2013Fire Weather Operating Plan for Kentucky, Parts of Southern Illinois, and Southeast Missouri

NWS Charleston, WV

NWS Jackson, KY

NWS Louisville, KY

NWS Paducah, KY

NWS Wilmington, OH

This operating plan will be a semi-permanent document, specifying Fire Weather services provided by National Weather Service serving the region noted above. The plan incorporates procedures detailed in the Interagency Agreement for Meteorological Services.

Table of Contents

I. Introduction…… 4
Purpose of the AOP…… 4
List of Participating Agencies…… 4
II. Service Area and Organizational Directory…… 5
Service Area……... 5
National Weather Service Headquarters…… 8
National Weather Service Regional Headquarters……. 8
Weather Service offices (WFO)……. 8
Meteorologists-in-Charge (MIC)…… 9
Program Leaders (or Focal Points)……. 9
Weather Service Forecast Offices and Contact Numbers…….. 9
Primary State Contacts…….. 13
III. Services Provided by the National Weather Service (NWS)……. 13
Fire Weather Seasons……. 13
Basic Services…… 14
Fire Weather Planning Forecast (FWF)……. 14
National Fire Danger Rating System (NFDRS) Forecasts……. 23
Procedures for Land Management Agencies……... 23
Issuance Times and Locations……. 24
Point Forecast Terminology……..... 24
Site Specific/Prescribed Burn Forecasts (FWS)……. 27
Experimental Smoke Modeling Plumes from HYSPLIT...……..... 30
Fire Weather Watch and Red Flag Warning Program……..... 30
Fire Weather Watch……. 30
Red Flag Warning……..... 30
Special Services …….. 31
Incident Meteorologists (IMETs)/On Site Support……..... 31
Other Non-Routine Services……..... 31
Training……... 31
Fire Weather Station Visits……. 32
NOAA All Hazards Weather Radio……... 32
Special Weather Statements/Public Information Statements……. 33
Hazardous Weather Outlooks……..... 33
IV. Natural Resource Agency Responsibilities…… 34
V. Joint Responsibilities……. 34
VI. Backup Procedures…… 34
VII. Signature Page…….. 34
VIII. Appendices…… 37
A: Illinois Fire Weather Zone Map…… 37
B: Kentucky Fire Weather Zone Map…… 38
C: Missouri Fire Weather Zone Map…… 39

D: CWA Fire Weather Forecast Areas…….……. 40
E: Fire Weather Observation Sites Map……..…….. 41
F: Fire Weather Observation Sites Table……...……... 42
G: Format of Morning Fire Weather Planning Forecast……... 43
Format of Afternoon Fire Weather Planning Forecast……. 44
H: Format of the Tabular Fire Weather Planning Forecast……... 46
I: Standardized Format for Spot Forecasts…….. 48
J: Red Flag Warning/Fire Weather Watch Format…….. 50
K: FWM Example……. 51
L: Hazardous Weather Outlook……... 52
M: WS Form D-1…….. 53
N: Requesting a HYSPLIT Run on NWS SPOT……. 56

I. INTRODUCTION

Purpose of the AOP

This Fire Weather Services Operating Plan serves as the official document governing the interaction and relationships between the National Weather Service (NWS) offices, and the federal, state, and local natural resource and land management agencies or cooperators in Kentucky, southern Illinois, and eastern Missouri. This document compliments and further defines in the above named area what is contained in the National Interagency Agreement for Meteorological Services and the National Memorandum of Understanding (MOU).

This Operating Plan is issued in lieu of a formal Memorandum of Understanding (MOU) between the National Weather Service Offices, federal, state, and other agencies that rely on fire weather support. The plan will outline forecast operations and services available to users. This includes products and formats, dissemination and coordination, and the responsibilities of the partners.

This Operating Plan will be the governing document for fire weather procedures and cooperation among the following agencies:

KY Department of Fish and Wildlife Resources
KY Division of Forestry
NOAA National Weather Service Forecast Offices
USDA Forest Service
USDI National Park Service
Illinois Department of Natural Resources
U.S. Fish and Wildlife Service
U.S Department of Defense
Missouri Department of Conservation
The Nature Conservancy

II. Service Area and Organizational Directory

A. Service Area

The service area covered by this AOP is the Commonwealth of Kentucky and portions of Southern Illinois and eastern Missouri, which are served by the National Weather Service Offices (WFOs) in Charleston, WV (RLX), Jackson, KY (JKL), Louisville, KY (LMK), Paducah, KY (PAH), and Wilmington, OH (ILN). A map of counties served by each WFO can be found in Appendix E.

The (Charleston, WV) **RLX forecast area** includes portions of extreme northeastern Kentucky.

The Kentucky counties served by WFO RLX include:

County	Zone #	County	Zone #
Boyd	KYZ103	Greenup	KYZ101
Carter	KYZ102	Lawrence	KYZ105

The (Wilmington, OH) **ILN forecast area** includes portions of north-central and northeastern Kentucky and southeastern Indiana.

The Kentucky Counties served by WFO ILN include:

County	Zone #	County	Zone #
Boone	KYZ091	Kenton	KYZ092
Bracken	KYZ097	Lewis	KYZ100
Campbell	KYZ093	Mason	KYZ099
Carroll	KYZ089	Owen	KYZ094
Gallatin	KYZ090	Pendleton	KYZ096
Grant	KYZ095	Robertson	KYZ098

The (Jackson, KY) **JKL forecast area** includes portions of eastern and south central KY

The Kentucky Counties served by WFO JKL include:

County	Zone #	County	Zone #
Bath	KYZ051	Elliott	KYZ104
Bell	KYZ087	Estill	KYZ058
Breathitt	KYZ112	Fleming	KYZ044
Clay	KYZ116	Floyd	KYZ110

County	Zone #	County	Zone #
Harlan	KYZ088	Montgomery	KYZ050
Jackson	KYZ069	Morgan	KYZ106
Johnson	KYZ107	Owsley	KYZ114
Knott	KYZ113	Perry	KYZ115
Knox	KYZ086	Pike	KYZ120
Laurel	KYZ080	Powell	KYZ059
Lee	KYZ111	Pulaski	KYZ079
Leslie	KYZ117	Rockcastle	KYZ068
Letcher	KYZ118	Rowan	KYZ052
Magoffin	KYZ109	Wayne	KYZ083
Martin	KYZ119	Whitley	KYZ085
McCreary	KYZ084	Wolfe	KYZ108
Menifee	KYZ060		

The **LMK forecast area** includes portions of central KY and southern Indiana.

The Kentucky Counties served by WFO LMK (Louisville, KY) include:

County	Zone #	County	Zone #
Adair	KYZ077	Garrard	KYZ056
Allen	KYZ073	Grayson	KYZ027
Anderson	KYZ039	Green	KYZ064
Barren	KYZ074	Hancock	KYZ023
Bourbon	KYZ042	Hardin	KYZ028
Boyle	KYZ055	Harrison	KYZ037
Breckinridge	KYZ024	Hart	KYZ063
Bullitt	KYZ029	Henry	KYZ033
Butler	KYZ061	Jefferson	KYZ030
Casey	KYZ066	Jessamine	KYZ048
Clark	KYZ049	Larue	KYZ053
Clinton	KYZ082	Lincoln	KYZ067
Cumberland	KYZ081	Logan	KYZ070
Edmonson	KYZ062	Madison	KYZ057
Fayette	KYZ041	Marion	KYZ054
Franklin	KYZ035	Meade	KYZ025

County	Zone #	County	Zone #
Mercer	KYZ047	Shelby	KYZ034
Metcalfe	KYZ076	Simpson	KYZ072
Monroe	KYZ075	Spencer	KYZ038
Nelson	KYZ045	Taylor	KYZ065
Nicholas	KYZ043	Trimble	KYZ032
Ohio	KYZ026	Warren	KYZ071
Oldham	KYZ031	Washington	KYZ046
Russell	KYZ078	Woodford	KYZ040
Scott	KYZ036		

The (Paducah, KY) **PAH forecast area** includes portions of central and western KY and portions of southern Indiana, southern Illinois, and southeastern Missouri.

The Illinois counties served by WFO PAH include:

County	Zone #	County	Zone #
Alexander	ILZ092	Perry	ILZ080
Edwards	ILZ077	Pope	ILZ090
Franklin	ILZ081	Pulaski	ILZ093
Gallatin	ILZ087	Saline	ILZ086
Hamilton	ILZ082	Union	ILZ088
Hardin	ILZ091	Wabash	ILZ078
Jackson	ILZ084	Wayne	ILZ076
Jefferson	ILZ075	White	ILZ083
Johnson	ILZ089	Williamson	ILZ085
Massac	ILZ094		

The Kentucky counties served by WFO PAH include:

County	Zone #	County	Zone #
Ballard	KYZ004	Livingston	KYZ007
Caldwell	KYZ013	Lyon	KYZ011
Calloway	KYZ009	Marshall	KYZ008
Carlisle	KYZ003	McCraken	KYZ005
Christian	KYZ017	McLean	KYZ020
Crittenden	KYZ010	Muhlenberg	KYZ021
Daviess	KYZ019	Todd	KYZ022
Fulton	KYZ001	Trigg	KYZ012
Graves	KYZ006	Union	KYZ014
Hickman	KYZ002	Webster	KYZ015
Hopkins	KYZ016		

The Missouri counties served by WFO PAH include:

County	Zone #	County	Zone #
Bollinger	MOZ086	Perry	MOZ076
Butler	MOZ109	Ripley	MOZ108
Cape Girardeau	MOZ087	Scott	MOZ111
Carter	MOZ107	Shannon	MOZ098
Mississippi	MOZ112	Stoddard	MOZ110
New Madrid	MOZ114	Oregon	MOZ106
Wayne	MOZ100		

B. National Weather Service Headquarters

NWS Headquarters, located in Silver Spring, Maryland, establishes policies and coordinates the national fire weather program. The national program manager coordinates the program with the regional program managers. The national program manager also works with the national headquarters of the Federal forestry and other natural resource management agencies and the Association of State Foresters in determining overall requirements for meteorological support. The national program manager coordinates national training in forestry and fire weather for NWS forecasters.

C. National Weather Service Regional Headquarters

Regional Headquarters manage the technical operational aspects of the fire weather program within each region. They also provide guidance and assistance to meteorologists-in-charge (MIC) on program operations and developing issues through Supplements to the National Directives System (NDS) and conferences. Regional Headquarters advise National Headquarters on matters pertaining to technical planning and operations. The regional program managers coordinate the regions' fire weather programs and advise the Regional Directors on the operational and administrative aspects of the regions' programs.

D. Weather Forecast Offices (WFO)

Weather Forecast Offices prepare and disseminate forecast products for all sectors of the population, including those for the Fire Weather program. These offices are responsible for providing forecasts for user agencies within their County Warning Area (CWA). Most offices have a designated fire weather focal point or fire weather program leader. The National Weather Service Weather Forecast Offices will provide 24-hour, 365 days a year service. The NWS WFO's can be reached at the contact numbers in section E starting on page 10.

1. Meteorologists-in-Charge (MIC)

The Meteorologist-in-Charge is responsible for the provision of adequate weather services for the office's assigned areas of program responsibility. The MIC will ensure that the focal points or program leaders are provided adequate time for user liaison and assistance activities. MICs can be reached via email or through contact with their respective office.

