

Northern Rockies Annual Fire Weather Operating Plan 2009



NWS Billings
NWS Glasgow
NWS Great Falls
NWS Missoula
NWS Riverton
NWS Spokane

SIGNATORY PAGE

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Montana Department of Natural Resources
and Conservation
Idaho Department of Lands
North Dakota Forest Service
Fish and Wildlife Service
National Park Service
Bureau of Indian Affairs
Bureau of Land Management
USDA Forest Service
Montana Fire Chief's Association
Montana Sheriff's and Peace Officer's Assoc.

Date: 6/8/09

Date: 6/11/09

CHANGES

TO THE

NORTHERN ROCKIES ANNUAL FIRE WEATHER OPERATING PLAN

Following are changes to the common section of the National Weather Service Northern Rockies Annual Fire Weather Operating Plan.

- A new [Interagency Agreement for Meteorological and Other Technical Services](#) has been signed.
- A new NWS Western Region [Fire Weather](#) page with a standard format will enable traveling fire management personnel to access information quickly and efficiently. Each tab also has a section for local configuration. Please change any bookmarks to the old Fire Weather Page, which is no longer supported. As Riverton is in NWS Central Region, their Fire Weather page will not be in this format.
- [Northern Rockies Predictive Services](#) would like to be notified when a Fire Weather Watch or Red Flag Warning has been issued. If they are not in the office, a message on their answering machine is suggested. They can be reached at 406-329-4703/4875.

NWS offices will be installing a new software for the product generators which will replace the headline of Fire Weather Watch/Red Flag Warning with "URGENT -- FIRE WEATHER MESSAGE." See [Example Red Flag Warning](#) under Warning Products.

Northern Rockies Annual Fire Weather Operating Plan

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For Local Information See Individual Office Sections

INTRODUCTION

The Northern Rockies Fire Weather Operating Plan is a joint effort between land management agencies of the Northern Rockies Geographical Area, the Northern Rockies Predictive Services Unit (PSU) and the National Weather Service (NWS) offices in Billings, Glasgow, Great Falls, Missoula, Riverton, and Spokane. The purpose of this plan is to coordinate the NWS and PSU products and services provided to the land management community. Representatives of the National Weather Service and the Northern Rockies Geographic Area will sign this document annually each spring.

This Operating Plan contains a "Common Section" and an "Individual Office Section." The Common section pertains to the products and services that are completed in a generally consistent and uniform manner. The Individual Office Section contains information unique to each office such as contact points, office location, and area maps.

FIRE WEATHER PRODUCTS

National Weather Service (NWS) offices provide a suite of scheduled and unscheduled meteorological products to support land management agencies. Scheduled products may include daily planning forecasts, outlooks, discussions, and numerical forecasts. These are generally produced for spring burning, wildfire season and fall burning. Unscheduled products include fire weather watches, red flag warnings, and spot and FARSITE forecasts. These are available upon request 24 hours a day throughout the year.

The PSU will provide daily, medium-range, and long-range fire weather, fire danger, and resource outlooks for use in tactical and strategic planning. These outlooks will complement forecast products provided by the NWS

The Billings, Glasgow, Great Falls, Missoula, Riverton, and Spokane NWS offices will issue detailed forecasts to fire control agencies in the area encompassing Montana, portions of north central Idaho, northwest South Dakota, and extreme northwest Wyoming. The descriptions of the fire weather districts can be found in the individual sections for each office. Agencies served include: USDA Forest Service, Bureau of Land Management, Bureau of Indian Affairs, National Park Service, United States Fish and Wildlife in Montana and Idaho, Divisions of Environmental Quality, the States of Montana and Idaho, and county and local agencies.

FORECAST TYPES

1. [Morning and Afternoon Planning Forecasts](#)
2. [Spots](#)
3. [FARSITE](#)
4. [Red Flag Warnings and Fire Weather Watches](#)
5. Updates to all scheduled products as conditions warrant
6. [Numerical Forecasts for NFDRS](#)
7. [Smoke Dispersion Graphics](#)

FORECAST DISSEMINATION

- Narrative forecasts, numerical forecasts, forecast updates, red flag warnings, and fire weather watches will be available on the Internet and will also be entered into the Weather Information Management System (WIMS).
- Spot and FARSITE Forecasts will be disseminated via the Internet; backup will be phone and fax.

Northern Rockies Annual Fire Weather Operating Plan
Fire Weather Products

OFFICE BACKUP

Office	Primary Backup	Secondary Backup
Billings	Glasgow	Riverton
Glasgow	Billings	Great Falls
Great Falls	Missoula	Glasgow
Missoula	Great Falls	Spokane
Riverton	Cheyenne	Billings
Spokane	Pendleton	Missoula

Following are the Internet sites for each office:

- <http://weather.gov/billings>
- <http://weather.gov/glasgow>
- <http://weather.gov/greatfalls>
- <http://weather.gov/missoula>
- <http://weather.gov/riverton>
- <http://weather.gov/spokane>

FORECAST ELEMENT DESCRIPTIONS

Headlines: This section is included when critical weather elements are expected during the forecast period. These elements include Fire Weather Watches, Red Flag Warnings, thunderstorms, significant precipitation, unusually low humidities, gusty winds, etc.

Weather Discussion: The weather discussion provides an understanding of the general weather pattern and its impact on expected weather. The discussion will accentuate the most important portions of the forecast such as the problem of the day and important features of the next couple days.

General Weather: Expected sky cover and precipitation events are the primary elements given in the general weather. It may also highlight elements such as dry thunderstorms, winds, temperatures, and humidities that are particularly significant to field personnel.

Lightning Activity Level (LAL): This is a scale of lightning or thunderstorm activity in a specific area. The LAL is outlined in [USDA Forest Service General Technical Report INT-39 \(October 1977\)](#).

Chance of Wetting Rain (CWR): A percentage will be used to indicate the likelihood of a wetting rain occurring over a forecast zone. Wetting rain is defined as 0.10 inches or more of rain over a major portion of the forecast zone. Chance of wetting rain (CWR) given on a spot forecast indicates the probability of receiving 0.10 inches or more of rainfall over the smaller scale area concerned.

Temperatures: The expected daily high and low temperature will be forecast in the range of values i.e., "Highs today 82-92."

Humidity: The expected daily minimum and nighttime maximum humidities will also be forecast in a range of values, i.e., Minimum RH 15-25%.

Slope/Valley Winds: Also known as surface winds, these are 10 minute average sustained winds measured at 20 feet above the average vegetation (standard Remote Automated Weather Station, RAWS) located at the lower elevations in a forecast zone (valley floor to mid-slope). Because these may be highly variable across a forecast zone, they will be quite general in the daily Fire Weather Planning Forecast.

Ridge Top Winds: These are the surface winds that would be measured by a standard RAWS located at the higher elevations (upper slopes and ridge tops).

Mixing Height: Mixing height is a forecast of the altitude in which the atmosphere will be well mixed. A mixing height forecasted in daytime periods will reflect the maximum

height expected (early to late afternoon). A mixing height forecasted in nighttime periods will reflect the lowest height expected. Mixing height information will be given in Above Ground Level (AGL) heights.

Mixing Winds (also called Transport Winds): A measure of the average wind speed and direction from the ground to the mixing height.

Haines Index: The Haines Index information will be included in the narrative forecasts. This index of basic lower atmospheric stability and moisture seems to correlate well with large fire growth. One note of caution, wind is not factored into the Haines Index. The Haines Index is categorized as follows:

Haines Index	Category
2 or 3	Very Low
4	Low
5	Moderate
6	High

Extended Forecast and Outlook: An extended forecast (3 to 7 days) will be included with every Fire Weather Planning Forecast. The outlook (from 8 to 10 or 14 days) is an optional element. An [extended outlook from 8 to 14 days](#) can also be found at the [Climate Prediction Center](#) homepage. The purpose of this guidance is to highlight major changes as well as general weather trends.

Note: For the [30/90-Day and Seasonal Outlooks](#), please go to the [Climate Prediction Center Homepage](#). These products are typically updated around the middle of the month.

Area Forecast Discussion (AFD)

For a more detailed meteorological discussion than can be found in the discussion portion of the Fire Weather Forecast (FWF), use the Area Forecast Discussion (AFD) which is located under the Forecast/Outlook tab of the Western Region Fire Weather page. Riverton WY, in Central Region, has their AFD posted on their [Fire Weather page](#).

The Area Forecast Discussion (AFD) is a semi-technical product primarily used as a means to explain the scientific rationale behind a forecast and to summarize any watches, warnings and advisories in effect. The forecast insight provided in the AFD is beyond that which can be found in other NWS products, including the forecasters' confidence in various weather scenarios. The AFD consists of two primary sections: (1) a narrative description of forecast information and reasoning, and (2) a summary of public, marine and fire weather watch/warning/advisory issuances. The discussions focus on the most significant weather issues to affect a forecast offices' geographic area of responsibility during the 7-day forecast period. Emphasis is placed on those forecast periods where hazardous weather is possible.

There also may be a Fire Weather section added to the AFD. This will specifically address fire concerns and will be supplemental to the information in the main discussion.

Area Forecast Discussions for:

[Billings](#) [Glasgow](#) [Great Falls](#) [Missoula](#) [Riverton](#) [Spokane](#)

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Example AFD

ZCZC GTFAFDMSO
FXUS65 KMSO 172048
AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE MISSOULA MT
248 PM MDT FRI AUG 10 2009

.DISCUSSION...SOUTHWEST FLOW REMAINS OVER THE NORTHERN ROCKIES AS A LARGE UPPER TROUGH CIRCULATES ALONG THE NORTHWEST COAST. SUBTROPICAL MOISTURE CONTINUES TO FLOW ACROSS LEMHI COUNTY AND SOUTHWEST MONTANA THIS EVENING...MAINTAINING THE THREAT OF ISOLATED THUNDERSTORMS THROUGH DARK. SMOKE...THICK IN PLACES...WILL CONTINUE TO BE AN ISSUE TONIGHT AND EARLY SATURDAY. THE UPPER TROUGH WILL SEND ITS FIRST DISTURBANCE THROUGH THE AREA SATURDAY. CONVECTION WILL STILL BE AN ISSUE OVER SOUTHWEST MONTANA AND LEMHI COUNTY...BUT THE MAIN CONCERN IS INCREASING SOUTHWEST WINDS AS THE MID LEVEL FLOW INCREASES. STRONGER WINDS WILL DEVELOP ON THE RIDGES MIDDAY...BUT PROBABLY NOT MIX DOWN TO THE VALLEYS UNTIL MID AFTERNOON...THEN PERSIST THROUGH THE EVENING. ONE GOOD ASPECT TO THIS IS THAT IT SHOULD IMPROVE AIR QUALITY TO SOME EXTENT.

SUNDAY THROUGH FRIDAY...MODELS SEEM TO BE MORE CONSISTENT WITH BRINGING A COLD FRONT INTO WESTERN MONTANA DURING THE DAY ON SUNDAY. THE BEST SHOT OF MOISTURE LOOKS TO IMPACT NORTHWEST MONTANA...BUT ALL OF WESTERN MONTANA AND NORTH CENTRAL IDAHO SHOULD SEE SOME RAIN BEFORE MONDAY MORNING. THE BAD NEWS IS WINDS WILL BE INCREASING WITH THE FRONT. ON MONDAY THE TROUGH MOVES TO THE EAST WITH SOME LINGERING PRECIPITATION. THEN TUESDAY THROUGH FRIDAY WESTERN MONTANA AND NORTH CENTRAL IDAHO REMAIN UNDER A WEST TO NORTHWEST FLOW WITH A FEW WEAK DISTURBANCES MOVING IN THE FLOW. THIS SHOULD KEEP TEMPERATURES COOLER WITH SOME WIDELY SCATTERED LIGHT SHOWERS.

&&

.AVIATION...SHOWERS AND THUNDERSTORMS WILL IMPACT AVIATION OPERATIONS ACROSS LEMHI COUNTY AND THE BUTTE/PINTLAR REGION THROUGH THIS EVENING. MAIN IMPACT WITH THESE STORMS WILL BE GUSTY AND ERRATIC WINDS. TERMINALS AFFECTED ARE KSMN AND KBTM. SMOKE WILL CAUSE LOWERED VISIBILITY AND GROUND OBSCURATIONS THROUGHOUT WESTERN MONTANA AND PORTIONS OF NORTH CENTRAL IDAHO THIS EVENING THROUGH SATURDAY. PLEASE SEE APPROPRIATE TAFS.

