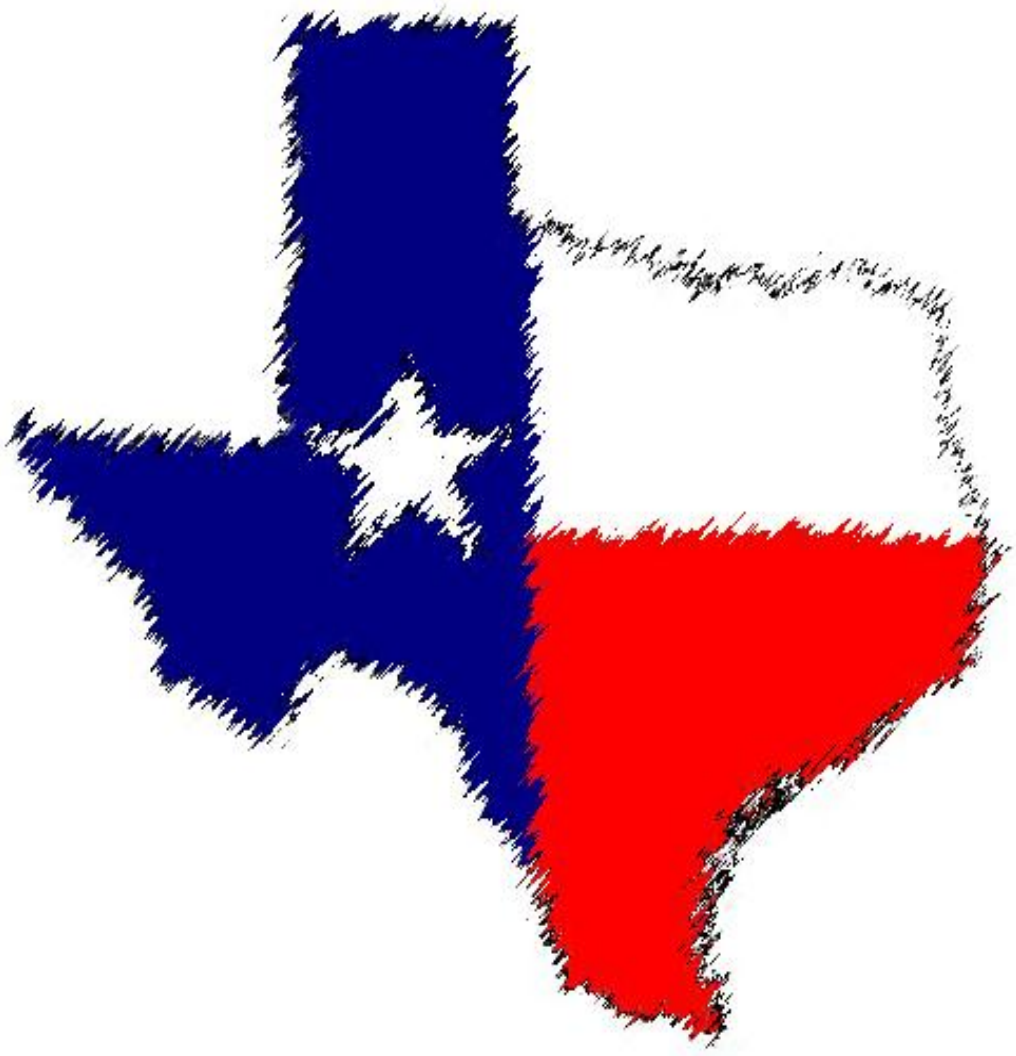
Texas Fire Weather Operating Plan
2012



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Texas Fire Weather Operating Plan 2012

National Weather Service
U.S. Dept. of Commerce

NWS Southern Region Headquarters
819 Taylor Street, Room 10A06
Fort Worth, TX 76102

Document Prepared by:
Monte Oaks
Austin/San Antonio NWS Office

NWS Signatories:

Monte Oaks
Austin/San Antonio NWS Office

Paul Witsaman
NWS Southern Region Headquarters

Latest Revision Date:
April 2012

TEXAS FIRE WEATHER OPERATING PLAN

(Sections in the Table of Contents below are hyperlinked to the page in the document)

I. INTRODUCTION

The Texas Fire Weather Operating Plan (TX-FWOP) serves as the Fire Weather Annual Operating Plan (AOP) for the state of Texas. 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 about the responsibilities of both NWS offices and fire management agencies regarding meteorological services provided to the fire management community in Texas, as contained under the umbrella of the National Agreement. References include:

- NWS Directive System NWSI 10-4: Fire Weather Services
- Interagency Agreement for Meteorological Services (also referred to as National Agreement)

Glossary and acronym references include:

- Glossary of Wildland Fire Terminology (National Wildfire Coordinating Group)
- *Appendix 3: List of Abbreviations and Acronyms* in this document

A. PARTICIPATING AGENCIES AND SIGNATORIES

Annual reviews of the TX-FWOP will be confirmed by agency signatories representing both the NWS and the participating fire management agencies of Texas. NWS signatories and partner agency signatories will submit their approval of annual TX-FWOP revisions through email. Copies of the annual email confirmations will be appended to copies of the TX-FWOP revisions and retained by at least one of the NWS signatories for a period of at least 5 years. A brief summary of revisions is provided at the end of the Introduction section.

Fire Management Agencies

Partner agencies acting in cooperation with the TX-FWOP include:

- Texas Interagency Coordination Center (TICC)
- Texas Forest Service (TFS)
- USDA Forest Service (USFS)
- US Fish and Wildlife Service (USFWS)
- National Park Service (NPS)
- Bureau of Indian Affairs (BIA)
- Texas Parks and Wildlife Department (TPWD)
- The Nature Conservancy (TNC)
- Southern Area Coordination Center (SACC)
- Southwest Coordination Center (SWCC)

NWS and Agency Signatories

NWS signatories include Monte Oaks (Fire Weather Program Leader, NWS Austin/San Antonio) and Paul Witsaman, (Regional Fire Weather Program Leader, NWS Southern

Region Headquarters). The NWS signatories are responsible for communicating NWS policy changes contained within this document.

Agency signatories representing fire management customers of fire weather products are listed in *Appendix 7: Agency Signatories*. A request for new signatories and/or changes to the TX-FWOP should be made in cooperation with one or more of the partner agency signatories. Details on making change requests at the WFO level are provided in *Section II.D. Interagency Cooperation*.

B. SUMMARY OF REVISIONS

The following updates were implemented since the previous routine update of the TX-FWOP:

- Reorganized order of sections and Table of Contents
- Updated Introduction section to list specific partner agencies
- Contacts for various NWS offices and area IMET contacts updated
- Revised wording on *Section I.A: Participating Agencies and Signatories* and moved change requests topic to *Section II.D.*
- Updated RAWS, FWM, and PFW sites for all WFO CWFAs and adjusted products and parameters issued
- Updated to reflect recent national policy updates on RFW and FWS issuances and formats
- Added Regional Climate Office and Storm Prediction Center as possible resources for decision support
- Added a general explanation of the different levels of “fire weather conditions” expressed in fire weather products and services used by IMETs, WFOs, and the SPC.
- Updated the IMET section to reflect a NWS transition toward a Type I, II, and III IMET structure
- New RFW Criteria for NWS CRP

II. NWS WEATHER SERVICES AND RESPONSIBILITIES

A. NATIONAL WEATHER SERVICE ORGANIZATION

Based on the National Agreement, national standards for fire weather forecast products and services are established in the NWS Directives System (NDS). These guidelines are then applied to local agreements set forth in local Annual Operating Plans such as the TX-FWOP. This section outlines the primary NWS resources utilized for decision support operations.

NWS Office Forecasters and Fire Weather Program Leaders

Section II.B. NWS Forecast Offices outlines the basic NWS Office operations, area of responsibility, and contacts for the State of Texas.

In general, NWS offices are staffed continuously by personnel that include one or more professional meteorologists that have met nationally and locally defined fire weather training requirements. Each NWS office has a designated individual with special knowledge and training to serve as the Fire Weather Program Leader (FWPL). FWPLs are responsible for the majority of interagency communication between the NWS and the fire community, providing outreach, training, and other specialized services. Additional responsibilities of the FWPL include local policy implementation of forecast products and services, and local forecaster training.

Incident Meteorologists

The NWS also maintains a network of specialists dedicated to providing specialized weather support, usually at a remote location. These on-site weather forecasters are commonly known as Incident Meteorologists (IMETs). IMETs are highly trained, strategically positioned NWS employees scattered across the United States for regional fire weather and decision support. However, the IMET may be dispatched to support incidents anywhere in the country or even internationally. *Section II.C. Decision Support and Other Specialized Services* provides further detail on the IMET and other decision support programs.

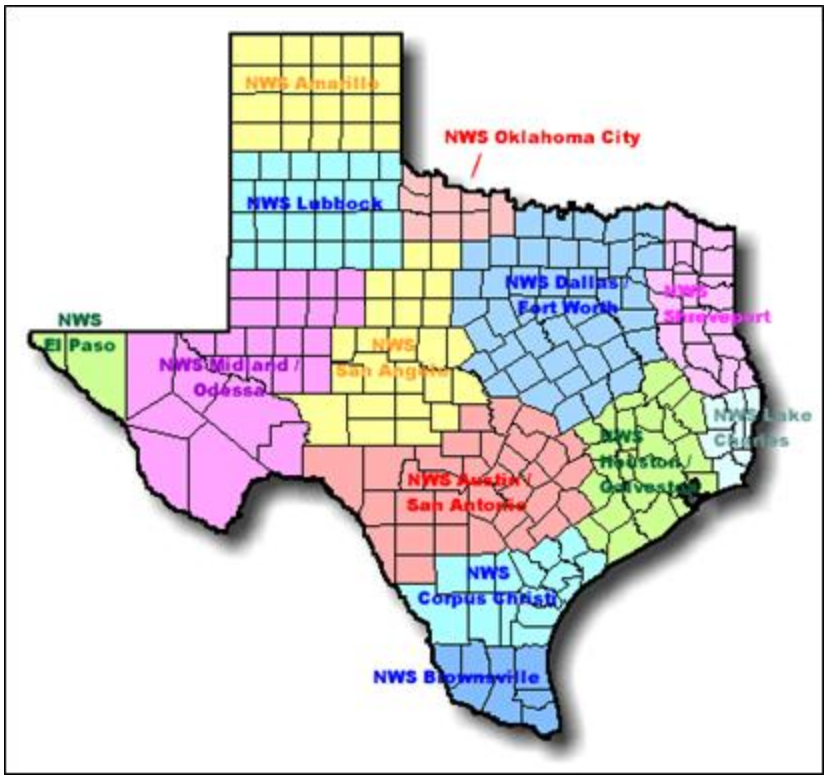
Climate Outlooks and Decision Support from Southern Region

During prolonged active fire and drought seasons, the Southern Region Climate Services Program Manager and the staff at the SR Regional Operations Center (ROC) can provide medium to long range climate outlooks as well as historical climate perspectives for the fire management agencies. The SR ROC duty officers are also available to organize and host conference calls between the NWS offices and the partner agencies. *Section II.C. Decision Support and Other Specialized Services* provides additional information on these decision support activities.

Storm Prediction Center

SPC Fire Weather program provides national fire weather guidance to field National Weather Service offices, as well as other federal, state, and local government agencies. *Section II.E. Basic Forecast Products* provides detailed information on their products.

B. NWS WEATHER FORECAST OFFICES



Each NWS Weather Forecast Office providing fire weather services to the state of Texas is staffed with meteorologists trained in fire weather forecasting 24 hours a day, 7 days a week, including holidays.

This section discusses the geographical service area of each NWS Office as well as the variety of services each office provides. Links to recently issued forecast products from each NWS office are provided in *Appendix 4*.

Customer feedback on local policies

Questions or concerns regarding the policies outlined in this section should be directed to the fire weather program leader (FWPL) and/or the MIC of the respective NWS office(s) or contact...