2. Fire Weather Program Leaders (or Focal Points)

Fire Weather Program Leaders (FWPLS) or focal points are the "customer service representatives" for the program. The focal points or program leaders, as representatives of the MIC's, are in regular contact with the partner agencies, helping them assess their meteorological needs, informing them of NWS products and services available to meet these needs, and educating them in the most effective use of the various NWS products and resources, including NOAA Weather Radio (NWR). Focal points and program leaders will work with users to utilize existing NWS products and services produced for other programs that could meet the requirements of natural resource management. The focal points and program leaders are also tasked with ensuring staff meteorologists are trained and remain proficient in preparing forecast products for support of the fire weather program. Fire Weather Program Leaders can be reached via e-mail or through contact with their respective office:

E. National Weather Service Forecast Offices and Contact Numbers

National Weather Service Charleston
400 Parkway Road
Charleston, WV 25309

Phone:
1-304-746-0189
1-304-746-0193 (fax)

Online:
http://www.erh.noaa.gov/rlx/firewx.html (Fire Weather Page)
http://spot.nws.noaa.gov/cgi-bin/spot/spotmon?site=rlx (Spot Requests)

FWPL: Simone Lewis (IMET) (Simone.Lewis@noaa.gov)
Meteorologist in Charge (MIC): Jamie Bielinski (Jamie.Bielinski@noaa.gov)

Primary Backup Office: NWS Pittsburgh (PBZ)
FWPL: Rihaan Gangat
(Rihaan.Gangat@noaa.gov)
MIC: Rich Kane (Richard.Kane@noaa.gov)
Phone: 716-262-1591, Fax: 716-XXX-XXXX

Secondary Backup Office: NWS Jackson, KY (JKL)
FWPL: Jon Pelton (Jonathan.Pelton@noaa.gov)
MIC: Shawn Harley (Shawn.Harley@noaa.gov)
Phone: 606-666-8000, Fax: 606-XXX-XXXX

National Weather Service Office Jackson
1329 Airport Rd.
Jackson, KY 41339

Phone:
1-606-666-8000
1-606-666-XXXX (fax)
Online:
http://www.crh.noaa.gov/jkl/fire.php (Fire Weather Page)
http://spot.nws.noaa.gov/cgi-bin/spot/spotmon?site=jkl (Spot Requests)

FWPL: Jon Pelton (IMET) **(**jonathan.pelton@noaa.gov)
Assistant FWPL(s) and/or additional IMETS:
John Jacobson (IMET) **(**john.jacobson@noaa.gov)
David Schallenberger (IMET Trainee) (david.shallenberger@noaa.gov)
Meteorologist in Charge (MIC): Shawn Harley **(**shawn.harley@noaa.gov)

Primary Backup Office: NWS Wilmington, OH (ILN)
FWPL:
John J. Franks (IMET) **(**john.j.franks@noaa.gov**)**
MIC:
Ken Haydu **(**kenneth.haydu@noaa.gov**)**
Phone: 937-383-0031, Fax: 937-XXX-XXXX

Secondary Backup Office: NWS Charleston, WV (RLX)
FWPL:
Simone Lewis (IMET) (Simone.Lewis@noaa.gov)
MIC:
Jamie Bielinski **(**Jamie.Bielinski@noaa.gov**)**
Phone: 304-746-0180, Fax: 304-XXX-XXXX

National Weather Service, Louisville
6201 Theiler Lane
Louisville, KY 40229

Phone:
1-502-969-8842

1-502-XXX-XXXX (fax)

Online:
http://www.crh.noaa.gov/lmk/?n=fireweather (Fire Weather Page)
http://spot.nws.noaa.gov/cgi-bin/spot/spotmon?site=lmk (Spot Requests)

FWPL: Brian Schoettmer **(**brian.schoettmer@noaa.gov)
Meteorologist in Charge (MIC): John Gordon **(**john.gordon@noaa.gov)

Primary Backup Office: NWS Paducah (PAH)
FWPL:
Kelly Hooper (IMET) (kelly.hooper@noaa.gov*)*
MIC: Beverly Poole (beverly.poole@noaa.gov)
Phone: 270-744-6440, Fax: 270-XXX-XXXX

Secondary Backup Office: NWS Indianapolis, IN (IND)
FWPL:
Joe Skowronek (joe.skowronek@noaa.gov)
Assistant FWPL(s) and/or IMET:
Casey Crosbie (IMET Trainee)
(casey.crosbie@noaa.gov)
MIC:
Daniel McCarthy (daniel.mccarthy@noaa.gov)
Phone: 317-856-0360, Fax: 317-XXX-XXXX

National Weather Service, Paducah
8250 U.S. Highway 60
West Paducah, KY 42086

Phone:
1-270-744-6440
1-270-XXX-XXXX (fax)

Online:
http://www.crh.noaa.gov/pah/?n=firewx (Fire Weather Page)
http://spot.nws.noaa.gov/cgi-bin/spot/spotmon?site=pah (Spot Requests)

FWPL: Kelly Hooper (IMET) (kelly.hooper@noaa.gov*)*
Meteorologist in Charge (MIC): Beverly Poole (beverly.poole@noaa.gov)

Primary Backup Office: NWS Louisville, KY (PAH)
FWPL:
Brian Schoettmer **(**brian.schoettmer@noaa.gov)

MIC:
John Gordon (john.gordon@noaa.gov)
Phone: 502-969-8842, Fax: 502-XXX-XXXX

Secondary Backup Office: NWS Springfield, MO (SGF)
FWPL:
Drew Albert (drew.albert@noaa.gov)
MIC:
William Davis (william.davis@noaa.gov)
Phone: 417-863-8028, Fax: 417-XXX-XXXX

National Weather Service, Wilmington
1901 South State Route 134
Wilmington, OH 45177

Phone:
1-937-383-0031
1-937-XXX-XXXX (fax)

Online:
http://www.nws.noaa.gov/er/iln/fireweather.htm (Fire Weather Page)
http://spot.nws.noaa.gov/cgi-bin/spot/spotmon?site=iln (Spot Requests)

FWPL: John Franks (IMET) (john.j.franks@noaa.gov)
Meteorologist in Charge (MIC): Ken Haydu (kenneth.haydu@noaa.gov)

Primary Backup Office: NWS Jackson, KY (JKL)
FWPL: Jon Pelton (Jonathan.Pelton@noaa.gov)
MIC: Shawn Harley (Shawn.Harley@noaa.gov)
Phone: 606-666-8000, Fax: 606-XXX-XXXX

Secondary Backup Office: NWS Cleveland, OH (CLE)
FWPL:
Will Kubina (IMET) (will.kubina@noaa.gov)
MIC: Bill Comeaux (william.comeaux@noaa.gov)
Phone: 216-265-2370, Fax: 216-XXX-XXXX

E. Primary Kentucky Contact

Kentucky Interagency Coordination Center
Daniel Boone NF Supervisor's Office
1700 Bypass Road
Winchester, KY 40391
Phone:
859-745-3171 or 3172

F. Primary Illinois Contact

Illinois Interagency Dispatch Center
2221 Walnut Street
Murphysboro, Illinois 62966
Phone:
866-684-2051/618-687-1725

G. Primary Missouri Contact

Missouri-Iowa Interagency Coordination Center
401 Fairgrounds Road
Rolla, MO 65401
Phone:
866-800-8595/573-341-7449

III. Services Provided by the National Weather Service (NWS)

A. Fire Weather Seasons

Specific dates for starting and ending routine services will be determined through coordination with the various user agencies and the individual National Weather Service offices.

Wildfires can occur in the Commonwealth of Kentucky as well as the Middle Mississippi Valley and Lower Ohio Valley regions at any time of the year. As a result, most offices issue the fire weather planning forecast at least once a day year-round. However, there are two distinct peaks for fire activity: The first running from late winter into the spring and again during most of the fall.

The **Kentucky Division of Forestry** and the **Daniel Boone National Forest** define the forest fire hazard seasons as follows: **February 15 through April 30 and October 1 through December 15.** Other land management agencies around the region define the fire hazard seasons similarly. These dates may be changed depending on the severity of the fire season and the needs of the users per coordination. Normally, the land

management agencies will notify the NWS office(s) of any extension(s) to the fire weather season(s) that they require.

B. Basic Services

1. Fire Weather Planning Forecast (FWF)

a. Issuance Time:

This forecast in narrative or tabular format will be issued by all offices during the fire season between about 400 AM and 700 AM Local Time each morning and around 400 PM Local Time each afternoon. The FWF will be updated as necessary.

Fire Weather Planning Forecasts will be updated when a Fire Weather Watch or Red Flag Warning is issued or cancelled or when forecast elements are deemed unrepresentative.

Some offices differ in FWF issuance frequency outside the fire seasons. Below is a table summarizing when the FWF is issued by each WFO:

WFO	Frequency During the Fire Season (s)	Frequency During the Rest of the Year
Charleston, WV	8 times per day	8 times per day
Jackson, KY	Twice daily	Once in the AM and updated as necessary
Louisville, KY	Twice daily	Once in the AM and updated as necessary
Paducah, KY	Twice daily	Twice daily
Wilmington, OH	Twice daily	Once in the AM and updated as necessary

b. Viewing the Forecast

Forecasts are available through the Weather Information Management System (WIMS) and online at the websites listed earlier in this document.

Graphical fire weather forecast images are posted at:
http://www.weather.gov/forecasts/graphical/sectors/centmissvlyFireDay.php#tabs (Western Part of the Region)

http://www.weather.gov/forecasts/graphical/sectors/midatlanticFireDay.php#tabs (Eastern Part of the Region)

c. Content/Format:

The FWF product is issued by individual county zones or by county groupings based on climatology, land management areas, or the ongoing or expected weather conditions.

The Morning Issuance will contain the next three periods in the near term portion (today, tonight, and tomorrow) in detail. The afternoon issuance will contain four periods in the near term period (tonight, tomorrow, tomorrow night, and the following day) in detail.

An extended forecast out to seven days (Days 3 through 7) will be included at the end of the near term period of the forecast. The extended forecast portion of the narrative forecast will pick up where the short term left off and continue out through day seven. The extended portion is a general forecast which mentions the expected general weather conditions, the possibility of precipitation, expected high and low temperatures for each day, and afternoon 20 foot winds for days 1 through 5.

A headline may be added to the top of the forecast, denoting significant weather, or for the issuance of a Red Flag Warning or Fire Weather Watch.
Routine forecast content/format will vary somewhat from office to office. The NWS Offices included in this plan will issue the FWF following either the standard narrative or standard tabular format in accordance with National Weather Service Directive 10-401 (see Appendix H). Some elements are optional and are not included by all NWS offices. Most Fire Weather Planning Forecasts will include some or all of the following general components:

d. Components:

1. .DISCUSSION

The discussion will briefly cover locations of fronts and systems which produce the weather along with highlighting significant trends or changes that the forecaster anticipates.

2. CLOUD/SKY COVER

A. Clear (or Sunny) -- < 1/8th cloud cover.
B. Mostly Clear/Mostly Sunny -- 1/8th to 2/8ths of cloud cover.

C. Partly Cloudy/Partly Sunny-- 3/8ths to 5/8ths of cloud cover.
D. Mostly Cloudy -- 6/8ths to 7/8ths cloud cover.
E. Cloudy -- 8/8ths cloud cover.
F. Increasing Cloudiness -- the clouds are increasing in amount (this also implies thickening of clouds).
G. Decreasing Cloudiness-- A progressive decrease in the amount of sky covered with clouds.
H. Variable Cloudiness-- A constant variation in the amount of clouds covering the sky with respect to time and space.

