2009

WISCONSIN

FIRE WEATHER OPERATING PLAN

COMPRISES OF NATIONAL WEATHER SERVICE, WISCONSIN DEPARTMENT OF NATURAL RESOURCES, DEPARTMENT OF THE INTERIOR'S BUREAU OF INDIAN AFFAIRS, FISH AND WILDLIFE SERVICE, AND THE NATIONAL PARK SERVICE, AND THE DEPARTMENT OF AGRICULTURE, FOREST SERVICE.

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I. INTRODUCTION

The National Weather Service (NWS) is legally mandated to provide a Fire Weather Program and there is a requirement from the customers for the NWS to supply the fire weather services. This annual operating plan describes the policies, procedures and relationship the NWS will have with the federal wildland fire management agencies, as well as with the state of Wisconsin wildland fire management agencies. This operating plan complies with and complements the Interagency Agreement for Meteorological Services. Those involved in the interagency agreement with the Department of Commerce, National Oceanic Atmospheric Administration-NWS are the Department of the Interior's Bureau of Land Management, Bureau of Indian Affairs, Fish and Wildlife Service, and the National Park Service, and the Department of Agriculture, Forest Service.

The Operating Plan is updated annually, and is reviewed by representatives of the NWS and each user agency prior to the onset of the spring fire season. All parties should have a copy of this plan available for reference purposes. Each fire management agency receiving this plan will be responsible for duplicating and distributing this plan to its field offices which require NWS forecasts.

A. SUMMARY OF CHANGES FOR 2009

NO SIGNIFICANT CHANGES FOR 2009.

II. ORGANIZATIONAL DIRECTORY

A. NWS OFFICES AND POINTS OF CONTACT

1. WFO MILWAUKEE/SULLIVAN **Backup Office: WFO Green Bay**

National Weather Service
N3533 Hardscrabble Road.
Dousman, WI 53118
Phone Number...262-965-2074
Internet Address: http://www.crh.noaa.gov/mkx/?n=fire

Meteorologist-in-Charge: Steve Brueske stephen.brueske@noaa.gov
Fire Weather Focal Point: Mark Gehring mark.g.gehring@noaa.gov
Assistant Fire Weather FP: J.J. Wood james.wood@noaa.gov

2. WFO LA CROSSE **Backup Office: WFO Des Moines**

National Weather Service
N2788 County Road FA
La Crosse, WI 54601
Phone Number…608-784-7294
Internet Address: http://www.crh.noaa.gov/arx/firewx.php

Meteorologist-in-Charge: Glenn Lusky glenn.lussky@noaa.gov
Fire Weather Focal Point: Dave Schmidt dave.schmidt@noaa.gov
Assistant Fire Weather FP: Rod Swerman rod.swerman@noaa.gov

3. WFO GREEN BAY **Backup Office: WFO Milwaukee/Sullivan**

National Weather Service
2485 South Point Road
Green Bay, WI 54313-5522
Phone Number...920-494-2363
Internet Address: http://www.crh.noaa.gov/grb/?n=firewx

Meteorologist-in-Charge: Gary Austin gary.austin@noaa.gov
Fire Weather Focal Point: Tim Kieckbusch tim.kieckbush@noaa.gov
Assistant Fire Weather FPs: Tom Helman tom.helman@noaa.gov ,
Tasos Kallas tasos.kallas@noaa.gov

4. WFO TWIN CITIES/CHANHASSEN **Backup Office: WFO Duluth**

National Weather Service
1733 Lake Drive West
Chanhassen, MN 55317
Phone Number...952-361-6708
Internet Address: http://www.crh.noaa.gov/mpx/fireWx.php

Meteorologist-in-Charge: Dan Luna daniel.luna@noaa.gov
Fire Weather Focal Point: Byron Paulson byron.paulson@noaa.gov
Assistant Fire Weather FP: Todd Krause todd.krause@noaa.gov

5. WFO DULUTH **Backup Office: WFO Twin Cities/Chanhassen**

National Weather Service
5027 Miller Trunk Highway
Duluth, MN 55811
Phone Number...218-729-6697
Internet Address: http://www.crh.noaa.gov/dlh/firewx.php

Meteorologist-in-Charge: Mike Stewart michael.stewart@noaa.gov
Fire Weather Focal Point: Roman Berdes roman.berdes@noaa.gov

6. WFO DES MOINES

National Weather Service
9607 NW Beaver Drive
Johnston, IA 50131
Internet Address: http://www.crh.noaa.gov/dmx/?n=firewx

Meteorologist-in-Charge: Brenda Brock brenda.brock@noaa.gov
Fire Weather Focal Point: frank.boksa@noaa.gov

7. OTHER IMPORTANT NWS CONTACTS

Larry Van Bussum, National Fire Weather Operations Coordinator
National Interagency Fire Center (NIFC)
3833 South Development Avenue, Bldg 3807
Boise, ID 83705-5354
E-mail: larry.vanbussum@noaa.gov
National Fire Weather web page http://fire.boi.noaa.gov

Jennifer Zeltwanger, Regional Operational Services Meteorologist (ROSM)
National Weather Service,
Central Region Headquarters
7220 NW 101st Terrace
Kansas City, MO 64153
Email: jennifer.zeltwanger@noaa.gov
Central Region web site http://www.crh.noaa.gov

Heath Hockenberry
National Fire Weather Program Leader
National Weather Service
3833 South Development Ave.
Boise, ID 83705
E-mail: heath.hockenberry@noaa.gov

B. PARTICIPATING AGENCIES

1. U.S. Forest Service (USFS)
    a. Chequamegon National Forest in northern Wisconsin
    b. Nicolet National Forest in northern Wisconsin
2. U.S. Fish and Wildlife Service (USFWS)
    a. Necedah National Wildlife Refuge in Juneau County
    b. Horicon National Wildlife Refuge in Dodge County
    c. Leopold Wetland Wildlife Refuge in Columbia County
3. Bureau of Indian Affairs (BIA)
4. National Park Service
5. Wisconsin Department of Natural Resources (WDNR)

A LIST OF CONTACTS FOR THESE AGENCIES IS LOCATED IN THE APPENDIX.

III. SERVICES PROVIDED BY THE NWS

A. Basic Services

This section describes the fire weather products and services provided by the NWS as described in National Weather Service Directive NWSI 10-401. Since there are no full-time forecasters devoted solely to fire weather, fire weather duties are scheduled among other warning and forecast responsibilities. **However, spot forecasts for wildfires are treated with a high priority.**

Fire weather forecasts will be prepared by the NWS for various fire control agencies in Wisconsin on a seasonal time schedule from early spring to late fall. Start-up and termination of the fire weather season is mainly related to snow coverage across Wisconsin and will be requested by the fire control agencies. The fire control agencies (i.e. WDNR, USFS) shall provide the NWS at least one week of advanced notice prior to the start-up of the fire season.

History indicates spring to be the most active season for the fire weather user, since dead fuels are abundant and the relative humidity is sometimes quite low. Fall may be another peak time for the fire weather agencies due to a new source of fuel from dead vegetation as a result of freeze damage.

Here are the general time periods for each season:

Spring season	March 15 to June 15
Summer season	June 15 to September 1
Fall season	September 1 through Thanksgiving weekend

The NWS is responsible for routine and non-routine forecasts, which include the Fire Weather Planning Forecast (FWF), NFDRS point forecasts, spot forecasts for prescribed burning and wildfires, Fire Weather Watches, and Red Flag Warnings. Most of these products will be available on the Weather Information Management System (WIMS) and/or the internet web sites of the NWS and Eastern Area Coordination Center (EACC). The NWS web sites are listed in the Organizational Directory.

The web site for the EACC in the Great Lakes region is:
http://gacc.nifc.gov/eacc/
Some additional fire weather forecasts that can be obtained on this web site are the weekly, monthly and seasonal **fire potential outlooks**. Fire weather agencies are encouraged to remain informed on these outlooks.

Table 1 below outlines the responsibilities of each NWS office and their respective geographic area. Figure 1 also indicates area of responsibility.

Table 1.

Forecast times, product identifiers and area responsibility of NWS offices

Office	7:00 AM LT 3:00 PM LT	Point forecast 3:30 PM CDT	Spot forecast on request	Watch/Warning	Fire district
Duluth	MSPFWFDLH	MSPFWMDLH	phone, web-based MSPFWSDLH	MSPRFWDLH	955 956 957
Chanhassen	MSPFWFMPX	MSPFWMMPX	phone, web-based MSPFWSMPX	MSPRFWMPX	961
La Crosse	MKEFWFARX	MKEFWMARX	phone, web-based MKEFWSARX	MKERFWARX	962 963 964
Milwaukee/ Sullivan	MKEFWFMKX	MKEFWMMKX	phone, web-based MKEFWSMKX	MKERFWMKX	965 966 967
Green Bay	MKEFWFGRB	MKEFWMGRB	phone, web-based MKEFWSGRB	MKERFWGRB	958, 959 960 965

Note: The fire weather responsibility of fire weather zone 965 is shared by WFO Milwaukee/Sullivan and WFO Green Bay. WFO Sullivan/Milwaukee has fire weather responsibility for Marquette and Green Lake counties of zone 965, while WFO Green Bay has fire weather responsibility for Waushara County of zone 965.

