Annual Operating Plan for Fire Weather Services in Ohio 2016

Publicly Available Version (phone numbers redacted)

Annual Operating Plan for the State of Ohio – Index Page

I. INTRODUCTION……3
II. NATIONAL WEATHER SERVICE DIRECTIVES……3
III. SERVICE AREA AND ORGANIZATIONAL DIRECTORY……3-9
A. National Weather Service (NWS) County Warning Areas (and map)……4
B. NWS Offices and Points of Contact……5
C. Participating Agencies and Points of Contact……6
IV. FIRE SEASONS……6-8
A. Definition of fire seasons……6-7
B. Fire season concept……7-8
V. SERVICES PROVIDED BY THE NATIONAL WEATHER SERVICE……8-21
A. Basic Services and Forecasts……8-19
1. Fire Weather Planning Forecast (FWF)……8-12
a. Issuance Times……8
b. Content/Format……8-12
2. National Fire Danger Rating System Forecasts (NFDRS-FWM)13-15
a. Issance Times and Locations……13
b. Content/Format……13-15
3. Site-specific Wildland Fire Forecasts, or Spot Forecasts (FWS)15-16
a. Criteria……15-16
b. Content……16
c. Procedure for Requesting a Spot Forecast……16
4. Fire Weather Watch and Red Flag Warning (RFW)……16-17
a. Criteria……16-17
b. Content……16-17
5. Fire Danger Statements (PNS and SPS)……17-18
a. Criteria……18
b. Content……18-19
B. Special Services and Training……19-20
C. Information Sources……20-21
VI. JOINT RESPONSIBILITIES……22
VII. EFFECTIVE DATES ……22
VIII. SIGNATORY PAGE……23
IX. APPENDICIES
A. Haines Index……24-25
B. Spot Forecast (FWS)……26-27
C. Tabular and Narrative Planning Forecast (FWF)……28-30
D. Red Flag Warning and Fire Weather Watch (RFW)……31

This is a redacted version of the AOP. For the full version with appropriate phone numbers, please contact your supervisor or supporting agency.

I. INTRODUCTION

This Annual Operation Plan (AOP) for Fire Weather Services is the official document that governs and defines the interaction and relationships between the National Weather Service (NWS), and their partners in land management agencies at the federal and state levels throughout Ohio. These include but are not limited to the following agencies:

- NOAA National Weather Service
- USDA Forest Service
- OH Division of Forestry

The National Weather Service fire weather program provides forecast and warning services in support of fire management planning and control operations, leading to the effective prevention, suppression, and management of forest and rangeland fires. The major objective of the fire weather program is to provide a service which will meet the meteorological requirements of federal and state wildland management agencies in the protection and enhancement of the nation's forest and rangelands.

The Eastern Area Coordination Center (EACC) will use this AOP with regards to its Memorandum of Understanding (MOU) for Meteorological Services contained in chapter 40 of its Geographic Area Mobilization Guide for use in Ohio. The National Mobilization Guide will also provide a more detailed relationship between fire management agencies and the NWS Incident Meteorologist.

This AOP will be reviewed at the beginning of each year by all concerned parties for accuracy and continued relevance. Any changes will be noted, and an updated AOP will be made available to all partner agencies noted within the document before the onset of the spring fire weather season

II. The NWS products and programs are spelled out within chapter 10 of the NWS Policy Directives. The structure of this chapter and associated links are as noted below:

- NDS 10-4 Fire Weather Services
  - 10-401 Fire Weather Services Product Specification
    - Eastern Region Fire Weather Watch/Red Flag Warning Program
  - 10-402 IMET Services to Support Fire and other Incidents
  - 10-403 Fire Weather Services Coordination and Outreach
  - 10-404 Fire Weather Services Annual Operating Plan and Report
  - 10-405 Fire Weather Services Training and Professional Development
  - 10-407 Fire Weather Services Zone Change Process

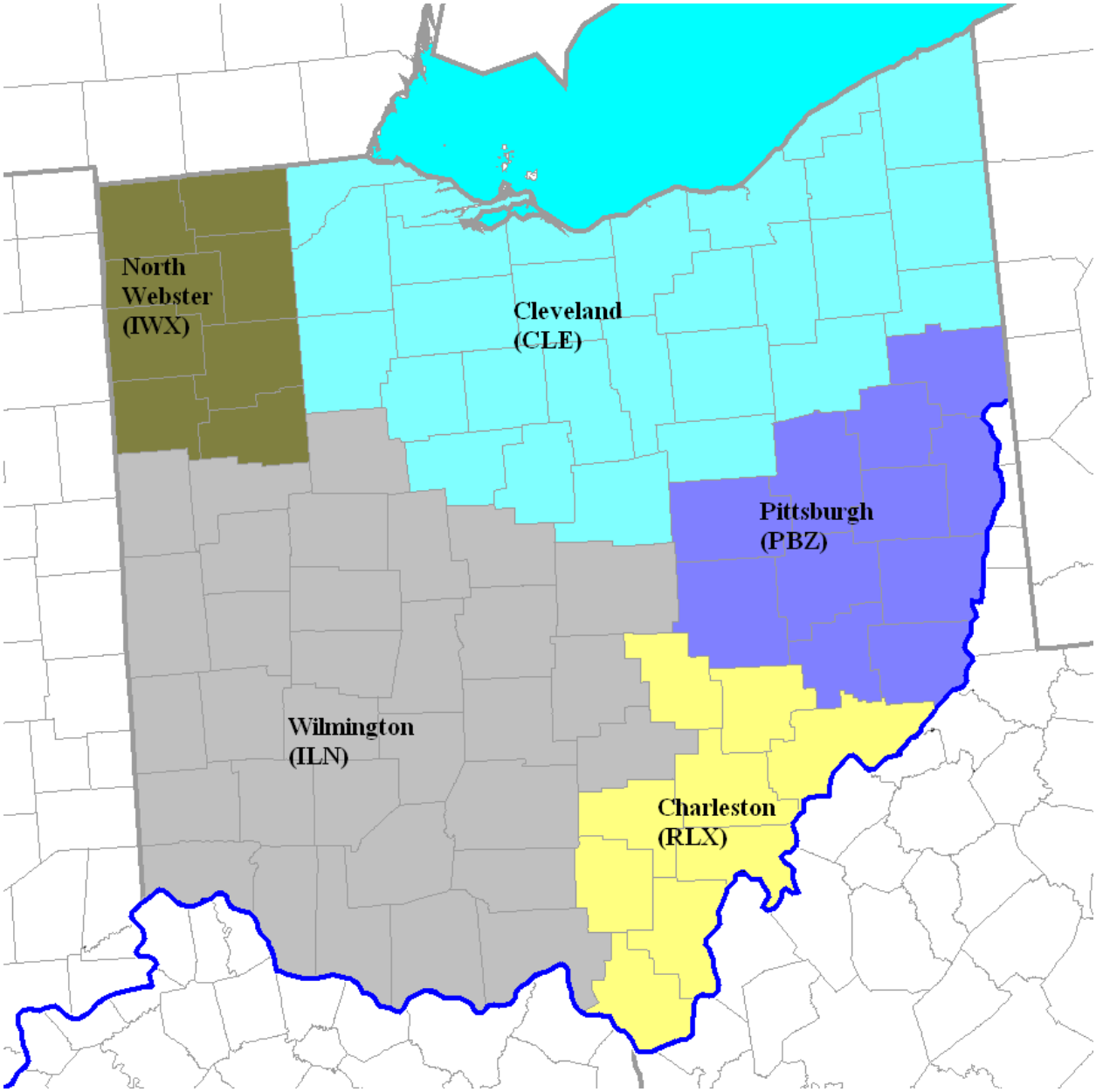
III. SERVICE AREA AND ORGANIZATIONAL DIRECTORY*

* Unlisted phone numbers will be removed/redacted for on-line, publicly accessible versions of this AOP. A separate redacted version of this document will accompany this plan when it is disseminated.