3. PRECIPITATION (PRECIP) TYPE

A. Rain--General, not showery, usually in a stable atmosphere. Small to medium sized water droplets.
B. Drizzle--General precipitation in a stable atmosphere. Very small water droplets that appear to float in the atmosphere.
C. Freezing Rain/Drizzle-- Liquid precipitation that freezes upon impact with the ground or vegetation.
D. Sleet--Precipitation that falls in the form of frozen rain or partially frozen rain.
E. Snow--Frozen precipitation of relatively long duration, general or patchy, not showery.
F. Snow Flurries--Light snowfall of short duration with some clearing between occurrences. Accumulation, if any, is slight.
G. Showers--Rain/snowfall of short duration and varying intensity, usually beginning and ending abruptly.
H. Sprinkles-- Light rainfall of short duration with some clearing between occurrences. Accumulation, if any, is slight and measures less than 0.005 inches.
I. Thundershowers--Same as a shower but accompanied by thunder.
J. Thunderstorms--Downpour of rain, often with strong gusty winds. Small hail may also be present.
K. Severe Thunderstorm-- Heavy downpours of rain, accompanied by wind gusts to 50 Knots (58 mph) or greater, hailstones of 1 inch or larger, and/or a tornado.

4. POP/PROB OF PRECIP/CHANCE PRECIP %

The probability of precipitation, expresses the chance that measurable rainfall will occur at any given point within a county

zone group. Measurable rainfall is 0.01 inches or greater. Probability is expressed in percent.

5. MAXIMUM (MAX)/MINIMUM (MIN) TEMPERATURE

The temperature will be in degrees Fahrenheit. The maximum and minimum temperatures are forecast for the day and night time periods, respectively. Local variations in temperature due to terrain (e.g. ridges/valleys) may be mentioned as well.

6. MAXIMUM (MAX)/MINIMUM (MIN) HUMIDITY

The Relative Humidity (RH) is the ratio, in percent, of the amount of moisture in the air compared to the amount the air could hold if fully saturated (100%). The range of RH is from 0% to 100%. Usually, the minimum RH occurs at the time of the maximum temperature and the maximum RH occurs at the time of the minimum temperature.

The minimum or lowest humidity will be forecast for the day period, and the maximum or highest humidity at night.

7. 24 HR TREND

A forecast element compared to what was observed 24 hours ago.

8. TEMP (24 HR TREND)

The average max or min temperature in each zone or zone group and the trend compared to the prior day.

9. RH % (24 HR TREND)

The average max or min humidity in each zone or zone group and the trend compared to the prior day.

10. 20 FOOT WIND

The wind direction applies to the direction from which the wind will blow. The direction will be listed using the 16 point compass (e.g. NE, S, WSW, etc.). Any significant changes expected during the forecast period will be mentioned in the narrative or the discussion.

The wind speed will be in miles per hour (mph). The forecast wind speed for the fire weather forecasts will reflect the 10 minute average wind that is commonly measured at fire weather sites. Since most surface observation stations used for National Weather

Service forecasts measure wind speed/direction at 10 meters (roughly 33 feet) with a two minute average, a reduction factor is used to arrive at the 20 foot wind forecast.

11. 20 FOOT WIND – AM (20FTWND-AM)

This is also referred to as AM wind or "early". This is the morning wind direction and speed in miles per hour. Direction is given in the 8 cardinal directions, the direction from which the wind is blowing (N, NE, E, SE…). Sustained speed is representative of the 20 foot level, with 10-minute averaging (as measured at RAWS sites).

12. 20 FOOT WIND-PM (20FTWND-PM)

This is also referred to as PM wind or "late". The 20FTWND-PM wind contains the same data as THE 20FTWND-AM, but for the afternoon and overnight periods only.

13. WIND SHIFT

If a shift in wind direction associated with a frontal passage is expected during the period, the new direction and wind speed will be forecast. Wind shifts may also be mentioned in the discussion. Because a front may take several hours to move through a zone, the approximate time of the wind shift will be encoded (i.e. Northeast 10 to 15 mph after midnight). Significant wind shifts may also be included in the remarks section of the forecasts following the tabular format.

14. PRECIP AMOUNT/QPF (INCHES)

The expected average rainfall if rain occurs for a county or zone group will be expressed in decimal notation in inches **(i.e. 0.10 to 0.50 inches, 1.00 to 1.50 inches).**

15. PRECIP DURATION

This is the average duration in whole hours that precipitation will occur in the county or zone group.

16. PRECIP BEGIN

This is the forecast beginning time of precipitation, given in local time in whole hours.

17. PRECIP END

This is the forecast end time of precipitation, given in local time in whole hours.

18. MIXING HEIGHT/MAX MIXING HEIGHT/MIXING HGT

Mixing height is the extent or depth to which smoke will be dispersed by means of turbulence and diffusion. The forecast of mixing height is expressed in feet above ground level (AGL) and is the maximum mixing height expected (generally during the afternoon). This value will be expressed as the average over the entire county zone or zone group.

19. TRANSPORT WIND

Transport wind is the average wind speed express in either meters per second (m/s) or in miles/hour (mph) in the mixing depth above the surface. These winds are a good indication of the horizontal dispersion of suspended particles. The transport wind is the forecast wind at the time of maximum mixing f the atmosphere, normally during the mid afternoon. Usually a wind of less than 4 m/s restricts an agency from burning. Transport wind directions are typically given to eight compass points (e.g. northeast, east southwest, etc.)

Note: Transport winds are not encoded for the nighttime portion of the forecast.

20. 1700 FOOT (500 METER) MIXING HEIGHT TEMPERATURE

This is the surface temperature that must be reached in order for the mixing depth to reach 1700 feet. Once the forecast temperature is reached at the burn site, it can be assumed that the mixing height above the burn site is at least 1700 feet or 500 meters.

Note: One consequence of the Clean Air Act, is that land managers must practice principles of careful smoke management. This is done by combining favorable meteorological conditions with a variety of prescribed fire techniques so that smoke will be readily dispersed. The 1700 foot/500 meter mixed layer is a common suggested minimum mixing layer depth for prescribed burning to limit the concentration of particulate matter near the ground and to limit the aerial coverage of limited visibility due to smoke. Local regulations or practices may differ.

21. HAINES INDEX

The Haines Index is used to indicate the potential for wildfire

growth by measuring the stability and dryness of the air over a fire. It is calculated by combining the stability and moisture content of the lower atmosphere into a number that correlates well with large fire growth. The stability term is determined by the temperature difference between two atmospheric layers; the moisture term is determined by the temperature and dew point difference. This index has been shown to be correlated with large fire growth on initiating and existing fires where surface winds do not dominate fire behavior. The Haines Index can range between 2 and 6. The drier and more unstable the lower atmosphere is, the higher the index.

The Haines Index used by NWS Offices which make up this plan will either be the low or mid elevation Haines Index. The low elevation is generally used for elevations of 1,000 feet above sea level and below (most areas), while the mid elevation Haines Index is normally used for locations with elevations between 1,000 and 3,000 feet above sea level (used by WFO JKL and WFO RLX). Values of the Haines Index range from 2 to 6. The Haines index correlates large plume dominated fire growth.

	Interpreting the Haines Index
2	Very Low Potential (Moist and Stable Lower Atmosphere)
3	Very Low Potential
4	Low Potential
5	Moderate Potential
6	High Potential (Dry Unstable Lower Atmosphere)

22. VENTILATION RATE (VENT RATE)/SMOKE DISPERSAL

The Vent Rate is a number that gives a relative indication of how well smoke will disperse in the atmosphere. It is calculated by taking the Mixing Height (in FT AGL) multiplied by the transport winds in knots. Units are in KNOT-FT.

Vent Rate (kt-ft) = Mixing Height (ft) * Average Transport Winds (kt)

The table on the following page gives and interpretation for a given value of Vent Rate used by NWS Jackson and NWS Louisville:

Vent Rate	Interpretation
< 29,000	Poor
≥ 29,000 & < 38,000	Marginal
≥ 38,000 & < 50,000	Fair
≥ 50,000 & < 95,000	Good
≥ 95,000	Excellent (Burn with caution)

The table below gives and interpretation for a given value of Vent Rate used by NWS Paducah:

Interpretation	Vent Rate (kt-ft)	Vent Rate (m/s-m
Excellent	>= 150,000	>= 23445
Very Good	>= 100,000 and < 150,000	>= 15630 and <23445
Good	>= 60,000 and < 100,000	>=9378 and <15630
Fair	>= 40,000 and < 60,000	>=6252 and <9378
Poor	<= 40,000	<=6252

23. DISPERSION INDEX

The Dispersion Index is a number that gives a relative indication of how well smoke will disperse in the atmosphere. It is calculated by taking the Mixing Height divided by 1000 and then multiplying the result by the transport winds in knots. See the table below for an interpretation for a given Dispersion Index value.

Dispersion Index	Interpretation
> 100	Very Good
60-100	Good
41-60	Fair to Good
21-40	Fair
13-20	Poor to Fair
7-12	Poor
1-6	Very Poor

24. DISPERSION

Dispersion indicates the forecast smoke dispersion category for the overnight periods only. (4 knots = 4.6 mph; 8 knots = 9.2 mph; 12 knots = 13.8 mph)

Value	Interpretation	Wind Speed
1	Very Poor	≥ 4 knots
2	Poor	> 4 and ≤ 8 knots
3	Good	> 8 and ≤ 12 knots
4	Excellent	> 12 knots

25. DAVIS STABILITY INDEX (DSI)

The Davis Stability Index is a common fire stability index parameter utilized primarily in the southeast United States. The formula for the Davis Stability Index is as follows: Davis Stability Index (DSI) = Max Temp (deg C) - 850mb Temp (deg C) If the difference is less than 10 deg C, it is considered a Category 1 or stable. If the difference is 10 deg C to 14 deg C, it is considered a Category 2 or conditionally unstable. If the difference is 15 deg C to 17 deg C, it is considered a Category 3 or unstable. If the difference is greater than 17 deg C, it is considered a Category 4 or absolutely unstable.

26. LIGHTNING ACTIVITY LEVEL (LAL)

A single digit (1 through 6) will be used. The meaning of each number is as follows:

1 No thunderstorms.
2 Few building cumulus with isolated thunderstorms. Occasional light rain reaching the ground.
3 Widely scattered thunderstorms with much building cumulus. Light to moderate rain reaching the ground.
4 Scattered thunderstorms, not obscuring the sky. Moderate rain reaching the ground.
5 Numerous thunderstorms, occasionally obscuring the sky. Moderate to heavy rain reaching the ground.
6 Same as **3** above, but dry, no rain.

27. .Outlook 8 to 14 days…

The extended outlook is taken from a daily forecast produced by the Climate Prediction Center (CPC). It includes temperature and precipitation trends compared to seasonal normal values for the time periods. ABOVE NORMAL, NEAR NORMAL, or BELOW NORMAL will be given. For more information on this and other extended outlooks, please see the CPC website at www.cpc.noaa.gov.

28. Remarks

Appropriate remarks are included in this section that add value to the forecast, mark significant weather changes, or any to annotate any additional information that they fell is pertinent to the forecast.

2. INDIVIDUAL STATION FORECASTS (FWM)/National Fire Danger Rating System Forecast (NFDRS)

The National Fire Danger Rating System measures wildland fire danger at observation sites throughout the contiguous United States. The National Weather Service role in NFDRS is forecasting weather input which, combined with user input, allows the NFDRS software to predict the next day's fire danger indices. These indices impact agency resource management decisions, firefighter safety, and protection of the public and property. Note that a NFDRS station may represent a large fire danger rating area of similar climatology and fuel type. NFDRS forecasts for a station are intended to be applied across a large fire danger rating area.

The Fire Weather Matrices forecasts (FWM) will be issued for any predetermined site for which an NFDRS observation is received, provided the observation is received on time, is complete, and is deemed accurate. Per NWSI 10-401, representative observations for use in making NFDRS projections can also be accessed by other dependable means, including the Real-time Observation Monitor and Analysis Network (ROMAN) and state RAWS collectives from the Internet.