&&

.FIRE WEATHER...WILL ISSUE A WATCH FOR THE WINDS SATURDAY MAINLY THROUGH THE CENTRAL PORTION OF THE FIRE WEATHER DISTRICT. BELIEVE STABILITY TO THE NORTH AND IN THE PALOUSE WILL KEEP WINDS FROM INCREASING TOO MUCH. SOUTHWEST MONTANA WILL GET THE WINDS...BUT THE DEWPOINTS SHOULD BE PRETTY HIGH TOMORROW. HAVE INCLUDED 110 IN THE WATCH DUE TO SLIGHTLY BETTER DRYING AND THE CURRENTLY GOING FIRES. SOUTHWEST MONTANA WILL SEE MORE DRYING SUNDAY ALONG WITH ANOTHER WINDY AFTERNOON.

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Fire Weather Products**

&&

.MSO WATCHES/WARNINGS/ADVISORIES...

MT...FIRE WEATHER WATCH FROM SATURDAY AFTERNOON THROUGH SATURDAY
EVENING FOR BITTERROOT-DEERLODGE/WEST BEAVERHEAD-EAST LOLO-
SALISH AND KOOTENAI RESERVATION-WEST LOLO.

ID...FIRE WEATHER WATCH FROM SATURDAY AFTERNOON THROUGH SATURDAY
EVENING FOR CLEARWATER/NEZ PERCE.

FIRE WEATHER PLANNING FORECAST

The Fire Weather Planning Forecast (FWF) is prepared for use in operational planning decisions including fire danger assessment, firefighter safety, protection of the public and property, and resource allocation. It is a 7-day forecast but tends to focus on the short term, or next couple days. The FWF is a general zone-based product consisting of a short weather discussion combined with a few "public forecast" parameters (e.g. sky/weather, high and low temperatures) and several "fire weather" parameters (e.g. Lightning Activity Level, humidities, Haines Index). The parameters used in the FWF have been coordinated with area customers and may vary slightly between offices. Please see individual office sections for more detail.

FNUS5i KNNN DDHHMM
FWFNMM

FIRE WEATHER PLANNING FORECAST FOR <for name of area>
NATIONAL WEATHER SERVICE CITY STATE
TIME-DATE (example: 500 AM MDT TUE AUG 10 2009)

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

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

SSZXXX-XXX>XXX-DDHHMM- (UGC/FIPS CODING)
GEOGRAPHICAL DESCRIPTORS (including land management governing units and
optional fire weather zone numbers)
TIME-DATE (example: 500 AM MDT TUE AUG 10 2009)

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

TODAY...

SKY/WEATHER.....
MAX TEMPERATURE.....

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24 HR TREND.....(Optional)
MIN HUMIDITY.....
24 HR TREND.....(Optional)
20 FT WIND.....(Optional - include sub-descriptors e.g.
slope/valley...ridges/upper slopes...ridge
top...etc.)

HAINES INDEX.....(Optional)
LAL.....(Optional)
CWR.....(Optional)
MIXING HEIGHT.....(Optional)
MIXING WINDS.....(Optional)

TONIGHT...

SKY/WEATHER.....
MIN TEMPERATURE.....
24 HR TREND.....(Optional)
MAX HUMIDITY.....
24 HR TREND.....(Optional)
20 FT WIND.....(Optional - include sub-descriptors e.g.
slope/valley...ridges/upper slopes...ridge
top...etc.)

HAINES INDEX.....(Optional)
LAL.....(Optional)
CWR.....(Optional)
MIXING HEIGHT.....(Optional)
MIXING WINDS.....(Optional)

TOMORROW...

SKY/WEATHER.....
MAX TEMPERATAURE.....
MIN HUMIDITY.....
20 FT WIND.....(Optional - include sub-descriptors e.g.
slope/valley...ridges/upper slopes...ridge
top...etc.)

HAINES INDEX.....(Optional)
LAL.....(Optional)
CWR.....(Optional)
MIXING HEIGHT.....(Optional)
MIXING WINDS.....(Optional)

.EXTENDED

(Optional time period) Winds included days 3-5; days 6 and 7 if appropriate; other elements per locally established policy. May be in each zone segment versus this location; may optionally be presented as 12-hour periods.

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Forecast for next geographical descriptor and fire weather zone group.

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

SMOKE DISPERSION FORECASTS

Mixing height and mixing winds are optional elements in general forecasts during the spring burning period, wildfire season and fall burning period. Some offices may also provide a stand-alone smoke dispersion forecast at those times a fire weather forecast is not being produced, i.e., early spring and late fall. A [Clearing Index](#) product is also available, which combines mixing heights and mixing winds as a graphical based forecast. See individual NWS Office sections to determine what smoke dispersion information is available.

NFDRS Forecasts

National Fire Danger Rating System (NFDRS) forecasts are provided on a daily basis from late spring until the end of wildfire season.

Afternoon observations (1400 LDT) should be sent from the field to WIMS by 1415 LDT. These observations will generally be received in the Forecast Office by 1445 LDT.

The forecasts will then be sent to WIMS by 1545 LDT. Forecasted NFDRS indices should be available by 1615 LDT.

These forecasts are for expected conditions 24 hours from the current day's observation (1400 LDT tomorrow).

Following is an explanation of codes used in NFDRS Forecasts:

FCST, STATION#, YYMMDD, 13, WX, TEMP, RH, LAL1, LAL2, , WIND, , TX, TN, RHx, RHn, PD1, PD2, WET FLAG

FCST,100708,040729,13,1,82,28,1,1,,04,,87,47,68,18,0,0,N
FCST,101013,040729,13,1,89,21,1,1,,02,,95,52,56,16,0,0,N
FCST,101028,040729,13,1,85,26,1,1,,03,,91,52,63,18,0,0,N
FCST,101031,040729,13,1,78,29,1,1,,04,,82,50,60,20,0,0,N
FCST,101045,040729,13,1,81,26,1,1,,04,,87,54,73,19,0,0,N
FCST,101049,040729,13,1,70,32,1,1,,08,,74,48,58,25,0,0,N
FCST,240107,040729,13,1,86,27,1,1,,02,,91,50,78,15,0,0,N
FCST,240110,040729,13,1,83,27,1,1,,03,,88,44,67,19,0,1,N
FCST,240112,040729,13,1,88,24,1,1,,04,,94,45,69,18,0,1,N

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FCST,240119,040729,13,1,82,24,1,2,,04,,87,41,56,20,0,2,N
FCST,240214,040729,13,1,78,28,1,1,,07,,83,47,73,16,0,1,N

FCST: Indicates individual site forecasts.

STATION#: NFDRS site number

YYMMDD: Date

13: Valid Forecast Time (Always 13 to indicate 1300 LST)

WX: Weather valid at 1300 LST tomorrow. Valid entries are:

0 clear
1 scattered clouds (1/8 to 4/8)
2 broken clouds (5/8 to 7/8)
3 overcast clouds (more than 7/8)
4 foggy
5 drizzle
6 raining
7 snowing or sleet
8 showers (in sight or at the station)
9 thunderstorm
(Categories 5, 6, 7 sets most NFDRS indices to 0.
ERC is the exception)

TEMP: Temperature in degrees F valid at 1300 LST

RH: Relative humidity in percent valid at 1300 LST

LAL1: Lightning Activity Level 1400 LST to 2300 LST

LAL2: Lightning Activity Level 2300 LST to 2300 LST

WIND: Wind speed in mph valid at 1300 LST

TX: Maximum temperature from 1300 LST to 1300 LST tomorrow

TN: Minimum temperature from 1300 LST to 1300 LST tomorrow

RHx: Maximum RH from 1300 LST to 1300 LST tomorrow

RHn: Minimum RH from 1300 LST to 1300 LST tomorrow

PD1: Precipitation duration in hours 1300 LST to 0500 LST

PD2: Precipitation duration in hours 0500 LST to 1300 LST

WETFLAG Y or N: Indicates whether fuels will be wet at 1300 LST.

Northern Rockies Annual Fire Weather Operating Plan Fire Weather Products

Zone average trends can be used when enough observations are available for the zone area. Following is an example of a Zone Trend Forecast.

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

```
FNUS85 KBOI DDHHMM
```

```
FWMBOI
```

```
ZONE,403,011027,13,1,-3,0,1,1,0,0,,,,,0,0,N
```

```
ZONE,404,011027,13,0,3,0,1,1,0,0,,,,,0,0,N
```

```
ZONE,408,011027,13,0,4,-5,1,1,-3,0,89,68,75,22,0,0,N
```

SPOT FORECASTS

Spot forecasts will be issued for wildfires, prescribed burns, or other incidents when requested. Requests for special forecasts should be made directly to the National Weather Service office serving your area. Whenever a spot forecast request is sent, a phone call to the weather office should be made to inform the forecaster of the request.

Please furnish the data indicated on the Internet version of the [Spot Forecast Request Form](#) to your local NWS office. This form can be found on the Fire Weather Section of each NWS office Homepage. Where access to the Internet is not available, [WS Form D-1, Spot Forecast Request Form](#), can be filled out and faxed to your local National Weather Service office.

Weather observations supporting a spot forecast request should be taken at the site of the incident, fire, or burn. The quality of the forecast will greatly depend on the accuracy of this observation. Observations taken the day of the planned burn are essential for a good forecast. In addition, if site observations from the previous day are available, please provide these to the forecaster.

If weather conditions develop which are not forecast and may threaten the success of the operations at the fire, the forecaster should be notified immediately. Timely feedback concerning the accuracy of forecasts will assist the forecaster greatly in the preparation of more accurate forecasts in the future.

SPOT FORECAST FORMAT

1. Spot forecasts for wildfires will contain headlines (when a RFW is in effect), discussion, sky/weather, temperature, relative humidity, and wind. Some optional elements may be requested as well.
2. Prescribed fire spot forecasts will always include a discussion. In addition, these forecasts will contain weather elements chosen by the requester.

SPOT FORECAST EXAMPLE

FNUS7i KXXX DDHHMM
FWSXXX

SPOT FORECAST FOR (location or name of burn)

NATIONAL WEATHER SERVICE (CITY STATE)
TIME-DATE (500 AM MDT TUES AUG 10 2009)

IF CONDITIONS BECOME UNREPRESENTATIVE, CONTACT THE NATIONAL WEATHER SERVICE.

...HEADLINE...

DISCUSSION...

FOR TODAY

SKY/WEATHER.....
TEMPERATURE..... MAX xx
HUMIDITY..... MIN xx%
WIND...20 FOOT..... xx MPH
OPTIONAL ELEMENTS..... CWR, SMOKE DISPERSION, ETC., AS
REQUESTED BY USERS

FOR TONIGHT

SKY/WEATHER.....
TEMPERATURE..... MIN xx
HUMIDITY..... MAX xx%
WIND...20 FOOT..... xx MPH
OPTIONAL ELEMENTS..... CWR, SMOKE DISPERSION, ETC., AS
REQUESTED BY USERS

OUTLOOK FOR TOMORROW

SKY/WEATHER.....
TEMPERATURE..... MAX xx
HUMIDITY..... MIN xx%
WIND...20 FOOT..... xx MPH
OPTIONAL ELEMENTS..... CWR, SMOKE DISPERSION, ETC., AS
REQUESTED BY USERS

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**Northern Rockies Annual Fire Weather Operating Plan
Fire Weather Products**

EXAMPLE SPOT REQUEST

Following is an example of the Spot Request form.