Paul Witsaman, Regional Fire Weather Program Manager
NWS Southern Region Headquarters
819 Taylor Street, Room 10E09
Fort worth, Texas 76102
Ph: 817.978.1100 x116

1. NWS Amarillo (AMA)

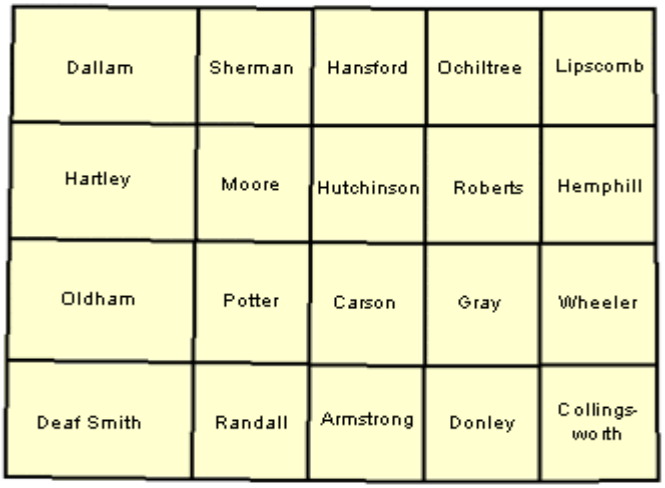
Address:
1900 English Road
Amarillo, TX 79108
Phone: 806-335-1421

Fire Weather Program Leader:
Ken Schneider

Meteorologist-In-Charge:
Jose Garcia

Type I IMET:
No

AMRS Unit:
No



Federal Fire Management Agencies Served (in Texas):

- National Park Service (Alibates Flint Quarries National Monument and Lake Meredith National Recreation Area)
- U.S. Fish and Wildlife Service (Buffalo Lake National Wildlife Refuge)
- U.S. Forest Service (Black Kettle National Grassland, McClellan Creek National Grassland and Rita Blanca National Grassland)

Red Flag Criteria for the Texas panhandle:
RFW criteria for the Amarillo NWS office must conform to the requirements from the Southwest Area Fire Weather Operating Plan which includes the following conditions simultaneously for 3 hours or more…

- 20 foot wind speeds of 20 mph or greater OR gusting to 35 mph or greater
- Relative Humidity of 15 percent or less
- NFDRS rating of HIGH or greater

Additional local criteria

- Dry lightning potential

Fire Weather Products Issued: Fire Weather Planning Forecasts, Fire Weather Watches, Red Flag Warnings, Fire Danger Statements, NFDRS Forecasts, Spot Forecasts and Fire Weather Point Forecast Matrices

Fire Weather Planning Forecast

- Product ID: LBBFWFAMA
- WMO Header: FNUS54 KAMA
- Issuance Time: Routinely twice a day at 7 AM and 330 PM

- Product Content: Discussion, information on any fire weather watches and red flag warnings in effect, NWSI 10-401 required elements, precipitation amount, LAL, mid level Haines Index, maximum height of the mixing layer (feet and meters AGL), mean transport wind speed (knots and m/s) and direction in the mixing layer, and ventilation rate

Fire Weather Watch/Red Flag Warning

- Product ID: LBBRFWAMA
- WMO Header: WWUS84 KAMA
- Issuance Time: Event Driven
- Product Content: Discussion elaborating on the weather conditions that support extreme fire behavior

Fire Danger Statement

- Product ID: LBBRFDAMA
- WMO Header: FNUS64 KAMA
- Issuance Time: Event Driven
- Product Content: Discussion elaborating on the weather conditions that support high fire behavior and based on the following criteria:
  - 20 foot wind speeds of 20 mph or greater OR gusting to 35 mph or greater
  - Relative Humidity of 15 percent or less
  - NFDRS rating of HIGH or greater

NFDRS Forecasts

- Product ID: LBBFWMAMA
- WMO Header: FNUS84 KAMA
- Issuance Time: Each afternoon after NWS forecasters receive the FWO collective that includes the following stations:

COMMON NAME	STATION ID	TX COUNTY
CEDAR	418701	Hutchinson
BOOTLEG	418801	Deaf Smith

Fire Weather Point Forecast Matrices

- Product ID: LBBPFWAMA
- WMO Header: FOUS54 KAMA
- Issuance Time: Twice a day at no later than 8 AM and 4 PM
- Product Content: Various forecasted weather parameters every three hours for certain predefined points. The predefined points in Texas are:

COMMON NAME	TX COUNTY
AMARILLO	Potter
BOOTLEG RAWS	Deaf Smith
BORGER	Hutchinson

CEDAR RAWS	Hutchinson
DALHART	Hartley

2. NWS Austin/San Antonio (EWX)

Address:
2090 Airport Road
New Braunfels, TX 78130
Phone: 830-629-0130

Fire Weather Program Leader:
Monte Oaks

Meteorologist-In-Charge:
Joe Arellano

Type I IMET:
No

AMRS Unit:
No

Federal Fire Management Agencies Served:

- U.S. Fish and Wildlife Service (Balcones Canyonlands National Wildlife Refuge)
- National Park Service (Amistad National Recreation Area and Lyndon B. Johnson and San Antonio Missions National Historical Parks)

Special Services: NWS Austin/San Antonio assists the Southern Region Fire Weather Program Manager in providing interagency liaison support for the State of Texas

Red Flag Criteria for South Central Texas:

- 20-ft wind speeds of 15 mph or greater and RH below 20% (Counties along and southeast of the Balcones Escarpment)
- 20-ft wind speeds of 20 mph or greater and RH below 20% (Southern Plains and Hill Country Counties)*
- Presence of dry lightning (LAL=6)
  *Southern Plains and Hill Country Counties are defined by Predictive Service Area Maps from the Texas Forest Service.

Fire Weather Products Issued: Fire Weather Planning Forecasts, Fire Weather Watches, Red Flag Warnings, NFDRS Forecasts, and Spot Forecasts, and Fire Weather Point Forecast Matrices

Fire Weather Planning Forecast

- Product ID: SATFWFEWX
- WMO Header: FNUS54 KEWX
- Issuance Time: Routinely twice a day by 7 AM and around 330 PM
- Product Content: Discussion, information on any fire weather watches and red flag warnings in effect, NWSI 10-401 required elements, maximum height of the mixing layer (feet AGL), mean transport wind speed (MPH) and direction in the mixing layer, chance of wetting rain, LAL and low level Haines Index

Fire Weather Watch/Red Flag Warning

- Product ID: SATRFWEWX
- WMO Header: WWUS84 KEWX
- Issuance Time: Event Driven
- Product Content: Discussion elaborating on the weather conditions that support extreme fire behavior

NFDRS Forecasts

- Product ID: SATFWMEWX
- WMO Header: FNUS84 KEWX
- Issuance Time: Each afternoon after NWS forecasters receive the FWO collective that includes the following stations:

COMMON NAME	STATION ID	TX COUNTY
BASTROP	415501	Bastrop
LAGRANGE	415602	Fayette
LOST MAPLES SNA	417802	Bandera
BIRD	417901	Gillespie
BALCONES CANYONLANDS	417902	Travis
BALCONES FLYING X	417903	Burnet
GUADALUPE RIVER SP	418101	Comal
KICKAPOO CAVERNS SP	418001	Kinney
MERRILL	418002	Edwards
PEARSALL	418102	Frio

Fire Weather Point Forecast Matrices

- Product ID: SATPFWEWX
- WMO Header: FOUS54 KEWX
- Issuance Time: Twice a day at around 4 AM and 4 PM
- Product Content: Various forecasted weather parameters every three hours for certain predefined points. The predefined points are:

COMMON NAME	TX COUNTY
BASTROP	Bastrop
LAGRANGE	Fayette
LOST MAPLES SNA	Bandera
BIRD	Gillespie
BALCONES CANYONLANDS	Travis
BALCONES FLYING X	Burnet
GUADALUPE RIVER SP	Comal
KICKAPOO CAVERNS SP	Kinney
MERRILL	Edwards
PEARSALL	Frio

3. NWS Brownsville (BRO)

Address:
20 South Vermillion
Brownsville, TX 78521-5798
Phone: 956-504-1432

Fire Weather Program Leader:
Jason Straub

Meteorologist-In-Charge:
Steve Drillette

Type I IMET:
No

AMRS Unit:
No

Federal Fire Management Agencies Served:

- National Park Service (Padre Island National Seashore and Palo Alto Battlefield National Historical Site)
- U.S. Fish and Wildlife Service (Laguna Atascosa, Lower Rio Grande Valley, and Santa Ana National Wildlife Refuges)

Red Flag Criteria for Deep South Texas:

- Conditions expected to last for 2 hours or more at any location. Wind assumed to be sustained unless otherwise noted (G=Gust).

Locations	RH	20 ft Wind	Fuel Dryness
All	<15%	15G20+	N/A
All but Zapata	<25%	20G25+	Dry+ (*)
Zapata	<25%	25+	Dry+ (*)
Jim Hogg, Starr, Brooks, Hidalgo	<35%	25+	Dry+ (*)
Kenedy, Willacy, Cameron	<40%	25+	Dry+ (*)
Coastal Willacy, Coastal Cameron	<45%	25+	Dry+ (*)
All but Zapata	<45%	25+	Critically Dry+†
Zapata	<35%	25+	Critically Dry+†

- (*) When Cured. If grass/rangelands are considered “cured”, fuel dryness will *not* be considered. Curing is defined as occurring from frost or drought. In general, a heavy winter frost/hard freeze will cure, and look for Drought

Monitor values of D2 (severe) or greater. If unsure, call USFWS or TFS personnel during daylight hours to determine actual curing due to drought or frost. The Texas Drought Monitor can be found at http://www.drought.unl.edu/dm/DM_state.htm?TX,S

- Fuel Dryness map is always one day prior to current day. In general, if the most recent dryness condition is Dry or greater, ***and*** the ***forecast*** RH and wind meet the thresholds above, the expected dryness should remain steady or worsen. Plans are underway to produce the dryness map during the evening of the same day, which will greatly help overnight shifts. http://webgis.tamu.edu/tfs/rawsd/dryness.png

- †Curing will not be considered for these cases, as RH thresholds are 10 percent above the normal threshold when fuel dryness is "Dry".

Fire Weather Products Issued: Fire Weather Planning Forecasts, Fire Weather Watches, Red Flag Warnings, NFDRS Forecasts, Fire Danger Statements, and Spot Forecasts

Fire Weather Planning Forecast
- Product ID: SATFWFBRO
- WMO Header: FNUS54 KBRO
- Issuance Time: Routinely once a day by 7 AM
- Product Content: Discussion, information on any fire weather watches and red flag warnings in effect, NWSI 10-401 required elements, RH trends for the first 24 hours and maximum height of the mixing layer (feet AGL)

Fire Weather Watch/Red Flag Warning
- Product ID: SATRFWBRO
- WMO Header: WWUS84 KBRO
- Issuance Time: Event Driven
- Product Content: Discussion elaborating on the weather conditions that support extreme fire behavior

Rangeland Fire Discussion
- Product ID: SATRFDBRO
- WMO Header: FNUS64 KBRO
- Issuance Time: Event Driven
- Product Content: Discussion elaborating on the weather conditions that support elevated non-red flag fire behavior
- Conditions expected to last for 2 hours or more at any location. Wind assumed to be sustained unless otherwise noted (G=Gust). Table is on the following page.

Locations	RH	20 ft Wind	Fuel Dryness†
Zapata, Cured*	15%≤RH<25%	15G20+	N/A
Hidalgo, Brooks, Jim Hogg, Starr, Cured*	15%≤RH<35%	15G20+	N/A
Kenedy, Willacy, Cameron, Cured*	15%≤RH<40%	15G20+	N/A
Coastal Cameron/Willacy, Cured*	15%≤RH<45%	15G20+	N/A
Hidalgo, Brooks, Jim Hogg, Zapata, Starr, Uncured	15%≤RH<25%	15G20+	Dry+
Kenedy, Willacy, Cameron, Coastal Cameron/Willacy, Uncured	25%≤RH<35%	15G20+	Dry+

- *Curing is defined as occurring from frost or drought. In general, a heavy winter frost/hard freeze will cure, and look for Drought Monitor values of D2 (severe) or greater. If unsure, call USFWS or TFS personnel during daylight hours to determine actual curing due to drought or frost.

NFDRS Forecasts

- Product ID: SATFWMBRO
- WMO Header: FNUS84 KBRO
- Issuance Time: Each afternoon after NWS forecasters receive the FWO collective that includes the following stations:

COMMON NAME	STATION ID	TX COUNTY
HEBBRONVILLE	418401	Jim Hogg
SANTA ANA NWR	418602	Hidalgo
LAGUNA ATASCOSA	418603	Cameron
FALCON LAKE	418604	Starr
LINN-SAN MANUAL	418605	Hidalgo

Fire Weather Point Forecast Matrices

Currently there are no matrices issued in the BRO CWFA

4. NWS Corpus Christi (CRP)

Address:
426 Pinson Drive
Corpus Christi, TX 78406-1803
Phone: 361-289-0959

Fire Weather Program Leader:
Jason Runyen

Meteorologist-In-Charge:
Scott Cordero

Type I IMET:
No

AMRS Unit:
No

Federal Fire Management Agencies Served:

- National Park Service (Padre Island National Seashore)
- U.S. Fish and Wildlife Service (Aransas National Wildlife Refuge)
- United States Department of Agriculture (Natural Resources Conservation Service)

Red Flag Criteria for the Coastal Bend and Rio Grande Plains:

Locations	RH	20 ft Wind (sustained or frequent gusts)	Fuel Dryness Category (from the Texas Forest Service)
Growing Season Criteria			
Coastal Counties	≤40%	≥25mph	Dry-Extreme*
Inland Counties	≤30%	≥25mph	Dry-Extreme*
Cured Fuel† Criteria			
Coastal Counties	≤40%	≥25mph	N/A
Inland Counties	≤30%	≥25mph	N/A

* Fuel Dryness forecast map: http://webgis.tamu.edu/tfs/rawsd/dryfcst.png
† If grass/rangelands are considered "cured", fuel dryness will *not* be considered. Curing is defined as occurring from frost or drought. In general, a heavy winter frost/hard freeze will cure, and during drought look for values of D2 (severe) or greater in the Texas Drought Monitor: http://www.droughtmonitor.unl.edu/DM_state.htm?TX,S

Fire Weather Products Issued: Fire Weather Planning Forecasts, Fire Weather Watches, Red Flag Warnings, NFDRS Forecasts, Spot Forecasts, and Fire Weather Point Forecast Matrices

Fire Weather Planning Forecast

- Product ID: SATFWFCRP
- WMO Header: FNUS54 KCRP
- Issuance Time: Routinely once a day by 630 AM / twice a day from October through April, with a second issuance by 400 PM
- Product Content: Discussion, information on any fire weather watches and red flag warnings in effect, NWSI 10-401 required elements, maximum height of the mixing layer (feet AGL), mean transport wind speed (MPH) and direction in the mixing layer, LAL and low level Haines Index

Fire Weather Watch/Red Flag Warning

- Product ID: SATRFWCRP
- WMO Header: WWUS84 KCRP
- Issuance Time: Event Driven
- Product Content: Discussion elaborating on the weather conditions that support extreme fire behavior

Fire Danger Statement

- Product ID: SATRFDCRP
- WMO Header: FNUS64 KCRP
- Issuance Time: Event Driven
- Product Content: Discussion elaborating on elevated fire weather conditions that fall just beneath red flag criteria.