The natural resource agencies will determine which observation sites (normally RAWS sites) will be NFDRS sites. Initation of NFDRS forecast for a new site will be coordinated with the NWS, and the agency requesting new NFDRS service will provide the NWS with information about the site location. The NWS will notify the owner agency when bad data is received from a RAWS station.

a. Procedures for Land Management Agencies

Per NWSI 10-401, weather observations valid for approximately 1300 Local Standard Time (LST) are taken by the land management agencies and transmitted through AWIPS using the FWO product ID. This product should have a header above the data which states "**Listing of Observations**". Forecasters will use these observations as a basis for generating forecasts valid 24 hours later (the NFDRS forecast), so NFDRS forecast issuance times are dependent on the timely arrival of these observations. Forecasts will only be prepared for predetermined sites, and usually only from those sites for which an observation has been received.

b. FWM forecast Issuance Times and Locations

The NWS offices will normally produce the NFDRS forecast around 1500 LST at least daily during the fire weather season. The NWS Offices included in this plan issue forecast for numerous points. A table of the RAWS sites is included in Appendix, while a map of the RAWS sites in included in Appendix F.

Note: All fire weather stations have been assigned numbers to be used as the identification number when entering into the Weather Information Management System (WIMS). If a new station is established, or a present Station is moved, a new identification number should be requested from the GACC Meteorologists. Also, please notify the local NWS Office Fire Weather Program Manager of this change.

Some offices differ in FWM issuance frequency outside the fire seasons. Below is a table summarizing when the FWM is issued by each WFO:

WFO	Frequency During the Fire Season (s)	Frequency During the Rest of the Year
Charleston, WV	Once daily	Once daily
Jackson, KY	Once daily	As requested
Louisville, KY	Once daily	As requested
Paducah, KY	Once daily	Once daily
Wilmington, OH	Once daily (If observation received)	As requested

Point Forecast Terminology: The point forecast follows the general format below:

FCST, ID,DATE,VT,WX,TT,RH,L1,L2,DD,VV,M,TX,TN,HX,HN,D1,D2,WETFLAG

FCST

FCST shows that this is a forecast for an NFDRS individual station.

ID (STATION NUMBER)

Before a forecast will be made for a station, it must have a valid station number in WIMS.

DATE (Valid Date)

The valid date will be the next day in the order: YYMMDD

VT (VALID TIME)

The valid time will be 1300 LST the next day

WX (State of the Weather)
A single digit number from 0 to 9.

0 Clear (Less than 1/10th of sky is cloud covered).
1 Scattered Clouds (1/10th to 5/10ths of sky cloud covered).
2 Broken Clouds (6/10ths to 9/10ths of sky cloud covered).
3 Overcast (More than 9/10ths of sky cloud covered).
4 Foggy
5 Drizzle
6 Rain
7 Snow or Sleet
8 Showers (In sight or at station and reaching the ground).
9 Thunderstorms/Hail

TT (TEMPERATURE)
Forecast of temperature in degrees F for 1300 the next day.

RH (Relative Humidity)
Relative Humidity forecast for 1300 the next day.

L1, L2 (LIGHTNING ACTIVITY)

1. Period 1 (**L1**) is from 1400 LST until 2400 that night (a 10 hour period).
2. Period 2 (**L2**) is from 0000 the night of the forecast until 2400 the next night (24 hour period.)
3. A single digit (1 through 6) will be used.
   The meaning of each number is as follows:

   1 No thunderstorms
   2 Few building cumulus with isolated thunderstorms
   3 Much building cumulus with scattered thunderstorms, light to moderate rain reaches the ground.
   4 Thunderstorms common but do not obscure the sky, moderate rain reaches the ground.
   5 Thunderstorms common and occasionally obscure the sky, moderate to heavy rain reaches the ground.
   6 Same as 3 above but dry, no rain

DD (WIND DIRECTION)
20 foot wind direction forecast at 1300 LST the next day.

VV (WIND SPEED)
20 foot wind speed forecast at 1300 LST the next day.

M (TEN HOUR TIME LAG FUEL MOISTURE)
Forecasters will not forecast 10 hour fuel stick moisture and M or a blank between commas will be used as a place holder.

TX (MAX TEMPERATURE)
The 24 hour maximum temperature forecast for 1300 the day of the forecast until 1300 the next day. This will typically be the maximum temperature of the current day.

TN (MIN TEMPERATURE)
The 24 hour minimum temperature forecast from 1300 the day of the forecast until 1300 the next day. This will typically be the overnight low expected in the next 12 to 16 hours.

HX (MAX RELATIVE HUMIDITY)
The 24 hour maximum Relative Humidity forecast from
1300 the day of the forecast until 1300 the next day.

HN (MIN RELATIVE HUMIDITY)
The 24 hour minimum Relative Humidity forecast from
1300 the day of the forecast until 1300 the next day.

D1 PRECIPITATION DURATION
The number of hours for which precipitation is forecast from 1300 the day of the forecast until 0500 the next day (16 hours).

D2 PRECIPITATION DURATION
The number of hours for which precipitation is forecast from 0500 the next day until 1300 that same day (8 hours).

WET FLAG
Wet flag is used to indicate "fuels wet". All indices will be forced to zero if Y=yes is used. NOTE: in most cases a N=no will be used unless there is snow on the ground or the ground is extremely wet. If the duration of precipitation is 3 hours or greater between 500 am to 100 pm of the next day, the Wet Flag should be tripped to a Y value. Also if rain or snow is expected to be occurring at 1300, the Wet Flag should be tripped to a Y value.

3. Site-Specific Wildland Fire Forecasts/Prescribed Burn Forecats (FWS)

SPOT forecasts are issued when requested by wildland fire and land management agencies for wild fires or planned prescribed burn operations or by federal, state, or local officials or agencies responding to hazardous material releases or other emergencies such as search and rescue operations. They are available 24 hours a day. They differ from routine fire weather forecasts as they are site-specific, localized weather forecasts in that they incorporate greater detail in timing, higher resolution of terrain influences, as well as other small-scale weather influences impacting the site. They should be requested within 18 hours of a prescribed burn. Beyond 18 hours, the Fire Weather Planning Forecast (FWF) should be utilized **NWS offices will not provide spot forecasts to private citizens or commercial entities not acting as an agent of a government agency.**

a. Criteria

Federal or state agencies requesting prescribed burn or spot forecasts should provide as much information as possible about the location and nature of the site. The more accurate the information received about the site, the more accurate the resulting forecast will be. Current weather information from the site, including temperature, wind speed, and relative humidity will increase the accuracy of the forecast. This should include the following information about the prescribed burn or wildland fire site:

1. location
2. elevation
3. slope
4. aspect
5. **Whenever possible, it is requested that agencies provide maps of the prescribed burn area from the prescribed burn plan to further clarify the burn area.** This information will aid the forecaster in providing a more specific forecast tailored to the local terrain.
6. **A current observation at the time a wildfire forecast is requested. For prescribed burn forecast, an observation or observations around 1300 from the previous afternoon is requested.**

b. Contents

All Spot or Prescribed burn forecasts will contain at least items 1 through 5, with additional forecast elements on request.

1. sky condition
2. weather
3. temperature
4. relative humidity
5. 20 foot wind and significant/sudden changes in wind speed or direction
6. mixing heights
7. transport winds

c. Procedure

1. Requests for Spot or Prescribed Burn forecasts will be made using the internet based NWSSPOT request form (instructions are below).
2. As a courtesy, land management agencies are requested to call the appropriate National Weather Service Office to confirm receipt of the spot or prescribed burn forecast request.
3. Once the forecast is completed, it will be available on the NWSSPOT website.
4. If the NWSSPOT server is down, requests for a spot forecast should be called in or faxed to the forecast office. Faxed requests should be made using WS Form D-1 in Appendix N or available online at http://nimbo.wrh.noaa.gov/pih/firewx/D1-V2005.pdf. In this case, the National Weather Service Office will send the forecast by fax or may give it verbally over the phone upon request (i.e., when only a few weather elements are necessary by the user).
5. **The National Weather Service Headquarters has directed that NWS forecasts should not be forecasting eye-level winds.** Forecasters don't know exact sheltering, vegetation or exposure at the forecast location and thus don't know what conversion factors to use. It is better to let land management agencies take the forecast 20-ft winds and do the conversions themselves to get a better value for eye level winds to use in fire behavior forecasts.
6. **Instructions for requesting a forecast:**
   a. Spot or Prescribed Burn Forecasts can be requested at the websites listed earlier in this plan.
   b. Fill in as much information as possible (items in red are required):

      1. Project Name: (Name of fire or prescribed burn)

2. Select Wildfire or Prescribed Burn, etc. as appropriate
3. Input your agency
4. Requesting Official (Your Name)
5. Phone number
6. Select “Wildfire” or “Non Wildfire” as appropriate
7. Input your Lat and Lon
8. Input Elevation (highest and lowest if available)
9. Input Aspect (valley, ridgetop, North, South etc. as appropriate)
10. Hit “Submit Request” at the bottom of the page. Once your request is submitted, it will alarm on the computer system at the local National Weather Service office and the National Weather Service will put together a weather forecast specifically for the location of the wildfire or prescribed burn.

7. Retrieving a forecast:

a. Allow adequate time for the forecaster to prepare the forecast. This will normally be around 30 minutes.

b. The SPOT website will auto-update upon completion of the SPOT forecast by the NWS Office (or if via fax, the NWS will fax the completed forecast.) The forecast can be accested simply by cliking on the incident/fire name of the SPOT request, once the status indicates “complete.”

d. Additional Information

1. Contact the responding NWS Office for a SPOT update if Forecast conditions appear unrepresentative of the actual weather conditions. When possible, provide feedback to the NWS Office during or shortly after an event. This will assist forecasters in subsequent forecasts.
2. Land management agencies can test out the online request page. For a TEST SPOT request, please contact the NWS Office to tell one of the foredcast that you are doing so, and include “TEST” within the name of the incident on the SPOT request form.

4. Experimental Smoke Modeling Plumes from HYSPLIT

Land management agencies that have a wildfire of 100 acres or greater, or are conducting a prescribed burn of 100 acres or greater, may request that the National Weather Service run the NOAA Air Resources Laboratory dispersion model, HYSPLIT, to model smoke dispersion when requesting a Spot or Prescribed Burn Forecast in NWSSPOT. This model is a combination of the U.S. Forest Service's Blue Sky Model and meteorological models used by NWS Forecasters. The data is output in a graphical form and is considered experimental since it is relatively new, and only limited testing has been conducted thus far. This data can be used in addition to a typical spot forecast that is used for Prescribed Burns and Wildfires.

Further instructions on how to request a HYSPLIT run within NWSSPOT can be found in Appendix O.

5. Fire Weather Watch and Red Flag Warning Program

Specific conditions must be met for a Fire Weather Watch and/or a Red Flag Warning to be issued for locations in IL, IN, KY, and MO. These conditions are as follows:

a. Ten hour fuel moisture values must be 8% or less.
b. Afternoon relative humidity levels are expected to fall to 25% or less (less than 25% for WFO PAH)
c. 20 foot sustained winds are expected to reach or exceed 15 mph (>15 mph for WFO PAH)

If the forecast office issues a Fire Weather Watch or Red Flag Warning for a specific forest, district, or national park, the fire weather forecaster will highlight the watch or warning in the narrative forecast by using a headline. As time allows, the NWS offices should contact the user agencies or State Coordination Centers.

A **"Fire Weather Watch"** is used to alert the user to the possible development of a Red Flag event in the near future. This could be up to 72 hours in advance. Usually a forecaster has a 50% confidence that the event will occur when issuing one.

A **"Red Flag Warning"** will be issued to warn the user of an impending or ongoing Red Flag event. A Red Flag Warning will be issued immediately when Red Flag Conditions are occurring. Otherwise, it will be issued for impending Red Flag Conditions when there is a high degree of confidence that conditions will develop. Usually a forecaster has an 80% confidence that the event will occur when issuing one.