The Service Area covered by this Operating Plan is the state of Ohio, which is served by the following National Weather Service Weather Forecast Offices:

A. National Weather Service (NWS) County Warning Areas:

- North Webster, IN (IWX) (574)
- Cleveland, OH (CLE) (216)
- Pittsburg, PA (PBX) (412)
- Charleston, WV (RLX) (304)
- Wilmington, OH (ILN) (937)



B. NWS Offices and Points of Contact:
Hyperlinks to the NWS office home page and contact e-mails are embedded in the following:

Cleveland (CLE)
Operations: (216)
Fax: (216)
Will Kubina, FW, IMET
Gary Garnet, MIC
Vacant, WCM
5301 West Hanger Rd
Federal Facilities Bldg.
Cleveland Hopkins Airport
Cleveland, OH 44135

Wilmington (ILN)
Operations: (937)
Fax: (937)
John Franks, FW, IMET
Ken Haydu, MIC
Brandon Peloquin, WCM
1901 S. State Route 134
Wilmington, OH 45177

Charleston (RLX)
Operations: (304)
Fax: (304)
Simone Lewis, FW, IMET
Jamie Bielinski, MIC
Faith Borden, WCM
400 Parkway Road
Charleston, WV 25309

Pittsburgh (PBZ)
Operations: (412)
Fax: (412)
Rihaan Gangat, FW
Tony Hall, MIC
Fred McMullen, WCM
192 Shafer Road
Moon Township, PA 15108

Northern Indiana (IWX)
Operations: (574)
Fax: (574)
Lonnie Fisher, FW
Mark Frazier, MIC
Michael Lewis, WCM
7506 E 850 North
Syracuse, IN 46567

National Fire Weather Program Manager
Heath Hockenberry, IMET
(208)
Fax: (208)
National Weather Service
3833 South Development Ave.
Boise, ID 83705

NWS EASTERN REGION
Headquarters
Harvey Thurm, W/ER1x4 (631)
Fax: (631
Airport Corporate Center
630 Johnson Ave
Bohemia, NY 11716

NWS CENTRAL REGION
Headquarters
Chris Foltz (816)
Cell: (816)
Emergency Response Specialist
NWS Central Region HQ
7220 Northwest 101st Terrace
Kansas City, MO 64153

C. Participating Agencies and Points of Contact:
Hyperlinks to the home pages of the agencies and contact e-mails are embedded in the following:

Eastern Area Coordination Center:
626 E. Wisconsin Ave. Suite 500
Milwaukee, WI 53202
Operations: (414)
Fax: (414)
Fire Weather Program Leader/Meteorologist Stephen Marien
Mississippi National River and Recreation Area
111 East Kellogg Blvd, Suite 105
St. Paul, MN 55101
(651)
Fax: (651)
Cell: (402)

Wayne National Forest:
13700 U.S. Highway 33
Nelsonville, OH 45764
Fax: (740) 753-0120
Fire Management Officer Ryan Sundberg
(928) cell
Dispatcher - Michele Stephens
(740)
(740) cell

Ohio Department of Natural Resources (DNR) Division of Forestry (DOF):
Headquarters
2045 Morse Road, H-1
Columbus OH 43224-1327
(614)
Fax: (614)
Greg Guess
Deputy Chief, State Forests and Fire Management
Columbus: (614)
Chillicothe (740)
Chief Bob Boyles
(614)
Fax: (614)

IV. FIRE WEATHER SEASONS

A. Definition of Fire Weather Seasons

In Ohio, open burning is prohibited during fire season, which runs the months of March, April, and May (spring season), and October and November (fall season). It is covered by Ohio Revised Code ORC 1503.18 regarding kindled fires enforced by the Ohio DNR Division of Forestry, and Ohio Administrative Code 3745.19 regarding outdoor burning enforced by the Ohio EPA. For more information, please see:

- http://ohiodnr.com/Portals/18/fire/pdf/OhioFireLaw.pdf
- http://epa.ohio.gov/portals/47/facts/openburn.pdf
- http://www.epa.ohio.gov/dapc/general/openburning.aspx

National Weather Service offices supporting the state of Ohio will make certain that the enhanced suite of fire weather products are produced during fire season. Individual WFOs may extend this season earlier or later to support other state fire weather programs.

During fire season, afternoon NFDRS point forecasts will be produced if an observation is generated. The afternoon planning forecast (FWF) will be generated by the Wilmington and North Webster office.

Regardless of fire season, Red Flag Warnings and Fire Weather Watches (both issued under the header RFW) as well as Spot Forecasts (FWS) will be supported.

Upon discussion between the land management agencies and affected NWS forecast offices, a fire "season" may be declared due to drought, enhanced fire danger, or other reasons. This declaration will trigger the twice daily forecasts and afternoon point forecast to be generated.

B. Fire Season Concept

Fire seasons are periods when fire control and land management agencies perform most prescribed (planned) burns. Most importantly, these are the periods when the probability of wildfires is the greatest.

In the spring, the advent of warm, dry weather is often accompanied by strong winds. This rapidly dries out dead material that has been on the ground through the winter. Also, the moisture content of live vegetation is lowest just before grass becomes green and leaves develop on deciduous shrubs and trees; this process is commonly called "green-up" by fire control agencies.

In the fall, fuel moisture decreases as grass dies and as leaves fall from the trees and dry up on the ground as a litter layer. This drying process is known as "curing".

Spring fire season in Ohio is typically busier than fall fire season.

During the spring, fine fuels (1 hour timelag) will dry out quickly during periods of dry weather because there are no leaves on the trees to shade the material. They are

most important for both fire ignition and spread on the ground within forested areas. However, during the late summer and early fall; leaves provide shade for this dead material on the forest floor. This material will not dry out as quickly during periods of drought and will thus not be as readily available as fuel for fires. In short, under almost identical conditions, dry fuels and Red Flag conditions will be more likely in the early spring than in the late summer or early fall in the state of Ohio.

During the summer, vegetation is green; green vegetation in the Ohio Valley contains a great deal of moisture and will usually not burn. Humidity levels during the summer are often high and, as a result, fine fuel moisture (1 hour timelag) is usually too high for fire ignition. During extended periods of drought these fuels can dry out and wildfires can occur outside of normal fire seasons. This situation occurred during the summer of 1988. As a result, the NWS offers Fire Weather Watch/Red Flag Warning and Spot Forecasts throughout the year.

V. SERVICES PROVIDED BY THE NATIONAL WEATHER SERVICE

A. Basic Services and Forecasts:

Routine fire weather products include the Fire Weather Planning Forecast (FWF) and National Fire Danger Rating System Fire Weather Matrix forecasts (FWM).

Non-routine products include SPOT forecasts (FWS), Fire Weather Watches (RFW), Red Flag Warnings (RFW), Special Weather Statements (SPS), and/or Public Information Statements (PNS).

1. Fire Weather Planning Forecast (FWF):

   a. FWF Forecast issuance times:
   The FWF product in Ohio is issued year-round in the morning, usually between 4 am and 6 am.

   During fire season the graphical forecast is updated at a minimum twice daily. The North Webster and Wilmington offices make an additional afternoon planning forecast available between 4 pm and 6 pm.

   Updates: The FWF may be issued at various times throughout the day to reflect significant changes or if the forecast becomes unrepresentative. It will be updated to note the issuance or cancellation of a Fire Weather Watch or a Red Flag Warning.

   Special notes:
   - The Charleston WV (RLX) office produces a new planning forecast year-round, and is updated every three hours.
   - The North Webster IN (IWX) office suspends the daily forecast in-between the fall and spring fire season. This is because of their physical

location in the Lake Michigan snowbelt and the typical snow cover in this area during this time.

b. Content/Format:

The Format of the Fire Weather Forecast is specified in National Weather Service Directive 10-401, Section 5. The format will have the following elements:

Headline:
A headline is required when Red Flag Warnings and/or Fire Weather Watches are in effect. The headline will include the warning type, location, and effective time period. Locations will be described in terms of geographic areas such as southeast Ohio, but may also use other easily identified markers such as forests, parks, or drainage basins (e.g. Scioto River Valley). Also, the headline for a warning and/or watch will be included in each individual zone or zone grouping.

Significant trends of locally-defined critical weather elements should be headlined for non-watch or non-warning periods. Typically, no headline is included during a routine forecast when there is little or no fire danger.

Discussion:
The discussion should be a brief, clear, non-technical description of weather patterns that influence the weather in the forecast area. The emphasis of the discussion should be on the first two days of the forecast period, though latter periods may be included if significant weather is expected to impact safety or operations, and the forecaster has reasonable confidence the weather will occur.

UGC FIPS Coding and Geographic descriptors:
The zone format (Z) of the Universal Generic Code (UGC) will identify each specific forecast zone within a FWF segment. Typically, the fire weather forecast zone breakdown is the same as the public zone forecast breakdown, but may be compressed for brevity or expanded to include more detailed information if the forecaster desires.

Forecast Period:
The forecast will include the next 3 weather periods in detail: today, tonight, and tomorrow (morning issuance) or the next 4 weather periods: tonight, tomorrow, tomorrow night, and next day (afternoon issuance).