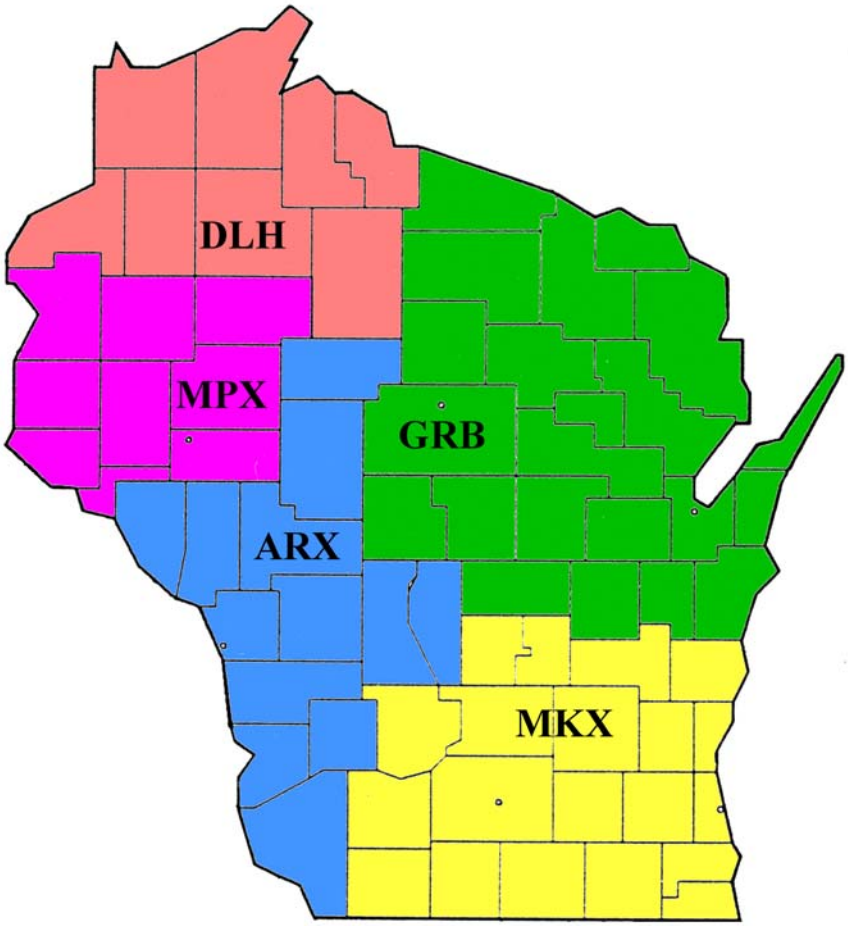
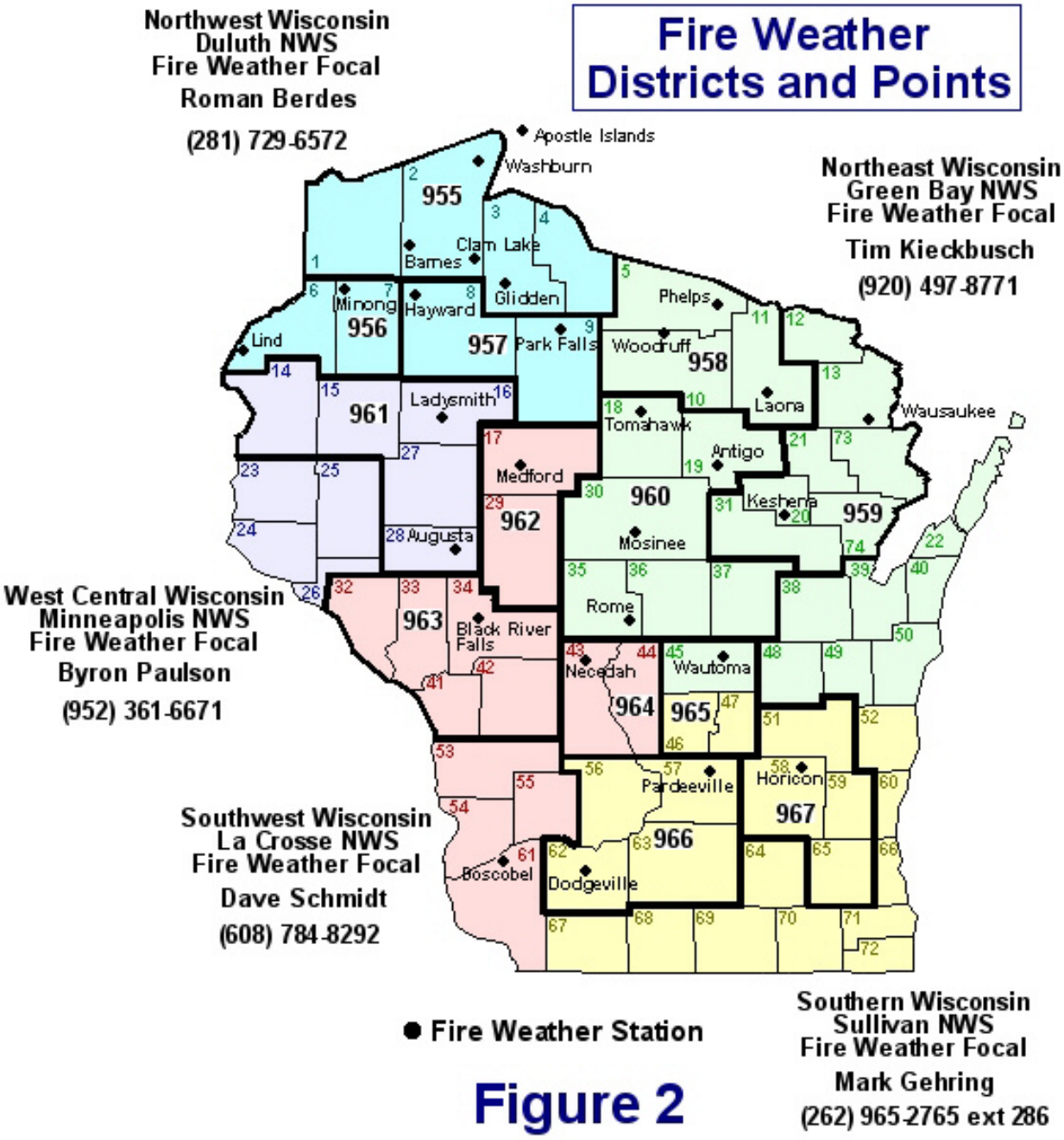


Figure 1. Forecast Areas

Products Issued:

1. Planning Forecasts
2. NFDRS Forecasts
3. Spot Forecasts
4. Fire Weather Watch
5. Red Flag Warning


Fire Weather Districts and Points
Northwest Wisconsin
Duluth NWS
Fire Weather Focal
Roman Berdes
(281) 729-6572
Northeast Wisconsin
Green Bay NWS
Fire Weather Focal
Tim Kieckbusch
(920) 497-8771
West Central Wisconsin
Minneapolis NWS
Fire Weather Focal
Byron Paulson
(952) 361-6671
Southwest Wisconsin
La Crosse NWS
Fire Weather Focal
Dave Schmidt
(608) 784-8292
Southern Wisconsin
Sullivan NWS
Fire Weather Focal
Mark Gehring
(262) 965-2765 ext 286
955
956
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962
963
964
965
966
967
Apostle Islands
Washburn
Clam Lake
Barnes
Glidden
Minong
Hayward
Lind
Park Falls
Phelps
Woodruff
Laona
Wausaukee
Ladysmith
Tomahawk
Antigo
Medford
Keshena
Mosinee
Augusta
Rome
Black River Falls
Necedah
Wautoma
Pardeeville
Horicon
Boscobel
Dodgeville
Fire Weather Station

Figure 2

1. Routine Fire Weather Planning Forecasts

The Fire Weather Planning Forecast is a zone-type product used by land management personnel. It is primarily for input in decision-making related to pre-suppression and other planning. The decisions impact firefighter safety, protection of the public and property, and resource allocation.

The morning and afternoon Fire Weather Planning Forecast (AWIPS/WIMS product **MKEFWFMKX, MKEFWFGRB, MKEFWFARX, MSPFWFMPX** or **MSPFWFDLH**) will be broken down into 74 zones with a zone number assigned to each Wisconsin county (**Figure 2**). Many zones will usually be combined to form one forecast group. The morning and afternoon forecast will be entered into the NWS AWIPS computer system by 700 AM LT and 3-330 PM LT respectively. They are then available to users via WIMS, NWS office web sites, or Predictive Services web sites at the GACCs.

The elements in the narrative forecast are:

Headline (Required for Red Flag Warnings and Fire Weather Watches)
- may also headline other significant weather concerns or changes

Discussion
- written with enough detail to give users knowledge of weather causes during the forecast period. Brief enough to make radio dissemination as efficient as possible
- provides frontal positions, movements and timing
- serves as a vehicle to discuss reasoning for headlines or expected changes in critical parameters such as temperature, humidity, and wind

Sky/Weather
- sky and general weather conditions (Appendix F) including trends
- as specific as possible on timing, duration and coverage of precipitation
- as specific as possible on cloud coverage, type, and trends

High and low temperature
- temperature ranges should be kept as small as possible, 5 degrees or less

Relative humidity
- forecast daytime minimum and nighttime maximum
- humidity ranges of 5 percent when RH is 40 percent or less;
- a maximum range of 10% can be used for RH greater than 40 percent

20 ft. wind speed (mph) and direction
- as specific as possible on timing of significant speed and directional changes
- given in ranges of 5 mph or less and includes gusts
- forecast direction to nearest 8 cardinal compass points (northwest, north, southeast)

Other elements included:

Haines Index
- low level determined from the 950 - 850 MB level (about 1,000 ft to 5,000 ft.)
- attached to "DAY" periods
- provided by all NWS offices year round

Smoke Management parameters
- depth of the mixing layer. The average mixing height from 12 to 18 hours local time.
- attached to "DAY" periods
- transport winds (speed and direction) in the mixing layer
- dispersion index consisting of a number and a text ranking of poor, fair, good, or excellent (Appendix B explains the terms used in smoke management)
- provided by all NWS offices year round

Hours of sunshine
- important for assessing probability of ignition of fine fuels (strong insolation can make them more likely to ignite)

Precipitation amount
- coverage and expected amount

Extended forecasts
- added after each forecast group providing forecasts for the 3-7 day period .
- included are: sky/weather, temperature, with a wind forecast thru Day 7.

**Optional elements in narrative forecasts may vary slightly between NWS offices

Examples of the morning and afternoon Fire Weather Planning Forecast are located on pages 13-15. The morning format includes the first three forecast periods, while the afternoon forecast will include an additional 4th period.

Morning Planning Forecast Example:

FIRE WEATHER PLANNING FORECAST FOR (name of area)
NATIONAL WEATHER SERVICE LA CROSSE WI
600 AM CDT THU MAY 25 2009

. . .RED FLAG WARNING THIS AFTERNOON FOR STRONG WINDS AND LOW HUMIDITY IN WEST CENTRAL WISCONSIN…

.DISCUSSION. . .AT DAYBREAK A COLD FRONT WAS MOVING INTO THE EASTERN DAKOTAS. WARM DRY AIR WILL PUSH INTO SOUTHEAST MINNESOTA AND SOUTHWEST WISCONSIN AHEAD OF THE FRONT WITH AFTERNOON TEMPERATURES WARMING INTO THE 80S. EXPECT SURFACE WINDS TO INCREASE AS THE FRONT APPROACHES. STRONG SOUTHWEST WINDS WILL CAUSE THE RELATIVE HUMIDITY TO BE LOWER THAN THE PAST SEVERAL DAYS. BY SUNSET THE FRONT WILL PUSH INTO WESTERN WISCONSIN. EXPECT A FEW SHOWERS AND THUNDERSTORMS NEAR THE FRONT...BUT THE FRONT WILL REMAIN MOSTLY DRY. COOLER AND STABLE HIGH PRESSURE WILL THEN SETTLE ACROSS THE AREA THROUGH MIDWEEK.

WIZ032>034-041>044-252200-
ADAMS-BUFFALO-JACKSON-JUNEAU-LA CROSSE-MONROE-TREMPEALEAU-
INCLUDING THE CITIES OF. . .BLACK RIVER FALLS. . .LA CROSSE. . .MAUSTON. . .
SPARTA/TOMAH
600 AM CST THU MAY 25 2008

. . .RED FLAG WARNING THIS AFTERNOON FOR STRONG WINDS AND LOW HUMIDITY IN WEST CENTRAL WISCONSIN. . .