NFDRS Forecasts

- Product ID: SATFWMCRP
- WMO Header: FNUS84 KCRP
- Issuance Time: Each afternoon after NWS forecasters receive the FWO collective that includes the following stations:

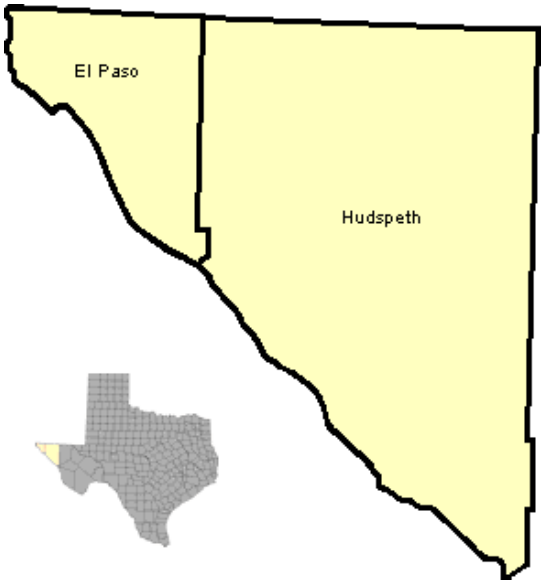
COMMON NAME	STATION ID	TX COUNTY
GEORGE WEST	418201	Live Oak
MATAGORDA ISLAND	418503	Aransas
VICTORIA	418202	Victoria
ARANSAS NWR	418502	Aransas

Fire Weather Point Forecast Matrices

- Product ID: SATPFWCRP
- WMO Header: FOUS54 KCRP
- Issuance Time: Twice a day at around 4 AM and 4 PM
- Product Content: Various forecasted weather parameters every three hours for certain predefined points. The predefined points are:

COMMON NAME	TX COUNTY
GEORGE WEST	Live Oak
MATAGORDA ISLAND	Aransas
VICTORIA	Victoria
ARANSAS NWR	Aransas

5. NWS El Paso (EPZ)



Address:
7955 Airport Road
Santa Teresa, NM 88008
Phone: 505-589-3972/3982

Fire Weather Program Leader:
Tom Bird

Meteorologist-In-Charge:
Jesse Haro

Type I IMET:
Yes

AMRS Unit:
Yes

Fire Management Agencies Served (in Texas):
- National Park Service (Chamizal National Memorial Park)

Red Flag Criteria for Far West Texas:
RFW criteria for the El Paso NWS office must conform to the requirements from the Southwest Area Fire Weather Operating Plan which includes the following conditions simultaneously for 3 hours or more…
- 20 foot wind speeds of 20 mph or greater OR gusting to 35 mph or greater
- Relative Humidity of 15 percent or less
- NFDRS rating of HIGH or greater

Note: The Silver City and Alamogordo Zone Dispatch Centers will be notified of RFW Issuances.

Fire Weather Products Issued: Fire Weather Planning Forecasts, Red Flag Warnings, Fire Weather Watches, NFDRS Forecasts, Spot Forecasts and Fire Weather Point Forecast Matrices

Fire Weather Planning Forecast

- Product ID: LBBFWFEPZ
- WMO Header: FNUS54 KEPZ
- Issuance Time: See Below
- Product Content: See Below

FWFEPZ In season (approximately May 1st - Oct 31st)	FWFEPZ Off Season (approximately Nov. 1st - Mar 31st)
Issued routinely twice a day, first issued around 930 am and again at around 230 pm.	Issued once daily around 930 am.
Content includes a discussion, information on any fire weather watches and red flag warnings in effect, NWSI 10-401 required elements, LAL, high-level Haines Index, and 10000 foot winds (knots)	The off-season format discontinues LAL and Haines Index. Maximum height of the mixing layer (feet AGL), and mixing layer transport winds are added to aide in smoke dispersal decisions

Fire Weather Watch/Red Flag Warning

- Product ID: LBBRFWEPZ
- WMO Header: WWUS84 KEPZ
- Issuance Time: Event Driven
- Product Content: Discussion elaborating on the weather conditions that support extreme fire behavior

NFDRS Forecasts:
Currently there are no NFDRS forecasts for the Texas portion of the ELP CWFA.

Fire Weather Point Forecast Matrices
Currently there are no matrices issued in the Texas portion of the ELP CWFA

6. NWS Fort Worth/Dallas (FWD)

Address:
3401 Northern Cross Blvd.
Fort Worth, Texas 76137-3610
Phone: 817-831-1157

Fire Weather Program Leader:
Joe Harris

Meteorologist-In-Charge:
Tom Bradshaw

Type I IMET:
Yes

AMRS Unit:
Yes

Federal Fire Management Agencies Served:

- U.S. Fish and Wildlife Service (Hagerman National Wildlife Refuge)
- U.S. Forest Service (Caddo and Lyndon B. Johnson National Grasslands)

Red Flag Criteria for North Central Texas:

- 33 foot winds 20 mph or higher with minimum RH of 30% or less
- Dry thunderstorms
- Ongoing large wildfires.

Fire Weather Products Issued: Fire Weather Planning Forecasts, Fire Weather Watches, Red Flag Warnings, Grass Fire Danger Statements, NFDRS Forecasts, and Spot Forecasts

Fire Weather Planning Forecast

- Product ID: FTWFWFFWD
- WMO Header: FNUS54 KFWD
- Issuance Time: Routinely twice a day by 8 AM and 4 PM
- Product Content: Discussion, information on any fire weather watches and red flag warnings in effect, NWSI 10-401 required elements, maximum height of the mixing layer (feet AGL/MSL-blended and meters AGL), transport wind speed (m/s) and direction in the mixing layer, sunshine hours and RH trends for the first 24 hours

Fire Weather Watch/Red Flag Warning

- Product ID: FTWRFWFWD
- WMO Header: WWUS84 KFWD
- Issuance Time: Event Driven
- Product Content: Discussion elaborating on the weather conditions that support extreme fire behavior

North Texas Grass Fire Danger Statement

- Product ID: FTWRFDFWD
- WMO Header: FNUS64 KFWD
- Issuance Time: Event Driven
- Product Content: Discussion elaborating on the weather conditions that support a very high or extreme fire danger. These conditions are determined and are based on stage of vegetation, expected afternoon high temperature, afternoon minimum relative humidity and daytime wind speed. Also included in the product are any burn bans that may be currently in effect.

NFDRS Forecasts

- Product ID: FTWFWMFWD
- WMO Header: FNUS84 KFWD
- Issuance Time: Each afternoon after NWS forecasters receive the FWO collective that includes the following stations:

COMMON NAME	STATION ID	TX COUNTY
CADDO	410202	Fannin
ATHENS	412101	Henderson
PALESTINE	412601	Anderson
ROUND PRAIRIE	413101	Robertson
POSSUM KINGDOM SP	419402	Palo Pinto
COMANCHE	419403	Comanche
LBJ	419601	Wise
GREENVILLE	419602	Hunt
CEDAR HILL SP	419701	Dallas
GRANBURY	419702	Hood
TEMPLE	419801	Bell
MCGREGOR	419802	McLennan

Fire Weather Point Forecast Matrices

Currently there are no matrices issued in the FWD CWFA

7. NWS Houston/Galveston (HGX)

Address:
1353 FM 646, Suite 202
Dickinson, TX 77539
Phone: 281-337-5074

Fire Weather Program Leader:
Kent Prochazka

Meteorologist-In-Charge:
Gene Hafele

Type I IMET:
Yes

AMRS Unit:
No

Federal Fire Management Agencies Served:

- National Park Service (Big Thicket National Preserve)
- U.S. Fish and Wildlife Service (Anahuac National Wildlife Refuge, Attwater Prairie Chicken National Wildlife Refuge and Big Boggy/Brazoria/San Bernard National Wildlife Refuges)
- U.S. Forest Service (Davy Crockett and Sam Houston National Forests)

Red Flag Criteria for Southeast Texas:

- RH 20-25% or less combined with winds 15 to 25 mph sustained or higher, and fuel moistures are low.

Fire Weather Products Issued: Fire Weather Planning Forecasts, Fire Weather Watches, Red Flag Warnings, NFDRS Forecasts, and Spot Forecasts

Fire Weather Planning Forecast

- Product ID: SATFWFHGX
- WMO Header: FNUS54 KHGX
- Issuance Time: Routinely twice a day around 730 AM and 330 PM
- Product Content: Discussion, information on any fire weather watches and red flag warnings in effect, NWSI 10-401 required elements, hours of sunshine, ventilation rate (meters squared/second), category day, height of the mixing layer (both feet and meters AGL), maximum height of the mixing layer (feet AGL and meters AGL), mean transport wind speed (both knots and

meters/second) and direction in the mixing layer, LAL and RH trends for the first 24 hours

Fire Weather Watch/Red Flag Warning

- Product ID: SATRFWHGX
- WMO Header: WWUS84 KHGX
- Issuance Time: Event Driven
- Product Content: Discussion elaborating on the weather conditions that support extreme fire behavior

NFDRS Forecasts

- Product ID: SATFWMHGX
- WMO Header: FNUS84 KHGX
- Issuance Time: Each afternoon after NWS forecasters receive the FWO collective that includes the following stations:

COMMON NAME	STATION ID	TX COUNTY
RATCLIFF	413302	Houston
HUNTSVILLE	414102	Walker
COLDSPRINGS	414201	San Jacinto
CONROE	415109	Montgomery
DAYTON	415201	Liberty
ANAHUAC PORTABLE	416099	Chambers
ATWATERS	416601	Colorado
BRAZORIA	418301	Brazoria
SAN BERNARD	418302	Brazoria

Fire Weather Point Forecast Matrices

Currently there are no matrices issued in the HGX CWFA

8. NWS Lake Charles (LCH)

Address:
500 Airport Blvd., #115
Lake Charles, LA 70607-0668
Phone: 337-477-5285

Fire Weather Program Leader:
Kent G. Kuyper

Meteorologist-In-Charge:
Andy Patrick

Type I IMET:
No

AMRS Unit:
No

Federal Fire Management Agencies Served (in Texas):

- National Park Service (Big Thicket National Preserve)
- U.S. Fish and Wildlife Service (McFaddin and Texas Point National Wildlife Refuges)

Red Flag Criteria for Extreme Southeast

- In general, Fire Weather Watches and Red Flag Warnings will be issued when sustained winds of 20 to 25 mph or greater are expected while the region is at Preparedness Level 2 or greater. Preparedness Level 2 or higher in the Gulf Coast Area means that fuels are sufficiently dry and RH values are usually low enough (30-35% or lower) or strong winds to cause erratic and extreme fire behavior.