Sky/Weather:
Each 12 hour period will contain:

- <u>CLOUD COVER</u>
  - Amount of clouds in the sky expressed as cloudy, mostly cloudy, partly cloudy, clear, etc.
- <u>CHANCE PRECIP (%)</u>

    - The chance of precipitation expressed as a percentage from 0 to 100, rounded to the nearest 10 percent. It describes the chance for precipitation to be measureable (0.01”). Forecast values of 0, 10, and 20% will usually not carry a precipitation type, but may if isolated or widely scattered precipitation is expected, typically in the form of showers or thunderstorms.
- PRECIP TYPE
    - Type of precipitation expected (if any). For example, TSTMS for thunderstorms, SNOW for snow, SNOW/RAIN for a mix, etc.

Maximum or Minimum Temperatures (optional 24 hour trend):

- TEMP (24H TREND)
    - The maximum and minimum 24 hour temperatures will be the highest and lowest temperature reached within the 12 hour period stated.
    - Trends of the temperature will be for the first 24 hours and reflect a 24 hour change from the previous day’s high temperature or night’s low temperature.

Maximum or Minimum Relative Humidity (optional 24 hour trend):

- RH % (24H TREND)
    - The maximum and minimum 24 hour relative humidity reached within the 12 hour period stated.
    - Trends of the humidity will be for the first 24 hours and reflect a 24 hour change from the previous day’s minimum humidity or previous night’s maximum humidity.

Wind:
Wind will be derived from the local surface wind grid which approximates the 20 foot, 10 minute average, and indicates the prevalent direction and speed of the wind for each time period. Other sub-descriptors can be added such as slope/valley, ridge top, AM/PM, or other local formatter options. Use the 8-point compass for the wind direction, or in complex terrain, indicate slope or valley oriented wind direction (upslope/downvalley, etc.).

- AM WIND
    - Prevailing wind (direction and speed) in the morning. This will not be included in the tonight period.
- PM WIND
    - Prevailing wind (direction and speed) during the afternoon or overnight hours.

Extended (days 6 and 7 optional):
Weather elements in the extended outlook period may include any or all of the mandatory day 1 and day 2 forecast elements. Typically, they will express the sky condition and/or expected weather, high and low temperature.

- Significant Winds: Forecasters will include the wind in the 3 to 5 day period. Wind forecasts should reflect the most significant synoptically driven wind affecting fire operations or ignition. A sustained synoptic scale wind of 15 miles an hour or more (20 foot 10 minute average wind). Forecasters will indicate winds less than 15 miles an hour if no significant winds are expected.

  Special Note: The North Webster forecast office does not include winds in the extended period and uses a 3-5 day outlook, versus 7 days for the rest of the NWS offices serving Ohio.

Additional Elements:
The following "optional elements" are found in some forecasts for the state of Ohio, depending on the office of origination.

- PRECIP AMOUNT
  - If precipitation occurs, expected amount of liquid equivalent only. Three inches of snow would typically be expressed as .30 and may vary depending on the water equivalent that is expected.
- PRECIP DURATION
  - Number of hours where measurable (.01 inches) precipitation occurs.
- PRECIP BEGIN
  - The beginning time that precipitation is expected to begin. CONTINUING is used if the precipitation is expected to be carried over from the previous period.
- PRECIP END
  - The time that precipitation is expected to end. CONTINUING is used if the precipitation is expected to continue into the next period.
- HAINES
  - The Haines Index (HI) is an indicator of atmospheric stability and will be forecast for the time of maximum temperature. The HI can be broken into a low level, mid level, or upper level calculation based on surface elevation.
  - Most of Ohio is forecast using the low level HI. However, the Cleveland and Charleston offices calculate a mid level HI.

*See Appendix A for specific information on the Haines Index.

- DISPERSION or SMOKE DISPERSAL
  - Values for a dispersive index vary with individual offices.
    - Pittsburgh calculates a daytime dispersion using the following categories, and reports the associated numeric values:
      Very Poor (1); Poor (2); Fair (3); Good (4); Excellent (5)
    - Charleston calculates a nighttime dispersion using the following categories, and reports the associated worded values:
      Very Poor (<4kt); Poor (4-8kt); Good (8-12kt); Excellent (>12kt)

        - North Webster uses a worded value for both day and nighttime dispersions. It is tied to a "Ventilation Index" where the mixing height is multiplied by the transport wind and divided by 100. Values range from:
          Poor (<130); Fair (130-299); Good (300-599); Excellent (>600)
        - Wilmington does not offer a dispersion value in the forecast.
- VENT RATE
    - Described in either Knot-Feet (KT-FT) or Miles Per Hour-Feet (MPH-FT). It is forecast for daytime periods only and is the product of the transport wind speed and the mixing height. The ventilation rate is used for forecasting smoke behavior and trajectories and highlights the potential for the atmosphere to disperse smoke.
- MIXING HGT
    - The mixing height will be forecast in feet above ground level (AGL). This value will be forecast for the time of the high or low temperature, i.e., for the time of the maximum or minimum mixing height.
- TRANSPORT WIND (DIRECTION and SPEED)
    - The prevailing direction that the wind is coming from in the mixed layer at the time of the maximum or minimum temperature. Values are reported as calm, variable, or as a numerical compass direction (e.g. 180=south, 270=west). The transport wind speed will be expressed in either miles per hour (MPH) or knots (KTS).
- 8 to 14 day outlook:
    - All issuances should have a general outlook section valid beyond day 7. In this general outlook section, a forecast period is a 24-hour block of time beginning at 12 midnight and ending at 12 midnight the next day.

      The outlook is typically taken from the Climate Prediction Center and is based on Ohio's average value for this time frame. See http://www.cpc.noaa.gov/products/predictions/814day for a graphic of this product.

* See Appendix B for an example of a fire weather forecast in both the tabular and narrative format:

2. National Fire Danger Rating System (NFDRS) Point Forecast, or Fire Weather Matrix (FWM):

   There are currently two NFDRS points in Ohio that have a forecast generated, Dean and Zaleski. Other RAWS sites in the state may become NFDRS points but need to be entered into the WIMS system in order for this to occur.

   The NFDRS forecast will be issued for any predetermined site from which an NFDRS observation is received provided the observation is received on time, is complete, and is deemed accurate. The natural resource agencies will determine which observation sites (normally RAWS sites) will be NFDRS sites. Initiation

of NFDRS forecasts 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.

Land management agencies are responsible for taking, quality controlling, transmitting, and archiving the NFDRS observations. Observations must be received at the NWS in a timely manner. Forecasts will only be prepared for predetermined sites, and usually only from those site for which an observation has been received. The deadline for the land management agency for transmitting the observation is 1900Z (2 pm EST/3 pm EDT). The NWS will prepare and transmit the NFDRS forecasts no later than 1945Z (2:45 pm EST/3:45 pm EDT). Although the data cutoff time for ingest into the NFDRS software is 7 pm, preliminary calculations based on the forecast are used by the land managers to make staffing decisions at shift briefing time (4 pm).

The inputs include an 18Z (1 pm EST / 2 pm EDT) observation by the fire managers, set parameters about fuel type, and the forecast (FWM), which is generated by 20Z (3 pm EST / 4 pm EDT). After 21Z (4 pm EST / 5 pm EDT), fire managers receive numeric outputs that suggest the severity of fire danger over a given area.

a. NFDRS-FWM Forecast Issuance times and locations

NFDRS forecasts are produced by the NWS no later than 1945Z (2:45 pm EST/3:45 pm EDT). NWS Charleston also issues a preliminary version around 1830Z (1:30 pm EST / 2:30 pm EDT) daily, to aid with land agency staffing decisions.

RAWS name:	Station ID:	County:	Elev.	Lat:	Lon:
Dean	338401	Lawrence	923	38° 42' 00"	-82° 38' 00"
Zaleski	338403	Vinton	730	39° 16' 31"	-82° 23' 06"

Other RAWS sites in Ohio (potential future point forecasts)

Chillicothe	337301	Ross	630’	39° 23' 09"	-82° 59' 06"
Shawnee	337501	Scioto	1068’	38° 41' 42"	-83° 11' 49"
Blue Rock	336001	Muskingum	641’	40° 00' 15"	-82° 04' 51"
Vinton Furnace	Not in WIMS	Vinton	920’	39° 12' 0.3"	-82° 23' 39"

b. Content/Format:

The following is an example of a complete FWM forecast:

FWMRLX
FCST,338401,120222,13,2,52,51,1,1,SW,10,,54,39,83,48,0,0,N

FCST,338403,120222,13,2,51,53,1,1,WSW,08,,54,38,85,44,0,0,N

The following is a breakdown of that forecast with an explanation of its elements:

FCST,NO,YYMMDD,13,WX,TEMP,RH,LAL1,LAL2,WDIR,WSPD,10 HR,
TX,TN,RHx,RHn,PD1,PD2,WETFLAG

- **FCST** Shows that this forecast is for an NFDRS individual station.
- **NO** NFDRS Zone Number (or individual NFDRS site number)
- **YYMMDD** Year, month, and day valid forecast time.
- **13** Always 1300 LST
- **WX** Weather valid at 1300 LST tomorrow. Valid entries are: 0 clear
    - 1 scattered clouds (1/8 to 4/8) (partly cloudy)
    - 2 broken clouds (5/8 to 7/8) (mostly cloudy)
    - 3 overcast clouds (more than 7/8) (cloudy)
    - 4 foggy
    - 5 drizzle
    - 6 raining
    - 7 snowing or sleeting
    - 8 showers (in sight or at the station)
    - 9 thunderstorm (Categories 5, 6, or 7 sets NFDRS index to 0)
- **TEMP** Temperature in deg F valid at 13 LST
- **RH** Relative humidity in percent valid at 13 LST
- **LAL1** Lightning Activity Level 1400 LST to 2300 LST
- **LAL2** Lightning Activity Level 2300 LST to 2300 LST
    - <u>Lightning Activity Levels (LAL)</u> - numbered 1 through 6
        - 1 – No thunderstorms.
        - 2 – Isolated thunderstorms (1-14% coverage). Lightning is very infrequent with 1-5 strikes occurring in a 5 minute period.
        - 3 – Widely scattered thunderstorms (15-24% coverage). Lighting is infrequent with 6-10 strikes occurring in a 5 minute period.
        - 4 – Scattered thunderstorms (25-54% coverage). Lightning is frequent with 11-15 strikes occurring in a 5 minute period.
        - 5 – Numerous thunderstorms (>55% coverage). Lightning is frequent and intense with over 15 strikes occurring in a 5 minute period.
        - 6 – Dry lightning * (same as LAL 3 but with little or no rainfall). * This type of lightning has the potential for extreme fire activity and is normally highlighted in a fire weather forecast with a Red Flag Warning in the Intermountain West. This type of lighting in Ohio is

meteorologically "impossible" and LAL 6 should not be used by NWS forecasters within the state of Ohio.

- **WDIR** Use only for point forecast (FCST) version. Enter direction using sixteen point compass (N, NNE, NE, ENE, etc.) valid at 13 LST (20 ft level/10 minute average).
- **WSPD** Wind speed in mph valid at 13 LST (20 ft level/10 minute average)
- **10HR** 10 hour timelag fuel moisture in percent valid at 13 LST (This value will be annotated by a blank between commas ,, since we are unable to forecast fuel moisture.)
- **Tx** Max temperature from 1300 LST to 1300 LST tomorrow
- **Tn** Min temperature from 1300 LST to 1300 LST tomorrow
- **RHx** Max relative humidity from 1300 LST to 1300 LST tomorrow
- **RHn** Min relative humidity from 1300 LST to 1300 LST tomorrow
- **PD1** Precipitation duration in hours 1300 LST to 0500 LST (This is the number of hours in which measurable (.01 inch or more) precipitation will occur.)
- **PD2** Precipitation duration in hours 0500 LST to 1300 LST (This is the number of hours where measurable (.01 inch or more) precipitation will occur.)
- **WETFLAG** Yes or No. Indicates whether liquid water will be on the fuels at 13 LST. (Y will set all the NFDRS indices to zero and indicate zero fire danger.)

3. Site-specific Wildland Fire Forecasts, or Spot Forecast (FWS):

A spot forecast is issued when requested by land management agencies for wildland fires or planned burn operations, or other specialized forest management activities. They are available year-round, 24 hours a day. In the event of an emergency which threatens life and/or property, a spot forecast may be provided to any federal, state, or local agency. Some examples of this would be for search and rescue, or chemical spills where a detailed trajectory is needed.

Spot forecasts 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.

a. Criteria

Before a SPOT forecast is issued for a particular site, detailed information about the area and who is making the request must be given. Some of these site details include elevation, latitude, longitude, and aspect. The more accurate the data 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 SPOT forecast. The requesting agency, project name, phone number, and effective time for the requested forecast must also be given.

b. Content

In general, the content includes sky conditions, weather, temperature, relative humidity, and wind speed. Additional specific fire weather parameters are available upon request.

* See Appendix C for an example of a fire weather forecast in both the tabular and narrative format:

c. Procedures for Requesting a Spot Forecast:

Spot forecasts should be requested through the NWSSpot program. The most user-friendly place to do this is by choosing the location of the fire on the experimental Spot Forecast Request Web Page. Drag the marker to your area of concern and zoom in on the map. You may also enter a street address as a location. The following are direct links to the individual spot forecast pages:

Cleveland:	http://spot.nws.noaa.gov/cgi-bin/spot/spotmon?site=cle
Pittsburgh:	http://spot.nws.noaa.gov/cgi-bin/spot/spotmon?site=pbz
Charleston:	http://spot.nws.noaa.gov/cgi-bin/spot/spotmon?site=rlx
Wilmington:	http://spot.nws.noaa.gov/cgi-bin/spot/spotmon?site=iln
North Webster:	http://spot.nws.noaa.gov/cgi-bin/spot/spotmon?site=iwx

If internet service is unavailable, please contact the appropriate office to set up alternate dissemination of the spot forecast. This may be verbal in nature, sent via e-mail, fax, or other mutually agreed upon method/format.

4. Fire Weather Watch and Red Flag Warning (RFW):

The Fire Weather Watches and Red Flag Warnings are issued to advertise the instance of dry (receptive) fuels combining with certain atmospheric conditions comprised of wind and relative humidity. The combination of these factors highlights the possibility of extensive wildfire occurrence and/or extreme fire behavior.

A Fire Weather Watch is issued 12 to 72 hours in advance of the onset of expected conditions.

A Red Flag Warning is issued within 12 hours of expected conditions, or the actual onset of these conditions.

a. Criteria

The Red Flag Event criteria in the state of Ohio are determined by coordination between the NWS at the local WFO level and land management agencies. The following Red Flag Event criteria consist of both fuel and weather parameters and need to be coordinated with each issuance:

- Ten hour fuel moisture must be at or below 8%.
- Relative humidity must be equal to or less than 25%.
- Surface wind speeds (sustained or gusts) must equal or exceed 15 mph.
- The above conditions must be met for at least 2 consecutive hours for a red flag event to be verified.

Forecasters should coordinate with local fire and land managers prior to the issuance of a Fire Weather Watch or Red Flag Warning. This is especially important to determine if fuels are receptive to fire (10 hour fuel moisture). If coordination is not possible (land management agencies are typically staffed 8AM to 5PM Mon-Fri and coordination is not always possible outside of these times), the forecaster will issue the appropriate product if deemed necessary.

A Fire Weather Watch will remain in effect until either (1) it is determined that Red Flag conditions will not develop, or that (2) the Watch is upgraded to a Red Flag Warning.

A Red Flag Warning will remain in effect until either (1) Red Flag conditions come to an end or (2) Red Flag conditions fail to develop as forecast. At such time, the warning will be canceled.

b. Content

The content of a Fire Weather Watch or Red Flag Warning will include:

- Effective zone codes and the product expiration time.
- A headline which states the critical weather element(s) causing the event, the effective time of the event, and a description of the affected area.
- A discussion which describes adverse weather conditions.

* See Appendix D for an example of a bulleted Red Flag Warning:

5. Fire Danger Statements, issued as either a Public Information Statement (PNS) or Special Weather Statements (SPS): This PNS or SPS will be broadcast on the appropriate NOAA Weather Radio – All Hazards transmitter but will not include the alarm feature (1050 Hz).