.TODAY. . .
SKY/WEATHER . . . . . PARTLY CLOUDY UNTIL 1500...THEN MOSTLY SUNNY.
MAX TEMPERATURE . . . 80 TO 85.
MIN HUMIDITY . . . . . 18 TO 23%.
20-FOOT WINDS . . . . . SOUTHWEST WINDS 22 TO 27 MPH. GUSTS TO 35 MPH.
HAINES INDEX . . . . . 6. . .HIGH.
HOURS OF SUN . . . . . .7 HOURS.
PRECIPITATION . . . . . .NONE.
MIXING HEIGHT . . . . . 3500 FT AGL (AVE. NOON-6PM).**
TRANSPORT WINDS . . . . . SOUTHWEST 20 TO 25 MPH (AVE. NOON-6PM). **
SMOKE DISPERSAL . . . . . .77000. . .EXCELLENT. (AVE. NOON-6PM).**

.TONIGHT. . .
SKY/WEATHER . . . . . A SLIGHT CHANCE OF SHOWERS AND THUNDERSTORMS UNTIL 2000. . .THEN PARTLY CLOUDY. CHANCE OF RAIN 20 PERCENT.
MIN TEMPERATURE . . . . 55 TO 60.
MAX HUMIDITY . . . . . 68 TO 73%.
20-FOOT WINDS . . . . . .SOUTH WINDS 15 TO 20 MPH. . .BECOMING NORTHWEST 10 TO 15 MPH AFTER MIDNIGHT.
PRECIPITATION . . . . . ISOLATED .05 TO .10 INCH.

.FRIDAY. . .
SKY/WEATHER . . . . . PARTLY CLOUDY UNTIL 1300...THEN MOSTLY SUNNY.
MAX TEMPERATURE . . . .65 TO 70.
MIN HUMIDITY . . . . . .34 TO 39%.
20-FOOT WINDS . . . . . .SOUTH WINDS 10 TO 15 MPH.
HAINES INDEX . . . . . .4 . . .LOW.
HOURS OF SUN . . . . . .9 HOURS.
PRECIPITATION . . . . . NONE.
MIXING HEIGHT . . . . . 2000 FT AGL (AVE. NOON-6PM).**
TRANSPORT WINDS……..SOUTH 30 MPH (AVE. NOON-6PM).**
SMOKE DISPERSAL . . . . . 60000. . .EXCELLENT. (AVE. NOON-6PM).**

.FORECAST DAYS 3 THROUGH 7. . .
.FRIDAY NIGHT…MOSTLY CLEAR. LOWS IN THE UPPER 50S. SOUTH WINDS 5 TO 10 MPH.
.SATURDAY. . .SUNNY. HIGHS IN THE UPPER 70S. SOUTH WINDS 10 TO 15 MPH.
.SATURDAY NIGHT…PARTLY CLOUDY. LOWS IN THE LOWER 50S. SOUTH WINDS 5 TO 10 MPH.
.SUNDAY. . ..PARTLY CLOUDY. BREEZY. CHANCE OF RAIN SHOWERS. HIGHS IN THE MID 70S.
SOUTHWEST WINDS 20 TO 25 MPH. CHANCE OF RAIN 30 PERCENT.
.SUNDAY NIGHT…PARTLY CLOUDY. LOWS IN THE LOWER 50S. SOUTH WINDS 5 TO 10 MPH.
.MONDAY. . .MOSTLY CLOUDY. BREEZY. CHANCE OF RAIN SHOWERS THEN CHANCE OF
SHOWERS AND THUNDERSTORMS. HIGHS IN THE MID 70S. SOUTHEAST WINDS 20 TO 25 MPH.
CHANCE OF RAIN 50 PERCENT.
.MONDAY NIGHT…CLOUDY. CHANCE OF SHOWERS AND THUNDERSTORMS. LOWS IN THE MID 50S.
SOUTH WINDS 10 TO 15 MPH. CHANCE OF RAIN 50 PERCENT.
.TUESDAY. . .CLOUDY. SHOWERS AND THUNDERSTORMS LIKELY. HIGHS IN THE LOWER 70S.
SOUTH WINDS 10 TO 15 MPH. CHANCE OF RAIN 70 PERCENT.
.TUESDAY NIGHT…PARTLY CLOUDY. CHANCE OF SHOWERS AND THUNDERSTORMS. LOWS IN THE
LOWER 50S. SOUTHWEST WINDS 5 TO 10 MPH.
.WEDNESDAY. . .PARTLY CLOUDY. HIGHS IN THE MID 60S. NORTHWEST WINDS 10 TO 15 MPH.

$$
. . .(other zone groups and forecasts from the remainder of the NWS office's county area of responsibility).

$$

FORECASTER NAME, INITIALS or NUMBER

The Afternoon Planning Forecast:

The afternoon planning forecast includes the same bulleted weather parameters as the morning planning forecast. The difference is a detailed, bulleted forecast is provided for the first four periods TONIGHT, TOMORROW, TOMORROW NIGHT and the NEXT DAY.

Afternoon Planning Forecast Example:

FIRE WEATHER PLANNING FORECAST FOR (name of area)
NATIONAL WEATHER SERVICE LA CROSSE WI
300 PM CDT THU MAY 25 2009

. . .COLD FRONT TO BRING SCATTERED SHOWERS AND THUNDERSTORMS ACROSS THE AREA TONIGHT…

.DISCUSSION. . .A SLOW MOVING WEATHER SYSTEM OVER SOUTHERN CANADA THIS
AFTERNOON...WILL DRAG A COLD FRONT OVER LAKE SUPERIOR INTO SOUTHEAST
MINNESOTA BY THIS EVENING. THIS FRONT IS EXPECTED TO BECOME STALLED
OVER SOUTHEAST MINNESOTA INTO WESTERN WISCONSIN TONIGHT AND SATURDAY.
SCATTERED SHOWERS AND THUNDERSTORMS ARE LIKELY IN THE VICINITY AND
EAST OF THE COLD FRONT.

WIZ032>034-041>044-261200-
ADAMS-BUFFALO-JACKSON-JUNEAU-LA CROSSE-MONROE-TREMPEALEAU-
INCLUDING THE CITIES OF...BLACK RIVER FALLS...LA CROSSE...MAUSTON...
SPARTA/TOMAH
300 PM CST THU MAY 25 2008

.TONIGHT. . .
SKY/WEATHER . . . . . PARTLY CLOUDY WITH SCATTERED SHOWERS AND THUNDERSTORMS.
CHANCE OF RAIN 30 PERCENT.
MIN TEMPERATURE . . . . . 53 TO 59.
MAX HUMIDITY . . . . . .95 TO 100%.
20-FOOT WINDS . . . . . SOUTH WINDS 5 MPH.
PRECIPITATION . . . .SCATTERED TRACE TO .05 INCH.

.FRIDAY. . .
SKY/WEATHER . . . . . PARTLY CLOUDY UNTIL 1300. . .THEN MOSTLY SUNNY.
MAX TEMPERATURE . . . . . .80 TO 85.
MIN HUMIDITY . . . . . .35 TO 40%.
20-FOOT WINDS . . . . . SOUTH WINDS 5 TO 10 MPH.
HAINES INDEX . . . . . 4. . .LOW.
HOURS OF SUN . . . .9 HOURS.
PRECIPITATION . . . . . NONE.
MIXING HEIGHT . . . . . 2500 FT AGL (AVE. NOON-6PM)..**
TRANSPORT WINDS . . . . . SOUTH 25 MPH (AVE. NOON-6PM). .**
SMOKE DISPERSAL . . . . . .62500. . .EXCELLENT. (AVE. NOON-6PM). **

.FRIDAY NIGHT. . .
SKY/WEATHER . . . . . .MOSTLY CLEAR.
MIN TEMPERATURE . . . . . 45 TO 50.
MAX HUMIDITY . . . . . .72 TO 77%.
20-FOOT WINDS . . . . . SOUTH WINDS 5 TO 10 MPH.
PRECIPITATION . . . .NONE.

.SATURDAY. . .
SKY/WEATHER . . . . . MOSTLY SUNNY UNTIL 1000...THEN PARTLY CLOUDY.
MAX TEMPERATURE . . . . . .85 TO 90.
MIN HUMIDITY . . . . . .35 TO 40%.
20-FOOT WINDS . . . . . SOUTH WINDS 10 TO 15 MPH.
HAINES INDEX . . . . . 6. . .HIGH.
HOURS OF SUN . . . . . 7 HOURS.
PRECIPITATION . . . . . NONE.
MIXING HEIGHT . . . . . 1500 FT AGL (AVE. NOON-6PM).**
TRANSPORT WINDS . . . . . SOUTH 25 MPH (AVE. NOON-6PM).**
SMOKE DISPERSAL . . . . . .37500. . .GOOD. (AVE. NOON-6PM).**

.FORECAST DAYS 3 THROUGH 7...
.SATURDAY NIGHT…PARTLY CLOUDY. LOWS NEAR 70. SOUTH WINDS 10 TO 15 MPH.
.SUNDAY. . .PARTLY CLOUDY. BREEZY. CHANCE OF RAIN SHOWERS IN THE AFTERNOON.
HIGHS IN THE MID 80S. SOUTH WINDS 15 TO 20 MPH. CHANCE OF RAIN SHOWERS 30 PERCENT.
.SUNDAY NIGHT…PARTLY CLOUDY. LOWS IN THE LOWER 50S. NORTHEAST WINDS 5 TO 10 MPH.
.MONDAY. . .MOSTLY CLOUDY. BREEZY. CHANCE OF SHOWERS AND THUNDERSTORMS. HIGHS
IN THE MID 70S. SOUTHEAST WINDS 20 TO 25 MPH. CHANCE OF RAIN 50 PERCENT.
.MONDAY NIGHT…CLOUDY. CHANCE OF SHOWERS AND THUNDERSTORMS. LOWS IN THE MID 50S.
SOUTH WINDS 10 TO 15 MPH. CHANCE OF RAIN 50 PERCENT.
.TUESDAY. . .CLOUDY. SHOWERS AND THUNDERSTORMS LIKELY. HIGHS IN THE LOWER 70S.
SOUTH WINDS 10 TO 15 MPH. CHANCE OF RAIN 70 PERCENT.
.TUESDAY NIGHT…PARTLY CLOUDY. LOWS IN THE LOWER 50S. WEST WINDS 5 TO 10 MPH.
.WEDNESDAY. . .PARTLY CLOUDY. HIGHS IN THE MID 60S. NORTHWEST WINDS 10 TO 15 MPH.
.WEDNESDAY NIGHT…CLEAR. LOWS IN THE MID 40S. NORTH WINDS 5 TO 10 MPH.
.THURSDAY. . .PARTLY CLOUDY. HIGHS IN THE MID 70S. SOUTH WINDS 10 TO 15 MPH.

$$

. . .(other zone groups and forecasts from the remainder of the NWS office's county area of responsibility).

$$

FORECASTER NAME, INITIALS or NUMBER

***-These smoke management elements are now provided year round.*

a) Updates to Fire Weather Planning Forecasts

Updates and a reason for an update will be provided whenever forecast conditions become unrepresentative. Fire agencies are also encouraged to call their local NWS office when the forecast is unrepresentative, or the forecasts between NWS offices are sufficiently different at the geographical NWS borders to create uncertainty among the fire weather users. Additionally, updates will be made to the morning or afternoon Fire Weather Planning Forecasts for changes in Red Flag headlines (coordination required) which include:

1. New issuance of a Fire Weather Watch or Red Flag Warning.
2. Upgrading from a Fire Weather Watch to a Red Flag Warning.
3. Change an area outline of a Fire Weather Watch or Red Flag Warning.
4. Cancellation of a Fire Weather Watch or Red Flag Warning.

