Demonstration to Justify Data Exclusion of Data Influenced by Exceptional Events

Date of Event:
August 5th - 6th, 2007

Mecklenburg County LUESA Air Quality
700 North Tryon Street
Suite 205
Charlotte, NC 28202

Demonstration to Justify Data Exclusion of Data Influenced by Exceptional Events

Date of Event:
August 5 - 6, 2007

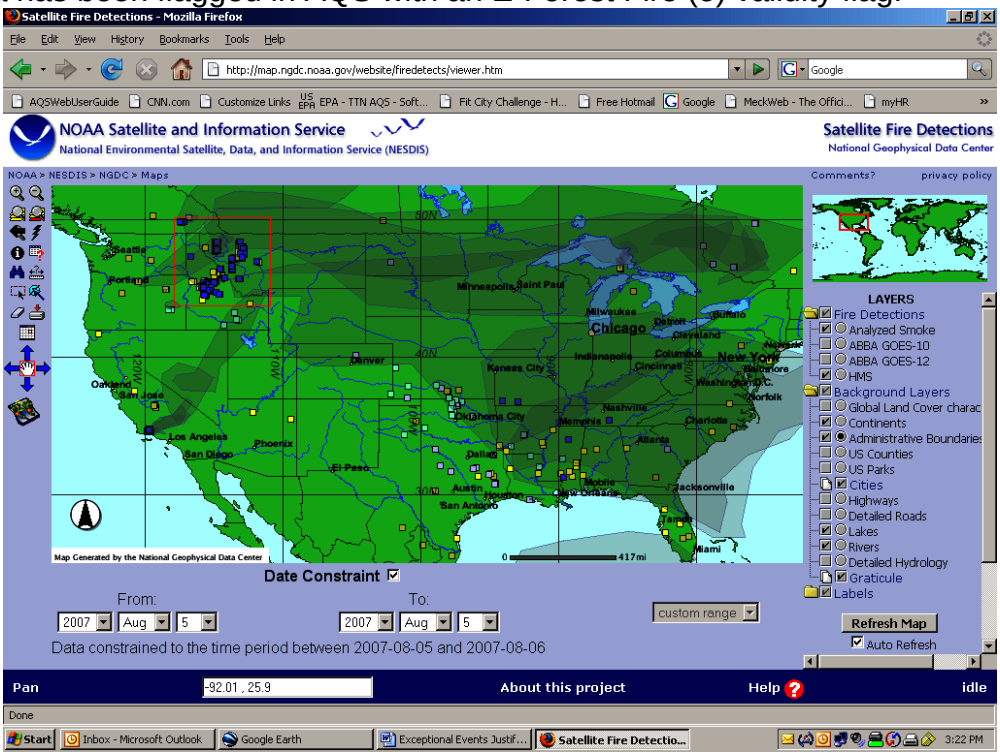
1.0 Background

The following analysis provides evidence to document an exceptional event associated with $PM_{2.5}$ measurements that exceeded the 24 hour National Ambient Air Quality Standard (NAAQS). These concentrations were measured in the Mecklenburg County (MCAQ), North Carolina ambient air monitoring network.

Large forest fires burning in Idaho, Montana, and Canada (primarily Idaho and Montana) bounded by a rectangle drawn at Lat: 44.00 N, Lon: -112.00 W and Lat: 50N, Lon: -117.5 W and centered at Lat: 47 N, Lon: -114.75 W, produced emissions which were transported east and resulted in high $PM_{2.5}$ readings on August 5 - 6, 2007 in Mecklenburg County, North Carolina. The high readings resulted in exceedances of the 24-hour PM NAAQS at site 37-119-0041 and very high readings which approached NAAQS exceedance levels at site 37-119-0043. The data is listed below:

Site:	37-119-0041	37-119-0043
Parmeter:	88101	88101
Sampler:	R-P 2025 Sequential	R-P 2025 Sequential
Interval:	24 hr	24 hr
August 5, 2007-	36.7 μg/m3	34.3 μg/m3
August 6, 2007-	36.1 μg/m3	34.5 μg/m3

This data has been flagged in AQS with an E-Forest Fire (e) validity flag.



NOAA Satellite and Information Service, Analyzed Smoke – August 5, 2007[1]
Figure 1.

This demonstration is submitted for EPA concurrence or non-concurrence as indicated by 40 CFR Part 50 § 50.14 - Treatment of Air Quality Monitoring Data Influenced by Exceptional Events.

2.0 Definition of an Exceptional Event

An exceptional event as defined by 40CFR Part 50 § 50.1 is “an event that affects air quality, is not reasonably controllable or preventable, is an event caused by human activity that is unlikely to recur at a particular location or a natural event, and is determined by the Administrator in accordance with 40 CFR 50.14 to be an exceptional event.”

3.0 Evidence Event Occurred

3.1 Location of Event

The event consists of multiple large forest fires. The forest fires occurred primarily in Idaho, Montana, and in Canada near the intersection of the borders of Idaho, Montana , and Canada. Figure 2 displays the areas burned between July 26, 2007 and August 5, 2007 in the southern area of the event.

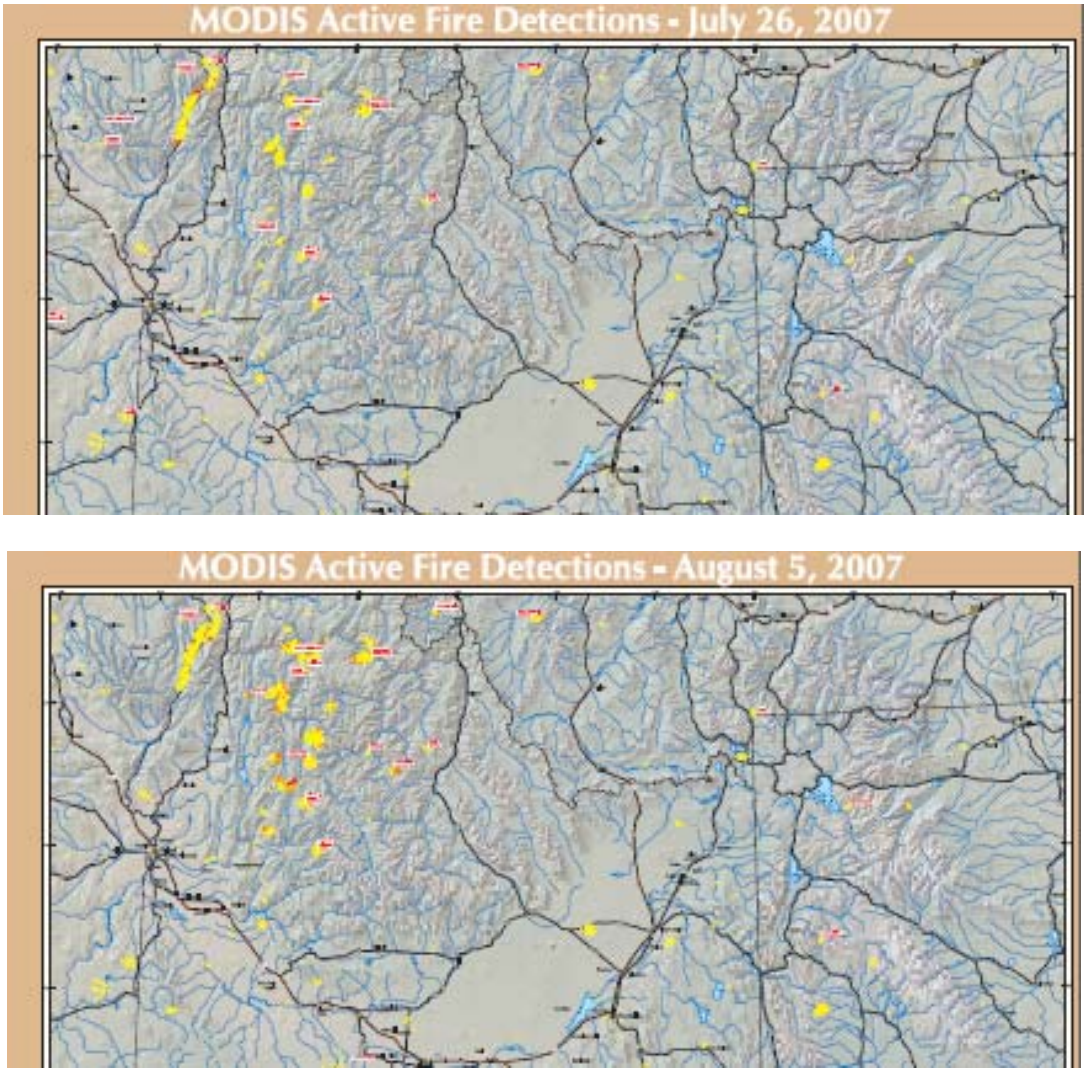


Figure 2. MODIS Active Fire Detection July 26, 2007[2]
and August 5, 2007 Southern Idaho

3.2 National Oceanic and Atmospheric Administration's National Environmental Satellite, Data, and Information Service (NESDIS)[4] Information

Listed below is the National Oceanic and Atmospheric Administration's National Environmental Satellite, Data, and Information Service (NESDIS) report from August 4, 2007. The report has been edited to provide data specific to this event.

Saturday, August 4, 2007

DESCRIPTIVE TEXT NARRATIVE FOR SMOKE/DUST OBSERVED IN SATELLITE IMAGERY
THROUGH 1700 UTC August 4, 2007

Western U.S and Southern Canada:
Persistent fires in northwestern United States and southeastern British Columbia are contributing to the dense and very dense smoke from northern Oregon/northern Idaho across Montana to southern Saskatchewan and Manitoba. The area of smoke becomes thinner and turns southward over the Northern Plains and the Upper Mississippi Valley. Risidual smoke from the large fires in Santa Barbara County in California extends northward to central California and western Nevada.

Central and Eastern United States:
The very large area of smoke and haze from the fires in the Northwest and British Columbia covers much of the central U.S.
, the Southeast and the Middle Atlantic. During the morning hours the most dense smoke and haze stretched from the Mid-Atlantic to southern New England. A plume of dense smoke from the fire in N Luce County in Michigan is drifting northward over eastern Lake Superior.

Brown

Figure 3 - Large fires - 31 July 2007

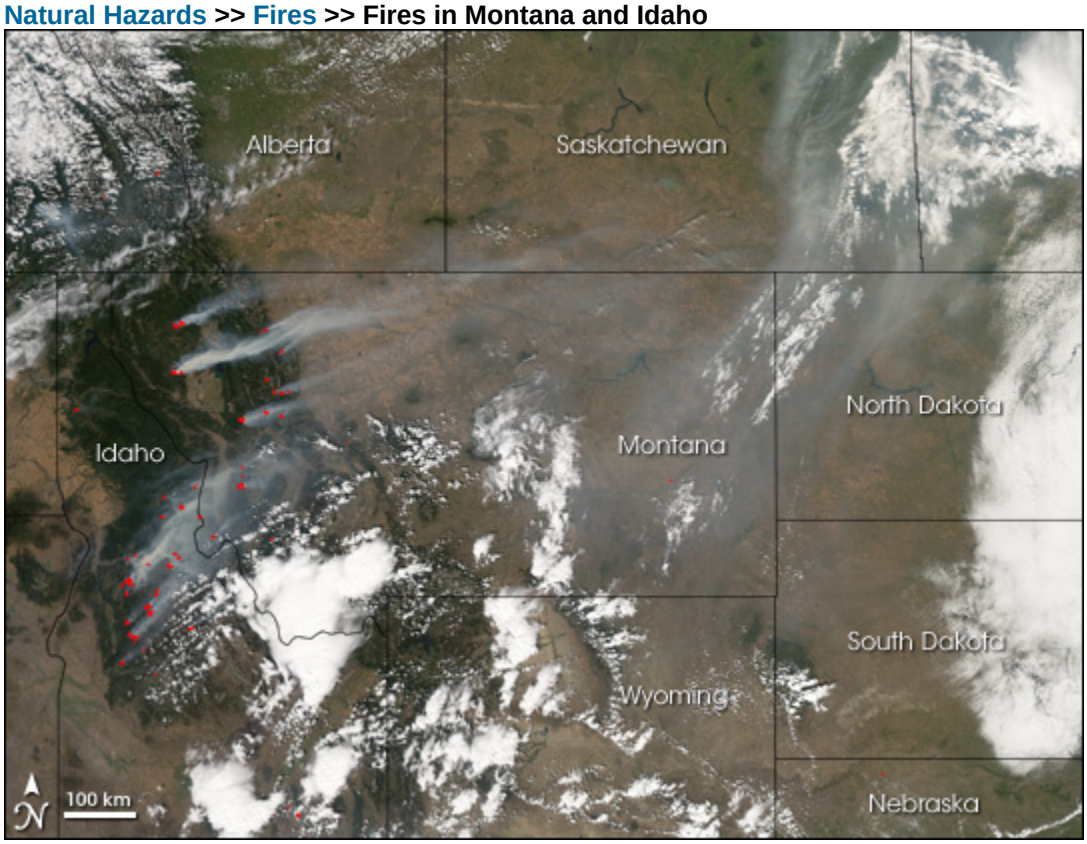
3.3 Internet Notice from NASA Earth Observatory[7]

earth observatory

home • data & images • features • news • reference • missions • experiments • search

NATURAL HAZARDS

Natural Hazards >> Fires >> Fires in Montana and Idaho



Click here to view high-resolution version (3.74MB)
Image Acquired: August 04, 2007

Fires in Montana and Idaho

Intense wildfires (location in red) raged in Idaho and Montana when the Moderate Resolution Imaging Spectroradiometer (MODIS) on NASA's Aqua satellite captured this image on August 4, 2007. According to reports from the National Interagency Fire Center on August 7, Idaho and Montana each had 14 large fires burning, with windy weather predicted to increase fire behavior in the area in subsequent days. In Montana, the fires had affected

Where in the World

more than 255,000 acres; in Idaho, fires had affected nearly 400,000 acres. These fires produced smoke that blanketed much of the United States.

You can download a 250-meter-resolution KMZ file of the fires in Montana and Idaho suitable for use with Google Earth.

NASA image created by Jesse Allen, using data provided courtesy of the MODIS Rapid Response team.