SPOT FORECAST REQUEST
Required Elements in RED

<p>PROJECT NAME</p> <p>Project Name: <input type="text"/></p> <p> <input type="radio"/> Wildfire <input type="radio"/> WFU <input type="radio"/> HAZMAT <input type="radio"/> Prescribed Fire <input type="radio"/> SAR </p> <p> Ignition Time: <input type="text"/> <input type="radio"/> Mountain Local Time <input type="radio"/> Pacific Local Time Date: <input type="text"/> </p>		<p>REQUESTING AGENCY</p> <p>NOTE: Do not use commas in this section.</p> <p>Requesting Agency: <input type="text"/></p> <p>Requesting Official: <input type="text"/></p> <p>Phone Number: <input type="text"/> Ext. <input type="text"/></p> <p>FAX Number: <input type="text"/></p> <p>Contact Person: <input type="text"/></p>																																													
<p align="center">REASON FOR SPOT FORECAST REQUEST</p> <p align="center">Must choose either Wildfire or one of the Non-Wildfire reasons</p> <p><input type="radio"/> Wildfire</p> <p><input type="radio"/> Non-Wildfire</p> <p> <input type="radio"/> Under the Interagency Agreement for Meteorological Services (USFS, BLM, NPS, USFWS, BIA). <input type="radio"/> State, tribal or local fire agency working in coordination with a federal participant in the Interagency Agreement for Meteorological Services. <input type="radio"/> Essential to public safety, e.g. due to the proximity of population centers or critical infrastructure. </p> <p><small>For NWS Spot forecast policy, see section 4.0 in NWS Instruction 10-401 at http://www.nws.noaa.gov/directives/010/010.htm</small></p>																																															
<p>LOCATION</p> <p>Lat: <input type="text"/></p> <p>Lon: <input type="text"/></p> <p>7.5' Quad: <input type="text"/></p> <p>Legal (T/R): <input type="text"/></p> <p><input checked="" type="radio"/> MT <input type="radio"/> ID</p> <p><small>*Enter Lat/Lon, Legal(T/R) also acceptable.</small></p>		<p>FUEL</p> <p>Type: <input type="text"/></p> <p> <input type="radio"/> Sheltering <input type="radio"/> Full <input type="radio"/> Partial <input type="radio"/> Unsheltered </p>																																													
<p align="center">OBSERVATIONS</p> <table border="1"> <thead> <tr> <th>Place</th> <th>Elev</th> <th>Time</th> <th>Wind</th> <th>Temp</th> <th>Wetbulb</th> <th>RH</th> <th>Dewpt.</th> <th>Sky/Weather</th> </tr> </thead> <tbody> <tr><td><input type="text"/></td><td><input type="text"/></td><td><input type="text"/></td><td><input type="text"/></td><td><input type="text"/></td><td><input type="text"/></td><td><input type="text"/></td><td><input type="text"/></td><td><input type="text"/></td></tr> <tr><td><input type="text"/></td><td><input type="text"/></td><td><input type="text"/></td><td><input type="text"/></td><td><input type="text"/></td><td><input type="text"/></td><td><input type="text"/></td><td><input type="text"/></td><td><input type="text"/></td></tr> <tr><td><input type="text"/></td><td><input type="text"/></td><td><input type="text"/></td><td><input type="text"/></td><td><input type="text"/></td><td><input type="text"/></td><td><input type="text"/></td><td><input type="text"/></td><td><input type="text"/></td></tr> <tr><td><input type="text"/></td><td><input type="text"/></td><td><input type="text"/></td><td><input type="text"/></td><td><input type="text"/></td><td><input type="text"/></td><td><input type="text"/></td><td><input type="text"/></td><td><input type="text"/></td></tr> </tbody> </table>			Place	Elev	Time	Wind	Temp	Wetbulb	RH	Dewpt.	Sky/Weather	<input type="text"/>																																			
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<p>PRIMARY FORECAST ELEMENTS</p> <p>TDA TNT TMR (Today, Tonight, Tomorrow)</p> <p> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Clouds / Weather <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Chance of Wetting Rain <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Temperature <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Relative Humidity <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 20 Foot Wind <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Smoke Dispersion </p>		<p>REMARKS</p> <div style="border: 1px solid black; height: 100px; width: 100%;"></div>																																													
<p>Submit Request Cancel Request Clear Form</p>																																															

WARNING PRODUCTS

FIRE WEATHER WATCHES and RED FLAG WARNINGS

A **FIRE WEATHER WATCH** will be issued if a significant potential exists for red flag conditions, in conjunction with critically dry fuels. See individual NWS Office sections for specific Red Flag Event Criteria. Fire Weather Watches will be available in WIMS and the Internet. Coordination with the Predictive Services Unit is recommended as well as a call to their office during business hours (406-329-4703/4875) upon issuing a RFW.

A Fire Weather Watch will normally be issued 12 to 48 hours, but not more than 96 hours, in advance of the expected onset of the red flag conditions. They will often be issued in conjunction with the routine morning or afternoon forecasts. However, a Watch may be issued at anytime with the use of a Red Flag Statement (RFW) and the Fire Weather Forecast (FWF) update. The area(s) affected, the time of the expected onset of the conditions, and an explanation of those conditions will be included in the Watch. A Watch may be issued (or continued) during the first 12 hours for dry lightning.

Fire Weather Watches will be cancelled if and when subsequent meteorological information indicates the red flag conditions are no longer a threat. This cancellation will be sent by a Red Flag Statement (RFW).

A **RED FLAG WARNING** will be issued to indicate the imminent danger of severe fire weather or when severe fire weather already exists. Red Flag Warnings will be available in WIMS and the Internet.

The Red Flag Warning will generally be issued within 24 hours of the expected onset of Red Flag conditions. The warning will also be issued by a new statement (RFW) and reflected in the headline of the fire weather forecast. The affected area, the valid time of the warning, and a description of the expected severe fire weather conditions will be included. Coordination with the Predictive Services Unit is recommended as well as a call to their office during business hours (406-329-4703/4875) upon issuing a RFW.

A Red Flag Statement (RFW) will be used to cancel a Red Flag Warning and the Fire Weather Forecast (FWF) will be updated.

Red Flag Conditions:

One or more of the following conditions, in conjunction with fuel conditions favorable to large fire growth, will be considered for Red Flag events. However, these criteria are very generalized. Please check individual office sections for detailed criteria.

1. Scattered dry thunderstorms. (A lightning storm accompanied by less than a wetting rain, 0.10 inch precipitation or less, often with very gusty winds).

Northern Rockies Annual Fire Weather Operating Plan
Fire Weather Products

2. Increased thunderstorm activity, wet or dry, during an extremely dry period.
3. Strong or gusty surface winds (e.g., 20 mph sustained, 30 mph gusts), along with low relative humidities (e.g., less than 20 percent).
4. Abrupt increase in winds and change in direction due to the approach and passage of a cold front, squall line, or other weather phenomena other than isolated thunderstorms.
5. In coordination with users, anytime the forecaster foresees a change in weather that would result in a significant increase in fire danger.

EXAMPLE RED FLAG WARNING (Fire Weather Watches will follow the same format)

Note: NWS offices will be installing new software for the product generators which will replace the headline of Fire Weather Watch/Red Flag Warning with "URGENT -- FIRE WEATHER MESSAGE." The example below incorporates the current format along with the new software changes.

```
WWUS8i KNNN DDHHMM
RFWNNN
```

```
RED FLAG WARNING (with new software, this will read "URGENT -
FIRE WEATHER MESSAGE")
```

```
NATIONAL WEATHER SERVICE CITY STATE
```

```
TIME-DATE (example: 500 AM MDT TUE AUG 10 2009)
```

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

```
. (optional overview discussion)
```

```
SSZXXX-XXX>XXX-DDHHMM- (UGC coding)
```

```
/<P-VTEC CODING>
```

```
GEOGRAPHICAL DESCRIPTORS (including land management governing
units, fire weather zone numbers, and/or county names)
```

```
TIME-DATE (example: 500 AM MDT TUE AUG 10 2009)
```

```
...RED FLAG WARNING IN EFFECT FOR STRONG WEST WINDS FROM 1PM
THROUGH 11PM TONIGHT IN WESTERN MONTANA...
```

```
DISCUSSION...THE NATIONAL WEATHER SERVICE IN [WFO or location]
HAS ISSUED A RED FLAG WARNING FOR WESTERN MONTANA FROM 1PM
THROUGH 11PM TODAY FOR STRONG WINDS. WEST WINDS 20 TO 30 MPH
WITH GUSTS TO 40 MPH WILL DEVELOP THIS AFTERNOON AHEAD OF A
STRONG COLD FRONT. IN ADDITION...HUMIDITIES WILL LOWER INTO THE
TEENS BY LATE AFTERNOON.
```

```
WINDS WILL DIMINISH BY LATE EVENING AS THE FRONT MOVES INTO
EASTERN MONTANA.
```

Public Watches, Warnings and Statements: Watches, warnings, and statements of potential severe or unusual weather events, that are not directly related to fire weather, are also issued by NWS offices. These statements, however, may still contain weather information significant to field personnel. Therefore, it would be beneficial to stay in tune with public weather forecasts.

GRAPHICAL/GRID BASED PRODUCTS

National Digital Forecast Database (NDFD)

The National Weather Service provides an enhanced forecast tool called the [National Digital Forecast Database \(NDFD\)](#). This database contains forecasted weather parameters on a 2.5 to 5 kilometer resolution grid. The NDFD extends through 7 days and is updated continuously by the NWS Forecast Offices. There are a number of different ways that information can be accessed from the NDFD, ranging from viewing colorized maps on the Internet to importing the data into applications that have been developed for use by land management agencies.

Actual NDFD fire weather forecast elements can be viewed graphically at :
<http://www.weather.gov/forecasts/graphical/sectors/northrockiesFireDay.php#tabs>

Information on the NDFD can be found at: <http://www.weather.gov/ndfd/>

For users who may be considering accessing NDFD information for use in other applications should check the information at: <http://www.weather.gov/ndfd/technical.htm>

Additional applications that interact with the digital database are listed below.

[Activity Planner](#)

[Point Forecast Matrix \(PFM\)](#)

[Digital Point Forecast](#)

[FARSITE Forecasts](#)

[Clearing Index](#)

[GRIB Data - Description](#) and [Tutorial](#)

[Official](#) / [Experimental Products](#)

Activity Planner

Another tool that gives land managers the ability to interact with the digital database is the Activity Planner. This tool allows one to enter various weather thresholds in order to determine potential “burn windows” through the next 7 days using the following interface set up for each NWS office.

Element	Min	Max	Element	Min	Max
Temperature	<input type="text"/>	to <input type="text"/>	Surface Wind Direction	<input type="text"/>	to <input type="text"/>
Relative Humidity	<input type="text"/>	to <input type="text"/>	Sky Cover	<input type="text"/>	to <input type="text"/>
Surface Wind Speed (mph)	<input type="text"/>	to <input type="text"/>	Precipitation Potential	<input type="text"/>	to <input type="text"/>

[Read watches, warnings & advisories](#) [Zoom Out](#)

Snow Advisory ■

Hazardous Weather Outlook ■

Short Term Forecast ■

Latitude/Longitude Entry
decimal degrees (i.e. 42.134) or deg min sec (i.e. 42 23 34)

Latitude:

Longitude:

Select Cities

ALBERTON MT

ARLEE MT

Anaconda MT

BIG ARM MT

BIGFORK MT

BONNER MT

Bozeman MT

Last Updated: Wed, Mar. 28 2008 12:27 PM

There are six defaulted parameters but drop down menus allow for several other choices.

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Element	Min	to	Max	Element	Min	to	Max
Temperature	40	to	70	Surface Wind Direction	270	to	320
Relative Humidity	25	to	50	Sky Cover		to	
Surface Wind Speed (mph)	0	to	15	Precipitation Potential	0	to	50

Temperature

Temperature >=100

Temperature <=32

Dewpoint

Heat Index

Wind Chill

Relative Humidity

Surface Wind Speed (mph)

Surface Wind Speed (kts)

Surface Wind Direction

Sky Cover

Precipitation Potential

For location, it is likely land managers will most often utilize the Latitude/Longitude interface.

Latitude/Longitude Entry
decimal degrees (i.e. 42.134) or
deg min sec (i.e. 42 23 34)

Latitude:

Longitude:

However, towns in the area may also be selected,

Select Cities

Rexford MT

Riggins ID

Ronan MT

SEELEY LAKE MT

SULA MT

SWAN LAKE MT

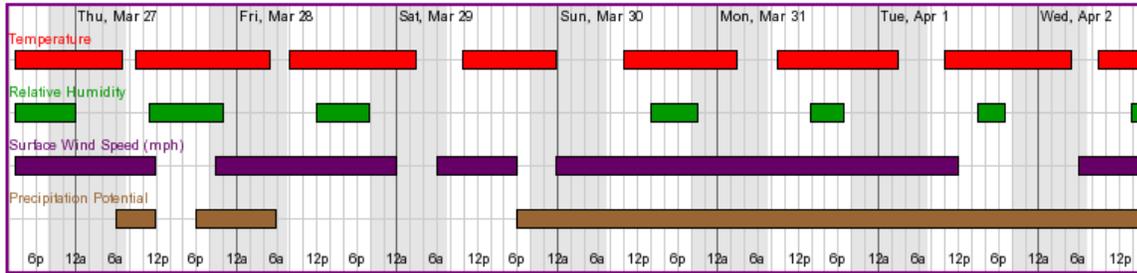
SYRINGA ID

or the location may be selected by clicking on the map.

The initial chart will give a general sense of if and when any potential burn windows might occur in the next week. Values within in the selected threshold ranges are

indicated by a solid bar for each parameter. Therefore, the time periods may be scanned vertically to determine if each parameter has a bar for in that period. Any value outside of the range, either too high or too low, will show up as a gap in the bar. Putting the mouse over any time period will yield the specific values under the chart.