Fire Weather Products Issued: Fire Weather Planning Forecasts, Fire Weather Watches, Red Flag Warnings, NFDRS Forecasts, and Spot Forecasts

Fire Weather Planning Forecast

- Product ID: NEWFWFLCH
- WMO Header: FNUS54 KLCH
- Issuance Time: Routinely twice a day around 6 AM and 3 PM
- Product Content: Discussion, information on any fire weather watches and red flag warnings in effect, NWSI 10-401 required elements, precipitation amount, precipitation timing and duration, LAL, maximum and minimum mixing heights (feet AGL/MSL-blended and m AGL/MSL-blended), mean transport wind speed (miles/hour and m/s) and direction in the mixing layer,

dispersion index, ventilation rate (meters squared/second), category day, and Keetch-Byram Index

Fire Weather Watch/Red Flag Warning

- Product ID: NEWRFWLCH
- WMO Header: WWUS84 KLCH
- Issuance Time: Event Driven
- Product Content: Discussion elaborating on the weather conditions that support extreme fire behavior

NFDRS Forecasts

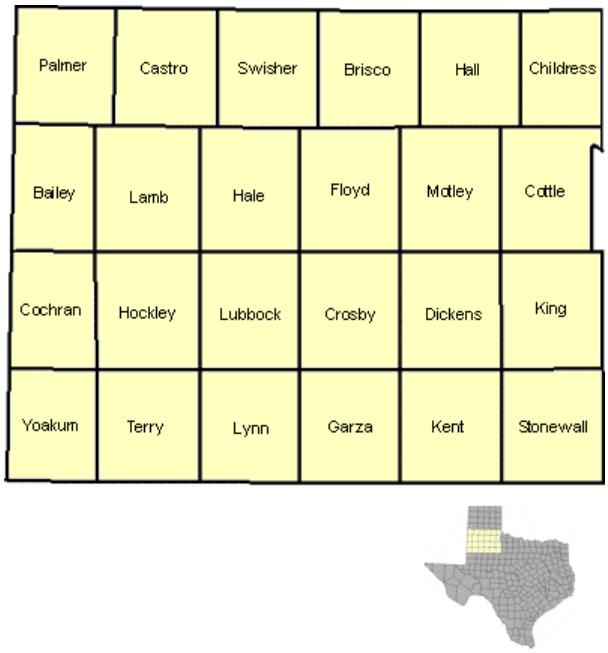
- Product ID: NEWFWMLCH
- WMO Header: FNUS84 KLCH
- Issuance Time: Each afternoon after NWS forecasters receive the FWO collective that includes the following stations:

COMMON NAME	STATION ID	TX COUNTY
WOODVILLE	414402	Tyler
KIRBYVILLE	414501	Jasper
SOUTHERN ROUGH	416101	Tyler
MCFADDIN	419901	Jefferson

Fire Weather Point Forecast Matrices

Currently there are no matrices issued in the Texas portion of the LCH CWFA

9. NWS Lubbock (LUB)



Address:
2579 South Loop 289, Suite 100
Lubbock, TX 79423-1400
Phone: 806-745-4260

Fire Weather Program Leader:
Ronald McQueen

Meteorologist-In-Charge:
Justin Weaver

Type I IMET:
No

AMRS Unit:
No

Federal Fire Management Agencies Served:
- U.S. Fish and Wildlife Service (Muleshoe National Wildlife Refuge)

Red Flag Criteria for the South Plains of Northwest Texas:
RFW criteria for the Lubbock NWS office must conform to the requirements from the Southwest Area Fire Weather Operating Plan which includes the following conditions simultaneously for 3 hours or more…
- 20 foot wind speeds of 20 mph or greater OR gusting to 35 mph or greater
- Relative Humidity of 15 percent or less
- NFDRS rating of HIGH or greater

Fire Weather Products Issued: Fire Weather Planning Forecasts, Fire Weather Watches, Red Flag Warnings, Fire Danger Statements, NFDRS Forecasts, Spot Forecasts and Fire Weather Point Forecast Matrices

Fire Weather Planning Forecast
- Product ID: LBBFWFLUB
- WMO Header: FNUS54 KLUB
- Issuance Time: Routinely twice a day around 6 AM and 3 PM
- Product Content: Discussion, information on any fire weather watches and red flag warnings in effect, NWSI 10-401 required elements, maximum height of the mixing layer (feet AGL), transport winds (knots), Haines Index and RH trends through 24 hours

Fire Weather Watch/Red Flag Warning
- Product ID: LBBRFWLUB

- WMO Header: WWUS84 KLUB
- Issuance Time: Event Driven
- Product Content: Discussion elaborating on the weather conditions that support extreme fire behavior

Fire Danger Statement

- Product ID: LBBRFDLUB
- WMO Header: FNUS64 LUB
- Issuance Time: Event Driven
- Product Content: Discussion elaborating on elevated fire weather conditions that fall just beneath red flag criteria.

NFDRS Forecasts

- Product ID: LBBFWMLUB
- WMO Header: FNUS84 KLUB
- Issuance Time: Each afternoon after NWS forecasters receive the FWO collective that includes the following stations:

COMMON NAME	STATION ID	TX COUNTY
CAPPROCK	418901	Briscoe
MATADOR WMA	418902	Motley
JAYTON	419001	Kent

Fire Weather Point Forecast Matrices

- Product ID: LBBPFWLUB
- WMO Header: FOUS54 KLUB
- Issuance Time: Twice a day at no later than 7 AM and 4 PM
- Product Content: Various forecasted weather parameters every three hours for certain predefined points. The predefined points are:

COMMON NAME	TX COUNTY
CAPPROCK RAWS	Briscoe
CHILDRESS	Childress
JAYTON	Kent
LUBBOCK	Lubbock
MATADOR RAWS	Motley
PLAINVIEW	Hale

10. NWS Midland/Odessa (MAF)

Address:
2500 Challenger Drive
Midland, TX 79706
Phone: 432-563-5006

Fire Weather Program Leader:
Gregory Murdoch

Meteorologist-In-Charge:
VACANT

Type I IMET:
Yes

AMRS Unit:
Yes

Federal Fire Management Agencies Served (in Texas):

- National Park Service (Big Bend National Park, Fort Davis National Historic Site and Guadalupe Mountains National Park)

Red Flag Criteria for the Trans-Pecos Region:
RFW criteria for the Midland/Odessa NWS office must conform to the requirements from the Southwest Area Fire Weather Operating Plan which includes the following conditions simultaneously for 3 hours or more…

- 20 foot wind speeds of 20 mph or greater OR gusting to 35 mph or greater
- Relative Humidity of 15 percent or less, and
- NFDRS adjective rating of HIGH or greater

Fire Weather Products Issued: Fire Weather Planning Forecasts, Fire Weather Watches, Red Flag Warnings, Fire Danger Statements, NFDRS Forecasts, Spot Forecasts and Fire Weather Point Forecast Matrices.

Fire Weather Planning Forecast

- Product ID: LBBFWFMAF
- WMO Header: FNUS54 KMAF
- Issuance Time: Routinely twice a day no later than 930 AM and 330 PM
- Product Content: Discussion, information on any fire weather watches and red flag warnings in effect, NWSI 10-401 required elements, maximum height of the mixing layer (feet AGL), transport winds (knots), Haines Index (high elevation level), LAL, 10,000 foot winds (mph), ventilation data and RH trends through 24 hours.

Fire Weather Watch/Red Flag Warning

- Product ID: LBBRFWMAF
- WMO Header: WWUS84 KMAF
- Issuance Time: Event Driven
- Product Content: Discussion elaborating on the weather conditions that support extreme fire behavior

Fire Danger Statement

- Product ID: LBBRFDMAF
- WMO Header: FNUS64 KMAF
- Issuance Time: Event Driven
- Product Content: Discussion elaborating on elevated fire weather conditions that fall just beneath red flag criteria.

NFDRS Forecasts

- Product ID: LBBFWMMAF
- WMO Header: FNUS84 KMAF
- Issuance Time: Each afternoon after NWS forecasters receive the FWO collective that includes the following stations:

COMMON NAME	STATION ID	TX COUNTY
PINERY	417101	Culberson
THE BOWL	417103	Culberson
FORT DAVIS	417201	Jeff Davis
PANTHER JUNCTION	417401	Brewster
CHISOS	417403	Brewster
MIDLAND	419202	Midland

Fire Weather Point Forecast Matrices

- Product ID: LBBPFWMAF
- WMO Header: FOUS54 KMAF
- Issuance Time: Twice a day at no later than 8 AM and 4 PM
  Product Content: Various forecasted weather parameters every three hours for certain predefined points. The predefined points are:

COMMON NAME	TX COUNTY
MIDLAND RAWS	Midland
FORT DAVIS RAWS	Jeff Davis
MARFA AWOS	Presidio
CHISOS RAWS	Brewster
PANTHER JUNCTION RAWS	Brewster
RIO GRANDE VILLAGE PORTABLE RAWS	Brewster

DOG CANYON RAWS	Culberson
MCKITTRICK RAWS	Culberson
PINERY RAWS	Culberson
THE BOWL RAWS	Culberson
PX WELL RAWS	Hudspeth

11. NWS Oklahoma City (OUN)

Address:
120 David L. Boren Blvd.
Suite 2400
Norman, OK 73072
Phone: 405-325-3816

Fire Weather Program Leader:
Scott Curl

Meteorologist-In-Charge:
VACANT

Federal Fire Management Agencies Served (in Texas):
None

Red Flag Criteria:

- RH less than or equal to 20% combined with 20-foot winds of 20 mph or higher.
- Availability of fuel during the growing season is also considered.

Fire Weather Products Issued: Fire Weather Planning Forecasts, Fire Weather Watches, Red Flag Warnings, NFDRS Forecasts, and Spot Forecasts

Fire Weather Planning Forecast

- Product ID: OKCFWFOUN
- WMO Header: FNUS54 KOUN
- Issuance Time: Routinely twice a day no later than 445 AM and 415 PM.
- Product Content: Discussion, information on any fire weather watches and red flag warnings in effect, NWSI 10-401 required elements, precipitation amount, maximum and minimum height of the mixing layer (feet AGL and m AGL), transport winds (mph and m/s), ventilation rate (meters squared/second) and category day

Fire Weather Watch/Red Flag Warning

- Product ID: OKCRFWOUN
- WMO Header: WWUS84 KOUN
- Issuance Time: Event Driven
- Product Content: Discussion elaborating on the weather conditions that support extreme fire behavior

NFDRS Forecasts

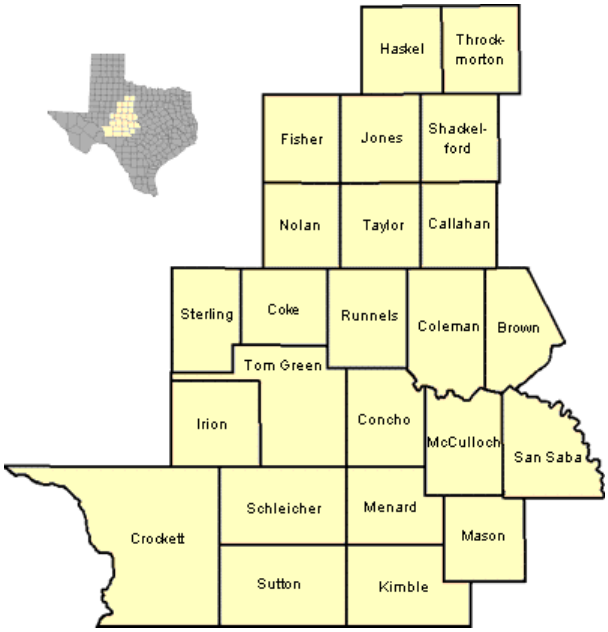
- Product ID: OKCFWMOUN
- WMO Header: FNUS84 KOUN
- Issuance Time: Each afternoon after NWS forecasters receive the FWO collective that includes the following stations:

COMMON NAME	STATION ID	TX COUNTY
MILLER CREEK	419301	Baylor

Fire Weather Point Forecast Matrices

Currently there are no matrices issued in the Texas portion of the OUN CWFA

12. NWS San Angelo (SJT)



Address:
7654 Knickerbocker Road
San Angelo, TX 76904-7892
Phone: 325-944-9445

Fire Weather Program Leader:
Mark Cunningham

Meteorologist-In-Charge:
Dr. Steve Lyons

Type I IMET:
No

AMRS Unit:
No

Federal Fire Management Agencies Served:

- United States Department of Agriculture (Natural Resources Conservation Service)
- The San Angelo NWS Office also supports the State of Texas with a fully trained IMET

Red Flag Criteria for West Central Texas:

- Minimum afternoon RH 20% and 20 foot winds of 20 mph.
- NFDRS adjective rating of HIGH or greater

Fire Weather Products Issued: Fire Weather Planning Forecasts, Fire Weather Watches, Red Flag Warnings, NFDRS Forecasts, Spot Forecasts and Fire Weather Point Forecast Matrices.

