

# Annual Operating Plan for Fire Weather Services in Ohio 2017

Redacted Version:

For use in public documents or web links  
with phone numbers removed in section III

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## 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 90](#) 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\*

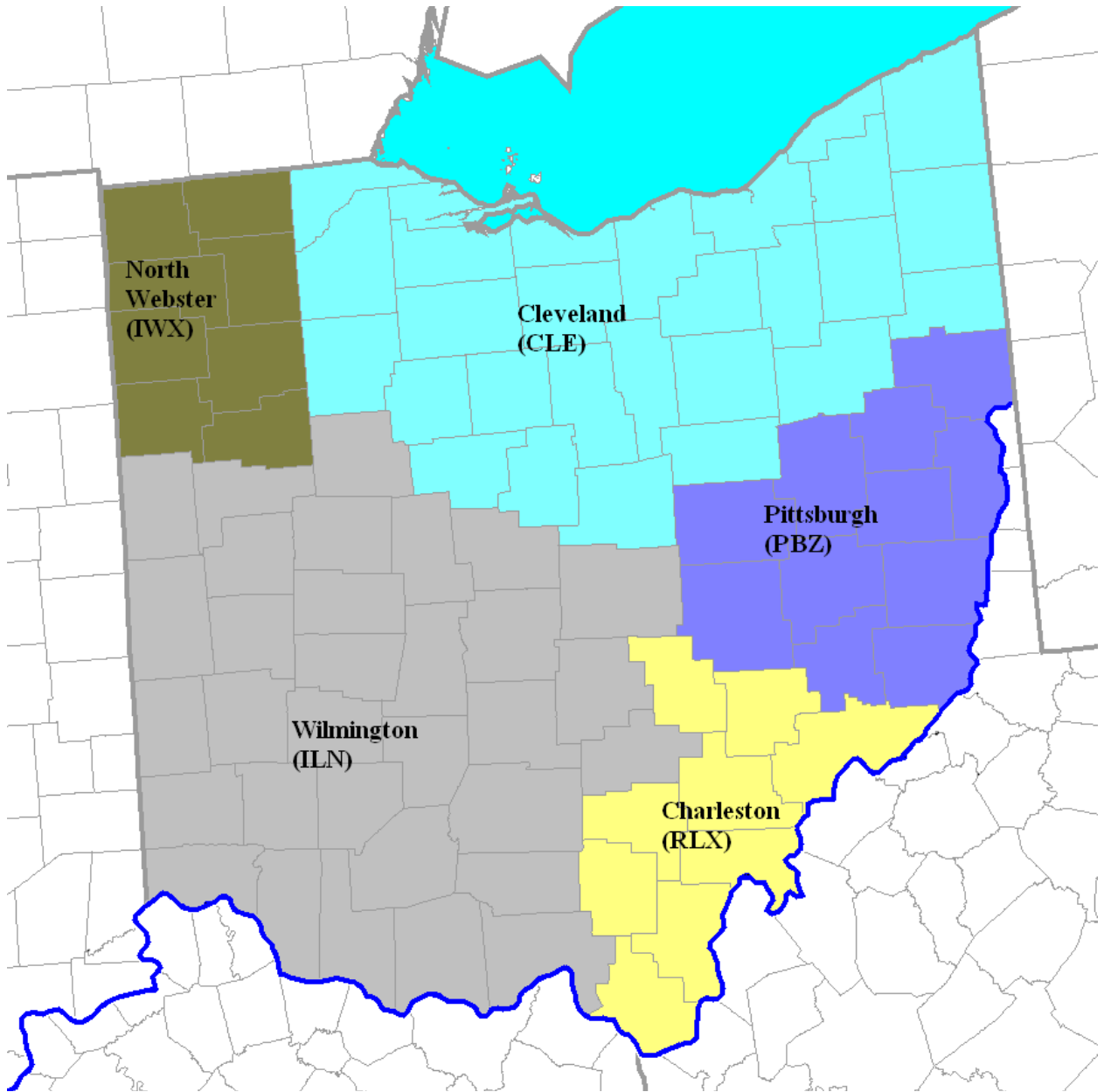
\* Unlisted phone numbers will be removed/redacted for on-line, publicly accessible