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Wednesday, March 26 at 3pm 48-hr Element Meteorogram
 Temperature: 42°F Surface Wind: SW 7mph
 Relative Humidity: 38% Precipitation Potential: 41%

After this initial look, there are a couple other ways to more closely investigate potential burn windows. Clicking anywhere on the chart will yield a tabular view of many of the parameters in the digital database.

- Temperature
- Dewpoint
- Wind Chill
- Surface Wind
- Sky Coverage
- Precipitation Potential
- Relative Humidity
- Thunder
- Rain
- Snow
- Freezing Rain
- Sleet

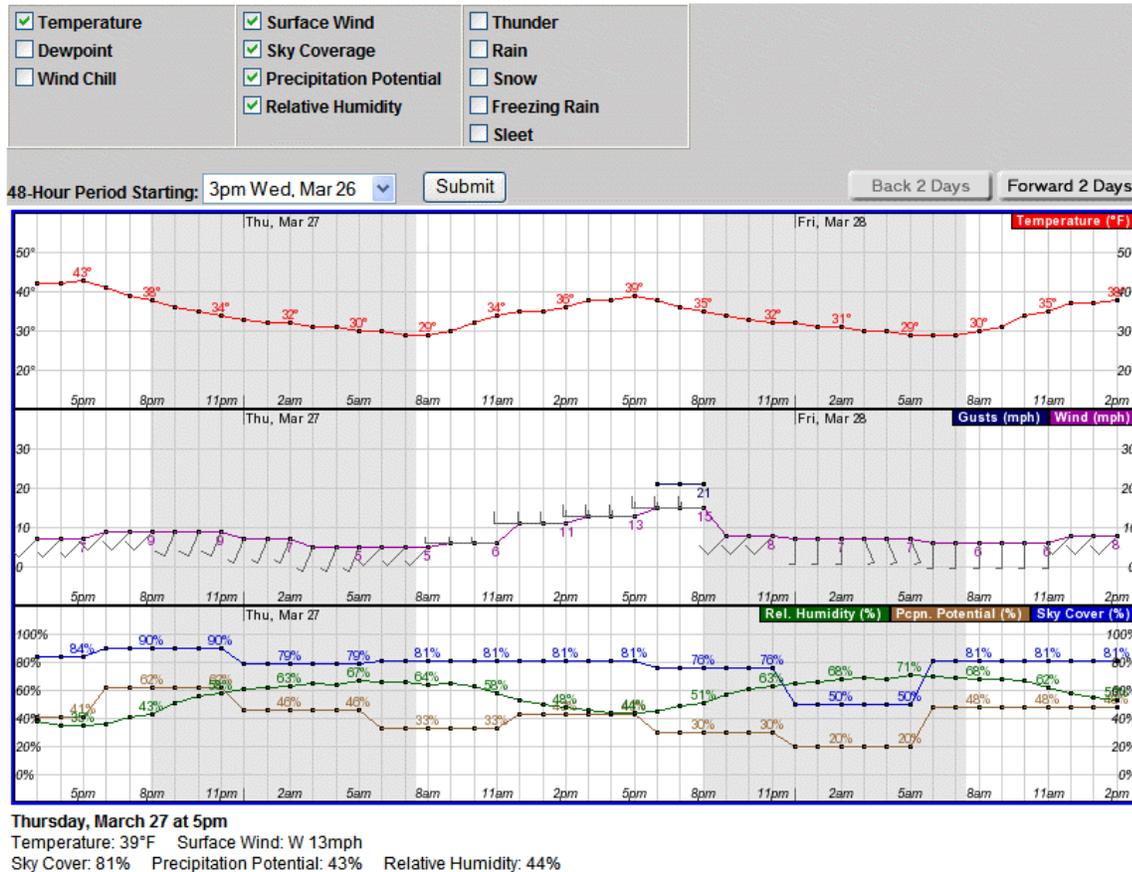
48-Hour Period Starting: 3pm Wed, Mar 26

Date	03/26												03/27											
Hour	15	16	17	18	19	20	21	22	23	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14
Temperature (°F)	42	42	43	41	39	38	36	35	34	33	32	32	31	31	30	30	29	29	30	32	34	35	35	36
Wind (mph)	7	7	7	9	9	9	9	9	9	7	7	7	5	5	5	5	5	6	6	6	6	11	11	11
Gusts (mph)																								
Wind Dir	SW	SW	SW	SW	SW	SW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SW	SW	SW	W	W	W	W	W	
Sky Cover (%)	84	84	84	90	90	90	90	90	90	79	79	79	79	79	79	81	81	81	81	81	81	81	81	
Popn. Potential (%)	41	41	41	62	62	62	62	62	62	46	46	46	46	46	46	33	33	33	33	33	33	43	43	
Rel. Humidity (%)	38	35	35	36	41	43	51	56	58	61	62	63	65	64	67	66	66	64	65	63	58	53	50	
Thunder	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Snow	Chc	Chc	Chc	Lkly	Lkly	Lkly	Lkly	Lkly	Lkly	Chc	Chc	Chc	Chc	Chc	Chc	Chc	Chc	Chc	Chc	Chc	Chc	Chc		

Once this table is produced, it can easily be adjusted for desired parameters and time periods.

Another useful way to look at specific values is to produce 48-Hour Element Meteograms by clicking on the link of this title at the lower right hand corner of the chart.

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These charts provide a good view of how the parameters are expected to trend over the next week.

CAUTION: While this could be a valuable planning tool out a week or so, the Activity Planner is not intended to replace a spot forecast. If forecast precision is required on the day of the project, the user should request a spot forecast for the site. A National Weather Service meteorologist can then fine tune these numbers based on the site characteristics (aspect, steepness, position on slope, etc.) and local observations to develop a more representative forecast.

The Activity Planner can be used in a similar fashion to obtain long lead times on potentially critical wildfire thresholds such as maximum temperature and minimum relative humidity.

Point Forecast Matrix (PFM)

The PFM product displays numerous forecasted weather parameters for a specific user-defined point, with data taken directly from a digital forecast database. The PFM represents the average conditions over a 2.5 or 5 square km point which is selected by the user. Forecasts for these parameters are at 3-hour, 6-hour, and/or 12-hour intervals through the 7-day forecast range. The format of the PFM allows for rapid visual scanning of a large number of forecast values. In addition, the forecast data is decodable by computers for those who wish to create derived products. Information in the PFM is provided to users as higher resolution detail than can be found in other standard NWS products.

Point Forecast Matrix

Select Interface: Fire Weather Zones Point Forecast Matrix Digital Point Forecast FARSITE Obs/RAWS [Activity Planner](#)

Click on radial for PFM Interface

Surrounding Offices: [Missoula](#) | [Pendleton](#) | [Portland](#) | [Seattle](#) Zoom Out <<<

[Spot Request](#) [Fire Status](#) [Forecasts/Outlooks](#) [Fuels](#) [Weather Tools](#) [Admin](#)

NOTICE TO USERS: This application generates a forecast matrix from a digital forecast database. It is intended for general planning purposes only. This application is NOT meant to replace a spot forecast request. Please relay any comments you have to your local NWS office. All forecast winds are at the 20 foot level.

Click a location on the Map below OR Select a RAWS Station from the drop down box OR enter a lat/lon location in decimal degrees.

RAWS Station Or Lat: Lon:

Click on RAWS Site

The PFM is not quality controlled by a forecaster prior to dissemination. Therefore the PFM is for planning purposes only and should not be used as a replacement for a spot forecast.

A link to the Point Forecast Matrix (PFM) is provided on at the top of each forecast office fire weather page. The link takes you to a map showing the RAWS locations for

**Northern Rockies Annual Fire Weather Operating Plan
Fire Weather Products**

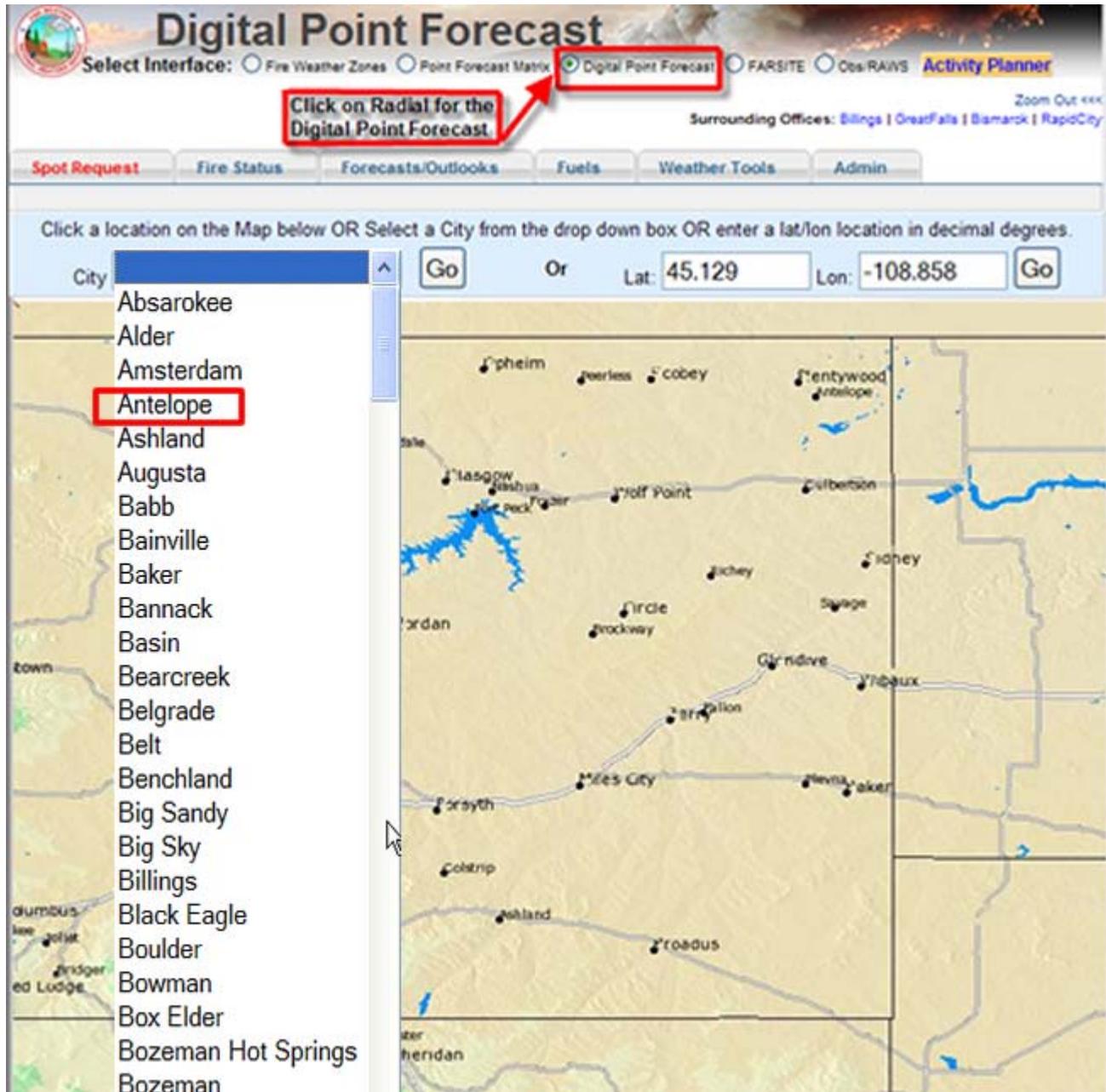
TEMP(F).....AIR TEMPERATURE
 DEWPT(F).....DEW POINT TEMPERATURE
 MIN/MAX RH OR MAX/MIN RH(%).....MAXIMUM/MINIMUM HUMDITY
 RH(%).....RELATIVE HUMIDITY
 WIND DIR(8 POINT COMPASS).....WIND DIRECTION
 WIND SPD(MPH).....WIND SPEED
 CLOUDS(CAT).....CLOUD COVER CATEGORY
 EXAMPLE: CL = CLEAR; FW = FEW; SC = SCATTERED; BK = BROKEN; OV =
 OVERCAST
 CLOUDS(%).....CLOUD COVER AS A PERCENTAGE
 POP 12HR(%).....PROBABILITY FOR ACCUMULATING
 PRECIPITATION
 WEATHER...
 TYPE...
 RAIN.....RAIN
 RAIN SHWRS.....RAIN SHOWERS
 TSTMS.....THUNDERSTORMS
 DRIZZLE.....DRIZZLE
 SNOW.....SNOW
 SNOWSHWRS.....SNOW SHOWERS
 SLEET.....SLEET
 FRZG RAIN.....FREEZING RAIN
 FRZG DRZL.....FREEZING DRIZZLE
 COVERAGE...
 IS.....ISOLATED
 SC.....SCATTERED
 NM.....NUMEROUS
 O.....OCCASIONAL
 S.....SLIGHT CHANCE
 C.....CHANCE
 L.....LIKELY
 WD.....WIDESPREAD
 D.....DEFINITE
 AR.....AREAS
 PA.....PATCHY
 LAL(CAT).....LIGHTNING ACTIVITY LEVEL
 HAINES(CAT).....HAINES INDEX
 MIX HGT(THOUSANDS OF FT AGL).....MIXING HEIGHT
 EXAMPLE: 6 = 6000 FEET; 12 = 12000 FEET; <1 = LESS THAN 1000 FOOT
 TRANSWIND DIR(8 POINT COMPASS).....TRANSPORT WIND DIRECTION
 TRANSWIND SPD(MPH).....TRANSPORT WIND SPEED