Also, updates will be made when the following conditions are met during a Fire Weather Watch or Red Flag Warning:

1. Precipitation occurrence or non-occurrence if different from the forecast.
2. Wind speed differs by more than 5 mph.
3. Temperature differs by more than 5 degrees Fahrenheit.
4. Relative Humidity differs by 10% or more.

2. NFDRS point forecasts

A point forecast will be issued for a fire weather user reporting an observation for any given day and must be entered into AWIPS by 330 PM CDT. The point forecasts are then used to calculate output from the National Fire Danger Rating System (NFDRS). The output is used by land management agencies to determine fire danger levels, staffing, and resource needs. NWS forecasters can retrieve this data under the AWIPS identifier **NMCFDICR**. Critical fire danger situations may exist when the energy release component (ERC) is 44 or higher in the q-fuel model (Jack Pine) and/or the 10 hour fuel moisture (10 H) is less than 10%.

Up to 27 point forecasts may be issued on a particular day statewide with high fire danger levels. But during wet periods or after green-up, there is considerably less point forecasts requested with land agencies. During periods of low fire danger, point forecasts may be terminated on weekends. In addition, after green-up in early June, and with the offering of a normal or wetter than normal summer, point and narrative forecasts may be terminated for all days until late summer, or when land agencies feel that point forecasts or narratives are again necessary.

A listing of observations from 1900 UTC is obtained from two separate transmissions at 1930 UTC and 2015 UTC. The transmissions are under the AWIPS identifier **NMCFWOCR**. After the point forecasts are issued, a third transmission of NMCFWOCR will list the point forecasts for that day. Point forecasts for NFDRS sites can be found under the identifiers MKEFWMMKX, MKEFWMGRB, MKEFWMARX, MSPFWMMSP or MSPFWMDLH. See **figure 2** for the location of NFDRS sites and **Table 2** for the format of the NFDRS forecasts. A catalog of all the NFDRS sites for Wisconsin is located in Appendix F.

Table 2. Fire weather point forecast coding reference

The format is: (commas but NO spaces)

FCST,SSCCNN,YYMMDD,VT,W,TT,RH,L1,L2,DD,VV,M,TM,TN,HM,HN,P1,P2,WF

STN # code SSCCNN where SS = State (21 is MN) CC = County NN = station

SSCCNN - 6 digit station number from above
YYMMDD - valid day of fcst - year/month/day The forecast made on April 10, 2007 for the 11th would be 070411
VT - Valid time. always a 13 for 1300 CST (2pm CDT)
W - State of the weather at 1300 CST tomorrow as shown below

0	= less than 1/8 clouds	4 = fog	7 = snow/sleet
1	= 1/8 to 4/8 opaque clouds	5 = drizzle	8 = showers
2	= 5/8 to 7/8 opaque clouds	6 = rain	9 = thunderstorms
3	= cloudy	(*Note: categories 5, 6, or 7 set NFDRS indices to zero*)	

TT = temperature for 1300 CST tomorrow
RH = relative humidity for 1300 CST tomorrow
* L1 = lightning activity level (1400 CST today until 2300 CST). Always a “1” in Wisconsin
* L2 = lightning activity level (2300 CST today until 2300 CST tomorrow). Always a “1” in WI.
DD = wind direction at 1300 CST tomorrow (16 point compass)
VV = 20 ft wind speed in mph at 1300 CST tomorrow
M = 10 hr fuel moisture (input by the users and left blank by the forecaster). Two commas will be noted next to each other
TM = maximum temperature from ***1300 CST to 1300 CST***
TN = minimum temperature from 1300 CST to 1300 CST
HM = maximum humidity in percent from 1300 CST to 1300 CST
HN = minimum humidity in percent from ***1300 CST to 1300 CST***
P1 = pcpn duration in hours from 1300 CST today till 0500 CST tomorrow
P2 = pcpn duration in hours from 0500 CST tomorrow till 1300 CST tomorrow
WF = Wet Flag. A Y or N. It is used to indicate if fuels will be wet at 1300 CST. Use with caution, a “Y” will set all NFDRS indices to ZERO! In most cases a “N” is recommended.

3. Spot forecasts

a) Criteria - Spot forecasts are site specific forecasts in support of wildfire suppression and natural resource management. Spot forecasts for a wildfire will be treated with a priority similar to that of severe weather warnings. It is the responsibility of the requestor to indicate that the request is for wildfire suppression.

By Interagency Agreement (NWSI 10-406), the NWS will provide spot forecasts to any federal, state, tribal, or local official for support of a wildfire.

For non-wildfire purposes, resources permitting, the NWS will provide spot forecast service under the following circumstances and conditions:

a. Upon request of any federal official who represents that the spot forecast is required under the terms of the Interagency Agreement for Meteorological Services (NWSI 10-406).
b. Upon request of any state, tribal, or local official who represents that the spot forecast is required to carry out their wildland fire management responsibilities in coordination with a federal land management agency participating in the Interagency Agreement for Meteorological Services.
c. Upon request of any public safety official who represents that the spot forecast is essential to public safety. A "public safety official" is an employee or contract agent of a government agency at any level (federal, state, local tribal, etc.) charged with protecting the public from hazards, including wildland fires of whatever origin and/or other hazards influenced by weather conditions such as hazardous material release.

The NWS will not provide spot forecasts to private citizens or commercial entities not acting as an agent of a government agency.

Requestor Identification - The requestor for each spot forecast must provide the following information before a spot forecast can be issued.

a. Name
b. Government agency
c. Address and phone number
d. Representation as to the reason for the spot forecast, which must be one of the reasons indicated above.

A current on-site weather observation should accompany the forecast request. The requestor should specify how the wind measurement was obtained (20 foot or eye-level). In the case of a wildfire or prolonged prescribed burn, updated observations should be provided during the course of the event. Land management personnel should contact the servicing NWS office if forecast conditions appear unrepresentative of actual weather conditions. Spot forecasts should be considered one-time requests, and are not routinely updated unless representative observations are available to the forecaster. Feedback from land management personnel is also encouraged during or after the burn.

Users are asked to read the Fire Weather Planning Forecast before making a spot forecast request. To hold the number of spot forecasts to a manageable level, internal coordination and planning should be done by user agencies making forecast requests.

b) Content and Format - The standard format for wildfire spots includes: headlines (Red Flag Warning or Fire Weather Watch) explaining what, when, where and why; discussion, sky/weather, temperature, relative humidity, and wind. Other optional elements may also be provided. See example below.

The content of non-wildfire spots should conform to the standard format for wildfire spots, though the content and number of forecast periods may be different, as determined by the requestor. Users should be as specific as possible when making a forecast request.

c) Procedures - An Internet-based program, NWS Spot, is the national standard for requesting, issuing, and retrieving spot forecasters. This program is available on NWS web sites. Spot forecasts can also be requested by phone or fax. A phone call must accompany the fax request so the forecaster is aware of the request.

The requesting agency should provide information about the location, topography, fuel type(s), size, ignition time, and a contact and telephone number of the responsible land management official. When possible, a representative weather observation should accompany the request. As indicated above in section 3a, requestor information justifying the spot forecast request must also be provided for the forecast request to be honored.

Feedback to the NWS office providing the spot forecast is highly encouraged.

```
FNUS73 KMKX 041600
FWSMKX

SPOT FORECAST FOR LUND WILDFIRE
NATIONAL WEATHER SERVICE MILWAUKEE/SULLIVAN
1100 AM CDT TUE APRIL 4 2009

IF CONDITIONS BECOME UNREPRESENTATIVE CONTACT THE NWS.

...RED FLAG WARNING FOR STRONG WINDS AND LOW HUMIDITY FOR
SOUTHERN WISCONSIN UNTIL 6 PM...

DISCUSSION...STRONG LOW PRESSURE WILL MOVE FROM THE CENTRAL PLAINS
TO NORTHWEST WISCONSIN TODAY.  GUSTY SOUTHWEST WINDS WILL BRING
VERY WARM AND DRY AIR INTO SOUTHERN WISCONSIN.

TODAY
SKY/WEATHER.................PARTLY SUNNY AND WINDY.
TEMPERATURE.................75-80
MIN HUMIDITY ................20-25%
20 FOOT WIND...................SOUTHWEST 20 TO 25 MPH

TONIGHT
SKY/WEATHER.................MOSTLY CLEAR
TEMPERATURE.................50 TO 55
MAX HUMIDITY................80 TO 85 PERCENT
20 FOOT WIND...................WEST 10 TO 15 MPH

WEDNESDAY
SKY/WEATHER.................PARTLY CLOUDY.
TEMPERATURE.................60 TO 65
MIN HUMIDITY................30 TO 35 PERCENT
20 FOOT WIND...................NORTHWEST 10 TO 15 MPH.

FORECASTER…(OPTIONAL)
$$
REQUESTING OFFICIAL…JOHN DOE
REASON FOR REQUEST…WILDFIRE
```

Standardized spot weather forecast for a wildfire during a Red Flag Warning.

4. Fire Weather Watches and Red Flag Warnings

NWS offices will issue Fire Weather Watches and Red Flag Warnings when the combination of dry fuels and weather conditions support extreme fire danger. The WDNR and USFS are responsible for keeping the NWS aware of fuel conditions that could lead to extreme fire danger. The NWS will coordinate with these primary user agencies prior to issuing Fire Weather Watches and Red Flag Warnings. See the call list under section 4. C. – Procedures.

User agencies will handle all public and media questions about fire potential and danger. The NWS will answer questions only about weather conditions, and will not comment on fire conditions.

The issuance of these products is typically a two-stage process.

A. Fire Weather Watch

A Fire Weather Watch is issued when there is a reasonable level of confidence for the development of a red flag event. A watch will be issued 12 to 72 hours in advance of the expected onset of criteria. **A watch will only be issued (or continued) in the first 12-hour time period for dry thunderstorm events**. Red flag criteria are listed below. All four of the following weather conditions, including the dryness of the fuels, must be anticipated for a watch to be issued. These criteria are subjective guidelines, so watches and warnings may be issued for lesser criteria assuming all involved NWS offices, WDNR, and the USFS agree that critical fire weather conditions will occur.

1. Sustained ten-minute winds at the 20 foot level are at or above 15 mph.
2. Minimum relative humidity at or less than 25 percent.
3. Temperatures at or greater than 75 degrees F.
4. The dryness of the fuels will be determined by looking at the Energy Release Component (ERC - NFDRS output) 44 or higher in Q-fuel model (jack pine) (do not consider if the ERC for the current day is below 38; ERC changes slowly) and visual observations. The WDNR and, if necessary, the USFS, will provide this information to the NWS. See the call list (under section 4. C. - Procedures) to determine who the NWS should contact for this information.

Other factors which may be considered if any of the above are marginal:

- The surface dew point depression (best indicator of high fire danger) is more than 40 F.
- The 850 mb dew point depression is greater than 18F (10C).
- It is before spring green-up (usually by June 1st).
- It is after the fall color change or a killing frost.