This product will be rare in nature, but could be issued in response to adverse fire conditions occurring outside of expected norms.

a. Criteria

Upon a request from an appropriate agency, the local NWS offices serving Ohio may issue a PNS or SPS highlighting a very high or extreme fire danger potential.

b. Content

The following are examples of an SPS with elevated fire danger, and two PNSs highlighting very high, and extreme fire potential. The SPS product available has a higher visibility as it scrolls across the bottom of the screen on many local and cable TV stations.

```
WWUS81 KILN 231510
SPSILN

SPECIAL WEATHER STATEMENT
NATIONAL WEATHER SERVICE WILMINGTON OH
1110 AM EDT SAT OCT 23 2010

INZ050-OHZ026-034-035-042>046-051>056-060>065-073-074-232300-
WAYNE-HARDIN-MERCER-AUGLAIZE-DARKE-SHELBY-LOGAN-UNION OH-DELAWARE-
MIAMI-CHAMPAIGN-CLARK-MADISON-FRANKLIN OH-LICKING-PREBLE-
MONTGOMERY-GREENE-FAYETTE OH-PICKAWAY-FAIRFIELD-ROSS-HOCKING-

1110 AM EDT SAT OCT 23 2010

...ELEVATED FIRE DANGER EXPECTED THIS AFTERNOON AND EARLY THIS
EVENING...

A VERY DRY AIRMASS COMBINED WITH EQUALLY DRY VEGETATION WILL
BRING AN ELEVATED FIRE RISK TO THE REGION TODAY. INCREASING
CLOUDS ARE FORECAST TO KEEP WINDS UNDER 20 MPH THIS AFTERNOON.
HOWEVER...IF SKIES BECOME PARTLY SUNNY AND WINDS INCREASE...THEN A
RED FLAG WARNING MAY BE NEEDED.

GIVEN THE AMPLE LEAF AND CROP LITTER AND GUSTY WINDS...ANY FIRE
COULD QUICKLY BECOME UNCONTROLLABLE. THE FIRE DANGER WILL SUBSIDE
AS SUNSET APPROACHES THIS EVENING...WITH DIMINISHING WINDS AND
INCREASING HUMIDITY.

PUBLIC INFORMATION STATEMENT
NATIONAL WEATHER SERVICE WILMINGTON OH
442 PM EDT FRI MAR 23 2012

...VERY HIGH FIRE DANGER IN SOUTH CENTRAL OHIO...

THE OHIO DEPARTMENT OF NATURAL RESOURCES/DIVISION OF FORESTRY REPORT
THAT THE FIRE DANGER IS VERY HIGH FOR THE FOREST...GRASSES AND
CROPLANDS IN THE LOWER SCIOTO RIVER VALLEY AND ADJACENT AREAS.
```

```
THIS MEANS THAT MANY FIRES MAY OCCUR...AND RESIDENTS SHOULD REFRAIN
FROM PERFORMING ANY OPEN BURNING. MOST FIRES WILL BE DIFFICULT TO
CONTROL FOR RESPONDING FIRE PERSONNEL...AND DEPARTMENTS MAY BE REQUIRED
TO RESPOND TO MULTIPLE FIRE STARTS AT THE SAME TIME.

$$

PUBLIC INFORMATION STATEMENT
NATIONAL WEATHER SERVICE WILMINGTON OH
442 PM EDT FRI MAR 23 2012

...EXTREME FIRE DANGER IN SOUTH CENTRAL OHIO...

THE OHIO DEPARTMENT OF NATURAL RESOURCES/DIVISION OF FORESTRY REPORT
THAT THE FIRE DANGER IS EXTREME FOR THE FOREST...GRASSES AND CROPLANDS
IN THE LOWER SCIOTO RIVER VALLEY AND ADJACENT AREAS.

THIS MEANS THAT ALL WILDLAND VEGETATION IS TINDER DRY. ALL OUTDOOR
BURNING IS PROHIBITED. MOST FIRES WILL REQUIRE REINFORCED ATTACK BY
RESPONDING FIRE SUPPRESSION FORCES...AND EXTREME CAUTION SHOULD BE
EXERCISED BY FIREFIGHTERS. THIS IS THE HIGHEST FIRE DANGER LEVEL
ISSUED.

$$
```

B. Special Services and Training:

Special services include teaching weather-related courses, an on-site Incident Meteorologist (IMET), or briefings/coordination calls.

When land management agencies would like a fire weather forecaster to attend and teach a course, the request should be made well in advance and no later than 4 weeks ahead of time. Requests for training assistance should be made through the Meteorologist-In-Charge (MIC) of NWS Wilmington. A one-day trip will incur minimal costs to the requesting agency. However, with an overnight stay, travel expenses should be paid for by the requesting agency.

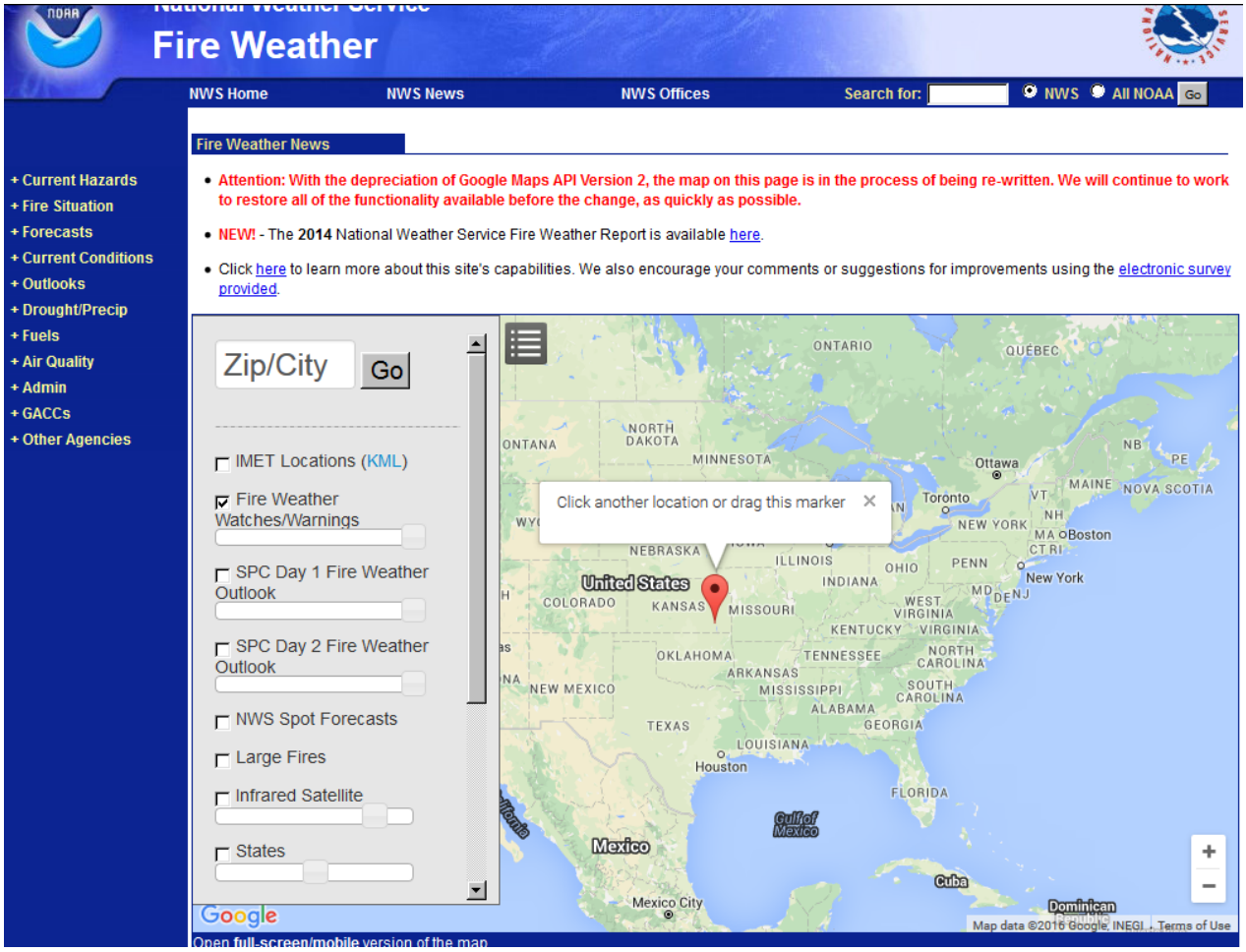
On-site forecast service support is available for wildfires, prescribed burns, and other non-wildfire high-impact incidents. This includes the dispatch of an Incident Meteorologist (IMET) and deployment of related service equipment such as the Atmospheric Theodolite Meteorological Unit (ATMU), the All Hazards Meteorological Response System (AMRS), and the Fire Remote Automated Weather Stations (Fire RAWS). The IMET, ATMU, AMRS, and the Fire RAWS are considered national fire fighting resources. Please reference the Eastern Area Mobilization Guide and/or the National Mobilization Guide for details about IMET dispatches and ATMU/AMRS/Fire RAWS deployments for wildland fire suppression or other emergency incident operations.