C. Special Services

Special meteorological services meet the needs of agencies that often have unique requirements for weather support, and may best be performed by the fire weather meteorologist away from the home forecast office. These services usually must be initiated by the requesting agency, and costs such as travel and per diem will be charged to a reimbursable task number assigned for the project. Special services may include fire weather station visits, familiarization trips to the forest, observer training sessions, and S-290, S-390, S-490, and other courses. The fire weather meteorologist may be asked to attend a prescribed burn when available. If the trip involves an overnight stay, the letter should state that the requesting agency will pay travel expenses. A one day trip will not incur any costs to the requesting agency. When the land management agency wishes for a fire weather forecaster to attend a course, the same procedure for requesting a forecaster to a station visitation should be followed, except that specific dates should be given in the letter. The letter will be forwarded to NWS Central Region Headquarters so that a reimbursable task code can be assigned for the trip.

1. Incident Meteorologists (IMETs)/On Site Support

On-site forecast service is a non-routine service available from National Weather Service Offices with designated Incident Meteorologists (IMETs). The NWS will provide IMET services upon request of federal, state, tribal, or local government fire agencies in support of wildfires. This support typically includes dispatches to Incident Command Posts, but may also include dispatches to land management coordination and dispatch centers, and Area Commands. IMET support will also be considered for non-wildfire situations if resources permit. Such uses will be limited to requests of federal fire agencies participating in the Interagency Agreement and requests by a public safety official who represents such support as essential to public safety (see section 4 of National Weather Service Instruction 10-401). Procedures to request the services of an IMET are detailed in NWS Instruction 10-402.

2. Other Non-routine Services

Other Non-routine services may be performed at the request of the land management agencies. These include briefings or coordination calls during periods of high fire danger, extensive prescribed burning, or during periods of high fire occurrence. The FWPL and MIC will ensure that the land management agency needs are met with little expense to either the land management agency or the NWS.

3. Training

When the land management agency wishes for a fire weather forecaster to attend a course or be an instructor for a course, the same procedure for requesting a

forecaster to a station visitation should be followed, except that specific dates should be given in the letter. The letter or email request will be forwarded to the NWS Regional Headquarters so that a reimbursable task code can be assigned for the trip.

4. Fire Weather Station Visits

A fire weather forecaster may be requested to accompany an official on a fire weather station visitation. A letter or email requesting the meteorologist should be mailed or emailed to WFO at least 2-3 weeks in advance of the planned trip. The message does not need to be specific about dates, this can be arranged over the phone. If the trip involves an overnight stay, the message should state that the requesting agency will pay travel expenses. A one day trip will not incur any costs to the requesting agency.

Supplies, equipment, and maintenance of the fire weather station are the responsibility of the land management agency.

If a new station is being established, or an old station is moved to another location, a station number will be assigned by the fire weather program leader for the appropriate National Weather Service Central Regional.

5. NOAA ALL HAZARDS RADIO

Kentucky has a statewide network of NOAA All Hazard Radio Transmitters. These 24-hour broadcasts provide continuous up-to-date weather information directly from the National Weather Service. Weather messages are typically repeated every three to six minutes with longer cycles possible during periods of active weather. The broadcast is routinely monitored and revised every few hours. The broadcasts are tailored to the weather needs of the people within the receiving area. These broadcasts can usually be heard as far as 40 miles or more from the antenna site depending on terrain, receiver quality, and other factors.

The quality of the reception of broadcasts may depend greatly upon the quality of the receiver. Receivers vary in cost from around $20 to more than $100. Specially designed receivers sound an alarm activated by the National Weather Service to warn of severe weather, or that an emergency exists. Specific Area Message Encoder (SAME) radios are available for around $40 that will allow the user to program in which county or group of counties he wants to hear the alarm tone for.

Fire Weather Watches are not typically broadcast on NOAA Weather Radio. The Jackson office **will** broadcast Red Flag Warnings for counties in the Jackson, Morristown, and Charleston CWAs that fall in the Jackson NOAA All Hazards Radio broadcast reach.

For a more information about NOAA All Hazards Radio visit the following website:
http://www.nws.noaa.gov/nwr/allhazard.htm or for information on county by county coverage visit:
http://www.nws.noaa.gov/nwr/indexnw.htm.

6. Special Weather Statements/Public Information Statements

When fire danger or fire occurrence is high, coupled with near-critical weather conditions, agencies may request that the NWS issue a Special Weather Statement (SPS) or Public Information Statement (PNS). These statements are generally rare, and issued in coordination with the requesting agency. The SPS or PNS can be broadcast on NOAA Weather Radio All-Hazards and will show up on National Weather Service webpages.

Example:
…Enhanced Fire Danger Today…

Here is a Wildfire Danger Statement issued in coordination with [Agency] in [City, State].

For [Day Month Date Year] the wildfire danger is [High, Very High, or Extreme] for the [Geographic area of danger] of Northeast Kentucky.

Open burning of any type is considered extremely dangerous at this time. Be very careful of heat and sparks while operating any equipment or smoking in wildland areas.

7. Hazardous Weather Outlooks

Hazardous Weather Outlooks are issued by weather forecast offices to alert the public to potentially dangerous weather situations. When a combination of meteorological conditions leads to an increased fire danger but falls short of Fire Weather Watch or Red Flag Warning criteria, this product may include this information to inform the public of a heightened fire danger and to discourage open burning and carless use of smoking materials. Approval of the user agencies is not necessary to issue this statement. Fire Weather Watches and Red Flag Warnings may also be mentioned within the Hazardous Weather Outlook. An example of this product can be found in Appendix M.

IV. Natural Resource Agency Responsibilities

Participating agencies should review the AOP and provide the Fire Weather Program Leaders with any suggestions or additions that may be needed along with suggestions that may lead to improved services.

Responsibilities consist of Operational support and predictive services.

A. Program Management
B. Monitoring, feedback and improvement
C. Technology Transfer
D. Agency Computer Systems
E. Fire Weather Observations
F. On-site support
G. Training

V. Joint Responsibilities

Service boundaries, fire weather zones, fire weather forecast areas and groupings may be negotiated to meet customer and forecaster need.

VI. Backup Procedures (for users)

From time to time NWS offices need to go into backup mode. This is usually during a period of software or hardware upgrading or perhaps a power or communications failure. If forecasters at a particular WFO are unable to be reached, you may try the primary backup office. Primary and Secondary Backup Offices for each WFO are located in the National Weather Service Offices and Contact Numbers starting on page 9.

VII. Signature Page

This Operating Plan becomes effective when all parties have signed the approval letters and will be effective until superseded by the 2014 Operating Plan.

An approval email will be sent to the agency listed below. Copies of these letters and/or an electronic signature will be kept on file at the National Weather Service Forecast Offices.

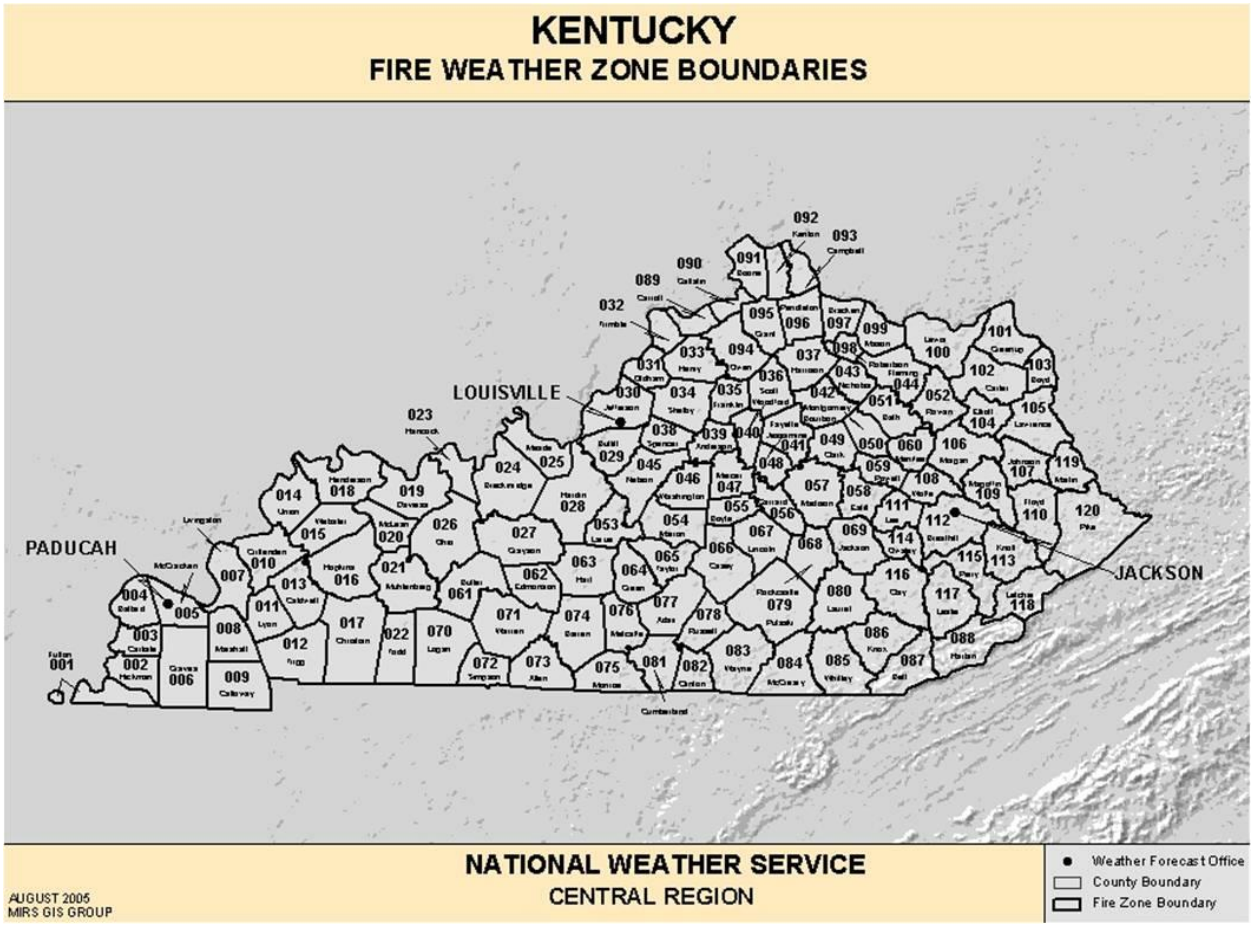
Office	Approving Authority	Date Signed
NWS (KY State Liaison Office)	John Gordon, MIC WFO LMK	7/9/2013
KICC Winchester, KY and Daniel Boone National Forest	Mitch Gandy, DBNF FMO	2/19/2013
Jefferson National Forest Clinch Ranger District	Jorge Hersel, District Ranger	5/9/2013
Mark Twain National Forest	Jody Eberly, FMO	3/12/2013
Shawnee National Forest/Illinois Interagency Coordination Center	Jon Teutrine, FMO	2/22/2013
Land Between the Lakes NRA	Dennis Wilson, Acting AFMO	3/12/2013
IL Department of Natural Resources	Tom Wilson, Fire Protection Manager	2/19/2013
KY Department of Fish and Wildlife	Dan Figert	6/20/2013
KYDOF	Luke S. Saunier, Fire Chief	4/8/2013
MO Department of Conservation	Ben Webster, Fire Supervisor	4/24/2013
Big South Fork NRRA	Tommy Barnes	2/20/2013