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) 265-2371  
[Cory Mottice](#), FW  
[Gary Garnet](#), MIC  
 Vacant, WCM  
 5301 West Hanger Rd

**[Wilmington \(ILN\)](#)**

Operations: (937)  
 Fax: (937) 383-0033  
[John Franks](#), FW, IMET  
[Ken Haydu](#), MIC  
[Brandon Peloquin](#), WCM  
 1901 S. State Route 134

Federal Facilities Bldg.  
Cleveland Hopkins Airport  
Cleveland, OH 44135

Wilmington, OH 45177

**Charleston (RLX)**

Operations: (304)  
Fax: (304) 746-0193  
[Simone Lewis](#), FW  
[Jamie Bielinski](#), MIC  
[Faith Borden](#), WCM  
400 Parkway Road  
Charleston, WV 25309

**Pittsburgh (PBZ)**

Operations: (412)  
Fax: (412) 262-2034  
[Rihaan Gangat](#), FW  
[Tony Hall](#), MIC  
[Fred McMullen](#), WCM  
192 Shafer Road  
Moon Township, PA 15108

**Northern Indiana (IWX)**

Operations: (574)  
Fax: (574) 834-3492  
[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) 334-1660  
National Weather Service  
3833 South Development Ave.  
Boise, ID 83705

**NWS EASTERN REGION**

**Headquarters**

[Harvey Thurm](#), W/ER1x4 (631)  
Fax: (631) 244-0167  
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 101<sup>st</sup> 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) 944-3838  
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) 290-3815  
Cell: (402)

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

[Ohio Department of Natural Resources \(DNR\) Division of Forestry \(DOF\):](#)  
Headquarters  
2045 Morse Road, H-1  
Columbus OH 43224-1327  
(614)  
Fax: (614) 447-9231  
[Greg Guess](#)  
Deputy Chief, State Forests and Fire Management  
Columbus: (614)  
Cell: (740)  
Chief [Bob Boyles](#)  
(614)  
Fax: (614) 265-6702

#### 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://forestry.ohiodnr.gov/burninglaws>
- <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:

- CLOUD COVER
  - Amount of clouds in the sky expressed as cloudy, mostly cloudy, partly cloudy, clear, etc.
- CHANCE PRECIP (%)
  - 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 measurable (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 four NFDRS points in Ohio that have a forecast generated, Dean, Zaleski, Chillicothe, and Shawnee. 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"
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"

Other RAWS sites in Ohio (potential future point forecasts)

Vinton Furnace	338201	Vinton	920'	39° 12' 0.3"	-82° 23' 39"
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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 sleet
  - 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
  - Lightning Activity Levels (LAL) - 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). Lightning 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 lightning 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 or latitude/longitude as a location.

Spot forecasts may be monitored at the following [Spot Forecast Monitor](#) web page. Individual pages are now consolidated to a national page where you may zoom in to the area of interest, not bounded by state or county warning area boundaries.

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 any 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 18 to 96 hours in advance of the onset of expected conditions.

A Red Flag Warning is issued within 48 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 a Special Weather Statements (SPS): This 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 SPS highlighting a very high or extreme fire danger potential.

b. Content

The following is an example of an SPS product issued for an elevated fire

danger. The SPS product has a high 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.

## 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.



After zooming in to the appropriate region, when a location is chosen via a mouse click, a smaller box (center) will make various tabs available to the user, consisting of the appropriate singular zone forecast\* (county in which the location was chosen), hourly graph at that point, tabular forecast, and a link to the NWS Spot page. It is suggested that you click the very top to open the full-screen/mobile version of the map.

Open full-screen/mobile version of the map.

