



National Weather Service Smoke Management Decision Support Tools

SWFSC Wildland Fire Smoke Workshop

Brent Wachter

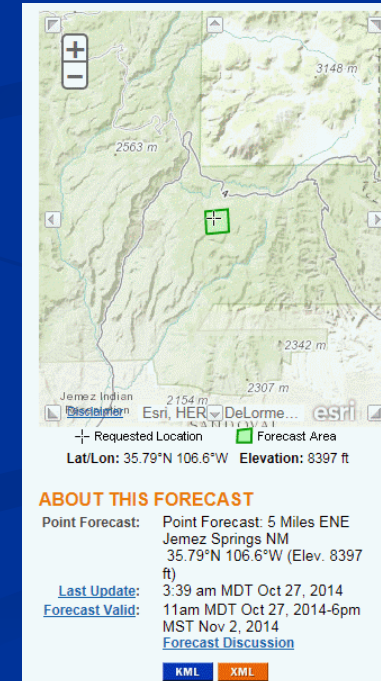
NWS Albuquerque

Nov 6th 2014



Introduction

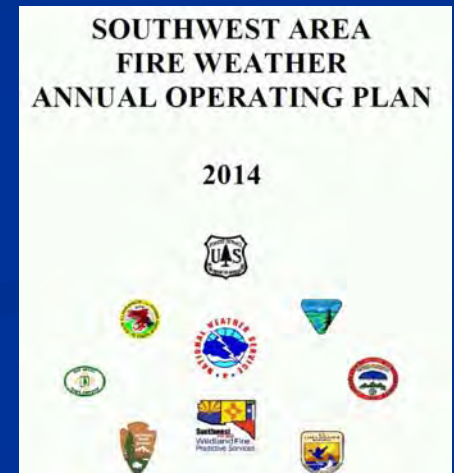
- National Weather Service (NWS) offices use a graphical editor (GFE) to produce smoke management forecasts.
 - Spatial resolution is 2.5 km or around 4 square miles.
 - Temporal resolution varies.
- Main elements include:
 - Mixing heights
 - Transport winds
 - Ventilation rates
 - Adjective Rating



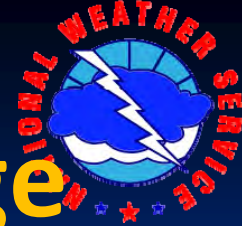


Introduction

- Several products originate from GFE and are presented in various display forms.
 - Tabular
 - Graph
 - Graphical display
 - Text
- SW Annual Operating Plan dictates what goes in some of the products.



http://gacc.nifc.gov/swcc/predictive/weather/swcc_wx_program/aop/SW_AOP.pdf



National Fire Weather Webpage

Enter location

Zip Code

Lat/Long

Name

Different product types

- + Current Hazards
- + Fire Situation
- + Forecasts
- + Current Conditions
- + Outlooks
- + Drought/Precip
- + Fuels
- + Air Quality
- + Admin
- + GACCs
- + Other Agencies

National Weather Service
Fire Weather

NWS Home NWS News NWS Offices Search for: NWS All NOAA

Fire Weather News

- Attention: With the depreciation of Google Maps API Version 2, the map on this page is in the process of being re-written. We will continue to work to restore all of the functionality available before the change, as quickly as possible.
- NEW! - The 2013 National Weather Service Fire Weather Report is available [here](#).
- Click [here](#) to learn more about this site's capabilities. We also encourage your comments or suggestions for improvements using the [electronic survey provided](#).

6 35.595 Go

IMET Locations
 Fire Weather Watches/Warnings
 SPC Day 1 Fire Weather Outlook
 SPC Day 2 Fire Weather Outlook
 NWS Spot Forecasts
 Large Fires
 Infrared Satellite
 States

5 Miles ENE Jemez Springs NM
 Hazardous Weather Outlook

Today
 A slight chance of showers, with thunderstorms also possible after noon. Mostly sunny, with a 15 mph. Chance of precipitation is 10%.

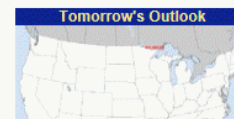
Tonight
 Partly cloudy, with a low around 29. Northwest wind 5 to 15 mph.

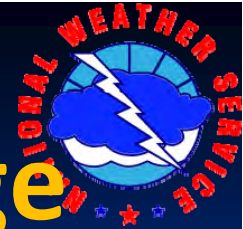
Fire Zone	7-Day Forecast	Hourly Graph	Digital/Tabular	Tabular
1
2
3
4
5
6
7
8
9
10

MesoWest Obs. (50 mile radius)
 FARSITE Input from NDFD data. (PROTOTYPE. Use with Caution): WTR | WND

Open full-screen/mobile version of the map.

<http://www.srh.noaa.gov/ridge2/fire/>





National Fire Weather Webpage

■ Tabular

DISCUSSION... DRY WEATHER WITH SURFACE WINDS AND SOUTHERLY BRISG ENOUGH TO BRING THUNDERSTORMS

Fire Zone 7-Day Forecast Hourly Graph Digital/Tabular

National Weather Denver/B
Home Site Map

TABULAR WEATHER FORECAST
 ISSUED BY: NATIONAL
 FORECAST RELEASE TIME: 3:54 AM MD
 CURRENT TIME: 9:22 AM MD
 POINT INFORMATION: Zone Num: 1
 LOCATIONS WITHIN 5 MILES: 5 Miles ENE
 FIRE ZONE FWF PRODUCT: [Click Here](#)
 SUNRISE/SUNSET INFO: Sunrise: 7:2
 GRAPHIC FORMAT: [Click Here](#)

FORECAST VALID AT (MDT)	SC	PP	CWR	TF	TD	AT	MX	RH	MX	SFC	SFC	G	H	L	15K	15K	MIXG	TRAN	TRAN	VENTL	AJTV	QPF	SNOW	PRIMARY
	%	%	%	F	F	F	MN	%	MN	WIND	WIND	S	I	A	WIND	WIND	HGT	WIND	WIND	RATE	RATG	SHRS	6HRS	WX TYPE
							TF		RH	DIR	MPH	T	L	DIR	MPH		AGL	DIR	MPH	KT-FT		OUR	DUR	
10/27-9A	45	10		42	32	36																		
10/27-10A	45	10		45	33	40																		
10/27-11A	45	10		50	33	45																		
10/27-12P	37	7		53	33	53																		
10/27-1P	37	7		54	31	54																		
10/27-2P	37	7		55	29	55																		
10/27-3P	37	7		55	27	55																		
10/27-4P	37	7		55	25	55																		
10/27-5P	37	7		54	23	54																		
10/27-6P	37	6		53	22	53	56																	
10/27-7P	37	6		50	21	45																		
10/27-8P	37	6		46	20	41																		
10/27-9P	37	6		43	19	38																		
10/27-10P	37	6		41	18	35																		
10/27-11P	37	6		39	17	33																		
10/28-12A	36	6		37	16	32																		
10/28-1A	36	6		36	17	30																		
10/28-2A	36	6		35	17	30																		
10/28-3A	36	6		34	17	29																		
10/28-4A	36	6		33	18	28																		
10/28-5A	36	6		31	18	27																		
10/28-6A	39	2		31	18	27	29	59	60	SSW	3	5	2	1			1000	S	7	6000	P	0.00	0.0	
10/28-7A	39	2		31	19	27				SSW	5	6	2	1			1000	S	7	6007	P			
10/28-8A	39	2		32	20	28				SSW	5	6	2	1			1000	S	7	5526	P			
10/28-9A	39	2		35	21	31				S	5	6	2	1			1000	S	6	5000	P			
10/28-10A	39	2		39	21	35				S	5	6	2	1			1500	S	6	6893	P			
10/28-11A	39	2		44	22	41				S	5	6	2	1			2000	SSW	5	8943	P			
10/28-12P	39	2		48	23	45				S	6	7	3	1			2500	SW	6	12500	P	0.00	0.0	
10/28-1P	39	2		50	23	48				SSW	6	7	3	1			3500	SW	8	23795	P			
10/28-2P	39	2		52	22	52				WSW	6	7	3	1			4500	W	10	40819	F			
10/28-3P	39	2		53	22	53				W	6	7	3	1			5500	W	13	60500	G			
10/28-4P	39	2		52	22	52				W	6	7	3	1			5500	W	13	62734	G			
10/28-5P	39	2		51	22	51				W	7	8	3	1			5000	W	13	54882	F			
10/28-6P	17	4		50	22	47	54	33	30	W	7	8	2	1			4500	WNW	12	44847	F	0.00	0.0	
10/28-7P	17	4		47	22	44				W	7	8	2	1			4000	WNW	10	34519	P			
10/28-8P	17	4		44	22	40				WNW	7	8	2	1			3000	WNW	8	21668	P			
10/28-9P	17	4		41	22	36				WNW	7	8	2	1			2500	WNW	7	15000	P			
10/28-10P	17	4		39	22	34				WNW	7	8	2	1			2000	WNW	7	11301	P			
10/28-11P	17	4		38	22	34				NW	6	7	2	1			1500	WNW	6	8167	P			





National Fire Weather Webpage

■ Digital Tabular



Point Forecast: 5 Miles ENE Jemez Springs NM
35.79N 106.6W (Elev. 8397 ft) Last Update: 3:39 am MDT Oct 27 2014

Tabular Forecast

[hide menu] | Font Size: **A A A** XML

Weather Elements	Weather/Precipitation	Fire Weather
<input type="checkbox"/> Temperature (°F)	<input type="checkbox"/> Rain	<input checked="" type="checkbox"/> Mixing Height <input type="text" value="x100ft"/>
<input type="checkbox"/> Dewpoint (°F)	<input type="checkbox"/> Thunder	<input type="checkbox"/> Haines Index
<input type="checkbox"/> Wind Chill (°F)	<input type="checkbox"/> Snow	<input type="checkbox"/> Lightning Activity Level
<input type="checkbox"/> Surface Wind <input type="text" value="mph"/>	<input type="checkbox"/> Freezing Rain	<input checked="" type="checkbox"/> Trans. Wind <input type="text" value="kt"/>
<input type="checkbox"/> Sky Cover (%)	<input type="checkbox"/> Sleet	<input type="checkbox"/> 20ft Wind <input type="text" value="mph"/>
<input type="checkbox"/> Precipitation Potential (%)	<input type="checkbox"/> Fog	<input checked="" type="checkbox"/> Vent Rate (x1000 kt-ft)
<input type="checkbox"/> Relative Humidity (%)		<input checked="" type="checkbox"/> Dispersion Index

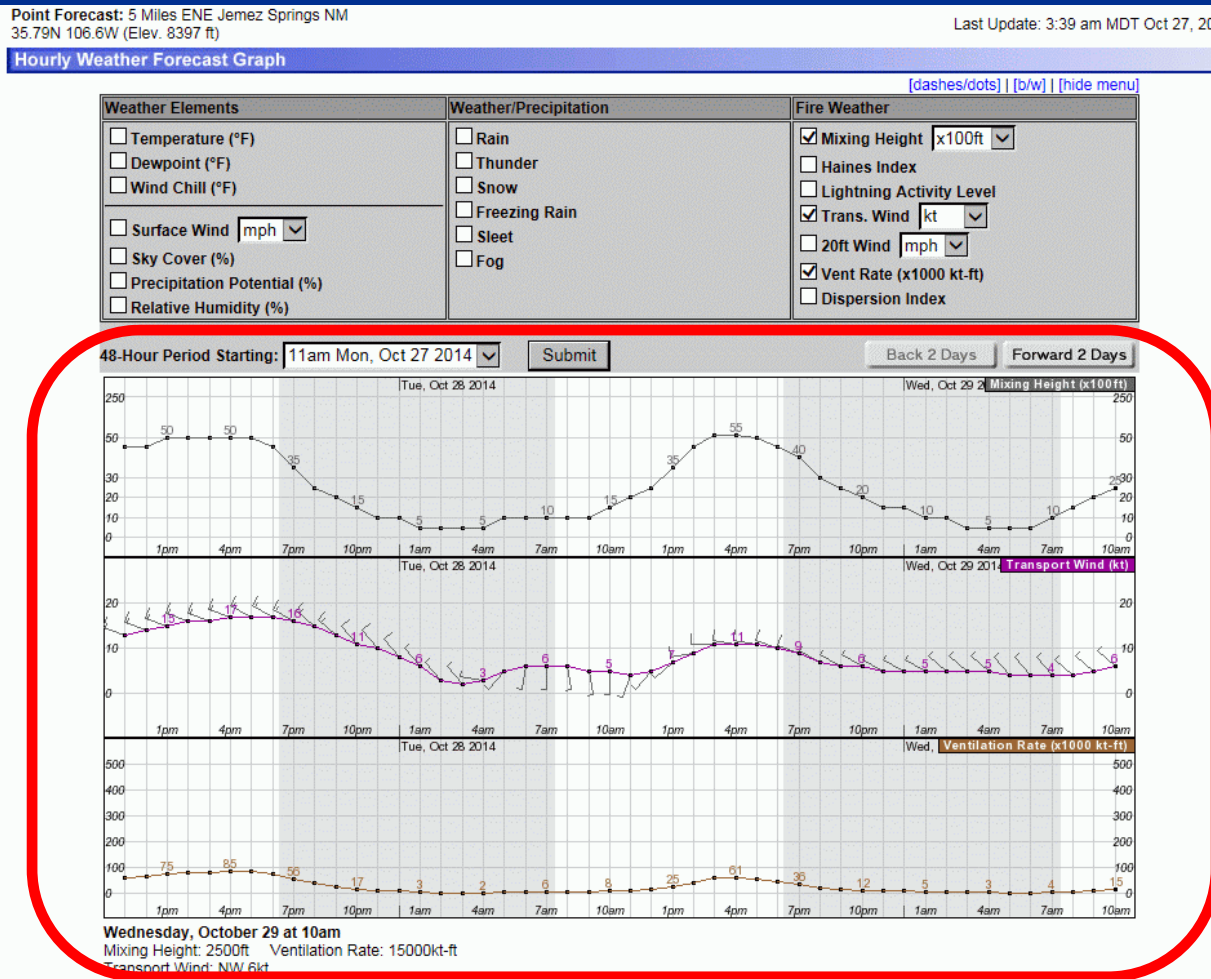
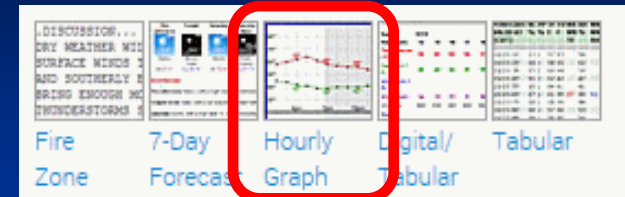
48-Hour Period Starting:

Date	10/27										10/28													
Hour (MDT)	10	11	12	13	14	15	16	17	18	19	20	21	22	23	00	01	02	03	04	05	06	07	08	09
Mixing Height (x100ft)	40	45	45	50	50	50	50	50	45	35	25	20	15	10	10	5	5	5	5	10	10	10	10	10
Transport Wind (kt)	13	13	14	15	16	16	17	17	17	16	15	13	11	10	8	6	3	2	3	5	6	6	6	5
Transport Wind Dir	W	W	W	W	W	W	W	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	W	SW	S	S	S	S
Ventilation Rate (x1000 kt-ft)	52	59	63	75	80	80	85	85	77	56	38	26	17	10	8	3	2	1	2	5	6	6	6	5
Dispersion Index																								
Date	10/29																							
Hour (MDT)	10	11	12	13	14	15	16	17	18	19	20	21	22	23	00	01	02	03	04	05	06	07	08	09
Mixing Height (x100ft)	15	20	25	35	45	55	55	50	45	40	30	25	20	15	15	10	10	5	5	5	5	10	15	20
Transport Wind (kt)	5	4	5	7	9	11	11	11	10	9	7	6	6	5	5	5	5	5	5	4	4	4	4	5
Transport Wind Dir	S	S	SW	SW	W	W	W	W	W	W	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW
Ventilation Rate (x1000 kt-ft)	8	8	13	25	41	61	61	55	45	36	21	15	12	8	8	5	5	3	3	2	2	4	6	10
Dispersion Index																								



National Fire Weather Webpage

Hourly graph





Graphical

- Forecast Display out 60 hours with 3 hr increments.

<http://graphical.weather.gov/>



A proposed replacement of the National Weather Service Graphical Forecast Page is available at preview.weather.gov/graphical/. Comments are encouraged and can be done by taking our survey.

Warnings & Forecasts | Graphical Forecasts | National Maps | Radar | Water | Air Quality | Satellite | Climate

Public | Fire Weather | Zoom Out

Graphical Forecasts - Albuquerque, NM

Daily View | Weekly View | Loops

Image List | Page Help | Metric Units | Key

Go to Region | View Images | Get Text Forecast

Mouse over the table below to change the forecast image.

Today	< -12Hrs	+12Hrs >
Max/Min Temperature	High	
Relative Humidity	9am 12pm 3pm 6pm	
Wind Gusts	9am 12pm 3pm 6pm	
Probability of Precip.	12 hr. probability	
Amount of Precip.	QPF	QPF
Dewpoint Temp	9am 12pm 3pm 6pm	
Weather	9am 12pm 3pm 6pm	
Sky Cover	9am 12pm 3pm 6pm	
Mixing Height	9am 12pm 3pm 6pm	
Transport Winds	9am 12pm 3pm 6pm	
20ft Winds	20' Wind	20' Wind
Ventilation Rate	Ventilation Rate	

Next Image | < | >

Mixing Height(ft) For Mon Oct 27 2014 3PM MDT
(Mon Oct 27 2014 21Z)
NWS Albuquerque, NM
Graphic Created Oct 27 4:46AM MDT



Text discussions

- Area Forecast discussion
- Fire Wx Planning Forecast
- Spot Forecast

FIRE WEATHER PLANNING FORECAST FOR NORTH AND CENTRAL NEW MEXICO
 NATIONAL WEATHER SERVICE ALBUQUERQUE NM
 739 AM MDT MON OCT 27 2014

.DISCUSSION...
 BREEZY TO WINDY CONDITIONS ARE EXPECTED TODAY...ESPECIALLY ALONG AND JUST EAST OF THE CENTRAL MOUNTAIN CHAIN AS AN UPPER LEVEL TROUGH AND ASSOCIATED COLD FRONT CROSS THE STATE. THE BACK DOOR SEGMENT OF THE COLD FRONT WILL SLIDE DOWN THE PLAINS LATE THIS AFTERNOON AND EVENING. IN ALL...TEMPERATURES WILL BE 5 TO 15 DEGREES COOLER THAN YESTERDAY. TUESDAY WILL BE EVEN CHILLIER ACROSS THE PLAINS...BUT ALL AREAS WILL BE NEAR NORMAL. QUIET WEATHER IN STORE AS RIDGING DEVELOPS ACROSS THE DESERT SOUTHWEST FOR THE LATTER HALF OF THE WEEK. MINIMUM RELATIVE HUMIDITIES MAY DROP NEAR 15 PERCENT ACROSS THE NORTHWEST AND NORTHEAST HIGHLANDS ON WEDNESDAY...AND MUCH OF THE AREA ALONG AND WEST OF THE RIO

DURING THIS PERIOD, HOWEVER...WINDS WILL BE PICK UP NEXT WEEKEND AS A DEEP UPPER LEVEL TROUGH CROSSES THE GREAT BASIN. POCKETS OF POOR VENTILATION WILL BE A CONCERN MID WEEK.

NMZ102-272130-
 NEW MEXICO FIRE WEATHER ZONE 102
 NORTH CENTRAL MOUNTAINS/WESTERN CARSON-SANTA FE NF/SNZ-TAZ-
 739 AM MDT MON OCT 27 2014

.TODAY...
 * SKY/WEATHER.....PARTLY CLOUDY. SLIGHT CHANCE OF SHOWERS...SOME WITH THUNDER IN THE AFTERNOON.
 * MAX TEMPERATURE.....
 * ABOVE 8000 FT....49-54.
 * BELOW 8000 FT....60-65.
 * 24 HR TREND.....DOWN 7 DEGREES.
 * MIN HUMIDITY.....
 * ABOVE 8000 FT....26-36 PCT.
 * BELOW 8000 FT....25-30 PCT.
 * 24 HR TREND.....DOWN 6 PCT.
 * 20-FOOT WINDS.....WEST 15 TO 20 MPH. GUSTS UP TO 40 MPH.
 * 10000 FT MSL WIND...WEST 25 TO 35 MPH DECREASING TO 15 TO 25 MPH IN THE AFTERNOON.
 * CHANCE OF PRECIP....20 PCT.
 * LAL.....1 INCREASING TO 2 IN THE AFTERNOON.
 * HAINES INDEX.....2 VERY LOW.
 * MIXING HEIGHT.....6000 FT AGL.
 * TRANSPORT WINDS....WEST 22 KNOTS.
 * VENTILATION CAT....VERY GOOD/132000 KNOT-FT.

FORECAST:

IF CONDITIONS BECOME UNREPRESENTATIVE,
 CONTACT THE NATIONAL WEATHER SERVICE.

SPOT FORECAST FOR CERRO MONTOSO...BLM
 NATIONAL WEATHER SERVICE ALBUQUERQUE NM
 833 AM MDT THU OCT 16 2014

IF CONDITIONS BECOME UNREPRESENTATIVE...CONTACT THE NATIONAL WEATHER SERVICE.

DISCUSSION...

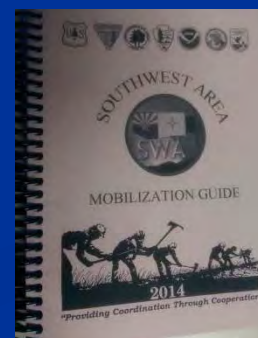
DRY CONDITIONS WILL REMAIN THE NEXT 48 HOURS ALTHOUGH LOOK FOR A SLIGHT INCREASE IN HUMIDITY AS THE MID LEVEL DRY INTRUSION ERODES OR WEAKENS. WIND SPEEDS SHOULD NOT BE ALL THAT GUSTY DUE TO THE WEAKER FLOW ALOFT. THE STRONGEST FLOW ALOFT WILL BE OVER THE

FIRE AREA THIS MORNING. THE STRONG RADIATION INVERSION THAT DEVELOPED OVERNIGHT SHOULD BREAK BETWEEN 1030 TO 1200 THIS MORNING. MIXING HEIGHTS TODAY AND FRIDAY WILL BE NEAR NORMAL FOR THIS TIME OF YEAR. ANOTHER STRONG RADIATION INVERSION WILL DEVELOP TONIGHT ALONG THE MIDSLOPE.



Specialized services

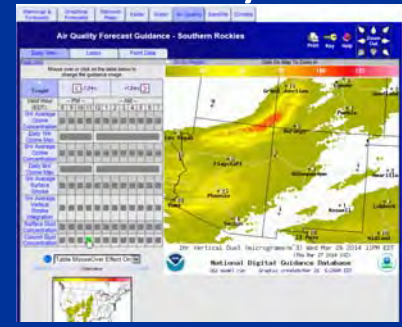
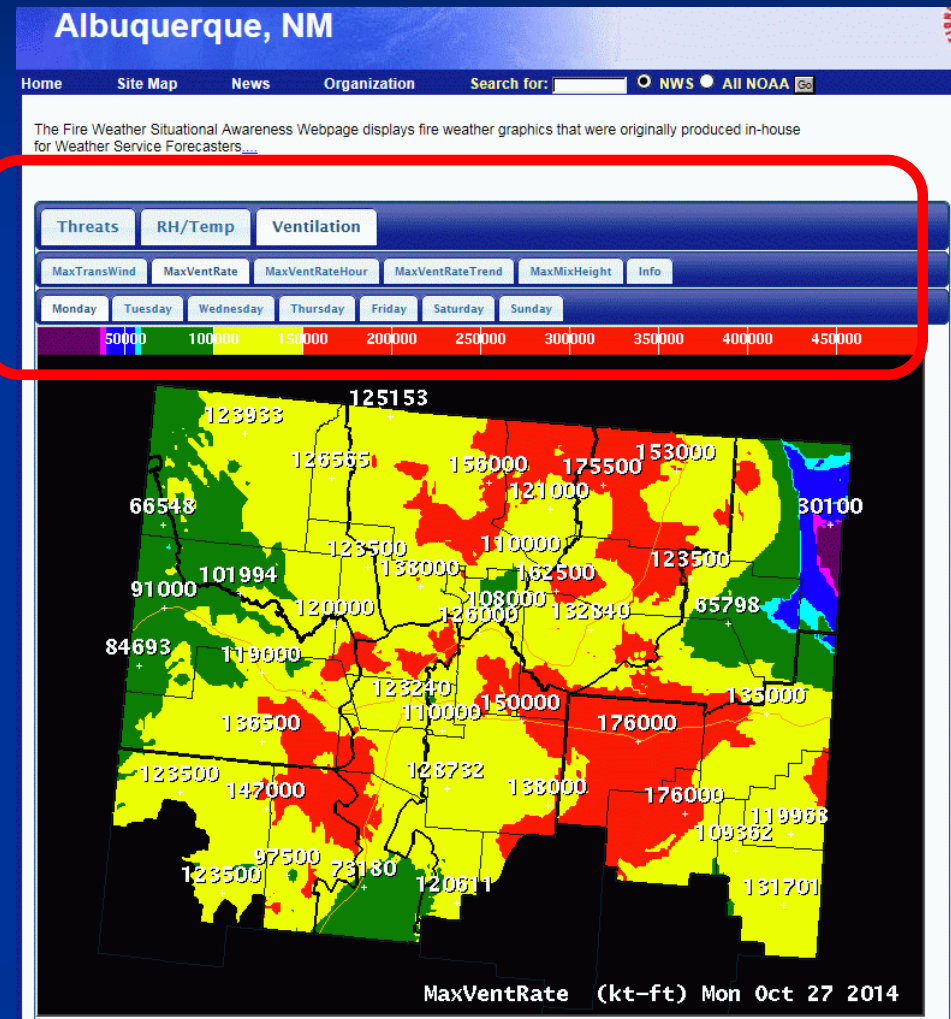
- Phone consultation
 - More information needed.
 - Clarify existing forecasts.
- Office phone number in the regional mobilization guide.





Specialized services

- Web graphics
 - Graphiccast/Weather Story
 - Specialized web pages
 - HYSPLIT
 - Local office
 - NOAA Air Quality



<http://www.srh.noaa.gov/abq/?n=forecasts-fireweather-dss#>



Specialized services



■ Social Media




■ Facebook


■ Twitter

■ #NMwx

■ #AZwx

■ YouTube

 **Smoke from the Slide Fire**  @NWSFlagstaff
 Flagstaff, AZ *National Weather Service, Flagstaff AZ*  Find us on Facebook



Smoke from the Slide Fire can be seen following two distinct paths this morning:

1. Near surface drainage below a temperature inversion into the Verde Valley
2. Smoke rising above the inversion into a layer of stronger northwest winds aloft.

The low level-drainage path will fade late this morning as temperatures warm up.

Visible Satellite Image 6:10 a.m. MST Memorial Day

[NWS Flagstaff @NWSFlagstaff](#)

[Thu] 6 am areas of smoke from prescribed burns affecting Tusayan & I-40 btwn Belmont & Flagstaff. Vsbys down to 1 mile thru mid morning [#azwx](#)

[NWS Flagstaff @NWSFlagstaff](#)

[Fri] 615pm: Reports of dense smoke from a prescribed burn along I-40 just east of Belmont. Visibility 200 feet or less. [#azwx](#)

Tweets from NWS-Flagstaff

Questions???

**MANAGED
BURN
DO NOT REPORT**