- The area has been in a dry spell for a week or more
- Dry lightning is anticipated (rare, except during periods of drought)
- Gusty winds in excess of 50 mph (can result in trees falling on power lines, causing power line to breaks and sparking fires) are expected.
- NFDRS values are in the high to extreme categories.
- 10-hour fuel moisture is less than 10%
- Extreme behavior on prescribed burns in the area the past several days.
- Haines Index values are in the moderate to high category (5 or 6)

The most common red flag or near red flag synoptic weather situations:

- Strong low pressure moving from the north or central U.S. Rockies to Lake Superior, or a strong Alberta Low tracking to near Lake Superior. Both situations require a windy dry slot associated with a low level jet.
- A departing Hudson Bay High Pressure replaced by the strong low pressure scenario. The high pressure area provides Wisconsin with dry easterly winds and subsiding air. This will effectively dry out the fuels.

Fire Weather Watch coordination and issuance:

- NWS offices will coordinate the issuance, change, and cancellation of Fire Weather Watches with the WDNR and USFS.

- All NWS offices will coordinate weather conditions internally via chat software or telephone. If critical weather conditions are expected, **one** NWS contact person will contact the WDNR and the USFS via telephone for fuel conditions using the phone list provided herein.

- If fuel coordination between the WDNR and USFS has not taken place prior to this call, a 10-15 minute collaboration period before the official “go-ahead” to issue a watch will be granted. During this period, the WDNR and USFS will coordinate fuel conditions, and the overall need for a watch. A spokesperson from the WDNR or USFS will call the NWS contact person to relay their decision.

- The NWS contact person shall be responsible for disseminating this information back to the other affected NWS offices via chat software or telephone.

- During situations of borderline criteria for a Red Flag Warning or when a Fire Weather Watch is in effect, the NWS is encouraged to use terminology such as “severe fire weather conditions may occur Monday afternoon” or “critical fire weather conditions may be met”. These terms may be used in the discussion section of the Fire Weather Watch and Fire Weather Planning Forecast.

- To avoid confusion, the term “red flag” should only be used in a Red Flag Warning. A Fire Weather Watch **will be** disseminated on NOAA Weather Radio.

- A Fire Weather Watch will be headlined in the Fire Weather Planning Forecast . The headline will include what, when, where and why. Headlines belong before the discussion and before each zone grouping of the Fire Weather Planning Forecast.

- If issued, a Fire Weather Watch (RFW) will describe the affected area, valid time of the watch, and reasons for the watch. A RFW shall have a UGC coding line followed by a Valid Time Event Code (VTEC). Identifiers for each office are MKERFWMKX, MKERFWGRB, MKERFWARX, MSPRFWMPX AND MSPRFWDLH.

B. Red Flag Warnings

A Red Flag Warning is issued when there is a high probability that all four weather criteria listed under the Fire Weather Watch section of this plan are imminent or will be met within 24 hours. However, a Red Flag Warning can be issued any time at the request of fire management personnel during times of critically dry fuels.

The WDNR and the USFS will monitor the Energy Release Component (ERC) to help them determine the dryness of the fuels. A Red Flag Warning will be issued immediately when red flag conditions are occurring, but will be coordinated prior to issuance with WDNR and USFS. The NWS may also monitor the Energy Release Component (ERC) by going to the WDNR or Eastern Area Coordination Center (EACC) Internet site. These sites will help the NWS monitor the dryness of the fuels in the state.

Red Flag Warning coordination and issuance:

- NWS offices will coordinate the issuance, change and cancellation for Red Flag Warnings with the WDNR and USFS. If **no** Fire Weather Watch is in effect, full coordination of fuels with the WDNR and USFS must be made prior to the issuance of a Red Flag Warning (using the same procedure as described above for the watch process). If the WDNR and USFS observe wet fuels and do not believe a warning should be issued, then do not issue the warning. If the NWS is not able to contact any of the officials listed below, then they **shall not** issue the Red Flag Warning.

- If a Fire Weather Watch has already been issued for the affected area (i.e. fuel coordination has already taken place), and if forecast offices agree that critical fire weather conditions will be met, a Red Flag Warning can be issued with the morning Fire Weather Planning Forecast **without any additional coordination** with the fire management agencies (i.e. WDNR and USFS).

- A Red Flag Warning **will be** disseminated on NOAA Weather Radio and also NAWAS.
- A Red Flag Warning will be headlined in the routine Fire Weather Planning Forecast (FWF). The headline will include what, when, where and why. Headlines belong before the discussion and before each zone grouping of the Fire Weather Planning Forecast.

- If issued, a Red Flag Warning (RFW) will describe the affected area, valid time of the warning, and reasons for warning. A RFW shall have a UGC coding line followed by a Valid Time Event Code (VTEC). Identifiers for each office are MKERFWMKX, MKERFWGRB, MKERFWARX, MSPRFWMPX AND MSPRFWDLH.

Cancellation of Fire Weather Watches and Red Flag Warnings:

When conditions warrant that a Fire Weather Watch or Red Flag Warning is no longer needed, it should be cancelled by the NWS as soon as possible. **Note: A cancellation statement is not needed if upgrading from a watch to a warning, or for a Red Flag Warning that is being allowed to expire.**

1. The cancellation will be coordinated with the users.
2. The cancellation will be headlined in the Fire Weather Planning Forecast.
3. A cancellation statement under the RFW message shall be issued. A RFW shall have a UGC coding line followed by a Valid Time Event Code (VTEC).

Updates to fire weather planning forecasts when red flag conditions are present:

Updates will be made to the morning or afternoon forecasts for changes in Red Flag headlines (coordination required with land management agencies) which include:

1. New issuance of a Fire Weather Watch or Red Flag Warning.
2. Upgrading from a Fire Weather Watch to a Red Flag Warning.
3. Change an area outline of a Fire Weather Watch or Red Flag Warning.
4. Cancellation of a Fire Weather Watch or Red Flag Warning.

In addition, updates will be made when the following conditions are met when a Fire Weather Watch or Red Flag Warning has been issued:

1. Precipitation occurrence or non-occurrence if different from the forecast.
2. Wind speed differs by more than 5 mph from the forecast.
3. Temperature differs by more than 5 degrees Fahrenheit from the forecast.
4. Relative Humidity differs by 5 % or more from the forecast.

C. Procedures for calling the WDNR and USFS during potential RFW situations.

Outlook Period (More than 48 hours prior to event):
- The NWS will attempt to provide fire control agencies (i.e. WDNR, USFS, etc.) a "heads-up" of potentially critical fire weather conditions several days in advance if possible. Initial communication may occur via email, during the weekly fire weather conference call, or a courtesy call to the land management agencies.

Watch Period (12 - 72 hours prior to event):
- After coordinating weather conditions via chat software or telephone, **one** NWS contact person will contact the WDNR and the USFS via telephone using the phone list provided below. The WDNR and USFS will coordinate fuel conditions, and the overall need for a watch. A spokesperson from the WDNR or USFS will call the NWS contact person to relay their decision. The NWS contact person shall be responsible for disseminating this information back to the other affected NWS offices via chat software or telephone. If the NWS is not able to contact any of the officials listed below, then they shall not issue the Fire Weather Watch.

Warning Period (less than 24 hours prior to the event):
- If no Fire Weather Watch is in effect, full coordination of fuels with the WDNR and USFS must be made prior to the issuance of a Red Flag Warning (same procedure as described above for the watch process). If the NWS is not able to contact any of the officials listed below, then they shall not issue the Red Flag Warning.

- If a Fire Weather Watch has already been issued for affected areas (i.e. fuel coordination has already taken place), and the NWS forecast offices agree that critical fire weather conditions will be met, a Red Flag Warning can be issued without any additional coordination with the WDNR and USFS.

1. First call made to WDNR Blair Anderson	3. Third call made to WDNR Jim Barnier-Wisconsin Dells	2. Second call made to USFS Steve Radaj
2. Second call made to WDNR Trent Marty	1. First call made to USFS Jim Grant	1. Call to EACC as alternate to WDNR and/or USFS Steve Marien

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WWUS83 KARX 201432
RFWARX

URGENT – FIRE WEATHER MESSAGE
NATIONAL WEATHER SERVICE LA CROSSE WI
932 AM CDT WED OCT 20 2009

...RED FLAG WARNING IN EFFECT FROM 4 PM CDT THIS AFTERNOON TO 8 PM CDT THIS EVENING FOR
SOUTHEAST MINNESOTA DUE TO STRONG WINDS AND LOW HUMIDITY...

.A STRONG COLD FRONT WILL MOVE ACROSS WESTERN AND CENTRAL MINNESOTA THIS AFTERNOON AND
EVENING BRINGING GUSTY WINDS AND LOW RELATIVE HUMIDITIES.  THE MOST CRITICAL FIRE WEATHER
CONDITIONS WILL OCCUR AHEAD OF AND ALONG THE FRONT ACROSS SOUTHEAST MINNESOTA.  BY THURSDAY
AFTERNOON...THE FRONT WILL HAVE MOVED INTO WESTERN WISCONSIN.  THOUGH TEMPERATURES WILL BE A
BIT COOLER...WINDS AND HUMIDITIES MAY BE CLOSE TO CRITICAL VALUES ACROSS PORTIONS OF
SOUTHEAST MINNESOTA...WEST CENTRAL AND SOUTHWEST WISCONSIN THURSDAY AFTERNOON.

MNZ079-086-087-094-095-202000-
/T.UPG.KARX.FW.A.0001.041020T2100Z-041021T0100Z/
/T.NEW.KARX.RF.W.0001.041020T2100Z-041021T0100Z/
WABASHA-DODGE-OLMSTED-WINONA-MOWER-FILLMORE-HOUSTON-
932 AM CDT WED OCT 20 2008

...RED FLAG WARNING IN EFFECT FROM 4 PM CDT THIS AFTERNOON TO 8 PM CDT THIS EVENING FOR
SOUTHEAST MINNESOTA DUE TO STRONG WINDS AND LOW HUMIDITY...

THE NATIONAL WEATHER SERVICE IN LA CROSSE HAS ISSUED A RED FLAG
WARNING...AND REPLACED THE FIRE WEATHER WATCH.

A RED FLAG WARNING IS ISSUED WHEN CRITICAL FIRE WEATHER CONDITIONS ARE EITHER OCCURING
NOW...OR WILL BE SHORTLY. A COMBINATION OF STRONG WINDS...VERY LOW RELATIVE HUMIDITY...WARM
TEMPERATURES AND EXCEPTIONALLY DRY FUELS WILL CREATE DANGEROUS WILDLAND FIRE CONDITIONS.
PERSONS ARE URGED TO BE CAREFUL WITH ANY ACTIVITIES THAT COULD POTENTIALLY LEAD TO A
WILDLAND FIRE. CAMPFIRES…OUTDOOR GRILLS…SMOKING…CHAIN SAWS…AND ATV OR OTHER SMALL ENGINE USE
ALL HAVE THE POTENTIAL TO THROW A SPARK AND IGNITE A DANGEROUS AND DESTRUCTIVE FIRE.

PLEASE ADVISE THE APPROPRIATE OFFICIALS OR FIRE CREWS IN THE FIELD OF THIS RED FLAG WARNING.

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Figure 3. Example of a Red Flag Warning. Fire Weather Watches would follow the same format.