 DAY 4 THROUGH 7...
 MAX/MIN TEMP OR MIN/MAX TEMP(F).....MAXIMUM/MINIMUM AIR TEMPERATURE
 TEMP(F).....AIR TEMPERATURE
 DEWPT(F).....DEW POINT TEMPERATURE
 RH(%).....RELATIVE HUMIDITY
 WIND SPD(MPH).....WIND SPEED
 EXAMPLE: <15 = LESS THAN 15 MPH; 15> = 15 MPH OR GREATER
 AVE CLOUDS(CAT).....AVERAGE CLOUD COVER CATEGORY
 POP 12HR(%).....PROBABILITY FOR ACCUMULATING
 PRECIPITATION
 WEATHER...
 SEE DAY 1 THROUGH 3 WEATHER DESCRIPTIONS

Digital Point Forecast

The Digital Point Forecast provides an easily accessible tabular forecast that is tailored toward fire behavior applications. A fire weather version of the Point Forecast Matrix (PFM) table with additional fire weather specific elements has been developed along with an intuitive point and click map interface to select the location of interest.

The location of interest can be chosen from a drop down menu, entering a Latitude and Longitude, or clicking on the interactive map.



The Digital Point Forecast is not quality controlled by a forecaster prior to dissemination and

**Northern Rockies Annual Fire Weather Operating Plan
Fire Weather Products**

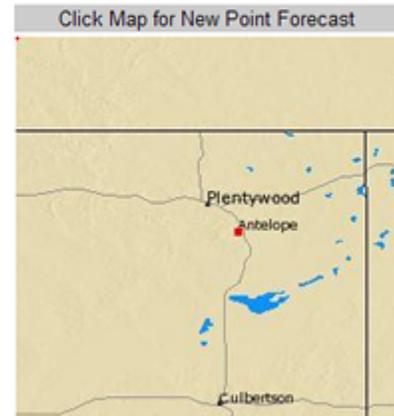
should be used for planning purposes only. This should not be used as a replacement for a spot forecast.

An example of the product is displayed below.

Forecast prepared by WFO GGW
0900 PM MDT Sun May 17 2009
48.684N 104.444W 2020FT

No Warnings or Advisories In Effect for this Point.

DATE	SUN 05/17/09				MON 05/18/09				TUE 05/19/09															
UTC 3HRLY	09	12	15	18	21	00	03	06	09	12	15	18	21	00	03	06	09	12	15	18	21	00		
MDT 3HRLY	03	06	09	12	15	18	21	00	03	06	09	12	15	18	21	00	03	06	09	12	15	18		
Max/Min Temp	43				78				47				68				37				66			
Temp	50	43	60	69	75	78	65	55	51	47	57	63	66	68	55	45	41	37	51	59	63	66		
Dewpt	34	35	42	41	38	34	39	40	39	37	42	44	45	45	40	36	33	30	37	38	37	35		
Max/Min RH	73				20				68				43				77				32			
RH	53	73	52	36	26	20	39	57	64	68	58	50	46	43	56	69	74	77	59	45	37	32		
Wind Dir	S	S	S	W	W	W	W	W	W	N	N	NE	NE	NE	NE	NE	NE	E	E	SE	SE	E		
Wind Spd	6	6	6	8	8	9	5	5	5	15	14	13	13	9	9	8	8	13	13	16	16	7		
Wind Gust(MPH)	6	6	6	12	12	13	5	5	5	22	19	19	19	13	13	12	12	19	19	23	23	7		
Clouds	SC	SC	SC	SC	SC	SC	SC	SC	SC	BK	BK	BK	BK	SC	SC	SC	SC	SC	SC	SC	SC	SC		
Clouds(%)	46	47	47	48	48	38	38	34	34	69	69	69	69	47	47	47	47	46	46	46	46	50		
POP 12HR	0				0				0				15				10				15			
QPF	0.00				0.00				0.00				0.00				0.00				0.00			



Red Point Indicates Location of Forecast
[Back to Main Page](#)

DATE	WED 05/20/09				THU 05/21/09				FRI 05/22/09				SAT 05/23/09																			
UTC 6HRLY	06	12	18	00	06	12	18	00	06	12	18	00	06	12	18	00																
MDT 6HRLY	00	06	12	18	00	06	12	18	00	06	12	18	00	06	12	18																
Min/Max Temp	46				64				39				64				38				69				42				72			
Temp	51	46	59	64	46	39	58	64	45	38	61	69	49	42	64	72																
Dewpt	40	39	39	34	36	33	35	28	36	34	39	33	37	34	40	35																
RH	66	76	46	33	69	79	42	26	72	85	44	26	62	73	40	26																
Wind Dir	SW	W	W	NW	NW	NW	NW	N	N	SE	SE	E	E	E	E	E																
Wind Speed	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15																
Avg Cloud Cover	SC	SC	SC	FW	FW	SC	SC	FW	FW	FW	FW	FW	FW	SC	SC	SC																
POP 12hr	20				25				10				15				5				10				15							
Rain Showers	S	C	C														S															

[Billings](#)

[Glasgow](#)

[Great Falls](#)

[Missoula](#)

Riverton (Not Available)

[Spokane](#)

Digital FARSITE Interface

A new tool has been developed to allow the direct interaction with the forecast database to produce FARSITE output files. This Interface is available through all NWS Western Region Offices on the upper portion of the Fire Weather Page. Riverton, WY, in Central Region will provide a FARSITE forecast upon request.

Digital FARSITE

Select Interface: Fire Weather Zones Point Forecast Matrix Digital Point Forecast **FARSITE** Obs/RAWS [Activity Planner](#)

Surrounding Offices: Glasgow | GreatFalls | Pocatello | Riverton | Bismarck | RapidCity

Zoom Out <<<

[Spot Request](#) [Fire Status](#) [Forecasts/Outlooks](#) [Fuels](#) [Weather Tools](#) [Admin](#)

Notice to users:
This experimental application generates FARSITE Wind and Weather input files from a digital forecast database. Use the interface below to select a point. Once the point is selected, you will be able to download both the Wind and Weather files. Please relay any comments you have to your local NWS office.

Click a location on the Map below OR Select a RAWS Station from the drop down box OR enter a lat/lon location in decimal degrees.

RAWS Station Or Lat: Lon:

Map locations: Lewis and Clark Portable #2, Kilo, Horse Thief, Steamboat, Cannonbell Creek, Knowlton, Badger Peak, Fort Howes, Bradshaw Creek, Wolf Mountain, Little Bighorn, Soda Springs, MTRMA_PORT1, Billings QD #2, Derby Mountain, Pryor Mountain, Wild Horse, Hillsboro, Boyd Ridge, Burgess, Mill Creek, Deer Mountain, Fishtail, Main Boulder, Wicked Creek, Timbercreek, Custer #1 Portable, Yellow Mule, Shenango, Hebgen Lake, GNF East Zone-Portable, MTRMA_PORT1, Wolf Mountain, Bradshaw Creek, Cannonbell Creek, Knowlton, Badger Peak, Fort Howes, Bradshaw Creek, Wolf Mountain, Little Bighorn, Soda Springs, MTRMA_PORT1, Billings QD #2, Derby Mountain, Pryor Mountain, Wild Horse, Hillsboro, Boyd Ridge, Burgess, Mill Creek, Deer Mountain, Fishtail, Main Boulder, Wicked Creek, Timbercreek, Custer #1 Portable, Yellow Mule, Shenango, Hebgen Lake, GNF East Zone-Portable.

FARSITE data is available from the internet via the appropriate NWS Office Fire Weather Page. Click on the radial button above the tabs. Then choose a RAWS site by using the pull down menu, or clicking on the RAWS site on the map, or entering your own latitude and longitude. Doing any of these will automatically produce the WND and WTR files, as well as take the requestor to the site where the files may be downloaded.

Northern Rockies Annual Fire Weather Operating Plan
Fire Weather Products

****Experimental****
FARSITE Weather Input
National Weather Service
Glasgow

This page shows fire agency requested weather data generated dynamically from weather grids for long range fire planning and strategy support. There are two files for each weather input (WND and WTR). Requested FARSITE weather input is data produced from the WFO Glasgow's digital forecast database.
If you suspect problems with the data, please call immediately.

Click on the file name and Save the files on your hard drive or in your project folder.

Files are for lat/lon location: 48.1494/-106.6845
Farsite Weather (WTR) file
Farsite Wind (WND) file

Webmaster
US Dept of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
Glasgow Weather Forecast Office
101 Airport Road
Glasgow, MT 59230
Tel: (406) 228-4042

Disclaimer
Information Quality
Credits
Glossary

Privacy Policy
Freedom of Information Act
About Us
Career Opportunities

Example of FARSITE output:

Weather:

ENGLISH

03 06 12 0700 1600 30 54 59 30 5620
03 07 63 0700 1600 27 44 84 63 5620
03 08 14 0700 1600 23 43 81 47 5620
etc., through seven days

Wind:

ENGLISH

03 06 0000 11 200 79
03 06 0300 12 200 84
03 06 0600 14 200 95
03 06 0900 15 200 95
03 06 1200 15 200 95
03 06 1500 14 200 90
03 06 1800 13 210 80
03 06 2100 10 220 80
etc., through seven days

Following are the FARSITE links for each office:

[Billings](#)

[Glasgow](#)

[Great Falls](#)

[Missoula](#)

[Riverton](#)

[Spokane](#)

Experimental Clearing Index (CI)

The Experimental Clearing Index is an Air Quality/Smoke Dispersion index that combines the affects of the Mixing Height (the maximum height above ground level that smoke could mix to during a designated period) and the Transport Winds (average wind within the Mixing Height). The computation of CI is as follows:

$$CI = (\text{Mixing Height}/100) \times \text{Transport Wind}$$

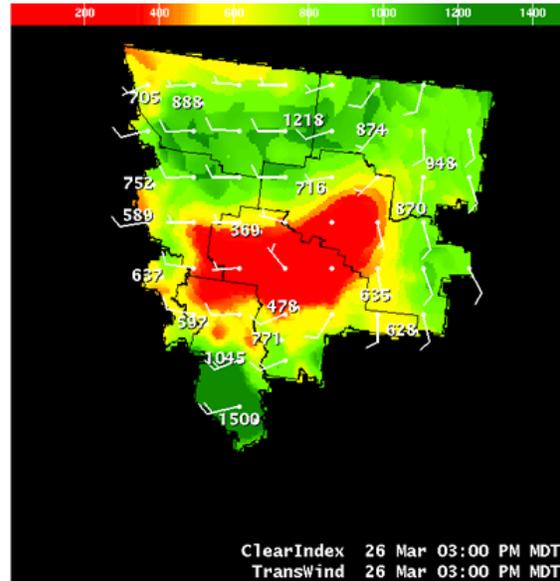
As an example:

Mixing Height = 8000 feet above ground level (AGL)

Transport Winds = 10 knots

$$CI = (8000/100) \times 10 = 800$$

A higher Clearing Index indicates better smoke dispersion.



The implementation of this product in Montana and north central Idaho is an effort to provide burners a more consistent method of using Mixing Height and Transport Wind information in their decision making. The Weather Service offices in Billings, Glasgow, Great Falls, Missoula and Spokane will provide maximum daytime CI forecasts out to three days. The CI will not be provided at night as it will generally be quite low.

Transport winds have also been added to the clearing index graphic. Transport wind speed is already part of the clearing index calculation, but the wind barbs will provide additional information on the potential smoke movement.

Qualitative Adjectives:

A group representing the various land management agencies, the Montana/Idaho Airshed Group, and the Northern Rockies Predictive Services Unit has assigned qualitative smoke dispersion adjectives to CI thresholds. These can be found on the Predictive Services web page at

http://people.montana.com/~smokemu/index_files/ClearingIndex.htm.