Cumberland Gap NHP	Dirk Wiley	2/20/2013
Office	Approving Authority	Date Signed
Abe Lincoln Birthplace NHP	William Justice	3/12/2013
Mammoth Cave National Park	Brad McDougal	6/21/20132
Ozark National Scenic Riverways	Bobby Bloodworth	3/12/2013
DOD Bluegrass Army Depot	Nathan White	5/7/2013
DOD Fort Campbell Public Works Business Center Environmental Division	Scott Osborne, Supervisory Forester	4/10/2013
DOD Fort Knox	N/A	
Clarks River NWR	Michael Johnson	2/20/2013
Crab Orchard NWR	Raymond J. Parrish	3/14/2013
Cypress Creek NWR	Raymond J. Parrish	3/14/2013
Mingo NWR	Ben Mense	2/19/2013
Middle MS River NWR	Raymond J. Parrish	3/14/2013
Reelfoot NWR	Randy Cook	3/13/2013
The Nature Conservancy	Chris Minor	2/18/2013

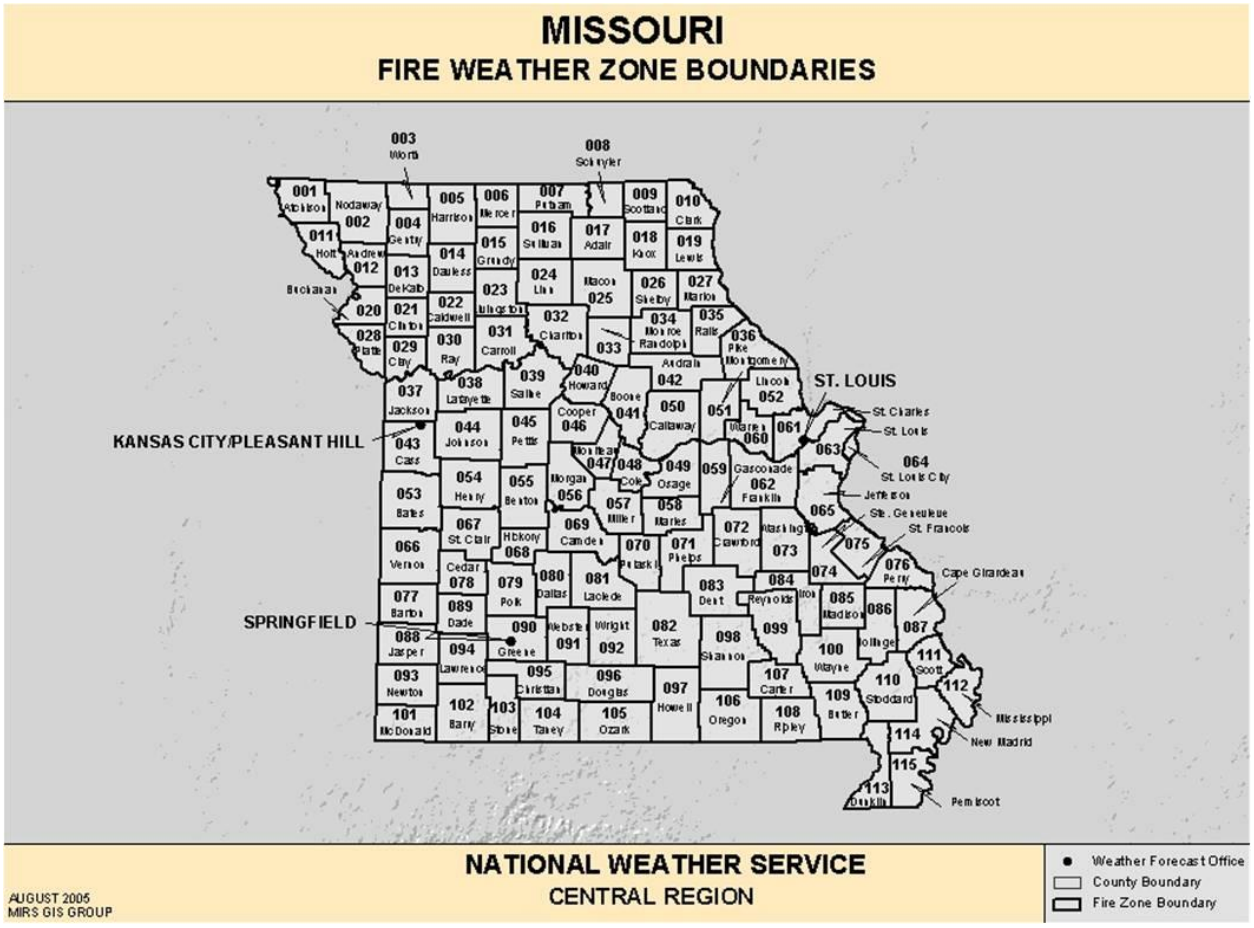
VIII: Appendices

Appendix A: Illinois Fire Weather Zones

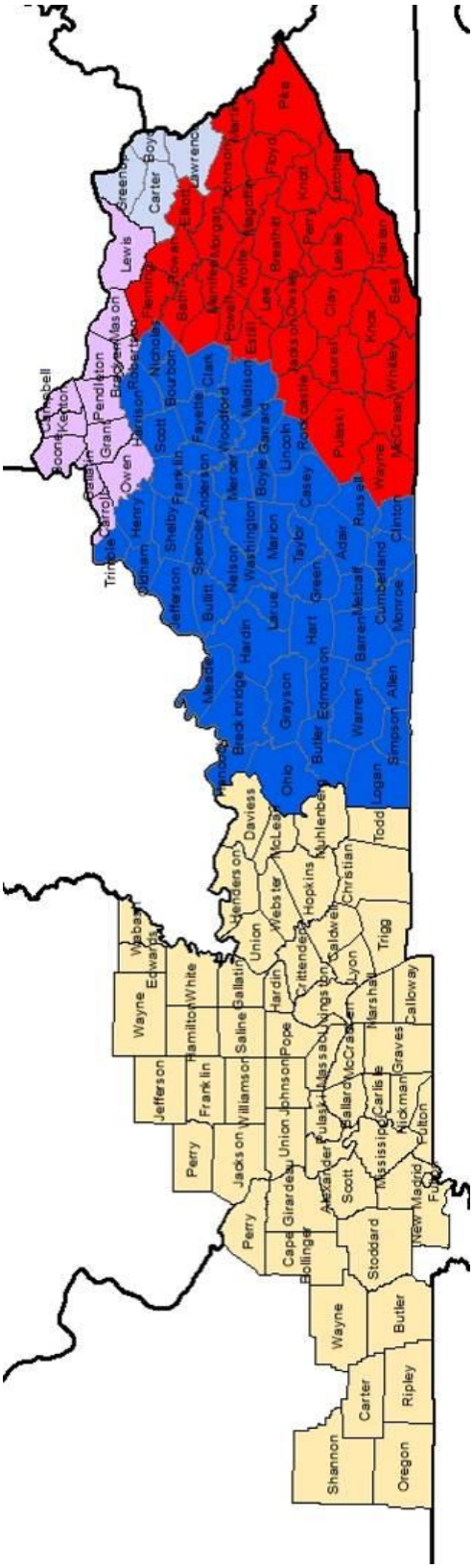
Appendix B: Kentucky Fire Weather Zones



Appendix C: Missouri Fire Weather Zones

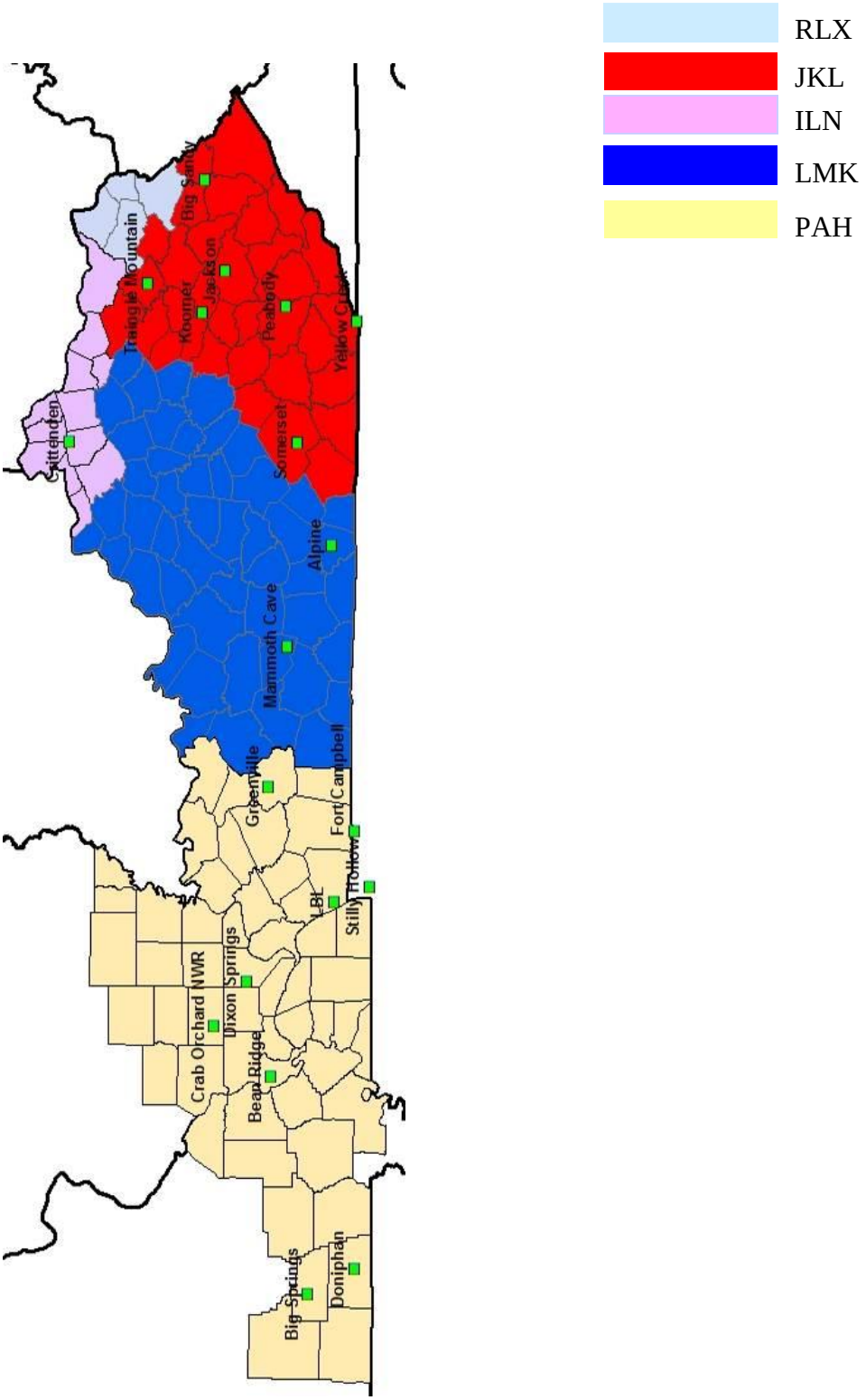


Appendix D: CWA Fire Weather Forecast Areas



RLX
JKL
ILN
LMK
PAH

Appendix E: Fire Weather Observation Sites Map



Appendix F: Fire Weather Observation Sites Table

Name	CWA	Station ID	County	Elev. (ft)	Lat.	Lon.
Crittenden	ILN	150703	Grant, KY	935	38.7692	-84.6019
Big Sandy	JKL	154801	Martin, KY	1180	37.7500	-82.6333
Peabody	JKL	157201	Clay, KY	1465	37.1381	-83.5797
Jackson	JKL	156001	Breathitt, KY	1388	37.5922	-83.3178
Koomer Ridge	JKL	154401	Wolfe, KY	1300	37.7689	-83.6333
Somerset	JKL	157002	Pulaski, KY	927	37.0556	-84.6150
Triangle Mountain	JKL	152001	Rowan, KY	1360	38.1750	-83.4083
Yellow Creek	JKL	159801	Bell, KY	1090	36.6036	-83.6961
Alpine	LMK	189501	Cumberland, KY	853	36:47:44	-85:22:49
Mammoth Cave	LMK	156502	Edmonson, KY	774	37.1317	-86.1481
Bean Ridge	PAH	119701	Alexander, IL	700	37.2486	-89.3786
Big Springs	PAH	239004	Carter, MO	632	36.9750	-91.0181
Crab Orchard NWR	PAH	119001	Williamson, IL	450	37.6792	-89.0028
Dixon Springs	PAH	119501	Pope, IL	540	37.4367	-88.6672
Doniphan	PAH	239102	Ripley, MO	635	36.6269	-90.8239
Greenville	PAH	151191	Muhlenberg, KY	552	37.2672	-87.2028
Fort Campbell	OHX	400201	Montgomery, TN	545	36.6256	-87.5369
LBL/Golden Pond	PAH	159901	Trigg, KY	649	36.7764	-88.0631
Stilly Hollow	OHX	400101	Stewart, TN	580	36.5128	-87.9511