Fire Weather Planning Forecast

- Product ID: LBBFWSJT
- WMO Header: FNUS54 KSJT
- Issuance Time: Routinely twice a day around 5 AM and 2 PM.
- Product Content: Discussion, information on any fire weather watches and red flag warnings in effect, NWSI 10-401 required elements, maximum and minimum height of the mixing layer (feet AGL) and transport winds (mph)

Fire Weather Watch/Red Flag Warning

- Product ID: LBBRFWSJT
- WMO Header: WWUS84 KSJT
- Issuance Time: Event Driven

- Product Content: Discussion elaborating on the weather conditions that support extreme fire behavior

NFDRS Forecasts

- Product ID: LBBFWMSJT
- WMO Header: FNUS84 KSJT
- Issuance Time: Each afternoon after NWS forecasters receive the FWO collective that includes the following stations:

COMMON NAME	STATION ID	TX COUNTY
BARNHART	417701	Crockett
MASON	417801	Mason
PAINT CREEK	419203	Coke
HAMBY	419401	Callahan
COLORADO BEND SP	419501	San Saba
COLEMAN	419502	Coleman

Fire Weather Point Forecast Matrices

- Product ID: LBBPFWSJT
- WMO Header: FOUS54 KSJT
- Issuance Time: Twice a day at no later than 8 AM and 4 PM
- Product Content: Various forecasted weather parameters every three hours for certain predefined points. The predefined points are:

COMMON NAME	TX COUNTY
BARNHART RAWS	Crockett
MASON RAWS	Mason
PAINT CREEK RAWS	Coke
HAMBY RAWS	Callahan
COLORADO BEND RAWS	San Saba
COLEMAN RAWS	Coleman

13. NWS Shreveport (SHV)

Address:
5655 Hollywood Ave.
Shreveport, LA 71109-7750
Phone: 318-631-3669

Fire Weather Program Leader:
Marty Mayeaux

Meteorologist-In-Charge:
Armando Garza

Type I IMET:
No

AMRS Unit:
No

Federal Fire Management Agencies Served:

- U.S. Forest Service (Angelina and Sabine National Forests)
- U.S. Fish and Wildlife Service (Caddo Lake Wildlife Refuge)

Red Flag Criteria:

- Strong wind (generally 25 mph or higher [20 mph RAWS]) with low RH (25% or less)
- Fire danger in the high or extreme categories.

Fire Weather Products Issued: Fire Weather Planning Forecasts, Fire Weather Watches, Red Flag Warnings, NFDRS Forecasts, and Spot Forecasts

Fire Weather Planning Forecast

- Product ID: NEWFWSHV
- WMO Header: FNUS54 KSHV
- Issuance Time: Routinely twice a day around 7 AM and 3 PM.
- Product Content: Discussion, information on any fire weather watches and red flag warnings in effect, NWSI 10-401 required elements, precipitation amount, precipitation duration, 500 m/1700 ft mixing height temperatures, maximum mixing heights (meters and feet MSL), mean transport wind speed (meters/second and miles/hour) and direction in the mixing layer, ventilation rate (meters squared/second), and category day and stability class

Fire Weather Watch/Red Flag Warning

- Product ID: NEWRFWSHV
- WMO Header: WWUS84 KSHV
- Issuance Time: Event Driven
- Product Content: Discussion elaborating on the weather conditions that support extreme fire behavior

NFDRS Forecasts

- Product ID: NEWFWMSHV
- WMO Header: FNUS84 KSHV
- Issuance Time: Each afternoon after NWS forecasters receive the FWO collective that includes the following stations:

COMMON NAME	STATION ID	TX COUNTY
CLARKSVILLE	410401	Red River
TEXARKANA	410501	Bowie
LINDEN	411102	Cass
GILMER	411401	Upshur
CADDO LAKE	411901	Harrison
HENDERSON	412202	Rusk
LUMBERJACK	412801	Nacogdoches
SABINE NORTH	412901	Shelby
ZAVALLA	413503	Angelina
LUFKIN	413509	Angelina
SABINE SOUTH	413701	Sabine

Fire Weather Point Forecast Matrices

Currently there are no matrices issued in the Texas portion of the SHV CWFA

C. DECISION SUPPORT AND OTHER SPECIALIZED SERVICES

Fire management agencies often need weather support that is not easily attained directly from a WFO. Most specialized services are described as decision support to reflect support provided to an incident as part of the Incident Command System (ICS) concept. The most common form of decision support to fire management agencies is the request of an Incident Meteorologist (IMET).

Other specialized services would include providing weather training, conducting training exercises, and participating in outreach functions. These services are commonly fulfilled at a location outside the WFO and may be performed by either a fully trained incident meteorologist (IMET) or other NWS forecaster meeting specific fire weather training requirements.

1. The IMET Program

The NWS maintains a cadre of roughly 70 highly trained Incident Meteorologists (IMETs) that are able to provide direct weather support at an incident or event. A Type I IMET has the sufficient training and experience to be capable of providing direct meteorological support at an Incident Command Post or to an Incident Management Team (IMT).

Type II and Type III IMETS

Due to the increasing volume and variety of incident support requests, of which some are non-wildfire related, the NWS has established a second and third tier set of training requirements for IMETs as described in greater detail at NDS NWSI 10-402. In general, a Type I IMET is certified to provide all wildfire related incidents as discussed above, while Type II and Type III level IMET training certifications restrict the decision support to operations from an Emergency Operations Center (EOC), Area Command, or Joint Field Office.

References and contact lists may represent Type II and Type III IMETs as IMET Trainees, but these roles are not exclusive. The Southern Region Fire Weather Program Manager will maintain a list of fully trained IMETs, the IMET Trainees, and the training courses taken by the IMET Trainees. The maintenance of this list ensures the NFWOC are able to properly fulfill IMET dispatch requests based on the needs of the incident.

Dispatch Requests

Requests for on-site meteorological services in support of incidents in Texas are routed through TICC to the National Fire Weather Operations Coordinator (NFWOC). TICC has the authority to request these special services as long as the IMET is located within the jurisdiction of TICC's dispatch zone. TICC managers will enter the availability of the requested IMET in the Resource Ordering and Status System (ROSS). Typically, the IMETs nearest to the incident are requested and deployed first.

Requests for Type II and Type III IMETs to support non-wildland fire events and training are generally left to the discretion of the local offices Meteorologist-in-Charge (MIC) or acting supervisor, and therefore are not necessarily subject to processing through TICC and the NFWOC. In special cases, IMET support may be acquired through SRH.

Upon notification of a dispatch request, IMETs are responsible for acquiring or requesting the equipment needed for communication, weather observation, and forecast preparation. For example, the All-hazard Meteorological Response System (AMRS) may be needed for an IMET operating in remote locations.

Reimbursement of Expenses
Costs incurred by the NWS in providing IMET support will be borne by the requesting agency. NDS NWSI 10-402 also provides guidance on the process that the NWS uses to recover reimbursable expenses. Reimbursable expenses for items such as travel, overtime, and per diem are to be recovered from fire management agencies are calculated on the basis of expense reports submitted by the WFO through Southern Region Headquarters (SRH).

2. Regional Fire Weather Support

The Southern Region Climate Services Program Manager and the SR Regional Operations Center (ROC) can be consulted to provide medium to long range climate outlooks as well as historical climate perspectives for the fire management agencies.

The ROC is also capable of providing Type II or Type III level IMET support for statewide operations, either on-site, or through internet based video presentations. Additionally, the ROC is able to provide interagency liaison support and host conference calls between the NWS field offices and the partner agencies.

Any of the above SRH services may be requested by contacting the ROC by phone at (817) 978-1100 x147. The ROC is staffed 7 days a week (including weekends and holidays) from 5 am to 8 pm CST/CDT, and can also be reached after-hours through a messaging system.

D. INTERAGENCY COOPERATION

The Interagency Agreement for Meteorological Services (National Agreement) establishes coordination guidelines between the NWS and participating wildland fire agencies. As indicated in this agreement, interagency wildland fire agency personnel stationed at the National Interagency Fire Center (NIFC), the Geographic Area Coordination Centers (GACCs), and local interagency coordination centers will work together to ensure fire agency decision makers receive consistent and coordinated fire weather products and services. Collectively, these agencies play a significant role in resource procurement, training and policy guidance, and the communication of operational fire weather information.

GACCs supporting the state of Texas include the Southwest Area Coordination Center (SWCC) for areas west of 100° W longitude and the Southern Area Coordination Center (SACC) for areas east of 100° W longitude. The Texas Interagency Coordination Center (TICC) serves as the local coordination center.

NWS Notification of Service Changes
NWS Offices making changes to forecast products and procedures are expected to provide notification to their respective partner agencies as set forth in the NWS Directives System. The Public Information Statement (PNS) is a means for public notification that a local office will use when a product or service is introduced or discontinued.

Requesting Service Changes
Partner agencies requesting changes in forecast products and services from a specific NWS office should submit a formal request to the Meteorologist-in-Charge (MIC) of the respective office. Queries regarding procedural matters, details of the fire weather program or equipment, special operational needs, et cetera, should be addressed to the FWPL or MIC of the appropriate NWS office. Contact information on each FWPL and MIC of the NWS offices serving Texas as well as a description of local products and services are listed for each office in *Section II.B.*

E. BASIC FORECAST PRODUCTS

NDS 10-401 ensures that all Texas NWS offices issue the following core suite of fire weather products:

1) Digital Forecasts and Services
2) Red Flag Warnings/Fire Weather Watches (RFW)
3) Spot Forecasts (FWS)
4) Fire Weather Planning Forecasts (FWF)
5) National Fire Danger Rating System (NFDRS) Forecasts (FWM)

Section II.E.6. Supplementary Products covers additional fire weather related products, some of which are considered optional or experimental. This includes:

- Hazardous Weather Outlooks and Area Forecast Discussions (all NWS offices)
- Fire Danger Statements (issued locally)
- Fire Weather Point Forecast Matrices (issued locally)

Section II.E.7. Storm Prediction Center Outlooks covers the national fire weather guidance provided by the SPC.

A glossary of fire weather parameters is not provided in this document, but many basic fire weather parameters are referenced in the Glossary of Wildland Fire Terminology at http://www.nwcg.gov/pms/pubs/glossary/f.htm

Product examples from each NWS office are available through the Internet links in *Appendix 4*.

1. Digital Forecasts and Services

National Digital Forecast Database (NDFD) grids are used to produce a wide variety of products and services for fire weather support. Operational status of NWS grid elements is available at this websites:
http://www.weather.gov/ndfd/resources/NDFD_element_status.pdf

The NWS digital database provides several decision support tools accessible via the fire weather web pages at each NWS office. For more information in these supplemental forecast tools, please contact your local NWS office.

2. The Red Flag Program (RFW)

The intent of the red flag program is to provide fire management agencies with the notification of weather conditions associated with wildfire outbreaks. Identification of red flag events is a primary responsibility of the forecaster producing the fire weather forecasts. Forecasters will issue a fire weather watch or red flag warning, based on the criteria and timing explained below.

a. Criteria

Red flag criteria are dependent on both critical fire weather conditions monitored by NWS offices and the fuel moisture and fire danger assessments provided by fire management agencies. Criteria will vary with each NWS office's county warning area based on the vegetation, topography, and distance from the Gulf of Mexico. Red flag criteria for each NWS office can be found in *Section II.B.* A tabular summary of critical weather thresholds is also provided for printing in *Appendix 1*.

Routine interagency coordination is necessary for establishing red flag criteria related to fuel dryness. While some NWS offices may base fuel dryness assessments solely on NFDRS rating categories, other offices may use a mix of NFDRS related outputs to account for variations in fuel characteristics, or rely on direct coordination with a fire behavior analyst. Internet sites containing fuel moisture and fire danger guidance are provided in *Appendix 4.*

i. Fire Weather Watch

A Fire Weather Watch is issued when there is a high potential for the development of a Red Flag event based on the red flag criteria established at each NWS office. The watch will be issued 18 to 96 hours in advance of the expected onset of criteria. The watch product contains a standard bulleted format and uses Valid Time Event Coding (VTEC) and a Product Identifier List (PIL) of "RFW", the same as that of the Red Flag Warning.

The Fire Weather Watch product uses a MND header of “FIRE WEATHER MESSAGE” and will need to be headlined with “FIRE WEATHER WATCH” using the format requirements outlined in NDS NWSI 10-401.

Once issued, the “FIRE WEATHER WATCH” headline will also be included at the top of the Routine Fire Weather Forecast (FWF). The watch will remain in effect until it expires, is canceled, or upgraded to a Red Flag Warning. Watches are cancelled by issuing a new short-duration RFW product.

ii. Red Flag Warning

A Red Flag Warning is issued when there is a high degree of confidence of an impending or occurring Red Flag event based on the red flag criteria established at each NWS office. The warning is issued when the red flag event is expected to occur in 48 hours or less. Longer lead times are encouraged when confidence is very high or the fire situation is critical. The warning product contains a standard bulleted format and uses Valid Time Event Coding (VTEC) and a Product Identifier List (PIL) of “RFW”, the same as that of the Fire Weather Watch.

The Red Flag Warning product uses a MND header of “FIRE WEATHER MESSAGE” and will need to be headlined with “RED FLAG WARNING” using the format requirements outlined in NDS NWSI 10-401.

Once issued, the “RED FLAG WARNING” headline will also be included at the top of the Routine Fire Weather Forecast (FWF). The watch will be continued on subsequent forecasts until conditions are no longer valid. Warnings may be left to expire as long as the previous message expresses a termination time. Warnings are cancelled by issuing a new short-duration RFW product.

b. Dissemination and Access

The dissemination of the RFW should reflect local user capabilities to provide the most efficient means of getting watches/warnings to the appropriate fire suppression personnel.