Recommend this Image to a Friend

Fires: Topic Home | Archive | Related Links

Natural Hazards Home | Section FAQ

Image Posted
August 06, 2007

Satellite & Sensor
Aqua- MODIS

Other Images for this Event
Posted: Sep 13, 2007
Posted: Sep 04, 2007
Posted: Aug 14, 2007
Posted: Aug 12, 2007
Posted: Aug 02, 2007
Posted: Aug 01, 2007

Fires Latest Events
Corral Fire Near Malibu, California
Fires and Haze in West Africa
Fires in Southern California
Bushfires in Northern Australia
Fires in the Amazon
Fire on Alaska's North Slope

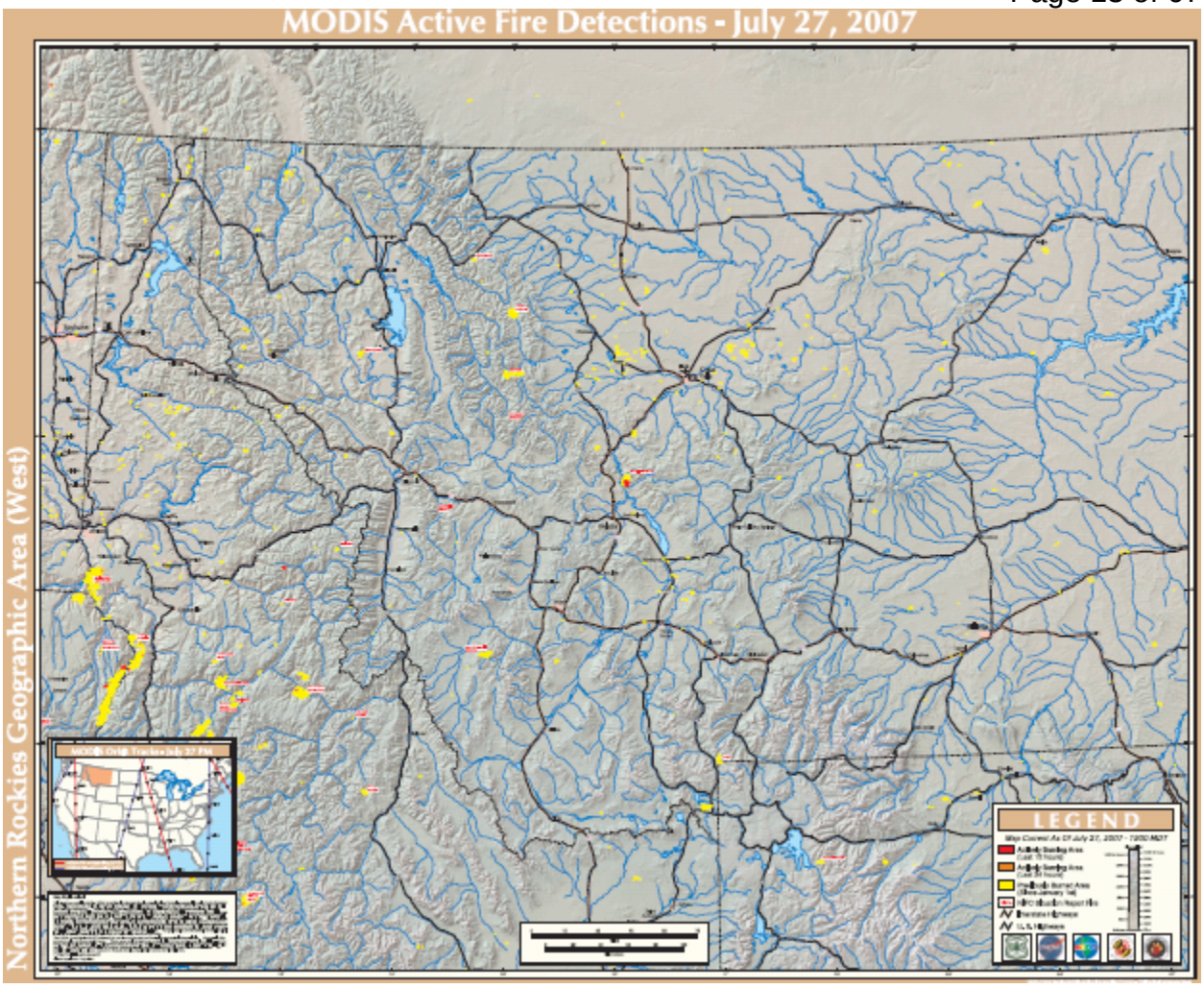
4.0 Composition and Size of Fires

Fires Burning in Idaho and Montana July, 27, 2007[5]: Between mid-July 2007 and mid-September 2007 more than 3000 square miles burned in 25 separate fires in the Idaho/Montana wildfire area.

IDAHO[6]								
Incident Name	Start	Est. Containment or End	ID	Type	Fuel	Size	Latitude	Longitude
Bridge	7/25/2007	11/1/2007	ID-CWF-000038	WF	Timber and Brush	43500	46°22´3"	114°37´16"
Cascade Complex	7/17/2007		ID-BOF-000635	WF	Model 8 & 10	302376	44°40´9"	115°41´9"
Chimney Complex	7/13/2007	8/17/2007	ID-CMS-43013	WF	Timber with grass understory	51000	46°2´48"	116°55´0"
Concord			ID-NPF-000022	WF		1570	45°35´42"	115°44´5"
Drake			ID-NPF-00035	WFU		280	45°59´15"	115°7´42"
EAST ZONE COMPLEX	7/7/2007	9/30/2007	ID-PAF-007071	WF	Fir, Lodgepole pine, spruce, ponderosa pine	300022	45°15´0"	115°41´0"
KRASSEL COMPLEX	6/17/2007		ID-PAF-007078	WFU	Timber, litter, and understory	85700	45°24´18"	114°52´30"
Middle Fork Complex	7/172007	8/17/2007	ID-BOF-000642	WF	Timber and Brush	17416	44°20´58"	115°29´37"
Murphy Complex	7/16/2007	8/2/2007	ID-TFD-002030	WF	Brush, grass, juniper	652016	42°10´19"	115°30´32"
Poe Cabin	7/18/2007	10/12/2007	ID-CMS-043014	WF	Timber	58520	45°41´39"	116°28´40"
RAINES			ID-PAF-007058	WF			45°18´52"	115°32´29"
Rattlesnake	7/13/2007	10/1/2007	ID-NPF-000017	WF	Timber	102000	45°25´51"	115°39´23"
TONGUE COMPLEX	7/6/2007	7/24/2007	ID-BOD-000490	WF	Juniper, sagebrush, grass	46680	42°15´53"	116°52´28"
Trapper Ridge WFU	7/17/2007		ID-BOF-000575	WFU	Timber	20159	44°1´22"	115°21´10"
Van Horn			ID-SCF-7244	WF		1650	44°45´55"	114°17´45"
						1,682,889		

Montana[6]								
Incident Name	Start	Est. Containment or End	ID	Type	Fuel	Size	Latitude	Longitude
AHORN	7/11/2007		MT-LCF-000013	WF	Lodgepole pine, spruce	52505	47°31´48"	113°2´48"
CONGER CREEK	7/16/2007		MT-LNF-000143	WF	Timber	25150	47°12´59"	113°2´13"
Fool Creek	6/28/2007		MT-LCF-000009	WF	Lodgepole pine, spruce	60038	47°55´24"	112°59´17"
LITTLE WOLF CREEK			MT-CES-052	WF		547	47°18´27"	112°16´24"
Meriwether	7/21/2007		MT-HNF-033	WF	Timber, grass, Shrub	43296	46°52´11"	111°52´56"
NOVAK			MT-CES-00051	WF		1859	47°17´22"	112°0´55"
Pattengail Creek	7/13/2007		MT-BDF-048	WF	Timber	15297	45°41´27"	113°25´17"
Rugby			MT-LCF-000022	WF		130	46°59´24"	111°0´43"
SAWMILL CREEK			MT-LNF-000145	WF		320	46°36´25"	113°42´2"
SKYLAND	7/23/2007		MT-FNF-000035	WF		45760	48°16´48"	113°23´6"
						244,902		
Total Acres Burned						1927791		
Square Miles Burned						3012		

http://gacc.nifc.gov/sacc/predictive/intelligence/NationalLargeIncidentYTDReport.htm
Table 1. Wildfires Idaho and Montana, Burning on July, 27, 2007.


MODIS Active Fire Detections - July 27, 2007
Northern Rockies Geographic Area (West)
LEGEND

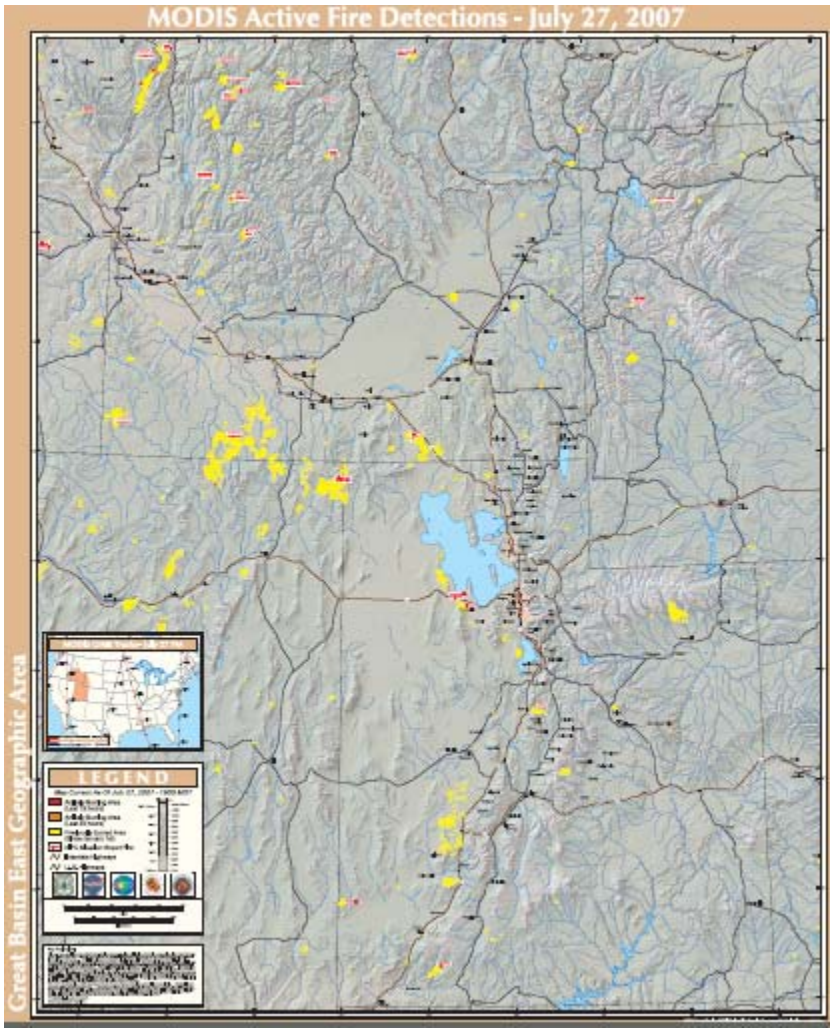


Figure 6. Maps of fires listed in Table 1 above (July 27, 2007), North and South Regions of Area (Idaho and Montana).[2]

5.0 Meteorological Data

8/5/07											
TimeEDT	Temperatu	Dew Point	Humidity	Sea Level	Visibility	Wind Direction	Wind Spee	Gust Spee	Precipitatio	Events	Conditions
12:52 AM	77	66	69	29.99	6	WNW	4.6	-	N/A		Haze
1:52 AM	75	66.9	76	29.99	6	Calm	Calm	-	N/A		Haze
2:52 AM	75	66	73	29.98	6	NW	4.6	-	N/A		Haze
3:52 AM	72	66	81	29.97	6	Calm	Calm	-	N/A		Haze
4:52 AM	69.1	64.9	87	29.97	6	Calm	Calm	-	N/A		Clear
5:52 AM	72	66.9	84	29.98	5	SW	4.6	-	N/A		Haze
6:52 AM	73	68	84	29.99	3	Variable	3.5	-	N/A		Haze
7:52 AM	75.9	68	76	30.01	4	WNW	5.8	-	N/A		Haze
8:52 AM	82	66.9	60	30	5	Calm	Calm	-	N/A		Haze
9:52 AM	86	66	51	30.01	5	WNW	3.5	-	N/A		Haze
10:52 AM	90	66	45	30.01	6	Variable	4.6	-	N/A		Haze
11:52 AM	91	66	44	30	7	WSW	4.6	-	N/A		Scattered Clouds
12:52 PM	93	66.9	42	29.99	7	Variable	5.8	-	N/A		Scattered Clouds
1:52 PM	95	66	38	29.97	8	Variable	5.8	-	N/A		Scattered Clouds
2:52 PM	96.1	64.9	36	29.95	7	Variable	6.9	-	N/A		Scattered Clouds
3:52 PM	95	64.9	37	29.93	7	Variable	4.6	-	N/A		Mostly Cloudy
4:52 PM	93.9	63	36	29.93	7	Calm	Calm	-	N/A		Mostly Cloudy
5:52 PM	93	66	41	29.92	7	Variable	4.6	-	N/A		Overcast
6:52 PM	90	66	45	29.91	6	NNW	5.8	-	N/A		Haze
7:52 PM	88	66	48	29.92	6	North	9.2	-	N/A		Haze
8:52 PM	86	66	51	29.93	5	NW	5.8	-	N/A		Haze
9:52 PM	84	66	55	29.93	6	NNW	4.6	-	N/A		Haze
10:52 PM	81	66.9	62	29.93	7	Calm	Calm	-	N/A		Mostly Cloudy
11:52 PM	78.1	66.9	68	29.93	7	Calm	Calm	-	N/A		Mostly Cloudy

8/6/07											
TimeEDT	Temperatu	Dew PointF	Humidity	Sea Level I	Visibility	Wind Direction	Wind Spee	Gust Spee	Precipitatio	Events	Conditions
12:52 AM	78.1	66.9	68	29.94	7	Calm	Calm	-	N/A		Mostly Cloudy
1:52 AM	78.1	68	71	29.93	6	NW	4.6	-	N/A		Haze
2:52 AM	73.9	68	82	29.91	6	Calm	Calm	-	N/A		Haze
3:52 AM	73.9	68	82	29.91	5	NW	3.5	-	N/A		Haze
4:52 AM	73.9	68	82	29.92	5	NW	4.6	-	N/A		Haze
5:52 AM	72	66.9	84	29.93	5	Calm	Calm	-	N/A		Haze
6:52 AM	72	68	87	29.95	4	Calm	Calm	-	N/A		Mostly Cloudy
7:52 AM	77	68	74	29.96	4	NW	3.5	-	N/A		Haze
8:52 AM	82	69.1	65	29.96	3	Calm	Calm	-	N/A		Haze
9:52 AM	86	69.1	57	29.96	4	Calm	Calm	-	N/A		Haze
10:52 AM	90	68	48	29.96	5	Variable	4.6	-	N/A		Haze
11:52 AM	93	68	44	29.96	6	NW	5.8	-	N/A		Haze
12:52 PM	97	66.9	37	29.94	6	WNW	9.2	-	N/A		Haze
1:52 PM	95	64.9	37	29.93	6	Variable	4.6	-	N/A		Haze
2:52 PM	96.1	64.9	36	29.92	7	Variable	4.6	-	N/A		Mostly Cloudy
3:52 PM	96.1	64.9	36	29.89	7	Variable	4.6	-	N/A		Mostly Cloudy
4:52 PM	84	72	67	29.89	4	NNE	11.5	-	0.01	Rain	Rain
5:52 PM	88	71.1	57	29.88	6	South	9.2	-	0		Haze
6:52 PM	89.1	70	53	29.87	7	Calm	Calm	-	N/A		Overcast
7:52 PM	86	71.1	61	29.89	6	Calm	Calm	-	N/A		Haze
8:52 PM	84	72	67	29.9	6	WNW	3.5	-	N/A		Haze
9:52 PM	82	73.9	76	29.91	7	Calm	Calm	-	N/A		Scattered Clouds
10:52 PM	81	73	77	29.91	5	NW	3.5	-	N/A		Haze
11:52 PM	79	73	82	29.91	6	NW	4.6	-	N/A		Haze

6.0 Ozone Data from Mecklenburg County and Other Regional Sites

Ozone Maximums

8 Hour Maximum

			2-Aug	3-Aug	4-Aug	5-Aug	6-Aug	7-Aug	8-Aug
Site Name	**County**	**AIRS Code**	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday
MonroeMS	Union	37-179-0003	0.070	0.066	0.071	0.063	0.082	0.080	0.091
Enochville	Rowan*	37-159-0022	0.082	0.086	0.074	0.081	0.077	0.089	0.087
Crouse	Lincoln	37-109-0004	0.085	0.084	0.072	0.060	0.060	0.075	0.056
Rockwell	Rowan*	37-159-0021	0.076	0.082	0.077	0.079	0.069	0.082	0.082
Arrowood	Meck. Co	37-119-1005	0.073	0.072	0.082	0.058	0.061	0.075	0.065
County Line (U)	Meck. Co	37-119-1009	0.071	0.080	0.073	0.077	0.072	0.092	0.078
Garinger	Meck. Co.	37-119-0041	0.072	0.080	0.078	0.069	0.067	0.089	0.086
Max			0.085	0.086	0.082	0.081	0.082	0.092	0.091
Mecklenburg Max			0.073	0.08	0.082	0.077	0.072	0.092	0.086

1 Hour Maximum

			2-Aug	3-Aug	4-Aug	5-Aug	6-Aug	7-Aug	8-Aug
Site Name	**County**	**AIRS Code**	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday
MonroeMS	Union	37-179-0003	0.078	0.076	0.081	0.068	0.09	0.096	0.102
Enochville	Rowan*	37-159-0022	0.086	0.093	0.077	0.101	0.081	0.098	0.1
Crouse	Lincoln	37-109-0004	0.096	0.107	0.079	0.066	0.066	0.083	0.067
Rockwell	Rowan*	37-159-0021	0.082	0.091	0.083	0.09	0.078	0.103	0.09
Arrowood	Meck. Co	37-119-1005	0.08	0.088	0.091	0.061	0.075	0.09	0.075
County Line (U)	Meck. Co	37-119-1009	0.075	0.097	0.077	0.088	0.08	0.105	0.083
Garinger	Meck. Co.	37-119-0041	0.078	0.1	0.084	0.073	0.081	0.106	0.108
Max			0.096	0.107	0.091	0.101	0.090	0.106	0.108
Mecklenburg Max			0.080	0.100	0.091	0.088	0.081	0.106	0.108

7.0 Trajectories and Mixing Heights

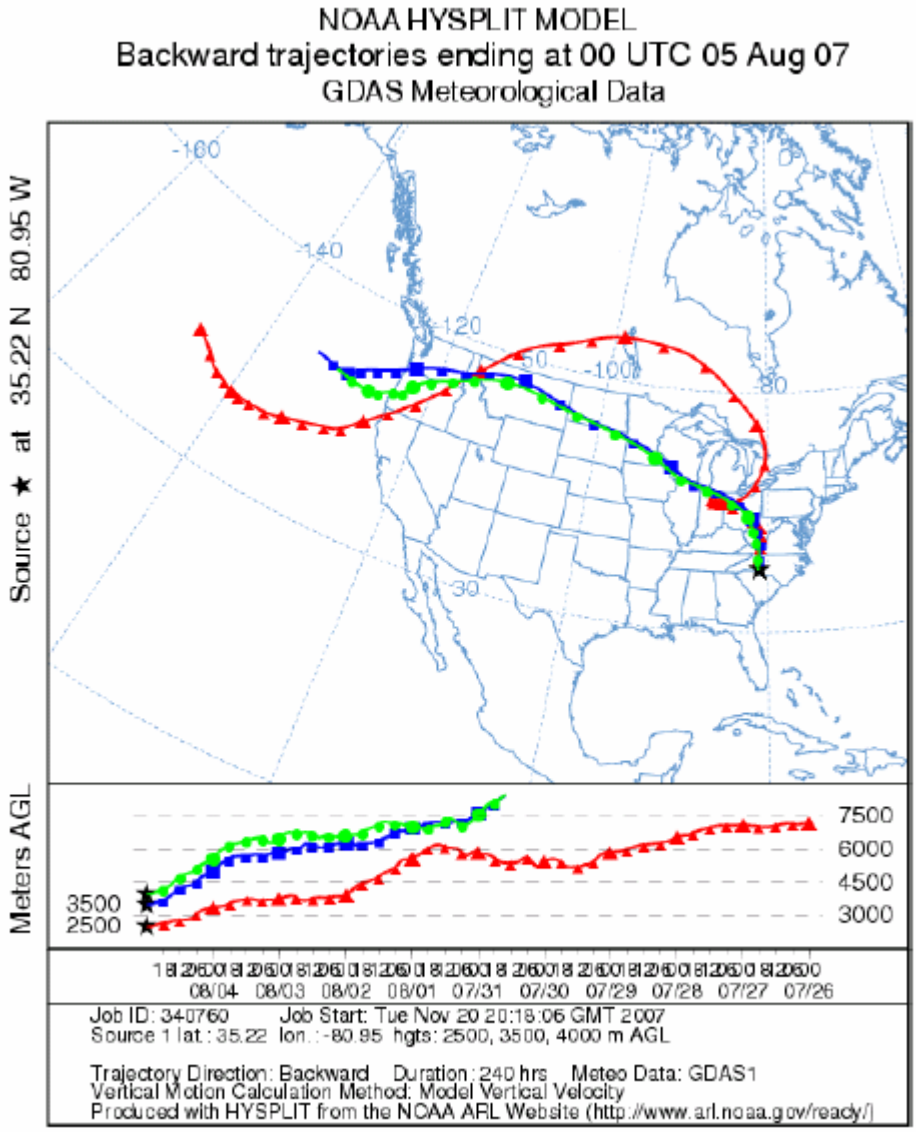


Figure 8.

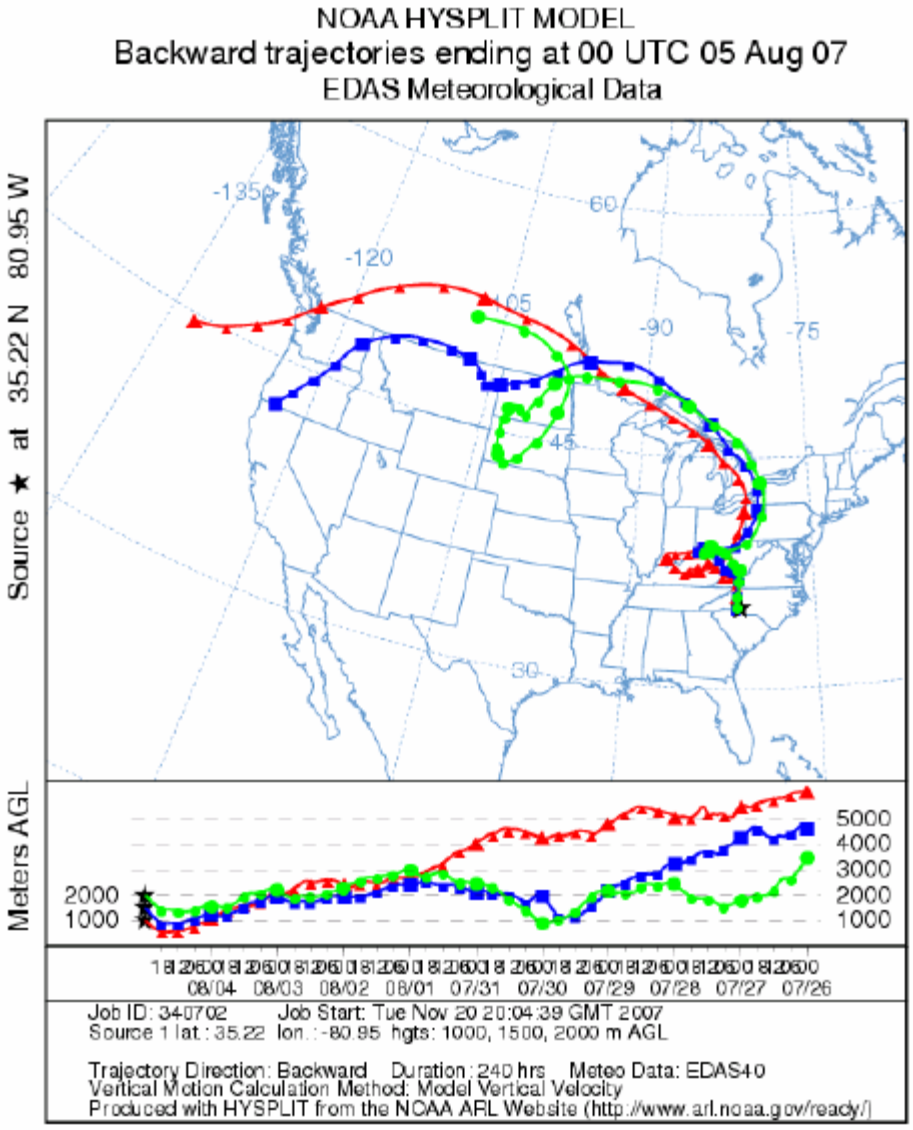

NOAA HYSPLIT MODEL
Backward trajectories ending at 00 UTC 05 Aug 07
EDAS Meteorological Data
Source ★ at 35.22 N 80.95 W
-135
-120
-105
-90
-75
60
45
30
Meters AGL
2000
1000
5000
4000
3000
2000
1000
08/04 08/03 08/02 08/01 07/31 07/30 07/29 07/28 07/27 07/26
Job ID: 340702 Job Start: Tue Nov 20 20:04:39 GMT 2007
Source 1 lat.: 35.22 lon.: -80.95 hgts: 1000, 1500, 2000 m AGL
Trajectory Direction: Backward Duration: 240 hrs Meteo Data: EDAS40
Vertical Motion Calculation Method: Model Vertical Velocity
Produced with HYSPLIT from the NOAA ARL Website (http://www.arl.noaa.gov/ready/)

Figure 9.

The table below documents the mixing height in Greensboro, NC on August 5 -6, 2007. Direct upper air measurements are not made in Charlotte, NC. Charlotte is approximately 90 miles SW of Greensboro, NC. The afternoon mixing heights reported from Greensboro, NC on August 5th and 6th; respectively, were 2709 and 2656 meters.

DAILY MIXING HEIGHTS AND AVERAGE WIND SPEEDS

U/A DATA STA. NO 13723 Greensboro, NC

SFC DATA STA. NO 72314 Charlotte, NC

			MORNING				AFTERNOON		
YEAR	MO	DAY	T	MXG HGT	WIND LYR	WIND SFC	T	MXG HGT	WIND LYR	WIND SFC
2007	08	01	1	338	2.1	1.5	1	2276		3.5
2007	08	02	1	109	1.0	1.0	1	2773		3.0
2007	08	03	1	161	5.8	1.1	1	2670		3.3
2007	08	04	1	149	.6	.6	1	2976		1.9
2007	08	05	1	49	1.2	1.2	1	**2709**		2.1
2007	08	06	1	114	.7	.7	2	**2656**		3.1
2007	08	07	1	108	1.2	1.2	1	2608		2.2
2007	08	08	1	40	.9	.9	1	3102		2.3
2007	08	09	1	96	1.6	1.6	1	3117		2.1
2007	08	10	1	185	1.3	.4	1	2568		2.0
2007	08	11	1	793	6.2	4.1	1	2288		3.4
2007	08	12	1	1424	3.1	3.5	1	2069		2.5
2007	08	13	1	96	.8	.8	1		3.0	3.0
2007	08	14	1	582	8.0	3.8	1	2557		3.8
2007	08	15	1	126	.7	.7	1		2.7	2.7
2007	08	16	1	516	6.8	2.8	1	2461		2.5
2007	08	17	1	628	7.0	2.9	1	1145		2.1
2007	08	18	1	182	9.2	2.0	1	1303		1.7
2007	08	19	1	740	9.5	3.1	1	1961		3.6
2007	08	20	1	323	9.4	2.6	1	2081		3.8
2007	08	21	1	513		2.4	1	2737		3.7
2007	08	22	1	472	2.9	1.4	1		2.6	2.6
2007	08	23	1	607	1.8	.7	1	2452		2.7
2007	08	24	1	409	4.1	1.3	1	1777		2.9
2007	08	25	1	285	5.3	1.3	1	1843		2.2
2007	08	26	1	338	3.8	1.0	1	1845		1.8
2007	08	27	1	1122		1.3	1	1683		3.3
2007	08	28	4				4			
2007	08	29	1	563	2.2	.6	1	2065		2.0
2007	08	30	1	294	2.1	.7	1	1997		3.0
2007	08	31	1	450	3.7	1.8	1	2073		3.3

MIXING HEIGHT IN METERS
WIND SPEED IN METERS/SEC
TYPE 1 = NO PRECIPITATION
TYPE 2 = PRECIPITATION
TYPE 3 = SELECTED TEMPERATURE LESS THAN RAOB TEMP
TYPE 4 = MISSING

Table 3.

8.0 Selected $PM_{2.5}$ Speciation Data

The following charts were compiled from data collected from the Speciation Trends Network site 37-119-0041:

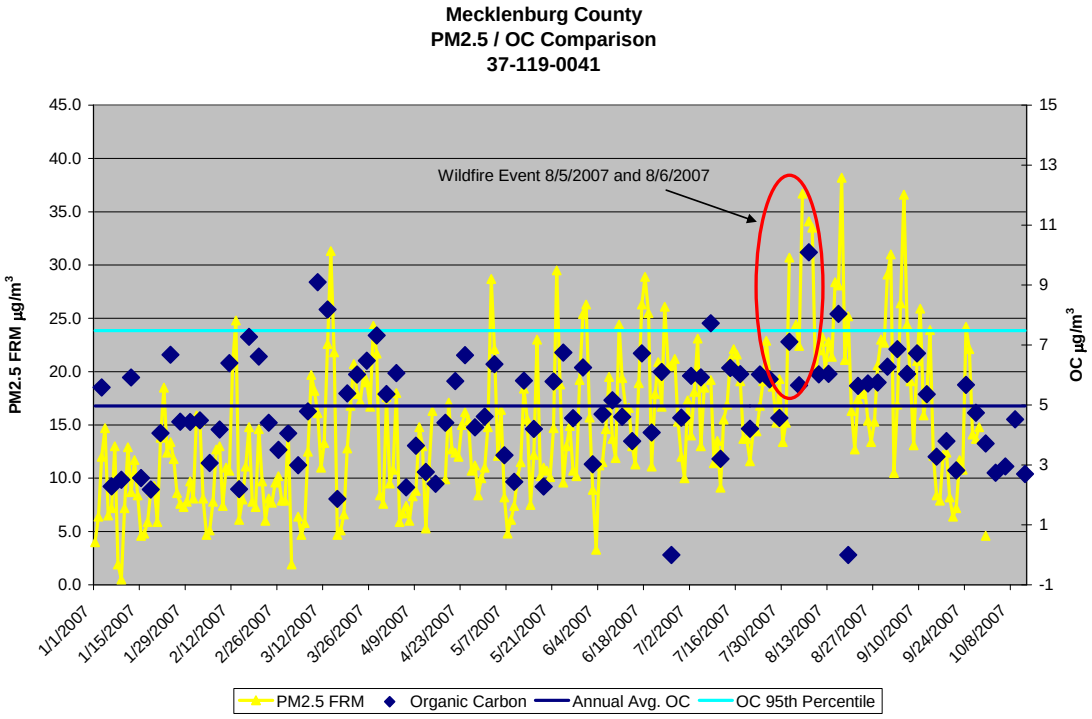


Figure 9. Organic Carbon Data

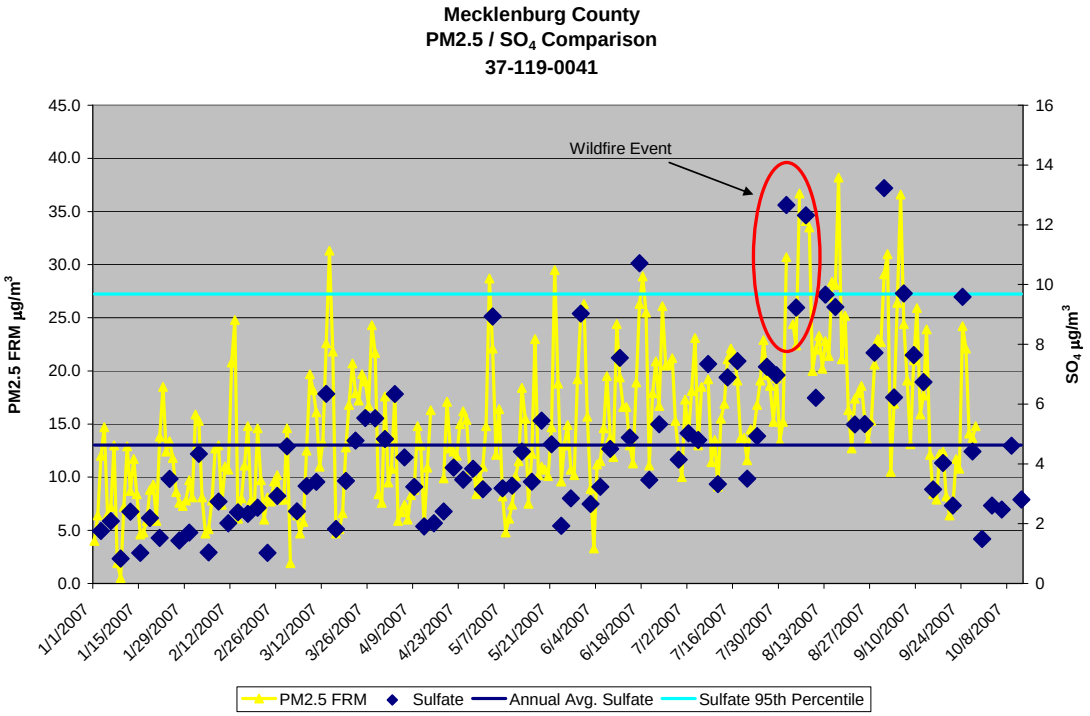


Figure 14. Sulfate Data

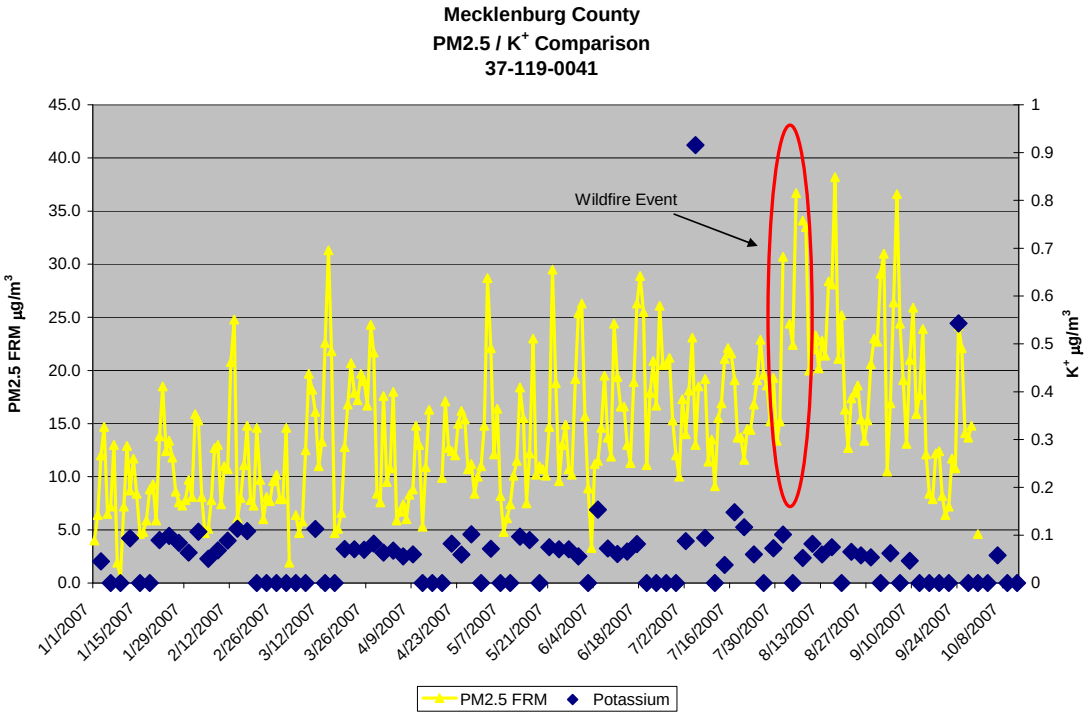


Figure 15.- Potassium Ion Measurements from STN.

9.0 Continuous and FRM $PM_{2.5}$ Monitoring Data

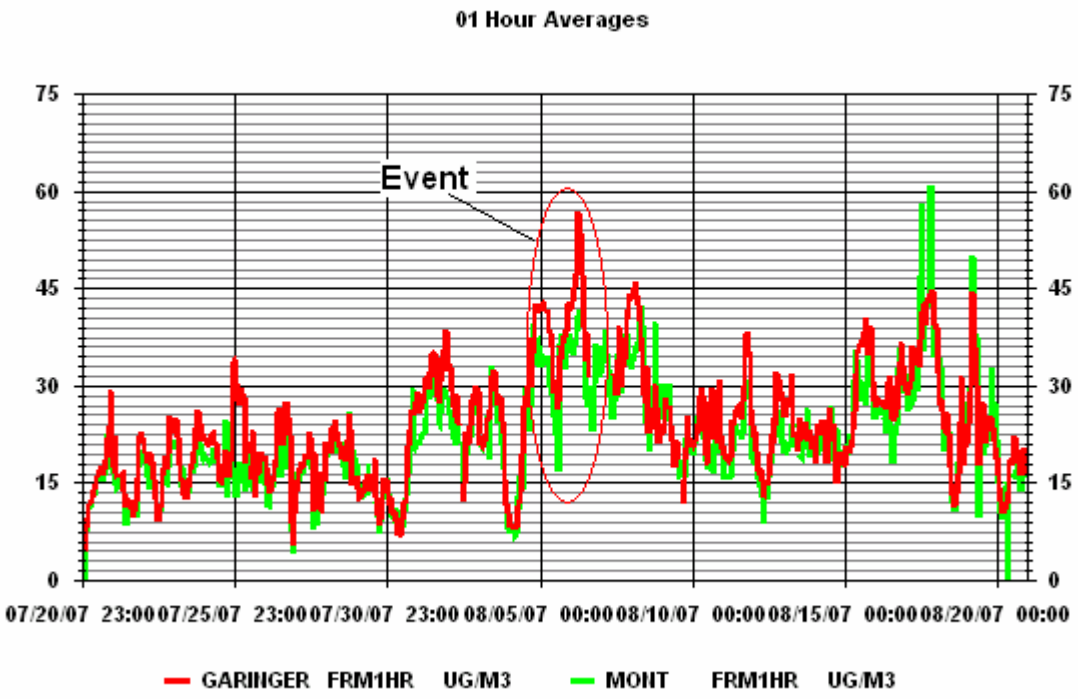


Figure 16. TEOM Data

Data displayed in the chart above was recorded at sites 37-119-0041 and 37-119-0042. The measurements were made using an R&P TEOM continuous PM2.5 instrument operating at 50ºC.

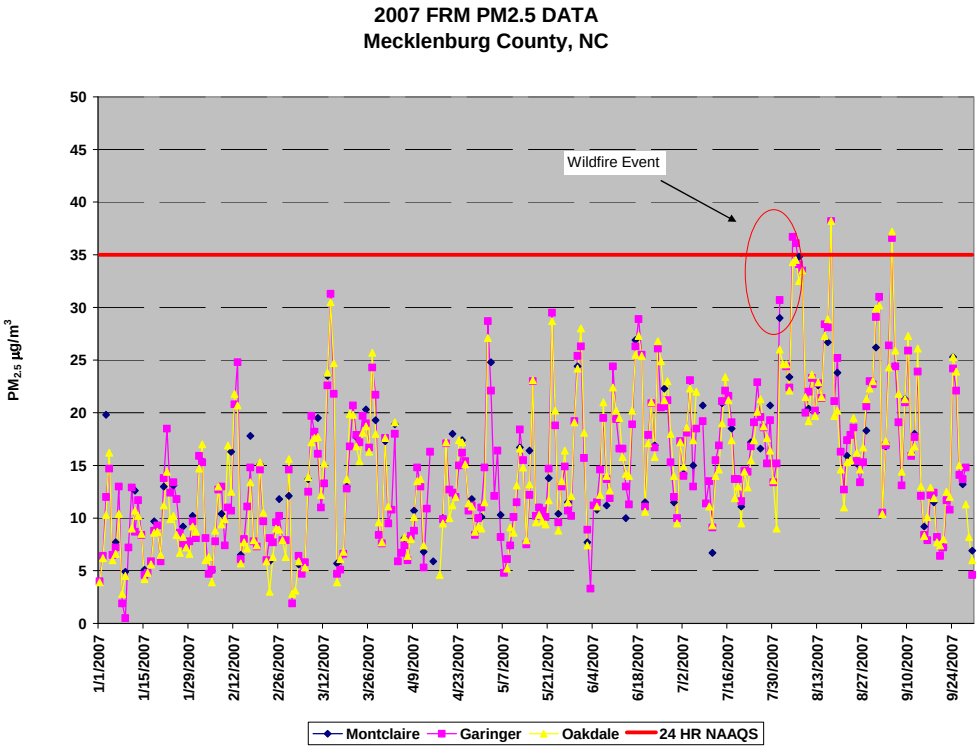


Figure 17. 2007 FRM $PM_{2.5}$ Data for Mecklenburg County

Data displayed in the chart above was recorded at sites 37-119-0041, 37-119-0042, and 37-119-0043.

10.0 Comparison to Typical Data

Below is the box and whisker plot for PM2.5 data measured at all sites operating in Mecklenburg County during the summer months from 2004 to 2006:

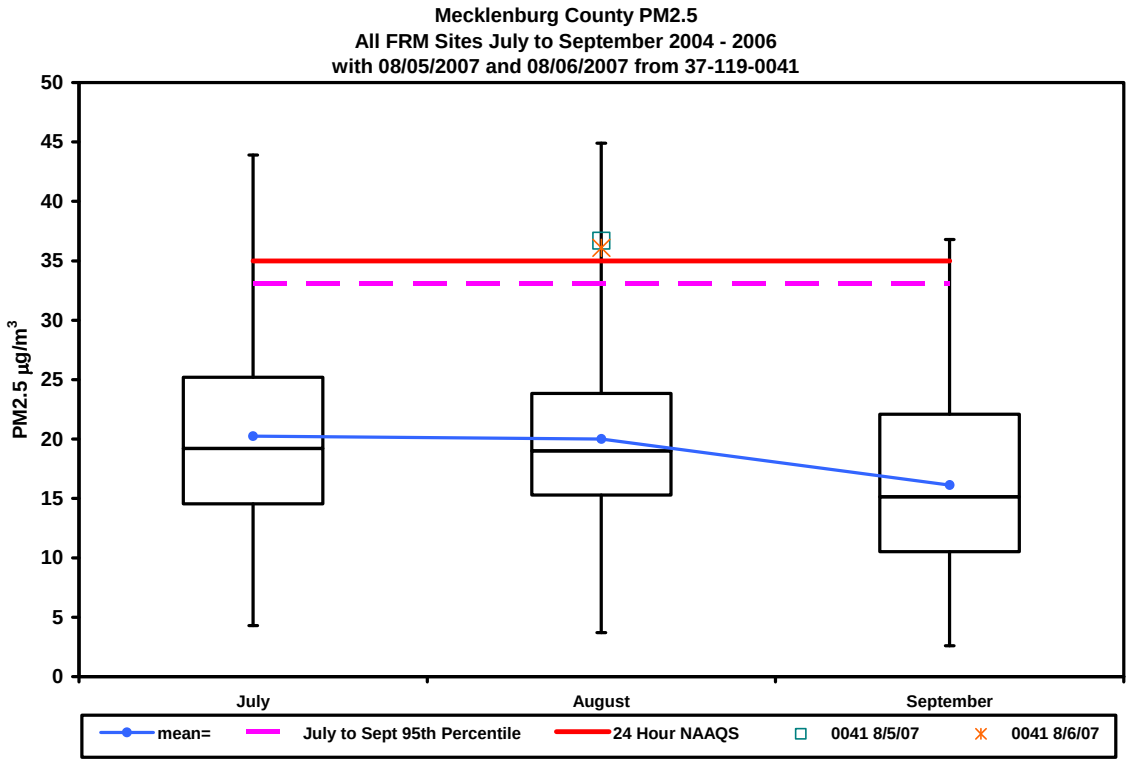


Figure 18.

Since the data being analyzed was measured on August 5th and 6th, the months of July – September were chosen for the analysis.

The data from August 5th (teal box) and 6th (orange ×), 2007 is plotted for 37-119-0041. The values are 36.7 µg/m^3 and 36.1 µg/m^3, respectively. The 95th percentile for July, August, and September during the period is 33.1 µg/m^3. The 24-hour NAAQS is 35 µg/m^3.

	July	August	September
n	200	199	200
# Values > 95th %	15	11	4
# Values > NAAQS	8	10	2

Table 2.

During the 3 year summer period listed above, 30 of 599 measurements are greater than the 95th percentile and 3.3% of the measurements (20/599) are greater than the NAAQS. The seasonal evidence indicates data for the date of concern (August 5th – 6th, 2007) is greater than the 95th percentile at the site of concern (37-119-0041). The data is also well above the 75th percentile:

	37-119-0041 August 5th	37-119-0041 August 6th
Data for August 5 - 6, 2007	36.7 μg/m^3	36.1 μg/m^3
95th Percentile (Seasonal)	33.1 μg/m^3	
75th Percentile (Seasonal)	23.6 μg/m^3	

Table 3.

For comparison, the annual data for all sites operating during the period 2004 – 2006 is displayed below:

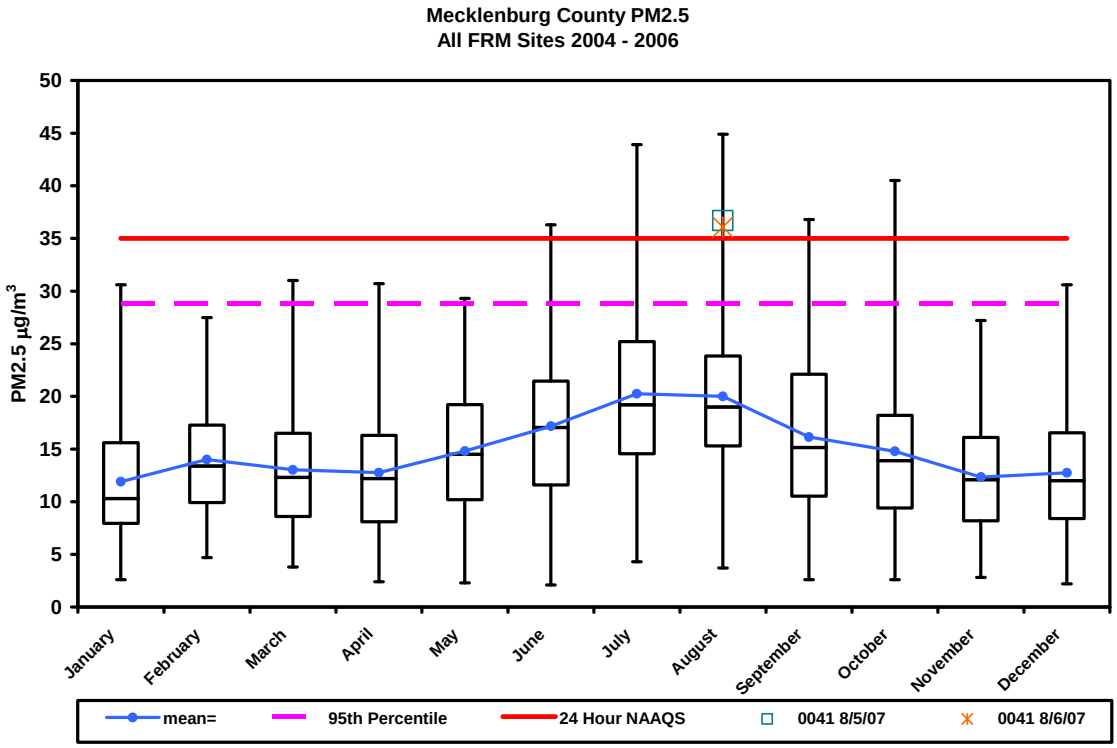


Figure 19.

During the 3 year period listed above 118 of 2375 measurements are greater than the 95th percentile (28.8 μg/m^3) and 1% of the measurements (24/2375) are greater than the NAAQS (35 μg/m^3).

Based on the qualifications of 40 CFR Part 50 § 50.14 (Federal Register / Vol. 72, No. 55 / Thursday, March 22, 2007 / Rules and Regulations Page-13569) and taking into consideration the evidence of the occurrence of the event, the event may be associated with an unusual measured concentration beyond typical fluctuations including background.

11.0 "But For" Analysis

The 25 fires examined as part of the documented events in Idaho and Montana are estimated to have had fuel loadings varying from 0.7 tons/acre (grass) to 12 tons/acre (timber). Assuming an average fuel loading of 6 tons/acre the event is estimated (assuming 100% consumption) to have consumed 11.6 million tons of fuel materials. Using an emission factor from the "First Order Fire Effects Model" (FOFEM)[13] under moderate conditions (18 lbs/ton) yields estimated total $PM_{2.5}$ emissions of 104,000 tons within a 118 day period (estimated total fire period 6/17/2007 to 10/12/2007).

The National Environmental Satellite, Data, and Information Service (NESDIS) maps document the path of the smoke plume across the continent. The NESDIS data on August 4, 2007 state:

"Western U.S and Southern Canada:
Persistent fires in northwestern United States and southeastern British Columbia are contributing to the dense and very dense smoke from northern Oregon/northern Idaho across Montana to southern Saskatchewan and Manitoba. The area of smoke becomes thinner and turns southward over the Northern Plains and the Upper Mississippi Valley. Risidual (sic)smoke from the large fires in Santa Barbara County in California extends northward to central California and western Nevada.

Central and Eastern United States:
The very large area of smoke and haze from the fires in the Northwest and British Columbia covers much of the central U.S. ,the Southeast and the Middle Atlantic. During the morning hours the most dense smoke and haze stretched from the Mid-Atlantic to southern New England..."

Notices on the NESDIS continue through the date of interest on August 5 - 6, 2007:

Sunday, August 5, 2007: "...Eastern United States:
A large area of thin smoke and haze is visible over the Midwest, the Southeast and the Middle Atlantic States..."

Sunday, August 5, 2007: "...British Columbia/Alberta/Saskatchewan/Ontario/Quebec/Idaho/Montana/ Dakotas/Minnesota/eastern half United States/Gulf of Mexico:
The big fires in southeastern British Coumbia, Idaho and Valley counties of Idaho, and Flathead and Lake counties of Montana are still buring and it cannot tell if these fires are still producing smoke due to thick weather clouds. However, a large belt area of moderately dense to locally dense smoke has covered the areas including: northern Idaho, all the Montana, southeastern British Columbia, southern Alberta, southern Saskatchewan, all of North Dakota, northern South Dakota, all of Minnesota, southern Ontario, and southern Quebec. Furthermore, a large area of thin to moderately dense smoke has covered all of the eastern half United States and the most portion of east Gulf of mexico..."

Modeled back trajectories (Figures 8.) from the monitoring area intersect areas near the fires. Afternoon mixing height in Charlotte, NC (Mecklenburg County) is assumed to have been similar to measured mixing heights is Greensboro, NC (approximately 90 miles NE of Charlotte). The afternoon mixing height at this location was approximately 2700 meters on August 5 - 6, 2007. Modeled Hysplit back trajectories from 37-119-0041 on August 5, 2007 cross just north of the wildfire area on July 27, 2007. The back trajectories originate from altitudes of <2000 meters, which are below the assumed mixing height on the date of the $PM_{2.5}$ measurement. The modeled trajectories may indicate the potential for smoke to become mixed into the lower atmosphere where it may have impacted measurements made at breathing height (2 m).

Information compiled in this analysis indicates the organic carbon (OC) fraction of the STN sample collected on August 4th and August 7th, 2007; dates which bracket the event of concern at site 37-119-0041, contained measured concentrations of 5.7 $\mu g/m^3$ and 10.1 $\mu g/m^3$ of organic carbon; respectively (See Figure 9.) The average concentration of organic carbon measured at 37-119-0041 from 2003 - 2006 during the summer months was 5.1 $\mu g/m^3$. OC levels were 0.6 and 5.0 $\mu g/m^3$ above the summer average on the STN sampling dates preceding and following the event. Elevated organic carbon concentrations may be associated with wood smoke emissions[12].

Given:

1. Estimated $PM_{2.5}$ emissions from the described event were in excess of 104,000 tons.

2. The 75th and 95th percentile of July, August, and September $PM_{2.5}$ data for all sites operating in the MCAQ network from 2004 – 2006 was 23.6 $\mu g/m^3$ and 33.1 $\mu g/m^3$, respectively. The values measured on August 5 - 6, 2007 were greater than the 95th percentile (36.7 $\mu g/m^3$ and 36.1 $\mu g/m^3$.)

3. Modeled back trajectories from the location of the described event intersect with areas near the location of the wildfires.

4. Elevated organic carbon concentrations (10.1 $\mu g/m^3$ on August 7, 2007 versus the summer average of 5.1 $\mu g/m^3$); were measured at site 37-119-0041 on the date of the described events influence.

5. Multi-variable regressions of seasonal (July to September) data for 2007 and 2005-2007 were performed using meteorological data obtained from Charlotte-Douglas International Airport. Daily wind speed, wind direction, temperature, dew point, precipitation, and previous day precipitation data were plotted versus the FRM $PM_{2.5}$ data for each site.

Site	Date of Event	PM2.5 μg/m^3	Data Period Used for Estimation	r^2	99% Up-Bnd	98% Up-Bnd	97.5 % Up-Bnd	96% Up-Bnd	95% Up-Bnd	94% Up-Bnd	93% Up-Bnd
37-119-0041	8/5/2007	36.7	July to Sept 2007	0.38	37.3	35.5	34.9	33.6	33.0		
37-119-0041	8/5/2007	36.7	July to Sept 2005-2007	0.29	39.0	37.2	36.5	35.1	34.4		
37-119-0041	8/6/2007	36.1	July to Sept 2007	0.37	38.8	37.0	36.4	35.1	34.4		
37-119-0041	8/6/2007	36.1	July to Sept 2005-2007	0.29	40.2	38.4	37.8	36.4	35.7	35.1	34.5

Yellow < measured value. Orange < NAAQS.

The estimated 97.5% upper-bound of a normal approximation (using estimation of missing observations by covariance with 2007 July to September data) for August 5, 2007 at site 37-119-0041 was 34.9 μg/m^3 (r^2 = 0.38) versus the measured value of 36.7 μg/m^3.

The estimated 95% upper-bound of a normal approximation for the data for August 6, 2007 at site 37-119-0041 was 34.4 μg/m^3 (r^2 = 0.37) versus the measured value of 36.1 μg/m^3.

Based on the 2007 seasonal estimations of missing observations by covariance, less than 2.5% of measured values would be expected to be greater than 34.9 μg/m^3 at the site on August 5, 2007 and less than 5% of measured values would be expected to be greater than 34.4 μg/m^3 at the site on August 6, 2007.

The results from the multi-year seasonal regression indicate less than 5% of measured values would be expected to be greater than 34.4 μg/m^3 on August 5, 2007 and less than 7% of measured values would be expected to be greater than 34.5 μg/m^3 on August 6, 2007.

But for the contribution of $PM_{2.5}$ from this event, the $PM_{2.5}$ NAAQS may not have been exceeded on August 5th and 6th, 2007 at site 37-119-0041.

Appendix A

Fire Information - Wildland Fire Statistics

National Year-to-Date Report on Fires and Acres Burned

by State for October 29, 2007

	Wildland		Prescribed		Wildland Fire Use	
State	# Fires	# Acres	# Fires	# Acres	# Fires	# Acres
AK	447	525,019	4	20,650	58	124,768
AL	3,368	64,207	14,725	846,850	0	0
AR	1,196	30,126	225	222,462	1	3,481
AZ	2,170	101,215	295	74,889	23	10,760
CA	8,417	1,463,239	589	59,653	37	731
CO	1,270	16,046	140	28,567	17	206
CT	244	231	7	60	0	0
DE	19	153	9	165	0	0
FL	4,584	571,492	295	238,872	18	2,753
GA	7,096	520,271	99	46,851	0	0
HI	5	21,030	0	0	0	0
IA	49	580	130	4,793	0	0
ID	1,454	1,992,148	290	32,078	73	188,136
IL	73	610	176	11,635	0	0
IN	803	5,401	284	25,161	0	0
KS	51	14,265	56	21,506	0	0
KY	1,821	55,147	32	16,490	0	0
LA	795	8,590	118	112,425	0	0
MA	2,204	2,687	5	46	0	0
MD	645	5,769	51	4,094	0	0
ME	460	399	37	196	0	0
MI	534	23,321	82	7,049	0	0
MN	1,777	115,495	539	81,881	2	11
MO	158	10,294	57	26,719	0	0
MS	991	13,363	191	210,921	0	0
MT	1,847	785,858	289	29,537	25	42,440
NC	6,329	51,234	186	94,084	0	0
ND	883	29,048	101	19,395	0	0

NE	50	3,920	52	9,540	0	0
NH	419	203	15	187	0	0
NJ	1,212	20,789	133	11,712	0	0
NM	1,387	78,194	141	44,023	22	26,785
NV	869	890,188	21	10,764	6	3,631
NY	211	855	13	353	0	0
OH	491	1,220	10	1,643	0	0
OK	1,230	46,213	30	19,281	0	0
OR	2,408	588,527	642	69,655	0	0
PA	523	1,047	3	40	0	0
PR	3,258	18,913	0	0	0	0
RI	99	60	5	110	0	0
SC	3,143	14,621	202	100,497	0	0
SD	1,478	105,570	118	25,721	0	0
TN	3,129	42,435	17	14,146	0	0
TX	526	16,612	153	190,712	1	1
UT	1,302	615,447	73	31,420	20	7,168
VA	1,414	13,118	35	10,350	2	407
VT	99	230	5	302	0	0
WA	1,249	216,412	1,278	30,326	3	802
WI	1,451	4,728	542	33,871	0	0
WV	922	6,781	6	450	0	0
WY	502	76,139	53	25,097	21	3,891
Grand Totals	77,062	9,189,460	22,559	2,867,229	329	415,971

IDAHO

Incident				Structures Destroyed					
Name	ID	Type	Size	Primary	Commercial	Out Building	Fatalities	Latitude	Longitude
INDIAN CREEK	ID-BOD-000292	WF	1,200				0	43°26´20"	116°12´11"
RIMSTEP	ID-BOD-000359	WF	725				0	43°12´43"	116°22´54"
Black Pine	ID-STF-001848	WF	60				0	42°2´38"	113°2´38"
Howard	ID-IFD-007004	WF	1,650	0	0		0	42°52´4"	112°30´50"
Roseworth	ID-TFD-001863	WF	273				0	42°19´6"	114°51´30"
Clover	ID-SIX-001868	WF	910			1	0	42°59´43"	115°1´50"
Cow Canyon	ID-IFDS-001862	WF	16,268				0	42°7´1"	112°51´20"
Brownlee Dam Fire	ID-PAF-007028	WF	80				0	44°50´10"	116°54´0"
ROCK	ID-SCCI-001916	WF	328				0	42°33´3"	114°57´18"
Trail Creek	ID-SIX-001874	WF	288				0	43°43´15"	114°19´44"
Birch	ID-BOD-000458	WF	753					42°57´43"	115°37´9"
Sand Dunes	ID-EICI-007018	WF	1,010				0	44°3´34"	111°47´46"
NICHOL	ID-BOD-000489	WF	4,900					43°0´22"	115°50´42"
LIBERATOR	ID-BOD-	WF	300					42°57´41"	115°39´58"

	000485								
2 Spots	ID-TFD-001957	WF	3,500				0	42°22´32"	113°50´8"
NORTH FLAT	ID-BOD-000488	WF	2,470					42°58´32"	115°39´47"
Dry Creek	ID-CMS-43004	WF	5,700				0	45°50´43"	116°45´51"
BALD MTN	ID-BOD-000474	WF	1,000					42°18´41"	116°56´56"
SPRING	ID-PAF-007033	WF					0	44°20´38"	117°8´1"
RED CANYON	ID-BOD-000476	WF						42°19´33"	116°57´4"
BLACK HAWK	ID-IFDS-007011	WF	6,225	1	0	1	0	43°22´49"	111°55´59"
CRUTCHER	ID-BOD-000475	WF						42°15´55"	116°52´36"
JIM BROWN BRIDGE	ID-TFD-001966	WF	400				0	43°4´42"	114°6´9"
Crater	ID-EIS-007029	WF	604				0	44°14´48"	111°46´42"
Peck Mountain	ID-PAF-007034	WF	136				0	44°52´13"	116°37´34"
ONEIDA NARROWS	ID-IFDS-007013	WF	583	0		0	0	42°13´26"	111°47´59"
RED BRIDGE	ID-TFD-001934	WF	45,862	0	0	5	0	42°47´16"	114°23´37"
Basin	ID-SCF-7191	WF	200					44°16´23"	114°49´42"
DANISH WFU	ID-CTF-007003	WFU	0				0	42°19´45"	112°22´6"
Arlington	ID-NPF-00016	WFU	1				0	45°31´6"	115°39´58"

Warm Springs	ID-PAF-007035	WF	23,760	0	0		0	44°23´0"	117°4´15"
ZENA CREEK	ID-PAF-007040	WF	700				0	45°4´10"	115°43´33"
West Fork	ID-NPF-000026	WFU	0				0	45°30´54"	115°39´23"
GOAT WFU	ID-PAF-007090	WFU	200					45°2´37"	115°17´6"
BUCKHORN WFU	ID-PAF-007060	WFU						44°52´41"	115°51´7"
MCCALLA WFU	ID-PAF-007041	WFU						45°20´26"	115°6´15"
Tag WFU	ID-PAF-00007019	WFU	5,000				0	45°24´18"	114°52´30"
Jack Fire	ID-TFD-001998	WF	800				0	42°5´16"	114°40´44"
Weston	ID-CTF-007020	WF	375				0	42°8´50"	112°8´56"
Sailor 2	ID-SRQ-002002	WF	2,200				0	42°40´59"	115°35´39"
Jim Sage	ID-TFD-001953	WF	5,400				0	42°7´27"	113°27´58"
Coyote Creek	ID-NPT-000024	WF	3,000	1		0	0	46°26´48"	116°50´22"
BELL	ID-TFD-001974	WF	400				0	42°50´41"	114°54´13"
Yatahoney	ID-BOD-000559	WF	1,102					42°13´47"	116°26´23"
BOULDER CREEK	ID-BOD-000481	WF	4,350	0		0	0	42°53´23"	116°41´56"
Gem County	ID-BOD-000632	WF	2,508				0	43°57´13"	116°21´42"
SMITHS CROSSING	ID-TFD-002013	WF	3,000				0	42°10´51"	115°10´34"
Black Canyon	ID-CTF-	WF	583			0	0	42°1´18"	112°6´21"

	007018								
Hula Fire	ID-SCS-002032	WF	563				0	42°54´9"	114°55´8"
Arkansas	ID-IFDS-007015	WF	1,498	0		0	0	42°32´5"	112°8´15"
Twin Buttes	ID-INE-007036	WF	9,436	0	0	0	0	43°29´5"	112°40´7"
Rowland	ID-TFD-002012	WF		0	0	0	0	41°56´57"	115°37´18"
ELK MOUNTAIN	ID-TFD-002017	WF		0		0	0	42°2´13"	115°6´32"
Wood Creek	ID-BOD-000629	WF	2,300				0	43°31´22"	115°51´59"
INDIAN VALLEY	ID-PAF-007118	WF	572	0			0	44°28´53"	116°24´39"
Pipeline	ID-IFDS-007020	WF	500		0		0	42°6´33"	111°56´39"
PEARLIE	ID-BOD-000714	WF	2,450				0	43°49´53"	116°50´48"
NORTH FORK	ID-SIS-007058	WF	800				0	44°41´57"	115°49´40"
Michaud Creek	ID-FHA-007006	WF	1,000			4	0	42°53´3"	112°35´7"
Elm Street Complex	ID-IPF-004001	WF	107		0		0	47°7´1"	116°13´14"
TONGUE COMPLEX	ID-BOD-000490	WF	46,680	0		3	0	42°15´53"	116°52´28"
JIM CANYON	ID-STF-002031	WF	4,300				0	41°57´23"	113°12´5"
Hidden WFU	ID-CWF-000039	WFU	1,400				0	46°21´24"	114°35´44"
Concord	ID-NPF-000022	WF	1,570				0	45°35´42"	115°44´5"

CEDAR SOUTH	ID-TFD-002057	WF	851				0	42°9´41"	114°49´53"
Lizard	ID-NPF-00046	WFU	450				0	46°13´54"	115°6´57"
Dog	ID-NPF-00047	WFU	1,200					46°6´36"	114°50´18"
Three Links	ID-NPF-00036	WFU	1					46°8´30"	115°5´21"
Snowslide WFU	ID-NPF-000014	WFU	5					45°56´59"	115°8´23"
Chain	ID-NPF-00042	WFU	300					46°19´42"	114°53´14"
Mink	ID-NPF-00041	WFU	1					46°3´24"	115°2´48"
Rhoda	ID-NPF-00048	WFU	2					46°14´12"	115°2´36"
Fitting	ID-NPF-0018	WFU	55			0		46°11´24"	114°52´36"
Drake	ID-NPF-00035	WFU	280				0	45°59´15"	115°7´42"
Kendrick	ID-PDS-041006	WF	175				0	46°36´24"	116°40´6"
COLD	ID-BOD-000777	WF	3,690	0	0	0	0	43°6´21"	115°22´17"
Doe	ID-NPF-00055	WFU	1					45°59´49"	115°5´49"
HORTON	ID-PAF-007136	WF	1,000				0	45°7´8"	116°4´20"
PAPOOSE	ID-SCF-7371	WFU	235					45°16´12"	114°48´18"
INSIDE DESERT	ID-TFD-002016	WF	3,041				0	42°19´51"	115°28´22"
Stewart	ID-EICI-007046	WF	360				0	42°23´50"	112°49´48"
GUN CANYON	ID-TFD-002024	WF	7,030				0	42°30´38"	113°27´41"
BALANCED	ID-TFD-002067	WF	500				0	42°33´20"	114°58´18"

Echo Springs	ID-SJS-32021	WF	505	0		1	0	47°18´50"	116°41´30"
RAINES	ID-PAF-007058	WF		4		3	0	45°18´52"	115°32´29"
Hubbard	ID-EICI-007045	WF	1,106	0		3	0	42°18´38"	112°39´1"
WALCOTT	ID-TFD-002078	WF	3,003				0	42°47´21"	113°19´8"
LAVA BUTTE	ID-TFD-002082	WF	690				0	43°12´19"	113°29´56"
Combine	ID-EICI-007050	WF	7,654	0		0	0	42°18´59"	112°48´38"
HORSE BUTTE	ID-TFD-002089	WF	334				0	42°33´9"	113°27´40"
Boxcar	ID-NPF-00061	WFU	40				0	45°56´23"	114°58´23"
Tony Fire	ID-NPF-000065	WFU	2				0	46°5´30"	114°55´36"
Cone Fire	ID-NPF-000075	WFU	3				0	46°12´18"	114°52´48"
Three Mile	ID-SIX-002071	WF	455				0	43°26´45"	114°50´47"
LOG	ID-NPF-000066	WFU	1					46°10´48"	114°55´48"
Battle Fire	ID-NPF-000076	WFU	7				0	46°13´47"	114°35´21"
Tiger	ID-NPF-00072	WFU	1				0	46°5´48"	114°56´12"
Bailey	ID-NPF-000073	WFU	1				0	46°14´18"	114°53´30"
Grizzly	ID-NPF-000064	WFU	80				0	46°6´12"	114°55´36"
Cleveland Hill	ID-IFD-007024	WF	2,500	1		7	0	42°16´23"	111°45´55"
SHOESTRING	ID-TFD-002095	WF	3,835				0	42°51´53"	114°42´16"
Wahoo	ID-NPF-000080	WFU	10				0	46°8´1"	114°39´1"

Double	ID-NPF-000081	WFU	1				0	46°14´22"	114°49´3"
Isaac	ID-NPF-000079	WFU	1				0	46°15´6"	114°49´26"
TAPPEN	ID-SCF-7242	WFU	7					44°53´11"	114°44´13"
Fox Fire	ID-NPF-000084	WFU	3				0	46°19´22"	114°48´21"
WOOD	ID-IDFS-007029	WF	2,700	0		0	0	42°13´15"	112°32´45"
Old Man WFU	ID-CWF-000034	WFU	75					46°15´1"	115°15´35"
Rock Lake WFU	ID-CWF-000035	WFU	55					46°16´52"	115°14´57"
BOHANNON	ID-IFDN-7174	WF	59				0	45°12´22"	113°40´28"
Middle Fork Complex	ID-BOF-000642	WF	17,416				0	44°20´58"	115°29´37"
Russell Ridge	ID-MCS-42013	WF	250	0		0	0	46°26´21"	116°17´35"
Chimney Complex	ID-CMS-43013	WF	51,000	0		7	0	46°2´48"	116°55´0"
DEADEYE	ID-STF-002077	WF	585				0	42°19´10"	114°16´30"
Slick 2 WFU	ID-CWF-061	WFU	20				0	46°34´46"	115°25´1"
Chapin Mountain	ID-SIX-002106	WF	400				0	42°27´8"	113°9´53"
Gifford Springs	ID-TFD-002107	WF	1,500				0	42°40´2"	113°15´35"
Birch Creek	ID-TFD-002105	WF	750				0	42°12´16"	113°49´27"

Moonshiner	ID-INE-007063	WF	2,672	0			0	43°29´2"	112°38´34"
Richfield West	ID-TFD-002127	WF	307				0	43°4´36"	114°15´12"
DOVE	ID-STF-002103	WF	600				0	41°51´8"	113°36´12"
WOOD	ID-IFD-007029	WF	2,855	0		0	0	42°13´15"	112°32´45"
Ramey	ID-SCF-7258	WFU	169					44°50´2"	114°52´19"
MOOSE	ID-SCF-7380	WFU	1					43°51´0"	114°3´59"
Bear Den Butte	ID-SCCI-002123	WF	29,532				0	43°8´47"	113°33´50"
Phillips	ID-SCCI-002125	WF	1,849				0	43°21´52"	113°53´26"
COW CREEK	ID-SCCI-002097	WF	5,280			0	0	43°20´48"	115°3´58"
Landmark Complex	ID-BOF-000796	WF	47,270				0	44°38´33"	115°31´57"
ROSS FORK	ID-FHA-007010	WF	1,134	0		1	0	43°1´38"	112°22´1"
Bitch Creek	ID-NPF-000088	WFU	1					46°4´0"	114°55´25"
SANDY	ID-BOD-000912	WF	10,600	0		0	0	44°9´5"	116°46´59"
0-7	ID-MCS-42016	WF	288				0	46°7´25"	115°47´7"
SWEETWATER	ID-IFD-0070036	WF	3,044	0	0	0	0	42°6´38"	111°3´0"
Taylor WFU	ID-CTF-007044	WFU	3				0	43°31´50"	110°59´10"
Middle	ID-TFD-	WF	2,300				0	42°10´39	113°51´6"

Mountain	002196							"	
ROSE CREEK	ID-BOD-000935	WF	363				0	42°46´12"	116°43´15"
Plummer	ID-NPF-000096	WFU	2					45°30´45"	115°39´30"
CONFLUENCE COMPLEX	ID-SCF-007371	WF	40,134				0	45°17´56"	114°33´5"
Turnbull	ID-TFD-002206	WF	4,000				0	42°27´29"	113°57´57"
CHIEF PARRISH	ID-SWS-000938	WF	3,690	0			0	44°1´29"	116°8´10"
GERMAN	ID-TFD-002219	WF	1,000				0	42°50´2"	113°31´33"
Boundary Junction	ID-CWF-047	WF	5,100			1	0	46°22´12"	115°35´1"
Bridge	ID-CWF-000038	WF	43,500			0	0	46°22´3"	114°37´16"
BLACK PINE 2	ID-STF-001943	WF	73,148	0	0	0	0	42°10´36"	113°14´12"
Shower Bath Complex	ID-SCF-7360	WF	122,600			4	0	44°37´15"	114°37´20"
CLEAR SAGE	ID-SCF-7228	WF	20,566					45°15´8"	114°24´59"
Van Horn	ID-SCF-7244	WF	1,650	0		0	0	44°45´55"	114°17´45"
Red Bluff	ID-SCF-7259	WF	62,591			3	0	44°44´29"	114°52´17"
Lake	ID-NPF-000109	WFU					0	45°37´30"	115°5´45"
GRAYS CREEK	ID-PAF-007143	WF	24,900	1		1	0	44°32´15"	116°22´59"
Brush Canyon	ID-IFDS-007037	WF	390				0	42°1´24"	112°15´27"
EAST ZONE COMPLEX	ID-PAF-007071	WF	300,022	6	0	7	0	45°15´0"	115°41´0"

Cleveland	ID-IFD-007027	WF	16,269	1	0	10	0	42°15´25"	111°48´29"
Murphy Complex	ID-TFD-002030	WF	652,016			3	0	42°10´19"	115°30´32"
Fawntooth	ID-IPF-04021	WFU	1				0	46°57´3"	115°30´38"
LA MOYNE WFU	ID-STF-002018	WFU	5				0	43°50´13"	115°1´7"
Mitchell	ID-IFD-007026	WF	9,473	0	0	0	0	42°17´32"	112°42´53"
ELLIE	ID-CTF-007072	WFU	0				0	43°24´30"	111°2´54"
KRASSEL COMPLEX	ID-PAF-007078	WFU	85,700				0	45°24´18"	114°52´30"
Maple	ID-CWF-0055	WFU					0	46°16´5"	114°44´7"
Spring Mountain	ID-CWF-000076	WFU					0	46°34´57"	114°54´7"
Syrup	ID-CWF-0058	WFU	50				0	46°15´32"	144°44´47"
County Line	ID-CWF-000077	WFU					0	46°35´3"	114°53´27"
Moose Creek WFU	ID-NPF-000047	WFU	48,630			1	0	46°6´36"	114°50´18"
Poe Cabin	ID-CMS-043014	WF	58,520	3		9	0	45°41´39"	116°28´40"
Spring Run	ID-CTF-007060	WFU	1				0	43°17´25"	111°3´58"
Elk Jensen	ID-CTF-007073	WFU	0				0	43°13´4"	111°13´21"
Bell	ID-NPF-000087	WFU	115				0	46°3´12"	114°29´56"
Trapper Ridge WFU	ID-BOF-000575	WFU	20,159				0	44°1´22"	115°21´10"

Cascade Complex	ID-BOF-000635	WF	302,376	1	0	4	0	44°40´9"	115°41´9"
Castle Rock	ID-STF-002132	WF	48,520	0	0	0	0	43°38´14"	114°33´39"
Slick	ID-CWF-054	WFU	410				0	46°34´58"	115°25´47"
BEAR WFU	ID-CTF-007046	WFU	3,621		0		0	43°14´11"	111°22´30"
Crag WFU	ID-CWF-000063	WFU						46°56´30"	115°35´35"
Elizabeth WFU	ID-CWF-000059	WFU	2				0	46°46´37"	115°14´20"
Cayuse WFU	ID-CWF-000029	WFU						46°38´4"	115°5´53"
Skull WFU	ID-CWF-000009	WFU	2					46°54´14"	115°19´20"
Fish Butte	ID-CWF-052	WFU	132					46°11´44"	115°24´34"
Fire Creek	ID-CWF-071	WFU						46°11´44"	115°24´34"
Rattlesnake	ID-NPF-000017	WF	102,000	5	0	3	0	45°25´51"	115°39´23"
HOMINY WFU	ID-CTF-007070	WFU	110				0	44°1´33"	110°56´3"
SHERMAN PEAK	ID-CTF-007057	WFU	0				0	42°27´37"	111°33´10"
TOTALS			2,495,879	24	0	82	0		

MONTANA

Incident				Structures Destroyed					
Name	ID	Type	Size	Primary	Commercial	Out Building	Fatalities	Latitude	Longitude
Madison Arm	MT-GNF-020	WF	3,660	0	0	0	0	44°41´58"	111°9´58"
Magruder Mtn #2	MT-BRF-5027	WFU	1					45°41´15"	114°48´46"
Magruder Mtn #1	MT-BRF-5026	WFU	1					45°42´25"	114°49´23"
FAREWELLL	MT-BID-000013	WF	521				0	45°33´2"	108°53´50"
Fort Harrison	MT-CES-034	WF					0	46°37´36"	112°9´46"
Halfway Pete	MT-BRF-5060	WF	3				0	45°43´15"	114°35´11"
Big Sag	MT-LED-022	WF	800				0	47°39´14"	109°46´57"
TIMBER CREEK	MT-MCD-027	WF	609				0	45°39´28"	104°59´42"
Fargo Coulee	MT-LED-024	WF	100				0	47°31´26"	108°50´42"
Black Coulee	MT-LED-026	WF	5,660			1		48°17´0"	107°49´0"
DIAMOND RING	MT-EAS-003	WF	270				0	46°36´22"	105°31´18"
CAMPBELL	MT-	WF	800				0	46°6´59"	105°40´51

	EAS-004								"
LITTLE WOLF CREEK	MT-CES-052	WF	547	0			0	47°18´27"	112°16´24"
Rugby	MT-LCF-000022	WF	130	0			0	46°59´24"	111°0´43"
NOVAK	MT-CES-00051	WF	1,859	0			0	47°17´22"	112°0´55"
RUMP	MT-MCD-048	WF	544				0	45°4´39"	105°33´6"
Bull Creek	MT-LED-027	WF	86					47°50´0"	108°44´0"
Swet Lake Cabin	MT-BRF-5039	WFU	1			0	0	45°31´42"	114°50´50"
Saddle Gulch	MT-BRF-5087	WFU	5					45°44´23"	114°39´14"
SAWMILL CREEK	MT-LNF-000145	WF	320	0	0	0	0	46°36´25"	113°42´2"
Wyman #2	MT-LNF-207	WF	800	0	0	0	0	46°21´28"	113°42´57"
Fisher Point	MT-LNF-000203	WF	200				0	46°29´56"	113°39´46"
VALLEY DRIVE	MT-EAS-008	WF	213				0	46°30´9"	105°40´38"
CUTT COULEE	MT-EAS-011	WF	1,020				0	46°5´45"	105°9´10"

Mile Marker 124	MT-SWS-000204	WF	6,231	0		0	0	46°45´0"	113°42´0"
Harrington Ridge	MT-BRF-5053	WFU	3,090			0	0	45°31´35"	114°53´21"
Elkhorn Ridge	MT-BRF-5099	WFU	225			0	0	45°29´14"	114°51´24"
Harrington Mountain	MT-BRF-5058	WFU	150			0	0	45°32´11"	114°55´6"
BRIARWOOD	MT-SOS-000007	WF	105				0	45°42´0"	108°30´0"
Patsy Anne	MT-BRF-5126	WFU	555				0	45°57´46"	114°26´41"
El Capitan West	MT-BRF-5116	WFU	1,317				0	45°59´3"	114°28´33"
Watchtower	MT-BRF-5124	WFU	40				0	45°51´52"	114°27´45"
JONES	MT-MCD-080	WF	1,206				0	46°17´8"	105°40´51"
SEVERSON ROAD	MT-EAS-00013	WF	250				0	46°15´16"	105°43´39"
GOODALE	MT-EAS-000015	WF	335				0	45°51´10"	106°12´4"
BALL RANCH	MT-EAS-000016	WF	628				0	45°52´54"	106°12´44"
SOUTH	MT-	WF					0	46°2´20"	106°10´21

MILLER	MCD-082								"
MOON CREEK SETTLEMENT	MT-EAS-000017	WF	1,161	0		0	0	46°2´13"	106°7´34"
OKERMAN	MT-EAS-000014	WF		0		1	0	46°12´57"	105°34´52"
WOLF CREEK	MT-MCD-087	WF	6,692	0		0	0	46°13´37"	105°49´37"
Tin Cup	MT-BRF-005138	WF	608	0			0	46°1´22"	114°14´1"
MAXWELL	MT-MCD-084	WF	1,700				0	45°56´44"	105°17´55"
Snake Creek	MT-BRF-5097	WFU	210				0	45°51´18"	114°42´29"
ROAD CREEK	MT-EAS-018	WF	5,770	0	0	1	0	45°31´38"	105°41´41"
Signal Rock 07	MT-BDF-129	WF	600				0	46°9´31"	113°46´59"
DeCock	MT-LG33-000001	WF	250				0	46°4´28"	107°3´6"
Pine Crest	MT-SOS-000008	WF	149	0			0	45°35´31"	109°7´37"
Lost Creek	MT-CRA-000098	WF	149				0	45°18´2"	108°26´58"

Ovando Point	MT-LNF-000253	WF	74				0	47°6´13"	113°0´51"
Ingomar Lake	MT-BRF-005148	WFU	100				0	46°13´7"	114°24´20"
POWDER RIVER COMPLEX	MT-MCD-096	WF	27,884	1		1	0	45°13´58"	106°12´35"
Ford	MT-SOS-000012	WF	804	3			0	45°47´22"	108°23´11"
BOYCE	MT-NES-003	WF	400					47°36´59"	109°41´49"
LAST DAY	MT-CMR - 008	WF	493				0	47°32´53"	108°7´41"
Black Cat	MT-SWS-000211	WF	11,758	0	0	7	0	47°1´20"	114°9´6"
Chouteau Co. Asst.	MT-NES-004	WF	2,800	0		2	0	47°43´0"	110°24´0"
BH	MT-BRF-005145	WF	758				0	45°39´0"	114°49´15"
LIGHTHOUSE	MT-EAS-000035	WF	996			1	0	46°30´53"	105°45´55"
BITTERROOT FIRE USE COMPLEX	MT-BRF-000160	WFU	18,790			1	0	45°57´46"	114°26´41"
Forest Grove	MT-LNF-	WF	180					47°4´18"	114°46´0"

	000640								
Chippy Creek	MT-NWS-431	WF	99,090	1		1	0	47°48´30"	114°59´50"
Porcupine	MT-GNF-062	WF	124				0	46°5´49"	110°24´39"
HICKS PARK	MT-GNF-088	WF	2,500				0	45°18´32"	110°14´39"
JOE LEG	MT-MCD-125	WF	388				0	45°48´5"	106°21´23"
Felix	MT-FNF-092	WF	645				0	48°11´12"	113°40´26"
STUBBLE	MT-FBA-135	WF	1,051					48°10´46"	108°35´49"
Jocko Lakes	MT-FHA-115	WF	36,388	1	0	7	0	47°11´56"	113°43´46"
SAWMILL COMPLEX	MT-LNF-211	WF	67,490				0	46°36´25"	113°42´2"
South Helen	MT-FNF-003	WFU	1				0	47°41´48"	113°17´23"
CONGER CREEK	MT-LNF-000143	WF	25,150		0	0	0	47°12´59"	113°2´13"
Brush Creek	MT-FNF-000039	WF	29,921				0	48°20´37"	114°54´38"
Rat Creek	MT-BDF-000113	WF	25,327				0	45°43´8"	113°51´4"

Pattengail Creek	MT-BDF-048	WF	15,297				0	45°41´27"	113°25´17"
FIVEMILE CREEK	MT-MCD-131	WF	1,370	0			0	45°3´25"	104°21´17"
AHORN	MT-LCF-000013	WF	52,505				0	47°31´48"	113°2´48"
MIDDLE FORK	MT-LCF-000008	WF	1,146				0	46°50´31"	110°26´32"
Fool Creek	MT-LCF-000009	WF	60,038			7	0	47°55´24"	112°59´17"
SKYLAND	MT-FNF-000035	WF	45,760	0	0	2	0	48°16´48"	113°23´6"
ROCK SPRINGS	MT-MCD-132	WF	3,237	0		0	0	46°52´7"	106°6´38"
WH COMPLEX	MT-GNF-000078	WF	29,100	0	0	0	0	45°14´8"	110°31´8"
GARCEAU	MT-FHA-107	WF	3,045	0			0	47°38´10"	114°26´30"
Calbick	MT-FNF-076	WF	1,011				0	48°6´51"	113°11´14"
Amphitheatre	MT-FNF-045	WFU	377					47°40´45"	113°11´13"
Turtlehead	MT-FNF-014	WFU	1,408				0	47°40´24"	113°13´9"

Corporal	MT-FNF-070	WF	16,104				0	47°53´31"	113°25´20"
Railley Mountain	MT-FNF-027	WF	21,858				0	47°17´58"	113°16´51"
Table Mountain	MT-FNF-101	WFU	100					47°52´40"	113°7´1"
WALK IN	MT-NCA-000032	WF	371				0	45°40´51"	106°27´11"
Meriwether	MT-HNF-033	WF	43,296	0		0	0	46°52´11"	111°52´56"
Rombo Mountain	MT-BRF-5130	WF	29,062	0			0	45°44´54"	114°14´7"
Chi Chi	MT-SOS-000018	WF	18,000	3	3	36	0	46°5´51"	110°10´23"
TOTALS			745,767	9	3	68	0		

Appendix B
Various News and Data Reports
From the Website – U.S. Air Quality, The Smog Blog,
Http://alg.umbc.edu/usaq/archives/2006_07.html

From the SMOGBLOG:

August 5, 2007

Haze in southeast/midAtlantic, fires in the west

Looking at the big picture from MODIS Aqua, the southeast and midAtlantic U.S. had significant haze today, likely enhanced by smoke, pushing fine particle concentrations into the Code Orange unhealthy range. In the northwest, dense smoke continued to cover Idaho, Montana, North Dakota, Minnesota, and southern Canada.

Climate of 2007
Wildfire Season Summary

National Climatic Data Center
15 November 200…..

“July

Fire activity spread dramatically across the West this past month. During mid-July, wildfires were burning across northern Nevada, eastern Oregon, and southern and central Idaho, and during the latter-half of July activity was focused across the Northern Rockies.

Idaho lawmaker blames grazing restrictions for wildfire's size

THE ASSOCIATED PRESS
Seattle Post-Intelligencer

July 24, 2007

BOISE, Idaho -- An Idaho state lawmaker-rancher is blaming federal grazing restrictions for the size and ferocity of a giant wildfire on the Idaho-Nevada border, a contention dismissed as baseless by the leader of a conservation group.

The Murphy Complex fire has burned across nearly 975 square miles, burning up grassland and killing at least one cow that couldn't escape the flames. Two small communities were briefly under evacuation orders.

Meanwhile, a northern Idaho man says firefighters set a backfire that destroyed his $1.2 million guest ranch, including an indoor riding arena.

And another northern Idaho resident reported that his home was looted after he fled a fire near Waha.

The Murphy Complex fire killed at least one cow owned by Rep. Bert Brackett, R-Rogerson, although officials say more dead cattle will likely be found.

"This didn't have to happen," he told The Times-News as he stood over the charred body of a cow. Had more cattle been allowed to graze, there would have been less available fuel, he said.

"I think we need to take a hard look at basic (grazing) policy issues because what we're doing just isn't working," Brackett said.

Jon Marvel, executive director of the Idaho-based conservation group Western Watersheds Project, disagreed.

"There is no scientific evidence that cattle or sheep grazing prevents fires at any time," he said. "If ranchers have evidence that grazing prevents fires, they should produce it."

Rick Vander Voet, a field manager with the U.S. Bureau of Land Management based in Jarbidge, Nev., said BLM offices are assessing grazing allotments to determine how the land is being affected by grazing regulations. He said the assessments are expected to be finished in the next two years.

The fire was about 30 percent contained, said Mark Wilkening, fire information officer, noting rain on Wednesday was helping.

Some buildings were being defended by firefighters, and power has been restored to Murphy Hot Springs and Jarbidge, Nev., which had been the subject of evacuation orders.

Meanwhile, the owner of Boulder Creek Outfitters, about eight miles north of White Bird in northern Idaho, said a backfire started last Thursday by firefighters in their efforts against the Poe Cabin Fire was left unmonitored and, when winds came up, burned over a mountain and down the other side to destroy the six buildings at the ranch on Friday.

"The backburn is what burnt us," Tim Craig told The Associated Press on Wednesday. "There was no monitoring it and the winds came and brought it over the hill."

He said he sent six employees out of the area when he saw flames approaching and then used heavy equipment to try to build a fire line around the ranch, but was forced to flee.

"I had to jump in a vehicle and drive through a bunch of flames," he said. "It killed deer right in the road. They weren't burnt at all - just no oxygen. The fire took all the air."

He said he is considering legal action.

Jodi Kramer, a spokeswoman for the Poe Cabin Fire, said the cause of the fire is under investigation but she had no information about any backfires that might have been started.

Laura Smith, a spokeswoman for the Nez Perce National Forest, said the Poe Cabin Fire was at 59 square miles and 20 percent contained on Wednesday, with about 400 managers and firefighters assigned to the blaze.

"We've got most of the flanks protected, especially up in the northern area, so that's either defensible space or structure protection, so we're focusing now on the southern flank," she said.

At another northern Idaho fire, the Chimney Complex south of Waha, an area resident returned from a mandatory evacuation to discover that about $9,000 worth of items had been taken between Friday and Saturday, according to a Nez Perce County sheriff's report.

The report said two computers, 200 DVDs, elk and deer meat, a case of red wine, a generator, five leather jackets, clothing, two chain saws and a wood splitter were taken.

Sheriff's officers say they are investigating.

On Wednesday, the Chimney Complex of fires had burned across about 80 square miles and was 65 percent contained, officials said.

About 13 large fires were burning in the state and had consumed about 1,400 square miles, according to the National Interagency Fire Center, based in Boise.

Western wildfire roundup

http://www.newwest.net/index.php/topic/article/wildfires_aggressive_in_idaho_oregon_montana/C38/L38/

Wildfires Aggressive in Idaho, Oregon

By Matthew Frank, 7-16-07

Oregon's Egley Complex Fire northwest of Burns blackened another 11,500 acres Sunday for a total of 101,000. The growth potential remains extreme and a precautionary evacuation was implemented Sunday night by the Harney County Sheriff's Department for the Yellow Jacket area. Five homes were evacuated until further notice. More than 1,800 personnel are assigned to the blaze, now about 45 percent contained. Visit InciWeb.org for more.

The Ahorn Fire burning 35 miles west of Augusta, Montana. Photo courtesy of the Forest Service.

Also in Oregon, the Monument Complex Fire burning in the Umatilla National Forest five miles north of Monument has jumped to 20,898 acres, zero percent contained. Power lines and 245 homes near Monument are threatened.

Visit the National Interagency Fire Information page for a rundown of all of Oregon's fires, totaling more than 156,000 acres.

Idaho

In Idaho, lightning storms sparked several fires that continue to grow. The Black Pine 2 Fire, ignited on July 6, is burning six miles southeast of Malta in the Sawtooth National Forest. A crew of almost 400 firefighters has the 72,000-acre fire 75 percent contained.

The Tongue Complex Fire, 45 miles south of Silver City took off fast Sunday, burning an additional 10,000 acres. Officials predict it will be tough to get a handle on the blaze with 97 firefighters preparing for more wind and heat. The Tongue Complex Fire is now 10 percent contained, after burning close to 48,000 acres.

The Chimney Complex fire, 19 miles south of Lewiston, prompted officials to issue a precautionary advisory for the area. Residents around Waha Lake and Redbird road have been advised to move

livestock and pack valuables in case evacuation is necessary. A crew of 178 is working on the fire, which now totals nearly 20,000 acres.

Montana
The Ahorn Fire, burning 35 air miles West of Augusta on the Lewis and Clark National Forest grew over the weekend from 600 acres to an estimated 4,000, helped by high winds. Firefighters were pulled, for safety reasons, from the fire as it spread in "all directions," under a thunderstorm, said Fire Information Officer Jack de Golia. A helicopter went down Monday morning near the fire's helispot, about three miles south of the Indian Point cabin. The pilot is reported to have minor injuries.

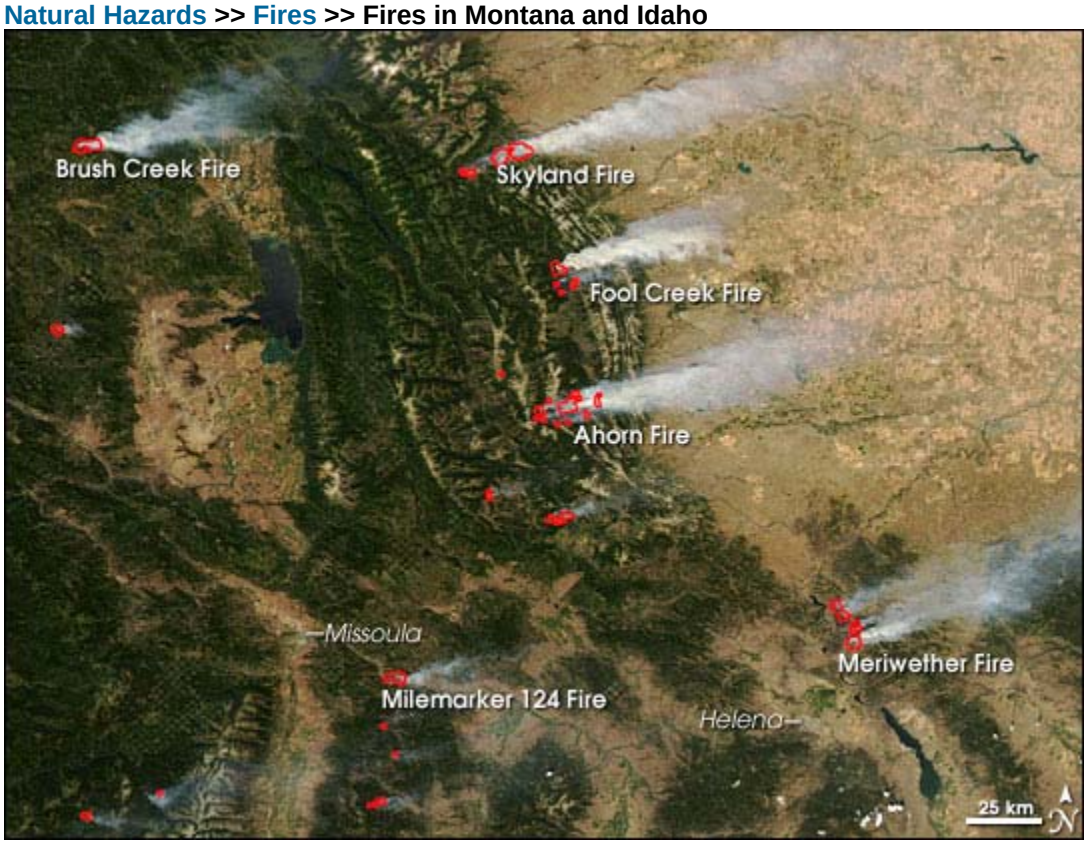
Meanwhile, the Patengail Creek Fire in Southwest Montana 10 miles north of Wisdom made significant movement Sunday afternoon fueled by high winds and was estimated at nearly 1100 acres by nightfall, according to InciWeb.org. Helicopters and air tankers were dropping water and retardant on the fire over the weekend, but no crews were on the ground because there are no escape routes or safety zones in the area. Two Hot Shot crews were heading into the area Sunday to try to start anchoring a line from the Upper Stone Lake.

Utah
The 363,000-acre Milford Flat Fire is 95 percent contained. Click here for words and pictures of what Utah's largest fire in history left behind.

Wyoming
Rain has helped to contained the 2,582-acre Salt Lick Fire burning northwest of Pinedale. It's 40 percent contained and the growth potential is low.

A new start dubbed the Sheep Trail 2 Fire 24 miles northwest of Kemmerer is up to 800 acres, zero percent contained.

For updates visit InciWeb.org and the National Interagency Fire Center.



Click here to view high-resolution version (865.38KB)
Image Acquired: July 31, 2007

Fires in Montana and Idaho

In the northern Rocky Mountains of Idaho and Montana, dozens of large, dangerous wildfires burned tens of thousands of acres in late July and early August 2007. Several communities in Montana were under evacuation on August 1, according to the daily report from the National Interagency Fire Center. Like much of the United States (with the notable exception of the southern Great Plains), the Northern Rockies of Montana and Idaho were experiencing

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moderate to severe drought in late July according to the weekly report from the U.S. Drought Monitor.

This image of Montana (with a little bit of Idaho included in the lower-left corner) was captured by the Moderate Resolution Imaging Spectroradiometer (MODIS) on NASA's Aqua satellite on July 31, 2007. Locations where the sensor detected actively burning fires are outlined in red. A westerly wind appeared to have been blowing at the time of the image (2:30 p.m. Mountain Daylight Time), and plumes of smoke spread from the mountains over the state's eastern plains. As of August 1, the Meriwether (20,745 acres) and Ahorn (36,311 acres) were the largest fires in the scene, but the Skyland Fire had grown most rapidly in the previous 24 hours; it grew by an estimated 7,505 acres to a total of 16,055 acres.

NASA's Terra and Aqua satellites both collect fire detection data over the United States at least twice a day, once in daylight and once at night. Through a partnership between NASA's Goddard Space Flight Center's MODIS Rapid Response Team, the University of Maryland, and the Remote Sensing Application Center of the USDA Forest Service, the satellite observations are relayed over the Internet to the Forest Service, which maps them. The Forest Service and its partners use the MODIS fire maps to help them make strategic decisions about where firefighting resources are needed at a national level.

The large image provided above has a spatial resolution (level of detail) of 250 meters per pixel. The MODIS Rapid Response Team provides twice-daily images of the region in additional resolutions.

NASA image courtesy the MODIS Rapid Response Team, Goddard Space Flight Center

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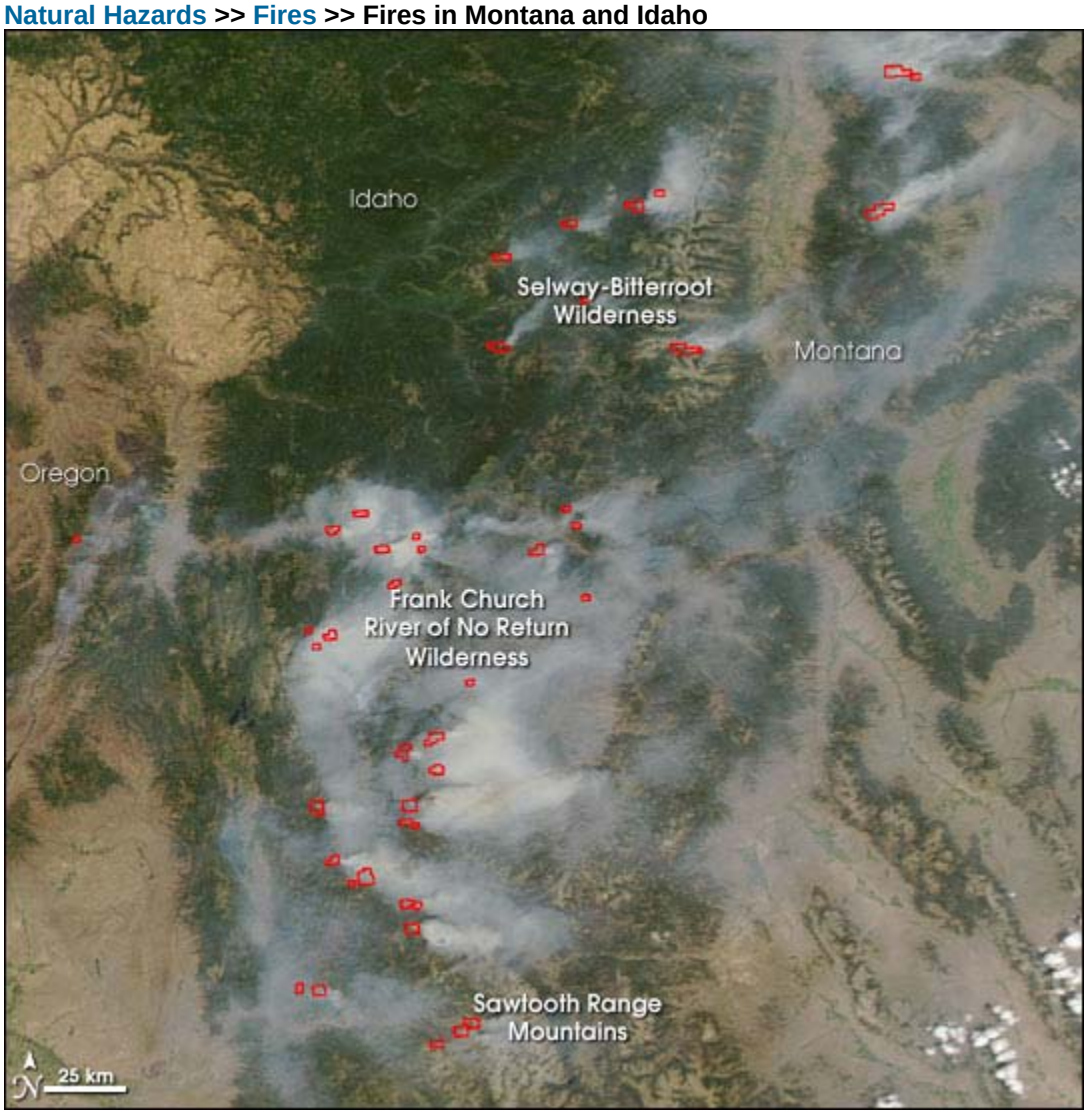

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Fires in Montana and Idaho

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In the Northern Rockies of Idaho and Montana, conditions were dry in July and August 2007. Dozens of large forest fires were burning in the area's remote,

rugged terrain, much of which is federally designated wilderness area. This image of the area was captured on August 1, 2007, by the Moderate Resolution Imaging Spectroradiometer (MODIS) on NASA's Aqua satellite. Places where MODIS detected actively burning fire are outlined in red. Dozens of large fires filled the skies with thick smoke.

According to the August 1 report from the National Interagency Fire Center, 11 large fires totaling more than 880,000 thousand acres were burning in Idaho. Five of these had been designated "Wildland Fire Use" fires, which means they will be allowed to burn according to pre-existing natural resource management plans. Because the forests of the Northern Rockies are adapted to naturally ignited fires, some fires must be allowed to burn to maintain the ecosystem in a healthy state.

The large image provided above has a spatial resolution (level of detail) of 250 meters per pixel. The MODIS Rapid Response Team provides twice-daily images of the region in additional resolutions.

NASA image courtesy the MODIS Rapid Response Team, Goddard Space Flight Center

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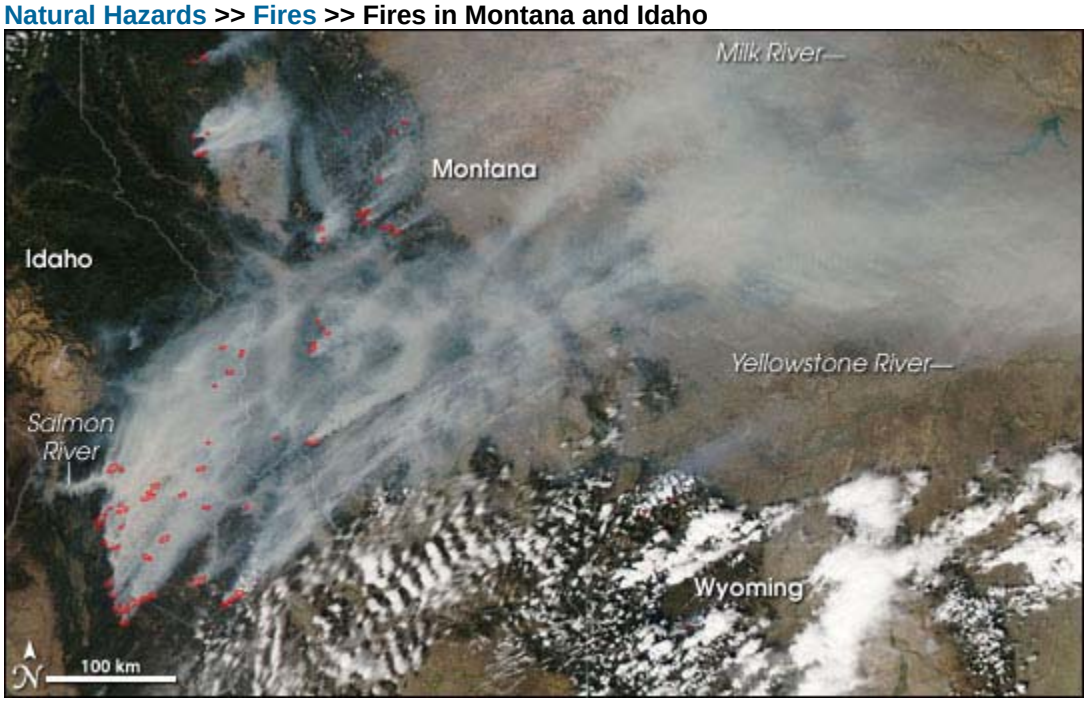

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Image Acquired: August 13, 2007

Fires in Montana and Idaho

Columns of thick smoke unfurled from forest fires burning across Idaho, Montana, and Wyoming and spread eastward across the plains at the foothills of the Northern Rocky Mountains on August 13, 2007. This image of the area was captured by the Moderate Resolution Imaging Spectroradiometer (MODIS) on NASA's Aqua satellite at 2:00 p.m. local time (U.S. Mountain Daylight Time). Locations where the sensor detected active fire are outlined in red. Fires are especially active in the Frank Church River of No Return Wilderness Area south of Idaho's Salmon

Where in the World

Image Posted
August 14, 2007

River. Gray-brown smoke cuts a diagonal swath across the center of the image. Smoke from these fires has been crossing the United States off and on throughout August, degrading air quality as far away as the East Coast.

The large image provided above has a spatial resolution (level of detail) of 250 meters per pixel. The MODIS Rapid Response Team provides twice-daily images of the region in additional resolutions.

NASA image by Jeff Schmaltz, MODIS Rapid Response Team, Goddard Space Flight Center.

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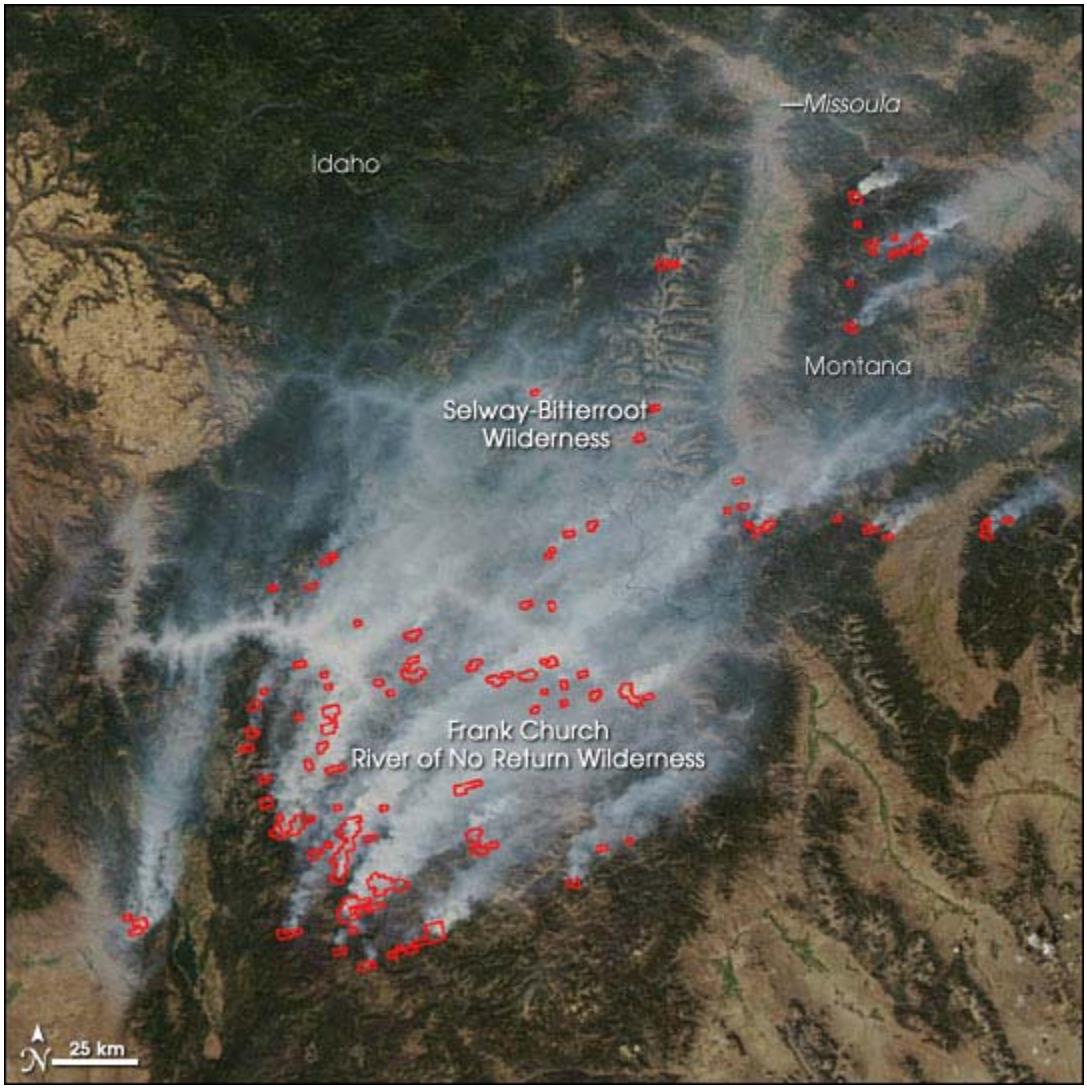

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Image Acquired: September 03, 2007

Fires in Montana and Idaho

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According to the September 4 report from the National Interagency Fire Center, 24 large fires burned in Montana and Idaho in early September

2007. Many of these fires had been burning in the states' remote, mountainous terrain for more than a month. Throughout the summer, the fires occasionally produced thick clouds of smoke that spread across the Great Plains and as far as the East Coast. This image from the Moderate Resolution Imaging Spectroradiometer (MODIS) on NASA's Aqua satellite shows the fires (red outlines) on September 3, 2007.

The large image provided above has a spatial resolution (level of detail) of 250 meters per pixel. The MODIS Rapid Response Team provides twice-daily images of the region in additional resolutions.

NASA image courtesy the MODIS Rapid Response Team, Goddard Space Flight Center

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