NWS meteorologists may also be asked to assist in other non-routine services during periods of high fire danger or fire occurrence, such as briefings or

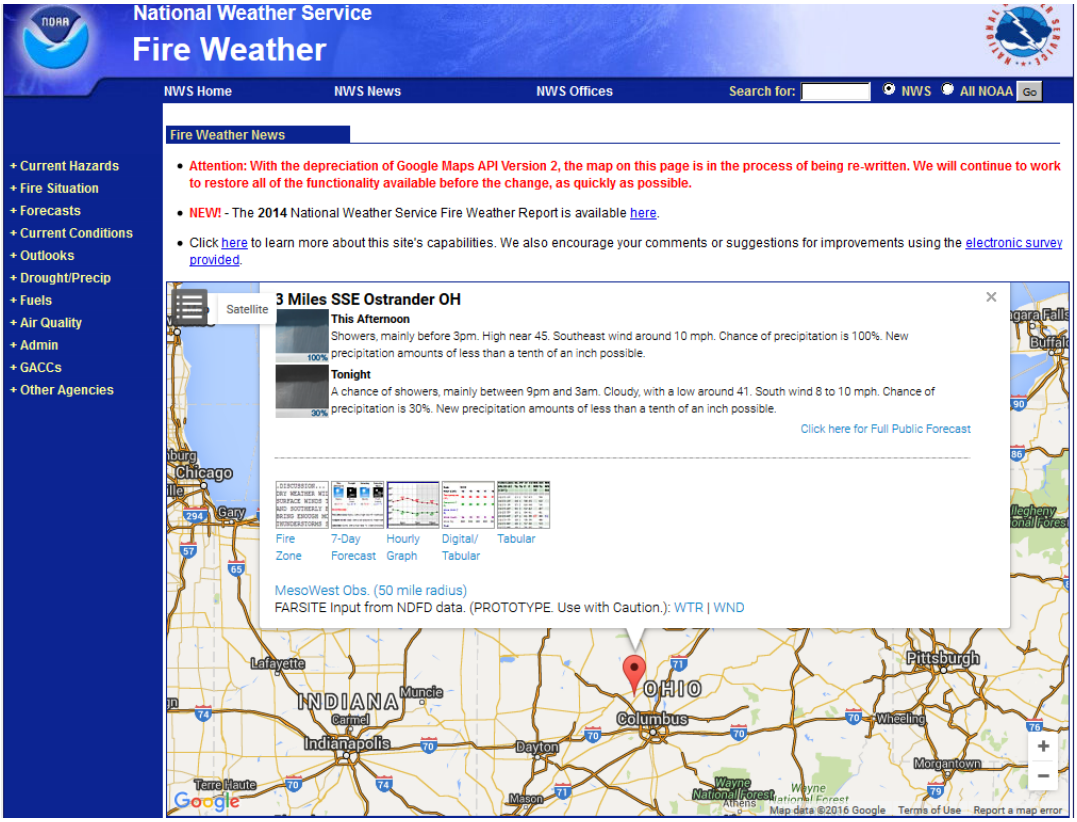
coordination calls. The FWPL and MIC will ensure that the land agency needs are met with little expense to either agency.

C. Information Sources:

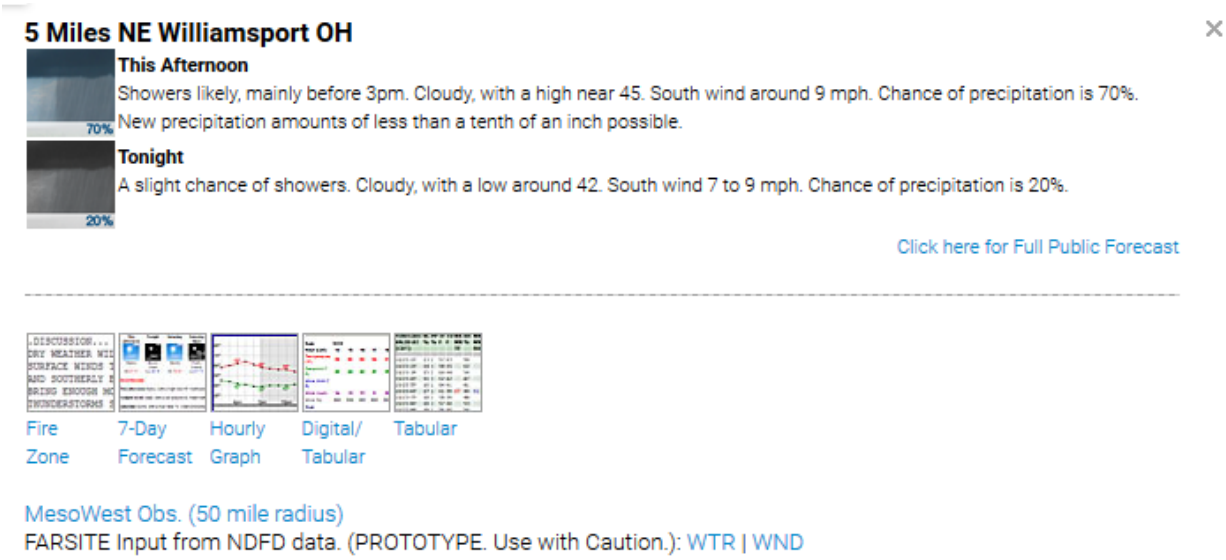
The national Fire Weather Web Page will provide you with one-stop shopping for all of the fire weather products, both in Ohio and nationally. In this screen-capture, you will see an example of the page.



When a location is chosen via a mouse click, a smaller box (center) will make various options available to the user, including links to the appropriate fire weather page, farsite, and various graphical forecasts. *The spot forecast request is no longer linked on this page.*



Note that when the text option of the forecast is chosen (image below – Fire Zone) the appropriate singular zone and associated extended and long-range forecast is given. Some FWF products list each individual county within the product, sometimes making it difficult to find.



VI. JOINT RESPONSIBILITIES

The individual agencies responsibilities will be as stated in the Interagency Agreement for Meteorological Services. This agreement serves as the basis of interaction between federal and state user agencies and the National Weather Service.

VII. EFFECTIVE DATES ON THE FIRE WEATHER SERVICES OPERATING PLAN

This agreement shall be effective for the current calendar year. The AOP will be updated as needed and reviewed annually between the fall and spring seasons. The first issuance of this statewide plan occurred in the spring of 2012.

VIII. SIGNATORY PAGE

The following signatories have agreed to the terms and conditions of this Fire Weather Services Operating Plan for the State of Ohio. Actual signatures are maintained on file at the Wilmington NWS office.

Kenneth J Hayden
<Signed>

for Brandon Peloquin
Warning Coordination Meteorologist
National Weather Service
Wilmington, Ohio

Robert Boyles

<Signed>

Bob Boyles
Chief, Division of Forestry
Ohio Department of Natural Resources
Columbus, Ohio

<Signed>

Ryan Sundberg
Forest Management Officer
Wayne National Forest
Pedro, Ohio

Haines Index (HI)

The Haines Index (HI) is a term that takes into account the stability and dryness of the atmosphere and was developed in 1988 by a USDA Forest Service meteorologist named Don Haines. It is a rudimentary index that indicates the potential for large fire growth based on atmospheric stability and dryness. It does not take into account wind and is not an indicator of potential ignition (it can only predict the growth of an existing fire). The HI will have a value between 2 and 6 and is comprised of the addition of a stability term and a dryness that each range between 1 and 3.

Stability Term:

1 if $\lambda \leq 3°C$

2 if $4°C \leq \lambda \leq 7°C$

3 if $\lambda \geq 8°C$

The lapse rate (λ) is the difference in Celsius between two layers of the atmosphere. The larger the temperature difference between two layers, the more (conditionally) unstable the airmass is.

Dryness Term:

1 if $T_{dd} \leq 5°C$

2 if $6°C \leq T_{dd} \leq 9°C$

3 if $T_{dd} \geq 10°C$

T_{dd} (Dewpoint Depression) is the difference between the temperature and the dewpoint at a certain level in the atmosphere. The lower the dewpoint depression is, the more humid the airmass is.

For all Haines Index Levels, the resultant potential for large fire growth is as follows:

Values of 2, 3, and 4 are considered **Low**.
A value of 5 is considered **Moderate**.
A value of 6 is a **High** value.

The **Low Level HI** uses the temperature difference between 950mb and 850mb (roughly 2,000' and 5,000') and uses the moisture at 950mb (~2,000').

The **Mid Level HI** uses the temperature difference between 850mb and 700mb (roughly 5,000' and 10,000') and uses the moisture at 850mb (~5,000').

The **High Level HI** uses the temperature difference between 700mb and 500mb (roughly 10,000' and 20,000') and uses the moisture at 700mb (~10,000').

The state of Ohio ranges in elevation from a low of 455' where the Ohio River exits the southwest part of the state in Hamilton County to the high point of 1550' at Campbell Hill near Bellefontaine in Logan County.

Most Fire Weather Forecasts in Ohio use the Low Level HI. Cleveland and Charleston calculate a Mid Level HI. The mid level calculations at Charleston reflect the WV topography which ranges from 4863' to 240'.