NOTE: DO NOT USE THE PHRASE “RED FLAG” IN A FIRE WEATHER WATCH PRODUCT. INSTEAD, USE PHRASES SUCH AS “CRITICAL FIRE WEATHER CONDITIONS” OR “EXTREME FIRE WEATHER CONDITIONS” TO DESCRIBE THE SITUATION.

5. Verification and Participation in Interagency Groups

1. Verification

Fire weather program leaders will verify the red flag program. Results will be distributed to the NWS regional fire weather program managers as well as the appropriate State and Federal user groups in Wisconsin. Red Flag Warnings will be verified based on the Probability of Detection, False Alarm Rate, Critical Success Index, and Lead Time.

2. Participation in Interagency Groups
NWS offices providing fire weather services for Wisconsin are expected to participate in the annual state fire meeting. This meeting serves as a forum for interaction between NWS program leaders and their interagency users. It also provides an effective vehicle for discussions pertaining to changes to the Annual Operating Plan.

6. Special Services

The NWS provides a cadre of trained Incident Meteorologists (IMETs) who will provide on-site forecasting when requested by land management agencies. A certified IMET is on staff at the Minneapolis/Chanhassen NWS office. In addition to wildfires, IMETs may be dispatched to support:

1. Critical resource value prescribed burns.
2. Land management coordination and dispatch centers
3. Hazardous substance release
4. Any special projects or incidents which fall under the mandate of the NWS.

By Interagency Agreement, the NWS will support land management agency requests for on-site meteorological support for wildland fires through the IMET program. Other events listed above may be supported depending upon resource availability, if requested by federal fire agencies participating in the Interagency Agreement or if requested by public safety officials who represent such support as essential to public safety.

1) Only certified IMETS may be dispatched to support on-site service and operate the AMRS. The NWS is responsible for maintaining proficiency of designated IMETs.

2) An Advanced Technology Meteorological Unit (ATMU) is cached at the Region 9 Cache in Grand Rapids, MN. The laptop computer and All Hazards Meteorological Response Unit (AMRS), which contains a satellite dish for data receipt, are cached at the NWS office in Minneapolis.

3) Land management agencies are responsible for transporting the ATMU. Helium will also be ordered for the ATMU upon request of the IMET. The IMET will be responsible for transporting the laptop computer and AMRS.

4) The NWS is responsible for assembly and operation of this equipment, calibration of instruments, ordering contract repair, and, if necessary, scheduling training sessions.

5) Request and dispatch of IMETs and equipment (ATMU, AMRS, and FireRAWS (if ordered) is accomplished through the National Resource Coordination System. If the IMET in Minneapolis is unavailable, the request will be sent to the Eastern Area Coordination Center (EACC). They will in turn forward the request to the NWS National Fire Weather Operations Coordinator (NFWOC) in Boise who will fill the order. If the Minneapolis IMET is not available, the Meteorologist-in-Charge will promptly notify the dispatch center that the order cannot be filled.

6) Incident Operations - The IMET must be provided a work area free from rain and wind as well as telephone access for computer use. The line is typically shared with the Fire Behavior Analyst. A source of power is also necessary (generator is OK). The IMET will work the hours and perform the forecast tasks required by the Incident Management Team. When a fire is declared contained or controlled, the IMET will assess the time requirement for further support in conjunction with the FBAN and Plans Section Chief.

7) Reimbursement for Services Provided - The NWS will be reimbursed for all costs associated with on-site operation as set forth in the Interagency National Agreement located in the Appendix of this plan or at http://www.weather.gov/directives under Section 10 Operations and Services, NDS 10-4. These include overtime costs associated with the deployment, travel costs and per diem, telecommunication services, as well as costs incurred by the NWS IMET duty station, such as covering shifts vacated by the IMET. After each deployment, the IMET will prepare a Report of Reimbursable Expenses. The NWS will recover costs, based on this report.

7. Training

1) Forecaster training - NWS forecasters producing fire weather forecasts shall be trained. Forecasters must fulfill the following requirements as set forth in NWSI 10-405:

a. Complete the S-290, Intermediate Wildland Fire Behavior course.

b. Local training generally consists of review of the AOP, the Fire Weather Station Duty Manual and other station instructions, as well as training established by the Fire Weather Program Leader.

c. Forecasters must also be familiar with all NWS fire weather products and services and become proficient in the preparation and dissemination of these products.

2. IMET Training and Certification requirements are detailed in NWSI 10-405.

3. NWS provided training to land management agencies - when NWS staff provides training to land management personnel, costs above planned salary and operating costs will be borne by the benefiting agency(s). Billing procedures are described in the Interagency Agreement for Meteorological Services between the NWS and Land Management Agencies.

IV. WILDLAND FIRE AGENCY SERVICES AND RESPONSIBILITIES

A. OPERATIONAL SUPPORT AND PREDICTIVE SERVICES - the GACC meteorologist at the EACC at Fort Snelling, Minnesota combines forecast information from NWS offices and other sources into area-wide summaries and briefings. This meteorologist, along with Fire Intelligence forms the Predictive Services group which produces fire weather/fire danger assessments for Wisconsin. These value added products enhance short and long range forecasts issued by the NWS to assist land managers in allocating fire-fighting resources. Products issued by the EACC are available on line at:

http://gacc.nifc.gov/eacc/predictive/predictive.htm

Mailing address:	Physical address:
Eastern Area Coordination Center 1 Federal Drive PO Box 29 St. Paul, MN 55111-4080	Eastern Area Coordination Center BHW Federal Building 1 Federal Drive G-20 Fort Snelling, MN 55111
Center Manager, Dave Boyd Meteorologist, Stephen Marien	Deputy Center Manager, Laura McIntyre-Kelly

B. AGENCY COMPUTER SYSTEMS - The communication system used to link the NWS with its users is the Weather Information and Management System (WIMS). The NWS receives user agency observations entered into WIMS via its AWIPS computer system. Point and narrative forecasts are also sent to WIMS via this system. Observations and forecasts are exchanged between WIMS and AWIPS in the USFS Kansas City Computer Center.

C. FIRE WEATHER OBSERVATIONS - All fire weather observations in Wisconsin are from automated sites and all have GOES antennas installed for data transmission. Station inspection and instrument maintenance are the responsibility of

land management agencies. NWS forecasters may monitor data quality from observation sites. Any NWS travel expenses for equipment maintenance or station visitation will be reimbursed by the Wildland Fire Agency making the request.

The following steps are procedures for implementing a new RAWS.

Step 1 - The federal land management agencies (USFS, NPS, USFWS, BLM, BIA, etc.) and the state agencies (Dept of Natural Resources (DNR) and a few misc. personnel (Nature Conservatory, etc.) begin the process by deciding to install a RAWS. Land management agencies sometimes request input from NWS personnel as to siting criteria. NWS offices are required (by the Interagency Agreement) to provide it if requested from the land management agencies. Also, notify Jennifer Zeltwanger at Central Region Headquarters and keep her informed throughout the process of RAWS implementation.

Step 2 – Land management agencies will request a 6-digit code/ID for the new RAWS station. NWS personnel shall forward the request for a new 6-digit ID to the Regional Fire Weather Program Manager (currently Jennifer Zeltwanger).

Step 3 – The Regional Fire Weather Program Manager will coordinate with the NWS office involved, the appropriate land management personnel, and the WIMS personnel to determine an identification number.

Step 4 - Once a 6-digit ID number is coordinated/determined, the Regional Fire Weather Program Manager will provide it to the requestor, and cc: the NWS office and the appropriate USFS personnel.

Step 5 - It's the responsibility of the requestor/land management person to notify WIMS in order for the observations to be received/sent from the WIMS.

D. REIMBURSEMENT FOR NWS PROVIDED ON-SITE SUPPORT AND TRAINING -- Agencies will reimburse the NWS for all costs incurred for IMET support as well as for training assistance or station visitation. Procedures are detailed in the Interagency National Agreement.

V. JOINT RESPONSIBILITIES

A. Meteorological training can be provided either by NWS or the EACC meteorologist. Each NWS office has a Fire Weather Program Leader, who is qualified to teach courses up through Intermediate Fire Behavior (S-290). Requests for NWS training should be directed to that office's Fire Weather Program Leader or MIC. Sufficient advance notice should be given to allow for preparation as well as scheduling. Costs incurred by the NWS will be reimbursed by the requesting agency.

B. NWS Fire Weather Program Leaders or other NWS forecasters will participate in coordination conference calls, primarily in the spring fire season. This duty will be shared by the program leaders. The NWS representative should be prepared to provide a statewide briefing highlighting significant weather trends as well as possible critical fire weather situations.

VI. EFFECTIVE DATES ON THE AOP

This document will be effective approximately from March 15, 2009 to March 15, 2010.

VII. AGENCY SIGNATURES

_____/signed/ _____
Stephen Brueske, NWS MIC Milwaukee/Sullivan Date
Signing for all NWS offices representing Wisconsin

_____/signed/ _____
Paul DeLong, Chief State Forester Date
Signing for the WDNR

_____/signed/ _____
Jeremy Bennett, WIFC Task Force Chairperson Date
Signing for All DOI Land Management Agencies - BIA, NPS, USFWS

_____/signed/ _____
Chequamegon-Nicolet NF, Jeanne Higgins, Forest Supervisor Date
Signing for the USDA Forest Service

VIII. APPENDICES

A. Haines Index
B. Smoke Management
C. Address and Phone Directory
D. FTS Stations
E. NFDRS Raws Site Catalog and Contact list
F. Precipitation and sky terminology and NOAA Radio
G. Interagency Agreement for Meteorological Services

APPENDIX A

HAINES INDEX

What is the Haines Index?

The Haines Index combines the effects of dry air and instability to determine the potential for large fire growth. Its purpose is to identify weather conditions that may allow an existing fire to spread rapidly or exhibit extreme fire behavior. It should NOT be used to predict the potential or probability for wildfires to ignite. No such danger or wording will be conveyed in any NWS products. The Haines Index is most applicable to plume-dominated fires. The Haines Index does not account for wind.

The Haines Index contains two components, one to assess the dry air, and the other to measure the instability. Dry air affects fire behavior by lowering fuel moisture, which increases the amount of fuel available to the fire and enhances the probability of spotting. Instability is caused by warming the lower levels of the atmosphere, cooling the higher levels, or by a combination of the two processes. An unstable air mass promotes the formation of rising currents of air and thus increases the vertical extent of a smoke column. Wildfires that burn in a dry, unstable environment can become plume-dominated and are often able to generate their own strong surface winds. Ground elevation will determine which of three levels in the atmosphere will be used to compute the Haines Index. In Wisconsin, the low-level layer between 950 mb and 850 mb will be used.

Computing the Haines Index

Haines Index = Stability + Moisture = A + B

Stability Term = 950 MB Temperature - 850 MB Temperature
Let A equal the following values according to the temperature differences

A = 1 when stability term is 3 degrees C or less
A = 2 when stability term is 4 to 7 degrees C
A = 3 when stability term is 8 degrees C or more

Large positive values of the stability term indicate an unstable layer of the atmosphere near the earth's surface. Negative values indicate a temperature inversion.

