Services. It provides fire managers at all levels with the information needed to make long range decisions concerning resource staffing and allocation. The Outlook identifies areas where significant wildland fire activity is expected to be above or below normal levels. The Outlook covers a four-month period, divided into four one-month sections. Maps for each period display areas of below normal, normal, and above normal significant wildland fire potential. A brief synopsis of the current and predicted national and GACC situation is included in the report. The Geographic Area Forecasts section provides brief but more specific weather, fuels and fire potential information for each of the Geographic Areas.

3. [Fuels and Fire Behavior Advisories](#) - Fuels and Fire Behavior Advisories are alerts issued as needed to address an exceptional or extreme circumstance that could threaten firefighter safety. Conditions that could be reasonably expected normally do not warrant a Fuels and Fire Behavior Advisory. Advisories will focus on fuel conditions and fire behavior that have long term impacts, not atmospheric conditions that can change significantly over short periods of time and can be found in other products.

Current Advisories, templates and issuance protocols can be found at [https://www.predictiveservices.nifc.gov/fuels\\_fire-danger/fuels\\_fire-danger.htm](https://www.predictiveservices.nifc.gov/fuels_fire-danger/fuels_fire-danger.htm).

- B. [RAWS & NFDRS Program Management](#) - Management of federal land management and fire agency fire weather and fire danger equipment, systems and programs.
  1. [RAWS Program Management](#) - The Regional RAWS Coordinator at SWCC will help manage the interagency RAWS program for the Southwest Area. This includes regular monitoring of data quality, assisting with station maintenance, and identifying or providing appropriate training. A top priority is ensuring that RAWS are sited and maintained according to [NWCG PMS 426-3](#) “National Fire Danger Rating System Weather Station Standards”.
  2. [NFDRS Program Management](#) - The lead meteorologist with SWA Predictive Services will provide technical oversight and subject matter expertise for the application of the National Fire Danger Rating System (NFDRS). This will involve working with interagency field units on a station-by-station basis to correctly configure NFDRS model elements in WIMS. The six-digit NWS station identification numbers that uniquely identify each NFDRS station are managed and assigned by the lead meteorologist with SWA Predictive Services.
- C. [Fire Weather/Fireline Observations](#) - Information provided here is based on existing wildland fire agency policies and/or practices in the Southwest.
  1. [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 conditions consistent with guidance provided in NFES 2140, “Weather Station Handbook - an Interagency Guide for Wildland Managers”.
  2. [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 purposes.
    - a) [General 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):
      - 1) Maximum temperatures

- 2) Minimum relative humidity
- 3) Significant afternoon winds (speed and direction)

b) Example of Minimum Required Feedback:

- 1) Maximum temperature = 61
- 2) Minimum RH = 18%
- 3) Afternoon winds south 2-4G8 mph (eye level) shifting to west at around 1500 hours.

c) Acceptable Methods of Providing Spot Forecast Feedback

- 1) Faxed copies of fireline (belt weather) observations
- 2) Phone call to appropriate NWS office
- 3) Submission of required information via “remarks” section of internet spot forecast
- 4) Faxed or electronically transmitted copies of hourly data from an on-site portable weather station
- 5) Notification of deployment of a portable GOES telemetered RAWS, so NWS can access and download the necessary data

D. Local Fire Management Liaisons - Each NWS Weather Forecast Office (WFO) is expected to develop relationships with fire management cooperators within their respective service areas and identify local fire management agency liaisons. These persons will act as primary points of contact between each NWS office and the interagency fire management units they serve, and should be invited to fire weather-related customer meetings. SWA Predictive Services should be consulted if there is a need for assistance with identifying local fire management liaisons.

## VII. JOINT RESPONSIBILITIES

A. Training - Meteorological training assistance for NWCG and other courses is provided jointly. In general, NWS has priority for local or sub-regional training conducted in or near their service areas while SWCC meteorologists will focus regional and national level training. **In all cases, sufficient advance notice should be given to allow for scheduling and proper preparation.**

1. NWS - Requests for training from NWS offices should be directed to that office’s Meteorologist-in-Charge. For NWS to provide training for non-federal agencies, the following conditions must be met:
  - a) An NWS instructor must be qualified and available to provide the training.
  - b) NWS must be able to be reimbursed for associated overtime and travel costs.
2. SWCC Predictive Services Meteorologists - Requests for training from SWCC meteorologists should be directed to the Lead of SWA Predictive Services.

B. Incident Response – The provision and usage of NWS Incident Meteorologists (IMETs) in the Southwest Area is consistent with national policy and practices specified elsewhere.