Haines Index					
Geopotential Height		**Approximate Height (warm season)**		**Approximate Height (cold season)**	
millibars (mb)	**Approximation in feet**	**meters**	**feet**	**meters**	**feet**
950 mb	2,000'	580	1902	570	1870
850 mb	5,000'	1525	5003	1450	4757
700 mb	10,000'	3135	10285	2980	9777
500 mb	20,000'	5800	19029	5475	17963

Spot Forecast:

The following spot forecast is a combination of the Narrative and Tabular forecast that is available to the requesting agency:

```
000
FNUS71 KPBZ 232042
FWSPBZ

SPOT FORECAST FOR GOAT FARM BURN...USDA FOREST SERVICE
NATIONAL WEATHER SERVICE PITTSBURGH PA
442 PM EDT FRI MAR 23 2012

FORECAST IS BASED ON IGNITION TIME OF 1300 EDT ON MARCH 23.
IF CONDITIONS BECOME UNREPRESENTATIVE...CONTACT THE NATIONAL WEATHER
SERVICE.

.DISCUSSION...

EAST COAST HIGH PRESSURE WILL PROVIDE ONE MORE DAY OF JUNE LIKE
WARMTH. A LOW PRESSURE SYSTEM, COMING SLOWLY EAST FROM KANSAS, WILL
BRING WEEKEND SHOWERS AND SCATTERED THUNDERSTORMS WITH TEMPERATURES
MORE TYPICAL OF MAY.

.TODAY...

SKY/WEATHER.........MOSTLY SUNNY (40-50 PERCENT).
TEMPERATURE.........73 AT IGNITION...MAX 77.
RH..................49 PERCENT AT IGNITION...MIN 34 PERCENT.
WIND (20 FT)........WINDS SOUTHEAST AT 6 MPH AT
                    IGNITION...OTHERWISE LIGHT AND VARIABLE
                    WINDS...BECOMING EAST 5 TO 6 MPH EARLY IN THE
                    MORNING...THEN BECOMING LIGHT AND VARIABLE LATE
                    IN THE MORNING...BECOMING SOUTHEAST 6 TO 10 MPH
                    WITH GUSTS UP TO 20 MPH IN THE LATE MORNING AND
                    AFTERNOON.
CHANCE OF PCPN......10 PERCENT.
LAL.................1.
HAINES INDEX........4 OR LOW POTENTIAL FOR LARGE PLUME DOMINATED
                    FIRE GROWTH AT IGNITION...MAX 5.
MIXING HEIGHT.......3900 FT AGL AT IGNITION...OTHERWISE 3000-4700
                    FT AGL...INCREASING TO 5000-5200 FT AGL LATE.
TRANSPORT WINDS.....SOUTHEAST 7 TO 16 MPH.

TIME (EDT)          1 PM   3 PM   5 PM   7 PM   9 PM   11 PM
SKY (%).............36     44     59     74     84     90
WEATHER COV.........                               CHANCE CHANCE
WEATHER TYPE........NONE   NONE   NONE   NONE   TSTORM TSTORM
TEMP................73     76     75     68     62     60
RH..................49     43     40     54     67     75
20 FT WIND..........SE 5   SE 6   SE 6   SE 5   SE 5   SE 6
20 FT WIND GUST.....20     20     20     20     15     15
MIX HGT (FT)........3900   4700   5200   5500   5000   3900
TRANSPORT WIND......SE 12  SE 13  SE 16  SE 20  SE 22  SE 24
CHC OF PCPN (%).....0      10     10     10     30     50
LAL.................1      1      1      1      3      3
HAINES INDEX........4      5      4      4      4      3
```

```
.TONIGHT...

SKY/WEATHER.........MOSTLY CLOUDY (80-90 PERCENT). A CHANCE OF
                    SHOWERS AND THUNDERSTORMS IN THE EVENING...THEN
                    SHOWERS WITH THUNDERSTORMS LIKELY AFTER
                    MIDNIGHT.
TEMPERATURE.........MIN 52.
RH..................MAX 100 PERCENT.
WIND (20 FT)........SOUTHEAST WINDS 6 TO 8 MPH. GUSTS UP TO 20 MPH
                    EARLY IN THE EVENING. GUSTY AND ERRATIC WINDS
                    EXPECTED NEAR THUNDERSTORMS IN THE LATE EVENING
                    AND EARLY MORNING. GUSTY AND ERRATIC WINDS
                    EXPECTED NEAR THUNDERSTORMS AFTER MIDNIGHT.
CHANCE OF PCPN......90 PERCENT.
LAL.................1 UNTIL 2100...THEN 3 UNTIL 2400...THEN 4 UNTIL
                    0200...THEN 2 UNTIL 0300...THEN 3.
HAINES INDEX........3 TO 4 OR OR VERY LOW POTENTIAL FOR LARGE PLUME
                    DOMINATED FIRE GROWTH TO OR LOW POTENTIAL FOR
                    LARGE PLUME DOMINATED FIRE GROWTH.
MIXING HEIGHT.......3900-5500 FT AGL...DECREASING TO 1800-3200 FT
                    AGL AFTER MIDNIGHT.
TRANSPORT WINDS.....SOUTHEAST 17 TO 26 MPH.

.SATURDAY...

SKY/WEATHER.........CLOUDY (95-100 PERCENT). A CHANCE OF
                    THUNDERSTORMS EARLY IN THE MORNING. SHOWERS.
                    THUNDERSTORMS IN THE LATE MORNING AND
                    AFTERNOON.
TEMPERATURE.........MAX 65.
RH..................MIN 66 PERCENT.
WIND (20 FT)........SOUTH WINDS 5 TO 6 MPH UNTIL LATE
                    AFTERNOON...BECOMING LIGHT AND VARIABLE. GUSTY
                    AND ERRATIC WINDS EXPECTED NEAR THUNDERSTORMS
                    EARLY IN THE MORNING. GUSTY AND ERRATIC WINDS
                    EXPECTED NEAR THUNDERSTORMS IN THE LATE MORNING
                    AND AFTERNOON.
CHANCE OF PCPN......100 PERCENT.
LAL.................3 UNTIL 0900...THEN 5 UNTIL 1300...THEN 4.
HAINES INDEX........3 OR VERY LOW POTENTIAL FOR LARGE PLUME
                    DOMINATED FIRE GROWTH.
MIXING HEIGHT.......1800-2900 FT AGL.
TRANSPORT WINDS.....SOUTH 16 TO 25 MPH.

$$
FORECASTER...33
REQUESTED BY...VERONICA LOPEZ
TYPE OF REQUEST...PRESCRIBED
.TAG 20120323.GOATF.02/PBZ
```

Tabular and Narrative Fire Weather Planning Forecasts (FWF)

Tabular:

```
000
FNUS51 KCLE 270846
FWFCLE

FIRE WEATHER PLANNING FORECAST FOR NORTHERN OHIO AND NORTHWEST PA
NATIONAL WEATHER SERVICE CLEVELAND OH
446 AM EDT TUE MAR 27 2012

.DISCUSSION...

HIGH PRESSURE OVER THE REGION WILL BUILD TO THE EAST COAST BY THIS
EVENING. SOUTHERLY WINDS WILL DEVELOP THIS AFTERNOON WITH
TEMPERATURES WARMING INTO WEDNESDAY. MOISTURE WILL OVERSPREAD THE
AREA TONIGHT BRINGING SCATTERED SHOWERS AND THUNDERSTORMS. LOW
PRESSURE WILL PASS NORTH OF THE STATE ON WEDNESDAY WITH A COLD
FRONT PUSHING SOUTH ACROSS THE AREA ON WEDNESDAY NIGHT.

OHZ003-272130-
LUCAS-
INCLUDING THE CITIES OF...TOLEDO
446 AM EDT TUE MAR 27 2012

                                TODAY      TONIGHT          WED

CLOUD COVER                     PCLDY        PCLDY        PCLDY
PRECIP TYPE                      NONE        TSTMS         NONE
CHANCE PRECIP (%)                   0           60            0
TEMP (24H TREND)             56 (+11)     47 (+18)           70
RH % (24H TREND)              33 (-5)     98 (+25)           36
20FTWND-AM(MPH)                 SE  7                     W 12
20FTWND-PM(MPH)             SE 11 G18         S 12     W 18 G27
PRECIP AMOUNT                    0.00         0.05         0.00
PRECIP DURATION                                  4
PRECIP BEGIN                                   9 PM
PRECIP END                                     6 AM
HAINES INDEX                        3            3            3
LAL                                 1            4            1
MIXING HGT(FT-AGL)               2770                      7150
TRANSPORT WND (KTS)             SE 13                     W 35
VENT RATE (KT-FT)               36010                    250250

REMARKS...NONE.

.FORECAST FOR DAYS 3 THROUGH 7...
.WEDNESDAY NIGHT...MOSTLY CLOUDY. LOWS IN THE UPPER 30S.
NORTHWEST WINDS 15 TO 20 MPH.
.THURSDAY...MOSTLY SUNNY. HIGHS AROUND 50. NORTH WINDS 10 TO
15 MPH.
.FRIDAY...PARTLY CLOUDY. A CHANCE OF RAIN SHOWERS AND
THUNDERSTORMS. LOWS IN THE LOWER 30S. HIGHS AROUND 50. SOUTHEAST
WINDS 5 TO 10 MPH.
```