Fire management personnel can find the current status of RFW conditions for a given location by viewing any of the following:

- Headline statements of the FWF and FWS
- Summary section at the bottom of the AFD
- Point-and-click map on local NWS office web page
- The National Fire Weather and GACC links (see Appendix 4)
- The TICC predictive services pages

3. Spot Forecasts (FWS)

Spot forecasts are specially requested site-specific forecasts for wildfires, prescribed burns, HAZMAT incidents, search and rescue operations, aerial spraying, and other functions of the fire management community. By being site-specific, these forecasts take into account the effects of topography, vegetation and any nearby bodies of water. Based on the request, spot forecasts can contain site-specific forecast information on sky condition, precipitation and thunderstorm probability, maximum and minimum temperature and humidity, wind speed and direction, and timing of weather changes. Due to limited resources, spot forecast requests are subject to certain restrictions as indicated below.

Who can request a spot forecast?

Under the terms of the Interagency Agreement for Meteorological Services (NDS: 10-406), the NWS will provide spot forecast services upon request of any federal, state, tribal, or local official who represents a spot forecast for wildfire support. For non-wildfire purposes, resources permitting, WFOs will provide spot forecast services under the following restrictions:

A. Upon request of any federal official who represents that the spot forecast is required under the terms of the National Agreement.

B. Upon request of any state, tribal, or local official who represents that the spot forecast is required to carry out their wildland fire management responsibilities in coordination with any federal fire management agency participating in the Interagency Agreement.

C. Upon request of any public safety official who represents the spot forecast is essential to public safety, e.g. due to the proximity of population centers or critical infrastructure. A “public safety official” is an employee or contract agent of a government agency at any level (federal, state, local, tribal, etc.) charged with protecting the public from hazards including wildland fires of whatever origin and/or other hazards influenced by weather conditions such as hazardous material releases.

Although anyone can act as a “public safety official” in the event of a fire or hazardous material related incident, it is best to coordinate a spot request through TICC or other federal, state, or local officials if available. Duplication of requests over the same incident could result in confusion or loss in response time. It is also important that non-federal agencies indicate a wildfire or other related public safety hazard as the reason for their request.

Persons not eligible for making a spot forecast request are encouraged to use the collection of planning tools outlined in the NDS at:
http://weather.gov/directives/010/401h/PlanningTools.pdf

Request and Response Times

Spot forecasts are available upon request 24 hours a day, seven days a week, including holidays. These requests will be given priority over routine operations and are usually available within 30 minutes of the time of request. However, protection

agencies should be aware that other duties (such as severe weather) may take higher priority, and short delays may occur. If a delay in response is considered excessive (ie. 60 minutes or more), or the request needs a quick response in support of a wildfire, please notify the appropriate NWS office by phone. Delays of 60 minutes or more may not be considered excessive if the request is in support of prescribed burn ignitions on the following day. While requests may be made for up to one day in advance of ignition time, fire managers are encouraged to utilize the links for planning tools listed in this section or the links provided on the local WFO internet site.

Quick response times are more likely if requesting officials develop the following habits:

- Place a 'heads-up" call to the appropriate NWS office before or immediately after sending the request
- Indicate whether the request is for wildfire support or other public safety threat
- Include preliminary observations (either manually or from a nearby station)
- Avoid processing prescribed burn forecast requests within 30 minutes of known NWS shift change times; contact local NWS office personnel to learn more about potentially sensitive shift-change times.
- Use the remarks section to convey the primary weather concerns

Request and Dissemination Methods

Nearly all spot forecasts are processed through an Internet program called NWS Spot. Requesting officials should consult with the appropriate NWS office for instructions on how to use this program. Each NWS office website will reference a NWS Spot tutorial in the "Fire Wx" section of the homepage. Completed spot forecasts requested through NWS Spot (for both wildfire and non-wildfire purposes) are available to everyone with access to the Internet.

Requesting officials without Internet access may also fax a form titled "Fire Weather Special Forecast Request" or otherwise known as "WS Form D-1". However, these requests must be accompanied by a phone call directly to the NWS forecast operations area in order to notify the appropriate office of the incoming fax request. Blank copies of these forms can be retrieved from the Internet at http://www.srh.weather.gov/srh/cwwd/msd/firewx/images/D1-V2005.pdf or faxed by request from any NWS Office. Once a faxed spot forecast request is fulfilled, NWS offices are encouraged to send a copy of the completed D-1 form to TICC for documentation purposes.

As a final resort, site-specific weather information can also be requested over the phone from NWS forecasters. This means of communication is inefficient for significant amounts of weather information.

Non-federal requesting officials should coordinate spot forecast requests with TICC using the guidelines given above and in the Interagency Agreement.

Format
Spot forecast formats may vary in order to provide the best possible services to requesting agencies. A common format to support prescribed burns includes a tabular group of weather parameters for selected times of the current day. However, requests supporting wildfires or other public safety threats must conform to the guidelines in NWSI 10-401 of the NDS.

Quality Control
NWS offices are encouraged to develop local verification schemes to monitor forecast accuracy. The NWS asks that each spot forecast request be accompanied by a preliminary observation (recorded at the time of the request) and a follow-up observation (recorded at the time of maximum or minimum heating depending upon the time that the request was sent) at the burn site, if possible.

Spot forecasts for prescribed burn support should typically be sent within 12 hours of the projected ignition time, and are most effective when sent within 4 hours of the ignition. Beyond 12 hours, accuracy is unlikely to be improved over the Fire Weather Planning Forecast (FWF). If the FWF does not contain the desired forecast information, customers may call the duty forecaster at the appropriate NWS office for additional detail.

4. Fire Weather Planning Forecasts (FWF)
Fire weather planning forecasts are available to anyone with an interest in fire management and pre-suppression activities in Texas.

Issuance Times:
- At least once per day—usually in the early morning.
- Routine afternoon updates common to many offices.
- Specific issuance times determined by local agreements.

Content:
Based on NWS Directive System requirements, all FWFs contain:
- A headline to emphasize a red flag warning or a significant change in weather conditions,
- Weather synopsis or map discussion,
- Predictions of sky cover and weather, temperature, humidity, and wind, and thunderstorms and/or precipitation, and
- An outlook or extended forecast through at least 5 days.

Each NWS office determines which optional forecast parameters to include in their forecasts based on customer feedback. Details on forecast parameters can be found in *Section II.F.*

Format:
The NWS Directives System allows for either a narrative or tabular format.

5. National Fire Danger Rating System Forecasts (FWM)

The National Fire Danger Rating System is an assessment of wildfire danger, based on fire weather conditions at key points throughout the United States. The NWS role in NFDRS is to make 24-hour weather projections that influence the following day's fire danger indices.

NFDRS observations occur at 1300 LST (1400 LDT). The NWS makes forecasts for these locations at 1300 LST (1400 LDT) the following day. This forecast data is combined with fuel moisture conditions to produce various indices describing fire danger.

Fire weather observations are quality controlled by interagency personnel before being provided to NWS forecasters via the Weather Information Management System (WIMS). Observations failing to reach the NWS through this medium may be noted as missing, and can be eliminated from the NFDRS process.

Format:

The NFDRS (FWM) forecast format is outlined in NDS NWSI 10-4. Required meteorological elements include state of weather, temperature, humidity, wind direction and speed, precipitation duration, and lightning activity level. An NFDRS forecast may be issued as a zone trend (typically where a fire weather zone contains a sufficient amount of observation stations) or as a station specific forecast.

6. Supplementary Products

The following products below are not necessarily issued as a part of the Interagency Agreement for Meteorological Services but are issued based on the guidelines from the NDS:

a. Hazardous Weather Outlooks

NWS offices are encouraged to mention Red Flag Warning, Fire Weather Watches, and other wildfire risk information in Hazardous Weather Outlooks. The decision of when to issue this product is left to the discretion of each forecaster as well local NWS office policies. The phrase “fire danger” should only be used in referencing the assessments provided by the Forest Service.

b. Fire Danger Statements

Fire Danger Statements are issued on an as needed basis, when there is either a very high or extreme fire danger. These conditions are determined and are based on stage of vegetation, expected afternoon high temperature, afternoon minimum relative humidity and daytime wind speed. Also included in the product are any burn bans that may be in effect.

c. Area Forecast Discussions

Area Forecast Discussions are semi-technical products used to explain scientific rationale behind a forecast. Forecasters also use this medium to express forecast confidence levels and to summarize watches, warnings and/or advisories in effect. The format of the product will occasionally contain a special fire weather discussion – mainly when fire weather parameters approach critical values. The bottom portion of these products contains a summary of any RFWs in effect; however, product issuance does not always correspond to changes in RFW status.

d. Special Weather Statements

The Special Weather Statement may be issued to alert agencies, the media, and the general public of significant fire weather related events. Some offices may use this product in lieu of a Fire Danger Statement, for fire weather events that are expected to remain just below red flag criteria.

e. Fire Warnings

Fire Warnings are issued by NWS Offices, and are tone alarmed on NOAA Weather Radio at the request of state and local emergency management coordinators or county judges. These warning products are reserved for wildfire events which present long duration threats to life and property or those that require extraordinary evacuation instructions to the public.

7. Storm Prediction Center Outlooks

The purpose of the SPC Fire Weather program is to provide a national fire weather guidance product for use by the National Weather Service, as well as other federal, state, and local government agencies. The product is intended to delineate areas of the contiguous U. S. where the pre-existing fuel conditions, combined with forecast weather conditions during the next 8 days will result in a significant threat for wildfires.

There are three types of Fire Weather Outlook areas - a Critical Fire Weather Area for Wind and Relative Humidity, an Extremely Critical Fire Weather Area for Extreme Conditions of Wind and Relative Humidity, and a Critical Fire Weather Area for Dry Thunderstorms.

The SPC Fire Weather Outlook is comprised of a Day 1 and a Day 2 forecast, in addition to a Day 3-8 forecast. Each forecast period will contain text products along with corresponding graphic products. The Day 1 Fire Weather Outlook is scheduled for issuance at 4:00 am CST/CDT and is updated at 11 am CDT (noon CST). The Day 2 Fire Weather Outlook is scheduled for issuance at 5 am CDT (4 am CST) and is updated at 3 pm CDT (2pm CST). The Day 3-8 Fire Weather Outlook is scheduled for issuance at 5 pm CDT (4 pm CST).

The Day 1 Outlook covers the 24-hour period from 12Z on the morning of product issuance to 12Z the following morning, with the update covering the 19-hour period from 17Z at issuance to 12Z the following morning. The Day 2 Outlook covers the following 24-hour period out to 48 hours. The Day 3-8 Outlook covers the period of 48 to 192 hours from 12Z on the morning of product issuance.

The outlook type depends upon the severity of the forecast weather, antecedent conditions, and climatology relative to the given geographic region. Critical Fire Weather Areas for Wind and Relative Humidity are typically issued when strong winds (>20 mph) and low RH are expected to occur where dried fuels exist. Critical Fire Weather for Dry Thunderstorms are typically issued when widespread or numerous thunderstorms producing little wetting rain (<0.10 inches) are expected to occur where dried fuels exist. Extremely Critical Fire Weather Areas for Wind and Relative Humidity are issued when very strong winds and very low RH are expected to occur with very dry fuels. Extremely Critical areas will be rarely issued, similar to the very low frequency of High Risk Convective Outlooks.

F. FORECAST WEATHER COMPONENTS AND PARAMETERS

This section will detail fire weather forecast parameters used in the fire weather forecast products issued by NWS offices serving Texas.

1. Headline Statement/Weather Synopsis

- Used at the beginning of the FWF, RFW, and FWS products
- Headline statements used when significant fire weather events are occurring or expected. In the absence of a Red Flag Warning or Fire Weather Watch, levels of impact are commonly described as “elevated”, “near critical”, “critical”, or “extreme” fire weather conditions; a general description of how to interpret these levels is explained further in *Appendix 6: Fire Weather Categories*.
- Discussion focuses on changes in the weather that will impact fire behavior:
- Allows for qualitative discussion on weather trends such as the time of inversion burn-off.

2. Precipitation and Thunderstorms

- Expressed in most NWS forecast products as the percent chance that a given location will receive 0.01 inches of precipitation for a 12 hour period.
- A forecast wetting rain is considered to be 0.10 inches for Texas unless otherwise noted.
- Thunderstorm influences that have a potential to produce critical fire weather conditions are expected to be detailed in the weather synopsis.

3. Sky Condition

- Usually expressed in terms of percent coverage.
- Trends often discussed qualitatively in the synopsis section when changes impact mixing levels.

4. Miscellaneous Weather Phenomena

Smoke, fog, and dust expected to create significant problems for wildfire control efforts should be included in the synopsis of the forecast. Severe weather, winter weather, and flash flood events are unlikely to occur during extreme wildfire events but could still be of interest to the user agencies for wildland planning efforts. Some of these parameters may be used in a tabular description for “weather”.