[Billings](#)

[Glasgow](#)

[Great Falls](#)

[Missoula](#)

[Spokane](#)

Riverton (No Clearing Index issued)

METEOROLOGICAL SERVICES

Briefings

Predictive Services or NWS meteorologists may be asked to provide briefings to agency decision-makers. The briefings usually consist of a short-term weather discussion of critical weather patterns and a longer-term discussion of trends during the next several days. These are designed to provide tactical (operational) and strategic (planning) information as needed for land managers.

Briefing schedules are determined by management priorities and therefore will vary with season, and fire activity. These briefing schedules and conference bridge phone numbers will be provided as needed.

Fire Weather Briefing Conference Calls

The National Weather Service Offices within the Northern Rockies Geographical Area may offer fire weather briefings via conference calls for local land managers. The briefings include an informational package containing data such as satellite images, weather observations, and forecast model data.

Please refer to your local servicing office's individual section, or contact that office, to determine if Fire Weather Briefing Conference Calls are available.

Incident Meteorologist (IMET)

Onsite weather support to large wildfires, prescribed fires, and other major incidents is available. The ordering process for Incident Meteorologists (IMETs) and supporting equipment is detailed in Chapter 20 of the [National Interagency Mobilization Guide](#). Conditions of these special dispatches are in the [National Interagency Agreement for Meteorological and Other Technical Services](#).

Liaison

The Fire Weather Program Managers (FWPM's) will visit a portion of their fire weather districts annually for familiarization, liaison, and program coordination. FWPM's are open to discuss any forecast problems, proposed prescribed burning plans in respect to weather needs, and any weather anomalies peculiar to their area. Ample notification will be provided prior to any visitation.

Training

Fire Weather forecasters are available for training courses, workshops, and seminars. When requesting a forecaster for these events, please give as much advance notification as possible. Per Diem and travel costs will be billed to the requesting Agency, as outlined in the [IMET/Fire Weather Reimbursable Handbook](#). For the assistance of a forecaster, please contact the Fire Weather Program Manager of your local servicing office.

There is a need for advanced notice for NWS participation with training or meetings. The longer lead time to plan (several months ideally with 3 weeks as a minimum) the better chance the office will be able to provide the service. The NWS Union Negotiated Agreement provides rules for scheduling of Bargaining Unit employees that limits modification of the work schedule in the short term. In cases where an office cannot provide the requested service, every effort will be made to find a back up meteorologist from a neighboring NWS office or the Predictive Services Unit.

NOAA Weather Radio Broadcasts

The NWS offices provide continuous broadcasts of public weather forecasts and warning information via NOAA Weather Radio (NWR), however, fire weather products are not included. The reception varies and is limited to line-of-sight. The information received over the NWR should be used **ONLY** as a supplement to the fire weather products prepared for your area.

Standard Nationwide NWR Frequencies (MHz) are:

162.400 162.425 162.450 162.475 162.500 162.525 162.550

Frequency	Area Covered
162.550 MHZ	Baker, MT
162.500 MHZ	Belgian Hill, MT
162.550 MHZ	Billings, MT
162.550 MHZ	Boise, ID
162.500 MHZ	Bonnors Ferry, ID
162.500 MHZ	Bozeman, MT
162.425 MHZ	Broadus, MT
162.450 MHZ	Browning, MT

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Meteorological Services**

162.550 MHZ	Butte, MT
162.550 MHZ	Circle, MT
162.500 MHZ	Conrad, MT
162.525 MHZ	Dayton, WA
162.400 MHZ	Dickinson, ND
162.475 MHZ	Dillon, MT
162.525 MHZ	Forsyth, MT
162.400 MHZ	Glasgow, MT
162.475 MHZ	Glendive, MT
162.525 MHZ	Glentana/Opheim
162.450 MHZ	Grangeville, ID
162.450 MHZ	Grant Village, WY
162.550 MHZ	Great Falls, MT
162.450 MHZ	Hardin, MT
162.400 MHZ	Havre, MT
162.400 MHZ	Helena, MT
162.500 MHZ	Jordan, MT
162.550 MHZ	Kalispell, MT
162.400 MHZ	Lethbridge, AB
162.550 MHZ	Lewiston, ID
162.500 MHZ	Lewistown, MT
162.525 MHZ	Livingston, MT
162.475 MHZ	Malta, MT
162.425 MHZ	Mammoth, WY
162.475 MHZ	McCall, ID
162.550 MHZ	Medicine Hat, AB
162.400 MHZ	Miles City, MT

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162.400 MHZ	Missoula, MT
162.400 MHZ	Pendleton, OR
162.475 MHZ	Plentywood, MT
162.550 MHZ	Pocatello, ID
162.550 MHZ	Poplar, MT
162.550 MHZ	Rapid City, SD
162.400 MHZ	Red Lodge, MT
162.450 MHZ	Ryegate, MT
162.450 MHZ	Roundup, MT
162.475 MHZ	Scobey, MT
162.475 MHZ	Sheridan, WY
162.400 MHZ	Spokane, ID
162.550 MHZ	Swift Current, SK
162.400 MHZ	Twin Falls, ID
162.550 MHZ	Williston, ND
162.400 MHZ	Winnett, MT

WIMS STATION ID CONTACT

All Remote Automated Weather Stations (RAWS) have been assigned numbers to be used as the identification number when entering into the Weather Information Management System (WIMS). If a new station is established, or a present station moved, a new identification number should be requested from the [Predictive Services RAWS Coordinator](#) at 406-329-4952.

The request should include:

- Station Name,
- Type of Station,
- State,
- County,
- Latitude/Longitude,
- Legal (township, range, section),
- Elevation, and
- Operating Agency

**Northern Rockies Annual Fire Weather Operating Plan
Interagency Agreement for Meteorological and Other Technical Services**

INTERAGENCY AGREEMENT
for
METEOROLOGICAL and OTHER TECHNICAL SERVICES

among the
Bureau of Land Management
Bureau of Indian Affairs
Fish and Wildlife Service
National Park Service
of the
United States Department of the Interior
and the
Forest Service
of the
United States Department of Agriculture
and the
National Weather Service
of the
National Oceanic and Atmospheric Administration
United States Department of Commerce

BLM Agreement No. 1422RAI080003
BIA Agreement No. RS08K42F01
FWS Agreement No. 982108K001
FS Agreement No. 08-IA-11130206-010
NPS Agreement No. F956080028
NWS Agreement No. 0-02 FedFireWeather 2008

I. INTRODUCTION.

Fire management and suppression in the Nation's wildlands is an on-going concern to the American public and to the Department of the Interior's Bureau of Land Management, Bureau of Indian Affairs, Fish and Wildlife Service, and National Park Service, and the Department of Agriculture, Forest Service, as well as to the Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service (NWS). Considerable cooperation and coordination among these agencies exists, which is critical to the success of fire management, suppression and safety. This agreement will refer to the National Weather Service, herein after referred to as "NWS," and the federal wildland fire management agencies, hereinafter referred to collectively as the "Wildland Fire Agencies."

The NWS is legally mandated to issue weather forecasts and warnings for the protection of life and property. In accordance with this mandate, the NWS will make a strong commitment to maintain a cadre of trained Incident Meteorologists (IMET) to meet the needs of the Wildland Fire Agencies under the terms of this agreement. The Wildland Fire Agencies recognize this mandated function of the NWS and the critical importance of the IMET's role in the incident command structure. The NWS IMET program has a long history of being a integral component to Wildland Fire Agencies'

Northern Rockies Annual Fire Weather Operating Plan Interagency Agreement for Meteorological and Other Technical Services

incident operations and planning, and the agencies anticipate there will be increasing demand for NWS IMET services in the future due to the increasing numbers of complex fire events and natural disasters. The Wildland Fire Agencies are responsible for the stewardship and/or protection of lands owned or held in trust by the United States or under the jurisdiction of state agencies.

The Wildland Fire Agencies are also responsible to ensure incident command team position qualifications and practices are consistent, standardized and reviewed in terms of currency and relevance. An interagency alliance involving essential aspects of fire weather products and services is crucial to the success of the Wildland Fire Agencies' missions.

II. AUTHORITIES.

- A. Economy Act of June 30, 1932, as amended (31 U.S.C. 1535).
- B. Organic Act of 1890 (15 U.S.C. 313).
- C. National Climate Program Act (15 U.S.C. 2901 *et seq.*).
- D. Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701 *et seq.*).
- E. National Park Service Organic Act of August 1916 (16 U.S.C. 1).
- F. National Wildlife Refuge Administration Act of June 27, 1998 (16 U.S.C. 668dd).
- G. National Indian Forest Resources Management Act of 1990 (25 U.S.C. 3101 *et seq.*).
- H. Cooperative Forestry Assistance Act of 1978 (16 U.S.C. § 2101 *et seq.*).
- I. Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended (42 U.S.C. 5121 *et seq.*).

III. PURPOSE.

The purpose of this Interagency Agreement is to identify products and services that are exchanged between the NWS and Wildland Fire Agencies. These products and services are designed to meet the needs of the public and all agencies for the protection of life, property, cost containment and efficiency to enhance ecosystem health. It is also the purpose of this Agreement to set forth the terms and conditions under which services are requested by the Wildland Fire Agencies. Accurate and timely meteorological and fire danger information is required to manage resources effectively and efficiently.

IV. OBJECTIVES.

The objectives of this Agreement are:

- A. Identify those products and services to be exchanged between the NWS and Wildland Fire Agencies;
- B. Continue and maintain interagency relationships; and
- C. Define roles and responsibilities of the NWS and Wildland Fire Agencies.

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V. RESPONSIBILITIES.

The responsibilities and services listed are not all-inclusive, but are meant to provide the overall scope of products, services and activities exchanged or requested by the respective agencies. All services undertaken by the NWS and Wildland Fire Agencies under this Agreement are subject to the availability of appropriated funds and are further defined in the Annual Operating Plan.

A. The NWS agrees to provide:

1. Basic meteorological services.
2. Non-routine services include, but are not limited to on-site meteorological support consultations and technical advice.
3. Wildland fire suppression-related support activities.
4. Other special fire management services including, but not limited to support for landscape scale prescribed wildland fires, Burned Area Emergency Rehabilitation (BAER) Teams, forecasting support for Long Term Fire Analyst (LTAN) input on wildland fires, and other technical support staff on Incidents. Special provision can be made to supply other technical services staff who meet interagency position standards during critical events of national significance and/or during national Planning Level (PL) 4 or 5. Supply of other technical services staff must have the approval of the applicable NWS Region and will be ordered via normal resource ordering process.

B. Wildland Fire Agencies agree to provide:

1. Operational support.
2. Wildland fire weather program management.
3. Research, development and application.
4. Reimbursement to the NWS for the following activities associated with on-site meteorological support:
 - a. Costs incurred by the NWS IMET duty station.
 - b. Costs above base salary including overtime incurred by the NWS IMET or compensatory time in lieu of overtime.
 - c. Administrative leave for NWS IMETs and the NWS IMET duty station, immediately effective following the release/travel date on the applicable Resource Order and return to the IMET's duty station, as appropriate. The determination of eligibility must be consistent with the policies in the Interagency Incident Business Management Handbook, <http://www.nwcg.gov/pms/pubs/iibmh>, for federal employees. This assists with maintaining proper work-rest periods
 - d. Costs for logistical and weather observation support required by NWS personnel at on-site operations.
 - e. Telecommunication services costs will be computed annually based on the average prorated percentage rate of use, as applicable, and/or otherwise attributable to the Wildland Fire Agencies and further defined in the National AOP. The Wildland Fire

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Agencies will split the prorated cost annually according to the National Wildfire Coordination Group (NWCG) cost distribution rate, and billings/payments will be obligated and administered at the national level.

- f. Hardware replacement for items that are damaged or fail due to on-site incident conditions.
- g. All travel costs and lodging expenses are authorized as consistent with the policies in the Interagency Incident Business Management Handbook for federal employees, <http://www.nwcg.gov/pms/pubs/iibmh>. Rental vehicles, or privately owned vehicle (POV) mileage, are authorized for IMETs due to the substantial amount of equipment they are required to bring with them to an incident.
- h. Miscellaneous office supplies necessary to accomplish on-site support.