.SATURDAY...MOSTLY CLOUDY WITH A CHANCE OF SHOWERS AND
THUNDERSTORMS. LOWS IN THE UPPER 30S. HIGHS IN THE MID 50S.
NORTHWEST WINDS 5 TO 10 MPH.
.SUNDAY...MOSTLY CLOUDY. LOWS IN THE UPPER 30S. HIGHS IN THE
LOWER 60S. EAST WINDS 5 TO 10 MPH.
.MONDAY...PARTLY CLOUDY. LOWS IN THE MID 40S. HIGHS AROUND 70.
SOUTHEAST WINDS 5 TO 10 MPH.

$$

.FORECAST FOR DAYS 3 THROUGH 7...
.WEDNESDAY NIGHT...MOSTLY CLOUDY WITH A CHANCE OF SHOWERS. LOWS
IN THE UPPER 30S. NORTHWEST WINDS 15 TO 20 MPH.
.THURSDAY...MOSTLY CLOUDY WITH A CHANCE OF SHOWERS. HIGHS IN THE
LOWER 40S. NORTHWEST WINDS 10 TO 15 MPH.
.FRIDAY...PARTLY CLOUDY. LOWS IN THE UPPER 20S. HIGHS AROUND 50.
NORTHEAST WINDS 10 TO 15 MPH.
.SATURDAY...MOSTLY CLOUDY WITH A CHANCE OF RAIN SHOWERS AND
THUNDERSTORMS. LOWS IN THE MID 30S. HIGHS IN THE LOWER 50S. WEST
WINDS 5 TO 10 MPH.
.SUNDAY THROUGH MONDAY...MOSTLY CLOUDY. LOWS IN THE UPPER 30S.
HIGHS IN THE LOWER 60S. SOUTHEAST WINDS AROUND 5 MPH.

$$

.OUTLOOK 8 TO 14 DAYS...
TEMPERATURES NEAR NORMAL. PRECIPITATION NEAR NORMAL.

Narrative:

000
FNUS53 KIWX 270813
FWFIWX

FIRE WEATHER PLANNING FORECAST FOR THE SOUTHERN GREAT LAKES
NATIONAL WEATHER SERVICE NORTHERN INDIANA
413 AM EDT TUE MAR 27 2012

.DISCUSSION...

DRY AND SEASONABLY WEATHER WILL PREVAIL THROUGH THIS AFTERNOON AS
HIGH PRESSURE SHIFTS INTO THE MID ATLANTIC. A WEAK COLD FRONT WILL
MOVE THROUGH THE AREA TONIGHT WITH A LOW CHANCE FOR WETTING RAINS
FOLLOWED BY DRY AND MILD WEATHER ON WEDNESDAY.

MIZ077>081-272100-
BERRIEN-CASS MI-ST. JOSEPH MI-BRANCH-HILLSDALE-
INCLUDING THE CITIES OF...NILES...BENTON HARBOR...ST. JOSEPH...
BUCHANAN...DOWAGIAC...CASSOPOLIS...MARCELLUS...STURGIS...
THREE RIVERS...WHITE PIGEON...MENDON...COLDWATER...BRONSON...
HILLSDALE...LITCHFIELD...JONESVILLE
413 AM EDT TUE MAR 27 2012

.TODAY...
SKY/WEATHER.....PARTLY SUNNY.
MAX TEMPERATURE.....55-65.
   24 HR TREND.....10 DEGREES WARMER.

```
MIN HUMIDITY........30-35 PERCENT.
   24 HR TREND......10 PERCENT DRIER.
20-FOOT WINDS.......SOUTH WINDS 15 TO 20 MPH.
LAL.................1.
HAINES INDEX........3 (VERY LOW).
SMOKE DISPERSAL.....GOOD.
PCPN AMOUNT.........NONE.
MIXING HEIGHT.......AROUND 2400 FT AGL.
TRANSPORT WINDS.....SOUTH AROUND 25 MPH.

.TONIGHT...
SKY/WEATHER.........PARTLY CLOUDY. CHANCE OF SHOWERS AND
                    THUNDERSTORMS. CHANCE OF PRECIPITATION 40
                    PERCENT.
MIN TEMPERATURE.....47-52.
   24 HR TREND......20 DEGREES WARMER.
MAX HUMIDITY........95-100 PERCENT.
   24 HR TREND......20 PERCENT WETTER.
20-FOOT WINDS.......SOUTHWEST WINDS 15 TO 20 MPH.
LAL.................3.
SMOKE DISPERSAL.....FAIR.
PCPN AMOUNT.........0.01-0.05 IN.
MIXING HEIGHT.......AROUND 800 FT AGL.
TRANSPORT WINDS.....SOUTHWEST AROUND 45 MPH.

.WEDNESDAY...
SKY/WEATHER.........MOSTLY SUNNY.
MAX TEMPERATURE.....55-70.
   24 HR TREND......5 DEGREES WARMER.
MIN HUMIDITY........35-40 PERCENT.
   24 HR TREND......15 PERCENT WETTER.
20-FOOT WINDS.......WEST WINDS 15 TO 20 MPH.
LAL.................1.
HAINES INDEX........3 (VERY LOW).
SMOKE DISPERSAL.....EXCELLENT.
PCPN AMOUNT.........NONE.
MIXING HEIGHT.......AROUND 5400 FT AGL.
TRANSPORT WINDS.....WEST AROUND 35 MPH.

.WEDNESDAY NIGHT...PARTLY CLOUDY. LOWS IN THE MID 30S.
.THURSDAY...MOSTLY SUNNY. HIGHS AROUND 50.
.THURSDAY NIGHT...MOSTLY CLEAR. PATCHY FROST. LOWS IN THE MID 30S.
.FRIDAY...PARTLY SUNNY WITH CHANCE OF SHOWERS AND THUNDERSTORMS.
HIGHS IN THE MID 50S.
.FRIDAY NIGHT...PARTLY CLOUDY WITH CHANCE OF SHOWERS AND
THUNDERSTORMS. LOWS AROUND 40.
```

Red Flag Warning and Fire Weather Watch

The following is an example of a Red Flag Warning (RFW) using the bulleted format that was introduced in 2012:

```
000
WWUS81 KILN 270727
RFWILN

URGENT - FIRE WEATHER MESSAGE
NATIONAL WEATHER SERVICE WILMINGTON OH
327 AM EDT TUE MAR 27 2012

OHZ073-079>082-088-280200-
/O.NEW.KILN.FW.W.0001.120327T1200Z-120327T2300Z/
ROSS-BROWN-HIGHLAND-ADAMS-PIKE-SCIOTO-
327 AM EDT TUE MAR 27 2012

...RED FLAG WARNING IN EFFECT FROM 8 AM TO 7 PM EDT TUESDAY FOR
WIND AND LOW RELATIVE HUMIDITY FOR SOUTH CENTRAL OHIO...

* AFFECTED AREA...SOUTH CENTRAL OHIO AND THE LOWER SCIOTO RIVER BASIN.

* WINDS...SOUTHWEST 10 TO 15 MPH WITH GUSTS TO 25 MPH.

* TIMING...THROUGH THIS AFTERNOON. CONDITIONS EARLY THIS MORNING
  WILL BE LOCALLY BELOW CRITERIA. HOWEVER...AS THE SUN RISES AND
  TEMPERATURES BEGIN TO WARM...CONDITIONS ARE EXPECTED TO REACH
  RED FLAG CRITERIA LEVELS.

* RELATIVE HUMIDITY...EXPECTED TO FALL TO 15 TO 20 PERCENT TODAY.

* IMPACTS...BECAUSE OF THE METEOROLOGICAL CONDITIONS...THE
  POTENTIAL EXISTS FOR RAPID SPREAD IF UNCONTROLLED FIRES DEVELOP.
  THE FIRE DANGER WILL BE ELEVATED DUE TO THE STRONG WIND GUSTS...
  RECENT LACK OF PRECIPITATION...LOW RELATIVE HUMIDITIES...AND
  DRY FUELS.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

A RED FLAG WARNING MEANS THAT DANGEROUS FIRE WEATHER CONDITIONS
ARE EXPECTED DUE TO THE COMBINATION OF GUSTY WINDS...LOW RELATIVE
HUMIDITIES...AND DRY FUELS. ANY FIRES THAT DEVELOP MAY QUICKLY GET
OUT OF CONTROL AND BECOME DIFFICULT TO CONTAIN.

&&

$$
```