1. All requests for IMETs will be processed through SWCC and the following information provided to the requested IMET:
  - a) Name of fire
  - b) Location of fire
  - c) Directions to location where the IMET is to report
  - d) Names of Incident Commander, Plans Section Chief and Fire Behavior Analyst if available
  - e) Request and Resource Order number for IMET
  - f) Verification that "Special Needs" section on Resource Order should include authorization for use if a rental vehicle, cell phone, computer equipment, and the All Hazards Meteorological Response System (AMRS)
2. 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. NWS Chat - SWCC Fire Weather Chatroom

1. The [NWS Chat Live](#) chatroom **swccfirechat** will be the routine means for real-time communication, status messaging and coordination, and will be utilized routinely by NWS and SWCC meteorologists during peak fire season.

Expectations for use of NWS Chat:

- a) NWS participants will include at least one operational forecaster from each WFO, and may also include Incident Meteorologists (IMET's), forecasters from the Storm Prediction Center (SPC), regional and national program leaders, and other NWS personnel as appropriate.
  - b) SWCC participants will include at least the meteorologist issuing the operational outlook products. At the least, SWCC participants will convey changes in general fuels conditions as they might relate to potential Fire Weather Watches and/or Red Flag Warnings.
  - c) General chat monitoring and participation hours will be 0800 MDT/0700 MST to 1800 MDT/1700 MST. Participants are expected to monitor the chat during this time frame and engage in pertinent communication as necessary.
  - d) It is understood that extreme and/or extenuating situations, staffing shortages/problems, IT issues, etc. may disrupt the NWS Chat environment and make meeting these expectations impossible on a full-time basis.
2. Conference calls will serve as an ad hoc backup to the NWS Chat, and will be initiated as the need arises.

**VIII. AGENCY SIGNATURES (On file)**

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Chuck Maxwell  
Lead, SWA Predictive Services

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Date

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Claudia Bell  
Regional Fire Weather Program Manager  
NWS Western Region Headquarters

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Date

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Paul Witsaman  
Regional Fire and Aviation Program Manager  
NWS Southern Region Headquarters