Appendix G: Format of a morning Fire Weather Planning Forecast.

```
FNUS5i KNNN DDHHMM
FWFNNN
FIRE WEATHER PLANNING FORECAST FOR name of area
NATIONAL WEATHER SERVICE CITY STATE
TIME-DATE (example: 900 AM MDT FRI JUL 10 1999)

...HEADLINE... (REQUIRED for Red Flag Warnings and Fire Weather
Watches....significant feature(s) at other times recommended)

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

SSZXXX-XXX>XXX-DDHHMM- (UGC/FIPS CODING)
GEOGRAPHICAL DESCRIPTORS (including land management governing units and
optional fire weather zone numbers)
TIME-DATE (repeat)

...RED FLAG WARNING/FIRE WEATHER WATCH HEADLINE (as needed in each appropriate
zone grouping)...

.TODAY...
SKY/WEATHER.........
MAX TEMPERATURE.....
   24 HR TREND...... (optional)
MIN HUMIDITY........
   24 HR TREND...... (optional)
20 FT WIND.......... (optional - include sub-descriptors e.g.
                     slope/valley..valleys/lwr slopes..ridge top...
                     ridges/upr slopes..etc.)
LOCAL OPTIONAL ELEMENTS...(transport winds, mixing heights, LAL,
                          Haines, CWR, etc.)generated from fire weather
                          grids.

.TONIGHT...
SKY/WEATHER.........
MIN TEMPERATURE.....
   24 HR TREND...... (optional)
MAX HUMIDITY........
   24 HR TREND...... (optional)
20 FT WIND.......... (optional - include sub-descriptors e.g.
                     slope/valley..valleys/lwr slopes..ridge
                     top...ridges/upr slopes..etc.)
LOCAL OPTIONAL ELEMENTS...(transport winds, mixing heights, LAL,
                          Haines, CWR, etc.)

.TOMORROW...
SKY/WEATHER.........
MAX TEMPERATURE.....
MIN HUMIDITY........
20 FT WIND.......... (optional - include sub-descriptors e.g.
                     slope/valley..valleys/lwr slopes..ridge top...ridges/upr
                     slopes..etc.)
LOCAL OPTIONAL ELEMENTS...(transport winds, mixing heights, LAL,
```

```
                            Haines, CWR, etc.)
(.FORECAST DAYS 3 THROUGH 7 may optionally be provided for each zone segment)

$$
[forecast for next geographical descriptor and fire weather zone group]
$$

.EXTENDED...(Optional time period)(winds must be included days 3-5, days 6
and 7 if appropriate; other elements per locally-established policy; may be
in each zone segment versus this location; may optionally be presented as 12
hour periods)
.DAY3... (days can be combined, e.g., .SUNDAY THROUGH TUESDAY...)
.DAY4...
.DAY5...
.DAY6... (days 6 and 7 optional)
.DAY7...

.OUTLOOK… FOR DAY MONTH DATE THROUGH DAY MONTH DATE (per local-established
policy - Days 8-14, 30 and 90 day outlooks when issued)

$$
```

Format of an afternoon narrative Fire Weather Planning Forecast.

```
FNUS5i KNNN DDHHMM
FWFNNN
FIRE WEATHER PLANNING FORECAST FOR name of area
NATIONAL WEATHER SERVICE CITY STATE
TIME-DATE (example: 300 PM MDT THU JUL 10 1999)

...HEADLINE... (REQUIRED for Red Flag Warnings and Fire Weather
Watches....significant feature(s) at other times)

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

SSZXXX-XXX>XXX-DDHHMM- (UGC/FIPS CODING)
GEOGRAPHICAL DESCRIPTORS (including land management governing units and
optional fire weather zone numbers)
TIME-DATE (repeated)

...RED FLAG WARNING/FIRE WEATHER WATCH HEADLINE (as needed in each appropriate
zone grouping)...

.TONIGHT...
SKY/WEATHER.........
MIN TEMPERATURE.....
   24 HR TREND...... (optional)
MAX HUMIDITY........
   24 HR TREND...... (optional)
20 FT WIND..........(include sub-descriptors e.g.
                     slope/valley..valleys/lwr slopes..ridge top...ridges/upr
                     slopes..etc.)
LOCAL OPTIONAL ELEMENTS...(transport winds, mixing heights, LAL,
                            Haines, CWR, etc.)
```

```
.TOMORROW...
SKY/WEATHER.........
MAX TEMPERATURE.....
   24 HR TREND...... (optional)
MIN HUMIDITY........
   24 HR TREND...... (optional)
20 FT WIND..........(include sub-descriptors e.g.
                     slope/valley..valleys/lwr slopes..ridge top...ridges/upr
                     slopes..etc.)
LOCAL OPTIONAL ELEMENTS...(transport winds, mixing heights, LAL,
                           Haines, CWR, etc.)

.TOMORROW NIGHT...(third period could be either TOMORROW NIGHT or FOLLOWING
DAY - Day 2)
SKY/WEATHER.........
MIN TEMPERATURE.....
MAX HUMIDITY........
20 FT WIND..........(include sub-descriptors e.g.
                     slope/valley..valleys/lwr slopes..ridge top...ridges/upr
                     slopes..etc.)
LOCAL OPTIONAL ELEMENTS...(transport winds, mixing heights, LAL,
                           Haines, CWR, etc.)

.FOLLOWING DAY (Day 2)...
SKY/WEATHER.........
MAX TEMPERATURE.....
MIN HUMIDITY........
20 FT WIND..........(include sub-descriptors e.g.
                     slope/valley..valleys/lwr slopes..ridge top...ridges/upr
                     slopes..etc.)
LOCAL OPTIONAL ELEMENTS...(transport winds, mixing heights, LAL,
                           Haines, CWR, etc.)

(.FORECAST DAYS 3 THROUGH 7 may optionally be provided for each zone segment)

$$
[forecast for next geographical descriptor and fire weather zone group]

$$

.FORECAST DAYS 3 THROUGH 7...(winds must be included days 3-5, days 6 and 7
if appropriate; other elements per locally-established policy; may be in each
zone segment versus this location; if day 2 not included above, then this
section should start at day 2; may optionally be presented as 12 hour
periods)
.DAY3... (days can be combined, e.g., .SUNDAY THROUGH TUESDAY...)
.DAY4...
.DAY5...
.DAY6... (days 6 and 7 optional)
.DAY7...

.OUTLOOK FOR DAY MONTH DATE THROUGH DAY MONTH DATE (per local-established
policy - Days 8-14, 30 and 90 day outlooks when issued)
$$
```

Appendix H: Format of the Tabular Fire Weather Planning Forecast.

Format shown is for the afternoon issuance; morning issuance is identical except for three periods instead of four. **Bold text** denotes required elements.

```
FNUS5i KNNN DDHHMM
FWFNNN
FIRE WEATHER PLANNING FORECAST FOR name of area
NATIONAL WEATHER SERVICE CITY STATE
TIME-DATE (example: 300 PM EST TUE JAN 1 2001)

...HEADLINE... (REQUIRED for Red Flag Warnings and Fire Weather
Watches...significant feature(s) at other times recommended)

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

SSZXXX-XXX>XXX-DDHHMM- (UGC/FIPS coding)
GEOGRAPHIC DESCRIPTORS (such as land management units, political boundaries,
geographic features, and/or fire weather zones)
TIME-DATE (repeated)

...RED FLAG WARNING/FIRE WEATHER WATCH HEADLINE (as needed in each
appropriate zone grouping) ...
```

PARAMETER	**TONIGHT**	**TOMORROW**	**TOMORROW NIGHT**	**FOLLOWING DAY**
CLOUD COVER	**(CLOUDY, MCLDY, PCLDY, CLEAR)**			
CHANCE PRECIP (%)	**(Percent chance precip 0-100 or areal coverage)**			
PRECIP TYPE	**(NONE, DRIZL, FRZ RAIN, SNOW/RAIN, RAIN, TSHWR)**			
TEMP (24H TREND)	**(Max/min temps as zone avg or extremes, trend not included in 3rd or 4th period PM forecasts)**			
RH % (24H TREND)	**(Max/min relative humidity as zone avg or extremes, trend not included in 3rd or 4th period PM forecasts)**			
20FT WND MPH(VALLEY/AM)	**(8 pt compass or upslope/downslope and MPH w/ gusts, can be VALLEY or AM wind)**			
20FT WND MPH(RIDGE/PM)	**(8 pt compass and MPH w/gusts, can be PM or ridge top winds)**			
PRECIP DURATION	(Hours of precip in period)			
PRECIP BEGIN	(Onset of precip probability)			
PRECIP END	(Cessation of precip probability)			
PRECIP AMOUNT	(Zone avg QPF inches)			
LAL	(Lightning Activity Level)			
HAINES INDEX (LOW)	(As applicable)			
HAINES INDEX (MID)	(As applicable)			
HAINES INDEX (HIGH)	(As applicable)			
MIXING HGT (AGL/MSL)	(Feet or meters)			
TRANSPORT WIND(KTS)	(8 pt compass)			
VENT RATE (KT-FT)	(Mixing height times transport wind)			
DISPERSION	(Locally defined category, e.g. GOOD)			
SUNSHINE HOURS	(Total hours of sun)			
(OTHER LCL OPTIONS)	??? ???			

```
REMARKS...APPROPRIATE REMARKS TO ADD VALUE AND MARK SIGNIFICANT WEATHER
CHANGES. INSERT 'NONE' IF NONE.
```