Moisture Term = 850 MB Temperature - 850 MB Dew Point Temperature

B = 1 when moisture term is 5 degrees C or less
B = 2 when moisture term is 6 to 9 degrees C
B = 3 when moisture term is 10 degrees C or more
The value of the moisture term will always be positive. The greater the value of this term, the drier the air is.

Significance of the Haines Index values

2 or 3	Very Low (moist, stable air)
4	Low
5	Moderate
6	High (dry, unstable air)

An example calculation

950 MB Temperature = 27 degrees C
850 MB Temperature = 18 degrees C
850 MB Dew Point = 14 degrees C
Haines Index = Stability (A) + Moisture (B)
From the tables above
950 MB Temp - 850 MB Temp = 27-18 = 9 A Stability term of 9, so let A = 3.
850 MB Temp - 850 MB Dew point = 18 - 14 = 4 A Moisture term of 4, so let B = 1.

A + B = 3 + 1 = 4.

An Index value of 4 corresponds to a “Low” category. The conclusion is that extreme fire behavior would not be expected on this day.

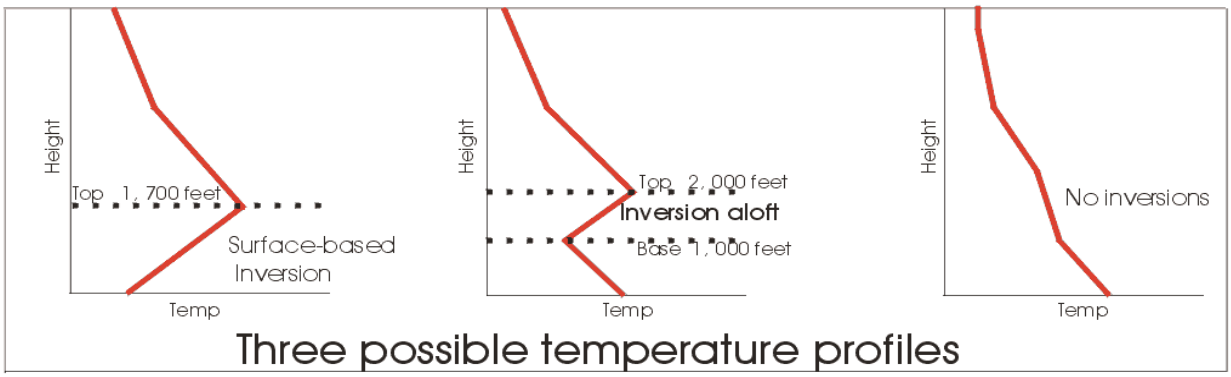
APPENDIX B

SMOKE MANAGEMENT

The Clean Air Act requires land management agencies to address the issue of smoke management in its prescribed burns. The goal is to burn in atmospheric conditions that would encourage smoke to rise to such a level that the smoke is dispersed as much as possible to reduce a number of health and safety risks near the fire.

The National Weather Service will support the smoke management efforts of federal, state, and local agencies as well as organizations involved in such burning. **The NWS will provide the mixing height, transport wind and dispersion index year round in the "daytime" portions of the fire weather planning forecast. These values will represent the average values from noon to 6 pm.** The NWS will also include the mixing height, transport wind and dispersion index, upon request of the land agency, in spot forecasts.

The three weather parameters of smoke management forecasts are mixing layer (or height), transport winds, and dispersion index. For smoke management purposes, the mixing layer is usually considered the lowest layers of the atmosphere bounded by the earth's surface and the bottom of any temperature inversion which may exist aloft. If a temperature inversion is based at the surface, then there is no mixing layer. A temperature inversion would serve to trap smoke at low levels, or would prevent sufficient lofting of smoke to a level where winds would dilute or transport it away from the area. See the figure below. Three upper air temperature profiles which affect smoke dispersal differently. a) a surface-based inversion is an absolutely stable condition that traps smoke and prevents lofting. b) An elevated



inversion is unstable or neutral and allows limited smoke rise, but the smoke will stop rising at the base of the inversion aloft. c) When no inversions are present, smoke is free to rise. However, the existing (ambient) lapse rate will determine the rate of rise and the plume

characteristics.

The transport wind (knots) is defined as the average wind speed and direction through the mixing layer. The transport wind may suggest the need for surveillance or resource location at downstream areas for the purpose of minimizing the danger posed by spotting due to firebrands and to determine the impacts of smoke on a sensitive area.

The Dispersion Index is intended to serve as a single adjective index which describes how smoke will disperse on that day. The Dispersion Rate is given by the following formula:

Dispersion Rate = (Mixing Height in feet) x (Transport Wind in knots)

The Minnesota Smoke Management Plan (SMP) suggests the following interpretation of the values:

Dispersion Index	Dispersion Rate
< 13,000	Poor
13,000 - 29,999	Fair
30,000 - 59,999	Good
60,000 or greater	Excellent

These values are also applicable in Wisconsin.
The SMP contains guidelines for using the index and should be consulted for those details.
Most smoke management inputs to software programs and nomograms are in metric units.
A table for conversion among various units is provided on the next page.

Smoke management models require input of parameters in metric units. The National Weather Service uses a variety of units of measure for wind and height. To minimize confusion and to make the conversion of units easier, the following conversion factors will prove helpful.

Multiply	By	To get
Feet	0.308	Meters
Feet	0.0152	Chains
Statute Miles	1609.34	Meters
Statute Miles	1.60934	Kilometers
Statute Miles	0.8684	Nautical Miles
Statute Miles	80	Chains
Nautical Miles	0.6080	Feet
Nautical Miles	1.152	Statute Miles
Nautical Miles	1853.25	Meters
Nautical Miles	1.85325	Kilometers
Chains	66	Feet
Chains	20.12	Meters
Chains	0.0125	Statute Miles
Meters	3.281	Feet
Meters	0.0497	Chains
Meters	0.00062	Statute Miles
Meters	0.00054	Nautical Miles
Kilometers	3280.84	Feet
Kilometers	0.6214	Statute Miles
Kilometers	0.5396	Nautical Miles
Knots	1	Nautical Miles Per Hour
Knots	1.152	Statute MPH
Knots	1.689	Feet Per Second
Knots	0.515	Meters Per Second
Knots	1.853	Kilometers Per Hour
Statute MPH	0.868	Knots
Statute MPH	1.467	Feet Per Second
Statute MPH	0.447	Meters Per Second
Statute MPH	1.609	Kilometers Per Hour
Statute MPH	88	Feet Per Minute
Kilometers Per Hour	0.278	Meters Per Second
Kilometers Per Hour	0.540	Knots
Kilometers Per Hour	0.621	Miles Per Hour
Kilometers Per Hour	0.911	Feet Per Second
Meters Per Second	3.6	Kilometers Per Hour
Meters Per Second	1.943	Knots
Meters Per Second	2.237	Miles Per Hour
Meters Per Second	3.281	Feet Per Second
Meters Per Second	196.85	Feet Per Minute

APPENDIX C

ADDRESS AND PHONE DIRECTORY

Unlisted phone numbers and addresses.

APPENDIX D

FOREST TECHNOLOGY SYSTEMS
DIRECTORY OF FTS WEATHER STATIONS WITH TELEPHONE ACCESS NUMBERS

LOCATION	KEY CONTACT	TEL # then FAX #	WEATHER STATION COM	LOGGER	STN NAME	NESID #	STN PH # or NESID #	GOES Transmit time	WHEN SHIPPED	LOCAL OFFICE	CONTACT
Necedah, WI	Matt Plagenz	608-565-4406 608-565-3160 (Fax)	TM	FWS-12S	Necedah		608-565-3330 shares w/tower		Aug-92	Wx station located at WI DNR 608-565-2519	DNR-Necedah
Mayville, WI	Patti Meyers John Krapfl (x 23)	920-387-2658 920-387-2973 (Fax)	TM	FWS-12S	Horicon NWR		414-387-1179		Dec-93	Set up Aug 18 94	
Madison, WI	Ken Terrill	608-266-0615 608-266-8576 (Fax)			For all WI DNR Stations						
Dodgeville, WI	John Nielsen	608-935-1919	TM	FWS-12S	Dodgeville Area	53702596	608-935-2358	176 at 00:11:40	Jul-93	608-935-1929	Vicki Hugill
Black River Falls, WI	Randy Schott	715-284-1414 715-284-2468 (Fax)	TM	FWS-12S	Black River Falls	537036O	715-284-0394	144 at 00:15:50	Jul-93	715-284-1470	Pat Glasspoole
Brule, WI	Beth Bartol	715-372-8539 x 104 715-372-5668 (Fax)	TM	FWS-12S	Barnes	53704070	715-795-2564	152 at 00:06:10, 10 second	Jul-93	715-795-2565	Colin Nowaczyk
Woodruff, WI	Dave	715.358.9216 715-356-4670 (Fax)	TM	FWS-12S	Woodruff	5370037A	715-358-5931	176w at 00:11:40, 10 second	Sep-93	715-358-9216	Dave
Minong, WI	Karyn Hullinger	715-822-5421 x115 715-822-3593 (Fax)	TM	FWS-12S	Minong	53705306	715-466-4540	146 at 03:30	Sep-93	715-466-2022	Joe Menkol
Wautoma, WI	Randy Williams	715-258-3539	TM	FWS-12S	Wautoma	5370660C	920-787-7789	176 at 00:12:00	Jul-93	715-258-4959	Debbie Johnson
Dodgeville, WI	John Nielsen	608-935-1919	TM	FWS-12S	Pardeeville	537075EA	608-429-2559	152 at 00:14:40	Aug-95	608/635-8121	Ralph Sheffer
Boscobel, WI	John Nielsen	608-935-1919	TM	FWS-12S	Boscobel		608-375-3178	146 at 00:03:20, 10 second	Sep. 05	608-375-4232	Cindy Kohles
Wisconsin Rapids, WI	Steven Courtney	715-421-7851 715-421-7859 (Fax)	TM	FWS-12S	Rome	5370856E	715-325-7809	146 at 00:05:20, 10 second	Aug-95	715-421-7841	Lloyd Dettwiler
Park Falls, WI	Larry Glodoski	715-634-9658 715-634-9232 (Fax)	TM	FWS-12S	Hayward	53709618	715-634-5738	146w at 00:07:40, 10 second	Aug-95	715-634-9658 ext 3510	Randy Sobralski
Black River Falls, WI	Randy Schott	715-284-1414 715-284-2468 (Fax)	TM	FWS-12S	Augusta	5370A382	715-286-5674	146 at 00:05:40	May-98	715-286-4340	Wayne Norris
Wausaukee, WI	Stephanie Jones	715-582-5040 715-582-5029 (Fax)	TM	FWS-12S	Wausaukee	5370BF4	715-856-6825	146 at 00:05:50, 10 second	Aug-95	715-856-5146	Jerry Stoltenberg
Grantsburg, WI	Karyn Hullinger	715-822-5421 x115 715-822-3593 (Fax)	TM	FWS-12S	Lind	5370C664	715-463-5009	144 at 00:06:30, 10 second	Jul-97	715-463-2897	Jason Doskocil
Park Falls, WI	Larry Glodoski	715-634-9658 715-634-9232 (Fax)	TM/ULT	FWS-12S	Diamond Lake	5370D512	715-678-2994	152 at 00:14:50, 10 second	Feb-97	715--748-4955	Mike Knipfel
	Dave	715.358.9216 715.356.4670 [Fax]	TM/ULT	FWS-12S	Antigo	5370E91	715-623-7114	146 at 00:05:10, 10 second	Feb-97	715.623.4190 x3114	Terry Fluger
Park Falls, WI	Bob White	715-532-4360 715-532- 4901 (Fax)	TM/ULT	FWS-12S	Ladysmith	53710180	715-532-3112	146 at 00:05:30, 10 second,	Oct-99	715-532-3911	Dan Schumacher
Woodruff, WI	Dave	715.358.9216 715.356.4670 [Fax]	TM/ULT		Tomahawk	5370100C	715-453-1045	10 minutes past the hour	Feb-97	715.453.1259	Andy Shaney
Rhinelander, WI	Steve Radaj	715-358-6863	GOES/TM	FWS-12S	Laona Ranger Dist. converted to GOES		715-674-2313 3284818C		Aug-93 Nov-01	715-674-4481	Darryl Richards
Nicolet National Forest		715-358-6283	TM	FWS-11	Glidden Ranger Dist.		715-264-2408		Aug-93	715-264-2511	Lenny Kempf
Chequamegon National Forest			TM	FWS-11	Washburn Ranger District		715-372-8922		Jul-94	715-373-2667	'Joyce Zifko
Neopit, WI	Tom Magnuson (Conrad Waniger)	715-799-3896 715-799-4323 (Fax)	TM	FWS-11	Menominee Tribal Ent. Keshena		715-799-4731	176 at 00:05:10,	Oct-93	715-258-4959	Deb Johnson
Fort McCoy, WI	Jim Palamaruk	608-388-2508 608-388-4997 (Fax)	TM	FWS-11	Fort McCoy		608-388-5290		May-95	608-388-2508	Lauri Braman