5. Relative Humidity (RH)

- Expressed in % as the ratio of the amount of water vapor actually in the air compared to the amount the air is capable of holding at its temperature and pressure.
- Critical to fire management activities and are always included in routine and spot forecasts.
- RH values can vary greatly over a small area due to variations in topography, vegetation and location with respect to bodies of water; may be expressed as a range of values.

6. Winds and Mixing

Wind speed and direction are generally indicated for the most hazardous part of the day or at other times specified in the forecast. The NDS requires that users of fire weather forecasts are made aware of the level for which the wind is forecast, i.e., eye-level, 20 feet, free-air, etc. Maximum gusts, erratic winds, and wind shifts should be mentioned when expected. The three most common wind assessments are listed below.

a. 20-foot winds

Winds at 20 feet above the ground or above the average height of vegetation are the most common winds used in the routine fire weather forecast. Since most surface stations used for NWS forecasts measure the wind at 33 feet, a reduction factor is needed to arrive at the 20-foot wind. FTS/RAWS sites, which measure 20 foot wind speed and direction, can be used to compare the 33 foot winds, but are available for only a few NWS offices with responsibilities in Texas.

b. Eye-level winds

Eye-level (or 6-foot) winds are often used for spot forecasts to compliment preliminary reports taken at the burn site. These wind forecasts may also be estimated using a reduction factor to the available surface wind data.

c. Transport winds / ventilation index

Average winds in the mixing layer and the depth of the mixing layer are parameters that are helpful for fire management agencies to evaluate the potential for very large fires and also for smoke dispersal. Data computed from morning atmospheric soundings and model forecast soundings are used to provide ventilation values for periods of maximum heating. The following are terms and definitions necessary to understanding ventilation data and values:

i. Mixing height or mixing depth

The height to which 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 elevation between the burn site and the referenced upper-air site, and modify the provided mixing depths accordingly.

ii. Transport Winds

A measure of the average rate of horizontal transport of air within the mixing layer. Units can be expressed in knots (1 knot = 1.15 mph) or mph. An average wind direction (the direction from which the wind is blowing) is provided. If winds are light and variable, then it may be best to consider local drainage effects when in critical situations.

iii. Ventilation Index

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. As a guide, the following categories have been established to describe the ventilation...

Excellent	150,000 kt-ft or greater
Very Good	100,000-149,999 kt-ft
Good	60,000-99,999 kt-ft
Fair	40,000-59,999 kt-ft
Poor	less than 40,000 kt-ft

When ventilation values are less than 40,000 kt-ft along with transport winds below 7.0 knots, dispersion of any pollutants released into the atmosphere will be severely limited.

7. Lightning Activity Level

Smoke, fog Lightning Activity Level (LAL) is a commonly used measure of the amount of lightning activity using values 1 to 6 where:

- **LAL 1** – No thunderstorms.
- **LAL 2** – Isolated thunderstorms. Light rain will occasionally reach the ground. Lightning is very infrequent, 1-5 cloud to ground strikes in a 5 minute period.
- **LAL 3** – Widely scattered thunderstorms. Light to moderate rain will reach the ground. Lightning is infrequent, 6-10 cloud to ground strikes in a 5 minute period.

- **LAL 4** – Scattered thunderstorms. Moderate rain is commonly produced. Lightning is frequent, 11-15 cloud to ground strikes in a 5 minute period.
- **LAL 5** – Numerous thunderstorms. Rainfall is moderate to heavy. Lightning is frequent and intense, greater than 15 cloud to ground strikes in a 5 minute period.
- **LAL 6** – Same as LAL 3 except thunderstorms are dry (no rain reaches the ground). This type of lightning has the potential for extreme fire activity and is normally highlighted in fire weather forecasts with a Red Flag Warning.

8. Haines Index

The Haines Index (HI) is a numerical value that indicates the potential for large wildfires to experience extreme fire behavior (i.e. crowning, spotting, and rapid rates of spread). The HI 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 one of the pressure levels. There are three different methods of computing HI depending upon whether the area elevation is considered low (<1000 ft), medium (1000-3000 ft) or high (>3000 ft). Each NWS office determines the elevation which is most suitable for their area of responsibility. For each elevation, Haines Index classifications are assigned to values 2 through 6 as shown below...

HAINES INDEX	POTENTIAL FOR LARGE FIRE GROWTH
2 or 3	Very Low
4	Low
5	Moderate
6	High

The HI numbers are computed for each elevation using the following parameters...

HI	=	STABILITY TERM (A)	+	MOISTURE TERM (B)
Low Elevation HI	=	950-850 MB TEMP A=1 when 3°C or less A=2 when 4-7°C A=3 when 8°C or more	+	850 MB TEMP-DEW POINT B=1 when 5°C or less B=2 when 6-9°C B=3 when 10°C or more
Mid Elevation HI	=	850-700 MB TEMP A=1 when 5°C or less A=2 when 6-10°C or less A=3 when 11°C or more	+	850 MB TEMP - DEW POINT B=1 when 5°C or less B=2 when 6-12°C or less B=3 when 13°C or more
High Elevation HI	=	700-500 MB TEMP A=1 when 17°C or less A=2 when 18-21°C A=3 when 22°C or more	+	700 MB TEMP - DEW POINT B=1 when 14°C or less B=2 when 15-20°C B=3 when 21°C or more

9. Inversion Burn-off

Information on inversion burn-off time and/or temperature is an optional forecast parameter that many user agencies may request. Since eroding inversions are often highly variable over a small area, forecast inversion burn-off times and temperatures will be most accurate and useful when used in site-specific weather forecasts. However, a qualitative analysis can be useful for synoptic discussions if forecaster confidence is high enough.

III. APPENDICES

Appendix 1: RFW RH / Wind Criteria Summary for Texas

Summary Disclaimer: For complete Red Flag criteria listings for each NWS Office, including the use of fuels assessments, fire danger classifications, and dry lightning criteria, please see *Section II.B*

NWS OFFICE	RH CRITERIA (Percentages expressed as "at or below minimums" or "at or above maximums" unless otherwise noted)	WIND CRITERIA (Wind heights and speeds indicated as 20 FT and in MPH unless otherwise noted)
AMARILLO (AMA)	15	20
AUSTIN/SAN ANTONIO (EWX)	20	15 (along and S of the escarpment) 20 (Hill Country and South Plains PSAs)
BROWNSVILLE (BRO)	<15% (All areas) <25% (All but Zapata) <25% (Zapata) <35% (Jim Hogg, Starr, Brooks, Hidalgo) <40% (Kenedy, Willacy, Cameron) <45% (Coastal Willacy, Coastal Cameron)	15+ 20G25+ 25+ 25+ 25+ 25+
CORPUS CHRISTI (CRP)	30 (Inland) 40 (Coastal)	25
EL PASO (EPZ)	15	20
FORT WORTH/DALLAS (FWD)	30	25 (33 FT level: Actual values bases on 20-30 MPH wind advisory criteria)
HOUSTON/GALVESTON (HGX)	20 (with moderate fuel moisture) 25 (with low fuel moisture)	25 (with moderate fuel moisture) 15 (with low fuel moisture)
LAKE CHARLES, LA (LCH)	30 (with moderate fuel moisture) 35 (with low fuel moisture)	25 (with moderate fuel moisture) 20 (with low fuel moisture)
LUBBOCK (LUB)	15	20
MIDLAND/ODESSA (MAF)	15	20
NORMAN, OK (OUN)	20	20
SAN ANGELO (SJT)	20	20
SHREVEPORT, LA (SHV)	25	25

Appendix 2: NFDRS Stations

COMMON NAME	WIMS ID	NWS OFFICE	NWS ID	TX COUNTY
CEDAR	418701	Amarillo	AMA	Hutchinson
BOOTLEG	418801	Amarillo	AMA	Deaf Smith
HEBBRONVILLE	418401	Brownsville	BRO	Jim Hogg
SANTA ANA NWR	418602	Brownsville	BRO	Hidalgo
LAGUNA ATASCOSA	418603	Brownsville	BRO	Cameron
FALCON LAKE	418604	Brownsville	BRO	Starr
LINN-SAN MANUAL	418605	Brownsville	BRO	Hidalgo
GEORGE WEST	418201	Corpus Christi	CRP	Live Oak
VICTORIA	418202	Corpus Christi	CRP	Victoria
ARANSAS NWR	418502	Corpus Christi	CRP	Aransas
MATAGORDA ISLAND	418503	Corpus Christi	CRP	Aransas
PX WELL	242991	El Paso	EPZ	Hudspeth
CADDO	410202	Ft. Worth	FWD	Fannin
ATHENS	412101	Ft. Worth	FWD	Henderson
PALESTINE	412601	Ft. Worth	FWD	Anderson
ROUND PRARIE	413101	Ft. Worth	FWD	Robertson
POSSUM KINGDOM SP	419402	Ft. Worth	FWD	Palo Pinto
COMMANCHE	419403	Ft. Worth	FWD	Commanche
LBJ	419601	Ft. Worth	FWD	Wise
GREENVILLE	419602	Ft. Worth	FWD	Hunt
CEDAR HILL SP	419701	Ft. Worth	FWD	Dallas
GRANBURY	419702	Ft. Worth	FWD	Hood
TEMPLE	419801	Ft. Worth	FWD	Bell
MCGREGOR	419802	Ft. Worth	FWD	McLennan
RATCLIFF	413302	Houston	HGX	Houston
HUNTSVILLE	414102	Houston	HGX	Walker
COLDSPRINGS	414201	Houston	HGX	San Jacinto
CONROE	415109	Houston	HGX	Montgomery
DAYTON	415201	Houston	HGX	Liberty
ANAHUAC	416099	Houston	HGX	Chambers
ATTWATER NWR	416601	Houston	HGX	Colorado
BRAZORIA NWR	418301	Houston	HGX	Brazoria
SAN BERNARD	418302	Houston	HGX	Brazoria
WOODVILLE	414402	Lake Charles	LCH	Tyler
KIRBYVILLE	414501	Lake Charles	LCH	Jasper
SOUTHERN ROUGH	416101	Lake Charles	LCH	Tyler
MCFADDIN	419901	Lake Charles	LCH	Jefferson
CAPPROCK	418901	Lubbock	LUB	Briscoe
MATADOR WMA	418902	Lubbock	LUB	Motley

COMMON NAME	WIMS ID	NWS OFFICE	NWS ID	TX COUNTY
JAYTON	419001	Lubbock	LUB	Kent
PINERY	417101	Midland	MAF	Culberson
DOG CANYON	417102	Midland	MAF	Culberson
THE BOWL	417103	Midland	MAF	Culberson
MCKITTRICK CANYON	417104	Midland	MAF	Culberson
PX WELL	417105	Midland	MAF	Culberson
FORT DAVIS	417201	Midland	MAF	Jeff Davis
PANTHER JUNCTION	417401	Midland	MAF	Brewster
CHISOS	417403	Midland	MAF	Brewster
MIDLAND	419202	Midland	MAF	Midland
BASTROP	415501	New Braunfels	EWX	Bastrop
LAGRANGE	415602	New Braunfels	EWX	Fayette
LOST MAPLES SNA	417802	New Braunfels	EWX	Bandera
BIRD	417901	New Braunfels	EWX	Gillespie
BALCONES CANYONLANDS	417902	New Braunfels	EWX	Travis
BALCONES FLYING X	417903	New Braunfels	EWX	Burnet
KICKAPOO CAVERNS SP	418001	New Braunfels	EWX	Kinney
MERRILL	418002	New Braunfels	EWX	Edwards
GAUDALUPE RIVER SP	418101	New Braunfels	EWX	Comal
PEARSALL	418102	New Braunfels	EWX	Frio
MILLER CREEK	419301	Norman	OUN	Baylor
BARNHART	417701	San Angelo	SJT	Crockett
MASON	417801	San Angelo	SJT	Mason
PAINT CREEK	419203	San Angelo	SJT	Coke
HAMBY	419401	San Angelo	SJT	Callahan
COLORADO BEND SP	419501	San Angelo	SJT	San Saba
COLEMAN	419502	San Angelo	SJT	Coleman
CLARKSVILLE	410401	Shreveport	SHV	Red River
TEXARKANA	410501	Shreveport	SHV	Bowie
LINDEN	411102	Shreveport	SHV	Cass
GILMER	411401	Shreveport	SHV	Upshur
CADDO LAKE	411901	Shreveport	SHV	Harrison
HENDERSON	412202	Shreveport	SHV	Rusk
LUMBERJACK	412801	Shreveport	SHV	Nacogdoches
SABINE NORTH	412901	Shreveport	SHV	Shelby
ZAVALLA	413503	Shreveport	SHV	Angelina
LUFKIN	413509	Shreveport	SHV	Angelina
SABINE SOUTH	413701	Shreveport	SHV	Sabine