VI. JOINT RESPONSIBILITIES:

NWS and Wildland Fire Agencies shall jointly prepare, as warranted, National and Geographic Area specific Annual Operating Plans (AOP) for Fire Weather Services separate from this Agreement that will set procedures and establish costs at Geographical Area Coordination Centers (GACC), National Interagency Fire Center (NIFC), or forecast office level. AOPs developed at the National, GACC and/or local levels shall not conflict with the terms of this Agreement or the procedures of the Mobilization Guides, and shall include:

- A. Shared responsibilities of all participants includes, but are not limited to weather briefings, training, research, product/service verification as outlined in Geographic Area specific AOPs.
- B. Procedures for documenting, monitoring and evaluating fire weather products, briefings and services delivered.
- D. Provision for monitoring and evaluating advances in science and technology.
- E. Provision for efficient means for technology transfer.
- F. Provision for participation in fire weather research, development and application activities.
- G. Provision that the NWS and Interagency Wildland Fire Agencies will work together at the National level to review IMET qualifications and standards annually, and will include changes, as appropriate, in the National Annual Operating Plan.
- H. Provision that NWS and Wildland Fire Agencies will work together to ensure fire agency decision makers receive consistent products and services.
- I. Provision that the NWS and Wildland Fire Agencies will jointly develop and share meteorological methodologies and procedures.
- J. Participation in weather briefings and conference calls with GACCs, NIFC, Multi-Agency Coordination Groups, NWS offices and IMETs as outlined in Annual Operating Plans.
- K. Provision of fire weather expertise in accident/incident investigations.
- L. Provision that the NWS forecast offices and Wildland Fire Agencies' websites establish specific links to both NWS and Predictive Services products.

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- M. Participation in Interagency groups
1. **Pre-season:**
 - a. Ensure that appropriate levels of communication are taking place prior to start of fire season.
 - b. Make updates to and disseminate (agency) points of contact list separate from this agreement and as warranted.
 - c. Address training needs and scheduling classes, as needed.
 - d. Update operational procedures documents, as needed and appropriate.
 2. **Post-season:**

Conduct a post season meeting either on site or by teleconferencing or by other means to review the coordinated actions of the prior season and share any “lessons learned” and suggested improvements to the overall process.
- N. Participation in a meeting or teleconference annually to review the status of the current year operations and determine necessary changes. This shall include estimating the costs for such changes and determining the recommended services and responsibilities among the partnering agencies in the development of the AOP.
- O. Maintenance of procedures for obtaining services, on-site support, other non-routine services and payment can be found in the Geographical Area and National Mobilization Guides. An electronic copy of the *National Mobilization Guide (aka “Red Book”)* can be viewed via www.nifc.gov by selecting “National Interagency Coordination Center.” Then select the “Policy” and “Reference Material” links to National Mobilization Guide.
- P. Establishment of separate agreements or other appropriate arrangements between the requesting and servicing entities for requesting participation and providing reimbursement for NWS employees to serve as instructors in National Wildfire Coordinating Group (NWCG) and other courses. Reference the National Annual Operating Plan for additional information.

VII. AVAILABILITY OF APPROPRIATED FUNDS.

The signatory agencies enter into this Agreement under the authority of the Economy Act (31 U.S.C. §1535), and their respective organic and appropriation acts.

The ability of the parties to carry out their responsibilities under this Interagency Agreement is subject to their respective funding procedures and the availability of appropriated funds. Should any party encounter budgetary shortfalls which may affect the activities to be carried out under this Interagency Agreement, that party will provide timely notification to the other party in writing. The Wildland Fire Agencies’ funding is identified as no-year funding.

The signatory agencies recognize that, given the current administrative process for payments for fire suppression activities, it is not feasible to obligate the full amount of funds that may be required pursuant to this Agreement, because this Interagency Agreement does not constitute a binding obligation under 31 U.S.C. § 1501 and since it cannot anticipate the specific goods or services for which payment will be requested, the individual payment amounts, or the responsible jurisdictional wildland fire management agency in each future case. This information can only be provided by Resource Orders executed when the goods or services are requested. At the same time, the signatory agencies recognize that Resource Orders are insufficient to constitute a binding obligation under the

Northern Rockies Annual Fire Weather Operating Plan Interagency Agreement for Meteorological and Other Technical Services

statute because there is no evidence of intent to be bound, no authorized signatures are present, and no legal authorities are cited, however, these requirements are satisfied by this Interagency Agreement. The two documents, when taken together, contain all the elements required for an obligation under the statute. Hence, the signatory agencies agree that this Interagency Agreement shall automatically be incorporated by reference into any Resource Orders issued under it for IMET services and products, and that an obligation of funds will occur by the responsible agency at the time the NWS presents a copy of this Agreement and the Resource Orders for payment.

VIII. STATEMENT OF WORK.

Procedures for notification of and obtaining services from the NWS will be prepared and specified in the AOPs and/or in the Memoranda of Understanding (MOU) for the Geographic Area Coordinating Centers, and in the Geographical Area and National Mobilization Guides. An electronic copy of the *National Mobilization Guide* can be viewed via www.nifc.gov by selecting "National Interagency Coordination Center," then selecting the "Policy" and "Reference Material" links to the National Mobilization Guide.

IX. TRANSFER OF FUNDS.

- A. Billing and collection procedures will follow the Intra-governmental Payment and Collection (IPAC) system process.
- B. Wildland Fire Suppression Activities: Obligation of funds and reimbursement of expenditures under this subsection are under the Economy Act (31 U.S.C. 1535). This Agreement is automatically incorporated by reference into any Resource Order that is issued under it, constituting a binding obligation. The Wildland Fire Agencies warrant that they will ensure the funds will be available when the obligations are recorded. The recording of the obligations will occur upon the receipt of the billing/IMET Reimbursable Expense Report package that includes the Fire Weather Billing spreadsheet by the applicable Wildland Fire Agency from the NWS. Each NWS' billing/expenditures invoice will be endorsed, reference the Resource Order, confirm the dates of services, include the amount billed, and include data elements required under Treasury Financial Manual, Vol.1, Bulletin 2007-03: each party's Treasury Account Symbol (TAS)--also called appropriation code, Business Partner Network Number--also called DUNS number, and Business Event Type Code (BETC). The billing/expense report package, inclusive of copies of this Agreement or reference to its applicable document number(s), the Resource Order(s) copy, and expenditure documentation, will define the specific services, supplied goods and costs for each order, and subsequent obligation and payment by the applicable jurisdictional Wildland Fire Agency.
 1. Reimbursement payments for suppression-related activities will be accomplished submission of billing invoices by NWS, which are inclusive of copies of the Resource Orders that define the requested services and goods, and the expenditure back-up documentation to the responsible jurisdictional wildland fire agency. The NWS will not charge an administrative surcharge/indirect cost rate or any other expenditure that is not authorized under the Wildland Fire Agencies' Mobilization Guides, Handbooks and fully executed AOPs as identified in this Agreement and related to these activities. Items to be included are listed as follows.
 - a. The fire name, jurisdictional unit, and incident number (The copy of the Resource Order generally includes this information as does the IMET Reimbursement Expense Form);
 - b. Applicable support documentation requirements and required agency data elements ;

**Northern Rockies Annual Fire Weather Operating Plan
Interagency Agreement for Meteorological and Other Technical Services**

- c. A copy of this Interagency Agreement complete with signatures, or the agency's agreement document number for subsequent billings;
 - d. Identification (name and phone number) of NWS financial contact; and
 - e. IPAC billings are to be submitted to the appropriate payment center by the NWS within sixty (60)-days of completion of service.
2. It is the responsibility of the requesting agency/office to develop and process a unilaterally signed funding document, or as otherwise authorized through the individual agencies' policies, to obligate funds. It is also the responsibility of the requesting agency/office to:
- a. Conduct any required verification of costs, authorization of expenditures and reconciliation of payment;
 - b. Provide the document number of the funding obligation, required agency data elements and billing instructions to the NWS office that provided the service; and
 - c. Provide information to NWS regarding which payment center to send the billings for processing;
- C. Non-Wildland Fire Suppression Activities: Activities requested under this heading are limited to unusual circumstances that require an on-site IMET and/or other technical support personnel to support landscape scale prescribed wildland fires, Burned Area Emergency Rehabilitation (BAER) Teams, and forecasting support for Long Term Fire Analyst (LTAN) input on wildland fires. The IMET must be requested through the Resource Order process. The obligation of funds, billings and payment functions will be accomplished pursuant to the process outlined above in Item B. of this Section and the Economy Act. The majority of IMET and/or other technical support to these activities is accomplished through Spot Weather Forecasts, which are provided by NWS without cost to the requesting agency.
- D. All-Hazard Emergency Incident Activities: Shall be accomplished pursuant to the National Response Plan and the applicable Emergency Support Function (ESF) policies and procedures. The Forest Service is the primary agency coordinator for the Wildland Fire Management Agencies, except for the operations that occur in the State of Alaska where the Bureau of Land Management is the operational lead. Related obligation of funds, billings and payments are to be accomplished separate from this Agreement and pursuant to the National Response Plan. As a Support Agency listed under the ESF #4 and in accordance with the policies and procedures, the Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service will bill the Department of Homeland Security, Federal Emergency Management Administration (FEMA) directly for all related costs for this activity.

X. TERM OF AGREEMENT.

The effective date of this Agreement will commence upon full execution of the final signature by the identified signatory agencies, and will include appropriate accrued costs for continuation of service effective October 01, 2007, and shall remain in effect through September 30, 2012, or until such time as the Interagency Agreement is terminated by mutual agreement. The Agreement shall be reviewed by all participants to determine its suitability for renewal, revision, or termination in accordance with Section XI. If this Agreement is extended, the extension must be in writing, and approved and signed by authorized signatories for the agencies.

**Northern Rockies Annual Fire Weather Operating Plan
Interagency Agreement for Meteorological and Other Technical Services**

XI. TERMINATION AND SEVERABILITY.

Any signatory may terminate their participation in this Interagency Agreement by written notice to all other signatories at any time before the date of expiration upon thirty (30) days written notice of such termination. Full credit shall be allowed for each affected party's expense and all non-cancelable obligations properly incurred up to the effective date of termination. The remaining signatories may continue the provisions of this Interagency Agreement as long as the NWS remains a signatory.

Nothing herein is intended to conflict with current DOC, USDA or DOI directives. If the terms of this Interagency Agreement are inconsistent with existing directives of either of the agencies entering into this Interagency Agreement, then those portions of the Interagency Agreement that are determined to be inconsistent shall be invalid but the remaining terms and conditions not affected by the inconsistency shall remain in full force and effect. At the first opportunity for review of the Interagency Agreement, all necessary changes will be accomplished either by an amendment to this Interagency Agreement or by entering into a new agreement, whichever is deemed expedient to the interest of all Parties.

XII. RESOLUTION OF DISAGREEMENT.

Should disagreement arise on the interpretation of the provisions or implementation of this agreement, the dispute shall be resolved pursuant to the Business Rules for Intragovernmental Transactions delineated in the Treasury Financial Manual, Vol.1, Bulletin 2007-03, Section VII (Resolving Intra-governmental Disputes and Major Differences).

XIII. MODIFYING THE AGREEMENT.

Any signatory agency may initiate the modification of this Interagency Agreement to incorporate any changes that are mutually agreed to by the participants. Such modifications shall be in writing and shall identify the specific activities, the total amount of funds applicable to the modification, as appropriate, and any other pertinent details of the modification. The BLM is designated as the agency responsible for all administrative oversight and preparation of modifications to this agreement. The modification(s) shall not take effect until documented and signed by authorized signatories for the agencies.

XIV. PRINCIPAL CONTACTS.

The Points of Contact are responsible for coordinating an annual review of the currency and adequacy of this Agreement among the signatories, and/or their designees. Changes to the Points of Contact can be made by written notification to the participating agencies.

National Weather Service:
National Fire Weather Program Manager
Heath Hockenberry
National Weather Service
3833 South Development Ave.
Boise, ID 83705
208/334-9862 – Office
heath.hockenberry@noaa.gov

Interagency Wildland Fire Agencies:
NIFC Fire Weather Program Manager
Rick Ochoa
National Interagency Fire Center
3833 South Development Ave.
Boise, ID 83705
208/387-5451- Office
rick_ochoa@nifc.blm.gov

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Interagency Agreement for Meteorological and Other Technical Services**

XV. DEFINITIONS.

See NWCG Glossary of Fire Weather Terminology (www.nwcg.gov/pms/pubs/glossary)

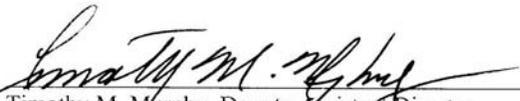
XVI. SIGNATORY.

This Agreement shall be effective with and upon full execution of the final signature by the identified signatory agencies, and it will remain in effect through September 30, 2012.