(.Extended forecast may optionally be provided for each zone segment)

$$

[Forecast for next geographical descriptor and fire weather zone group]

$$

.EXTENDED... (wind required days 3-5, days 6 and 7 if appropriate; other elements per locally-established policy; days 3-7 may be grouped in any combination; may be in each zone segment versus this location; may optionally be presented as 12 hour periods)
.DAY 3...
.DAY 4...
.DAY 5...
.DAY 6... (days 6 and 7 optional)
.DAY 7...
.OUTLOOK (per local-established policy - Days 8-14, 30 and 90 day outlooks when issued)

$$

Appendix I: Standardized Format for Spot Forecasts for Wildfires (also for HAZMAT

```
FNUS7i KXXX DDHHMM
FWSXXX

SPOT FORECAST FOR (location or name of burn)
NATIONAL WEATHER SERVICE (CITY STATE)
TIME-DATE (800 AM MST TUE NOV 27 2001)

IF CONDITIONS BECOME UNREPRESENTATIVE...CONTACT THE NATIONAL WEATHER SERVICE.

...HEADLINE...(if a fire weather watch or red flag warning is in effect, a
headline is required - otherwise, a headline is recommended for every
issuance.)

.DISCUSSION...(required)

.FIRST PERIOD...

SKY/WEATHER.........
TEMPERATURE.........
HUMIDITY............
WIND................(specify the wind level)
OPTIONAL ELEMENTS...(as requested by the users)

.SECOND PERIOD...

SKY/WEATHER.........
TEMPERATURE.........
HUMIDITY............
WIND................(specify the wind level)
OPTIONAL ELEMENTS...(as requested by the users)

.THIRD PERIOD...

SKY/WEATHER.........
TEMPERATURE.........
HUMIDITY............
WIND................(specify the wind level)
OPTIONAL ELEMENTS...(as requested by the users)

(OPTIONAL TABULAR INFORMATION)
.FIRST PERIOD...
TIME (LST or LDT) (time step) (time step) (time step) (time step)
-------------------------------------------------------------------
ELEMENT #1.............
ELEMENT #2.............
ELEMENT #3.............
(other optional elements as requested by the users)
.SECOND PERIOD...
TIME (LST or LDT) (time step) (time step) (time step) (time step)
-------------------------------------------------------------------
ELEMENT #1.............
ELEMENT #2.............
ELEMENT #3.............
```

```
(other optional elements as requested by the users)

.THIRD PERIOD...
TIME (LST or LDT) (time step) (time step) (time step) (time step)
-------------------------------------------------------------------
ELEMENT #1.............
ELEMENT #2.............
ELEMENT #3.............
(other optional elements as requested by the users)

FORECASTER...(optional)

$$
REQUESTING OFFICIAL...(name of requester)
REASON FOR REQUEST...(reason for request)
```

Appendix J: Red Flag Warning/Fire Weather Watch Format

WWUS8i KNNN DDHHMM
RFWNNN
URGENT – FIRE WEATHER MESSAGE
NATIONAL WEATHER SERVICE CITY STATE
TIME-DATE (example: 830 CDT WED SEP 1 2009)

...OVERVIEW HEADLINE/S (optional)...

.(optional overview discussion, focus on adverse weather conditions)

SSZXXX-XXX>XXX-DDHHMM- (UGC coding)
/<VTEC CODING>
GEOGRAPHICAL DESCRIPTORS (including land management governing units, fire weather zone numbers, and/or county names)
TIME-DATE (example: 0830 CDT WED SEP 1, 2009)

...SEGMENT HEADLINE (Red Flag Warning or Fire Weather Watch, when, why, and where)...

Repeat of contents of the headline.

```
STATEMENT BODY (Discussion/details of weather parameters and systems
affecting the area)

PRECAUTIONARY/PREPAREDNESS ACTIONS...(Call to Action, definition of a
                                      Fire Weather Watch or Red Flag
                                      Warning)
```

$$

[next segment if necessary]

$$

Appendix K: FWM Example

FNUS83 KJKL 131900
FWMJKL

FCST,154401,010214,13,6,58,78,1,1,SW,10,M,58,48,93,83,5,6,N

FCST,157002,010214,13,6,61,67,1,1,SW,12,M,61,47,99,72,8,5,N

FCST,157201,010214,13,6,58,78,1,1,SW,13,M,58,49,93,88,6,6,N

FCST,159801,010214,13,6,59,75,1,1,SW,09,M,59,47,99,72,7,5,N

FCST,152001,010214,13,6,57,80,1,1,SW,12,M,57,48,93,67,5,6,N

FCST,154801,010214,13,6,58,78,1,1,SW,10,M,58,47,99,71,5,6,N

FCST,156001,010214,13,6,58,78,1,1,SW,10,M,58,48,97,77,6,6,N

Appendix L: Hazardous Weather Outlook Example

```
HAZARDOUS WEATHER OUTLOOK
NATIONAL WEATHER SERVICE JACKSON, KY
600 AM EDT WED APRIL 21 2009

THIS HAZARDOUS WEATHER OUTLOOK IS FOR PORTIONS OF EASTERN KENTUCKY.

.DAY ONE...TODAY AND TONIGHT.

SOUTHWEST WINDS INCREASING TO 10 TO 20 MPH WITH HIGHER GUSTS ALONG WITH
AFTERNOON RELATIVE HUMIDITY READINGS DROPPING TO 25 TO 30 PERECENT WILL
COMBINE TO PRODUCE AN INCREASED THREAT OF WILDFIRES ACROSS THE REGION TODAY.
THOSE PLANNING OUTDOOR BURNING PROJECTS TODAY SHOULD TAKE EXTRA PRECAUTIONS
TO PREVENT THE OCCURRENCE OF UNCONTROLLED GRASS FIRES.

.DAYS TWO THROUGH SEVEN...THURSDAY THROUGH TUESDAY.

NO HAZARDOUS WEATHER IS EXPECTED AT THIS TIME.

.SPOTTER INFORMATION STATEMENT...

SPOTTER ACTIVATION IS NOT ANTICIPATED.
```

Appendix M: WS Form D-1

WS FORM D-1 (1-2005) (Supersedes Previous Editions)	**SPOT REQUEST** (See reverse for instructions)	U.S. Department of Commerce NOAA National Weather Service

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

1. Time†	**2. Date**	**3. Name of Incident or Project**	**4. Requesting Agency**
5. Requesting Official	**6. Phone Number**	**7. Fax Number**	**8. Contact Person**

9. Ignition/Incident Time and Date

10. Size (Acres)

11. Type of Incident

- ○ **Wildfire**
- ○ **Prescribed Fire**
- ○ **Wildland Fire Use (WFU)**
- ○ **HAZMAT**
- ○ **Search And Rescue (SAR)**

12. Reason for Spot Request (choose one only)

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

13. Latitude/Longitude:

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

15. Drainage

16. Aspect

17. Sheltering

- ○ **Full**
- ○ **Partial**
- ○ **Unsheltered**

18. Fuel Type: ___ Grass ___Brush ___Timber ___Slash ___Grass/Timber Understory ___Other_____
Fuel Model: 1,2,3 4,5,6,7 8,9,10 11,12,13 2,5,8

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

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

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

21. Requested Forecast Period Date
Start _____
End _____
Forecast needed for:

- ○ **Today**
- ○ **Tonight**
- ○ **Day 2**
- ○ **Extended**

22. Primary Forecast Elements (Check all that are needed) ***(for management ignited wildland fires, provide prescription parameters):***
Needed:
Sky/Weather __
Temperature __
Humidity __
20 ft Wind __
Valley __
Ridge Top __
Other (Specify in #23) __

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

24. Send Forecast to: ATTN:	25. Location:	26. Phone Number: Fax Number:
27. Remarks (Special requests, incident details, Smoke Dispersion elements needed, etc.):		
EXPLANATION OF SYMBOLS:	**† Use 24-hour clock to indicate time. Example: 10:15 p.m. = 2215; 10:15 a.m. = 1015 Indicate local standard time or local daylight time**	

WS FORM D-1

WS FORM D-1, January 2005 INSTRUCTIONS:

I. Incident Personnel:

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

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

   b. If the incident (HAZMAT, SAR) involves marine, put the wave/swell height and direction in the Remarks section.

2. Transmit in numerical sequence or fax to the appropriate Weather Forecast Office. (A weather forecaster on duty will complete the special forecast as quickly as possible and transmit the forecast and outlook to you by the method requested)

3. Retain completed copy for your records.

4. **Provide feedback to NWS utilizing separate page.** Be sure to include a copy of the spot forecast with any feedback submission including forecaster's name. Feedback to NWS personnel is imperative to assist with future forecasts. Remember, feedback on correct forecasts is equally as valuable as feedback on incorrect forecasts! If spot forecast is significantly different than conditions on site, a second forecast may be required.

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

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

NOTICE: Information provided on this form may be used by the National Weather Service for official purposes in any way, including public release and publication in NWS products. False statements on this

form may be subject to prosecution under the False Statement Accountability Act of 1996 (18 U.S.C. § 1001) or other statutes.

Appendix N: Requesting a HYSPLIT Run on NWS SPOT

How to request:

To request a HYSPLIT run for your prescribed burn or incident:

1. Request a Spot Forecast through NWSSPOT using the appropriate links found in Section II.
2. In the remarks section (authorized users only), enter the following phrase in quotes: "hysplit to (email address of authorized user)"

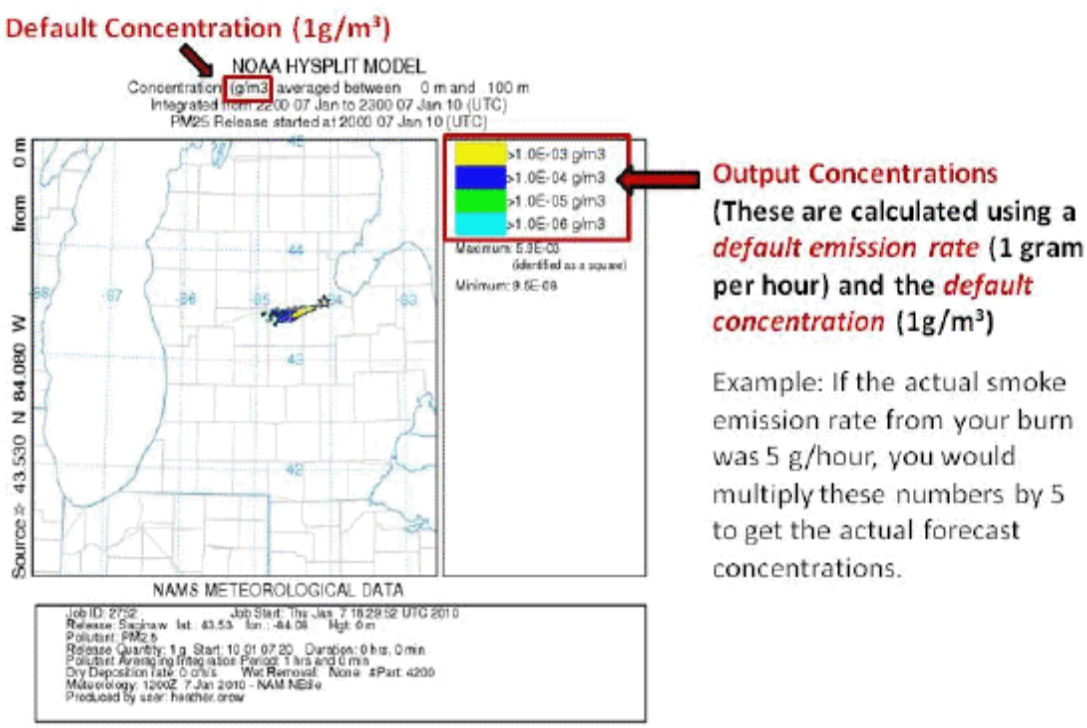
Notes: Do not enter an email address in parenthesis.

The HYSPLIT trajectory raw data, as well as .gif and .kml files will be sent to the specified email address.

How to Interpret the results:

Plotted output concentrations (the output graphics) are calculated using a default concentration and a default emission rate. These two parameters tell the model how much smoke to release, and how fast to release it. The default concentration rate will always be 1 unit of mass per cubic meter (for example 1g/m3). The default emission rate will always be one mass unit per hour (for example, 1g/hour).

Since the output graphics use a default concentration and a default emission rate, the raw HYSPLIT smoke concentration shown on the output graphics do not represent actual concentrations and cannot be used to estimate health impacts. If the actual emission rate of smoke per hour is know, you can perform a simple calculation to obtain actual concentrations:

Actual concentrations = actual emission rate X output concentrations

An example of the Output is shown in the image below: