

# ROCKY MOUNTAIN AREA FIRE WEATHER ANNUAL OPERATING PLAN

## 2006



Colorado  
Kansas  
Nebraska  
South Dakota  
Wyoming

ROCKY MOUNTAIN AREA FIRE WEATHER ANNUAL OPERATING PLAN  
2006

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Rocky Mountain Area Interagency Fire Weather Operating Plan – 2006

I. INTRODUCTION

This document serves as the Interagency Fire Weather Annual Operating Plan (AOP) for the Rocky Mountain Geographic Area. The general relationship between NWS and the interagency fire management community is set forth in the National Interagency Agreement for Meteorological Services. The AOP provides specific procedural and policy information about the responsibilities of both NWS offices and land management offices regarding meteorological services provided to the fire management community in the Rocky Mountain Area, as contained within the umbrella of the National Agreement.

References will include:

- National Weather Service Directives NWSI 10-4: Fire Weather Services
- Interagency Agreement for Meteorological Services (National MOA or National Agreement)
- Rocky Mountain Area and National Mobilization Guides

II. SIGNIFICANT CHANGES SINCE LAST YEAR

- A. New Meteorologist-In-Charge at Aberdeen and Cheyenne Weather Offices
- B. Fuels Status for Red Flags will default to "YES" if status is not updated in the 7 day window.

### III. SERVICE AREA AND ORGANIZATIONAL DIRECTORY

- A. Fire weather services in the Rocky Mountain Area are provided by the NWS forecast offices, RMA Predictive Services, and States listed below

Boulder, CO	Riverton, WY	North Platte, NE
Pueblo, CO	Rapid City, SD	Goodland, KS
Grand Junction, CO	Billings, MT	Aberdeen, SD
RMCC, Lakewood, CO	Cheyenne, WY	Sioux Falls, SD
State of South Dakota		

ROCKY MOUNTAIN AREA PREDICTIVE SERVICES, 2850 Youngfield St, Lakewood, CO 80215

FAX Number: (303) 445-4319

Web Site Address: <http://www.BLM.gov/colorado/rmafwx/index.html>

Name	Position	Phone	E-Mail
Tim Mathewson	Meteorologist / Program Manager	(303) 445-4309	<a href="mailto:tim_mathewson@co.BLM.gov">tim_mathewson@co.BLM.gov</a>
Russ Mann	Meteorologist / Asst. Manager	(303) 445-4308	<a href="mailto:russ_mann@co.BLM.gov">russ_mann@co.BLM.gov</a>
Marco Perea	Fire Intelligence Coordinator	(303) 445-4303	<a href="mailto:marco_perea@co.blm.gov">marco_perea@co.blm.gov</a>
Main Coordination Center Number		(303) 445-4300	

STATE OF SOUTH DAKOTA FIRE METEOROLOGIST, South Dakota School of Mines & Technology

Department of Atmospheric Sciences, 501 East Saint Joseph Street, Rapid City, South Dakota 57701-3995

FAX (605) 394-6061

Web Site Address: <http://www.ias.sdsmt.edu/RBenson/FireHome.htm>

Name	Position	Phone	E-Mail
Randall Benson	Fire Meteorologist	(605) 394-1996	<a href="mailto:randall.benson@sdsmt.edu">randall.benson@sdsmt.edu</a>
		CELL (605) 381-9253	

BOULDER WEATHER SERVICE FORECAST OFFICE WS1, 325 Broadway, Boulder, Colorado 80305-3328

FAX Number: (303) 494-4409

Web Site Address: <http://www.crh.noaa.gov/den>

Backup Office: WFO Pueblo

Name	Position	Phone	E-Mail
Rob Krohn	IMET/Asst. Fire Weather Focal Point	(303) 494-3877	<a href="mailto:robert.krohn@noaa.gov">robert.krohn@noaa.gov</a>
Dan Leszczynski	Fire Weather Focal Point	(303) 494-3877	<a href="mailto:daniel.leszczynski@noaa.gov">daniel.leszczynski@noaa.gov</a>
Larry Mooney	Meteorologist-In-Charge	(303) 494-3877	<a href="mailto:larry.mooney@noaa.gov">larry.mooney@noaa.gov</a>

PUEBLO WEATHER SERVICE FORECAST OFFICE, 3 Eaton Way, Pueblo, Colorado 81001-4856

FAX Number: (719) 948-9729

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Web Site Address: <http://www.crh.noaa.gov/pub>

Backup Office: WFO Boulder

Name	Position	Phone	E-Mail
Makoto Moore	IMET/Fire Weather Focal Point	(719) 948-3838	<a href="mailto:makoto.moore@noaa.gov">makoto.moore@noaa.gov</a>
Eric Petersen	IMET/Asst. Fire Weather Focal Point	(719) 948-3838	<a href="mailto:eric.petersen@noaa.gov">eric.petersen@noaa.gov</a>
William Fortune	Meteorologist-In-Charge	(719) 948-3838	<a href="mailto:william.fortune@noaa.gov">william.fortune@noaa.gov</a>

GRAND JUNCTION WEATHER SERVICE FORECAST OFFICE, 792 Eagle Drive, Grand Junction, Colorado 81506-8648

FAX Number: (970) 257-0452

Web Site Address: <http://www.crh.noaa.gov/gjt>

Backup Office: WFO Salt Lake City

Name	Position	Phone	E-mail
Chris Cuoco	Fire Weather Focal Point	(970) 256-9463	<a href="mailto:christopher.cuoco@noaa.gov">christopher.cuoco@noaa.gov</a>
Mike Chamberlain	IMET/Asst. Fire Weather FP	(970) 256-9463	<a href="mailto:mike.chamberlain@noaa.gov">mike.chamberlain@noaa.gov</a>
Joe Ramey	IMET	(970) 256-9463	<a href="mailto:joe.ramey@noaa.gov">joe.ramey@noaa.gov</a>
Doug Crowley	Meteorologist-In-Charge	(970) 256-9463	<a href="mailto:doug.crowley@noaa.gov">doug.crowley@noaa.gov</a>

CHEYENNE WEATHER SERVICE FORECAST OFFICE, 1301 Airport Parkway, Cheyenne, Wyoming 82001

FAX Number: (307) 772-2099

Web Site Address: <http://www.crh.noaa.gov/cys>

Backup Office: WFO Riverton

Name	Position	Phone	E-mail
Mike Sowko	IMET/Fire Weather FP	(307) 772-2376	<a href="mailto:mike.sowko@noaa.gov">mike.sowko@noaa.gov</a>
John Eise	Meteorologist-In-Charge	(307)772-2376	<a href="mailto:john.eise@noaa.gov">john.eise@noaa.gov</a>

RIVERTON WEATHER SERVICE FORECAST OFFICE, 12744 West U.S. Highway, Riverton, Wyoming 82501

FAX Number: (307) 857-3861

Web Site Address: <http://www.crh.noaa.gov/riw>

Backup Office: WFO Cheyenne

Name	Position	Phone	E-mail
Dave Lipson	IMET/Fire Weather Focal Point	(307) 857-3898	<a href="mailto:david.lipson@noaa.gov">david.lipson@noaa.gov</a>
Todd Baker	IMET/Asst. Fire Weather Focal Point	(307) 857-3898	<a href="mailto:todd.baker@noaa.gov">todd.baker@noaa.gov</a>
Joe Sullivan	Meteorologist-In-Charge	(307) 857-3898	<a href="mailto:joe.sullivan@noaa.gov">joe.sullivan@noaa.gov</a>

BILLINGS WEATHER SERVICE FORECAST OFFICE, 2170 Overland Avenue, Billings, Montana 59102-6455

FAX Number: (406) 652-3214

Web Site Address: <http://weather.gov/Billings>

Backup Office: WFO Glasgow

Name	Position	Phone	E-mail
Dan Borsum	IMET/Fire Weather Focal Point	(406) 652-0851	<a href="mailto:dan.Borsum@noaa.gov">dan.Borsum@noaa.gov</a>
Todd Chambers	Assistant Focal Point	(406) 652-0851	<a href="mailto:todd.chambers@noaa.gov">todd.chambers@noaa.gov</a>
Keith Meier	Meteorologist-In-Charge	(406) 652-0851	<a href="mailto:keith.Meier@noaa.gov">keith.Meier@noaa.gov</a>

RAPID CITY WEATHER SERVICE FORECAST OFFICE, 300 East Signal Drive, Rapid

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City, South Dakota 57701-3800  
FAX Number: (605) 341-9867  
Web Site Address: <http://www.crh.noaa.gov/unr>  
Backup Office: WFO North Platte

Name	Position	Phone	E-mail
Scott Rudge	Fire Weather Focal Point	(605) 341-7435	<a href="mailto:scott.rudge@noaa.gov">scott.rudge@noaa.gov</a>
Jeffrey Schild	Asst. Fire Weather Focal Point	(605) 341-7435	<a href="mailto:jeffrey.schild@noaa.gov">jeffrey.schild@noaa.gov</a>
Dave Carpenter	Meteorologist-In-Charge	(605) 341-7435	<a href="mailto:dave.carpenter@noaa.gov">dave.carpenter@noaa.gov</a>

ABERDEEN WEATHER SERVICE FORECAST OFFICE, 824 Brown County 14 South,  
Aberdeen, South Dakota 57401-0198  
FAX Number: (605) 225-7417  
Web Site Address: <http://weather.gov/aberdeen>  
Backup Office: WFO Sioux Falls

Name	Position	Phone	E-mail
Stanley Keefe	Fire Weather Focal Point	(605) 225-0519	<a href="mailto:stanley.keefe@noaa.gov">stanley.keefe@noaa.gov</a>
Jim Scarlett	Meteorologist-In-Charge	(605) 225-0519	<a href="mailto:James.Scarlett@noaa.gov">James.Scarlett@noaa.gov</a>

SIOUX FALLS WEATHER SERVICE FORECAST OFFICE, 26 Weather Lane, Sioux  
Falls, South Dakota 57104-0198  
FAX Number: (605) 330-4248  
Web Site Address: <http://www.crh.noaa.gov/fsd>  
Service Backup Office: WFO Aberdeen

Name	Position	Phone	E-mail
Mike Fuhs	Fire Weather Focal Point	(605) 330-4244	<a href="mailto:michael.fuhs@noaa.gov">michael.fuhs@noaa.gov</a>
Greg Harmon	Meteorologist-In-Charge	(605) 330-4244	<a href="mailto:greg.harmon@noaa.gov">greg.harmon@noaa.gov</a>

NORTH PLATTE WEATHER SERVICE FORECAST OFFICE, 5250 E. Lee Bird Dr,  
North Platte, Nebraska 69101-2473  
FAX Number: (308) 532-9557  
Web Site Address: <http://www.crh.noaa.gov/lbf/>  
Service Backup Office: WFO Rapid City

Name	Position	Phone	E-mail
Dennis Phillips	Fire Weather Focal Point	(308) 532-4936	<a href="mailto:dennis.phillips@noaa.gov">dennis.phillips@noaa.gov</a>
Brian Hirsch	Meteorologist-In-Charge	(308) 532-4936	<a href="mailto:brian.hirsch@noaa.gov">brian.hirsch@noaa.gov</a>
John Stoppkotte	Science and Operations Officer	(308) 532-4936	<a href="mailto:john.stoppkotte@noaa.gov">john.stoppkotte@noaa.gov</a>

GOODLAND WEATHER SERVICE FORECAST OFFICE, 920 Armory Road, Goodland,  
Kansas 67735-9273  
FAX Number: (785) 899-3501  
Web Site Address: <http://www.crh.noaa.gov/gld>  
Service Backup Office: WFO Boulder

Name	Position	Phone	E-mail
Fred Stasser	Fire Weather Focal Point	(785) 899-2360	<a href="mailto:fredrick.stasser@noaa.gov">fredrick.stasser@noaa.gov</a>
Scott Mentzer	Meteorologist-In-Charge	(785) 899-2360	<a href="mailto:scott.mentzer@noaa.gov">scott.mentzer@noaa.gov</a>

#### IV. NATIONAL WEATHER SERVICE SERVICES AND RESPONSIBILITIES

A. **Basic Services** – The following constitute the current operational Fire Weather Planning

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Forecast products provided by NWS offices in the RMA. Significant changes to these forecast services or deployment of new operational forecast products and services will be coordinated through Rocky Mountain Area Predictive Services (Reference NWSI 10-403) and local users within the County Warning Forecast Area (CWFA) of the NWS office that would like to make the change. Any non-operational forecast products will be clearly labeled as “Experimental” or “Prototype”. Basic meteorological services include:

## 1. Fire Weather Planning Forecasts (FWF)

Most, but not all, NWS offices serving the Rocky Mountain Area issue routine Fire Weather Planning Forecasts. The FWF is a zone-type product used by land management personnel primarily for input in decision-making related to pre-suppression and other planning (NWSI 10-401) Unless otherwise noted, the format of the FWF will conform to NWSI 10-401.

### a) Standard Issuance Times and Dates –

**Colorado Start/Stop Dates:** Once daily around April 1 through April 30 by 5:00 p.m. Twice daily by 8:00 a.m. and 5:00 p.m. local time from May 1 through October 31. (Exception: Once daily April 1 through October 31 for fire weather zones 252, 253 and 254 under the Goodland NWS). Beginning and ending dates are general guidelines to incorporate the majority of prescribed burn and wildfire season, and are flexible.

**Wyoming Start/Stop Dates:** Twice daily by 7:00 a.m. and 5:00 p.m. local time from around May 1 through October 31. Beginning and ending dates are general guidelines to incorporate the majority of prescribed burn and wildfire season, and are flexible.

**Cheyenne NWS:** Will issue twice daily around June 1<sup>st</sup> through September 30<sup>th</sup>. Once per day around October 1<sup>st</sup> through May 31<sup>st</sup>.

**Rapid City South Dakota Start/Stop Dates:** Once daily around March 15 through October 31 by 8:00 a.m. twice daily around July 1 through September 30 by 8:00 a.m. and 5:00 p.m. Beginning and ending dates are general guidelines to incorporate the majority of prescribed burn and wildfire season, and are flexible.

**Sioux Falls South Dakota Start/Stop Dates:** Twice Daily around April 1 through May 31 by 8:00 a.m. and 4:00 p.m. Once daily around June 1 through August 14 by 8:00 a.m. twice daily around August 15 through October 31 by 8:00 a.m. and 4:00 p.m. Beginning and ending dates are general guidelines to incorporate the majority of prescribed burn and wildfire season, and are flexible.

**Aberdeen South Dakota Start/Stop Dates:** Twice daily around

April 1 through October 31 by 8:00 a.m. and 4:00 p.m. Beginning and ending dates are general guidelines to incorporate the majority of prescribed burn and wildfire season, and are flexible.

**North Platte Nebraska Start/Stop Dates:** Twice daily around April 1 through October 31 by 8:00 a.m. and 4:00 p.m. Beginning and ending dates are general guidelines to incorporate the majority of prescribed burn and wildfire season, and are flexible.

**Note: Some offices in the Rocky Mountain Area provide Fire Weather Planning Forecasts outside these dates, based on local needs. Please see individual office information for FWF services outside these core dates.**

b) **Issuance Outside Regular Times and Dates-** NWS offices will issue FWF's for their CWFA outside regular times and dates when:

1) A Fire Weather Watch or Red Flag Warning has been issued from the servicing NWS office. **Note: Offices may issue the FWF for only those zones in the watch or warning area.**

2) Large fire activity is occurring (100 acres in timber, 300 in grass/sage) within the servicing office CWFA and is expected to last more than 24 hours (less than 100% contained), **Note: In this case, Land Agency Meteorologists will request an earlier start date, or an extension to the stop date. Also, offices may issue an FWF for a specific zone or zones in lieu of the entire forecast area if weather forecast trends indicate that significant weather changes will reduce fire potential within 24 hours, or current conditions (fuels, weather, high elevation snowpack) do not support elevated fire potential.**

c) **Forecast Updates-** The FWF will be updated when: 1) A Fire Weather Watch or a Red Flag Warning is issued or updated, 2) The current forecast does not depict the NWS forecaster's vision of current or predicted weather conditions, or 3) A significant topographical/format error is detected. **Note: The NWS office will notify the local dispatch offices when the FWF is updated.**

d) **Access** – Forecasts are transmitted automatically through the NWS AWIPS computer system and made available within minutes via WIMS, the Rocky Mountain Area Predictive Services web site, and the web sites of the various NWS offices that serve the Rocky Mountain Area. **These web site addresses can be found under section III, Service Area and Organizational Directory.**

e) **Content and Format** – The FWF will conform to the “narrative” or “tabular” format, per NWSI 10-401. Morning forecasts will focus



on the following 36 hours and afternoon forecasts on the following 48 hours, with general extended outlooks in both cases out to at least 5 days and no more than 10 days.

Each FWF will begin with pertinent headlines and a non-technical weather discussion. Six-hour increments or greater will be used for forecast weather elements for the periods out to 48 hours. The extended forecast periods beyond 48 hours will contain the most significant weather within each 12 hour (in the case of a night period) or 24 hour period. Headlines are required for Red Flag Warnings and Fire Weather Watches, but may be included for other significant situations including air stagnation, record heat, severe weather potential, significant weather pattern changes, etc.

Forecasts for the first 36 or 48 hours will contain the following elements for each zone or zone grouping, listed in the order they will appear. Some of the elements are optional and will be included in the FWF based on user needs.

1. Headline(s) as appropriate
2. Sky/weather
3. Temperature (24 hour trends optional)
4. Humidity (24 hour trends optional)
5. Wind - 20 foot RAWs standard (slope/valley)
6. Wind – Ridgetop (as appropriate)
  
7. Chance of Wetting Rain (Optional)
8. Lightning Activity Level (LAL)
9. Haines Index
10. Mixing Level (Optional)
11. Transport Winds (Optional)
12. Ventilation (kt-ft) and Ventilation/Dispersion Category (Optional)
13. Extended outlook to at least day 5 (or at end of product)

Format examples and descriptions of forecast parameters can be found in the appendices.

## 2. **Site-specific (Spot) Forecasts**

- a) **Criteria** - Spot forecasts are site-specific forecast products issued for wildfires, prescribed burns, aerial spraying, HAZMAT incidents, search and rescue etc., and are available upon request at any time of day, week or season. WFO's will provide site-specific (spot) forecast services upon request of any qualified user agency to support land management activities associated with wildland fire (including prescribed burning). Providing non-federal, non-wildfire spots will be restricted to purposes directly related to personnel,

equipment, fuels reduction projects (prescribed burns or spraying) for public safety, or interagency protection agreements providing such involvement).

A spot forecast will be assigned high priority by the receiving NWS office. Normally, a request should be provided to the requestor in less than 60 minutes of the receipt of the request. During heavy spot loads 60 minutes may be exceeded.

Site-specific forecasts are considered one-time requests, and are not routinely updated. However, spot forecasts should be updated when representative observations are available to the forecaster and he/she deems the current forecast does not adequately represent current or expected weather conditions. Land management personnel may contact the appropriate WFO for a spot update if forecast conditions appear unrepresentative of the actual weather conditions.

Spot forecasts will not be updated for changes within the third period of the forecast, because at this point spot forecasts will be 24 hours old, or nearly so, and a new spot forecast request should be submitted.

Priority for the update of spot forecasts is as follows:

- Wildfires
- Prescribed burns or Wildland Fire Use (WFU)
- Spot forecasts for non-critical operations, aerial spraying, etc

**Site-specific forecasts for Wildfires managed for resource benefit (those fires with little or no suppression efforts).** Initially, spot forecasts will be issued under the same guidelines as spot forecasts for a declared wildfire. The requesting agency should provide the local NWS office with an idea of how long the fire is expected to burn, and what weather conditions are critical to the prescription. With the initial spot forecast request, the requesting agency should set up a schedule for providing fire line weather observations to the NWS and requesting follow-on spot forecasts for the duration of the fire. The requesting agency is encouraged to also request more detailed long-range weather forecasts to aid in the planning and control efforts. Be sure to discuss these needs with the fire weather forecaster.

The spot forecast will be corrected when a significant typographical/format error is detected. Corrections should be delivered to users in the same manner as the original spot forecast when possible.

Spot forecast requests and updates will be responded to according to

the instructions of the requesting agency. Web based spot forecast requests (from NWS web sites) are preferred, and will generally result in more efficient and timely feedback.

The WFO will contact the local user by phone whenever the spot forecast is updated.

b) **Content and Format** – Spot forecasts will contain the required minimum elements, unless otherwise specified upon request:

1. Headline (required when Red Flag Warning / Fire Weather Watch)
2. Discussion
3. Sky/weather (including chance of rain)
4. Temperature
5. Relative humidity
6. 20 foot winds

Optional elements (including transport winds, mixing depth, smoke dispersal, LAL, Haines index, etc.) may be included upon request.

The valid time will be determined at the time of the request. Most spots contain three periods, usually “TODAY”, “TONIGHT”, and “NEXT DAY”, e.g., “TODAY”, “TONIGHT”, and “THURSDAY”.

c) **Procedures** – Internet-based NWS Spot is the standards for requesting and retrieving spot forecasts and should be used when available. They are accessible via web sites of the various NWS offices that serve the Rocky Mountain Area. **Links to the web based spot program can be found under Section IV-D, individual forecast office information.** In times when internet access is hindered or not possible, spot forecasts may be requested and disseminated via phone or fax using the backup spot forecast request form found in the appendices. In most cases, spot forecasts should be available in less than 60 minutes from the time the appropriate NWS office receives the request. The NWS should be contacted if a spot forecast is not available within this time frame.

The requesting agency will provide information about the location, topography, fuel type(s), elevation(s), size, ignition time, contact name(s), and telephone number(s) of the responsible land management personnel.

d) **Weather Observations** - Quality representative weather observation(s) at, or within close proximity of the project should be made available to the responsible WFO along with the request for a spot forecast(s). At the beginning of a project, a nearby RAWS site may be used for the initial spot request if it is at a similar elevation,

aspect, and sheltering, and has been shown to be very representative of the actual project. The requesting agency should provide the fire weather meteorologist with as many observations from the project as possible to help provide detail in the spot forecasts which will aid in fire behavior predictions. The best observations to send are those that show the maximum temperature, minimum humidity, and character of the winds from the previous afternoon. Additionally, a morning observation depicting the humidity recovery and downslope/downvalley wind is recommended. **Failing to provide on-site complete observations, may result in a less accurate forecast.**

However, there are special circumstances where fire personnel are unable to provide an on-site weather observation. Land Agencies should communicate to the responsible WFO when on-site weather observations are not possible.

**Certain prescribed burns will be considered high risk in Colorado for significant smoke impacts, as determined by the Smoke Risk Rating Worksheet for Prescribed Fire Projects which is part of the Colorado Memorandum of Understanding (MOU). These burns could either be Category III or IV burns, and requires detailed observations at least 3 days prior to burn as well as feedback. Consult with the Fire Weather Program Manager at the appropriate WFO well in advance of the scheduled burn date for further information.**

- e) **Spot Forecast Feedback** – Timely feedback on forecast performance (both positive and negative) is requested, and should be given whenever possible by the requesting agency.
3. **Red Flag Program** - The Red Flag program is a means by which the weather forecaster informs the land management agencies of the combination of dry fuels and critical weather conditions that support extreme fire behavior. Identification of Red Flag events is a primary responsibility of the forecaster producing the Fire Weather Planning Forecasts.

A **Red Flag Warning** informs agencies of the imminent or actual occurrence of Red Flag conditions. A Red Flag Warning will be issued when there is high confidence that Red Flag criteria will be met within the next 24 hours, or when those criteria are already being met or exceeded. A warning may be issued for all, or portions of a fire weather zone or region.

A **Fire Weather Watch** alerts agencies to the high potential for development of a Red Flag event in the 12-72 hours. **A watch may only be issued (or continued) in the first 12-hour time period for dry**

**thunderstorm events.** The watch may be issued for all, or portions of a fire weather zone or region.

a) **Criteria** – The criteria for issuing of Fire Weather Watches and Red Flag Warnings in the Rocky Mountain Area are a combination of weather and fuels conditions (as determined by fire management) for any 3 hours or more in a 12 hour period. These criteria are defined as the following:

1. Fuel characteristics are favorable for large fire growth as determined by fire management using the Red Flag Fuels Support Page

[http://www.blm.gov/colorado/rmafwx/fuel\\_status/public/index.php](http://www.blm.gov/colorado/rmafwx/fuel_status/public/index.php)

**Note: It is the responsibility of Land Agencies to maintain and update the Red Flag Fuels Support Page. The fuel condition within the support page will default to “Yes” if the assigned FMO or Fuel Specialist fails to update the fuel condition within a 7-Day period.**

2. Sustained wind **or frequent gusts** of 25 mph or greater –AND- relative humidity of 15% or lower in Colorado, Wyoming, and western South Dakota, and for Nebraska zones 204, 206, 208-210, and 219. 20% or lower for Nebraska zone 209. 25% or lower for South Dakota zones 255 through 258 and 267 through 273.
3. Dry thunderstorms (15% coverage or more, constituting an LAL 6)

### **Issuing Fire Weather Watches and Red Flag Warnings**

A fire weather watch or red flag warning will be issued when fuel characteristics are “**Yes**” as determined and relayed by land agencies using the fuel status web page, and one of the weather criteria (**as stated under 2 and 3 above**) is met.

### **Additional Red Flag Factors:**

In addition to the basic criteria above, a combination of other elements may result in Red Flag conditions. Haines Index of 5 or 6, wind shifts associated with cold frontal passages, first significant lightning (wet or dry, 15% coverage of thunderstorms or more) event after an extended hot and dry period, and poor RH recovery.

***Note:** The decision to issue a Fire Weather Watch or Red Flag Warning can be difficult and complicated at times. Coordination*

*with neighboring NWS offices and Land Agencies will play a vital role in the final decision.*

b) **Product Format and Contents** – An RFW product will be issued whenever a Fire Weather Watch or Red Flag Warning is issued, updated, extended, or canceled. The RFW message will include:

1. A standard UGC header coding, as mandated within the NWSI 10-401, including the fire weather zone number and expiration time
2. A headline, as mandated within NWSI 10-401.
3. A short, but detailed discussion on the causes and nature of event, including weather element values.

c) **Procedures and Access** - When Fire Weather Watches and Red Flag Warnings are issued, they will be headlined in spot forecasts, the general Fire Weather Planning Forecast (FWF) and appropriate zone sections within the FWF. The headline will be in the same descriptive format as on the RFW product itself. The FWF will be updated if a Fire Weather Watch or Red Flag Warning is issued, canceled, or expires. Red Flag Warnings and Fire Weather Watches will remain in effect through the expiration time noted in the forecast, or until canceled or extended.

Red Flag Warnings and Fire Weather Watches are available within minutes of issuance via WIMS, the Rocky Mountain Area Predictive Services page and the web sites of the various NWS offices that serve the Rocky Mountain Area. These links can be found in the office directory (Section III) of this document.

d) **Notification** – When a Fire Weather Watch or Red Flag Warning is issued or updated (non-routine), NWS offices will verbally notify affected zone dispatch centers that fall under the watch or warning area. Also, the NWS will verbally notify the Rocky Mountain Area Coordination Center at (303)445-4300.

4. **NFDRS Forecasts** - The National Weather Service provides 24-hour weather forecasts for NFDRS that allow the NFDRS software to predict the next day's fire danger indices.

a) **Observational Requirements** –NFDRS observations must be complete and available in WIMS by 1350 LST (1450 LDT) local time to be received by NWS in time to produce a forecast. NFDRS stations that do not have valid observations in WIMS on time will not have next day fire danger indices available.

b) **Content and Format** – Complies with NWSI 10-401 and is outlined in Appendix A for reference. The actual NWS NFDRS forecast

product is used only by WIMS and is not viewed directly by fire management.

- c) **Procedures** – For every NFDRS observation received from WIMS at the 1350 local time collective, forecast weather parameters for 1300 local time the next day will be produced.

- 5. **Participation in Interagency Groups** - NWS offices and land management providing service within the Rocky Mountain Area should provide representation at the regional AOP meeting held annually. Proxy representation is acceptable. NWS offices should host at least one meeting each year with local fire management units, or visit local fire management units once per year.

B. **Special Services** – Special meteorological services include mobile unit and other on-site meteorological services, participation in user agency training activities, weather observer training, and weather observation station visits requested by user agencies, as time and office staffing permits. The services are usually provided away from the office or on overtime. As stated in the Interagency Agreement for Meteorological Services among the Interagency Wildland Fire Agencies and the National Weather Service, the user agencies will pay overtime, travel, and per diem costs for these special services. The NWS and Land Agencies will provide and maintain a cadre of trained IMETs to provide on-site incident meteorological support.

C. **Forecaster Training** - The NWS recognizes the need for specialized training in fire weather meteorology for forecasters. All NWS meteorologist producing fire weather products will have met the requirements set forth in NWSI 10-405.

D. **Individual Forecast Office Information**

1. **North Central and Northeast Colorado – Boulder, CO**

Unless otherwise mentioned, it is to be assumed that services provided by NWS Boulder for units in northeast Colorado will follow the regional policies and procedures set forth in the Rocky Mountain Area Fire Weather AOP.

General Information

The National Weather Service in Boulder, CO is responsible for providing Fire Weather support for north central and northeast Colorado. The area of responsibility covers Fire Weather Planning Forecast zones 211 through 218, and 238 through 251. The Boulder office is staffed with 13 meteorologists trained in fire weather forecasting, one of which is designated as an Incident Meteorologist. All fire weather forecasters are trained to produce all the routine fire weather products and spot forecasts. A Fire Weather Forecaster will be on duty 24 hours a day...seven days a week year round.

## 2006 Changes:

### Fire Weather Planning Forecasts (FWF)

The fire weather planning forecast (FWF) will be issued by 0800 and 1600 during the designated fire season.

### Spot Forecasts

The Boulder office will prepare spot weather forecasts for prescribed burns and wildfires upon request for locations within the office's county warning area (CWA). The primary means of requesting and disseminating spot forecasts is the NWSSpot Internet-based spot request and reply program. During your follow-up telephone call to ensure receipt, tell the forecaster that your reply is for a wildfire. If you have not received your spot after 60 minutes, call the WFO to check on the status of your spot or to determine if there has been a communications system failure. The NWS strongly encourages land agencies to use the "REMARKS" section within NWSSpot to provide feedback with all follow-up spot requests. NWSSpot for Boulder can be accessed at:

<http://spot.nws.noaa.gov/cgi-bin/spot/spotmon?site=bou>

When internet or computer capabilities are not available, fax, phone or telefax will be used to request a spot forecast.

**When requesting a non-wildfire spot forecast, it is STRONGLY SUGGESTED that requests during the fire season NOT be made between 1100 and 1500.** Requests made during this time will occur during the key preparation period for the afternoon Fire Weather Planning Forecasts and will result in a much longer delay between the request and receipt of a spot forecast.

Certain prescribed burns will be considered high risk for significant smoke impacts, as determined by the Smoke Risk Rating Worksheet for Prescribed Fire Projects which is part of the Colorado Memorandum of Understanding (MOU). These burns could either be Category III or Category IV burns, and requires detailed observations at least 3 days prior to burn as well as feedback. Consult with the Fire Weather Program Manager will in advance of the scheduled burn date for further information.

### Red Flag Warnings / Fire Weather Watches

Red Flag Warnings and Fire Weather Watches will be issued as required for Colorado narrative zones 211 through 218, and 238 through 251 after coordination and collaboration with customers and adjacent NWS offices.

### Smoke Management Forecasts (SMF)



This forecast is routinely issued no later than 1600 during the fire season. It is a separate product from the afternoon forecast and is valid for the tonight and tomorrow periods. The Smoke Management Forecast includes a brief discussion of airmass stability and any meteorological parameter that may affect smoke dispersal. The forecast also includes a forecast of transport winds, mixing heights and a ventilation forecast for the tonight and tomorrow time periods.

#### NFDRS Forecasts

This product is issued by 1515 during the fire season and is an separate product from the afternoon forecast. The forecasts are used as input to the National Fire Danger Rating System (NFDRS) through WIMS to compute fire danger indices.

#### IMET Services

The Boulder office has an IMET available for dispatch to major forest fires and projects.

#### Training

The fire weather program leader or assistant fire weather program leader may be available to handle fire weather training requests from north central/northeast Colorado customers. Training requests outside the area will be handled on case-by-case bases. Refer all training requests or technical support questions to the fire weather program leader or assistant.

#### Additional Information

The Boulder office maintains a Fire Weather Page on its web site home page. This page contains links to the FWF, RFW, Spot Forecasts, SMF, Public Fire Danger Statements, RAWS observations, the annual operating plan, and other fire weather related sites. A clickable map is provided to obtain a narrative FWF. Simply click on the map within the region of interest. To go directly to the Boulder fire weather web site, use the following url:

<http://www.crh.noaa.gov/bou/awebphp/fireindx.php>

#### BACK-UP

The primary service backup for NWS Boulder is NWS Pueblo and the secondary backup is NWS Grand Junction (Please See Service Area and Organizational Directory). The servicing NWS office will notify their local dispatch centers and RMACC when the office is in or plans to be in backup mode. To receive a spot from a backup office, customers should access the web based spot program of the office that is providing the backup service.

## 2. South Central and Southeast Colorado - Pueblo, CO

Unless otherwise mentioned, it is to be assumed that services provided by NWS Pueblo will follow the regional policies and procedures set forth in the Rocky Mountain Area Fire Weather AOP.

### General Information

The National Weather Service office in Pueblo provides fire weather support for most of south central and southeast Colorado. This area covers fire weather zones 220 through 237. The Pueblo office has a staff of 13 meteorologists, two of which are designated as the Incident Meteorologist (IMET). All fire weather forecasters are trained to produce all the routine fire weather products and spot forecasts. A Fire Weather Forecaster will be on duty 24 hours a day...seven days a week year round.

### Digital Web-Based Products

WFO Pueblo continues to add services to the fire weather community through their web site **weather.gov/pub**. Information is derived from the Digital Forecast Database to develop graphical and digital products that are tailored to fire weather customers.

Graphical fire weather and smoke management parameters are available by clicking on Fire Weather, in the left hand margin under Forecasts. This link will take you to the Fire Weather page where you will find links to our new graphical and digital products. These products are currently listed as experimental but they are part of our mainstream forecast process, and will be updated along with our Fire Weather Zones forecasts and other forecast products.

Information available in graphical format includes all of the normal forecast parameters, and in addition includes the following parameters that are tailored to the fire weather community:

- Max and Min Relative Humidity
- Mixing Height
- Haines Index
- 10,000 ft Winds
- Transport Winds
- Ventilation Rate
- Lightning Activity Level
- 8-14 Day Temperature and Precipitation Outlook
- Critical Fire Weather Potential Graphic

Digital text information is available for all RAWS sites by clicking on the link to the **Experimental Fire Weather Point Forecast Matrix (PFM)**. This link

will take you to a list of RAWS sites that you can click on to get a digital forecast with all fire weather forecast parameters.

The NWS would appreciate your comments and opinions about these new, experimental, products. Each page has a link to a survey that will be sent to the National Weather Service Office in Pueblo. These surveys are anonymous and are designed to help us improve our services to the fire weather community.

### Fire Weather Planning Forecasts (FWF)

Narrative Fire Weather Planning Forecasts will be issued by 0800 and 1600 each day during the designated fire season. The standard start and stop dates are outlined in the basic services.

### Spot Forecasts

The Pueblo office will prepare spot weather forecasts for prescribed burns and wildfires as requested for locations within the office's fire weather service area. The primary means of requesting and disseminating spot forecasts will be through the NWS Spot Internet based forecast/reply program. NWS Spot for Pueblo can be accessed at:

<http://spot.nws.noaa.gov/cgi-bin/spot/spotmon?site=pub>

When internet or computer capabilities are not available, fax, phone or telefax will be used to request a spot forecast.

When requesting a non-wildfire spot forecast, it is **STRONGLY SUGGESTED** that requests during the fire season NOT be made between 1100 and 1500. Requests made during this time will occur during the key preparation period for the afternoon Fire Weather Planning Forecasts and will result in a much longer delay between the request and receipt of a spot forecast.

To ensure receipt by the fire weather forecaster, the requester should call the NWS after submitting each spot request. During this follow-up telephone call, please be sure to tell the forecaster if the request is for a wildfire so it can receive the proper priority.

Certain prescribed burns will be considered high risk for significant smoke impacts, as determined by the Smoke Risk Rating Worksheet for Prescribed Fire Projects which is part of the Colorado Memorandum of Understanding (MOU). These burns could either be Category III or Category IV burns, and requires detailed observations at least 3 days prior to burn as well as feedback. Consult with the Fire Weather Program Leader well in advance of the scheduled burn date for further information.

### Red Flag Warnings / Fire Weather Watches

Red Flag Warnings and Fire Weather Watches will be issued as required for Colorado narrative zones 220 through 237 after coordination and collaboration with customers and adjacent NWS offices.

### Smoke Management Forecasts (SMF)

This forecast is issued no later than 1600 during the fire season. It is a separate product from the afternoon forecast and is valid for the first 48 hours.

The Smoke Management Forecast includes a brief discussion of airmass stability and any meteorological parameter that may affect smoke dispersal. The forecast also includes a forecast of transport winds, mixing heights and a ventilation forecast.

### NFDRS Forecasts

This product is issued at 1515 during the fire season and is a separate product from the afternoon forecast. The forecasts are used as input to the National Fire Danger Rating System (NFDRS) through WIMS to compute fire danger indices.

### IMET Services

The Pueblo office has 2 IMETs available for dispatch to major forest fires and projects.

### Training Services

The fire weather program leader/IMET or assistant fire weather program leader, may be available to handle fire weather training requests from south central/southeast Colorado customers. Training requests outside the area will be handled on case-by-case bases. Refer all training requests or technical support questions to the Program Leader or his Assistant.

### Additional Information

The Pueblo office maintains a Fire Weather Page on its web site home page. This page contains links to forecasts (FWF), RFW, Spot Forecasts, SMF, RAWS observations, the annual operating plan, and other fire weather related sites. A clickable map is provided to obtain a narrative FWFs. Simply click on the map within the region of interest. To go directly to the Pueblo fire weather web site, use the following url:

<http://weather.gov/pub?n=/fire/index.php>

### BACK-UP:

The primary service backup for NWS Pueblo is NWS Boulder and the secondary backup is NWS Goodland (Please See Service Area and Organizational Directory). The servicing NWS office will notify their local dispatch centers and RMACC when the office is in or plans to be in backup mode. To receive a spot from a backup office, customers should access the web based spot program of the office that is providing the backup service.

### 3. **Western Colorado – Grand Junction, CO**

Unless otherwise mentioned, it is to be assumed that services provided by NWS Grand Junction will follow the regional policies and procedures set forth in the Rocky Mountain Area Fire Weather AOP.

#### General Information

The Grand Junction Weather Forecast Office (WFO) provides fire weather support for western Colorado and eastern Utah. Its area of responsibility covers Colorado fire weather zones 201, 203, 205, and 207. Refer to the map at the end of this section. The Grand Junction office is staffed with 10 meteorologists trained in fire weather forecasting, two of which are certified Incident Meteorologists (IMET). All forecasters have been trained to produce all the routine fire weather products, warnings, watches, and spot forecasts.

#### 2006 Changes:

#### Fire Weather Planning Forecasts

The fire weather planning forecast (FWF) will be issued by 0800 and 1600 during the designated fire season.

#### Spot Forecasts

The Grand Junction office prepares spot weather forecasts for prescribed burns and wildfires as requested for locations within the office's county warning area (CWA). There is one exception: WFO Grand Junction provides spot forecasts for that part of the Gunnison National Forest within northwest Saguache County, as per an agreement with the Gunnison National forest and the Grand Junction and Pueblo WFOs.

The primary means of requesting and disseminating spot forecasts is the NWSSpot Internet-based spot request and reply program. **To ensure receipt by the fire weather forecaster, the requester should call the NWS after submitting each spot request.** If you have not indicated on the spot request, during your follow-up telephone, please tell the forecaster that your request is for a wildfire or a prescribed burn, so that your request can receive the proper priority. This call to the WFO will also allow the fire weather forecaster to ask any questions he/she might have, and inform you if multiple spot requests

may delay completing your forecast. WFO Grand Junction will show the same courtesy by calling the requesting agency after each completed spot forecast is transmitted.

The NWS strongly encourages land agencies to use the “REMARKS” section within NWSSpot to provide feedback with all follow-on spot requests. NWS Spot for Grand Junction can be accessed at:

<http://spot.nws.noaa.gov/cgi-bin/spot/spotmon?site=gjt>

When internet or computer capabilities are not available, fax or phone can be used to request a spot forecast.

When requesting a non-wildfire spot forecast any time of year, it is strongly suggested that requests NOT be made between 1100 and 1500. Requests made during this time will occur during the key preparation period for the afternoon routine weather forecasts and will result in a delay in completing the spot forecast.

Certain prescribed burns will be considered high risk for significant smoke impacts, as determined by the Smoke Risk Rating Worksheet for Prescribed Fire Projects, which is part of the Colorado Memorandum of Understanding (MOU). These burns could either be Category III or Category IV burns, and REQUIRE detailed observations at least 3 days prior to burn. Consultation with the fire weather program leader or assistant program leader, well in advance of the scheduled burn date, daily feedback, and fire line observations throughout the course of the project are required by the Smoke Risk Rating Worksheet and the Colorado MOU.

#### Red Flag Warnings / Fire Weather Watches

WFO Grand Junction issues Red Flag Warnings and Fire Weather Watches as required for its all part of its County Warning Area (CWA), after coordination and collaboration with customers and adjacent NWS offices as outlined in the Basic Services section of this AOP.

#### Smoke Management Forecasts (SMF)

This forecast is issued no later than 1600 during the fire season. It is a separate product from the afternoon forecast and is valid for the tonight and tomorrow periods. The Smoke Management Forecast includes a brief discussion of airmass stability and meteorological parameters that may affect smoke dispersal. The forecast also includes a forecast of transport winds, mixing heights and a ventilation index (clearing index for eastern Utah) for the tonight and tomorrow time periods.

#### NFDRS Forecasts

This product is issued at 1515 during the fire season and is a separate product from the afternoon forecast. The forecasts are used as input to the National Fire Danger Rating System (NFDRS) through WIMS to compute fire danger indices.

#### IMET Services:

The Grand Junction office has two certified IMETs available for dispatch to major forest fires and incidents. Dispatch for significant prescribed burn projects, i.e., CAT III and CAT IV burns, will only be possible when coordination with the fire weather program leader and WFO Meteorologist-in-Charge (MIC) has been accomplished well in advance (months in advance) of the project and only when NWS manpower and resources permit.

#### Training Services

The fire weather program leader, assistant fire weather program leader, IMETs, or MIC may be available for fire weather training requests from western Colorado and eastern Utah customers. Training requests outside the area will be handled on case-by-case bases. Refer all training requests or technical support questions to the program leader, assistant program leader, and MIC.

#### Additional Information

The Grand Junction office maintains a Fire Weather Page on its web site home page. This page contains links to forecasts, warning and watches, spot forecasts, RAWS observations, the annual operating plan, and other fire weather related sites. A clickable map is provided to obtain a narrative forecast. Simply click on the map at the point of interest or input the exact latitude and longitude to get a forecast. To go directly to the Grand Junction fire weather web site, use the following url:

<http://www.crh.noaa.gov/gjt/fire.php>

#### BACK-UP:

The primary service backup for NWS Grand Junction is NWS Salt Lake City and the secondary backup is NWS Boulder (Please See Service Area and Organizational Directory). The servicing NWS office will notify there local dispatch centers and RMACC when the office is in or plans to be in backup mode. To receive a spot from a backup office, customers should access the web based spot program of the office that is providing the backup service.

#### 4. **Western-Central-Northern, Wyoming- Riverton, Wyoming**

Unless otherwise mentioned, it is to be assumed that services provided by

NWS Riverton will follow the regional policies and procedures set forth in the Rocky Mountain Area Fire Weather AOP.

### General Information

The National Weather Service in Riverton is responsible for providing fire weather support for western-central-northern Wyoming. Its area of responsibility covers Wyoming fire weather zones 140, 274 through 283, 285 through 289, and 414 through 416. The Riverton office is staffed with 14 meteorologists trained in fire weather forecasting, one of which is designated as Incident Meteorologists (IMET). All fire weather forecasters are trained to produce all the routine fire weather products and spot forecasts.

### 2006 Changes:

#### Fire Weather Planning Forecasts

The Riverton office will issue routine Fire Weather Planning Forecasts (FWF) for its zones by 0700 and 1500 during the prescribed burn and wildfire seasons outlined in this AOP. The Riverton office will provide a noon update to the FWF that will focus on changes to the afternoon and early evening forecast. If no changes are expected, the morning forecast shall be retransmitted with NO CHANGES TO THE MORNING FORECAST added to the beginning of the discussion.

#### Spot Forecasts

The Riverton office issue spot forecasts in support of wildfire and prescribed fire operations within its area of responsibility. Normally, spots forecasts will be provided to you within 30 to 45 minutes of the receipt of the request for wild fire and for prescribed burns when prior notification has been provided.

Forecasts can be requested and retrieved at the web site below:

<http://spot.nws.noaa.gov/cgi-bin/spot/spotmon?site=riw>

When internet or computer capabilities are not available, fax or phone will be used to request a spot forecast.

#### Red Flag Warnings / Fire Weather Watches

Red Flag Warnings and Fire Weather Watches will be issued as appropriate for Wyoming fire weather zones 140, 274 through 283, 285 through 289, and 414 through 416.

#### Smoke Management Forecasts (SMF):

The Riverton office does not issue a separate SMF. Smoke management



forecast elements (transport winds, mixing height and ventilation or dispersion) are located within the Fire Weather Planning Forecasts (FWF).

#### NFDRS Forecasts

National fire danger rating system trend forecasts are routinely issued seven days a week from May 1st to November 1st of each year as observations are provided by the Land Management Agencies. The trend forecasts shall be prepared by 1600 each afternoon. Requests for spot forecasts in the afternoon may delay the issuance of the trend forecasts, as spot forecasts shall take priority over the trend forecasts.

#### IMET Services

Incident response meteorologist services (IMET dispatch) are usually available locally upon request 24 hours a day, seven days a week throughout the year. Due to scheduling conflicts and leave, at times an IMET from WFO Riverton may not be available for dispatch. If this is the case another IMET within the Rocky Mountain Area, the Eastern Great Basin Area or the Northern Rockies Area will usually be available. IMET dispatches shall be coordinated through the National Interagency Fire Coordination Center (NIFC).

#### Training Services:

There are two fire meteorologists available to assist the user agencies with training at fire behavior and other weather related courses. A request should be forwarded in writing to the office as early as possible to help ensure the request can be satisfied. Every attempt will be made to meet training requests. However, staffing limitations will need to be considered, and consequently, each request will be reviewed on a case by case basis.

#### Additional Information:

The Riverton office maintains a Fire Weather Page on its web site home page. This page contains links to forecasts (FWF), RFW, Spot Forecasts, RAWS observations, the annual operating plan, and other fire weather related sites. A clickable map is provided to obtain a narrative FWFs. Simply click on the map within the region of interest. To go directly to the Riverton fire weather web site, use the following url:

<http://www.crh.noaa.gov/riw/fire.htm>

#### BACK-UP:

The primary service backup for NWS Riverton is NWS Cheyenne and the secondary backup is NWS Billings (Please See Service Area and Organizational Directory). The servicing NWS office will notify there local

dispatch centers and RMACC when the office is in or plans to be in backup mode. To receive a spot from a backup office, customers should access the web based spot program of the office that is providing the backup service.

5. **Northern Bighorn Mountains/Bighorn Canyon Rec. Area – Billings, MT**

Unless otherwise mentioned, it is to be assumed that services provided by NWS Billings will follow the regional policies and procedures set forth in the Rocky Mountain Area Fire Weather AOP.

General Information

The National Weather Service in Billings is responsible for providing Fire Weather support for the Northern Bighorn Mountains of Wyoming (zone number 284) and the Wyoming portion of the Bighorn Canyon Recreation Area (zone number 129). The Billings office is staffed with 14 meteorologists trained in fire weather forecasting, one of which is designated as Incident Meteorologist (IMET). All fire weather forecasters are trained to produce all the routine fire weather products and spot forecasts.

2006 Changes:

None

Fire Weather Planning Forecasts

Forecasts commence in late March or early April, ending in November. The active fire season typically lasts from July through October. All dates are flexible and determined with user input.

Typical forecast issuance times:

Early spring	Morning Daily	0700
May1 thru October 31	Mornings Daily	0700
	Afternoons Daily	1500 - 1530
November	Mornings Daily	0700

Spot Forecasts

The Billings office will prepare spot weather forecasts for prescribed burns and wildfires as requested for locations within the office's fire weather service area. The primary means of requesting and disseminating spot forecasts will be through the NWSSpot Internet based forecast/reply program. NWSSpot for Billings can be accessed at:

<http://spot.nws.noaa.gov/cgi-bin/spot/spotmon?site=byz>

When internet or computer capabilities are not available, fax, phone or telefax will be used to request a spot forecast.

During your follow-up telephone call to ensure receipt of the request, please be sure to tell the forecaster if your request is for a wildfire.

#### Red Flag Warnings / Fire Weather Watches

Red Flag Warnings and Fire Weather Watches will be issued as required for Billings narrative zones 129 and 284 after coordination and collaboration with customers and adjacent NWS offices.

#### Smoke Management Forecasts

The Billings office will be issuing a Clearing Index Forecast which will be available on their internet web site.

#### NFDRS Forecasts

This product is issued at 1515 during the fire season and is a separate product from the afternoon forecast. The forecasts are used as input to the National Fire Danger Rating System (NFDRS) through WIMS to compute fire danger indices.

#### IMET Services:

The Billings office has one IMET available for dispatch.

#### Training Services

The office has a cadre of meteorologists that may be available to handle fire weather training requests from northern Wyoming customers. Training requests outside the area will be handled on case-by-case basis. Refer all training requests or technical support questions to the Focal Point or his Meteorologist in Charge.

#### Additional Information

The Billings office maintains a Fire Weather Page on its web site home page. This page contains links to forecasts, Red Flag Warnings and Fire Weather Watches, Spot Forecasts, RAWs observations, the annual operating plan, and other fire weather related sites. To go directly to the Billings fire weather web site, use the following url:

<http://newweb.wrh.noaa.gov/byz/fire.php>

#### FARSITE data support

For the 2006 fire season, NWS Billings will offer automatic 7-day FARSITE weather data support with wildfire spot forecast issuances. For prescribed

burn spot forecasts, FARSITE data will be produced at the request of the agency. Please call the NWS office issuing the prescribed burn forecast directly to request this service, or place the request in the "Remarks Section" of the spot request form. All FARSITE data will be available from the internet via the appropriate NWS office Fire Weather Page. Check for a "FARSITE Forecasts" button near the Spot Forecast Request link. The data will be in simple ASCII format. Examples of the two FARSITE support outputs ("weather" and "wind") are below.

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
03 07 0000 09 210 80
03 07 0300 08 210 80
03 07 0600 11 240 80
03 07 0900 11 260 80
03 07 1200 09 260 80
03 07 1500 09 270 77
03 07 1800 10 290 70
03 07 2100 11 320 70
```

etc., through seven days

BACK-UP:

The primary service backup for NWS Billings is NWS Glasgow and the secondary backup is NWS Riverton (Please See Service Area and Organizational Directory). The servicing NWS office will notify there local dispatch centers and RMACC when the office is in or plans to be in backup mode. To receive a spot from a backup office, customers should access the web based spot program of the office that is providing the backup service.

## 6. Southeast Wyoming-Nebraska Panhandle- Cheyenne, Wyoming

Unless otherwise mentioned, it is to be assumed that services provided by NWS Cheyenne will follow the regional policies and procedures set forth in the Rocky Mountain Area Fire Weather AOP.

### General Information

The National Weather Service in Cheyenne is responsible for providing fire weather support for southeast Wyoming and portions of western Nebraska. Its area of responsibility covers Wyoming fire weather zones 290 through 296, and western Nebraska fire weather zones 200 and 202. The Cheyenne office is staffed with 13 meteorologists trained in fire weather forecasting, two of which are designated as Incident Meteorologists (IMET). All fire weather forecasters are trained to produce all the routine fire weather products and spot forecasts.

### 2006 Changes:

#### Fire Weather Planning Forecasts

The Cheyenne office will issue routine Fire Weather Planning Forecasts (FWF) for its zones by 0700 and 1430 during the prescribed burn and wildfire seasons outlined in this AOP.

#### Spot Forecasts

The Cheyenne office issues spot forecasts in support of wildfire and prescribed fire operations within its area of responsibility. Normally, spots forecasts will be provided to you within 30 to 45 minutes of the receipt of the request for wild fire and for prescribed burns when prior notification has been provided.

<http://spot.nws.noaa.gov/cgi-bin/spot/spotmon?site=cys>

#### Red Flag Warnings / Fire Weather Watches

NWS Cheyenne issues Red Flag Warnings and Fire Weather Watches as appropriate for the fire weather zones in its fire weather service area.

#### Smoke Management Forecasts (SMF):

The Cheyenne office does not issue a separate SMF. Smoke management forecast elements (transport winds, mixing height and ventilation) are located within the Fire Weather Planning Forecasts (FWF).

#### NFDRS Forecasts

National fire danger rating system trend forecasts are routinely issued seven days a week from May 1st to November 1st of each year as observations are provided by the Land Management Agencies. The trend forecasts shall be prepared by 1600 each afternoon. Requests for spot forecasts in the afternoon may delay the issuance of the trend forecasts, as spot forecasts shall take priority over the trend forecasts.

#### IMET Services:

The IMETs at NWS Cheyenne has primary responsibility for incident response in Southeast Wyoming.

#### Training Services:

The fire weather program leader, assistant fire weather program leader, or IMET may be available to handle fire weather training requests from southeast Wyoming customers. Training requests outside the area will be handled on case-by-case bases. Refer all training requests or technical support questions to the Focal Point or his Assistant

#### Additional Information:

The Cheyenne office maintains a Fire Weather Page on its web site home page. This page contains links to forecasts (FWF), RFW, Spot Forecasts, RAWS observations, the annual operating plan, and other fire weather related sites. A clickable map is provided to obtain a narrative FWFs. Simply click on the map within the region of interest. To go directly to the Cheyenne fire weather web site, use the following url:

<http://www.crh.noaa.gov/cys/firewx.php>

#### BACK-UP:

The primary service backup for NWS Cheyenne is NWS Riverton and the secondary backup is NWS Rapid City (Please See Service Area and Organizational Directory). The servicing NWS office will notify there local dispatch centers and RMACC when the office is in or plans to be in backup mode. To receive a spot from a backup office, customers should access the web based spot program of the office that is providing the backup service.

### **7. Northeast Wyoming – Western South Dakota- Rapid City, SD**

Unless otherwise mentioned, it is to be assumed that services provided by NWS Rapid City will follow the regional policies and procedures set forth in the Rocky Mountain Area Fire Weather AOP.

#### General Information

The National Weather Service in Rapid City is responsible for providing fire weather support for portions of Northeast Wyoming and Western South Dakota. Its area of responsibility covers Northeast Wyoming fire weather zones 259, 297, 298, and 299, and Western South Dakota fire weather zones 260 through 266. The Rapid City office is staffed with 9 meteorologists trained in fire weather forecasting. All fire weather forecasters are trained to produce all fire weather products.

#### Changes for 2006

None.

#### Fire Weather Forecasts

The Rapid City office will issue routine Fire Weather Planning Forecasts (FWF) for all of its fire zones by 0700 LT, March 15 through October 31, and both 0700 LT and 1430 LT July 1 through September 30. Requests for an early start or an extension to the FWF product season should be made in writing to:

David M. Carpenter  
Meteorologist in Charge  
300 East Signal Drive  
Rapid City, SD 57701-3800

#### Spot Forecasts

The Rapid City office issues spot forecasts in support of wildfire and prescribed fire operations within its area of responsibility. Normally, spots forecasts will be provided to you within 30 to 45 minutes of the receipt of the request for wild fire and for prescribed burns when prior notification has been provided.

<http://spot.nws.noaa.gov/cgi-bin/spot/spotmon?site=unr>

#### Red Flag Warnings / Fire Weather Watches

NWS Rapid City issues Red Flag Warnings and Fire Weather Watches as appropriate for the fire weather zones in its fire weather service area.

#### Smoke Management Forecasts (SMF):

Smoke management forecast elements (transport winds, mixing height and ventilation) are included in the Fire Weather Planning Forecasts (FWF).

#### NFDRS Forecasts

National fire danger rating system trend forecasts are routinely issued seven

days a week from May 1st to November 1st of each year as observations are provided by the Land Management Agencies. The trend forecasts shall be prepared by 1600 each afternoon. Requests for spot forecasts in the afternoon may delay the issuance of the trend forecasts, as spot forecasts shall take priority over the trend forecasts.

IMET Services:

The Rapid City office does not have a trained IMET.

Training Services:

Fire Meteorologists are available for all training requests. Please send a letter to the Rapid City NWS Office requesting these services with the time, date, and place of the training.

David M. Carpenter  
Meteorologist in Charge  
300 East Signal Drive  
Rapid City, SD 57701-3800

Additional Information:

The Rapid City office maintains a Fire Weather Page on its web site home page. This page contains links to fire weather planning forecasts (FWF), Red Flag Warning and Fire Weather Watch (RFW), Spot Forecasts, South Dakota Grassland Fire Danger, the Annual Operating Plan, and other fire weather related information. A clickable map is provided to obtain the narrative FWF for each Fire Zone. Simply click on the map within the region of interest. To go directly to the Rapid City fire weather web site, use the following URL:

<http://www.crh.noaa.gov/unr/firewx/>

BACK UP: Primary back up of the Rapid City office for all Fire Weather Products will be done by the North Platte NWS office, and the Cheyenne NWS office as a secondary back up office. Contact numbers for these offices can be found in the main body of the Rocky Mountain Area Fire Weather AOP.

**8. Central, North Central, and Northeast South Dakota – Aberdeen, SD**

Unless otherwise mentioned, it is to be assumed that services provided by WFO Aberdeen for its area of responsibility in South Dakota will follow the regional policies and procedures set forth in the Rocky Mountain Area Fire Weather AOP.

General Information



The National Weather Service in Aberdeen is responsible for providing fire weather support for portions of central, north central and northeast South Dakota, and two counties in west central Minnesota. Its area of responsibility covers South Dakota fire weather zones 267 through 273 and Minnesota fire weather zones 036 and 046. The Aberdeen office is staffed with 9 meteorologists trained in fire weather forecasting. All fire weather forecasters are trained to produce all the routine fire weather products and spot forecasts.

#### Fire Weather Planning Forecasts

The Aberdeen office will issue routine Fire Weather Planning Forecasts (FWF) for its zones by 0700 and 1630 during the prescribed burn and wildfire seasons -- typically April 1 through October 31. However, these dates are general guidelines and are flexible depending upon weather and fuels conditions, thus beginning and ending dates may be later or earlier than listed above.

#### Spot Forecasts

Aberdeen will issue spot forecasts upon request for locations within its fire weather service area. The primary means of requesting and disseminating spot forecasts will be through the internet based NWSpot forecast/reply program. NWSpot for WFO Aberdeen can be accessed at:

<http://spot.nws.noaa.gov/cgi-bin/spot/spotmon?site=abr>

When internet or computer capabilities are not available, fax or phone will be used to request a spot forecast.

#### Red Flag Warnings / Fire Weather Watches

NWS Aberdeen issues Red Flag Warnings and Fire Weather Watches as appropriate for the counties in its fire weather service area. Appropriate fire weather products will contain a statement as to the impact of such warnings/watches on the applicable fire weather zones.

#### Rangeland Fire Danger Statement

WFO Aberdeen issues a Rangeland Fire Danger (RFD) Statement as appropriate when the rangeland fire danger index reaches the very high or extreme categories. The RFD is issued for applicable counties. This statement serves the public, media and user agencies with a product that defines burning conditions which are severe or extreme, but with conditions not as critical as under a Red Flag Warning. In addition to this statement, a Rangeland Fire Danger map is posted daily on the WFO Aberdeen fire weather website during the prescribed burn and wildfire seasons as described above. To display the Rangeland Fire Danger Statement for a specific county, click on the applicable county in the map.

### NFDRS Forecasts

Not currently produced

### IMET Services:

The Aberdeen office does not have a trained IMET.

### Training Services:

Fire Meteorologists may be available for training requests from customers within the WFO Aberdeen area of responsibility. Training requests outside the area will be handled on case-by-case bases. Refer all training requests or technical support questions to the Fire Weather Focal Point or Assistant Fire Weather Focal Point.

### Additional Information:

The Aberdeen office maintains a Fire Weather Page on its internet webpage. This page contains links to the FWF, RFW, RFD, Spot Forecasts, RAWS observations, the annual operating plan, and other fire weather related sites. A clickable map is provided to obtain a narrative FWF. Simply click on the map within the region of interest. To go directly to the Aberdeen fire weather web site, use the following URL:

[http://www.crh.noaa.gov/abr/FireWeather/fire\\_danger.htm](http://www.crh.noaa.gov/abr/FireWeather/fire_danger.htm)

### BACK-UP:

The primary service backup for WFO Aberdeen is WFO Sioux Falls and the secondary backup is WFO Bismarck (Please See Service Area and Organizational Directory). During the prescribed burn and wildfire seasons, the servicing NWS office will notify their local dispatch centers and RMACC when the office is in or plans to be in backup mode. To receive a spot from a backup office, customers should access NWSpot via the backup office's fire weather webpage.

## **9. South Central-Southeast South Dakota – Sioux Falls, South Dakota**

Unless otherwise mentioned, it is to be assumed that services provided by NWS Sioux Falls will follow the regional policies and procedures set forth in the Rocky Mountain Area Fire Weather AOP.

### General Information:

The National Weather Service in Sioux Falls is responsible for providing fire weather support for the southeast quadrant and a small portion of south central South Dakota, extreme southwest Minnesota and far northeast Nebraska. Its

area of responsibility covers South Dakota fire weather zones 255 through 258, and Minnesota fire zone 900. The Sioux Falls office is staffed with 10 meteorologists and one hydro-meteorological technician trained in fire weather forecasting. All fire weather forecasters are trained to produce all the routine fire weather products and spot forecasts.

#### 2006 Changes:

##### Fire Weather Planning Forecasts

The Sioux Falls office will issue routine Fire Weather Planning Forecasts (FWF) for its zones with “no later than” issuance times of 0700 and 1600 during the prescribed burn and wildfire seasons, which closely correlate to April 1<sup>st</sup> through May 31<sup>st</sup>, and again from August 15<sup>th</sup> through October 31<sup>st</sup>. From June 1<sup>st</sup> through August 14<sup>th</sup>, only the morning Fire Weather Planning Forecast will be issued unless directed otherwise through interagency agreement. This is due to radically decreased burning conditions during the “green” period in the true summer months.

##### Spot Forecasts

Spot forecasts prepared by the Sioux Falls weather office are available by request, 24 hours a day, 7 days per week, for locations within the office’s fire weather service area. The primary means of requesting and disseminating spot forecasts will be through the internet based NWSpot forecast/reply program. NWSpot for Sioux Falls can be accessed at:

<http://spot.nws.noaa.gov/cgi-bin/spot/spotmon?site=fsd>

When internet or computer capabilities are not available, fax or phone will be used to request a spot forecast.

##### Red Flag Warnings / Fire Weather Watches

NWS Sioux Falls issues Red Flag Warnings and Fire Weather Watches as appropriate for fire weather zones within its fire weather service area. All attempts at coordination with involved user agencies are first attempted.

##### Grassland Fire Danger Statement

NWS Sioux Falls issues a Grassland Fire Danger Statement as appropriate when the grassland fire danger index reaches the very high or extreme categories. This statement serves the public, media and user agencies with a product that defines burning conditions which are severe or extreme, but with conditions not as critical as under a Red Flag Warning. In addition to this formal statement, a Grassland Fire Danger map is posted daily on the Sioux Falls fire weather website (see the additional information section below for the URL) from April 1<sup>st</sup> through October 31<sup>st</sup> no matter what the index rates.

### NFDRS Forecasts

### IMET Services:

The Sioux Falls office does not have a trained IMET.

### Training Services:

The fire weather focal point is available for training services in resident courses with user agencies in the Sioux Falls forecast area. Specific user agency responsibilities in the reimbursement of costs associated with travel, per diem and overtime, are detailed in the National Interagency Agreement for Meteorological Services.

### Additional Information:

The Sioux Falls office maintains a Fire Weather Page on its web site home page. This page contains links to the Fire Weather Planning Forecast (FWF), Grassland Fire Danger Index, Spot Forecasts, Red Flag Warnings/Fire Weather Watches, products from the Storm Prediction Center, RAWS observations, the annual operating plan, and other fire weather related sites. A clickable map is provided to obtain a narrative FWF. Simply click on the map within the region of interest. To go directly to the Sioux Falls fire weather web site, use the following URL:

<http://www.crh.noaa.gov/fsd/firewx.htm>

### BACK-UP:

The primary service backup for NWS Sioux Falls is NWS Aberdeen and the secondary backup is NWS Minneapolis (Please See Service Area and Organizational Directory). The servicing NWS office will notify their local dispatch centers and RMACC when the office is in or plans to be in backup mode. To receive a spot from a backup office, customers should access the web based spot program of the office that is providing the backup service.

## **10. Western and North Central Nebraska – North Platte, Nebraska**

Unless otherwise mentioned, it is to be assumed that services provided by NWS North Platte will follow the regional policies and procedures set forth in the Rocky Mountain Area Fire Weather AOP.

### General Information

The National Weather Service in North Platte is responsible for providing fire weather support for portions of Western and North Central Nebraska. Its area of responsibility covers Nebraska fire weather zones 204, 206, 208, 209, 210,

and 219. The North Platte office is staffed with 9 meteorologists trained in fire weather forecasting. All fire weather forecasters are trained to produce all the routine fire weather products and spot forecasts.

#### 2006 Changes:

Critical fire weather conditions occurring outside the normal fire season will be relayed to the local customers via the Hazardous Weather Outlook (OMAHWOLBF) product for RH values at 20 percent or less. A phone call to the users will be utilized if RH values drop below 15 percent.

#### Fire Weather Planning Forecasts

The North Platte office will issue routine Fire Weather Planning Forecasts (FWF) for it's zones twice daily by 0700 and 1600 during the prescribed and wildfire season. The FWF product may also be reduced to one issuance by 0700, or suspended, after coordination between NWS North Platte and our users. This most likely will occur during green up and abnormally wet periods when extreme fire behavior is minimal.

#### Spot Forecasts

The North Platte office prepares spot weather forecasts for prescribed burns and wildfires as requested for locations within the office's county warning area (CWA).

The primary means of requesting and disseminating spot forecasts is the NWSSpot Internet-based spot request and reply program. Internet requests are preferred and once sent, will alarm at the forecaster workstation. Phone calls to the WFO are welcome to ensure receipt of the spot request by the fire weather forecaster. If you have not received your spot forecast after 60 minutes, call the WFO to check on the status of your spot or to determine if there has been a communications system failure. The NWS strongly encourages land agencies to use the "REMARKS" section within NWSSpot to provide feedback with all follow-on spot requests. NWS Spot for North Platte can be accessed at:

<http://spot.nws.noaa.gov/cgi-bin/spot/spotmon?site=lbf>

When internet or computer capabilities are not available, fax or phone can be used to request a spot forecast.

#### Red Flag Warnings / Fire Weather Watches

NWS North Platte issues Red Flag Warnings and Fire Weather Watches as appropriate for the fire weather zones in its fire weather service area.

#### NFDRS Forecasts

WFO North Platte currently has one forecast point located at the Bessey Ranger District, in the Nebraska National Forest near Halsey. This product is issued around 1530 during the fire season and is used as input to the National Fire Danger Rating System (NFDRS) through WIMS to compute fire danger indices.

#### IMET Services:

The North Platte office does not have a trained IMET.

#### Training Services:

The fire weather program leader, SOO, or MIC may be available to handle fire weather training requests from customers within the WFO North Platte CWA. Training requests outside the area will be handled on a case-by-case basis. Refer all training requests or technical support questions to the fire weather program leader, SOO, or MIC.

#### Additional Information

The North Platte office maintains a Fire Weather Page on its web site home page. This page contains links to the FWF, Spot Forecasts, RAWs observations, this operating plan, and other fire weather related sites. A clickable map is provided to obtain a narrative forecasts. Simply click on the map within the region of interest. To go directly to the North Platte fire weather web site, use the following url:

<http://www.crh.noaa.gov/lbf/firewx/firewx.php>

#### BACK-UP:

The primary service backup for NWS North Platte is NWS Rapid City and the secondary backup is NWS Hastings (Please See Service Area and Organizational Directory). The servicing NWS office will notify there local dispatch centers and RMACC when the office is in or plans to be in backup mode. To receive a spot from a backup office, customers should access the web based spot program of the office that is providing the backup service.

### **11. Extreme Eastern Colorado – Goodland, Kansas**

Unless otherwise mentioned, it is to be assumed that services provided by NWS Goodland will follow the regional policies and procedures set forth in the Rocky Mountain Area Fire Weather AOP.

#### General Information

The National Weather Service in Goodland is responsible for providing fire

weather support for portions of extreme eastern Colorado. Its area of responsibility covers Colorado fire weather zones 252, 253, and 254. The Goodland office is staffed with 9 meteorologists trained in fire weather forecasting. All fire weather forecasters are trained to produce all the routine fire weather products and spot forecasts.

#### 2006 Changes

None

#### Fire Weather Planning Forecasts

The Goodland office will issue routine Fire Weather Planning Forecasts (FWF) for its zones by 0700 during the prescribed burn and wildfire seasons outlined in this AOP. Due to a lack of fuels, local fire weather planners, and a limited amount of state or federal lands, the FWF will be issued only once a day. Forecasts will be updated as appropriate. Twice daily FWFs will be issued if requested by the RMA Predictive Services during critical fire weather situations.

#### Spot Forecasts

Goodland will issue a spot weather forecast upon request from all local, state, and federal land management agencies in support of wildland fires and prescribed burns. Spot forecasts are requested and retrieved using the following web address:

<http://spot.nws.noaa.gov/cgi-bin/spot/spotmon?site=gld>.

#### Red Flag Warnings / Fire Weather Watches

NWS Goodland issues Red Flag Warnings and Fire Weather Watches as appropriate for fire weather zones within its fire weather service area.

#### NFDRS Forecasts

Not currently issued.

#### IMET Services:

The Goodland office does not have a trained IMET.

#### Training Services:

Fire Meteorologists are available for training requests.

#### Additional Information

The Goodland office maintains a Fire Weather Page on its web site home page. This page contains links to forecasts (FWF), RFW, Spot Forecasts, and other fire weather related sites. A clickable map is provided to obtain a narrative FWFs. Simply click on the map within the region of interest. To go directly to the Goodland fire weather web site, use the following url:

[http://www.crh.noaa.gov/gld/fire\\_weather/index.htm](http://www.crh.noaa.gov/gld/fire_weather/index.htm)

**BACK-UP:**

The primary service backup for NWS Goodland is NWS Dodge City (phone number 620-227-3700) and the secondary backup is NWS Pueblo (Please See Service Area and Organizational Directory). The servicing NWS office will notify there local dispatch centers and RMACC when the office is in or plans to be in backup mode. To receive a spot from a backup office, customers should access the web based spot program of the office that is providing the backup service.

**V. WILDLAND FIRE AGENCY SERVICES AND RESPONSIBILITIES**

Wildland Fire Agencies' programs provide Geographic Area and national products for the strategic role of resource prioritization and utilization. Some specific responsibilities of Wildland Fire Agencies are listed below.

- A. **Operational Support and Predictive Services** – Interagency Fire Meteorologists at RMCC combine forecast information from NWS, local weather analysis, and other sources into area-wide summaries and briefings (briefings to fire management on a local or geographical level). The meteorologists work in conjunction with Fire Intelligence to form the Predictive Services group, which produces integrated fire weather/fire danger assessments for the entire Rocky Mountain Area. The intent of Predictive Services is to provide strategic, regional and sub-regional information to assist in the preparedness, movement and allocation of firefighting resources. RMA Predictive Services is the exclusive provider of fire danger and potential forecasts within the Rocky Mountain Area beyond the next day NFDRS forecasts provided by NWS. All products and services are available online and can be obtained from the RMA Predictive Services homepage at:

<http://www.blm.gov/colorado/rmafwx/index.html>

**Predictive Services Products** – (Examples in Appendix C)

1. **Daily Fire Weather/Fire Danger Highlights.** This product is a combination of graphic and text, based on a summarization of NWS Fire Weather Planning Forecasts and analysis by the RMA Predictive Services Meteorologists. The product outlines and highlights significant fire weather elements that may have impact on fire operations.



**Issuance Schedule:** Issued twice daily by 800 a.m. (for the current day) and 400 p.m. (for the next day), from approximately June 1 – September 30 (or as wildfire potential warrants outside the core dates).

2. **7-Day Significant Fire Potential Outlook.** Observed and forecasted dryness levels (Based on fuel information and historical fire data) for predetermined predictive service zones based on RAWS climatology. Dryness levels in conjunction with lightning and wind events (high risk day) increase the risk of large fire activity.

**Issuance Schedule:** Issued Daily from approximately June 1 – September 30, by 1000 am MDT. (or as wildfire potential warrants outside the core dates).

3. **Southwest Monsoon Outlook.** This product is a combination of graphics and text that outlines and discusses the current and forecasted moisture flux and patterns associated with the Southwest Monsoon. The Southwest Monsoon plays a significant role the severity of the RMA fire season. RMA Predictive Services analysis is solely responsible for this product.

**Issuance Schedule:** Approximately mid to late June – late August/early September. Updated every Wednesday and Sunday afternoon by 1500 MDT.

4. **Monthly and seasonal fire potential outlooks.** Utilizes all available weather, climate and fire danger information to make longer-term predictions of fire business potential. Outlooks will highlight time frames and potential for large fire activity and resource utilization relative to normal.

**Issuance Schedule (Monthly):** Year round, a few days before the end of each month.

**Issuance Schedule (Seasonal):** Two to three times per year, with a preliminary issuance in April and a primary outlook issued by mid May. A subsequent update will occur by the beginning of July to encompass the Northern Rockies fire season and Southwest Monsoon outlook.

**B. Program Management** - Management of federal land management and fire agencies' fire weather programs and responsibilities.

1. RAWS – RMA Predictive Services will monitor and quality control RAWS data on a regular basis and will make the appropriate contacts when data is suspect or when a station appears to be malfunctioning.
2. Liaison - Predictive Services Fire Weather Program Manager will act as

a liaison between fire managers and various service providers, including NWS, the private sector and the research community. Fire Managers and the NWS will try to resolve conflicts at the local level. Predictive Services will be notified by the NWS and Fire Managers of all conflicts and resolutions. Fire Managers may choose to have Predictive Services Meteorologist represent them or act as a liaison when conflicts arise.

**C. Monitoring, Feedback and Improvement of Fire Weather Information** – RMCC meteorologists will monitor all sources of fire weather information to ensure consistency, quality and applicability. Where issues arise, data will be archived and brought to the attention of the provider to enhance awareness and work towards improvement. Some priorities include:

1. General forecast parameter consistency across the Rocky Mountain Area, especially across forecast area and land management unit boundaries.
2. Accuracy and applicability of Red Flag Warnings.
3. Overall adherence to policies and procedures set forth in AOP.

**D. Technology Transfer** – RWCC meteorologists will work to integrate advanced technology analytical and prediction systems into fire management planning and operations. Some efforts will include:

1. Regional numerical modeling of weather and smoke dispersion
2. Proper use of RAWS and NFDRS
3. Developing an NFDRS/RMA fuels map in support of the Red Flag Program
4. Research and development to advance fire meteorology

**E. Agency Computer Systems** - Where fire management computer systems like WIMS are locally available, access to the systems will be granted to NWS to provide or develop services, as needed. Costs will be borne by the Interagency Wildland Fire Agencies for requirements that are beyond the distribution of weather information through a central communications gateway.

**F. Fire Weather Observations**

1. RAWS & NFDRS Observations

Fire weather observations for stations that desire next day forecasts will be entered into WIMS no later than 1350 LST (1450 LDT).

Observations from Remote Automated Weather Stations (RAWS) sites will be the latest data available from the satellite interrogation. RAWS and NFDRS stations are expected to be sited and maintained according to NWCG PMS 426-3 “National Fire Danger Rating System Weather Station Standards”. Proper siting of all stations is a goal in the Rocky Mountain Area rather than an operational reality. In practice, some long

standing NFDRS stations will remain improperly sited due to extensive fire danger histories. Any new or relocated stations will be correctly sited in a long-term effort to address this issue. Regardless of station age or location, annual RAWS maintenance requirements will be strictly adhered to.

## 2. Fire-line Observations

Fireline Observations – Fireline observations must be taken prior to requesting a spot forecast. Fire management agency personnel should take standard fireline observations of temperature, humidity, wind speed and direction and weather/sky condition consistent with guidance provided in NFES 2140 "Weather Station Handbook - an Interagency Guide for Wildland Managers". Under limited circumstances RAWS observations may be provided to the NWS for an initial spot forecast request on a multi-day project, but only if the RAWS site is located at a similar elevation, aspect, and sheltering as the burn site and has been shown to have weather conditions that are representative of the at the burn site.

G. **Technical Specialist**- Land Agency Meteorologist can be dispatched to incidents or prescribed burns as a Technical Specialist

H. **Reimbursement for NWS Provided On-site Support and Training Assistance** – Federal agencies will reimburse NWS for all costs incurred by the agency for IMET support and training assistance, per the procedures set forth in the National Agreement. Non-federal agencies do not have blanket reimbursable agreements under the national agreement.

## VI. JOINT RESPONSIBILITIES

A. **Training** – Meteorological training assistance for NWCG and other courses will be provided jointly. Requests for training from NWS offices should be directed to that office's fire weather focal point or assistant fire weather focal point, followed by a formal written request sent to the Meteorologist-in-Charge. Requests for training from RMA fire meteorologists should be directed to the Predictive Services Group Fire Weather Program Manager. In all cases, sufficient advance notice should be given to allow for scheduling and proper preparation. Costs incurred by NWS in providing training assistance will be borne by the requesting agency.

B. **Incident Response** - Costs incurred by NWS in providing IMET support will be borne by the requesting agency. Qualified (Under NWS or Land Agency Qualifications) fire management agency IMETs may be utilized under special circumstances, and to maintain qualifications. All requests for IMETs will be processed through RMCC. The following information will be provided to the requested IMET:

1. Name of fire
2. Location of fire

3. Directions to location where the IMET is to report and Fire Camp Location
4. Name of Incident Commander, Plans Chief and Fire Behavior Analyst if available, and telephone contacts at the ICP.
5. Request and Resource Order number for IMET
6. If the IMET resource order is delayed, NWS offices may call the RMCC meteorologists, who will ensure the order process is expedited.

Note: If the IMET resource order is delayed, NWS offices may call the RMCC meteorologists, who will insure the order is expedited.

Additionally, the user agency is responsible for providing adequate shelter to allow the equipment and fire weather meteorologist to function efficiently. This would include a location free of excessive dust, heat and moisture, protection from wind and other elements, table and chair. Transportation and shelter arrangements should be made at the time of request. 120 volt AC power is desirable.

IMETs will carry their own communications equipment and will no longer need a separate order for an All Hazards Meteorological Response System (AMRS). An Atmospheric Theodolite Meteorological Unit (ATMU) may be ordered by the IMET from the incident. Below is a list of IMETs and ATMUs in the Rocky Mountain Area.

#### 1. Rocky Mountain Area Incident Meteorologists

<u>Location</u>	<u>Name</u>	<u>Agency</u>
Boulder, CO	Rob Krohn	NWS
Pueblo, CO	Makoto Moore	NWS
Pueblo, CO	Eric Petersen	NWS
Grand Junction, CO	Mike Chamberlain	NWS
Grand Junction, CO	Joe Ramey	NWS
Riverton, WY	Dave Lipson	NWS
Cheyenne, WY	John Griffith	NWS
Cheyenne, WY	Mike Sowko	NWS
Billings, MT	Dan Borsum	NWS
RMCC	Tim Mathewson	BLM
Rapid City, SD	Randall Benson	SD State (For Joe Lowe Type 3 Team)

#### Rocky Mountain Area ATMUs

<u>CACHE</u>	<u>RESOURCE</u>
Denver	CO-01

- C. **Briefings** – Either NWS or RMCC meteorologists will conduct briefings upon request, time and resources permitting. RMCC meteorologists will provide briefings for strategic planning during organized RMA MAC.
- D. **Conference Calls** – April 1 through October 31 RMA NWS offices and RMA Predictive Services may conduct daily or weekly conference calls to discuss the current and forecasted fire weather situation during periods of significant fire activity. These dates and times are flexible and may change based on the fire situation.

- E. **WIMS IDs for NFDRS Stations** – All NFDRS observation stations are assigned a 6-digit NWS station identification number for use in WIMS. Land agencies will coordinate with their local NWS office and Regional Fire Weather Focal Point to obtain the 6-digit ID. The NWS will coordinate the new station and 6-digit ID to RMA Predictive Services. A listing of current NFDRS stations and IDs is included in the appendices.

**VII. EFFECTIVE DATES ON THE AOP**

May 1, 2006 to May 1, 2007

This AOP shall be effective on the date the last signature is placed on the signature section and it will remain in effect until the date the last signature is placed on the signature page the following year. Updates or amendments may be added in the interim upon agreement of all signatories.

**VIII. AGENCY SIGNATURES (*On file*)**

<u>/s/ Darrell Ausborn</u> Chair Rocky Mountain Area Coordinating Group	<u>5/2/06</u> Date
<u>/s/ Michael Looney</u> Chief, Meteorological Services Division NWS Central Region Headquarters	<u>4/26/06</u> Date
<u>/s/ Gary C. Schmeling</u> Manager, Regional Fire and Aviation Programs NWS Central Region Headquarters	<u>4/24/06</u> Date
<u>/s/ Jim Fletcher</u> Rocky Mountain Area Coordination Center Manager BLM Colorado State Office	<u>4/24/06</u> Date
<u>/s/ Timothy O. Mathewson</u> Fire Weather Manager, RMA Predictive Services BLM Colorado State Office	<u>4/24/06</u> Date

IX. APPENDICES

A. APPENDIX – FORECAST PARAMETER DEFINITIONS

1. General Parameters

Sky/weather – Cloud cover and weather. Weather could include rain, snow, showers, thunderstorms, etc. Cloud cover is as follows

Clear	10% or less cloud cover
Mostly Clear/Mostly Sunny	10% - 30% cloud cover
Partly cloudy/Partly Sunny	40% - 60% cloud cover
Mostly Cloudy	70% - 80% cloud cover
Cloudy/Overcast	90% or greater cloud cover

Temperature and 24 hour trend – Dry bulb temperature extreme, either daytime or nighttime, and trend of extreme from previous 24 hours.

Humidity and 24 hour trend – Relative humidity extreme, either daytime or nighttime, and trend of extreme from previous 24 hours.

Wind - 20 foot RAWs standard – Surface wind speed and direction as altered by local terrain and surface roughness and measured per instrumentation and siting standards set by NWCG for the RAWs program and NFDRS.

Ridgetop winds – Synoptic scale wind speed and direction representative of wind conditions at or just above mean ridgetop level.

Chance of Rain – Probability of occurrence of 0.01” or greater liquid equivalent precipitation. In the case of convective cells, this will pertain to the areal coverage of cells producing rainfall.

Haines Index – A numerical means to indicate the potential for existing large wildfires to experience extreme fire behavior (i.e. crowning, spotting, and rapid rates of spread). The Index combines both the instability and dryness of the air by examining the lapse rate between two pressure levels in the atmosphere and the dryness at the lower level. For most of the Rocky Mountain Area, the levels used are 700 mb (about 10,000 ft) and 500 mb (about 18,000 ft). The drier and more unstable the atmosphere, the higher the Haines Index and the potential for extreme fuel driven fire behavior. Haines Index values vary from 2 to 6 and classifications are shown below:

<u>HAINES INDEX</u>	<u>POTENTIAL FOR LARGE FIRE GROWTH</u>
2 or 3	Very Low
4	Low
5	Moderate
6	High

(Haines Index does **not** include the effects of wind on fire spread.)

## APPENDIX A - FORECAST PARAMETER DEFINITIONS (Dispersion and Ventilation)

### 2. Dispersion/Ventilation

Basic ventilation information is used by some states within the Rocky Mountain Area in considering the potential for smoke impacts from wildland fires. The following are terms and definitions necessary to understanding ventilation data and values:

**Mixing height or mixing depth:** The height to which relatively vigorous mixing occurs due to heating. Units are in feet above ground level (AGL), with ground level being the elevation above mean sea level (MSL) of the upper-air site.

**Transport winds:** A measure of the average rate of the horizontal transport of air within the mixing layer (as defined above). Units are in mph. An average wind direction (the direction from which the wind is blowing) is provided.

**Smoke Dispersion:** As used in smoke management forecasts, the ability of the atmosphere to rid itself of smoke. Dispersion is a combination of vertical mixing and horizontal transport. These two components are independent of one another. Vertical mixing is a function of atmospheric stability. A stable airmass is characterized by poor vertical mixing; an unstable airmass is characterized by good vertical mixing. Horizontal transport is a function of wind speed: the stronger the wind the better the horizontal transport. (see mixing height and transport wind).

Smoke Dispersion will be forecast using one of the following terms:

VERY POOR- very high air pollution potential  
POOR- moderate to high air pollution potential  
FAIR- marginal air pollution potential  
GOOD- moderate to low air pollution potential  
VERY GOOD- low air pollution potential  
EXCELLENT- very low air pollution potential

Dispersion is related and often interchanged with the term "VENTILATION". The ventilation index is a product of mixing height TIMES the transport wind and is measured in knot-feet.

APPENDIX A – FORECAST PARAMETER DEFINITIONS (LAL)

3. Lightning Activity Level (LAL)

<b>LIGHTNING ACTIVITY LEVEL GUIDE FOR FIRE WEATHER OBSERVERS</b>					
			Individual storm cell cloud to ground lightning discharges		
<b>LAL</b>	<b>Cloud and Storm Development</b>	<b>Areal Coverage</b>	<b>Counts<sup>1</sup>cg/5 min</b>	<b>Counts<sup>1</sup>cg/15 min</b>	<b>Average<sup>1</sup>cg/min</b>
1	No thunderstorms	None	----	----	----
2	Cumulus clouds are common but only a few reach the towering stage. A single thunderstorm must be confirmed in the rating area. The clouds mostly produce virga but light rain will occasionally reach ground. Lightning is very infrequent.	<15 %	1-5	1-8	<1
3	Cumulus clouds are common. Swelling and towering cumulus cover less than 2/10 of the sky. Thunderstorms are few, but 2 to 3 occur within the observation area. Light to moderate rain will reach the ground, and lightning is infrequent.	15-24 %	6-10	9-15	1-2
4	Swelling cumulus and towering cumulus cover 2-3/10 of the sky. Thunderstorms are scattered but more than three must occur within the observation area. Moderate rain is commonly produced, and lightning is frequent.	25-50 %	11-15	16-25	2-3
5	Towering cumulus and thunderstorms are numerous. They cover more than 3/10 and occasionally obscure the sky. Rain is moderate to heavy, and lightning is frequent and intense.	>50 %	>15	>25	>3
6	Dry lightning outbreak. (LAL of 3 or greater with majority of storms producing little or no rainfall.)	>15 %	----	----	----

<sup>1</sup> Cloud-to-ground lightning discharges



## B. APPENDIX – NWS FORECAST EXAMPLES

### 1. Fire Weather Planning Forecast Standard Format Example

FNUS55 KPUB 312222 AAA  
FWFPUB

FIRE WEATHER FORECAST FOR SOUTH CENTRAL AND SOUTHEAST COLORADO  
NATIONAL WEATHER SERVICE PUEBLO COLORADO  
300 PM MST FRI OCT 31 2003

.DISCUSSION...

STRONG UPPER LEVEL LOW PRESSURE SYSTEM AND ELONGATED UPPER TROF OVER WESTERN U.S. WILL PROVIDE FOR STRONG SOUTHWEST FLOW OVER THE REGION THROUGH THE WEEKEND. THE UPPER LOW WILL MOVE TO NEVADA TONIGHT AND THEN ACROSS NORTHERN COLORADO SATURDAY NIGHT AND SUNDAY. HEAVY SNOW WILL FALL ACROSS THE HIGHER LEVELS OF THE SAN JUAN...LA GARITA AND EASTERN SAWATCH MOUNTAINS TONIGHT AND SATURDAY. UP TO 2 FEET OF SNOW IS POSSIBLE IN THE EASTERN SAN JUAN MOUNTAINS ON SOUTH AND WEST FACING SLOPES WITH 5 TO 10 INCHES OVER THE SAWATCH RANGE. MEANWHILE LOW CLOUDS AND FOG WILL PERSIST OVER THE EASTER PLAINS THROUGH TONIGHT WITH CLOUDS DECREASING SLOWLY SATURDAY. RELATIVE HUMIDITY WILL REMAIN HIGH OVER THE REGION THROUGH SUNDAY THEN DRY SOMEWHAT NEXT WEEK. WINDS ALOFT MAY STILL BE A CONCERN BUT WITH THE INCREASE IN MOISTURE THIS WEEKEND PROBABLY WILL NOT BE A BIG PROBLEM.

--- THUNDERSTORMS IMPLY STRONG GUSTY AND ERRATIC WINDS ---

COZ220-011300-  
UPPER ARKANSAS-  
INCLUDING...CHAFFEE COUNTY...LAKE COUNTY  
300 PM MST FRI OCT 31 2003

.TONIGHT...

SKY/WEATHER.....CLOUDY. NUMEROUS SHOWERS.  
LAL.....1.  
MIN TEMPERATURE.....19-29F.  
MAX HUMIDITY.....100 PERCENT.  
20-FOOT WINDS.....SOUTHWEST 12-21 MPH WITH GUSTS TO AROUND 45 MPH.  
HAINES INDEX.....3 OR VERY LOW POTENTIAL FOR LARGE PLUME DOMINATED  
FIRE GROWTH.  
10K FT WINDS.....SOUTHWEST 25-35 MPH.

.SATURDAY...

SKY/WEATHER.....MOSTLY CLOUDY. NUMEROUS SHOWERS. CHANCE OF RAIN  
AFTER 0800 UNTIL 0900...THEN RAIN LIKELY.  
LAL.....1.  
MAX TEMPERATURE.....43-52F...EXCEPT 29-40F ABOVE 10000 FEET.  
MIN HUMIDITY.....44-47 PERCENT...EXCEPT 51-71 PERCENT ABOVE 10000  
FEET.  
20-FOOT WINDS.....SOUTHWEST 19-29 MPH WITH GUSTS TO AROUND 60 MPH.  
HAINES INDEX.....3 OR VERY LOW POTENTIAL FOR LARGE PLUME DOMINATED  
FIRE GROWTH.  
10K FT WINDS.....SOUTHWEST 25-35 MPH.

*Fire Weather Planning Forecast Standard Format Example Continued...*

.SATURDAY NIGHT...  
SKY/WEATHER.....MOSTLY CLOUDY. RAIN AND SNOW LIKELY UNTIL  
2000...THEN SCATTERED SHOWERS AND SNOW LIKELY  
UNTIL 2400...THEN SCATTERED SHOWERS.  
LAL.....1.  
MIN TEMPERATURE....27-33F...EXCEPT 16-26F ABOVE 10000 FEET.  
MAX HUMIDITY.....82-92 PERCENT...EXCEPT 97-100 PERCENT ABOVE 10000  
FEET.  
20-FOOT WINDS.....SOUTHWEST 12-16 MPH. MOUNTAIN TOP  
WINDS...SOUTHWEST 16-27 MPH.  
HAINES INDEX.....2 OR VERY LOW POTENTIAL FOR LARGE PLUME DOMINATED  
FIRE GROWTH.  
10K FT WINDS.....SOUTHWEST 25-35 MPH.

.SUNDAY...  
SKY/WEATHER.....MOSTLY CLOUDY. SCATTERED SHOWERS.  
LAL.....1.  
MAX TEMPERATURE....43-55F...EXCEPT 29-40F ABOVE 10000 FEET.  
MIN HUMIDITY.....28-35 PERCENT...EXCEPT 45-63 PERCENT ABOVE 10000  
FEET.  
20-FOOT WINDS.....SOUTHWEST 12-24 MPH WITH GUSTS TO AROUND 45 MPH.  
HAINES INDEX.....3 OR VERY LOW POTENTIAL FOR LARGE PLUME DOMINATED  
FIRE GROWTH.  
10K FT WINDS.....SOUTHWEST 20-30 MPH.

.FORECAST DAYS 3 THROUGH 7...  
.MONDAY...MOSTLY CLOUDY. SCATTERED SHOWERS. LOWS 16-26. HIGHS 32-55.  
SOUTHWEST WINDS 12-20 MPH.  
.TUESDAY...MOSTLY CLOUDY. ISOLATED SHOWERS. LOWS 14-24. HIGHS 27-49.  
SOUTHWEST WINDS 12-22 MPH.  
.WEDNESDAY...PARTLY CLOUDY. ISOLATED SHOWERS. LOWS 10-19. HIGHS  
28-49. SOUTHWEST WINDS 12-17 MPH.  
.THURSDAY...PARTLY CLOUDY. ISOLATED SHOWERS. LOWS 11-20. HIGHS 25-44.  
.FRIDAY...PARTLY CLOUDY. ISOLATED SHOWERS. LOWS -1 TO 18. HIGHS  
24-40.  
=  
\$\$

B. APPENDIX – NWS FORECAST EXAMPLES

2. Spot Forecast

**FORECAST:**

IF CONDITIONS BECOME UNREPRESENTATIVE,  
CONTACT THE NATIONAL WEATHER SERVICE.

DISCUSSION...AN UPPER DISTURBANCE WILL MOVE ACROSS THE FOUR CORNERS  
AREA LATER TODAY BRINGING CLOUDS AND A CHANCE OF PRECIPITATION...AND  
SHOULD HELP LOW LEVEL INSTABILITY SOMEWHAT. ANOTHER DISTURBANCE WILL  
APPROACH FROM THE NORTHWEST LATE FRIDAY.

FOR TODAY

WEATHER.....MOSTLY CLOUDY. SCATTERED RAIN OR SNOW  
SHOWERS.  
20-FT WINDS.....VARIABLE LESS THAN 5 MPH UNTIL 1100...THEN  
SOUTH 5-7 MPH.  
MIXING HEIGHT.....BELOW 500 FT AGL UNTIL 1000...THEN RISING TO  
3500 AGL 1300 TO 1630.  
TRANSPORT WINDS.....VARIABLE 5 MPH OR LESS UNTIL 1000...THEN  
SOUTHEAST 12 MPH...BECOMING SOUTH BY 1600.  
SMOKE DISPERSAL.....POOR UNTIL 1000...THEN BECOMING LOW-END FAIR.  
(REACHING 42,000 KT-FT BETWEEN 1300-1630)

FOR TONIGHT

WEATHER.....MOSTLY CLOUDY. SCATTERED SHOWERS UNTIL 2300.  
20-FT WINDS.....SOUTHWEST 5-7 MPH BECOMING NORTHWEST 5 MPH  
AFTER MIDNIGHT.  
MIXING HEIGHT.....LOWERING BELOW 500 FT AGL BY 2000.  
TRANSPORT WINDS.....SOUTH 12 MPH UNTIL 2000 BECOMING  
NORTHWEST 5 MPH AFTER MIDNIGHT.  
SMOKE DISPERSAL.....POOR.

FOR FRIDAY

WEATHER.....MOSTLY CLOUDY IN THE MORNING...THEN BECOMING  
PARTLY CLOUDY (50%).  
20-FT WINDS.....NORTHWEST TO WEST 5-8 MPH AFTER 1200.  
MIXING HEIGHT.....BELOW 1000 FT AGL UNTIL 1200...THEN RISING  
TO 2500 FT AGL.  
TRANSPORT WINDS.....NORTHWEST 11 MPH AFTER 1200.  
SMOKE DISPERSAL.....POOR (27,500 KT-FT)

B. APPENDIX – NWS FORECAST EXAMPLES

3. Red Flag Warning / Fire Weather Watch

RFWDEN  
COZ034>  
RED FLAG WARNING  
NATIONAL WEATHER SERVICE DENVER CO  
1020 AM MDT MON APR 15 2001

...RED FLAG WARNING ISSUED FOR COLORADO FOOTHILLS AND SOUTHERN  
PARK COUNTY, FIRE ZONES 214,215 AND 216, TODAY FROM 1030 THROUGH  
2000 TODAY FOR STRONG WESTERLY WINDS AND LOW HUMIDITIES...

THE NATIONAL WEATHER SERVICE IN DENVER COLORADO...IN COORDINATION  
WITH THE LAND MANAGEMENT AGENCIES HAS UPGRADED THE FIRE WEATHER  
WATCH FOR COLORADO FIRE ZONES 214...215 AND 216 TO A RED FLAG WARNING.  
THIS WARNING WILL BE IN EFFECT TODAY FROM 1030 TO 2000.

VERY DRY CONDITIONS CONTINUE ALONG THE FRONT RANGE FOOTHILLS.  
WARM TEMPERATURES AND LOW RELATIVE HUMIDITY LEVELS ARE EXPECTED AGAIN  
THIS AFTERNOON...ALONG WITH INCREASING WINDS FROM AN APPROACHING UPPER  
LEVEL WEATHER DISTURBANCE.

SUSTAINED WINDS OF 15 TO 30 MPH WILL OCCUR TODAY...WITH GUSTS TO 40  
MPH. RELATIVE HUMIDITY READINGS ARE EXPECTED TO DROP TO AS LOW AS  
10 PERCENT.

THE COMBINATION OF WARM TEMPERATURES...LOW RELATIVE HUMIDITIES...  
LOW FUEL MOISTURES AND GUSTY WINDS PRESENT OPTIMUM CONDITIONS  
FOR RAPID FIRE GROWTH. ANY FIRE THAT STARTS TODAY COULD QUICKLY  
DEVELOP INTO A LARGE WILDFIRE.

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

B. APPENDIX – NWS FORECAST EXAMPLES

4. Experimental Point Forecast Matrix (Example from Pueblo office)

RED DEER RAWS-CHAFFEE CO  
 38.82N 106.20W  
 411 AM MDT TUE APR 26 2005

DATE	TUE 04/26/05							WED 04/27/05							THU																	
04/28/05																																
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	52							27							57			26														
52																																
TEMP	21	34	48	52	49	41	32	29	27	42	50	55	49	42	30	28	26	37	49													
52 49																																
DEWPT	21	21	18	19	20	25	29	29	27	23	16	17	18	20	21	20	19	17	16													
17 18																																
MIN/MAX RH	27							100							21																	
RH	100	58	30	27	31	52	88	100	100	46	25	22	29	41	69	71	74	44	26													
25 29																																
WIND DIR	NW	NW	NW	NW	NW	NW	W	SW	SW	S	W	W	W	W	W	W	SW	W	W													
W W																																
WIND SPD	5	9	12	13	12	5	4	4	4	4	18	17	13	9	8	8	8	10	14													
14 12																																
WIND GUST	24							25							17			33			31			25			23			26		
26																																
CLOUDS	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	BK												
BK SC																																
CLOUDS(%)	41	43	44	50	57	50	44	51	57	57	68	68	61	61	63	63	64	64	74													
74 61																																
POP 12HR	10							10							20			20														
20																																
RAIN SHWRS	IS							IS							IS			IS			IS			IS								
IS IS																																
TSTMS												IS			IS			IS			IS											
IS IS																																
SNOWSHWRS	IS			IS			IS							IS			IS			IS												
LAL	1	1	1	1	1	1	1	1	1	1	1	3	3																			
HAINES	2	2	3	3	3	3	3	3	2	3	3	4	3	3	3	3	3	3	3	3												
4																																
10K WIND DIR	NW	NW	NW	NW	NW	NW	NW	W	W	W	W	W																				
10K WIND SPD	17	17	19	19	19	17	14	12	14	16	20	19																				
MIX HGT	<1	5	9	9	9	6	<1	<1	<1	6	9	9																				
T WIND DIR	NW	NW	NW	NW	NW	NW	W	SW	SW	W	W	W																				
T WIND SPD	5	20	24	23	23	21	4	4	4	25	27	23																				
SMOKE DISP	PR	GD	EX	EX	EX	VG	PR	PR	PR	VG	EX	EX																				
CRTCL FWX POT	U	U	P	P	P	U	U	U	U	U	P	P	P	U	U	U	U	U	U	P												
P																																

DATE	FRI 04/29/05					SAT 04/30/05					SUN 05/01/05					MON 05/02/05																								
UTC 6HRLY	06	12	18	00	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	00	06	12	18																				
MIN/MAX TEMP	28					51					28					46					28					51					27					54				

**Rocky Mountain Area Fire Weather Annual Operating Plan** **4/28/2006**

TEMP	34	28	47	48	32	28	42	44	32	28	47	47	33	27	50	53
DEWPT	23	23	25	23	21	20	22	24	24	20	19	20	15	17	20	26
RH	64	81	42	37	63	71	44	45	72	71	32	34	47	65	30	35
WIND SPD		<15	15>			<15	<15			<15	15>			<15	<15	
AVG CLOUDS	SC	SC	BK	BK	BK	BK	BK	BK	BK	BK	SC	SC	BK	BK	BK	BK
POP 12HR		20	30			40	40			30	30			20	20	
RAIN SHWRS	IS		SC	SC	SC		SC	SC	SC		SC	SC	IS		IS	IS
TSTMS	IS															
SNOWSHWRS		IS	SC			SC	SC			SC	SC			IS	IS	

BELOW IS A WEATHER ELEMENT KEY FOR THIS PRODUCT

DAY 1 THROUGH 3...

MAX/MIN TEMP or MIN/MAX TEMP(F).....MAXIMUM/MINIMUM AIR TEMPERATURE

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

10K WIND DIR(8 POINT COMPASS).....10000 FOOT WIND DIRECTION

10K WIND SPD(MPH).....10000 FOOT WIND SPEED

MIX HGT(THOUSANDS OF FT AGL).....MIXING HEIGHT

EXAMPLE: 6 = 6000 FEET; 12 = 12000 FEET; <1 = LESS THAN 1000 FOOT

T WIND DIR(8 POINT COMPASS).....TRANSPORT WIND DIRECTION

T WIND SPD(MPH).....TRANSPORT WIND SPEED

SMOKE DISP(CAT(KT-FT)).....SMOKE DISPERSION CATEGORY

EXAMPLE: PR = POOR; FR = FAIR; GD = GOOD; VG = VERY GOOD; EX = EXCELLENT  
 CRTCL FWX POT.....CRITICAL FIRE WEATHER POTENTIAL  
 EXAMPLE: U = UNLIKELY; P = POSSIBLE; L = LIKELY; S = SEVERE

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  
 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

C. APPENDIX – PREDICTIVE SERVICES PRODUCT EXAMPLES

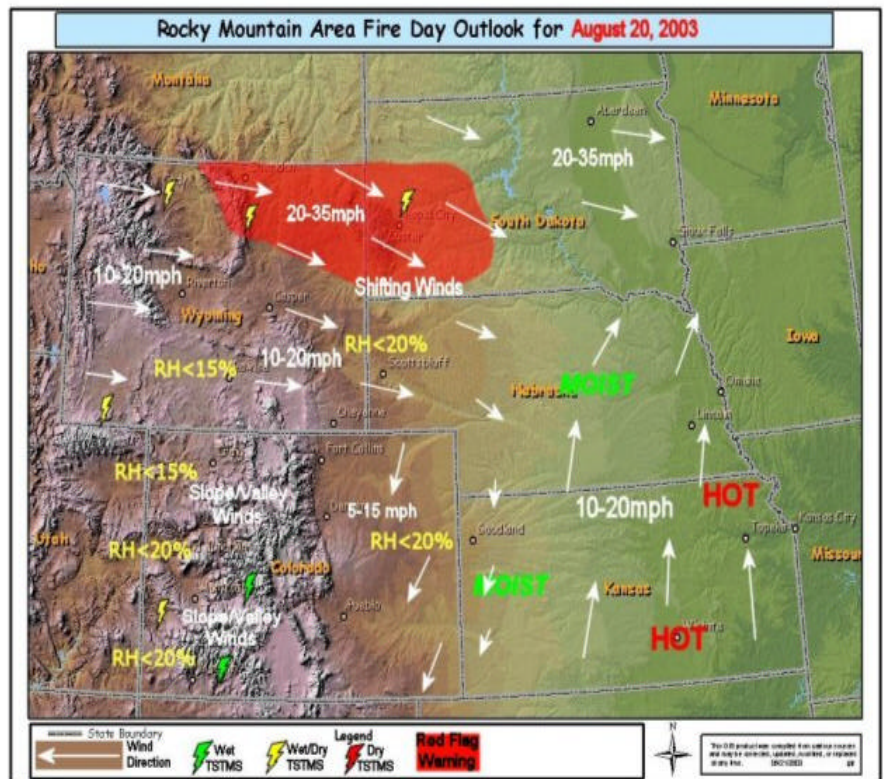
1. Daily Fire Weather / Fire Danger / Fire Behavior Potential Summary

**ROCKY MOUNTAIN AREA FIRE DAY OUTLOOK**  
 ISSUED DAILY AT 8 AM AND 4 PM by RMA Predictive Services  
 Outlook Valid August 20, 2003

Product Issue Time: 800 AM Friday

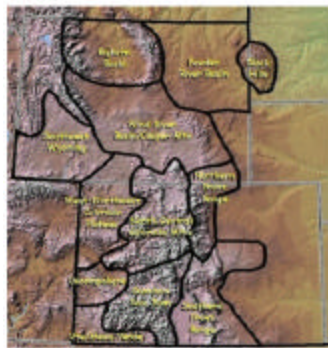
...Red Flag Warning northeast Wyoming and western South Dakota for strong shifting winds, hot temperatures, low relative humidities, isolated dry thunderstorms, and high haines...

**Today (Friday):** A strong cold front pushes through northern Wyoming and western South Dakota this afternoon. Strong shifting winds associated with the front, low relative humidities, warm temperatures and high haines indices results in Red Flag conditions through early evening. Isolated dry thunderstorms may lead to new ignition. In that pushed through most the RMA in recent days begins to weaken on Saturday. This results in decreasing precipitation and moderating temperatures east of the divide. West of the divide, a southwest flow aloft brings in increasing moisture on Saturday, with an increasing chance of mountain snow and rain/snow mixed at the lower elevations. The strongest winds remain over western Colorado with a 15 to 25 mph southwest flow expected. The warmest temperatures will be over western Colorado with 50 to 55 at the lower elevations, while the coolest readings are anticipated over Wyoming with generally only 30s at the lower elevations. Minimum humidities remain above at least 30% over the entire RMA. \*\*\*Note\*\*\* (Users should print using landscape orientation)



[Click Here To Learn About This Product](#)

C. APPENDIX - PREDICTIVE SERVICES PRODUCTS EXAMPLES  
 2. 7-Day Fire Weather / Fire Danger Outlook



**Legend:**

**Fuel Dryness**

- **Moist** - Little if any threat for large fire.
- **Dry** - Low threat for large fires when significant weather is absent.
- **Very Dry** - Moderate threat for large fires when significant weather is absent.
- Data Unavailable.

**Weather**

**Lightning** - The combination of either "Dry" or "Very Dry" Fuel Dryness along with isolated dry lightning.

**"High Risk" Days**

- The combination of either "Dry" or "Very Dry" Fuel Dryness along with widely scattered or greater coverage of dry thunderstorms (LAL-B), or a wet thunderstorm event following an extended hot and dry period.
- The combination of either "Dry" or "Very Dry" Fuel Dryness along with wind gusts 25 mph or greater.

\*\*\*\*Note\*\*\*\* \*\*\*\*Please Read\*\*\*\*  
 If Problems Printing From Internet Explorer: Go to "Internet Options" under "Tools". Go to "Advanced" and assure that the "Print Background Colors and Images" box is checked.

## Rocky Mountain 7 Day Significant Fire Potential

Issued: Wednesday, Oct 05, 2005

Predictive Service Areas	Wed Oct 05	Thu Oct 06	Fri Oct 07	Sat Oct 08	Sun Oct 09	Mon Oct 10	Tue Oct 11
Ute/Mesa Verde							
Uncompahgre							
Gunnison/San Juan							
Southern Front Range							
W-NW Colorado Plateau							
North Central Colorado Mtns							
Northern Front Range							
Wind River Basin/Casper Mtn							
Southwest Wyoming							
Big Horn Basin							
Powder River Basin							
Black Hills							

**Weather Synopsis:**  
 High pressure dries out the RMA early in the period, but with cool temperatures continuing through Thursday. By Friday, a southwest flow slot develops as the high pressure ridge moves eastward and a relatively strong Pacific weather system approaches from the west. Mountain/foothill snow and lower elevation rain is likely from this system by Saturday night through Monday west of the Continental divide, and east of the divide by Sunday night into Tuesday. \*\*\*\*This is the last 7-day assessment of the season\*\*\*\*

**Fire Potential Discussion:**  
 Cool and moist conditions along with mountain snow over much of the region, and snow in the lower elevations of Wyoming and South Dakota have moderated fuel conditions into the "Moist" category in most locations.

**RMA Preparedness Level**  
 The Rocky Mountain Area Preparedness Level is currently at 2. As of October 5th, 5 Type 1 crews are committed and none are available nationally. 13 RMA Type 2 or Type 2/A crews are available locally or GACC while 2 Type 2 crews are available for national assignment and 1 Type 2/A. The RMAs Type 1 IMT (Krugman) is committed to Katrina - Jackson Square Support, LA-FEM in New Orleans. (Mulleris) Type 2 IMT is currently unavailable. (Hohnenberg) RMA FUMT is committed to Wapama WFFU, CA-YNP in Yosemite. (Blumes) Type 2 IMT is only available to the GACC. 6 SEATS, 1- Type 3 helicopter - only available to GACC or state specific. Most aircraft are going off contract at this time. IA has been light to minimal in the RMA- most fires have been in FM 1, 2, 3 and 5 or short term fuels. Dispatch Centers have reported adequate resources, although supporting other geographical areas including hurricane support orders. WX is starting to be favorable for RX in some units- mainly broadcast burning in sage and grass and occasional piles. The National Preparedness Level is currently at 4 as of October 5th. 6 Geographic Areas, including the RMA, are reporting large fires at this time.

The following is a link to the RMA Daily Resource Report:  
[http://www.fs.fed.us/2/mre/daily\\_resource\\_status.htm](http://www.fs.fed.us/2/mre/daily_resource_status.htm)



C. APPENDIX - PREDICTIVE SERVICES PRODUCTS EXAMPLES

3. Southwest Monsoon Outlook

# Rocky Mountain Area Predictive Services Southwest Monsoon Update September 1, 2003

**Current Situation:**

A strengthening northern stream jet resulted in an unseasonably strong low pressure system and cold front over portions of Wyoming and the Colorado Front Range this past Friday and Saturday (8/29-30). Although rainfall from this storm system wasn't from a monsoonal source, it was extensive and heavy over central to southern Wyoming and the Colorado Front Range, with widespread amounts ranging from .50 inches to 1.5 inches. Amounts over Kansas ranged from 1 to 3 inches with locally heavier amounts. Amounts over the remaining RMA locations of extreme northern Wyoming, the Black Hills, the Colorado western slope, and the northeast plains, ranged from only .05 to .15 inches with locally over .25 inches over southwest Colorado. Rainfall trends began to taper off on Sunday (8/31) due to a lack of monsoon moisture or northern stream storm system. The dry weather with a warming trend is expected early in the week (Mon 9/1), as high pressure and a northwest flow aloft develops. However, an upper level disturbance (trough) and associated cool front moves across the Great Basin and into the RMA on Tuesday (see Figure 1, valid Tuesday evening 9/2), which slows the warming trend and brings in scattered thunderstorms with isolated dry lightning across Colorado and central-southern Wyoming.

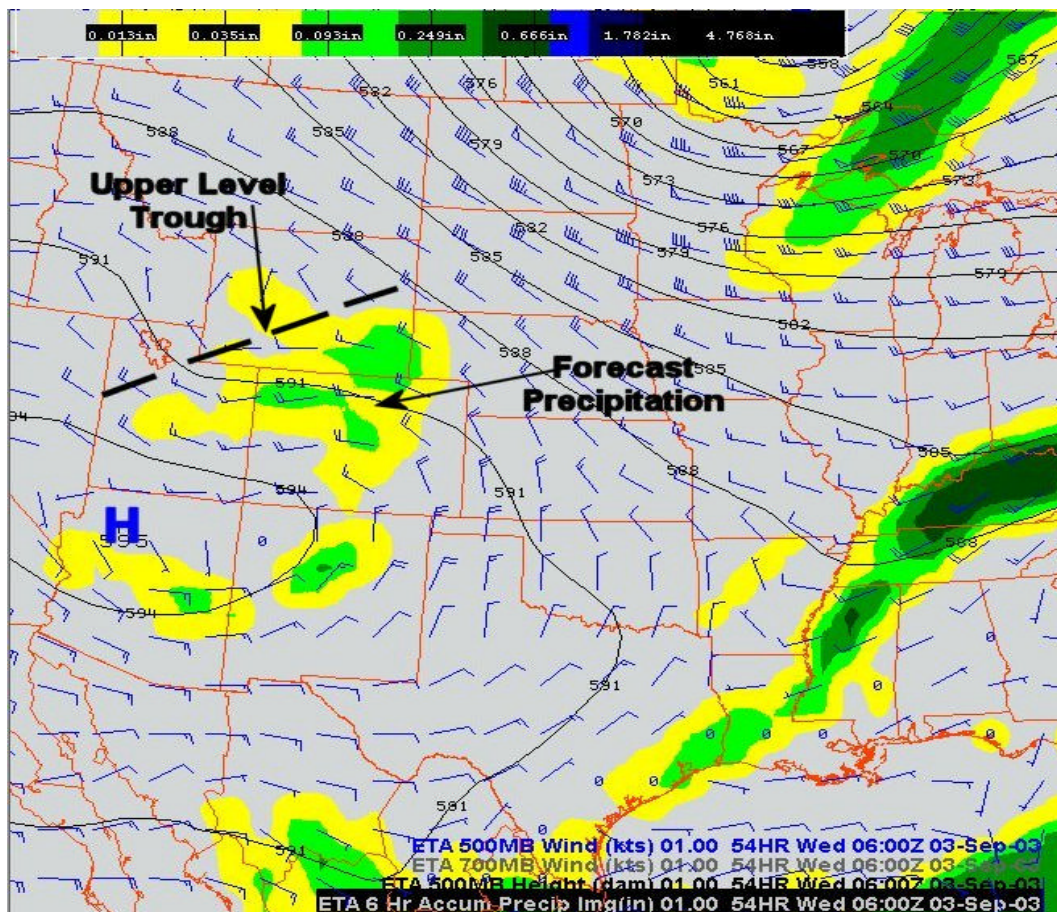


Figure 1. ETA 500 MB pressure pattern (~18,000 ft msl), 500 mb wind (blue barb) and Precipitation (Color Image)

**Outlook:**

Although the northwest flow and occasional cold frontal passage should keep temperatures on the moderate side this week, readings are still expected to be near normal to a few degrees above normal for this time of year. By Wednesday (9/3) a cold front pushes southward, with scattered showers and thunderstorms centered over the Colorado Front Range, with a drying trend elsewhere. Although a drier day is expected on Thursday (9/4), with the northwest flow shunting monsoon moisture to the south, another weather system moves across the Great Basin and into the RMA by Thursday night. By Friday (Figure 2), this system brings another round of scattered thunderstorms and a cooling trend into the RMA. Note in Figure 2 that the upper level high pressure center moves very little from earlier in the week (Figure 1).

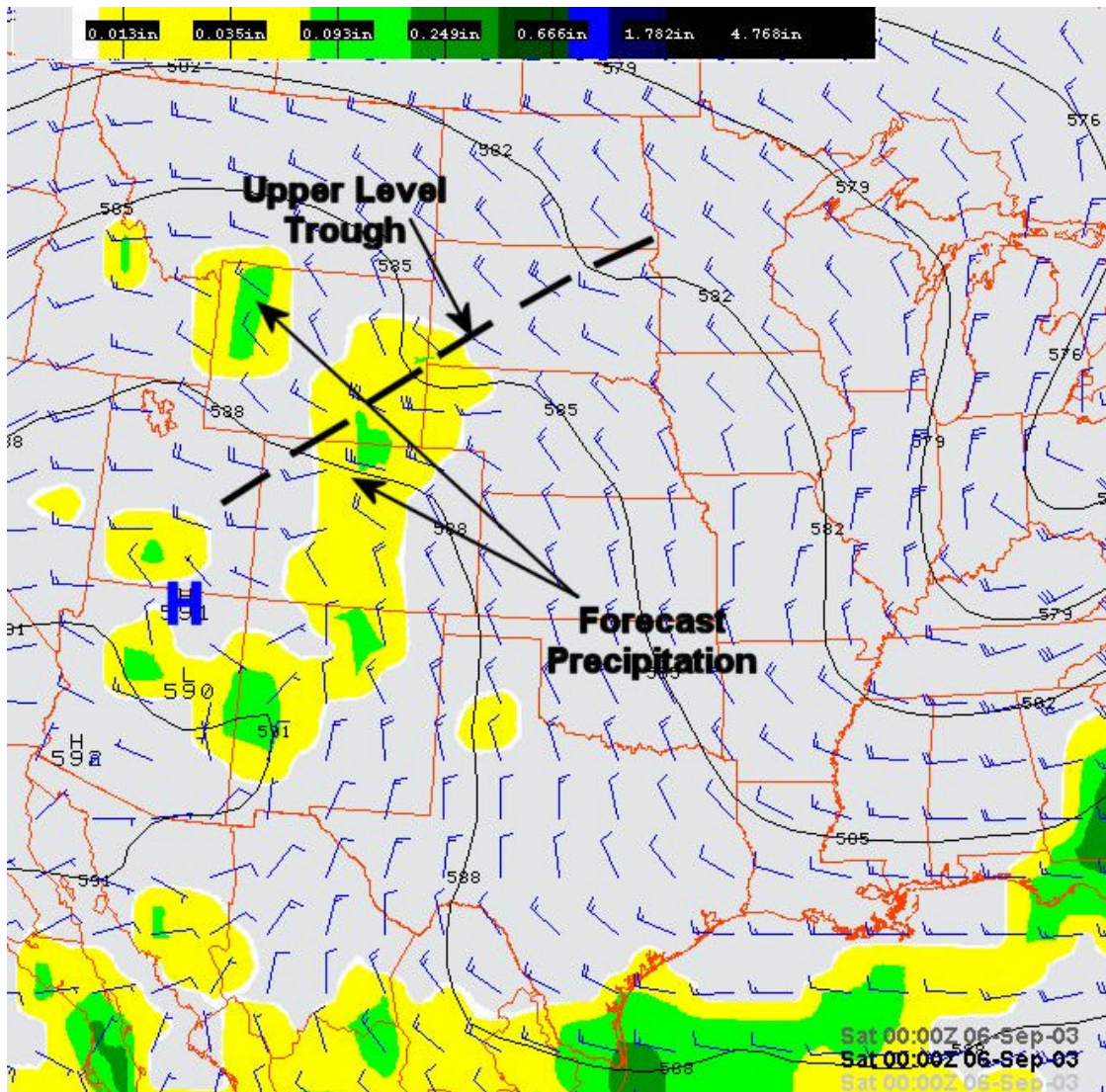


Figure 2. AVN 500 mb pressure pattern (~18,000 ft msl), 500 mb wind (blue barb), and Precipitation (Color Image)

C. APPENDIX - PREDICTIVE SERVICES PRODUCTS EXAMPLES

4. Monthly Large Fire Potential Outlook

**ROCKY MOUNTAIN AREA**  
**MONTHLY FIRE WEATHER / FIRE DANGER OUTLOOK**  
 Issued for: February 2004

1. **REPORTING UNIT:** Rocky Mountain Area Coordination Center

2. **DATE:** January 26, 2004 (Outlook for February 2004)

3. **POTENTIAL FOR SERIOUS/CRITICAL FIRE PROBLEMS:**

COMING MONTH <b>March</b>	BELOW NORMAL	<b>X</b>	NORMAL	<b>X</b>	ABOVE NORMAL	
SEASON	BELOW NORMAL		NORMAL	<b>X</b>	ABOVE NORMAL	<b>X</b>

4. **FIRE WEATHER OUTLOOK:**

***RMA DROUGHT CONDITIONS...***

"Severe-Extreme" drought categories, except for abnormally dry to moderate over northeast Colorado, the Black Hills, and eastern sections of Nebraska, Kansas, and South Dakota.

***RMA Precipitation Outlook...***

RMA February Precipitation: Average.

***RMA February Temperature Outlook...***

RMA February Temperature: Average

5. **FUELS:**

CURRENT FINE FUELS:

GRASS STAGE	GREEN		CURED	<b>X</b>		
NEW GROWTH	SPARSE		NORMAL		ABOVE NORMAL	

**LIVE FUEL MOISTURE (Sage, deciduous, conifer)**

Higher elevations of the area are snowcovered. In lower elevations grasses are cured, leaves have fallen and trees are in dormancy. Recently lower elevations have received snowfall as well.

*Monthly Large Fire Potential Outlook Continued...*

**CURRENT 1000-HOUR DEAD FUEL MOISTURE:** Much of the RMA is under snow at this time. In areas that are not snowcovered, 1000-hour dead fuel moistures are normal to low.

**NORMAL/AVERAGE FUEL MOISTURE FOR THIS TIME OF YEAR:**  
N/A

**6. AVERAGE FIRE OCCURRENCE/ACRES BURNED (to date 5 year average): 2/1, 210**

FIRE OCCURRENCE: N/A

ACRES BURNED: N/A

**4. YEAR-TO-DATE FIRE OCCURRENCE/ACRES BURNED:**

(Average 2000-2002, Cumulative April – September Only)

FIRE OCCURRENCE: N/A

ACRES BURNED: N/A

**6. WRITTEN SUMMARY:**

*Potential: Below Normal to Normal*

General fire danger levels have rescinded to within the below normal to normal range for this time of year due to recent precipitation, though levels across the southeast quadrant of New Mexico remain elevated. Any new ignitions should be held to the initial attack stage. The exception might be on rangelands in the southern portion of the Area, where fuel conditions dry out much sooner than in other parts of the Area.

**Large Fires**

For the month of March during the period 1991-2002, the SWA experienced a total of 59 large fires (ie. Fires >100 acres). Of this number, 54 were human caused and 5 were ignited by lightning. By year, 1993 stands out as the year with the highest number of large fires at 15. The years 2000 and 1999 had 12 and 10, respectively. Overall, the average number of large fires for the month of March is less than 5.

*Monthly Large Fire Potential Outlook Continued...*

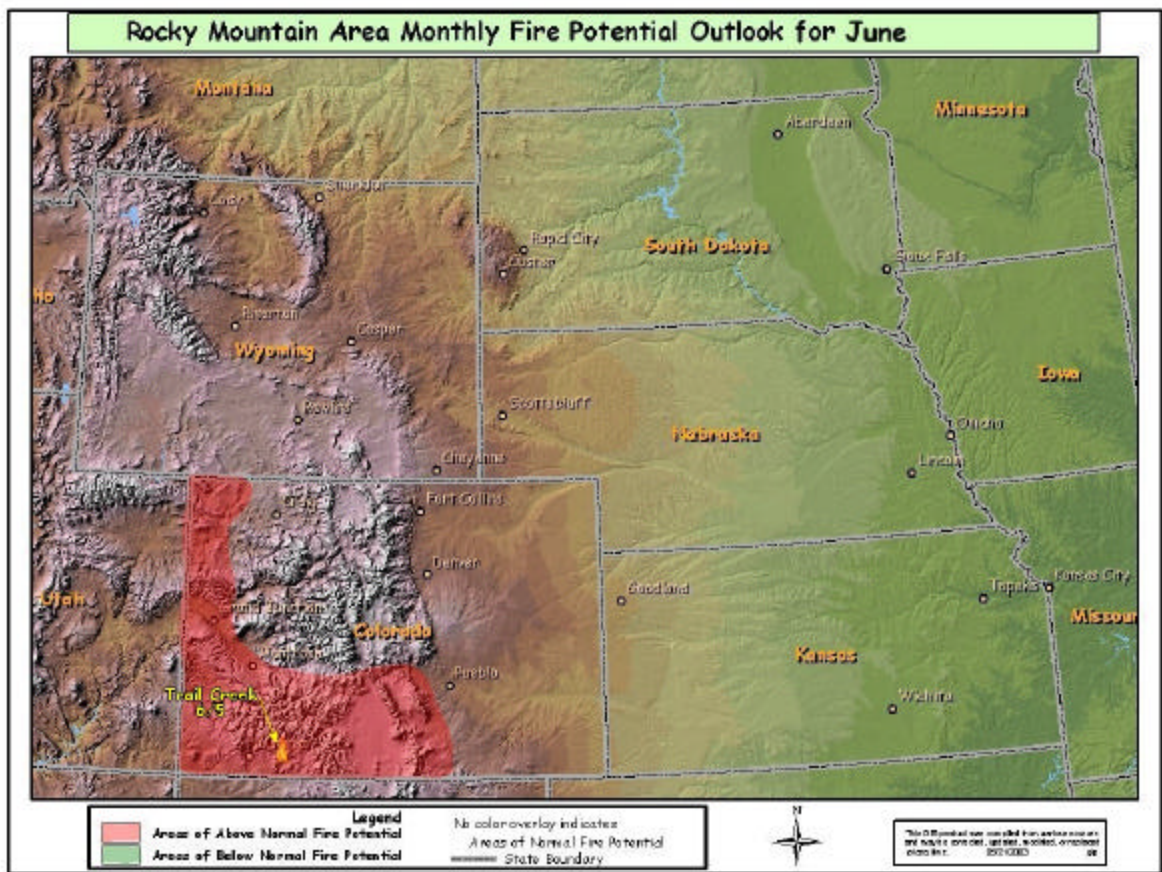
With precipitation continuing to flow into the Area every 5-7 days, fuel conditions are wet enough to keep fire spread rates to a minimum. Thus, expectations are the number of large fires should remain below five for the month.

**Mobilization of Resources**

**Incidents with Teams Assigned:** For the same period (1991-2002), only six incidents required the mobilization of a Type 1 or 2 team. Thus, the average number of team assignments during this 12-year period is less than one per year. Of the six assignments, four of them occurred during 2000.

With fire danger expected to be in the below normal to normal range, significant resource mobilization (i.e. team assignment) is not anticipated. As always, though, local engine resources may be needed and should be ready and available.

**7. MAP:**



# ROCKY MOUNTAIN AREA PREDICTIVE SERVICES

2004 Preliminary Seasonal Fire Weather/Fire Danger Outlook

*April 15, 2004*

Tim Mathewson  
RMA Fire Meteorologist

Gwenan Poirier  
RMA Intelligence Coordinator

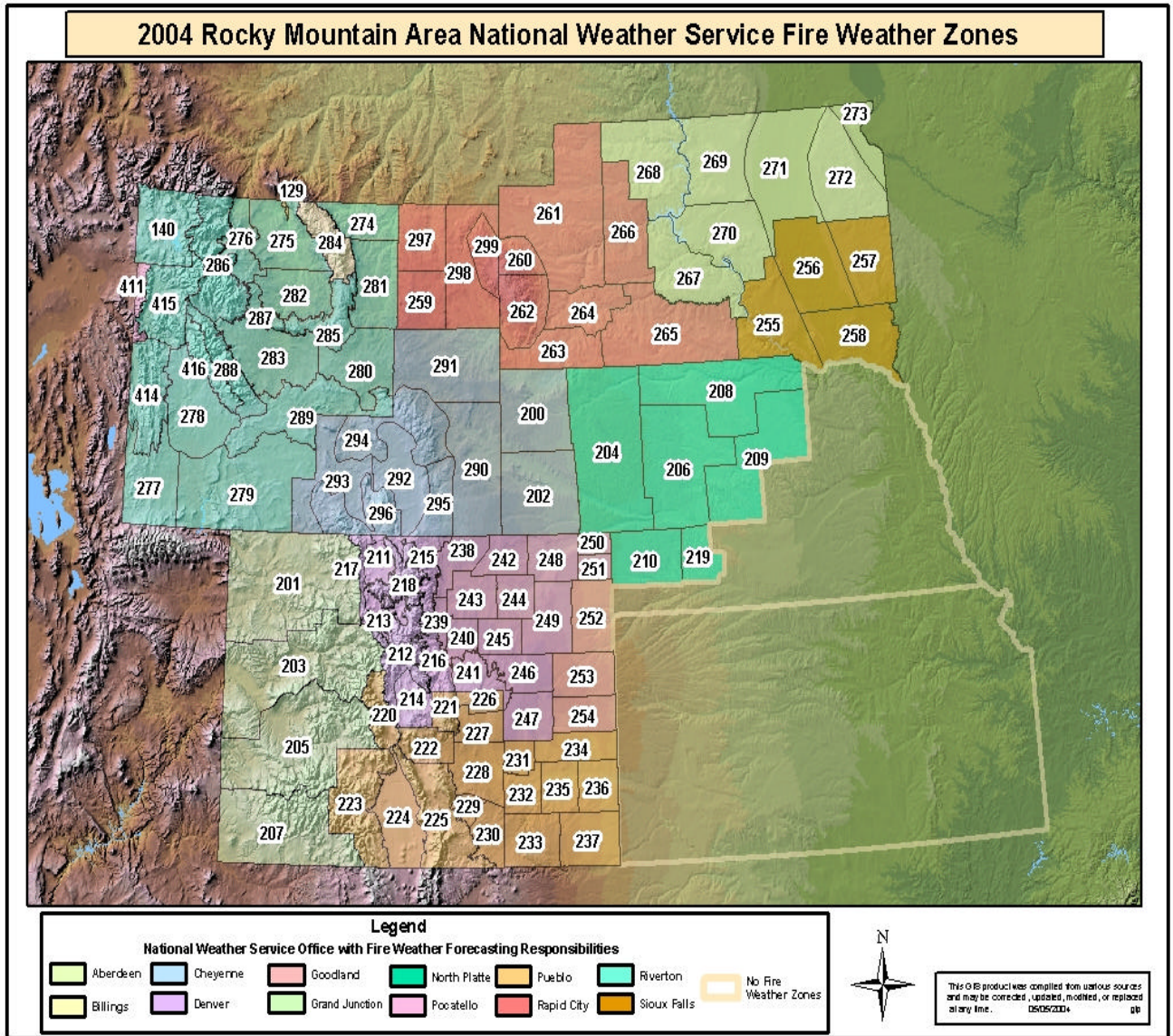
Russ Mann  
RMA Fire Meteorologist

Randall Benson  
State of South Dakota Fire Meteorologist



Rocky Mountain Area (RMA) Predictive Services provides fire weather and intelligence support to the 10 cooperating agencies of the RMA, which are the USDI Bureau of Indian Affairs, the USDI Bureau of Land Management, the USDI Fish and Wildlife Service, the USDI National Park Service, the USDA Forest Service, and the states of Colorado, Kansas, Nebraska, South Dakota and Wyoming.

D. APPENDIX – ROCKY MOUNTAIN AREA FIRE WEATHER ZONE MAP



E. APPENDIX –BACKUP SPOT FORECAST REQUEST FORM

WS FORM D-1 (1-2005) (Supersedes Previous Editions)		<b>SPOT REQUEST</b> (See reverse for instructions)				U.S. Department of Commerce NOAA National Weather Service					
<b>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.</b>											
<b>1. Time†</b>		<b>2. Date</b>		<b>3. Name of Incident or Project</b>			<b>4. Requesting Agency</b>				
<b>5. Requesting Official</b>			<b>6. Phone Number</b>		<b>7. Fax Number</b>		<b>8. Contact Person</b>				
<b>9. Ignition/Incident Time and Date</b>		<b>12. Reason for Spot Request (choose one only)</b> <input type="radio"/> <b>Wildfire</b> <input type="radio"/> <b>Non-Wildfire</b> Under the Interagency Agreement for Meteorological Services (USFS, BLM, NPS, USFWS, BIA) <input type="radio"/> <b>Non-Wildfire</b> State, tribal or local fire agency working in coordination with a federal participant in the Interagency Agreement for Meteorological Services <input type="radio"/> <b>Non-Wildfire</b> Essential to public safety, e.g. due to the proximity of population centers or critical infrastructure.				<b>13. Latitude/Longitude:</b>					
<b>10. Size (Acres)</b>						<b>14. Elevation (ft, Mean Sea Level)</b> Top:                      Bottom:					
<b>11. Type of Incident</b> <input type="radio"/> <b>Wildfire</b> <input type="radio"/> <b>Prescribed Fire</b> <input type="radio"/> <b>Wildland Fire Use (WFU)</b> <input type="radio"/> <b>HAZMAT</b> <input type="radio"/> <b>Search And Rescue (SAR)</b>						<b>15. Drainage</b>					
		<b>16. Aspect</b>		<b>17. Sheltering</b> <input type="radio"/> <b>Full</b> <input type="radio"/> <b>Partial</b> <input type="radio"/> <b>Unsheltered</b>							
<b>18. Fuel Type:</b> <input type="checkbox"/> <b>Grass</b> <input type="checkbox"/> <b>Brush</b> <input type="checkbox"/> <b>Timber</b> <input type="checkbox"/> <b>Slash</b> <input type="checkbox"/> <b>Grass/Timber Understory</b> <b>Other</b> _____ <b>Fuel Model:</b> <b>1,2,3</b> <b>4,5,6,7</b> <b>8,9,10</b> <b>11,12,13</b> <b>2,5,8</b>											
<b>19. Location and name of nearest weather observing station (distance &amp; direction from project):</b>											
<b>20. Weather Observations from project or nearby station(s):</b> (Winds should be in compass direction e.g. N, NW, etc.)											
Place	Elevation	†Ob Time	20 ft. Wind		Eye Level Wind.		Temp.		Moisture		Remarks
			Dir	Speed	Dir	Speed	Dry	Wet	RH	DP	(Relevant Weather, etc)
<b>21. Requested Forecast Period Date</b>  <b>Start</b> _____		<b>22. Primary Forecast Elements (Check all that are needed) (for management ignited wildland fires, provide prescription parameters):</b>  <b>Needed:</b>				<b>23. Remarks (other needed forecast elements, forecast needed for specific time, etc.)</b>					



<b>End</b> <hr/> Forecast needed for: <ul style="list-style-type: none"> <li><input type="radio"/> Today</li> <li><input type="radio"/> Tonight</li> <li><input type="radio"/> Day 2</li> <li><input type="radio"/> Extended</li> </ul>	<b>Sky/Weather</b> ___ <b>Temperature</b> ___ <b>Humidity</b> ___ <b>20 ft Wind</b> ___ <b>Valley</b> ___ <b>Ridge Top</b> ___ <b>Other (Specify in #23)</b> ___	
<b>24. Send Forecast to:</b> <b>ATTN:</b>	<b>25. Location:</b>	<b>26. Phone Number:</b> <b>Fax Number:</b>
<b>27. Remarks (Special requests, incident details, Smoke Dispersion elements needed, etc.):</b>    		
<b>EXPLANATION OF SYMBOLS:</b> † 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		

F. APPENDIX – CATALOG OF RAWS AND NFDRS OBSERVATION LOCATIONS

**RAWS Stations and Locations**

State	Surveyed by Pred- Svcs?	RAWS Name & ID	NWS ID	NESSID	Elev.FT	LAT/LON DEG:MIN:SEC	Owner
SD		Huron	393101	83787214	1876	n:44:14:28/ w98:46:12	fws
SD		Porcupine	395202	52111166	3786	n43:17:22 / w102:16:16	bia pub county
CO		Colorado City	--	6200012A	6190	n37:56:52 / w104:52:09	dod
NE		Echo 01 (dod)	--	3265E31A	5279	n41:06:11 / w103:59:00	dod
NE		Fox (dod)	--	3266579A	4767	n41:43:41 / w103:29:17	dod
CO		Hackett (BAER)	--	326A067A	9259	n39:04:26 / w105:17:42	blm
CO		Matacat (BAER)	--	3269D71C	8809	n39:05:35 / w105:22:34	blm
CO		Dinosaur (manual nfdrs)	050102	--	5940	n40:14:45 / w108:58:19	nps
CO	X	Ladore	050104	325A4300	5946	n40:44:19 / w108:50:09	blm
CO	X	Dinosaur	050105	FA45B596	6280	n40:30:37 / w108:56:01	nps
CO	X	Great Divide	050106	3259C21A	7246	n40:45:28 / w107:51:10	blm
CO		Craig (manual nfdrs)	050107	--	6200	n40:30:53 / w108:33:14	blm
CO	X	Dry Lake	050207	3235E758	8378	n40:32:05 / w106:46:49	usfs
CO	X	Willow Ck Harbison Meadow (formerly Sulphur)	050304	*****	9735	n40:21:06 / w106:12:53	usfs
CO		Gunsight	050402	3335F58C	8640	n40:16:14/ w105:50:18	usfs
CO	X	Porcupine	050404	325FC2D4	8454	n40:12:40 / w106:19:44	blm
CO	X	Red Feather	050406	3235D2C2	8938	n40:05:53 / w106:40:47	usfs
CO	X	Estes Park	050505	323610D2	8260	n40:47:35 / w105:34:18	usfs
CO	X	Redstone	050507	323EE4F0	7900	n40:21:59 / w105:33:44	usfs
CO	X	Sugarloaf	050508	3335E6FA	6134	n40:34:15 / w105:13:35	usfs
CO	X	Pinto	050604	323ED16A	6775	n40:01:05 / w105:21:39	usfs
CO	X	Dead Horse	051402	325A65EC	6683	n40:01:15 / w108:23:50	blm
CO	X	Hunter	051404	323603A4	8970	n40:04:43 / w107:22:02	usfs
CO	X	Dragon	051406	324A6272	7321	n39:46:18 / w108:19:43	blm
CO	X	Ernie	051407	324A8180	6282	n39:54:55 / w108:53:13	blm
CO	X	Rifle	051408	324A92F6	7101	n40:02:49 / w108:11:42	blm
CO	X	Crown	051504	324A7104	6200	n39:30:45 / w107:44:54	blm
CO	X	Demaree	051506	325A9568	8387	n39:21:09 / w107:05:39	blm
CO	X	Storm King	051507	3265F06C	7458	n39:27:36 / w108:52:47	blm
CO	X	Deep Creek	051508	324AA76C	8671	n39:35:13 / w107:24:14	blm
CO		Dowd	051510	3276B3F6	9404	n39:46:25 / w107:38:49	blm
CO	X	Gypsum	051606	3241B960	9074	n39:37:39 / w106:27:05	usfs
CO	X	Hangman	051607	3259D16C	7411	n39:41:40 / w106:58:22	blm
CO		Soda Creek	051608	32574066	7834	n39:55:05/ w106:54:58	blm
CO	X	Corral Creek	051703	323591C8	9555	n39:33:36 / w105:59:06	usfs
CO	X	Pickle Gulch	051804	327137D6	8100	n39:38:24 / w105:27:49	usfs
CO	X	Bailey	051901	32714146	9340	n39:50:40 / w105:31:00	usfs
CO	X	Waterton	052001	3240E534	8000	n39:22:46 / w105:20:18	usfs
CO		Pine Ridge	052002	328262B0	8714	n39:28:02 / w105:12:35	usfs
CO	X	Walker (manual nfdrs)	052407	32778496	6680	n39:14:17 / w108:22:57	blm
CO		Dominguez (JcksCnyn)	052408	--	4840	n39:07:14 / w108:31:15	blm
CO	X	Little Delores	052409	325A137C	7808	n38:45:12 / w108:34:45	blm
CO	X		052410	326607E6	6913	n38:58:07 / w108:56:37	blm

CO	X	Jay	052704	324AC28A	6263	n38:50:44 / w107:44:16	blm
CO	X	McClure	052810	3235B724	9027	n39:07:36 / w107:17:07	usfs
CO	X	Taylor Park	052812	323547A0	10435	n38:54:31 / w106:36:08	usfs
CO	X	Huntsman	052813	325A000A	9435	n38:19:54 / w107:05:21	blm
CO	X	Red Deer	052902	3241C122	8703	n38:49:38 / w106:12:40	usfs
CO	X	Lake George	053002	3240C3D8	8060	n38:58:43 / w105:21:14	usfs
CO	X	Jones Hill	053004	32862480	9553	n39:02:29 / w106:00:12	usfs
CO	X	Cheeseman	053102	3241AA16	7535	n39:10:54 / w105:16:01	usfs
CO		Polhemus	053103	326A150C	8685	n39:15:17 / w105:08:00	usfs
CO	X	Ft Carson	053603	32673086	6770	n38:39:32 / w104:51:13	usfs
CO	X	Sanborn	053804	3235A452	7900	n38:11:32 / w108:12:58	usfs
CO	X	Cottonwood	053805	3259A7FC	7260	n38:34:23 / w108:16:40	blm
CO	X	Black Canyon	053806	325A5076	8424	n38:32:33 / w107:41:07	blm
CO	X	Nucla	053807	3251D5CA	5900	n38:14:00 / w108:33:40	blm
CO		Carpenter	053808	323C241A	8100	n38:27:34 / w109:02:49	usfs
CO		Four Mile (manual nfrs)	053903	--	6080	n38:32:55 / w105:11:40	blm
CO	X	Copper Gulch	053904	32599266	7764	n38:18:48 / w105:29:03	blm
CO	X	Lujan	054702	3240D0AE	11065	n38:15:17 / w106:34:02	usfs
CO		Needle Creek	054704	32405868	8900	n38:23:22 / w106:31:51	usfs
CO	X	Willis Creek	054801	3240B548	9050	n38:00:11 / w105:03:20	usfs
CO	X	Salter	055205	3235C1B4	8154	n37:39:04 / w108:32:11	usfs
CO	X	Blue Park	055305	3234F6D4	10388	n37:47:35 / w106:46:41	usfs
CO	X	Sand Dunes	055503	8378E776	8324	n37:43:36 / w105:30:39	fws
CO		Black Mountain	055601	3230101C	8982	n37:51:42 / w105:17:03	usfs
CO	X	Chapin	055704	FA62F546	7144	n37:11:59 / w108:29:19	nps
CO	X	Morefield	055706	FA630738	7826	n37:17:52 / w108:24:50	nps
CO		Park Point (manual nfrs)	055709	--	8571	n37:16:42 / w108:27:36	nps
CO		Mockingbird	055710	327A9486	6420	n37:28:28 / w108:53:03	usfs
CO	X	Mesa Mtn	055805	5210A012	7413	n37:03:23 / w107:42:29	bia
CO		Big Bear Park	055807	3276A080	10400	n37:29:46 / w107:43:46	usfs
CO	X	Devil Mtn	055901	323A37A2	7460	n37:13:37 / w107:18:18	usfs
CO	X	San Doval	055902	32661490	8472	n37:05:59 / w107:18:07	bia
CO	X	Big Horn	056005	32302586	8616	n37:01:15 / w106:12:02	usfs
CO	X	Pinion	056202	3241E7CE	5390	n37:32:33 / w104:01:53	usfs
CO	X	Bosque (cuchara)	056203	325D1148	8170	n37:05:31 / w104:55:09	usfs
CO		Logchute (sat non-nfrs)	109899	FA62A53A	7520	n37:21:06 / w107:19:17	blm
KS		Tall Grass	145201	FA63812C	1254	n38:25:27 / w96:33:39	nps
KS		Stafford	146501	8375B46C	1771	n38:03:36 / w98:28:46	fws
KS		Cimarron	148601	33337356	3537	n37:08:30 / w101:54:00	usfs
WY		Hillsboro	245609	FA643096	3986	n44:06:20 / w108:13:05	nps
NE		Agate	250105	FA6643F2	4250	n42:25:32 / w103:43:56	nps
NE		Kings Canyon	250203	32382120	4100	n42:43:26 / w102:58:17	usfs
NE		Valentine	250402	8375A71A	3040	n42:29:02 / w100:31:24	fws
NE		Scotts Bluff	251905	FA40F15C	4224	n41:49:42 / w103:42:27	nps
NE		Crescent Lake	252101	83759280	3060	n41:45:40 / w102:26:16	fws
NE		Bessey	252402	32674616	2825	n41:53:51 / w100:18:39	usfs
SD		Camp Crook	390101	3276D610	3120	n45:33:45 / w103:59:30	blm
SD		Bear Creek	391201	52109588	2290	n45:03:26 / w101:28:36	bia
SD		Nemo	392506	3230668C	4600	n44:11:23 / w103:30:35	usfs
SD		Pinnacles	392602	FA64C012	3080	n43:52:56 / w102:12:15	nps
SD		Mt Rushmore	392603	FA66138E	5400	n43:52:30 / w103:27:30	nps

SD		Baker Park	392606	32828142	4674	n43:58:45 / w103:25:30	usfs
SD		Wind Caves/Elk Mtn	393505	FA6600F8	4110	n43:33:39 / w103:29:29	nps
SD		Custer	393506	326760FA	5200	n43:45:00 / w103:38:00	usfs
SD		Ft Pierre	393801	3231B21E	2274	n44:06:55 / w100:18:05	usfs
SD		Red Canyon	395105	323075FA	4400	n43:25:33 / w103:45:32	usfs
SD		White River	395201	FA6507F6	2610	n43:30:40 / w102:29:49	nps
SD		Magpie	395601	521167F6	2840	n43:19:05 / w101:08:40	bia
WY	X	Rattlesnake	480212	3278A4E8	8390	n44:34:26 / w109:15:38	blm
WY		Crandall	480213	32353130	6640	n44:51:01 / w109:36:41	usfs
WY	X	Eagle	480214	326FA142	7520	n44:29:08 / w109:53:46	usfs
WY		Mill Creek	480306	323A0238	8930	n44:27:20 / w107:27:00	usfs
WY	X	Hyatt High	480307	3264D47A	5720	n44:17:55 / w107:30:19	blm
WY		Burgess	480403	32304060	7743	n44:47:10 / w107:32:09	usfs
WY		Boyd	480404	3249760A	7740	n44:56:29 / w107:42:32	usfs
WY		Echeta	480501	3278318A	4320	n44:28:00 / w105:50:46	blm
WY		Rochelle	480502	323036F0	5199	n43:33:02 / w105:05:32	usfs
WY		Bear Lodge	480605	32362548	5280	n44:35:50 / w104:25:39	usfs
WY		Devils Tower	480606	FA64F588	4200	n44:34:54 / w104:43:10	nps
WY		Grass Creek	480804	3264C70C	7100	n43:53:37 / w108:51:20	blm
WY		Split Rock	480904	3278B79E	6000	n43:33:38 / w107:23:51	blm
WY		Leigh Creek	480906	32829234	8202	n44:06:24 / w107:13:26	usfs
WY		School House	481002	3239F5B2	8604	n44:18:23 / w106:58:55	usfs
WY		Poker	481003	3264E1E0	6440	n43:33:41 / w106:58:01	blm
WY	X	Elk Horn	481410	323A114E	8135	n43:40:45 / w109:36:38	usfs
WY	X	Wind River	481411	52117480	9200	n42:58:41 / w109:07:17	bia
WY		Casper Mtn	481502	3264B19C	7740	n42:42:47 / w106:20:46	blm
WY		Fales Rock	481504	3265139E	6380	n42:01:23 / w107:16:20	blm
WY	X	Muddy Creek	481801	327861F6	6900	n41:24:01 / w110:33:03	blm
WY	X	Anderson	481903	32787280	8115	n42:26:14 / w108:56:42	blm
WY	X	Snow Springs	481904	32789172	7775	n41:25:04 / w109:02:05	blm
WY		Rawlins Dspth (manual nfrs)	482006	--	6784	n41:50:00 / w108:20:00	blm
WY		Camp Creek	482010	3278546C	7380	n42:20:45 / w107:33:10	blm
WY	X	Cow Creek	482011	3278471A	7175	n41:18:33 / w107:34:24	blm
WY		Esterbrook	482102	3240A63E	6420	n42:24:55 / w105:21:40	usfs
WY	X	Sawmill	482105	323504AA	9070	n41:04:27 / w106:07:50	usfs
WY	X	Dodge Creek	482106	3276E38A	7300	n41:58:02 / w105:31:07	blm
WY		(ern grt basin)Bechler				n44:09:00 / w111:02:48	
WY		(ern grt basin)Burro Hill				n43:50:23 / w110:22:15	
WY		(ern grt basin)Grand Teton				n43:43:25 / w110:42:37	
WY		(ern grt basin)Half Moon				n42:54:53 / w109:44:50	
WY		(ern grt basin)Hoback				n43:13:13 / w110:25:23	
WY		(ern grt basin)Quadrant				n44:55:39 / w110:59:29	
WY		(ern grt basin)Rasberry				n43:28:20 / w110:01:06	
WY		(ern grt basin)Snider Basin				n42:29:27 / w110:31:36	
WY		(ern grt basin)Thorofare			8380	n44:09:28 / w110:05:05	
NE		Bravo (dod)		3266210A	5259	n41:30:36 / w104:00:00	dod