APPENDIX E

NFDRS RAWS SITE CATALOG AND CONTACT LIST

IF WEATHER OBSERVATIONS APPEAR TO BE INACCURATE, PLEASE CONTACT THE APPROPRIATE DISPATCHER SO THAT THE WEATHER STATION CAN BE SERVICED.

NWS GREEN BAY CWA

PHELPS 470502 WDNR LAT: 46.04N LONG: 89.10W ELEV: 1770 FT.
AREA DISPATCHER: STEVE RADAJ (USFS-WOODRUFF)
SOIL TYPE: SAND LOAM/PEAT

WOODRUFF 471002 WDNR LAT: 45.89N LONG: 89.65W ELEV: 1600 FT.
AREA DISPATCHER: DAVE CHRISTENSON (WDNR-WOODRUFF)
SOIL TYPE: SAND LOAM

LAONA 471101 USFS LAT: 45.56N LONG:88.68W ELEV: 1580 FT.
AREA DISPATCHER: STEVE RADAJ (USFS-WOODRUFF)
SOIL TYPE: SILT LOAM/SAND LOAM NEARBY

WAUSAUKEE 471301 WDNR LAT: 45.39N LONG: 87.97W ELEV: 763 FT.
AREA DISPATCHER: JOHN GOLDSCHMIDT (WDNR-PESHTIGO)
SOIL TYPE: SAND LOAM

TOMAHAWK 471801 WDNR LAT: 45.47N LONG: 89.80W ELEV: 1470 FT.
AREA DISPATCHER: DAVE CHRISTENSON (WDNR-WOODRUFF)
SOIL TYPE: SAND

ANTIGO 471901 WDNR LAT: 45.16N LONG: 89.12W ELEV: 1520 FT.
AREA DISPATCHER: DAVE CHRISTENSON (WDNR-WOODRUFF)
SOIL TYPE: SILT LOAM AND PEAT

KESHENA 472002 BIA/WDNR/MTE LAT:44.89N LONG: 88.66W
AREA DISPATCHER: JEFF GUIDINGER (WDNR-WAUPACA) ELEV: 870 FT.
SOIL TYPE: SAND LOAM

MOSINEE 472602 WDNR LAT: 44.77N LONG: 89.67W ELEV: 1230 FT.
AREA DISPATCHER: DEB JOHNSON (WDNR-WIS RAPIDS)
SOIL TYPE: SILT LOAM/SAND LOAM NEARBY

ROME 473501 WDNR LAT: 44.26N LONG: 89.81W ELEV: 1025 FT.
AREA DISPATCHER: DEB JOHNSON (WDNR-WIS RAPIDS)
SOIL TYPE: SAND

WAUTOMA 474201 WDNR LAT: 44.06N LONG: 89.30W ELEV: 982 FT.
AREA DISPATCHER: JEFF GUIDINGER (WDNR-WAUPACA)
SOIL TYPE: SAND

NWS SULLIVAN/MILWAUKEE CWA

DODGEVILLE 476001 WDNR LAT: 43.02N LONG: 90.14W ELEV: 1260 FT.
AREA DISPATCHER: VICKI HUGILL (WDNR DODGEVILLE)
SOIL TYPE: FORESTED AND PRAIRIE SITLY SOILS.

PARDEEVILLE 475701 WDNR LAT: 43.54N LONG: 89.30W ELEV: 820 FT.
AREA DISPATCHER: VICKI HUGILL (WDNR DODGEVILLE)
SOIL TYPE: PRAIRIE WITH SILTY SOILS. SOME MARSH LAND NEARBY, ISOLATED SANDY REGIONS.

HORICON 475601 U.S. FISH & WILDLIFE LAT: 43.57N LONG: 88.60W ELEV: 850 FT.
REFUGE MANAGER: PATTI MEYERS
FIRE TECHNICIAN: JON KRAPFL
SOIL TYPE: FORESTED AND SILTY SOILS. EXTENSIVE MARSH LAND IN AREA.

NWS LA CROSSE CWA

DIAMOND LAKE 471703 WDNR LAT: 45.11N LONG: 90.69W ELEV: 1317 FT.
AREA DISPATCHER: JOHN KELTO (WDNR-PARK FALLS)
SOIL TYPE: SILTY TO LOAMY

BLACK RIVER FALLS 473901 WDNR LAT: 44.30N LONG: 90.83W ELEV: 838 FT.
AREA DISPATCHER: PATRICK GLASSPOOLE (WDNR-BLACK RIVER FALLS)
SOIL TYPE: GENERALLY FORESTED SOILS OVER SANDSTONES.

NECEDAH 474301 WDNR AND US FISH & WILDLIFE LAT: 44.02N LONG: 90.08W ELEV: 950 FT.
AREA DISPATCHER: DEB JOHNSON (WDNR-WISCONSIN RAPIDS)
PRESCRIBED FIRE SPECIALIST: MICHAEL BELSKY (USFWS-NECEDAH)
SOIL TYPE: WETLAND/MARCH SOILS IN BOTTOM LANDS, OTHERWISE SANDY.

BOSCOBEL 476002 WDNR LAT: 43.1492N LONG: 90.6842W ELEV: 673 FT.
AREA DISPATCHER: VICKI HUGILL (WDNR-DODGEVILLE) (608) 935-1929
SOIL TYPE: SANDY

NWS CHANHASSEN/MINNEAPOLIS CWA

AUGUSTA 472801 WDNR LAT: 44.43N LONG: 91.04W ELEV: 1000 FT.
CONTACT: WAYNE NORRIS (WDNR-AUGUSTA)
SOIL TYPE: FOREST OVER SANDSTONE.

LADYSMITH 471601 WDNR LAT: 45.43N LONG: 91.11W ELEV: 1147 FT.
CONTACT: DAN SCHUMACHER (WDNR-LADYSMITH)
SOIL TYPE: SILTY TO LOAMY

NWS DULUTH CWA

HAYWARD 470803 WDNR LAT: 46.03N LONG: 91.45W ELEV: 1215 FT.
AREA DISPATCHER: JOHN KELTO (WDNR-PARK FALLS)

PARK FALLS 470901 WDNR LAT: 45.90N LONG: 90.40W ELEV: 1491 FT.
AREA DISPATCHER: JOHN KELTO (WDNR-PARK FALLS)

GLIDDEN 470302 WDNR LAT: 46.13N LONG: 90.55W ELEV: 1550 FT.
AREA DISPATCHER: JOHN KELTO (WDNR-PARK FALLS)

LIND 470603 WDNR LAT: 45.74N LONG: 92.80W ELEV: 813 FT.
AREA DISPATCHER: KARYN HULLINGER (WDNR-CUMBERLAND)

MINONG 470703 WDNR LAT: 46.80N LONG: 91.59W ELEV: 1060 FT.
AREA DISPATCHER: KARYN HULLINGER (WDNR-CUMBERLAND)

BARNES 470202 WDNR LAT: 46.20N LONG: 91.32W ELEV: 1190 FT.
AREA DISPATCHER: BETH BARTOL (WDNR-BRULE)

WASHBURN 470207 WDNR LAT: 46.57N LONG: 91.25W ELEV: 1260 FT.
AREA DISPATCHER: BETH BARTOL (WDNR-BRULE)

APOSTLE ISLANDS 470303 NPS LAT: 46.92N LONG: 90.75W ELEV: 651 FT.
FMO: SCOTT BRESSLER

CLAM LAKE 470304 USFS LAT: 46.20N LONG:90.97W ELEV: 1500 FT.
AREA DISPATCHER: STEVE RADAJ (USFS-WOODRUFF) (715) 358-6863

APPENDIX F

PRECIPITATION AND SKY TERMINOLOGY AND NOAA WEATHER RADIO

PROBABILITY OF PRECIPITATION TERMS (POP)

Terminology	**POP**
NONE OR SLIGHT CHANCE	10%
SLIGHT CHANCE	20%
CHANCE	30 TO 50%
LIKELY	60 TO 70%
NO MODIFIER	80 TO 100%

SHOWER AND THUNDERSTORM TERMINOLOGY	**POP**
(assumes 100% probability that showers and thunderstorms will occur)	
ISOLATED OR NONE	10%
ISOLATED OR WIDELY SCATTERED	20%
SCATTERED	30-50%
NUMEROUS	60-70%
NO MODIFIER	80-100%

CLOUD COVER will be subject to some variability in amount or location.

SUNNY/CLEAR...no clouds. 0/8 of opaque clouds.

MOSTLY SUNNY/MOSTLY CLEAR...the prevailing condition is sunny or clear but some clouds may be present either over a portion of the area or for a short period of time over the entire area. 1/8 to 2/8 of opaque clouds.

PARTLY CLOUDY/PARTLY SUNNY...3/8 to 5/8 of the sky will be covered by opaque clouds.

MOSTLY CLOUDY OR CONSIDERABLE CLOUDINESS...6/8 to 7/8 of the sky will be covered by opaque clouds.

CLOUDY...the sky is completely covered with clouds (8/8).

NOAA WEATHER RADIO

Fire Weather Watches and Red Flag Warnings will be broadcast on NOAA weather radio. Use this internet link for NOAA Weather Radio coverage and frequencies across Wisconsin: http://www.crh.noaa.gov/mkx/nwr-table.php

APPENDIX G

Please go to the address below to view the
Interagency Agreement for Meteorological Services

http://www.nws.noaa.gov/directives/sym/pd01004006curr.pdf