Appendix 3: List of Abbreviations and Acronyms

AOP – Annual Operating Plan
AMRS – All-hazard Meteorological Response System
ASOS – Automated Surface Observation System
ATMU – Advanced Technology Meteorological Unit
AWIPS – Advanced Weather Information Processing System
BLM - Bureau of Land Management
COB – Close of Business
CWFA – Country Warning and Forecast Area
EOC – Emergency Operations Center
FBPS – Fire Behavior Prediction System
FWF – Fire Weather Planning Forecast
FWPL – Fire Weather Program Leader
FWS – Fish and Wildlife Service
GACC – Geographic Area Coordination Center
HAZMAT – Hazardous Materials
IMET – Incident Meteorologist
IMT – Incident Management Team
LDT – Local Daylight Time
LST – Local Standard Time
NDS – NWS Directives System
NFDRS – National Fire Danger Ratings System
NIFC – National Interagency Coordination Center
NPS – National Park Service
NWCG – National Wildfire Coordinating Group
NWS – National Weather Service
NWSI – National Weather Service Instruction
RAWS – Remote Automated Weather System
RFW – Red Flag Warning
ROC – Regional Operations Center
SACC – Southern Area Coordination Center
SRH – Southern Region Headquarters
SPC – Storm Prediction Center
SWACC – Southwest Area Coordination Center
TG – Telecommunications Gateway
TICC – Texas Interagency Coordination Center
TX-FWOP – Texas Fire Weather Operating Plan
USDA FS – United States Department of Agriculture Forest Service
WIMS – Weather Information Management System

Appendix 4: Internet Links

NWS Directives System:

10-401 Fire Weather Services Product Specification	http://www.nws.noaa.gov/directives/sym/pd01004001curr.pdf
10-402 Fire Weather Services On-Site Support	http://www.nws.noaa.gov/directives/sym/pd01004002curr.pdf
10-403 Fire Weather Services Coordination and Outreach	http://www.nws.noaa.gov/directives/sym/pd01004003curr.pdf
10-404 Fire Weather Services Annual Operating Plan and Report	http://www.nws.noaa.gov/directives/sym/pd01004004curr.pdf
10-405 Fire Weather Services Training and Professional Development	http://www.nws.noaa.gov/directives/sym/pd01004005curr.pdf
10-406 Interagency Agreement for Meteorological Services Among the Bureau of Land Management, Bureau of Indian Affairs, US Fish and Wildlife Service, and National Park Service of the US Dept. of Interior; the Forest Service of the US Dept. of Agriculture; and the National Weather Service of the US Dept. of Commerce (Recertified 03/05/07)	http://www.nws.noaa.gov/directives/sym/pd01004006curr.pdf
10-407 Fire Weather Services Zone Change Process	http://www.nws.noaa.gov/directives/sym/pd01004007curr.pdf

NWS Forecast Office Links:

NWS Office	Homepage / Fire Weather Page
Amarillo (AMA)	http://www.srh.noaa.gov/ama http://www.srh.noaa.gov/ama/?n=fireweather
Austin/San Antonio (EWX)	http://www.srh.noaa.gov/ewx/ http://www.srh.noaa.gov/ewx/html/firewx.htm
Brownsville (BRO)	http://www.srh.noaa.gov/bro http://www.srh.noaa.gov/bro/fire.php
Corpus Christi (CRP)	http://www.srh.weather.gov/crp http://www.srh.noaa.gov/crp/fire/default.html
El Paso (EPZ)	http://www.srh.noaa.gov/elp http://www.srh.noaa.gov/epz/misc/firewx.php
Fort Worth/Dallas (FWD)	http://www.srh.noaa.gov/fwd http://www.srh.noaa.gov/fwd/firewx.html
Houston/Galveston (HGX)	http://www.srh.noaa.gov/hgx http://www.srh.noaa.gov/hgx/fire.htm
Lake Charles (LCH)	http://www.srh.noaa.gov/lch http://www.srh.noaa.gov/lch/cgi-bin/fire.php
Lubbock (LUB)	http://www.srh.noaa.gov/lub http://www.srh.noaa.gov/lub/?n=firewx
Midland/Odessa (MAF)	http://www.srh.noaa.gov/maf http://www.srh.noaa.gov/maf/Fire/index.php
Oklahoma City (OUN)	http://www.srh.noaa.gov/oun http://www.srh.noaa.gov/oun/firewx
San Angelo (SJT)	http://www.srh.noaa.gov/sjt http://www.srh.noaa.gov/sjt/html/firewx/firewx.html
Shreveport (SHV)	http://www.srh.noaa.gov/shv http://www.srh.noaa.gov/shv/firewx.htm

Fire Weather Planning Forecasts by Office:

NWS Office	Internet Address
AMA	http://www.srh.noaa.gov/productview.php?pil=FWFAMA&max=61
EWX	http://www.srh.noaa.gov/productview.php?pil=FWFEWX&max=61
BRO	http://www.srh.noaa.gov/productview.php?pil=FWFBRO&max=61
CRP	http://www.srh.noaa.gov/productview.php?pil=FWFCRP&max=61
ELP	http://www.srh.noaa.gov/productview.php?pil=FWFELP&max=61
FWD	http://www.srh.noaa.gov/productview.php?pil=FWFFWD&max=61
HGX	http://www.srh.noaa.gov/productview.php?pil=FWFHGX&max=61
LCH	http://www.srh.noaa.gov/productview.php?pil=FWFLCH&max=61
LUB	http://www.srh.noaa.gov/productview.php?pil=FWFLUB&max=61
MAF	http://www.srh.noaa.gov/productview.php?pil=FWFMAF&max=61
OUN	http://www.srh.noaa.gov/productview.php?pil=FWFOUN&max=61
SJT	http://www.srh.noaa.gov/productview.php?pil=FWFSJT&max=61
SHV	http://www.srh.noaa.gov/productview.php?pil=FWFSHV&max=61

Fire Weather Watches/Red Flag Warnings by Office (only recent products are available):

NWS Office	Internet Address
AMA	http://www.srh.noaa.gov/productview.php?pil=RFWAMA&max=61
EWX	http://www.srh.noaa.gov/productview.php?pil=RFWEWX&max=61
BRO	http://www.srh.noaa.gov/productview.php?pil=RFWBRO&max=61
CRP	http://www.srh.noaa.gov/productview.php?pil=RFWCRP&max=61
ELP	http://www.srh.noaa.gov/productview.php?pil=RFWELP&max=61
FWD	http://www.srh.noaa.gov/productview.php?pil=RFWFWD&max=61
HGX	http://www.srh.noaa.gov/productview.php?pil=RFWHGX&max=61
LCH	http://www.srh.noaa.gov/productview.php?pil=RFWLCH&max=61
LUB	http://www.srh.noaa.gov/productview.php?pil=RFWLUB&max=61
MAF	http://www.srh.noaa.gov/productview.php?pil=RFWMAF&max=61
OUN	http://www.srh.noaa.gov/productview.php?pil=RFWOUN&max=61
SJT	http://www.srh.noaa.gov/productview.php?pil=RFWSJT&max=61
SHV	http://www.srh.noaa.gov/productview.php?pil=RFWSHV&max=61

Spot Forecast Request and Monitor Pages by Office:

NWS Office	Internet Address
AMA	http://spot.nws.noaa.gov/cgi-bin/spot/spotmon?site=ama
EWX	http://spot.nws.noaa.gov/cgi-bin/spot/spotmon?site=ewx
BRO	http://spot.nws.noaa.gov/cgi-bin/spot/spotmon?site=bro
CRP	http://spot.nws.noaa.gov/cgi-bin/spot/spotmon?site=crp
ELP	http://spot.nws.noaa.gov/cgi-bin/spot/spotmon?site=elp
FWD	http://spot.nws.noaa.gov/cgi-bin/spot/spotmon?site=fwd
HGX	http://spot.nws.noaa.gov/cgi-bin/spot/spotmon?site=hgx
LCH	http://spot.nws.noaa.gov/cgi-bin/spot/spotmon?site=lch
LUB	http://spot.nws.noaa.gov/cgi-bin/spot/spotmon?site=lub
MAF	http://spot.nws.noaa.gov/cgi-bin/spot/spotmon?site=maf
OUN	http://spot.nws.noaa.gov/cgi-bin/spot/spotmon?site=oun
SJT	http://spot.nws.noaa.gov/cgi-bin/spot/spotmon?site=sjt
SHV	http://spot.nws.noaa.gov/cgi-bin/spot/spotmon?site=shv

Fire Weather Point Forecast Matrices by Office (experimental):

NWS Office	Internet Address
AMA	http://www.srh.noaa.gov/productview.php?pil=PFWAMA&max=61
EWX	http://www.srh.noaa.gov/productview.php?pil=PFWEWX&max=61
CRP	http://www.srh.noaa.gov/productview.php?pil=PFWCRP&max=61
ELP	http://www.srh.noaa.gov/productview.php?pil=PFWEPZ&max=61
LUB	http://www.srh.noaa.gov/productview.php?pil=PFWLUB&max=61
MAF	http://www.srh.noaa.gov/productview.php?pil=PFWMAF&max=61
SJT	http://www.srh.noaa.gov/productview.php?pil=PFWSJT&max=61

National Fire Weather Page / RFW Status Page (experimental): http://radar.srh.noaa.gov/fire/
Storm Prediction Center – Fire Weather Outlooks: http://www.spc.noaa.gov/fire/
Southern Region Fire Weather Page: http://www.srh.noaa.gov/srh/cwwd/msd/firewx/index.htm
Climate Prediction Center - Medium and Long Range WX Outlooks:
http://www.cpc.noaa.gov/products/predictions/

Partner Agency Links:
Texas Interagency Coordination Center - http://www.tamu.edu
Texas Forest Service - http://txforestservice.tamu.edu
TICC Predictive Services - http://ticc.tamu.edu/PredictiveServices/predictiveservices.htm
National Interagency Fire Center - http://www.nifc.gov
Southwest Area Coordination Center - http://gacc.nifc.gov/swcc
Southern Area Coordination Center - http://gacc.nifc.gov/sacc

USDA Forest Service Fire Site - http://www.fs.fed.us/fire
National Park Service Fire Site - http://www.nps.gov
U.S. Fish & Wildlife Service Fire Site - http://www.fws.gov/fire
USDA Wildland Fire Assessment System - http://www.wfas.net

Appendix 5: Texas IMET List

Valid 03/09/12

Active Type I IMETs	TX NWS Office	IMET Trainees	NWS Office
Tom Bird	EPZ	Ken Schneider	AMA
Joe Harris	FWD	Jason Straub	BRO
Kent Prochazka	HGX	Jason Runyen	CRP
Greg Murdoch	MAF	Monte Oaks	EWX
Corey Pieper	SRH	Jason Dunn	FWD
		Chris McKinney	HGX
		Todd Lindley	LBB
		Kent Kuyper	LCH
		Cody Lindsey	MAF
		Bill Adams	SHV
		Mark Cunningham	SJT
		Kurt Vanspeybroek	SRH
		Paul Witsaman	SRH

Appendix 6: Fire Weather Categories

(experimental: This reference page is proposed as an attempt to quantify the meaning of the adjective descriptions of fire weather conditions in terms of the typical fuel and weather parameter values expected under these conditions.)

Non-Elevated Fire Weather Conditions
-Fuel dryness is “above normal to normal”, Fire Danger is “low/moderate”; RH minimums over 15 percent greater that critical (RFW) values and/or 20-FT level winds are light or more than 10 mph below critical values

Elevated Fire Weather Conditions
-Fuel dryness/Fire Danger and RH meets critical (RFW) criteria values while winds are at least 5 mph below RFW criteria values
-Fuel dryness/Fire Danger and winds meet RFW criteria values while RH values are at least 5% away from RFW criteria values
-Winds and RH meet RFW criteria but Fuel dryness/Fire Danger is not suggested to promote RFW conditions
-All weather and fuel parameters are/were previously suggested to reach RFW criteria, but a widespread rain over one-half inch received in the past day

Near Critical Fire Weather Conditions
-All parameters suggested to reach critical criteria, but widespread wetting rains up to 0.5 inches received in the past day
-Dry Lightning possible over an area meeting fuel dryness criteria but confidence too low for a RFW

Critical Fire Weather Conditions
-RFW in effect (or expected for extended periods)

Extreme Fire Weather Conditions
-In addition to RFW in effect (or expected for extended periods), an event expected to be considered one of historical significance (among top 10 worst conditions seen in the past decade, etc…)

Appendix 7: Agency Signatories

NWS Signatories:

Monte Oaks
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(830) 629-0130

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Customer Agency Signatories:

U.S. Forest Service:

Glen Hammond
US Forest Service, Lufkin

Tom Spencer
Texas Forest Service, College Station

Texas Interagency Coordination Center:

Cynthia Foster
Texas Forest Service, College Station/Lufkin

U.S. Fish and Wildlife Service:

James Stockie
Texas Chenier Plain NWR's

Southern Area Coordination Center:

Denver Ingram
Region 8 Predictive Services, Atlanta, GA