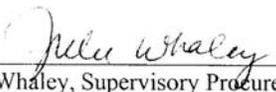
David Caldwell, Director
Office of Climate, Water and Weather Services
DOC, NOAA, National Weather Service

07/21/08
Date



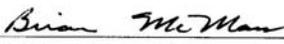
Timothy M. Murphy, Deputy Assistant Director
Fire and Aviation (Boise)
DOI, Bureau of Land Management

08-01-08
Date



Julie Whaley, Supervisory Procurement Analyst
Bureau of Land Management- Fire and Aviation (Boise)

8/1/08
Date



Brian McManus, Chief
Branch of Fire Management
DOI, Fish and Wildlife Services

7/23/08
Date



Nedra Stallone, Contracting Officer
Fish and Wildlife Services – Division of Contracts and
Facilities Management

Date

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Lyle Carlile, Director
Branch of Fire Management
DOI, Bureau of Indian Affairs

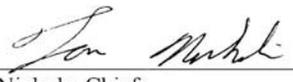
7/23/08

Date

see attached

Byron J. Greene, Contracting Officer
Bureau of Indian Affairs - Division of Acquisition

Date



Tom Nichols, Chief
Branch of Wildland Fire
DOI, National Park Service

7/23/08

Date

see attached

Mary Ray, Contracting Officer
National Park Service – Washington Office

Date



Karyn L. Wood, Assistant Director, Operations
Fire and Aviation Management
USDA, Forest Service

7-23-08

Date



Cheryl Molis, Administrative Manager
USDA, Forest Service- Fire and Aviation Management

7-28-08

Date

**Northern Rockies Annual Fire Weather Operating Plan
Interagency Agreement for Meteorological and Other Technical Services**

XV. DEFINITIONS.

See NWCG Glossary of Fire Weather Terminology (www.nwcg.gov/pms/pubs/glossary)

XVI. SIGNATORY.

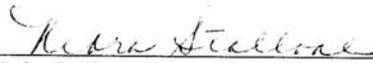
This Agreement shall be effective with and upon full execution of the final signature by the identified signatory agencies, and it will remain in effect through September 30, 2012.

David Caldwell, Director
Office of Climate, Water and Weather Services
DOC, NOAA, National Weather Service
Date _____

Timothy M. Murphy, Deputy Assistant Director
Fire and Aviation (Boise)
DOI, Bureau of Land Management
Date _____

Julie Whaley, Supervisory Procurement Analyst
Bureau of Land Management - Fire and Aviation (Boise)
Date _____

Brian McManus, Chief
Branch of Fire Management
DOI, Fish and Wildlife Services
Date _____



Nedra Stallone, Contracting Officer
Fish and Wildlife Services – Division of Contracts and
Facilities Management
Date 6/27/08

**Northern Rockies Annual Fire Weather Operating Plan
Interagency Agreement for Meteorological and Other Technical Services**

Lyle Carlile, Director
Branch of Fire Management
DOI, Bureau of Indian Affairs

Date



Byron J. Greene, Contracting Officer
Bureau of Indian Affairs - Division of Acquisition

14 Jul 2008

Date

Tom Nichols, Acting Chief
Branch of Wildland Fire
DOI, National Park Service

Date

Mary Ray, Contracting Specialist
National Park Service – Washington Office

Date

Karyn L. Wood, Assistant Director, Operations
Fire and Aviation Management
USDA, Forest Service

Date

Cheryl Molis, Administrative Manager
USDA, Forest Service- Fire and Aviation Management

Date

**Northern Rockies Annual Fire Weather Operating Plan
Interagency Agreement for Meteorological and Other Technical Services**

Lyle Carlile, Director
Branch of Fire Management
DOI, Bureau of Indian Affairs

Date

Byron J. Greene, Contracting Officer
Bureau of Indian Affairs - Division of Acquisition

Date

Tom Nichols, Acting Chief
Branch of Wildland Fire
DOI, National Park Service

Date

Mary Ray

Mary Ray, Contracting Officer
National Park Service – Washington Office

7-10-08

Date

Karyn L. Wood, Assistant Director, Operations
Fire and Aviation Management
USDA, Forest Service

Date

Cheryl Molis, Administrative Manager
USDA, Forest Service- Fire and Aviation Management

Date

WEATHER TERMINOLOGY

In general, terms used in fire-weather discussion and summaries are plain language 'dictionary' words. There are, however, a few terms which have a meteorological connotation not covered by the standard dictionary definition. These are defined below:

Advection: The transfer of atmospheric properties by horizontal movement of air. Most commonly used in reference to transfer of warmer or colder air.

Dry Thunderstorm: A lightning storm accompanied by less than a wetting rain, 0.10 inch precipitation or less, often with very gusty winds.

Front: (cold, warm, or stationary) A zone of temperature and density discontinuity between two air masses.

Gradient: (pressure gradient) Change of value of the atmospheric pressure per unit of distance. The greater the change per unit of distance, the stronger the gradient, and the stronger the winds.

High: An area of high-atmospheric pressure delineated by closed isobars.

Instability: (unstable air mass) A state in which the vertical distribution of temperature is such that an air particle, if given either an upward or downward impulse, will tend to move away with increasing speed from its original level. Thunderstorm development would be an example of an unstable air mass.

Low: (depression, cell, disturbance) An area of low atmospheric pressure delineated by closed isobars (lines of equal pressure).

Low Aloft: (cold low, cold low aloft, upper-level low) Same as low above, except occurring in the upper atmosphere and characterized by moist, unstable and abnormally cooler temperatures aloft.

Ridge: (high-pressure ridge) An elongated area of relatively high atmospheric pressure.

Ridge Aloft: The same as ridge but occurring in the upper atmosphere. When a ridge is strong and persistent, it is often associated with warm and dry subsiding air.

Stability: (stable air mass) A state in which the vertical distribution of temperature is such that an air particle will resist displacement from its level. An inversion is an example of a very stable condition.

Subsidence: (subsiding air) A descending motion of air in the atmosphere.

Temperature Inversion: (inversion) A layer in which the temperature increases with altitude.

Thermal low: (heat low) A low pressure system caused by intensive heating at the earth's surface. Not associated with frontal systems. Occurs under high-pressure aloft and remains stationary.

Trough (Trof): An elongated area of relatively low atmospheric pressure. The axis of a trough is the trough line. Fronts are often located in the trough line at the surface.

Upper-level Trough: (upper trough, trough aloft) A pressure trough existing in the upper atmosphere.

LIGHTNING ACTIVITY LEVEL GUIDE

The lightning activity level guide for observers describes clouds, storm and lightning frequency criteria for classifying lightning events. Because the objective is to describe the lightning activity, lightning counts take precedence over the cloud-storm-rain narrative description. For instance, if the clouds should fit the LAL 3 descriptive criteria, but the lightning averages three cloud-to-ground discharges per minute, the LAL should be classified as a 4.

Also included in the lightning activity level guide for observers is the relative frequency of occurrence of the various LAL. For instance, LAL 6 is a rare event not likely to occur on more than 1 or 2 percent of the lightning days.

The observation of lightning (the LAL) should include what has happened within a 25 to 30-mile radius of the station.

The fire weather observer must obtain as much information as possible from all available sources to insure an accurate LAL observation. The fire weather forecaster has other sources of information on thunderstorm activity, and therefore, should be consulted if there is confusion over the selection of an LAL.

Lightning Activity Level Guide for Weather Observers

LAL	Cloud & Storm Development	Individual Storm Cell Cloud to Ground Lightning Discharge (cg)			% of T-storm Days
		Countsc g/5 min	Countsc g/15 min	Avg. cg/min	
1	No T-storms	-	-	-	--
2	Cumulus clouds are common but only a few reach the towering cumulus stage. A single thunderstorm must be confirmed in the observation area. The clouds produce mainly virga, but light rain will occasionally reach the ground. Lightning is very infrequent.	1-5	1-8		10
3	Towering cumulus covers less than two-tenths of the sky. Thunderstorms are few, but two to three must occur within the observation area. Light to moderate rain will reach the ground, and lightning is infrequent.	6-10	9-15	1-2	35
4	Towering cumulus covers two to three-tenths of the sky. Thunderstorms are scattered and more than three must occur within the observation area. Moderate rain is common and lightning is frequent.	11-15	16-25	2-3	35
5	Towering cumulus and thunderstorms are numerous. They cover more than three-tenths and occasionally obscure the sky. Rain is moderate to heavy and lightning is frequent and intense.	>15	>25	>3	18
6	Similar to LAL 3 except thunderstorms are dry.				<2

Map of Fire Weather Zones



SPOT REQUEST
(See reverse for instructions)

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

Please provide feedback to WFO on forecast.

1. Time†	2. Date	3. Name of Incident or Project	4. Requesting Agency			
5. Requesting Official		6. Phone Number	7. Fax Number		8. Contact Person	
9. Ignition/Incident Time and Date		12. Reason for Spot Request (choose one only) <input type="radio"/> Wildfire <input type="radio"/> Non-Wildfire Under the Interagency Agreement for Meteorological Services (USFS, BLM, NPS, USFWS, BIA) <input type="radio"/> Non-Wildfire State, tribal or local fire agency working in coordination with a federal participant in the Interagency Agreement for Meteorological Services <input type="radio"/> Non-Wildfire Essential to public safety, e.g. due to the proximity of population centers or critical infrastructure.		13. Latitude/Longitude:		
10. Size (Acres)				14. Elevation (ft, Mean Sea Level) Top: Bottom:		
11. Type of Incident <input type="radio"/> Wildfire <input type="radio"/> Prescribed Fire <input type="radio"/> Wildland Fire Use (WFU) <input type="radio"/> HAZMAT <input type="radio"/> Search And Rescue (SAR)				15. Drainage		
				16. Aspect	17. Sheltering <input type="radio"/> Full <input type="radio"/> Partial <input type="radio"/> Unsheltered	

18. Fuel Type: Grass Brush Timber Slash Grass/Timber Understory Other _____
Fuel Model: 1,2,3 4,5,6,7 8,9,10 11,12,13 2,5,8

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

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

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

21. Requested Forecast Period Date _____ Start _____ End _____ Forecast needed for: <input type="radio"/> Today <input type="radio"/> Tonight <input type="radio"/> Day 2 <input type="radio"/> Extended	22. Primary Forecast Elements (Check all that are needed) <i>(for management ignited wildland fires, provide prescription parameters):</i> <table style="width:100%;"> <tr> <td style="width:50%;">Needed:</td> <td style="width:50%;"></td> </tr> <tr> <td>Sky/Weather</td> <td>___</td> </tr> <tr> <td>Temperature</td> <td>___</td> </tr> <tr> <td>Humidity</td> <td>___</td> </tr> <tr> <td>20 ft Wind</td> <td>___</td> </tr> <tr> <td>Valley</td> <td>___</td> </tr> <tr> <td>Ridge Top</td> <td>___</td> </tr> <tr> <td>Other (Specify in #23)</td> <td>___</td> </tr> </table>	Needed:		Sky/Weather	___	Temperature	___	Humidity	___	20 ft Wind	___	Valley	___	Ridge Top	___	Other (Specify in #23)	___	23. Remarks (other needed forecast elements, forecast needed for specific time, etc.) _____ _____ _____
Needed:																		
Sky/Weather	___																	
Temperature	___																	
Humidity	___																	
20 ft Wind	___																	
Valley	___																	
Ridge Top	___																	
Other (Specify in #23)	___																	

24. Send Forecast to: ATTN: _____	25. Location: _____	26. Phone Number: _____ Fax Number: _____
---	----------------------------	--

27. Remarks (Special requests, incident details, Smoke Dispersion elements needed, etc.):

EXPLANATION OF SYMBOLS: † Use 24-hour clock to indicate time. Example: 10:15 p.m. = 2215; 10:15 a.m. = 1015
 Indicate local standard time or local daylight time

WS FORM D-1
WS FORM D-1, January 2005 INSTRUCTIONS:

I. Incident Personnel:

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

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

- b. If the incident (HAZMAT, SAR) involves marine, put the wave/swell height and direction in the Remarks section.
2. Transmit in numerical sequence or fax to the appropriate Weather Forecast Office. (A weather forecaster on duty will complete the special forecast as quickly as possible and transmit the forecast and outlook to you by the method requested)
3. Retain completed copy for your records.
4. **Provide feedback to NWS utilizing separate page.** Be sure to include a copy of the spot forecast with any feedback submission including forecaster's name. Feedback to NWS personnel is imperative to assist with future forecasts. Remember, feedback on correct forecasts is equally as valuable as feedback on incorrect forecasts! If spot forecast is significantly different than conditions on site, a second forecast may be required.

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

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

NOTICE: Information provided on this form may be used by the National Weather Service for official purposes in any way, including public release and publication in NWS products. False statements on this form may be subject to prosecution under the False Statement Accountability Act of 1996 (18 U.S.C. § 1001) or other statutes.