NWS Fire Weather -- Zone Forecast

Fire Zone Forecast | Hourly Graph | Tabular | Request Spot

### Routine Fire Wx Fcst (With/Without 6-10 Day Outlook)

#### Warren

Issued by NWS Wilmington, OH

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**Product Version:** 2017-02-06 09:10:09

714  
FNUS51 KILN 060910  
FWFILN





FIRE WEATHER PLANNING FORECAST FOR THE MIDDLE OHIO VALLEY  
NATIONAL WEATHER SERVICE WILMINGTON OH  
410 AM EST MON FEB 6 2017

.DISCUSSION...  
LOW PRESSURE TRAVELING FROM THE MISSISSIPPI VALLEY TO THE GREAT LAKES WILL BRING WIDESPREAD SHOWERS AND POSSIBLY THUNDERSTORMS TONIGHT THROUGH TUESDAY. COLDER AIR IN THE WAKE OF THE LOW WILL ALLOW FOR RAIN SHOWERS CHANGING TO SNOW SHOWERS ON WEDNESDAY INTO WEDNESDAY NIGHT.

\*Note that the appropriate and singular zone (county) forecast is given depending on where your location was chosen (image below)

Open full-screen/mobile version of the map.

**NWS Fire Weather -- Zone Forecast**

 **Fire Zone Forecast**
 Hourly Graph
  Tabular
  Request Spot

FIRE WEATHER PLANNING FORECAST FOR THE MIDDLE OHIO VALLEY  
 NATIONAL WEATHER SERVICE WILMINGTON OH  
 410 AM EST MON FEB 6 2017

.DISCUSSION...  
 LOW PRESSURE TRAVELING FROM THE MISSISSIPPI VALLEY TO THE GREAT LAKES WILL BRING WIDESPREAD SHOWERS AND POSSIBLY THUNDERSTORMS TONIGHT THROUGH TUESDAY. COLDER AIR IN THE WAKE OF THE LOW WILL ALLOW FOR RAIN SHOWERS CHANGING TO SNOW SHOWERS ON WEDNESDAY INTO WEDNESDAY NIGHT.

**OHZ073-071015-**  
**ROSS-**  
 INCLUDING THE CITY OF CHILLICOTHE  
 410 AM EST MON FEB 6 2017

	TODAY	TONIGHT	TUE
CLOUD COVER	MCLEAR	MCLDY	CLOUDY
PRECIP TYPE	NONE	SHOWERS	TSTMS
CHANCE PRECIP (%)	20	100	80
TEMP (24H TREND)	55 (+5)	49 (+22)	62
RH % (24H TREND)	56 (+10)	90 (0)	72
20FTWND-AM(MPH)	LGT/VAR		SW 10 G23
20FTWND-PM(MPH)	S 5	LGT(VAR)	SW 10 G23

## 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.

  
<Signed>

 Brandon Peloquin  
Warning Coordination Meteorologist  
National Weather Service  
Wilmington, Ohio



---

<Signed>

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

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<Signed> 

Ryan Sundberg  
Forest Management Officer  
Wayne National Forest  
Pedro, Ohio

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## 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  $\lambda \leq 3^{\circ}\text{C}$
- 2 if  $4^{\circ}\text{C} \leq \lambda \leq 7^{\circ}\text{C}$
- 3 if  $\lambda \geq 8^{\circ}\text{C}$

The lapse rate ( $\lambda$ ) 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  $T_{\text{dd}} \leq 5^{\circ}\text{C}$
- 2 if  $6^{\circ}\text{C} \leq T_{\text{dd}} \leq 9^{\circ}\text{C}$
- 3 if  $T_{\text{dd}} \geq 10^{\circ}\text{C}$

$T_{\text{dd}}$  (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'.

<b>Haines Index</b>					
<b>Geopotential Height</b>		<b>Approximate Height (warm season)</b>		<b>Approximate Height (cold season)</b>	
<b>millibars (mb)</b>	<b>Approximation in feet</b>	<b>meters</b>	<b>feet</b>	<b>meters</b>	<b>feet</b>
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.

Table with 7 columns: TIME (EDT), 1 PM, 3 PM, 5 PM, 7 PM, 9 PM, 11 PM. Rows include SKY (%), WEATHER COV., WEATHER TYPE, TEMP., RH., 20 FT WIND, 20 FT WIND GUST, MIX HGT (FT), TRANSPORT WIND, CHC OF PCPN (%), LAL, and HAINES INDEX.

.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.

&&

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