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Date



## IX. APPENDICES

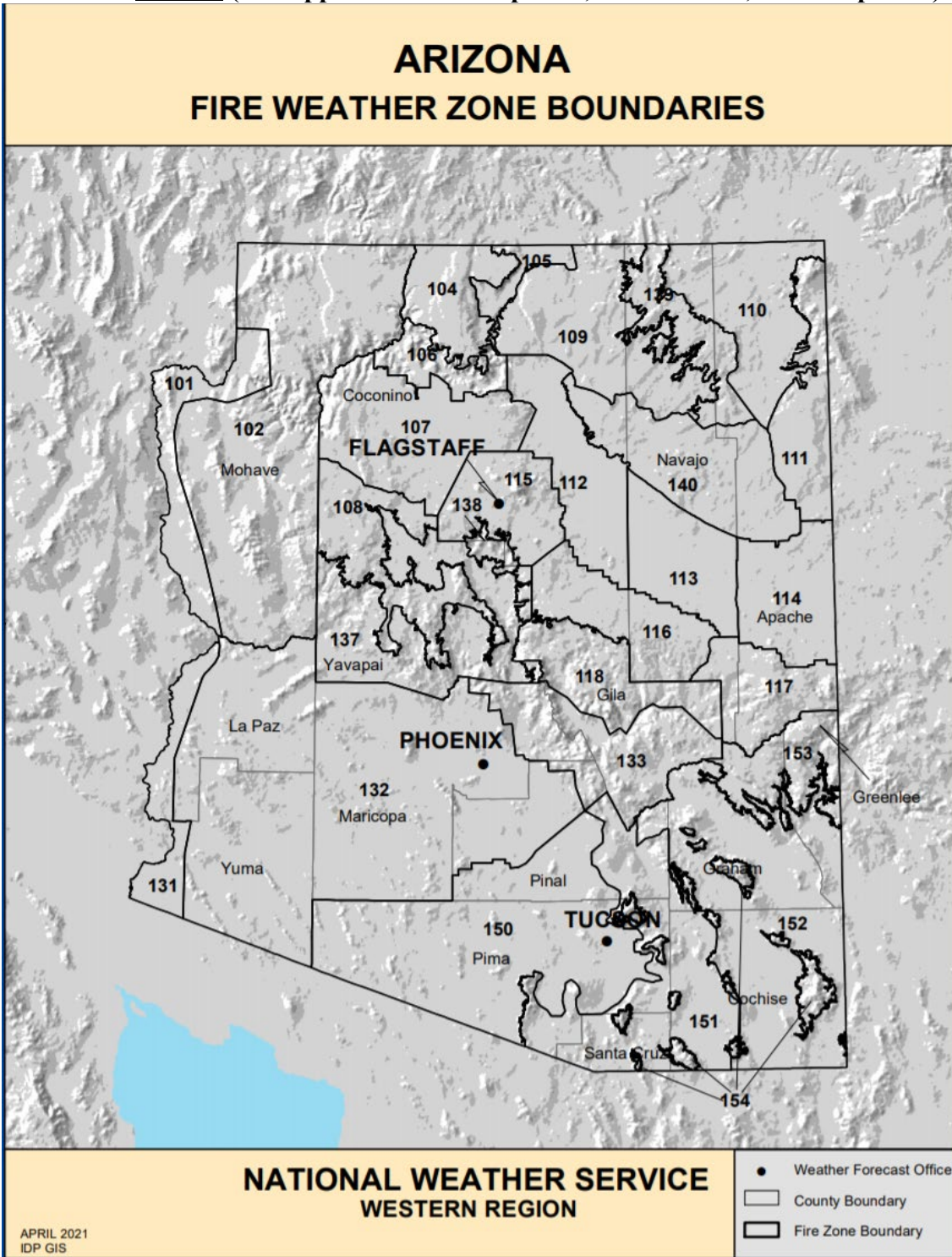
### A. APPENDIX – FORECAST ELEMENT DEFINITIONS

1. [Link to comprehensive description of NWS Fire Weather forecast elements](#)
2. [Link to NWS forecast definitions pertaining to both public and fire weather forecasts](#)
3. 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:
  - a) **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 to note the difference in elevations between the burn site and the referenced upper-air sight, and then modify the provided mixing depths accordingly. Users can also view point-specific ventilation forecasts out to 72 hours from the [NWS National Fire Weather Website](#) without any adjustments.
  - b) **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.
  - c) **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 meters<sup>2</sup>/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.

<b>Ventilation (Dispersion) Categories and Values</b>		
<u>Adjective Category</u>	<u>Knot - Feet</u>	<u>Meters<sup>2</sup>/Second</u>
<b>ARIZONA</b>		
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
<b>NEW MEXICO</b>		
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

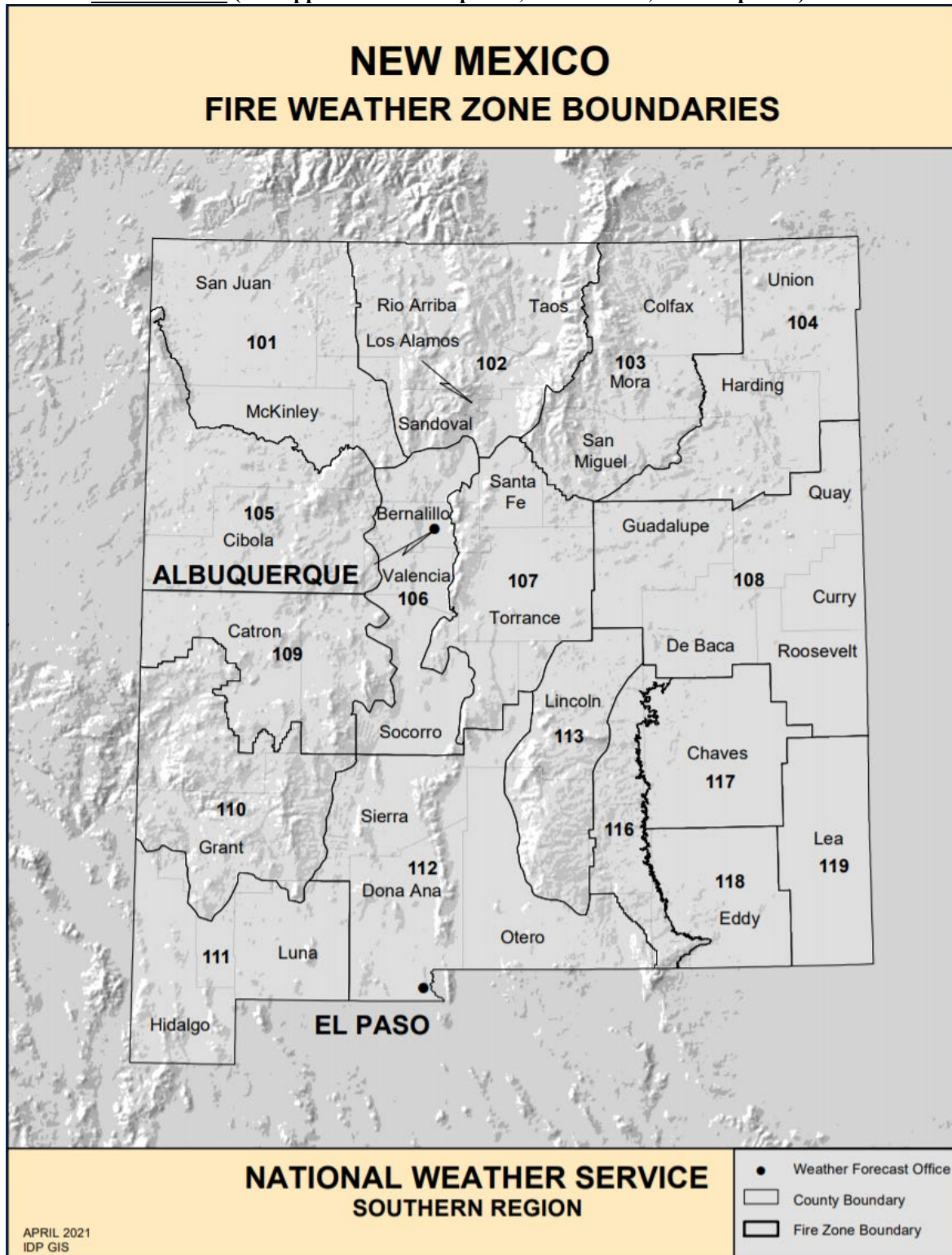
B. APPENDIX – NWS FIRE WEATHER ZONE MAPS

1. Arizona (See Appendix D for shapefiles, KML/KMZs, and/or updates)



Reference: [https://www.weather.gov/media/pimar/FireZone/az\\_firezone.pdf](https://www.weather.gov/media/pimar/FireZone/az_firezone.pdf)

2. New Mexico (See Appendix D for shapefiles, KML/KMZs, and/or updates)



Reference: [https://www.weather.gov/media/pimar/FireZone/nm\\_firezone.pdf](https://www.weather.gov/media/pimar/FireZone/nm_firezone.pdf)



C. APPENDIX – BACKUP SPOT FORECAST FORM AND INSTRUCTIONS ([click this hyperlink to access the PDF and print this form](#))

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

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

**I. Incident Personnel:**

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

13. Weather Observations from project or nearby station(s):											
Place	Elevation	†Ob Time	20 ft. Wind		Eye Level Wind.		Temp.		Moisture		Remarks <i>(Relevant Weather, etc.)</i>
			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.**

D. APPENDIX – Online Map and Map Data Access

The links below provide access to more authoritative, more frequently updated spatial data resources (KML/KMZ, shapefiles, geodatabases) for the following features:

<b>Feature</b>	<b>Online Spatial Resource</b>
RAWS Locations (authoritative)	<a href="https://www.wfas.net/google-earth/raws.kmz">https://www.wfas.net/google-earth/raws.kmz</a>
Predictive Services Areas, Key RAWS, Fire Potential Outlooks, and ArcGIS REST GIS services (authoritative)	<a href="https://fsapps.nwccg.gov/psp/npsg/forecast/home/downloads">https://fsapps.nwccg.gov/psp/npsg/forecast/home/downloads</a>
NWS Fire Weather Zones (authoritative)	<a href="https://www.weather.gov/gis/FireZones">https://www.weather.gov/gis/FireZones</a> <a href="https://www.weather.gov/pimar/FireZones">https://www.weather.gov/pimar/FireZones</a>
New Mexico Arizona	<a href="https://www.weather.gov/media/pimar/FireZone/nm_firezone.pdf">https://www.weather.gov/media/pimar/FireZone/nm_firezone.pdf</a> <a href="https://www.weather.gov/media/pimar/FireZone/az_firezone.pdf">https://www.weather.gov/media/pimar/FireZone/az_firezone.pdf</a>

E. APPENDIX – Office and Personnel Directory

**NOAA/NWS Regional and Field Leadership Contact List:**

<https://www.weather.gov/media/nws/wcm-soo.pdf>

**Southwest Area Mobilization Guide (password protected)**

[https://gacc.nifc.gov/swcc/dispatch\\_logistics/dispatch/mobguide/mobguide.htm](https://gacc.nifc.gov/swcc/dispatch_logistics/dispatch/mobguide/mobguide.htm)

Click on '[Phone Directory](#)' ([Obtain password](#), as needed)